October 2020

Niagara-on-the-Lake
Fire & Emergency Services

Fire Master Plan

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Executive Summary

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

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

Current challenges faced by the NOTLFES are similar to those faced by many rural/urban interface fire departments in Ontario. Increased rigour from statutory and standards requirements related to firefighter health and safety, increased skills and competency requirements, changing work patterns where fewer firefighters are available for workday response, and increased emphasis on prevention and public education are examples of common themes.

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

Objectives

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

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

Scope of Work

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

A) Administration:

1. Evaluate all respects of the NOTLFES to determine optimal service levels for fire protection service to meet the current and future needs of the community including:
    - Fire protection delivery for legislative compliance
    - *Fire Protection and Prevention Act*
    - Section 21 Guidance Notes
    - *Occupational Health & Safety Act*
    - Municipal By-Laws
    - Fire protection delivery against National Fire Protection Association (NFPA), related Standards
    - Office of the Fire Marshal's Public Fire Safety Guidelines inclusive of the Office of the Fire Marshal's review for current administrative processes, workflow, and management practices.
    - Identify enhanced processes for technology including computer and information technology needs, system redundancies, data and records management systems, incident reporting, computer aided dispatch, mobile data terminals.
    - Assess mutual aid and automatic aid agreements with neighbouring municipalities.
    - Consideration for growth in population and density to the Town and Niagara Region.
2. Conduct a detailed trend analysis including issues and best practices regarding Fire and Emergency Services in an effort to identify opportunities for continued improvement, service optimization, and innovation.
3. Evaluate aspects of current fire communications agreements, technology, radio systems, paging systems, and operational formats for future optimization and infrastructure requirements.
4. Evaluate and review capabilities of existing staffing levels across all divisions including full-time and volunteer positions. Identify future needs to meet and maintain current and projected future service levels.
5. Conduct a detailed review of the current administrative facility location vs administration needs.
6. Evaluate existing Fire and Emergency Services operating budgets, capital budgets and any

reserves. Review and assess current fees for service and make any recommendations.

B) Community Risk Reduction:

1. Assess and evaluate the current Public Fire Safety Education programs for efficiencies and effectiveness against applicable standards/legislation and analysis of data analytics.
2. Evaluate the current Fire Prevention inspection and enforcement strategies to determine their adequacy and effectiveness against applicable standards/legislation and analysis of data analytics.
3. Review current fire investigation practices and equipment against applicable standards, legislative requirements, and best practices.
4. Conduct a comprehensive review of the current draft Community Risk Assessment (CRA) and provide comment for enhancement of this document.

C) Fire Operations:

1. Detailed review of service delivery levels against accepted applicable standards, legislation, community needs and industry best practices for identification of opportunities for efficiencies and enhancements.
2. Comprehensive examination of response times for each station against standards, legislation, community needs and best practices. Identify projected long-range needs and implementation strategies and timelines.
3. Review of current and emerging technologies that may be employed to effectively and efficiently improve current and future services.

D) Training and Professional Development:

1. Review existing service delivery against applicable standards and legislation.
2. Identify opportunities for enhancement and effectiveness of training practices to improve training delivery methods, infrastructure, props, tools, facilities, and enhancement of the training environment.

E) Apparatus and Equipment:

1. Analyze long range strategy for vehicle acquisition and equipment replacement.
2. Assess and evaluate all apparatus, vehicle and equipment conditions, maintenance programs, replacement schedules, and plans relative to existing and expected service demands, budget process, budget reserves, and preventive maintenance requirements.
3. Review applicable fire apparatus maintenance repair standards, legislation, and best practices to identify opportunities to increase efficiencies.

F) Emergency Planning:

1. Review of plans and systems against applicable standards, legislation, and best practices.
2. Evaluate present emergency planning processes and responsibilities and identify opportunities for increasing efficiencies and effectiveness including oversight and management of the current Emergency Management Program.
3. Evaluate current Emergency Operations Centre (EOC) location and capabilities.

Based on the aforementioned criteria (A – F) and through meetings with the Fire Chief and other stakeholders, the consulting team was able to complete a thorough review of elements that are working well and those requiring improvement within the NOTLFES.

The following recommendations are broken down into two categories within the Executive Summary. Strategic Recommendations are those that require Council approval as they may require funding from either the operational or capital budgets and/or increased staffing levels. The other recommendations are categorized as Operational Recommendations; these are recommendations in which the Fire Chief has direct authority.

NOTE: Since the following recommendations are broken into Strategic and Operational formats, they are not necessarily listed in a sequential order.

Strategic Recommendations

Rec #	Recommendation	Suggested Timeline
6	Hire a part-time Fire and Life Safety Educator to focus on community public education and Volunteer Public Education Coordination. An option is to utilize the Administrative Assistant, who is already trained as a Fire and Life Safety Educator.	Short-term (1 - 3 years)
7	Hire a full-time Fire Prevention and Public Education Officer to focus on Bed and Breakfast occupancies, hotels, long and short-term licensed rentals, secondary occupancies, restaurants, and other commercial buildings, as well as public education.	Mid-term (4 - 6 years)
8	Relocate headquarters staff to Station #1 to provide immediate call response from Monday to Friday office hours to reduce the turnout time for calls in the Old Town. This would be a temporary measure until a new headquarters could be built adjacent to Station #1.	Immediate (0-1 year)
9	Trial a duty crew model for 2021 on weekends, during the prime tourist season (e.g. June to September) and select long weekends/special events (e.g. Christmas Parade) to assess its impact on reducing turnout time.	Immediate (0-1 year)

Rec #	Recommendation	Suggested Timeline
10	A review of the volunteer firefighter compensation package should be undertaken.	Short-term (1 - 3 years)
11	Diesel exhaust ventilation systems should be installed in all the NOTLFES fire stations.	Short-term (1 - 3 years)
12	The Fire Chief present a response time goal for the approval of Council, which may reference the NFPA 1720 – expectation of 10 staff in 10-minutes (80 percentile), and that performance measures are continuously monitored. Fire Chief to continue monitoring response times along with how many times, if any, a full response component was not amassed.	Short-term (1 - 3 years)
13	It is recommended that the staffing levels be increased to a total of 30 firefighters at the Old Town (Station #1) and Virgil (Station #3) stations.	Short-term (1 - 3 years)
17	It is recommended that the Town conduct a needs assessment in the mid-term for a transition to digital technology.	Short-term (1 - 3 years)
18	It is recommended that a new Headquarters be built on land adjacent to Station #1 Old Town.	Short to Mid-term (1- 6 years)
19	It is recommended that the Town of Niagara-on-the-Lake amalgamate stations 2 and 4 into a larger station in both size and firefighter numbers.	Short to Mid-term (1 - 6 years)
24	It is recommended that the NOTLFES contact Fire Underwriters to acquire their Superior Water Shuttle Accreditation. Further, the Town should also maintain and expand the water source infrastructure that may be needed to improve the access to water supplies in rural areas such as dry hydrants and cisterns.	Short-term (1 - 3 years) and ongoing
25	It is recommended that the Town consider adding a purpose built EOC/Training Room in a future municipal construction.	Short to Mid-term (1 - 6 years)
26	It is recommended that a standby generator be obtained to power the Town Offices and Council Chamber in the event of a loss of power.	Immediate (0 - 1 year)
28	NOTLFES investigate contracting a third-party firm to recover insurance funds that are available from structure fires.	Short-term (1 - 3 years)

Operational Recommendations

Rec #	Recommendation	Suggested Timeline
1	It is recommended that NOTLFES prioritize and allocate staff time to pursue its accreditation with the CFAI.	Short to Mid-term (1 - 6 years)
2	Continued emphasis on additional staff time spent in fire prevention activities. In addition to public education, there should be emphasis placed on assessing building stock within the community to identify types and number of hazards that may exist.	Short-term (1 - 3 years) and ongoing
3	Work with developers and the public to encourage Home Sprinkler Systems and make this initiative an ongoing part of its fire prevention program and community risk reduction efforts.	Short-term (1 - 3 years) and ongoing
4	It is recommended that the CRA be completed as per *Ontario Regulation 378/18 and the Fire Protection and Prevention Act 1997 (FPPA) by July 1, 2024.*	Short-term (1 - 3 years)
5	The Department should continue its ongoing efforts towards certification for staff for each position (that requires or recommends certification) and ensure that certifications are maintained.	Short-term (1 - 3 years)
14	It is recommended that the NOTLFES review the firefighter station assignments to realign them so that firefighters may be assigned to stations closer to their place of residence. A policy should be developed that addresses this requirement in the future.	Immediate (0 - 1 years)
15	The Fire Chief contact the NEMS to review and update the tiered medical agreement.	Short-term (1 - 3 years)
20	It is recommended that the NFPA 1901 and ULC S-515-12 and other related NFPA standards relating to vehicle design, replacement, and refurbishing, be utilized.	Short-term (1 - 3 years) and ongoing
21	It is recommended that permanently fixed standby generators be installed in all stations that start-up upon detecting a power failure.	Short to Mid-term (1 - 6 years)
22	It is recommended that all fire hydrants be inspected and tested as required in Articles 6.6.5.2. through 6.6.5.7. of Ontario Regulation 213/07 of the *Municipal Act*, and NFPA 291, Recommended Practises of Fire Flow Testing and Marking of Hydrants. Further, NOTLFES work in conjunction with the NOTL Water Department to convert the steamer ports over to storz couplings.	Short-term (1 - 3 years)
23	It is recommended that the NOTLFES acquire 5” (125 mm) supply lines with 4” (100 mm) storz couplings to be assigned to the aerial devices.	Short-term (1 - 3 years)

Rec #	Recommendation	Suggested Timeline
27	It is recommended that the NOTLFES take advantage of any grants that may be available for training or equipment purchases.	Short-term (1 - 3 years)
29	It is recommended that the fees schedule for services provided by the NOTLFES be reviewed annually to ensure they meet current standards.	Short-term (1 - 3 years)

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DEFINITIONS

Immediate	Recommendations that should be addressed urgently due to the legislative or health and safety requirements
Short-term	Recommendations that should be addressed within 1 – 3 years
Mid-term	Recommendations that should be addressed within 4 – 6 years
Long-term	Recommendations that should be addressed within 7 – 10 years
AED	Automatic External Defibrillator
AVL	Automatic Vehicle Locators
BLS	Basic Life Support
CAD	Computer Aided Dispatch
CAO	Chief Administrative Officer
CBRNE	Chemical Biological Radiological Nuclear Explosive
CEMC	Community Emergency Management Coordinator
CERB	Central Emergency Reporting Bureau
CFAI	Commission on Fire Accreditation International
CISC	CRTC Interconnection Steering Committee
CPSE	Centre for Public Safety Excellence
CRA	Community Risk Assessment
CRTC	Canadian Radio-television & Telecommunications
DPG	Dwelling Protection Grade
DRD	Drag Rescue Device
EAP	Employee Assistance Program
EMCPA	Emergency Management & Civil Protection Act
EMT	Emergency Management & Training Inc.
EOC	Emergency Operation Centre
ERP	Emergency Response Plan
EVT	Emergency Vehicle Technician
FC	Fire Chief
FESO	Fire and Emergency Services Organization
FMP	Fire Master Plan
FPO/PFLSE	Fire Prevention/Public Fire Life Safety Educator
FPPA	Fire Prevention & Protection Act
FUS	Fire Underwriters Survey
GPS	Global Positioning System
HFSC	Home Fire Sprinkler Coalition
HR	Human Resources
IP	Internet Protocol
IRM	Integrated Risk Management Approach

MDT	Mobile Data Terminal
NEMS	Niagara Emergency Medical Services
NFPA	National Fire Protection Association
NG 9-1-1	Next Generation 9-1-1
NIOSH	National Institute for Occupational Safety & Health
NIST	National Institute of Standards and Technology
NOTL	Niagara-on-the-Lake
NOTLFES	Niagara-on-the-Lake Fire & Emergency Services
NRHU	Niagara Regional Health Unit
OAFC	Ontario Association of Fire Chiefs
OFC	Ontario Fire College
OFMEM	Office of the Fire Marshal and Emergency Management
PFPC	Public Fire Protection Classification
PPE	Personal Protective Equipment
PSAPs	Public Safety Answering Points
PTSD	Post-Traumatic Stress Disorder
RCMP	Royal Canadian Mounted Police
RFP	Request for Proposal
RTT	Real-time Text
SOG	Standard Operating Guideline
SOP	Standard Operating Procedure
SRA	Simplified Risk Assessment
SWOT	Strengths, Weaknesses, Opportunities, Threats
TSP	Telecommunications Service Provider
VOIP	Voice Over Internet Protocol

Overview

Project Initiation

In 2020, the Town of Niagara-on-the-Lake issued a Request for Proposal (RFP) on behalf of its Fire Department. As the successful bidder, Emergency Management and Training Inc. (EMT) has worked collaboratively with the Town of Niagara-on-the-Lake and the Niagara-on-the-Lake Fire & Emergency Services (NOTLFES) in the gathering of data and development of this Fire Master Plan (FMP). EMT would like to thank all staff and the community for their input.

Review Process and Scope

Emergency Management and Training Inc. (EMT) has based its review process on the Town's initial Request for Proposal (RFP) and the response document submitted by EMT.

The specified areas noted in the project's RFP were reviewed by utilizing best practices, current industry standards, and applicable legislation as the foundation for all work undertaken. EMT also used both quantitative and qualitative research methodologies to develop a strong understanding of current and future needs and circumstances of the community, as well as the customer service demands of the public.

Based on the review of the Fire Department's facilities, equipment, staffing, programs, and related data, EMT is submitting a total of 27 recommendations for consideration and implementation.

Performance Measures and Standards

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

- The of the Fire Marshal and Emergency Management (OFMEM) Public Safety Guidelines
- The Office of the Fire Marshal Office and Emergency Management (OFMEM) Comprehensive Fire Safety Effectiveness Model
- *The Fire Protection and Prevention Act*
    - *O.Reg 378/18 – Community risk assessments*
- The National Fire Protection Association (NFPA) standards
    - NFPA 1221 addresses recommended standards in relation to communications/dispatching services
    - NFPA 1720 addresses recommended standards for volunteer fire departments
    - NFPA 1730 addresses recommended standards for fire prevention and education activities

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

Project Consultants

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

- Darryl Culley, President Emergency Management and Training Inc.
- Rick Monkman, Fire & Emergency Services Consultant
- Jeremy Parkin, Fire & Emergency Services Consultant

Together, the team has amassed a considerable amount of experience in all areas of fire and emergency services program development, review, and training. The EMT team have worked on projects that range from fire service reviews, the creation of strategic and fire master plans, Community Risk Assessments, and development of emergency response programs for clients.

SECTION 1 – Community & Fire Department Overview

1.1 Community Overview

1.2 Fire Department Composition

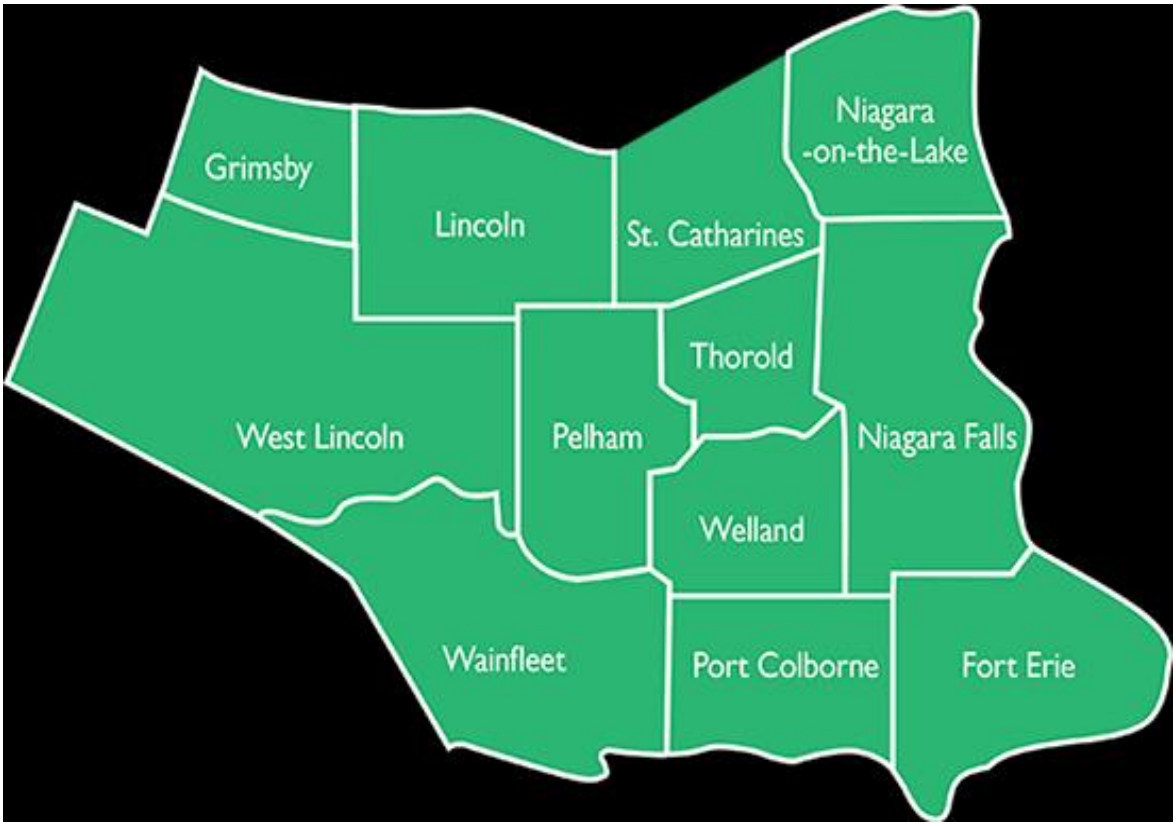
Section 1: Community and Fire Department

1.1 Community Overview

The Town of Niagara-on-the-Lake was settled in 1781 and incorporated in 1792. It is located in the Niagara Peninsula and is one of 12 municipalities that makes up the Regional Municipality of Niagara. The Town is home to a population of approximately 17,511 (2016 census)[1] residents, largely located within the villages of Old Town, Virgil, St. Davids, Queenston, and Glendale.[2]

The Town's population is forecasted to grow to roughly 22,400 people by 2031. With a land area of approximately 132 km^2, the community contains an abundance of significant rural areas, agricultural lots, and natural areas, including the Niagara River, provincially significant wetlands, and environmentally sensitive areas. It is well known for its perfect climatic conditions for growing grapes for the production of wines. The Town normally sees in excess of 3 million visitors per year, 2020 being an exception due to COVID-19.

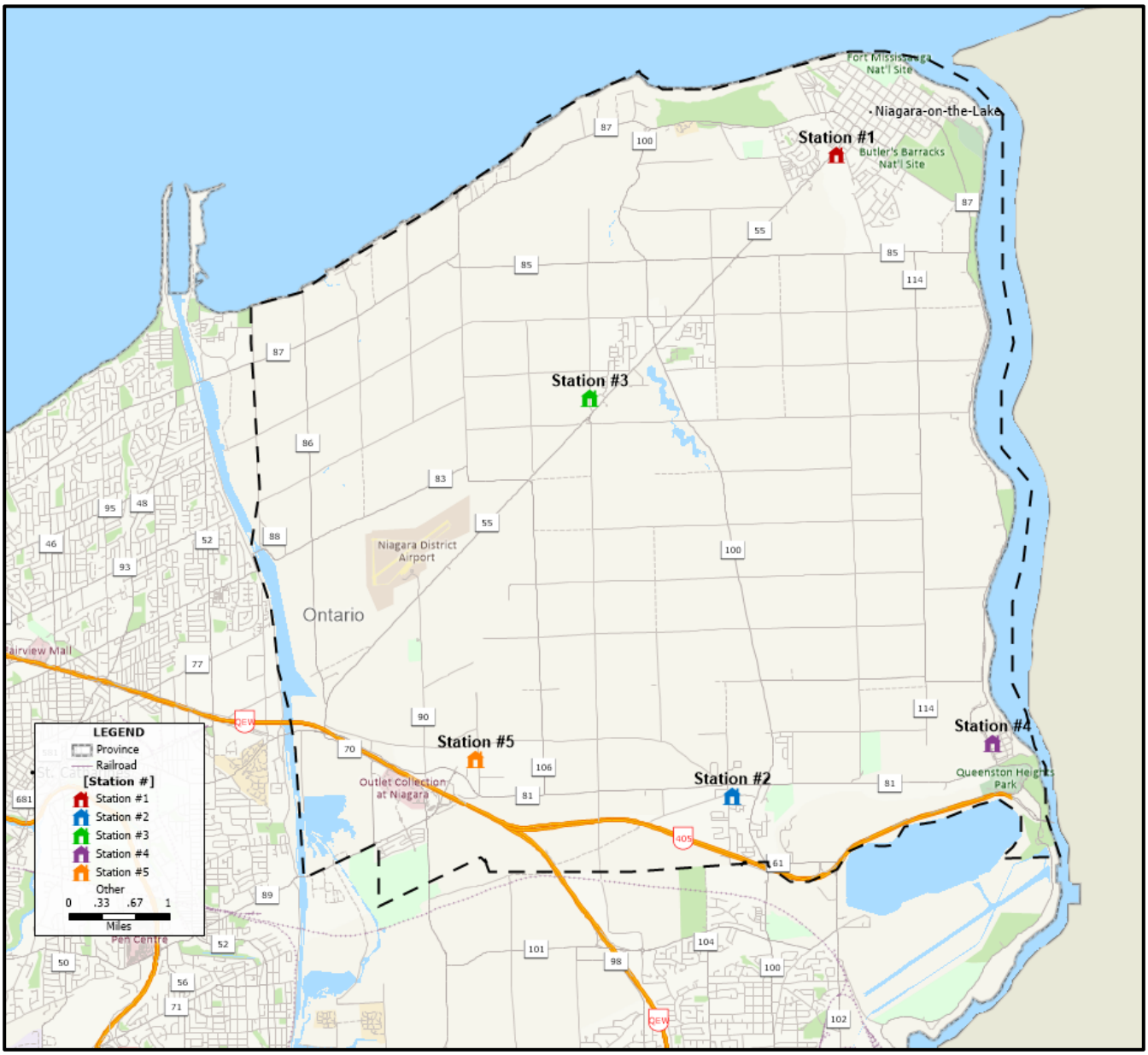
FIGURE #1: Map of Regional Municipality of Niagara



[1] https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=3526047&Geo2=PR&Code2=35&SearchText=Niagara-on-the-Lake&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=3526047&TABID=1&type=0

[2] https://www.notl.org/content/visiting-our-community

FIGURE #2: Map of Niagara-on-the-Lake with Station Locations



1.2 Fire Department Composition

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

The NOTLFES currently provides fire protection services from five fire stations located in the communities of Old Town, St. Davids, Virgil, Queenston, and Glendale. Evidence of the history and tradition within each of the volunteer fire stations located in these communities remains visible in each of these stations today. Pictures and plaques mounted on station walls reflect the years of dedicated service the volunteer firefighters have provided to their respective communities.

This sense of community pride continues in the commitment of today's volunteer firefighters as indicated by their individual and coordinated efforts to provide fire protection services to their local areas and the larger community. Each of the five fire stations continues to host individual volunteer firefighter associations that remain active in fundraising efforts and support of their local communities.

The five fire stations are as follows:

- District 1 – Old Town Station – 22 Anderson Lane
- District 2 – St. Davids – 745 Warner Road
- District 3 - Virgil – 1391 Concession 6 Road
- District 4 – Queenston – 5 Dumfries Street
- District 5 – Glendale – 350 Townline Road

The NOTLFES responds to approximately 600 to 700 calls for service per year. These incidents include, but are not limited to, fire related incidents, medical assist, water rescue, and motor vehicle collisions.

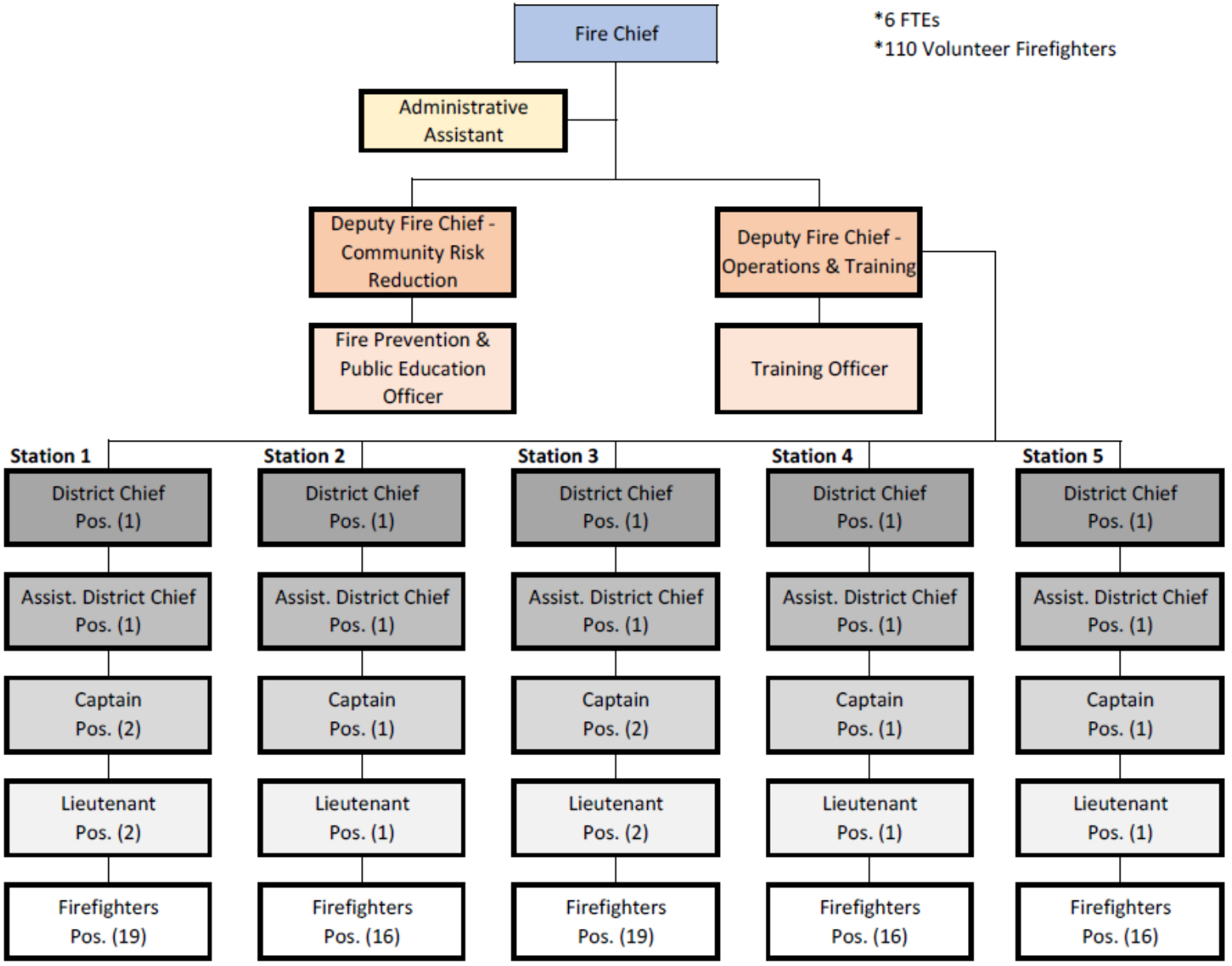
The Fire Department staff includes:

- One (1) full-time Fire Chief
- Two (2) full-time Deputy Fire Chiefs
- One (1) full-time Training Officer
- One (1) full-time Fire Prevention Officer
- One (1) full-time Administrative Assistant

Each station has a complement of district chiefs, volunteer assistant district chiefs, captains, lieutenants, and firefighters who respond out of the five fire stations. The total firefighting force for the Fire Suppression/Operations Division consists of 110 volunteer firefighters.

The organizational chart noted in FIGURE #3 reflects the general reporting structure within the Fire Department.

FIGURE #3: Fire Department Organizational Chart



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

The Fire Service has developed a Vision, Mission and Core Values for their organization to follow for all to view. The NOTLFES has developed and received Council's approval for new Vision, Mission and Core Values Statements.

The following are the Vision, Mission, and Core Values Statements:

***VISION STATEMENT**:*

To be high-performing, progressive, and visionary in the provision of emergency services within our community.

***MISSION STATEMENT**:*

To protect lives and property through prevention, education, and response.

CORE VALUES STATEMENT:

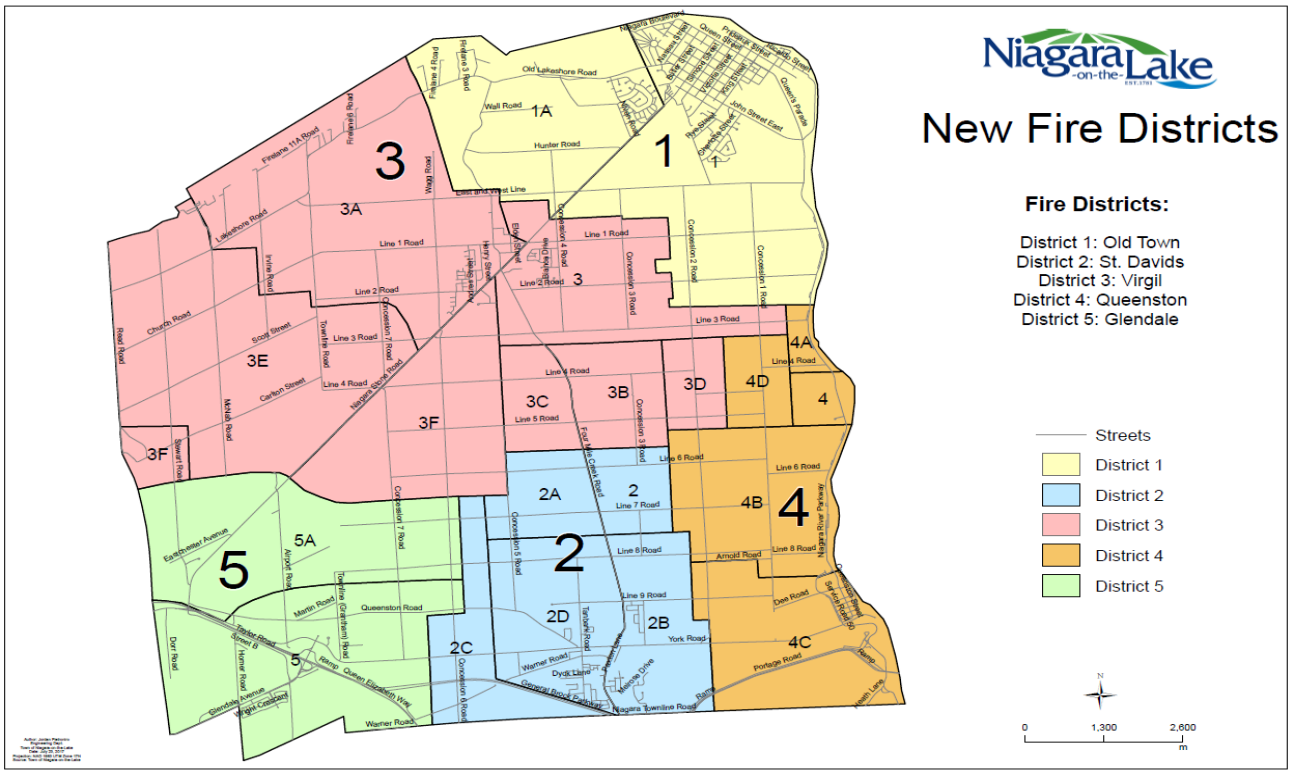
- ***Commitment –** We feel responsible for the goals, mission, and vision of the department and are dedicated to upholding and achieving them. We are committed to our organization and each other.*

- ***Teamwork –** We are highly skilled in building trust, solidarity, and collaboration. We value our trust and respect for each other and are loyal to our fellow firefighters and community.*

- ***Community –** We share common attitudes, interests, and goals. The needs of our community are at the forefront of all that we do.*

Time, collaboration, and effort have been invested in developing these core Values, Mission, and Vision Statements. Having them posted at each fire station will help ensure new firefighters and the community understand where the focus of the department is.

FIGURE #4: NOTL Municipal Boundaries and Fire Station Response Boundaries



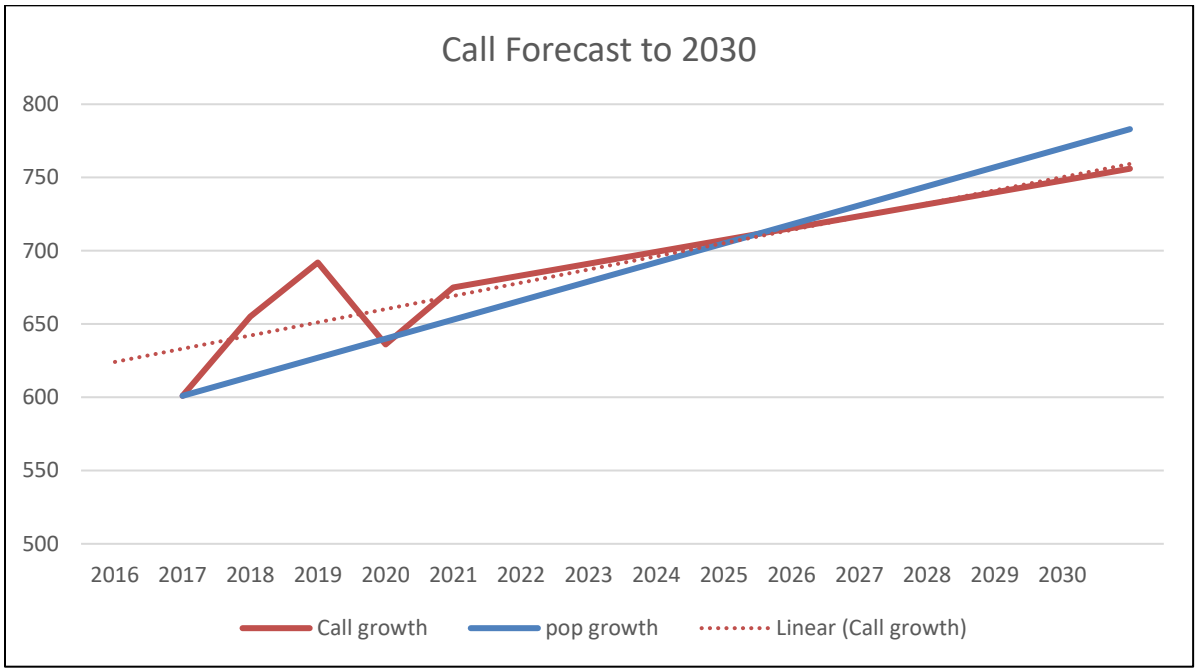
1.2.1 Community Growth

According to Statistics Canada, the population of Niagara-on-the-Lake is approximately 17,511 (2016 census) people and is forecasted to grow to roughly 22,400 people by 2031[3], according to the 2015 Official Plan Review – Growth Analysis. This represents an estimated population increase of over 4,889 citizens or approximately 27% from 2016 - 2031. This percent increase in population growth may not translate directly into a call volume increase of the same percentage for the Fire Department. Over the past 5 years, the call volume growth has been approximately 12%.

Using both population growth and call volume growth would indicate call volumes in 2030 being approximately 756-783 annual calls.

[3] https://notl.civicweb.net/document/6185

FIGURE #5: 10-year Call Projection



How much the call volume will increase, however, is unknown because population percentage growth or historical call growth are not the only factors related to calls for service. Other factors include:

- population demographic changes (e.g. aging population may increase medical calls)
- variations in tourist populations (e.g. COVID-19 restrictions reduced the numbers of vehicles and persons visiting the Town in 2020)
- changes in policy/protocols (e.g. changes in tiered response or other dispatch protocol)
- commercial development (e.g. both types and size of development)
- weather events (e.g. a single weather event can increase call volume significantly)
- technology changes (e.g. development of CO alarms increased calls)

The chart helps to illustrate a correlation with an increase of population and an associated increase in call volumes. This will then translate into an increase in demand on the volunteer firefighters. This type of increase will need to be monitored in conjunction with response times and volunteer firefighter turnout.

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

Key areas to monitor include medical related responses which account for approximately 17% and fire alarms which make up more than 33% of the Department's annual call volume.

As an example of anticipated growth, the Glendale secondary plan shows both commercial and residential growth. The planned development, which is illustrated in FIGURE #5, indicates in the dark blue areas where the new proposed structures will be built. There are many large developments slated for several areas of the Town that have not received formal approvals. These include residential, hotel, and commercial structures.

FIGURE #6: Glendale Demonstration Plan

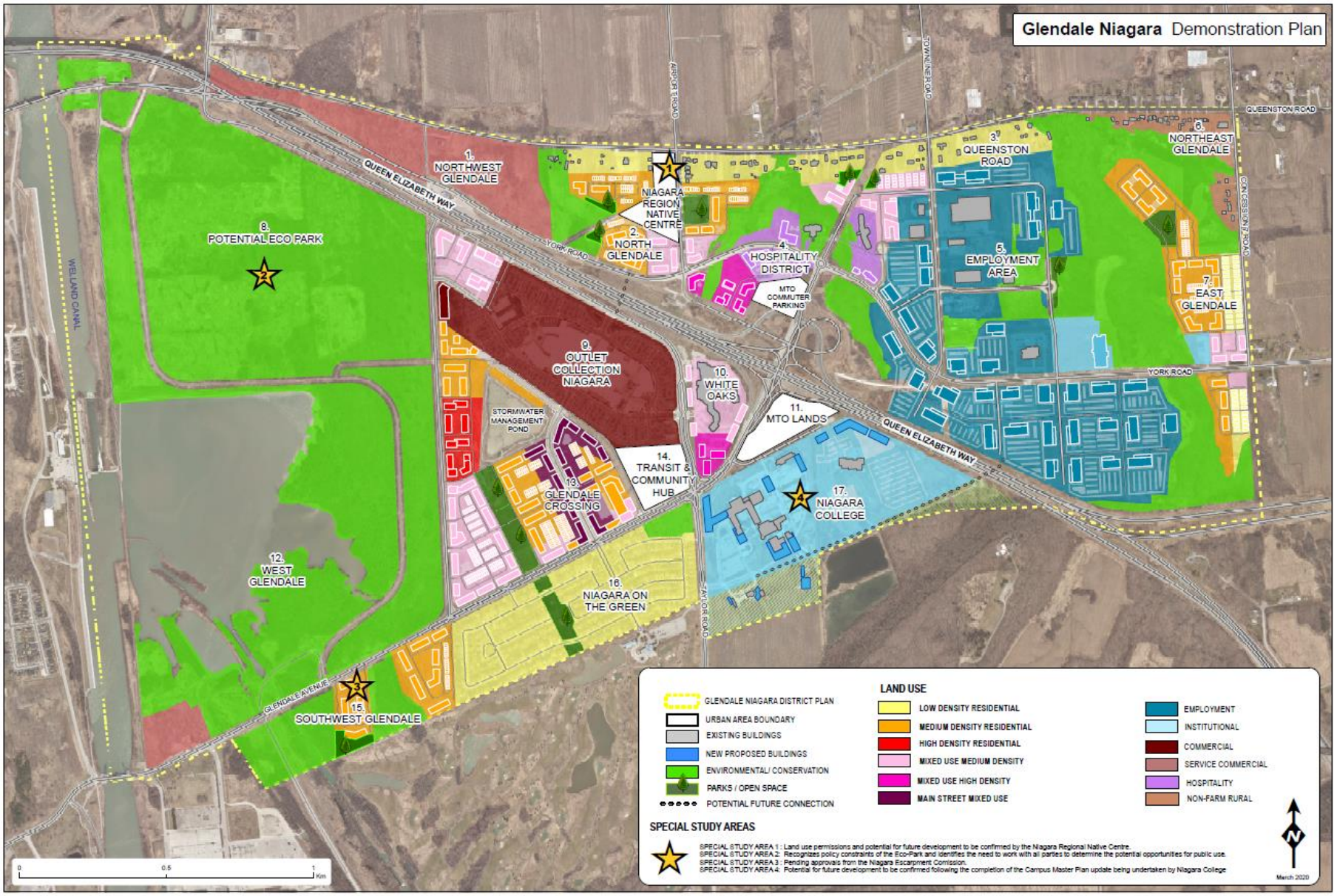
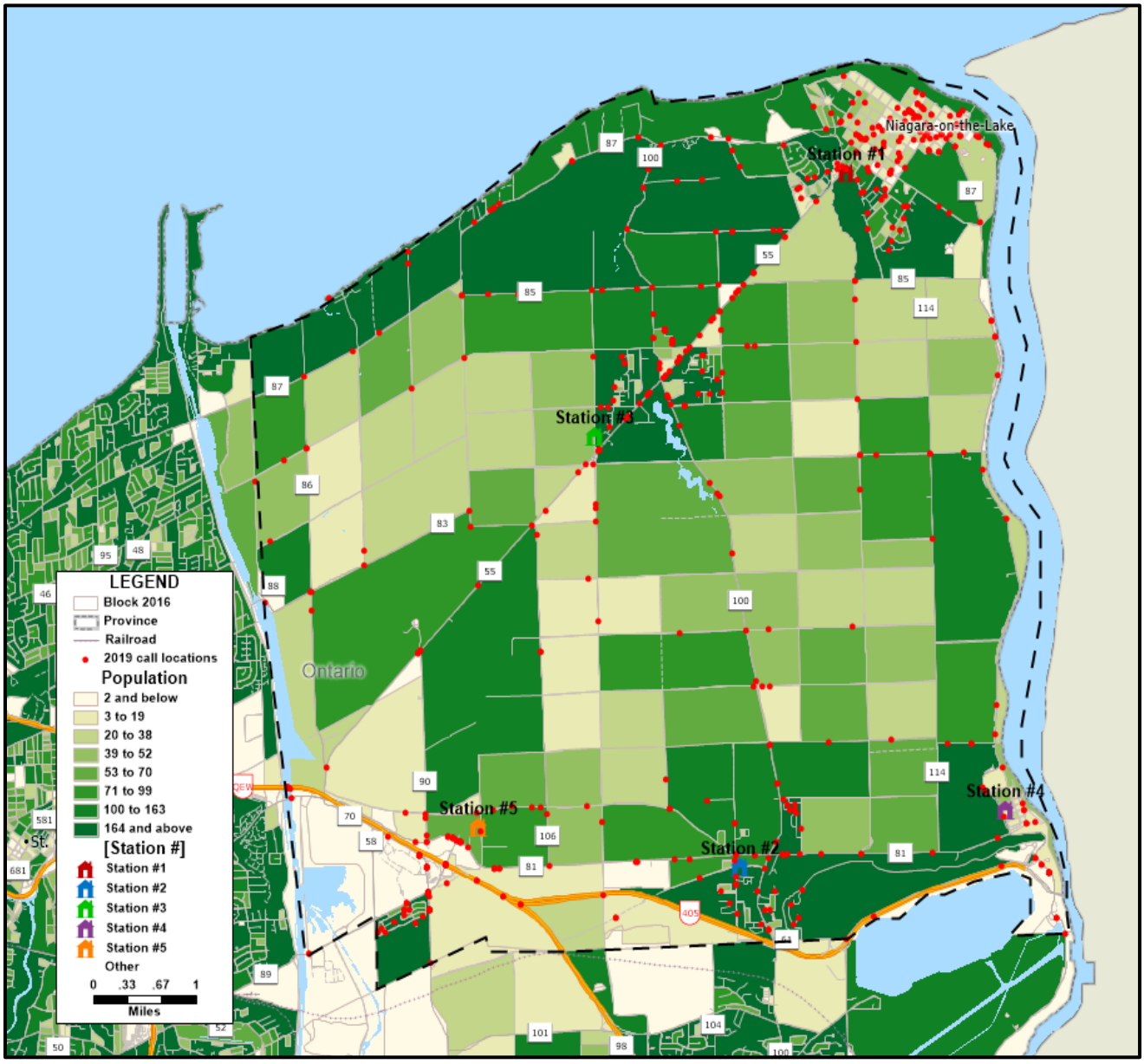


FIGURE #7: Population Density Map and 2019 Call Locations



Based on the 2016 population, the population density of NOTL is approximately 132 residents/km^2.

In a 2018 BMA Municipal Study on cost per capita, Niagara-on-the-Lake paced in the middle range of cost per capita of municipalities with a population range of 15,000 – 29,999 people. The top end is $294.00 per capita, whereas NOTL is at $111.00 per capita costs.

Unfortunately, the cost per capita does not factor in the unique pressures that NOTL faces with more than 3.2 million visitors a year and the additional infrastructure demands for the tourism such as accommodations, restaurants, vehicles on the roads, etc. These create pressure for the fire service, through both fire prevention requirements (education and inspection) and emergency response.

If it was assumed that none of the visitors stayed overnight, the number of tourists is equivalent to more than 8,700 permanent residents (higher when considering overnight accommodations). With this in mind, including consideration of per capita and visitor time, the cost per capita is 67% of the current chart, closer to $74.37 inclusive of amortization, $58.29 exclusive of amortization.

This is a positive reflection on the NOTLFES and the level of service it provides to the community of Niagara-on-the-Lake in a cost-effective manner.

Each municipality's results are influenced to varying degrees by a number of factors including:

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

TABLE #1: Fire Service Costs per Capita re Population 15,000 to 29,999

Municipality	Net Cost per Capita Excl. Amort.	Net Cost per Capita Incl. Amort
Centre-Wellington	$45	$53
Strathroy-Caradoc	$47	$57
West Lincoln	$49	$59
Woolwich	$47	$61
Bracebridge	$50	$62
Huntsville	$50	$63
Tillsonburg	$64	$67
Wilmot	$61	$70
Springwater	$66	$75
Pelham	$59	$77
Grimsby	$69	$79
Middlesex Centre	$67	$81
Lincoln	$71	$89
Niagara-on-the-Lake	$87	$111
King	$89	$111
Prince Edward County	$92	$112
Port Colborne	$142	$157
East Gwillimbury	$140	$168
Kenora	$146	$168
Thorold	$181	$194
Collingwood	$186	$208
Owen Sound	$207	$214
Brockville	$286	$294
Average	**$100**	**$114**
Median	**$69**	**$81**

Recommendation(s)

No recommendations for this section.

SECTION 2 – Planning

2.1 Three Lines of Defence

2.2 Industry Standards and Best Practises

2.3 Strengths, Weaknesses, Opportunities, and Threats

2.4 National Fire Protection Association Standards

2.5 Establishing and Regulating By-law

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

2.7 Commission on Fire Accreditation International

2.8 Stakeholder Surveys

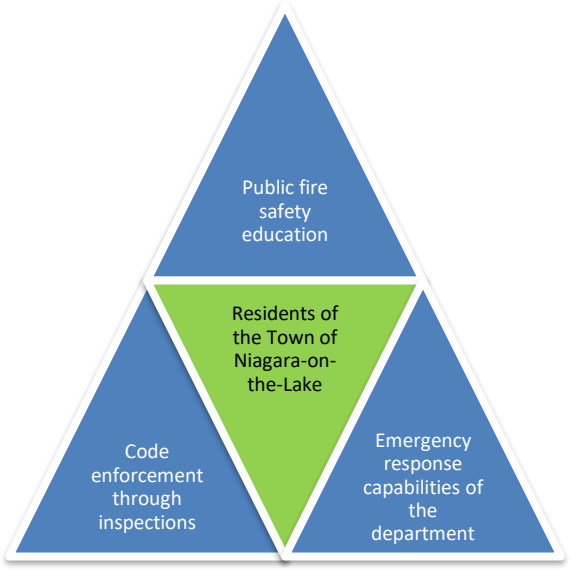
Section 2: Planning

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

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 National Fire Protection Association (NFPA). Adherence to these standards is not mandated but they form the foundation of the fire services recommended best practices. These NFPA standards are also utilized by organizations such as the Fire Underwriters Survey (FUS) group to conduct their assessments of a fire department and the community. The provincial Fire Marshal Offices and provincial fire schools also use them to form the foundation of their evaluation and training programs.

2.2 Industry Standards and Best Practises

In 2014, the Province of Ontario adopted a move to the NFPA Standards for training and certification courses at the Ontario Fire College. To assist with Emergency Management & Training Inc.'s review, reference has been made to key NFPA Standards that identify services that should be offered and how they are to be delivered based on the composition of the fire department.

To assist with EMT's review and resultant recommendations, reference has been made to NFPA Standards, the North American benchmark for fire services.

It is quite apparent that the Fire Chief is very active in reporting to both the CAO and Council on Fire Department matters. By initiating this FMP project, Niagara-on-the-Lake is endeavoring to meet the expectations of this noted section of the NFPA Standard and should be commended.

2.2.1 NFPA 1720

NFPA 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments. To provide the Fire Department more defined focus on what the ultimate goals for emergency response criteria are, the NFPA suggests that response times should be used as a primary performance measure in fire departments.

Based on NFPA 1720, NOTLFES is categorized as a volunteer fire department because more than 85% of its staff are volunteer. As such, response time criteria should be focused on the recommendations as seen in the following chart.

Note: The Suburban and Rural sections illustrated in TABLE #2 relate to the varied populations within the Town (Suburban and Rural) and have been used in relation to response goals and expectations. If the criteria are simply based on the overall population verses square kilometres ratio, Niagara-on-the-Lake has a population ratio of 131 residents per square kilometre, which means that it falls well within the Rural category. However, there are pockets of population within the communities of Old Town, Virgil, and St. Davids that exceed this Rural category. Which means that NOTLFES should also consider future reporting based on the Suburban response criteria as a response guideline for those more heavily populated areas.

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

2.2.2 NFPA 1201

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 (CAO) and governing body (Council), create a master plan 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 1720 (refers to goals and expectations for Volunteer Fire Departments) 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 3 and 4.

2.3 Strengths, Weaknesses, Opportunities, and Threats (SWOT)

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

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

2.3.1 Strengths

The Town of Niagara-on-the-Lake benefits from having fire stations that are staffed and well-equipped for response to emergencies. These stations are staffed by a team of dedicated, motivated and community focussed volunteer firefighters who have expressed, through the completion of the internal surveys, that they are quite proud of the level of service they provide to the community. The

fire stations and equipment are adequate, and the firefighters believe that they are well-equipped to effectively carry out their responsibilities.

The firefighters and the administration team are well trained and competent in their jobs. The Department has clear organizational Vision, Mission, and Values with a strong commitment to excellence.

NOTLFES has strong relationships with neighbouring fire departments and a long history of cooperative services. There is a mutual aid plan and other agreements in place to help meet the fire safety needs of the community of Niagara-on-the-Lake.

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

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

2.3.2 Weaknesses

Due to other commitments, such as their full-time jobs and family obligations, there is no guarantee these volunteer firefighters will be adequately available to respond to every situation. The turnout times (time of page to time fire truck leaves station) confirm challenges of getting firefighters to some of the stations, particularly Monday through Friday during business hours.

Due to the growth of the Town, along with increased traffic flow, especially during the busy summer months, it is believed that a reorganization of the fire station response zones should be conducted, and future consideration be given to the location and viability of a new St. Davids/Queenston Station. More information on the proposed new station is noted in Section 6.

When an apparatus or piece of equipment is out of service, the duration of downtime could become a hinderance to the department. When apparatus or a piece of equipment is out of service, the crews must make do with either spare apparatus or equipment that they are not accustomed to. This could present an issue under Health & Safety if fire fighters are operating a piece of equipment they are not trained to do so.

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

All the fire stations lack direct source exhaust systems which reduce toxic fumes within the stations. This is discussed further in the report in Section 4.6.1.

As with many professions, technology comes at a very remarkable pace and difficult to embrace and the move forward may become difficult for some to grasp, and the fire service is no different. This change at times becomes difficult to sell to the fire fighters and it is up to the administration team to promote the positives that could be seen with change especially when it comes to new technologies.

2.3.3 Opportunities

NOTLFES has a mutual aid program in place in which NOTLFES may call on neighbouring fire departments for assistance whenever local resources are exhausted and there is an inability to handle the incident with the Department's resources in an efficient and effective manner. This type of mutual aid resource is not meant to supplement NOTLFES's response ability; it is to be used when no other options are available such as automatic aid and fire services agreements. These two types of agreements offer the community a more consistent level of response to areas not properly covered by the local fire department.

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

When an apparatus or piece of equipment is out of service, the duration of downtime could become a hinderance to the department. The crews must make do with spare apparatus or equipment that they are not accustomed to. This could present an issue under Health & Safety if firefighters are operating a piece of equipment they are not trained on.

Many fire services resolve such issues by purchasing the same apparatus chassis, with the same pumps and ancillary equipment. Standardization of the fire fleet and equipment is becoming a common practise. There are significant cost savings to be had as there will be less training required and a significant savings in repair costs.

2.3.4 Threats/Challenges

The present level of volunteer firefighters and equipment must be considered as the community's population continues to grow in both the residential and commercial sectors. As noted earlier in this document, NOTL could expect to see up to a 30 to 35% increase in population by 2029. The bulk of this growth will occur in the area of Glendale. The best way to mitigate such a challenge is to plan

ahead by using industry standards and recommended best practices as a guideline. Researching comparable communities in terms of how they dealt with such community growth can give NOTLFES an indication of future call volumes.

As with many communities throughout Ontario, the recruitment and retention of new volunteer firefighters are a challenge. Mitigation strategies to combat this challenge are discussed in Section 4 of this report.

The Town's population is expected to grow from 17,511 in 2016 to 22,400 in 2031, which is approximately 27%. With the noted anticipated growth in population in the community comes increased traffic, types of occupancies, business, and call volumes. The Department, through ongoing planning and data assessments, will be able to better adjust to such changes. When reviewing population growth, the tourist demographic must be taken into account. At this time, it is estimated over three million tourists visit Niagara-on-the-Lake each year and the numbers will inevitably rise. The outlet mall has as many as six million visitors per year. Many of those come from abroad and present a different challenge, such as language barriers. This could equate to a greater focus on fire safety education that comes in numerous languages, which can put a strain on the one Fire Prevention Officer.

In addition, there is an international border crossing and two major 400 series highways running through the municipality with millions over vehicles traversing the community each year.

Many of the new residents come from a large urban setting and some believe the level of service they received in the larger municipality will be the same at NOTL. Anecdotally, some believe their fire service is operated by career fire fighters and not aware that it is a volunteer response. This presents a need to educate the new residents that it is a volunteer response and that firefighters are not waiting in the fire station for a call.

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

A challenge being seen by all communities are the so-called "100-year storms". Due to changes in climate, inclement weather incidents such as freezing rain/ice storms and flooding are becoming more commonplace and need to be part of the response program for each community. This change in climate conditions along with the resulting frequency and severity of incidents has created the need for a larger response component to these emergencies. This is another reason for ensuring strong ties with other communities regarding mutual and automatic aid programs. These challenges support the necessity for exercising and updating the community's emergency preparedness program annually.

More information in relation to community risks and recommendations for mitigation will be highlighted within the Office of the Fire Marshal & Emergency Management's, Community Risk Assessment (CRA) document.

TABLE #2: NFPA Response Goal Expectations

Demand Zone	Demographics	Minimum FF to respond	Response time (minutes)	Meets objective (%)
Urban area	>1000 people/mi^2 >386 people per km^2	15	9	90
Suburban area	500-1000 people/mi^2 193-386 people per km^2	10	10	80
Rural Area	<500 people/mi^2 <193 people per km^2	6	14	80
Remote Area	Travel distance > 8 mi (12.87km)	4	Directly dependent upon travel distance	90
Special risks	Determined by Authority Having Jurisdiction	Determined by Authority Having Jurisdiction	Determined by Authority Having Jurisdiction	90

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

2.4 Establishing & Regulating By-Law

The current Establishing & Regulating (E&R) By-Law 5244-20 was updated in 2020, making this a very current document. Many parts of the E&R document line up with the expectations of the *Fire Protection and Prevention Act*.

To assist the Fire Chief in meeting the needs and expectations of Council, the E&R By-law notes that the Fire Department shall respond to a variety of incidents designed to protect the lives and property of the inhabitants of Niagara-on-the-Lake.

Although no actual response time expectations are noted in the Department's E&R By-law, a review of the past three to five years offers a good understanding and baseline for how the Department has been performing, along with identifying areas for improvement.

The Fire Chief is continuing to utilize the most recent set of three years of data as a baseline to evaluate the response capabilities of the Fire Department. This evaluation will be invaluable to measure population growth versus call volumes and response times, along with any challenges that the Department might be encountering (i.e. increasing response times and/or number of volunteer firefighters responding to the calls).

Standards are not binding documents but are considered professional guidelines of current industry standards for fire departments to reference and possibly follow. Some of the standards, such as NFPA 1710 and 1720, have standards that most fire departments cannot achieve, but use as guidelines to work towards.

E&R By-laws should be reviewed yearly and updated to reflect such things as new legislation, changes in the types and level of response, and training expectations. Further, NOTL should contact their solicitor to obtain a legal opinion on whether the NFPA 1720 response time standards should be included within their E&R By-Law as a target to attain.

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

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

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

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

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

- A *policy* is a high-level statement that expects consistent compliance. There is very little to no leeway permitted with a policy.

- A *guideline* is a standard with an acceptable level of quality or attainment on how to act in a given situation with non-mandatory controls.
- A *procedure* is a standard with an acceptable level of quality or attainment in a series of detailed steps to accomplish an end. There are step-by-step instructions for implementation.

NOTLFES's SOGs are current and thorough. To keep all of the SOGs current, the Fire Chief should review and revise existing policies and SOGs on a regular basis and develop new policies and SOGs as required. For example, some fire departments review a third of the SOGs annually so that the entire document is reviewed every three years.

A good source of information for the Fire Chief is the Section 21 Guidance notes that are kept current by a Provincial team of fire service personnel. The Section 21 Committee is part of the *Health and Safety Act* initiative for firefighter safety.

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

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

2.6 Commission on Fire Accreditation International

"When a Fire Department applies a model of risk assessment to help determine their level of emergency services commitment, they have moved from being reactive to being proactive."[5]

The NFPA standards represent the benchmark to strive for in the fire service. Many of these standards have, to a large degree, been adopted by the OFMEM. The Commission on Fire Accreditation International (CFAI) is an organization that has incorporated all national and local standards into an accreditation process, which has become the model for best practices for all fire departments.

Benefits of Accreditation:

- A system for risk assessment, decision making, and continuous improvement
- A plan for sustainment and self-assessment
- Agency performance objectives and performance measures

[5] CFAI overview information – Self Assessment Manual

- Verification by peers

The CFAI program revolves around 10 categories, which are:

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** – this includes fire prevention, fire suppression, training, 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** – staffing of the organization in all divisions and how the fire service works with the municipality's Human Resources Department
8. **Training and Competency** – review of all training programs based on what the fire department is mandated to provide
9. **Essential Resources** – 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.

The NOTLFES is moving forward with a plan for accreditation, with this being evident by the number of improvements to previous operations and the implementation of new processes. The Department is moving forward at a good pace and not exceeding its capabilities. It is recommended that NOTLFES allocate necessary staff time to pursue its accreditation with the CFAI.

2.7 Stakeholder Surveys

To obtain a clear understanding of how well NOTLFES is meeting the needs of its staff and the community, surveys were conducted with Council (2 of 9 councilors responded), the internal staff and volunteers of the NOTLFES (26 team members), and 32 external stakeholders of the Town.

Due to the COVID-19 pandemic, EMT met with many stakeholders via telephone or video conference, to assist with the completion of this review. Community and firefighters' surveys were completed to obtain a wide range of input. The community survey was advertised through local media and was available on the Town's website (in the form of an electronic survey).

2.7.1 Internal Surveys

During the FMP process, feedback was gathered from internal staff, which included firefighters, Administration, Training, and Fire Prevention.

The information received from the internal surveys identified the following:

- Many of the staff are proud of the service that they offer to the community and appreciate the effort put forth by the members and believe that the community feels that they are served by a professional and dedicated group of firefighters.
- Overall, the firefighters feel they have adequate facilities to work out of, along with a good variety of equipment to do their jobs.
- There were concerns expressed with equipment failures such as the SCBA and poor radio communications.
- Training was a common issue within the responses as many would like more opportunities to receive training, and a wider variety such as officer training, professional (non-fire related), and succession planning opportunities.
- Compensation for the firefighters should be reviewed and at a consistent level, compared to other fire departments in the area.
- There needs to be enhanced education to the residents that the department is staffed by "volunteers" and what the green lights stand for in their vehicles.
- The Department is heading in a positive direction under the new administration.
- Some firefighters would like to see a performance review of the firefighters, not just credit for attendance.
- The firefighters would like to be more involved with public education and believe the Department should have a dedicated Public Fire Life Safety Educator (PFLSE).
- The top three major challenges for the Fire Department are the anticipated growth that is occurring in Niagara-on-the-Lake; volunteer firefighter recruitment and retention; and the assurance of properly, trained and equipped staff in meeting response challenges.
- The top three services that they feel are priority to the community are:
    - Firefighting
    - Auto extrication
    - Medical responses
- Responses addressing what the department might look like in 10 years included:
    - A high performing, progressive and visionary department, leading in service provision while maintaining the volunteer firefighter model.

- The amalgamation of stations 2 & 4
- A new fire administration centre
- The Department operating as one organization (not as individual stations)

2.7.2 External Surveys

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

Responses were submitted by 32 respondents. Much of the information received from the external surveys identified the following:

- For a small community, the FD is well equipped
- Very professional, reliable, and competent
- Engaged with the community
- Excellent service provision for a volunteer department
- Firefighters are very community focused and committed to serve
- Those that have attended a Public Education event found it to be very informative and all questions were answered well

The following input was received:

- The top three services noted by external respondents are:
  - Fire Fighting
  - Medical assist and response
  - Auto extrication
- Responses addressing what the department might look like in 10 years included:
  - Fire station placement to improve response time
  - Full time firefighters
  - Increased level of public education on fire safety and prevention
  - Ensure the seniors demographic is educated on fire safety
  - Green flashing light campaigns to educate the public on what they are for and who uses them
  - Engagement with the public, both in person and through social media outlets
  - Council maintain funding for training and equipment
  - Increased diversity during recruitments

- Public warning systems, such as tornado sirens
- Decrease the number of fire stations, while increasing the number of fire fighters assigned to each station

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

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
1	It is recommended that NOTLFES prioritize and allocate staff time to pursue its accreditation with the CFAI.	Staff time	Short to Mid-term (1 - 6 years)

SECTION 3 – Risk Assessment

3.1 Current and Future Needs

3.2 Community Risk Assessment

3.3 Integrated Risk Management Web Tool

3.4 Residential Fire Sprinklers

3.5 Fire Underwriters Survey

3.6 Review of Draft Community Risk Assessment

Section 3: Risk Assessment

3.1 Current and Future Needs

The population of Niagara-on-the-Lake is forecasted to grow to 22,400 by 2031. With a land area of approximately 132 km^2, the community contains an abundance of significant rural areas, agricultural lots, and natural areas, including the Niagara River, provincially significant wetlands, and environmentally sensitive areas. Most of the population is located, in the communities of Old Town, Virgil, St. Davids, Glendale, and Queenston.

3.1.1 Municipal Responsibilities

It is Council that sets the level of service within the community. 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.*[6]

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

Methods of Providing Services

(2) In discharging its responsibilities under subsection (1), a municipality shall:

> (a) Appoint a community fire safety officer or a community fire safety team; or
> (b) establish a Fire Department.

The Town of Niagara-on-the-Lake 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 must thereby be provided is further outlined in Section 2.1(b) of the *Act*. The level of service to be provided is determined by the needs and circumstances of the community and can be derived from conducting a FMP for Council. The 'needs' can be defined by the type of buildings, infrastructure, and demographics of the local area which in turn can be extrapolated into the types of services that would be offered and needed. The 'circumstances' are considered the ability to afford the level of service to be provided.

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

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

Niagara-on-the-Lake is currently experiencing growth, which is leading to an infill involving the communities. While the majority of this growth is residential in design, it brings commercial and industrial prospects. This increase impacts the service delivery of the Fire Department, increasing the need for service along with the population.

To date, NOTLFES has been able to effectively keep the up with the call volumes, however, there is concern that future challenges in meeting reasonable response times could occur as call volumes increase. This creates a possible risk to the community and, as such, the Fire Chief will need to monitor response times including how often a full response component was not amassed. This type of information can be utilized to identify any future needs and/or considerations for the incorporation of a partial full-time response component.

3.2 Community Risk Assessment

The first and most effective way to reduce injuries, death, and property damage due to fire is through public education, inspections, and enforcement. The Fire Prevention Program addresses these key components of fire safety which starts with conducting a Community Risk Assessment (CRA).

3.2.1 Community Risk Assessment Profile

Risk assessment is the process utilized to identify the level of fire protection required within the boundary of the Town of Niagara-on-the-Lake. 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 Town. The Fire Chief is responsible for informing Council of any and all risks existing within the Town. It is based on this information that Council is able to make an informed decision on the level of service to be achieved.

The Province of Ontario Regulation 378/18 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 5 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 NOTLFES 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.

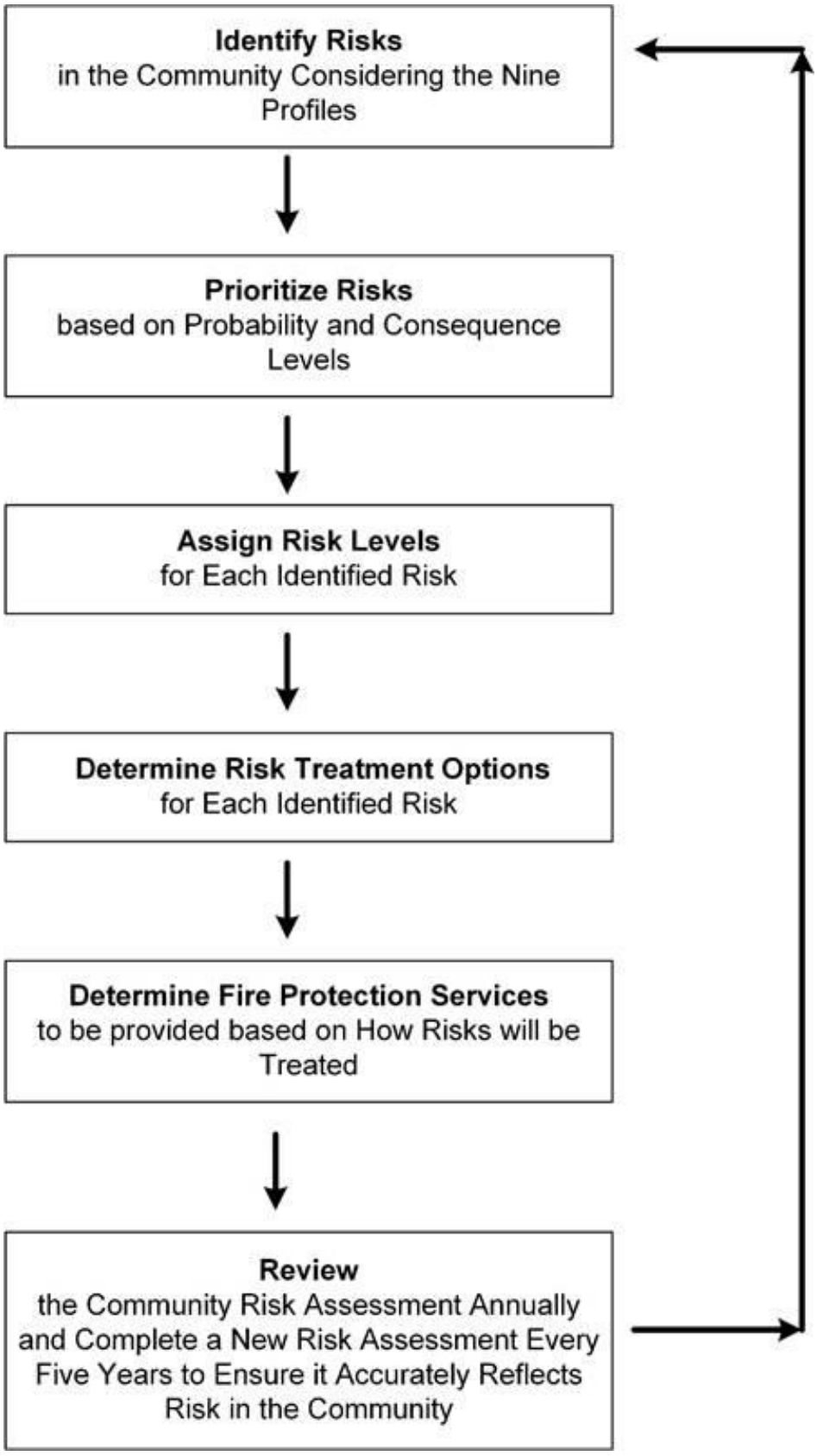
Once gathered, this information will assist in the completion of the CRA, which may identify gaps and areas where actual conditions vary from the desired outcomes. Data to be review for each mandatory profile include:

- *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* – how are resources distributed 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* – be they 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, outlines the process whereby risks are to be identified from past events while also reviewing future growth trends within the municipality relating to demographics and building stock.

FIGURE #8: 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 means for establishing the quantification levels. To establish this level, four components are to be considered:

1. Life Safety – any injuries or loss of life to anyone involved, public and firefighters (includes actual or potential situations)
2. Property Loss – the dollar loss relating to public and private buildings, contents, irreplaceable assets, significant/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

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*

3.2.2 Future Needs

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

According to the new provincial legislation and continued growth within the Town, there will be a continuing need for additional staff time spent in fire prevention and public education related activities. These activities are not just related to public education; there should also be emphasis placed on assessing building stock within the community to identify types and number of hazards that may exist.

3.2.3 Provincial Community Risk Statistics

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

The first set of statistics noted are of the most recent Provincial data found on the Officer of the Fire Marshal and Emergency Management website, which can be compared with the most recent NOTLFES statistics.

Provincial - Loss fires by Property class

From 2009 to 2018, there were 113,111 fires with loss reported to the OFMEM.

- *47% of these fires occurred in Residential occupancies.*
- *27% occurred in vehicles.*
- *13% occurred on structures/properties not classified by the Ontario Building code – this includes many non structure property types – land, outdoor storage, and some structures ranging from barns to weather stations.*
- *5% of loss fires occurred in Industrial occupancies.*
- *3% in Assembly occupancies.*
- *2% in Mercantile occupancies*
- *2% in Business and personal services occupancies.*
- *1% in Care and detention occupancies.*

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

Provincial - Loss Fires Property class: Structures only

From 2009 to 2018, there were 73,692 Structure fires with loss reported to the OFMEM.

- *Fires in residential occupancies account for 73% of structure loss fires.*
- *Properties not classified by the Ontario Building code – 8%*
- *Industrial occupancies – 7%*
- *Assembly occupancies – 4%*
- *Mercantile – 4%*
- *Business and Personal Services – 3%*
- *Care and Detention Occupancies – 1%*

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

Provincial - Structure Loss Fires: Ignition source

9% of the structure loss fires were suspected to be arson or vandalism (intentionally set).

Between 2009 and 2018 the ignition sources in other (not intentionally set) structure loss fires were:

- *18% cooking*
- *9% electrical distribution equipment – wiring*
- *8% heating/cooling*
- *8% miscellaneous (which includes fires - natural causes and chemical reactions)*
- *7% cigarettes*
- *4% appliances*
- *4% other electrical, mechanical*
- *4% Exposure fires*
- *4% other open flame tools (excluding matches, lighters)*
- *2% lighting - excluding candles*
- *2% candles*
- *1% matches or lighters (excluding arson fires)*
- *1% processing equipment*
- *19% reported as undetermined*

3.2.4 Niagara-on-the-Lake Community Risk Statistics

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

Fire Loss by Occupancy Classification

The analysis indicates that between 2016 to 2018 approximately 80 to 89% of the fires reporting a loss occurred in Group C - residential occupancies.

Town of Niagara-on-the-Lake Fire Loss by Property Classification

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

- Group C – Residential occupancies
- Group E - Mercantile occupancies
- Group F - Industrial occupancies
- Other occupancies not classified within the Ontario Building Code (i.e. farm buildings)
- Group A – Assembly occupancies
- Group D - Business and Personal Services Occupancies
- Group B – Institutional Care or Detention occupancies

Town of Niagara-on-the-Lake Reported Fire Cause

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

The leading causes of fire were:

- Misuse of ignition source/material first ignited
- Mechanical/Electrical in nature
- Maintenance deficiencies
- Other unintentional
- Undetermined
- Arson

Town of Niagara-on-the-Lake Ignition Source Class

The leading causes for ignition sources were:

- Undetermined
- Cooking equipment
- Heating equipment, chimney, etc.
- Appliances
- Lighting equipment
- Electrical equipment
- Other electrical/mechanical
- Exposure

To assist the fire department in its fire safety goals, it is recommended that the Fire Department staff meet with relevant local community groups to form a partnership for organizing fire safety and public education events that can be tailored to the unique needs and challenges within the community. These events can be based on the previous fire cause information supplied. An example of community

groups would be a local group that wish to promote fire safety in the community or any local Lions Clubs (or other clubs) that want to support fire safety initiatives.

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

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

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

The data shows that in the three measurable categories (At Risk Areas, Private Single Detached Dwellings, and At-Risk Population), Niagara-on-the-Lake is above the averages at both the provincial and federal levels. Federally and provincially the number of At-Risk Dissemination Areas per Total Dissemination Areas ratio is roughly 1 in 8. Niagara-on-the-Lake has a ratio of 1 in 6. Within the percentages of At-Risk Private Single Detached Dwellings and At-Risk Population, provincial and federal levels sit just six points below NOTL. TABLE #5 details the data as sorted within the report.

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

TABLE #3: Niagara on the Lake At-Risk Comparison

Garis et al Report Criteria	NOTL	Ontario	Canada
Number of At-Risk Dissemination Areas	4	2,630	7,198
Total Dissemination Areas	24	19,964	56,154
Percent of At-Risk Dissemination Areas	**16.67%**	**13.17%**	**12.82%**
Number of Private Single Detached Dwellings in At-Rik Dissemination Areas	1,340	501,990	1,320,785
Total of Private Single Detached Dwellings	5,070	2,712,000	7,301,825
Percent of At-Risk Private Single Detached Dwellings	**26.43%**	**18.51%**	**18.09%**
Population of At-Risk Dissemination Areas	3,282	1,420,807	3,585,822
Total Population	12,704	7,488,061	19,325,962
Percent of At-Risk Population	**25.83%**	**18.97%**	**18.55%**

Based on this data, it would benefit Niagara-on-the-Lake to focus its limited resources on targeting its public education campaigns. A dedicated Public Education Officer would be able to concentrate public education programs where they are needed most, and better prioritize program scheduling. The data used in the Garis et al report is nearing ten years old, but a focus on local planning data would provide a clearer picture of the current state of Niagara on the Lake as it pertains to its at-risk populations. All target audience public education programs should be fluent and adaptive to the changing needs of the community. NOTL is involving more data analytics in its operations. By including identification of at-risk groups, the department could better utilize available personnel resources and improve efficiency of programs. They would likely find ways to cross reference the data and metrics obtained in other areas of fire safety (i.e. tracking fire calls with areas targeted public education).

3.3 Integrated Risk Management Approach

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

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

- Line one: Public Fire safety education
- Line two: Fire safety standards and enforcement
- Line three: Emergency response

The Integrated Risk Management Web Tool is built around the three lines of defence and intended for municipal and fire service decision-makers. The tool was designed to assist municipalities in fulfilling the responsibilities prescribed in Section 2 of the *Fire Protection and Prevention Act*, 1997 (FPPA).

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

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

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

NFPA 1730 defines the risks in three categories and provides examples for each. These risk categories are:

- High-Risk Occupancy – An occupancy that has a history of high frequency of fires, or high potential for loss of life or economic loss. Alternatively, an occupancy that has a low or moderate history of fire or loss of life, but the occupants have an increased dependency in the built-in fire protection features or staff to assist in evacuation during a fire or other emergency (e.g. apartment buildings, hotels, dormitories, lodging and rooming, assembly, childcare, detention, educational, and health care).
- Moderate-Risk Occupancy – An occupancy that has a history of moderate frequency of fires or a moderate potential for loss of life or economic loss (e.g. ambulatory health care, and industrial).
- Low-Risk – An occupancy that has a history of low frequency of fires and minimal potential for loss of life or economic loss (e.g. storage, mercantile, and business).

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

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

3.4 Residential Fire Sprinklers

The NFPA, along with the 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 noted that because fire sprinklers react so quickly, they can dramatically reduce the heat, flames, and smoke produced in a fire. Properly installed and maintained fire sprinklers help save lives, reduce damage, and make it safer for firefighters.

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

Facts about home fire sprinklers

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

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

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

- 85% of all U.S. fire deaths occur in the home.
- The civilian death rate of 1.4 per 1,000 reported fires was 81% lower in homes with sprinklers.
- The civilian injury rate of 25 per 1,000 reported fires was 31% lower in homes with sprinklers. Many of the injuries occurred in fires that were too small to activate the sprinkler or in the first moments of a fire before the sprinkler operated.
- The average firefighter injury rate of 13 per 1,000 reported home fires was 789% lower where sprinklers were present.
- Where sprinklers were present, flame damage was confined to the room of origin in 97% of the fires compared to 74% of fires without sprinklers.
- Home fire sprinklers can control and may even extinguish a fire in less time than it would take the fire department to arrive on the scene.

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

- Only the sprinkler closest to the fire will activate, spraying water directly on the fire. In 84% of home fires where the sprinklers operate, just one sprinkler operates.
- If you have a fire in your home, the risk of dying is cut by about one-third when smoke alarms are present (or about half if the smoke alarms are working), while automatic fire sprinkler systems cut the risk of dying by about 80%.
- In a home with sprinklers, the average property loss per fire is cut by about 70% (compared to fires where sprinklers are not present.)
- The cost of installing home fire sprinklers averages $1.35 per sprinklered square foot.

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

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

3.5 Fire Underwriters Survey

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

FUS Certified Fire Protection Specialists conduct detailed field surveys of the fire risks and fire defences maintained in built up communities (including incorporated and unincorporated communities of all types) across Canada. The results of these surveys are used to establish a Public Fire Protection Classification (PFPC) for each community. While the FUS is not involved in 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 amount 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 DPG is a measure of the ability of the protective facilities of a community to prevent and control the structure fires in detached dwellings by evaluating the adequacy, reliability, strength and efficiency of the protective facilities and comparing the level of protection against the level of fire risk associated with a typical dwelling.

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

The NOTLFES has recently completed all the submissions for an updated assessment by FUS and are expecting to have a report by the end of 2020.

Currently the NOTLFES has one FPO/PFLSE on staff, who has been meeting minimum standards but struggling to have a proactive inspection program due to staffing issues in 2019 and COVID-19 in 2020. With the anticipated population growth and new developments there will be an increased requirement for plan reviews, fire inspections, enforcement, and public education. Further, there will be significant workload in developing the Community Risk Reduction Plan that will be developed post completion of the CRA. It is recommended that the NOTLFES hire an additional FPO to assist with handling the anticipated requirements of the position.

3.6 Review of Draft Community Risk Assessment

One of the deliverables of this FMP is a review of the current draft CRA and to provide direction on further enhancements to the document. EMT would like to make the following suggested changes/additions to the document to aid in bringing it in line with the Province of Ontario Regulation 378/18 Community Risk Assessment.

When Regulation 378/18 came in effect, the OFMEM provided a CRA Guideline document which provided guidance on the completion of the CRA and templates that could be used in its completion. They refer to these templates as worksheets and there are the basic nine sections to be completed, plus a tenth which culminates all of the information within the document that then assists in formulating the Community Risk Reduction Plan.

It is advised that the worksheet templates be used in the completion of the CRA. Doing so will bring the Town more in compliance with the Regulation.

The draft report in general covers a wide spectrum in the community and is at a high level of presentation. Within each profile it speaks to impacts to the fire service; this is not required until Worksheet # 10 which was not included in the draft. EMT believes there needs to be additional and/or supporting information in each profile.

The following is a synopsis of the current draft CRA by reviewing each profile.

Worksheet # 1 – Geographic Profile

- There is no need to assign a probability or consequence to each feature unless required in the template.
- The worksheet does not require an assigned risk level to each feature unless required in the template.
- "Water" should be broken down further to include watersheds and wetlands.
- Even though there are no rail lines running through the Town, they do operate close to the southern boundary of the Town. Consideration to include these in this profile as a derailment could prove consequential to the Town.

Worksheet # 2 – Building Stock Profile

- The use of the template is again suggested.
- There is no requirement to speak to each sub-group of each property classification. An example is to identify the issues and concerns with Group A – Assembly, that could include all occupancies assigned to that group.
- The information that is listed for each group is thorough and could be transferred to the template in bullet form.
- Special mention should be made regarding the number of wineries/distilleries in the community and the associated hazards found within their operations.

Worksheet # 3 – Critical Infrastructure Profile

- Recommended that the Towns Hazard Identification & Risk Assessment (HIRA) which is part of the Town's Emergency Response Plan, be used as a reference in the completion of this section.
- Should be noted that the information contained in this profile should be considered as confidential and not shared with the pubic and should be noted within the document.
- Due to the confidential nature of the information to be included in this profile a list of additional material that could be included will not be apart of this Plan but made available via other forms of communication.

Worksheet # 4 – Demographics Profile

- The information contained in this profile is relevant but could include the following areas of data for review:
    - Population Distribution – i.e. age groups, average age, median age
    - Workforce – i.e. # employed, unemployed, not in workforce, participation rate, employment rate, unemployment rate
    - Population breakdown by ethnicity
    - Levels of education
    - Household characteristics – i.e. owner, renter, band housing, private dwelling, condominium, non-condominium
    - Household breakdown of income
    - Data could reflect female, male, and the totals of both in some data
- In the tourism section, should speak to language barriers
    - Public education pamphlets of different languages
    - Emergency evacuation directions for B & B's, motels hotels in multiple languages
    - Worksheet 4b which speaks to issues and concerns of each group and it suggested this worksheet be included and the information be separated from the present demographic profile
- Worksheet 4b should include groups such as:
    - Immigrant Population
    - General Population
    - Student Population
    - Summer Tourists
    - Migrant workers if present (wineries and other agricultural environments)
- Review established cultural programs for public education and/or public service

Worksheet # 5 – Hazard Profile

- This section covers a wide range of potential hazards, it too is completed at a high level and could be broken down into individual hazards, not grouped together such as:
    - Environmental could be broken down into ice storms, snowstorms, sleet storms, severe thunderstorms, severe rain events, tornados, earthquake, erosion, subsidence, etc.
    - Human Health Emergency could include influenza, pandemic,
- The Worksheet that is provided by the OFMEM, breaks it down into sections, being:
    - Identified Hazard
    - Probability
    - Consequence
    - Assigned Risk Level
    - There is no breakdown of the probability of any of the hazards occurring in the report.

Worksheet # 6 – Public Safety Response Profile

- This section identifies a good cross section of emergency services
- Other groups that could be included:
    - Niagara-on-the-Lake Fire & Emergency Service
    - Canadian Border Security Agency
    - United States Coast Guard
    - Transport Canada
    - Trenton Search & Rescue
    - Canadian Red Cross Disaster Assistance Branch
    - Niagara Peninsula Conservation Authority
    - RCMP
    - OFMEM
    - St John Ambulance

Worksheet # 7 – Community Services Profile

- A good number of agencies listed, but include those that provide, funding for PE of fire safety messaging or facilities to deliver PE events.
- Possibly include the Canadian Mental Health Association, Housing Authorities, Salvation Army, etc.
- NOTLFES should reach out to the local service groups for support with their fire safety messaging

Worksheet # 8 – Economic Profile

- Again, good information included in this profile, but suggest transferring it onto the OFMEM's Worksheet.
- Key risks could also include weather events, utility interruptions, fires, telecommunications failures, road closures of long duration.
- Could include the following occupancies Municipal Operation, Schools, Accommodations, Industries.

Worksheet # 9 – Past Loss and Event History

- Should use the past fire history worksheet provided by the OFMEM
- Basic history is included but no mention of injuries or fatalities of civilians or firefighters
- Should include what the ignition sources were.
- Should include vehicle fires
- Could compare NOTLFES vs Provincial statistics
- Did not include a breakdown by property classification, by fire causes, nor assign a probability, consequence, or risk to each
- Historically fire services reflect on the dollar loss in fires. EMT believes that fire services should also focus on the dollar amount of property saved based on pre-fire value of contents and structures. Property saved is successes in the fire service and should be recognised. If there is

a $1.5 M fire loss, but another $8 M in property was saved, that is a success. NOTLFES could begin capturing this data by property classification and reporting such information to Council, the firefighters, and the public at large.

Worksheet # 10 – Identifying Treatment Options for the Top Risks in the Community

- This section was not included in the draft.
- In this section the risks of each profile are listed, list the top risks or concerns, and identified the preferred treatment of each.
- In this section is where the preferred treatment is assigned as mention previously:
    - **Avoid the Risk** – *implementation of programs to prevent fires or emergencies from occurring*
    - **Mitigate the Risk** - *Programs and initiatives implemented to reduce the probability and/or consequences of a fire or emergency*
    - **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*
    - **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*
- Once the treatment is identified along with the risks, then the NOTLFES will be able to develop a Community Risk Reduction Plan.

There is quality information included in the draft CRA; it just requires supporting documentation and additional data for improvement. It is recommended that the CRA be completed as per *Ontario Regulation 378/18 and the Fire Protection and Prevention Act 1997 (FPPA) by July 1, 2024.*

EMT would like to offer its services to NOTLFES to assist in the completion of their CRA.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
2	Continued emphasis on additional staff time spent in fire prevention activities. In addition to public education, there should be emphasis placed on assessing building stock within the community to identify types and number of hazards that may exist.	Staff time	Short-term (1 - 3 years) and ongoing
3	Work with developers and the public to encourage Home Sprinkler Systems and make this initiative an ongoing part of its fire prevention program and community risk reduction efforts.	Staff time	Short-term (1 - 3 years) and ongoing
4	It is recommended that the CRA be completed as per *Ontario Regulation 378/18 and the Fire Protection and Prevention Act 1997 (FPPA) by July 1, 2024.*	Staff time	Short-term (1 - 3 years)

SECTION 4 – Department Staffing & Programs

Section 4: Department Staffing & Programs

4.1 Overview

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

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

- Is there a proper level of senior staff to manage the Department and its divisions?
- Is there adequate administrative support staff to assist with such things as records management and addressing day-to-day operations of the Department?
- Is there a need for other support staff for vehicle and facility maintenance?
- When does a fire department need to consider moving from a volunteer service to a composite or full-time fire service – or does it?

This section will discuss the following divisions:

- Administration
- Training
- Fire Prevention
- Fire Suppression

Based on the *Fire Protection and Prevention Act*, 1997, section 6(3) "A fire chief is the person who is ultimately responsible to the council of a municipality that appointed him or her for the delivery of fire protection services." However, as noted earlier in this document, the Fire Chief of NOTLFES reports to the Town's Chief Administrative Officer (CAO) in a council-manager style of government. This reporting system allows for the Fire Chief to present reports and updates to Council.

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

- Two (2) full-time Deputy Fire Chiefs
- One (1) full-time Training Officer
- One (1) full-time Fire Prevention Officer
- One (1) full-time Administrative Assistant
- 110 Volunteer Firefighters

4.2 Administration Division

The Administration Division is comprised of senior staff and administrative staff. In Niagara-on-the-Lake this includes the Fire Chief, two (2) Deputy Fire Chiefs, and an Administrative Assistant. Over past years, there has been an ongoing change of personnel in the key administrative positions of NOTLFES. The placement of qualified and dedicated personnel in these key roles over the last year has greatly increased the stability of the Department.

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

4.2.1 Commission on Fire Accreditation International

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

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

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

4.3 Training and Education Division

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

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

- **4.11.1 Purpose.** The Fire & Emergency Services Organization shall have training and education programs and policies to ensure that personnel are trained, and that competency is

maintained to effectively, efficiently, and safely, execute all responsibilities.[10]

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

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

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

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

The NOTLFES Training Division is comprised of a team of dedicated individuals. The Training Officer is a full-time position and is supported by five Training Coordinators, one from each station. The Training Officer, in conjunction with the Deputy Chief of Operations, is responsible for establishing an annual training plan. These seven positions comprise the Training Committee, who coordinate the delivery.

The Niagara-on-the-Lake Training Program is well structured to meet the levels of service outlined in the Establishing & Regulating By-law. The training programs are well documented in all aspects, are prepared accordingly, and are deliberate in their intent. Ranging from the annual Training Plan, to Standard Operating Guidelines, Training Safety Plans, and Training Modules, the NOTL training documentation is very well organized. All staff associated with creating and maintaining these documents should be commended for their efforts.

Training is electronically tracked and provides an accurate status of all NOTL personnel. Continued use of this will ensure proper training records are maintained.

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

In general, training is delivered in seven areas:

- Recruit Training
- Firefighter Skills Maintenance
- Medical
- Specialized Skills
- Apparatus Driver/Operator
- Officer Development
- New Equipment & Skills

These topics constitute the Training Curriculum and are delivered over a three-year cycle. The topics are presented according to priority that ensures all sessions are delivered at least once within the 36-month schedule.

TABLE #4 details the training delivered within the Department from 2018 to September 2020. A review of this data shows that over 10,000 classes were delivered totalling over 25,000 hours. On average, each personnel attended almost 30 sessions and just under 70 hours of training. These are impressive numbers for a volunteer fire department with over 100 personnel.

TABLE #4: NOTL Training Data 2018 – 2020

Category	2018	2019	2020 (Jan 1 – Sept 2)	Total class attendance	Recruits
Personnel	125	124	114	n/a	15
Total Classes	2,657	4,671	3,532	**10,860**	786
Total Hours	5,634.25	13,209.5	6,445.84	**25,289.59**	4,624.35
Average Classes per Personnel	21.26	37.67	30.98	**29.92**	52.4
Average Hours per Personnel	45.07	106.53	56.54	**69.67**	308.89

The Recruit Training Program is a highly organized venture that sees recruits completing more than 300 hours of training. Based on a scaled pay grid which has the recruits escalating in pay as they graduate, the estimated costs as reported by NOTL staff were $90,090 for 15 recruits in 2019. At approximately $6,000 to train and certify each recruit, NOTLFES is making a strong investment into its staff. Two-thirds of that number should be noted as PPE and uniform costs. Turnover is reportedly low, which is important. The training investment is returning dividends in the form of high retention rates.

The following table outlines the associated costs with training new recruits based on 2019 expenditures.

TABLE #5: NOTL Recruit Training Costs 2019

Number of Recruits	**Number of Administrators**	**Number of Recruit Training Days (8 hr day)**
15	4	35
Training Officer Hours	**AVG Number of Volunteer Instructors per day**	**Projected Amount of Training Hours**
1 hr prep/day=35	3	280
4 hr prep/day=140	**Administrator Hours During Training**	
0.5 per recruit for workbook=263	420	
AVG Lunch cost/day	**PPE per set**	**CPAT cost (refunded by dept upon completion)**
$10.00	$3,500	$150
Training Wage	**Additional Rental Charges**	**Cost of Uniform**
$21.50/hour	n/a	$550
Cost for Administrators	**Cost for Instructors**	**Additional cost (lunch & rentals)**
$9,030	$18,060	$0.00
PPE Costs	**Uniform Costs**	**CPAT Costs**
$52,500	$8,250	$2,250
Total Recruit Costs		$90,090
Total costs if recruits were paid		$180,390

Chief Officers have recently been enrolled in the Blue Card Command course. Blue Card is a command training and certification system that trains company and command officers how to standardize local incident operations across their organization.

All ranks are encouraged to attend leadership training sessions when offered. Staff in the fire prevention division are also actively engaged in attending required certification courses. NOTLFES has shown that from Recruit to Chief Officer, staff are committed to training and certification. This was outlined in detail in the 2020 Stabilization and Growth Plan, and efforts should be made to continue this endeavour.

4.3.1 Training Facilities

The Department lacks its own training facility 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 station. Aside from in-station classes, training has been delivered at several sites. Live fire training was conducted at the Grimsby Fire Department training facility and recently switched to the Fort Erie training facility. There may be an opportunity to move to the Niagara Falls live fire site once the Department completes retrofits to the units.

With a 40-minute travel time to the current training facility in Fort Erie, taking personnel, apparatus, and equipment out of service for long durations is a logistical struggle. The Niagara Falls facility is a better suited location to deliver live fire training as it is about half the distance. If costs are within reason and both municipalities are agreeable, Niagara Falls would be a preferred partnership.

Certification courses from the Ontario Fire College are offered at the Grimsby training facility which is an identified Regional Training Centre. The proximity and course availability make this an ideal location for staff to attend theory-based courses to obtain NFPA certifications. In 2019, NOTL certified 89 personnel to an NFPA standard course.

More local options exist within the Town such as taking advantage of the space available at the Glendale Fire Station. There is enough space to build a small training module that can be used for search and rescue training, fire extinguishment, firefighter survival, and more. Any training props should meet NFPA 1402, *Standard on Facilities for Fire Training and Associated Props*.

4.3.2 Commission on Fire Accreditation International

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

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

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

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

To complete the evaluation of the Department's training programs and related successes in meeting the training needs of the firefighters, EMT is recommended the following:

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

4.3.3 Certification

Most of the firefighters noted that they wanted more professional training opportunities in the form of certification to the NFPA standards that are offered at the Ontario Fire College and some of the local Regional Training Centres.

Therefore, EMT is recommending that the Department continue the certification for staff for each position (that requires or recommends certification) and ensure that certifications are maintained. This includes the certification of firefighters, officers, training officers, and fire prevention staff.

Being that NOTLFES is in the process of certifying its staff, the Department should be commended for this pro-active endeavour. This will put NOTLFES in a very good position with the possible reintroduction of mandatory firefighter certification by the Province on Ontario.

4.4 Fire Prevention and Public Education

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

NOTLFES has a full-time Community Risk Reduction division. The Deputy Fire Chief oversees one Fire Prevention/Public Education Officer. The Deputy Chief oversees all prevention and education activities and sets overall program goals. They also manage community outreach, data analytics, commercial building plans, new developments, and act as the primary for fire investigations. The Deputy Chief manages the municipal Emergency Management Program for NOTL.

The Fire Prevention Officer (FPO) is responsible for running prevention and education activities and creating and/or delivering education programs. They also manage issuing orders, filing court documents, and carrying out inspections. NOTL is committed to delivering a full array of fire prevention services and public education programs with available resources.

After reviewing data provided by NOTL, it was confirmed that there is an annual inspection and public education program in place. The Deputy Chief oversees all facets of the program in conjunction with the Fire Chief to ensure that the Community Risk Reduction division is meeting their goals. In a three-year period from 2017 to 2019, the Community Risk Reduction division completed 2,143 activities. TABLE #8 details the type and total number in this time period.

TABLE #6: NOTL Prevention Activities 2017-2019

Activity	2017	2018	2019	Total
Fire Inspections	174	427	236	837
Occupation Inspection w/Building	9	--	27	36
Fire Orders Issued	45	106	33	184
FSP Reviews	10	26	29	65
Site Plan Reviews	--	90	28	118
Construction Plan Reviews	3	10	12	25
Planning Reviews	64	--	63	127
Spec. Event Reviews	137	176	133	446
Spec. Event Letter Issued	50	--	40	90
AGCO Permits Issued	9	11	10	30
File Searches	21	6	9	36
Pub Ed Events	41	36	31	108
Witnessed Drills	10	11	11	32
Charges Laid	4	0	0	4
Investigations	--	--	4	4
TAPP-C	--	--	1	1
Total Activities	**577**	**899**	**667**	**2,143**

Based on general recommendations by the FUS group, the fire prevention officer per population ratio should be approximately one fire prevention officer per 15 to 20 thousand population minimum.

NOTL had a 2016 population of 17,511, up 13.7% from the 2011 population of 15,400. This growth rate was higher than the provincial average of 4.6%. NOTL also anticipates aggressive expansion in certain areas of the municipality. This could put population rates beyond the FUS recommendations. The workload placed upon one FPO may exceed their capacity within three to five years if growth continues at the current rate.

Fire prevention is seen as the first line of defence; therefore, the more resources assigned to this endeavour, the more proactive a community and its fire department are regarding safety. Based on the total activities detailed, fire inspections accounted for 49% of the total, with public education events less than 5%. An increased effort in promoting public education is needed. In addition to the traditional school programs and community events, target audiences could include parents with pre-school children, home day cares, and seniors.

A committed public education officer, even at a part-time rate, would have the ability to focus programs to at risk areas, coordinate a Volunteer Public Education Division (as referenced in the 2020 Stabilization and Growth Plan), and ensure that annual programs and initiatives receive the attention they require.

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

TABLE #7: FUS Suggested Inspection Frequency Chart

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

It is acknowledged that the FUS suggested frequency chart can be difficult to address, therefore priority should be focused on the vulnerable occupancies (e.g. nursing homes, retirement homes, group homes etc.), institutional buildings, assemblies, multi-residential, and industrial buildings.

It has also been brought to the attention of EMT that the Town is proposing the licensing of long-term rentals such as those they currently have for short-term rentals like Airbnbs. Imposing this new licensing requirement will increase the number of inspections to be completed which will be difficult to achieve with all the other responsibilities the present FPO/PFLSE has.

4.4.1 Determination of Current Staffing Requirements

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

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

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

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

By completing this process, it will assist the NOTL Community Risk Reduction division in further identifying what services it not only wants to offer, but what can be delivered based on present staffing levels. More information on this staffing equation can be found in the NFPA 1730 Standard.

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

The Fire Chief and the Deputy Chief are highly encouraged to review the amount of inspections and associated orders/fines issued on the concept of recidivism; that by which businesses are requiring more inspections, more follow-up, and therefore more time of the FPO, versus those which require minimal assistance or interaction of the FPO. A business or owner with tendencies to relapse or ignore the primary concepts of fire prevention may tend to preoccupy the FPO unnecessarily.

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

> *A public education program is in place and directed toward reducing specific risks in a manner consistent with the agency's mission and as identified within the community risk assessment and standards of cover. The agency should conduct a thorough risk-analysis as part of activities in Category 2 to determine the need for specific public education programs.*

The utilization of existing resources is a cost-effective option for the promotion of fire prevention and public education programs. To accomplish this, some fire departments have trained suppression staff to conduct inspections or assist in public education. This not only brings more resources to the table but also enhances the level of fire safety awareness by those trained staff.

NOTLFES is offering NFPA 1031 Fire Inspector training to all firefighters, (core session only, no code-specific courses) and have five (5) personnel currently trained to this level (completed voluntarily). NOTLFES has also made NFPA 1035 Fire and Life Safety Educator available to staff and will be implementing it into future recruit courses. Approximately ten (10) staff members have voluntarily taken this training. These initiatives will better serve to promote fire prevention as a key focus for all staff and the community. Having firefighters with these certifications will assist the consistency with which the Safe Home program is delivered, improve engagement at public events and the quality of public education efforts when the firefighters are in attendance. Both fire department management and involved staff should be commended for their efforts in this venture.

The 2020 Stabilization and Growth Plan identified a goal to work with the HR Generalist to review the compensation and hours of work of the Fire Prevention Officer (and Training Officer) to address staff retention, which is important to maintain consistency in the Town.

The 2020 Stabilization and Growth Plan spoke of initiating a volunteer Public Education group composed of firefighters. This does not replace the community events that the volunteers participate in but is focused on target groups such as school children and seniors. This gives the volunteers an opportunity on a part-time basis to utilize their skills and improves community public education without adding additional staff.

It is recommended that NOTLFES create a part-time position of Fire and Life Safety Educator within three years. If the workload expands, increasing the position to full-time may be considered. One of the duties of this individual could be the development and implementation of the Volunteer Public Education group.

An alternative option is to reclassify the current Administrative Assistant to a Fire Inspector and Life Safety Coordinator, increasing hours from 35 to 40 hours per week. This could then be a duel role to

coordinate the Volunteer Public Education group and assist with public education programs as available. The Administrative Assistant is already trained as a Fire and Life Safety Educator, so it would be appropriate to provide a salary top up for these additional responsibilities. If this option is selected, it would require a review in 3 to 5 years to see if there is need for adding a part-time Administrative Assistant, depending on the workload demands.

It is further recommended to hire an additional full-time Fire Prevention Officer in the next 4-6 years to focus on Bed and Breakfast occupancies, hotels, long and short-term licensed rentals, secondary occupancies (e.g. in-law suites, basement apartments), restaurants, and other commercial buildings. The estimated cost would be $95,000/year for salary and benefits plus and an additional $30,000 - $40,000 for a vehicle.

Currently the Fire Prevention Officer and the Training Officer work a 35-hour week. It is suggested that the Town review the potential increase in costs for salaries and the increase in work output if the weekly hours were to be increased to 40-hours per week. By doing so, the Department would see an increase of 260-hours/position in work production per year and benefit by providing a more competitive income which would improve staff retention.

4.5 Suppression

There is no identified standard dictating how many firefighters are required within a given population or whether the Fire Department needs to be composed of full-time, composite (blend of full-time and volunteer firefighters), or volunteer staff.

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

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

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

- Does the Fire Department have an approved response criterion as a baseline?
    - Has Council given direction to the Fire Chief (based on his recommendations) on 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?

- Does the Department have issues/concerns with getting enough volunteer firefighters to respond during daytime hours (or other times) on a consistent basis to ensure a viable level of response?
- What local and national standards and guidelines exist to help direct the Fire Department in its decisions relating to station location and staffing models?
    - Specifically, NFPA 1720 along with reference to the CFAI "industry best practices" recommendations
- What increase or decrease in population and industry is occurring that may precipitate more or less fire stations and staffing?

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

A key notation in NFPA 1720 for volunteer fire departments, chapter 4.3.1, is in relation to the deployment of volunteer firefighters and focus for response times by the Department:

> The fire department shall identify minimum staffing requirements to ensure that the number of members that are available to operate are able to meet the needs of the department.
>
> Staffing and Response Time
>
> - *In Urban areas (population greater than 1,000 per sq. mile) (386 per sq. km.), there should be a minimum response of **15 staff within 9 minutes**, 80% of the time.*
> - *In Suburban areas (population of 500 – 1,000 per sq. mile) (193-386 per sq. km.), there should be a minimum response of **10 staff within 10 minutes,** 80% of the time.*
> - *In Rural areas (population of less than 500 per sq. mile) (less than 193 per sq. km.), there should be a minimum response of **6 staff within 14 minutes,** 80% of the time.*[17]

NOTL has 132 persons per km^2 putting the department in the rural response criteria of having 6 firefighters on scene within 14 minutes. We would recommend with the density of the Old Town area, Virgil, and St. Davids that NOTLFES targets 10 firefighters within 10 minutes in those communities.

[17] https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1720

The 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). Most homes in Niagara-on-the-Lake, however, have basements and are built close enough to each other to create an exposure risk for potential fire spread, which must be considered by the Fire Department in its response efforts. NFPA 1710 recommends a minimum of 16 firefighters on scene for a single-family dwelling (17 if an aerial is used), so having the ability to call upon additional resources by having a multiple station response to fire calls is important.

NOTLFES is diligently working to meet the 1720 Standard in relation to population versus staff and response times. Based on response data review and discussions with the Fire Chief, NOTLFES is meeting the response criteria of six firefighters in 14 minutes. It should also be noted that with its complement of dedicated volunteer staff, they are also doing an admirable job at meeting the needs and expectations of the community, as noted by the input received through the community surveys.

4.5.1 Considerations for Full-time Firefighters

Communities often ask when the Fire Department should consider moving to a career or composite (career and volunteer) model, thus reducing the reliance on its volunteer firefighters. There is no document that specifically identifies the tipping point for this move. It is based on the level of service set by the community's Council, coupled with regular reports by the Fire Chief on how the Department is meeting service level expectations.

There are many factors including the number of volunteer firefighters arriving when paged out, how quickly they respond to the page, what the turnout numbers are based on, the time of the day, and day of the week (e.g. availability, day shift vs. night shift), etc. Volunteer firefighters must be provided with the same minimum training certifications and equipment as career firefighters.

As with many volunteer fire departments, the daytime hours from Monday to Friday are the greatest challenge for volunteer response due to fact that many volunteer firefighters are at work, school, away weekends, or taking care of family matters.

Another indicator for making the decision to include a full-time component is tracking the number of volunteer firefighters that arrive at the fire station to respond. If, for example, the standard set by a fire department is that three or more volunteer firefighters must arrive at the station before the fire truck can respond, this should be monitored along with how many times the department is unable to assemble the needed personnel to effectively respond based on time of day and day of the week. Continued monitoring of this data will assist with future fire service needs.

Going to a composite or full-time service is a large cost to the community (as much as $2-2.5 million for each 24/7 truck staffed by career firefighters) and therefore many communities have accomplished this in stages to meet the present needs of the community. Niagara-on-the-Lake's model of a volunteer fire department is a very cost-effective form of fire protection for a community of its size. Moving forward, all the previously noted information needs to be considered and measured to verify and support the continued effectiveness of the volunteer firefighter model or perhaps present a future need to move to a partial full-time component.

At this time EMT is not recommending moving towards a full-time component, only that consideration is given as call volumes and response times increase. Instead, we are recommending that the Headquarters be moved to Station #1 (Old Town) and during the weekday office hours, the current full-time staff (Chief, Deputy, FPO, TO, Admin Assist) of NOTLFES respond to calls. This will serve to reduce the response time within the Old Town from Monday to Friday during office hours and reduce the number of volunteer call outs from the station for single apparatus calls, thereby reducing the number of callouts of the volunteers. To address the extended turnout times for Station #1 the Headquarters staff should be relocated to Station #1 as a temporary measure until a new headquarters can be built.

Recommendation #18 addresses the new headquarters in the Section 6 of the report.

On weekends, during the prime tourist season (e.g. June to September) and select long weekends/ special events (e.g. Christmas Parade), NOTLFES should trial a duty crew model for 2021 to assess its impact on reducing turnout time when road congestion and high tourist demand is present. This would consist of having an assigned crew of 3 firefighters plus an officer be paid for being on-duty at Station #1 for 8 to 12 hours per day on Saturdays and Sundays (plus long weekends). Further, this model would eliminate a whole station page for single apparatus calls such as medical calls, CO without symptoms, burn complaints, etc.

Both the Towns of Lincoln and Grimsby utilize a duty crew model in this manner to gain efficiencies in response time.

4.5.2 Recruitment and Retention of Volunteer Firefighters

Recruitment and retention of volunteers is becoming more of a challenge within the fire service with the increase in annual training that must be committed and with staff turnover.

NOTLFES, as with many other fire departments, is always challenged when it comes to retention of volunteer firefighters. This puts a strain on the department in the areas of recruitment, training, and staffing of the fire stations. One of the issues some firefighters have identified is the high cost of housing in Niagara-on-the-Lake and surrounding areas.

Currently, the NOTLFES looses approximately 8-10% of their firefighting force each year, equating to 8 to 12 firefighters.

Some of the anecdotal reasons EMT has heard in conducting dozens of Fire Master Plans as to why people stop volunteering include the following:

- No time to volunteer
- Demands exceed what was expected
- Conflicts within the organization
- Organizational leadership created an adverse atmosphere
- Too much training
- Attitude of existing personnel towards newcomers
- Criticism received from officers/older members
- Lack of camaraderie

While some issues may be uncontrollable, other issues can be mitigated such as conflicts within the organization, leadership, training, attitudes, criticism, and camaraderie.

The NOTLFES has had an ongoing recruitment program and a notice placed on the Town's website along with the application form. Members of the Department have also been spreading the word that the fire department is looking for new members.

Some reasons for the limited response may include:

- Lack of marketing the fire service as a volunteer department as some newcomers may not be aware it is.
- A weakening sense of community among the population in part because the fire department may not adequately reflect the diversity of the people it serves.
- The ratio of men versus women in the fire service giving the misconception that a department is looking for firemen vs firefighters.
- Lack of the ability of the fire department to fully connect with the community by promoting the activities and services provided by the NOTLFES.

It is suggested that a proactive approach be taken to recruit new members. This may include:

- Placing ads in local media such as newspapers, rate-payers association newsletters, and websites along with working with local radio stations to provide public service announcements about the recruitment.
- Posting notices on social media such as Facebook, Twitter, and Instagram, including increasing the fire department profile by posting pictures of the firefighters in action and statistics on social media outlets.

- Develop a recruitment video and use local students to help develop and film the video as part of their required community service time.
- Start to recruit new members when they are young by implementing a Junior Fire Fighter Club. This has been successful in the United States and is beginning to grow in Canada as a means of gaining interest in the fire service at an early age. Make sure those that join the Club feel that they are important and welcomed to the department and are valued members of the fire service family.
- Promote and conduct an information night at the station for potential new members to drop by to see what being a firefighter is all about. Encourage attendees to bring the entire family and have activities for children to promote the Fire Service as a family unit.
- During the information sessions, members of the department could provide tours of the station and apparatus. Administration would outline the expectations of members of the department such as the number of fire calls and training sessions they must attend; the honorarium that is paid; satisfaction gained knowing that you are helping your neighbour; describe the life long friendships that are started; understand what true teamwork is like and the bond that is garnered between firefighters.
- Diversity can only thrive in a welcoming, inclusive environment. This will require a plan on making new members feel accepted and welcomed. There needs to be a change in attitudes and overall fire department culture. Involve female firefighters in the recruitment process. Include a focus on visible minorities that live in the community.
- Fire departments tend to recruit in a one-dimensional fashion which is not always successful. Departments need to adapt the recruitment strategies to better suit the individuals in the community and recruit those that believe in the department's Vision, Mission and Values.
- Establish a recruitment committee comprising of both male and female firefighters of the NOTLFES.

The issue of retention has been identified as a challenge with just about every volunteer fire service with a high turnover of members. Opportunities to increase retention may include:

- Family nights at the fire station that would include a movie and activities for the children.
- Assign a seasoned member to mentor each rookie when a new member joins the department.
- Conduct firefighter appreciation events (e.g. dinner, BBQ) where members are recognised by Council for their long-term, outstanding service, or something exceptional they did at a call.
- Council recognize the employers of the firefighters for permitting their participation in the fire department and/or permitting them to leave work to attend fire calls.
- Survey other fire services to compare pay rates and adjust the rates accordingly.

- Implement a service recognition pay incentive. This might include paying extra in the form of a 5 to 10% pay increase for every 5 years they have been on the department; this would prevent the loss of years of experience.
- Performance pay for those who reach high percentages of attendance at training sessions and fire calls.
- Offer benefit packages as many may not have benefits at their place of employment, and some are self employed. Such packages would include basic dental, drug, and eyewear coverage.
- Purchase a wellness benefit package for the firefighters such as mental, financial, and family counseling.
- Engage in treating Post Traumatic Stress Disorder (PTSD), which is a common illness among fire responders.
- Offer an RRSP/pension savings plan with contributions from the Town after they have been a member of the department for a predetermined length of time.
- Provide excellent training opportunities to make them want to remain a member of the fire department. Make the training sessions fun and memorable.
- Recognition and support of those who want to attend Fire College or regional courses, which sometimes requires firefighters using their vacation time from their full-time employers.
- The implementation of an “on call or platoon” program that would pay a week or weekend stipend to the volunteer firefighters who commit to being available by signing up for weekdays and/or weekends.
- Education assistance programs to support staff in their professional development.
- Maintain and improve morale by providing modern trucks, equipment, and station.
- Endorse that the firefighters design a logo for their station promoting the Town or the services they provide. They could include a tasteful mascot character. These could be placed on t-shirts and perhaps the apparatus as a sense of pride.
- Provide strong leadership that focusses on the Vision, Mission, and Values of the Department while resolving conflict resolution in a timely manner.
- Conduct exit interviews with those that leave the Department to understand their reasons for leaving. While there may be simple reasons, there could be a deep-rooted issue that administration may not be aware was occurring.
- Foster the history of each fire station by creating displays of pictures of past members, events, and apparatus, to instill a sense of pride on how far the Department has grown.

It costs the Town a large sum of money to train and equip new firefighters, therefore it is important that a means to retain their investment is developed and supported by Council. The cost of training a

new firefighter to NFPA 1001, I & II could be in the neighbourhood of $7,500 - $9,500. The Town also covers the costs incurred for a firefighter to have their driver's license renewed so they may drive a fire apparatus.

At this time the NOTLFES does not pay recruit firefighters. Further, firefighters receive a different rate of pay during training than during call responses. This was noted as a concern of the firefighters in their comments to EMT. It is felt that recruit firefighters should receive some compensation for their training time once they successfully complete their training. It was also felt that the firefighters should receive the same pay rate for training time as they do for call responses. Therefore, a review of the volunteer firefighter compensation package should occur whenever the Town's Employee Bargaining Group negotiations occur.

The OFMEM has put out a document on recruitment and retention in an effort to offer some criteria and/or guidelines that departments can utilize. Refer to Appendix E for the document.

Some of these points relate to enhancing training and special projects for the staff to become more involved in, such as:

- Long service awards in the form of remuneration or a stipend
- Education assistance programs to support staff in their professional development
- Increased training opportunities

While these concepts have great intentions, there is limited effect if the community is not offering the desired employment, education, or housing needs of the firefighters.

4.6 Health & Wellness

Health and wellness of staff is a key focus for all municipalities and Niagara-on-the-Lake is no exception. Due to the nature of volunteer firefighters maintaining a separate primary vocation, a focus on fitness can be overlooked. The inherit nature of firefighting is both stressful and physically demanding. During the review by EMT, it was noted that only Station #3 of the five stations have been equipped with workout facilities to ensure that staff have the ability to keep fit, which helps to reduce work related injuries. The fire department should work towards adding fitness equipment to the other stations. An alternative for Station #1 firefighters would be to provide the firefighters with free or discounted access to the Town's fitness facilities at the Community Centre.

Many fire departments routinely test their firefighters to meet occupational fitness tests delivered internally or by a third party. NFPA 1582 details basic expectations placed upon firefighters. NOTLFES is encouraged to review these and incorporate them into both candidate testing and firefighter fitness and functionality. It is recommended that, as part of a larger commitment to firefighter health and wellness, NOTLFES review the physical expectations of a firefighter for use in training and recruiting.

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

5.1 Essential Job Tasks and Descriptions

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

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

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

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

4.1 Program Overview

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

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

ensure the promotion and success of this process. Health and fitness needs to become a value within the organization just as safety is a value.
Data suggest a correlation between the following:

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

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

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

It is suggested that, as part of a larger commitment to firefighter health and wellness, NOTLFES review the 14 essential job tasks from NFPA 1582 as they pertain to their recruitment and testing process, and seek options for offering personnel the ability to exercise and maintain fitness levels as explained in NFPA 1583.

Niagara-on-the-Lake has included all its fire department staff in the Employee Assistance Program (EAP) offered through its municipal employee benefits. This is an important piece of employee wellness. NOTLFES should meet with administrative staff from the Town who oversee it to ensure that firefighting personnel are fully aware of what benefits the EAP offers, should they need it.

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

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

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

4.6.1 Cancer Prevention

In recent years there has been a more intensive review of cancer prevention and a correlation of the disease to firefighting. The focus has been on contamination control surrounding fire incidents. From pre-fire, incident duration, to cleaning and decontamination post-fire, all aspects of prevention are currently under review by all levels of fire service management. Departments are limiting opportunities for cross contamination and secondary exposure of carcinogens involved in fire scenes. It is suggested that, as part of a larger commitment to firefighter health and wellness, NOTLFES begin work on a cancer prevention program. This may include items such as, but not limited to:

- Post-fire decontamination of PPE
- Firefighter hygiene at fire scenes
- PPE during handling of contaminated gear/equipment
- Documenting potential exposures
- Reducing exposures to diesel exhaust

None of the stations are equipped with diesel exhaust systems to reduce exposure to vehicle exhaust. Diesel exhaust has been contributed to health issues when people are exposed to it over long duration. By having these systems in each station, the health concern is greatly reduced. The Ministry of Labour, through its Section 21 Committee, sets out fire service guidance notes. Guidance note 3-1 Reducing Exposure to Diesel Exhaust states:

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

Diesel exhaust ventilation systems should be installed in all the NOTLFES fire stations.

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

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

The appendices to that section also references that "…it is imperative that the protective elements be routinely inspected to ensure that they are clean, well maintained, and still safe". NOTLFES has a

program that PPE is inspected and cleaned in-house, and that there is a cache of used gear that can accommodate a large portion of the Department. NOTLFES is also planning on the issuance of a second set of gear to each firefighter in the coming years.

NOTLFES has standard operating guidelines on PPE/Bunker Gear inspections and cleaning. There is a need for instructions ensuring the correct re-assembly of the ensemble, including how to check that the Drag Rescue Device (DRD) has been properly installed.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
5	The Department should continue its ongoing efforts towards certification for staff for each position (that requires or recommends certification) and ensure that certifications are maintained.	Staff time	Short-term (1 - 3 years)
6	Hire a part-time Fire and Life Safety Educator to focus on community public education and Volunteer Public Education Coordination. An option is to utilize the Administrative Assistant, who is already trained as a Fire Inspector and Life Safety Educator.	$40,000 - $50,000/year Option $7,500 salary top up	Short-term (1 - 3 years)
7	Hire a full-time Fire Prevention and Public Education Officer to focus on Bed and Breakfast occupancies, hotels, long and short-term licensed rentals, secondary occupancies, restaurants, and other commercial buildings, as well as public education.	$95,000/year salary / benefits plus $40,000 for a vehicle.	Mid-term (4 - 6 years)
8	Relocate headquarters staff to Station #1 to provide immediate call response from Monday to Friday office hours to reduce the turnout time for calls in the Old Town. This would be a temporary measure until a new headquarters could be built adjacent to Station #1.	Minor renovations	Immediate (0-1 year)
9	Trial a duty crew model for 2021 on weekends, during the prime tourist season (e.g. June to September) and select long weekends/special events (e.g. Christmas Parade) to assess its impact on reducing turnout time.	$20-$30,000	Immediate (0-1 year)
10	A review of the volunteer firefighter compensation package should be undertaken in conjunction with the Town's Employee Bargaining Group negotiations.	Costs based on review outcome	Short-term (1 - 3 years)
11	Diesel exhaust ventilation systems should be installed in all the NOTLFES fire stations.	$20,000 to 30,000 per bay	Short-term (1 - 3 years)

SECTION 5 – Fire Suppression & Dispatching

Section 5: Fire Suppression & Dispatching

5.1 Fire Suppression/Emergency Response

NOTLFES is a volunteer department, and as such the NFPA 1720 standard for volunteer fire departments is applicable for this review. It should be noted that although the NFPA is not a mandated standard, it is recognized as an industry best practice. As such, it is advisable that fire departments use NFPA standards as goals and guidelines to strive for.

When volunteer departments receive a call for service, firefighters are often not in the station when the call comes in. They must drive to their assigned fire station, get into their bunker gear, board the apparatus, and then respond; this is known as the 'turnout' time. The NFPA Standard for volunteers uses 4 minutes as the benchmark turnout time. Based on the 2020 data from January 1st to July 29th the turnout time for NOTLFES ranged from seven minutes to just over eight minutes (see Figure #14).

The majority of the calls occur in the areas covered by the Old Town and Virgil stations. Due to the call volumes, increased turnout times, and distance some firefighters have to travel to get to the station, it is recommended that the staffing levels at the Old Town and Virgil stations be increased to a total of 30 firefighters (4 additional firefighters and 1 Lieutenant per station). Doing so will improve the turnout time if additional firefighters live in proximity of their assigned station.

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

TABLE #8: Staffing Assigned to Each Station

Station	District Chief	Assistant District Chief	Captains	Lieutenants	Firefighters	Total
Stn. # 1 Old Town	1	1	2	2	19	**25**
Stn. # 2 St. Davids	1	1	1	1	16	**20**
Stn. # 3 Virgil	1	1	2	2	19	**25**
Stn. # 4 Queenston	1	1	1	1	16	**20**
Stn. # 5 Glendale	1	1	1	1	16	**20**

As previously mentioned, the NOTLFES staffing requires some members to travel a lengthy distance to arrive at their assigned station, consequently increasing the turnout time. In the past, when

firefighters moved or relocated, they often stay assigned to their original station even if their new residence is much closer to another station.

To be more efficient with response to stations by the firefighters, it is recommended that the NOTLFES review the firefighters' station assignments to realign them so that firefighters may be assigned to stations closer to their place of residence. Further, NOTLFES should develop a policy that requires firefighters to notify their District Chief when they move and for the fire department to transfer them to the most appropriate station. This has the potential to improve turnout times on emergency calls.

5.1.1 National Fire Protection Association (1720)

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

When considering the response times and needs of a community, the fire response curve (FIGURE #9) presents the reader with a general understanding of how fire can grow within a furnished residential structure over a short period of time. Depending on many factors, the rate of growth can be affected in several different ways, which can increase or suppress the burn rate through fire control measures within the structure.

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

- The distance between the fire department and response location.
- The layout of the community.
- Impediments such as weather, construction, traffic jams, lack of direct routes (rural roads).
- Notification time.
- Assembly time of the firefighters, both at the fire station and at the scene of the incident.
    - Assembly time includes dispatch time, turnout time to the fire station, and response to the scene. It should be noted that assembly time can vary greatly due to weather and road conditions, along with the time of day as many firefighters are at their full-time jobs and cannot respond to calls during work hours.

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

FIGURE #10: Fire Response/Propagation Curve

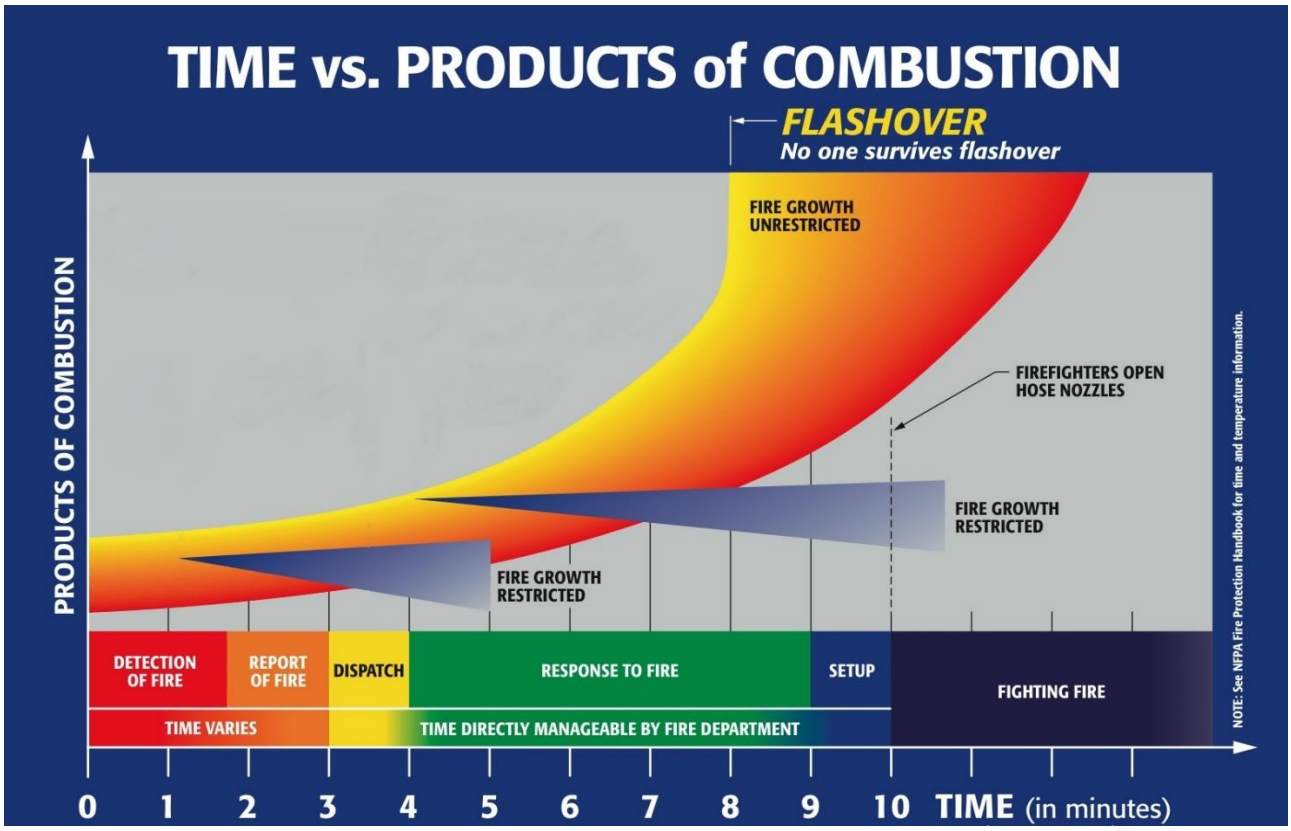


FIGURE #10 notes the following time variables:

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

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 to the rest of the structure. Alternatively, if the first fire attack team arrives with fewer than four firefighters on board, it is limited to what operations it can successfully attempt.

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

The Fire Chief must ensure that each station has a complement that allows for an initial full crew response to incidents. To accomplish this, a response protocol is in effect that ensures whenever a station and its firefighters are dispatched to any type of call where back-up may be required, another station is automatically dispatched to the same incident.

5.1.2 Response Data

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

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

Performance measurements that the fire department could benefit from include monitoring:

- Response time: the total time from receipt of call (on 9-1-1) to the time the fire vehicle arrives at the incident location.
- Firefighter turnout time: time from page until the first vehicle is responding.
- Drive time: time tracked from when the fire vehicle has left the station until arrival at the incident location.
- Staffing time: time from the page until the appropriate number of firefighters are on scene (e.g. 10 firefighters).

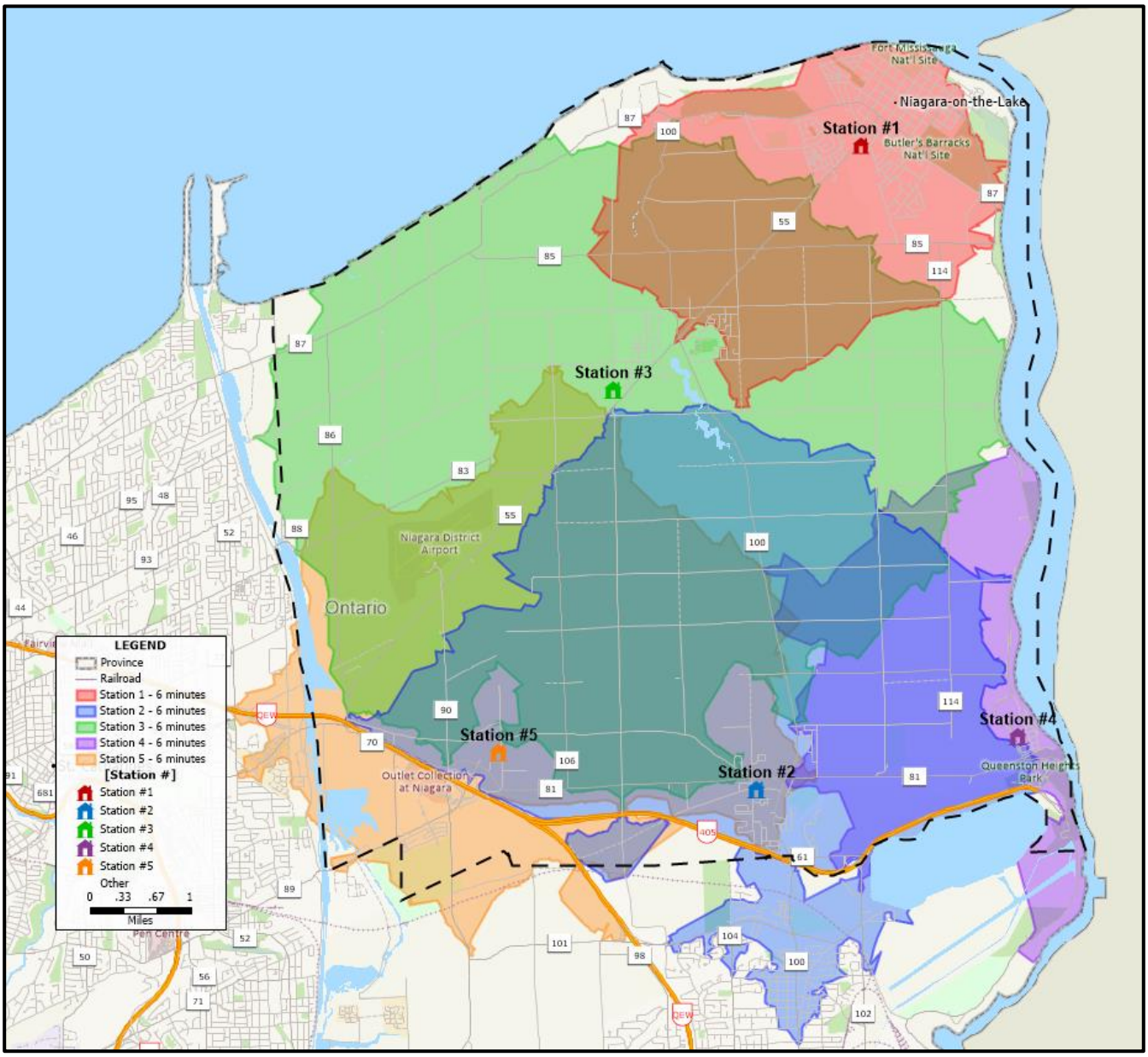
In reviewing the time it takes to arrive at an incident once leaving a fire station, it was found that the majority of the time the apparatus arrives in less than 6 minutes. The following map indicates the areas the crews may arrive within a 6-minute drive time.

Note: *In monitoring time measurements, the 80th percentile criterion is the recommended practice that is endorsed by the NFPA and CFAI. This data is more accurate since it is evaluating the times based on 80% of the calls, as opposed to averaging the times at the 50th percentile. For example:*

- *8 out of 10 times the fire department arrives on scene in 10 minutes or less, which means that only 20 percent of the time they are above that 10-minute mark*
- *as opposed to 5 out of 10 times (average) the fire department arrives on scene in 10 minutes or less, which means that 50% of the time they are above the 10-minute mark.*

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

FIGURE #11: 6-Minute Travel Time Map

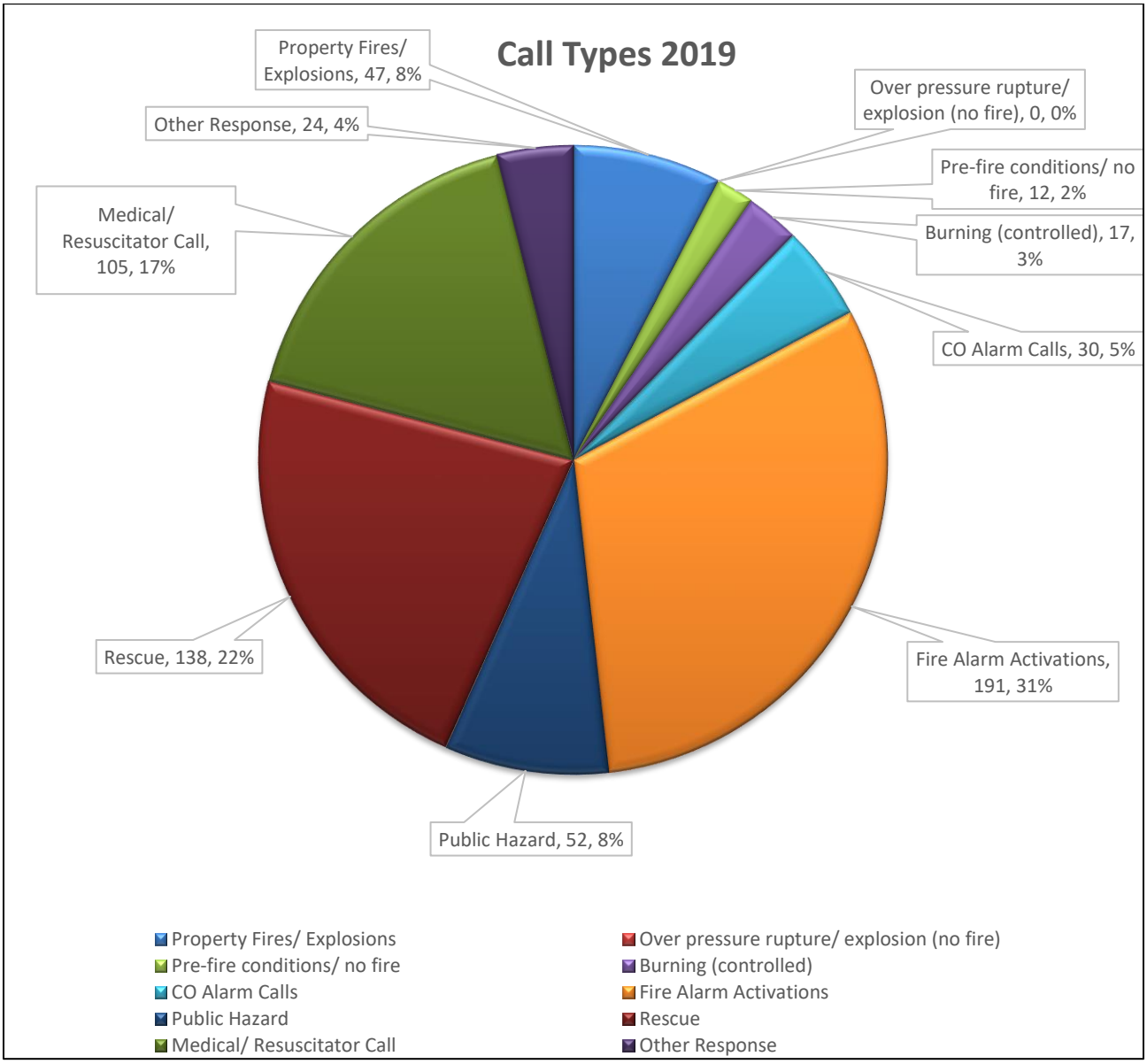


The response zone map identifies a solid level of coverage based on the physical locations of the stations relative to the NFPA recommended response times. As illustrated, except for some very small areas, the entire Town is within a 6-minute drive time of at least one fire station.

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

FIGURE #11 illustrates the types of calls responded to by NOTLFES in 2019. Additional charts with data for the years 2017 and 2018 are available in Appendix C.

FIGURE #12: 2019 Call Types



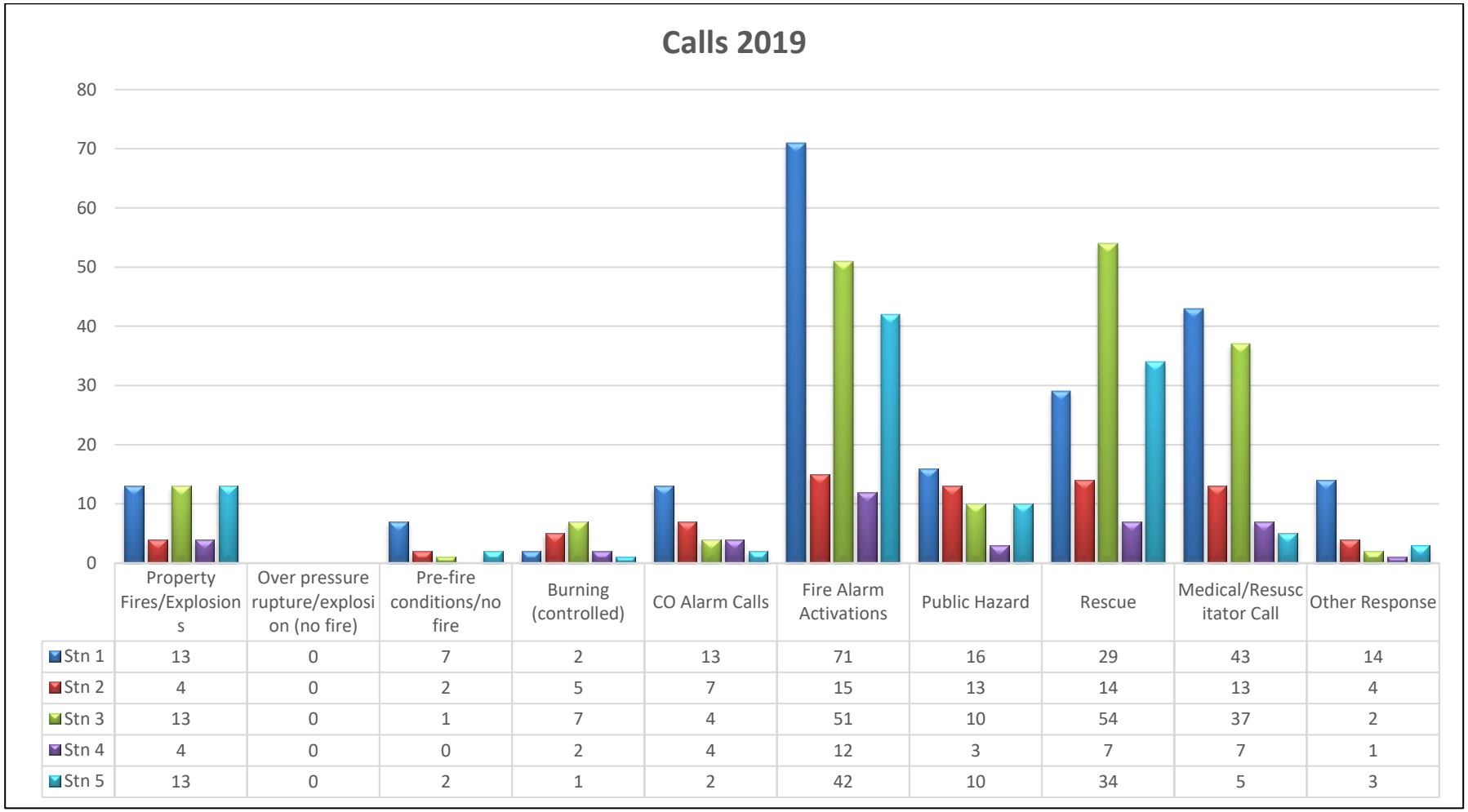
As can be seen in the above chart, the top three types of calls that NOTLFES responds to are:

1. Fire alarm activations accounted for 31% of the responses
2. Rescues accounts for 20% of the responses
3. Medical/resuscitator accounts for 17% of the responses

These top three types of calls have remained relatively the same over the passed five years.

FIGURE #13 breaks the call types down by station. As indicated in FIGURE #12, the majority of the call types are fire alarms, medicals, or other rescues. With so many fire alarm activations, many of them are false alarms caused by faulty equipment or testing of alarm systems without notifying the answering service, etc. The Fire Chief has taken measures to assist in reducing the number of false fire alarm calls that the crews are called out in the form of invoicing for unnecessary call outs.

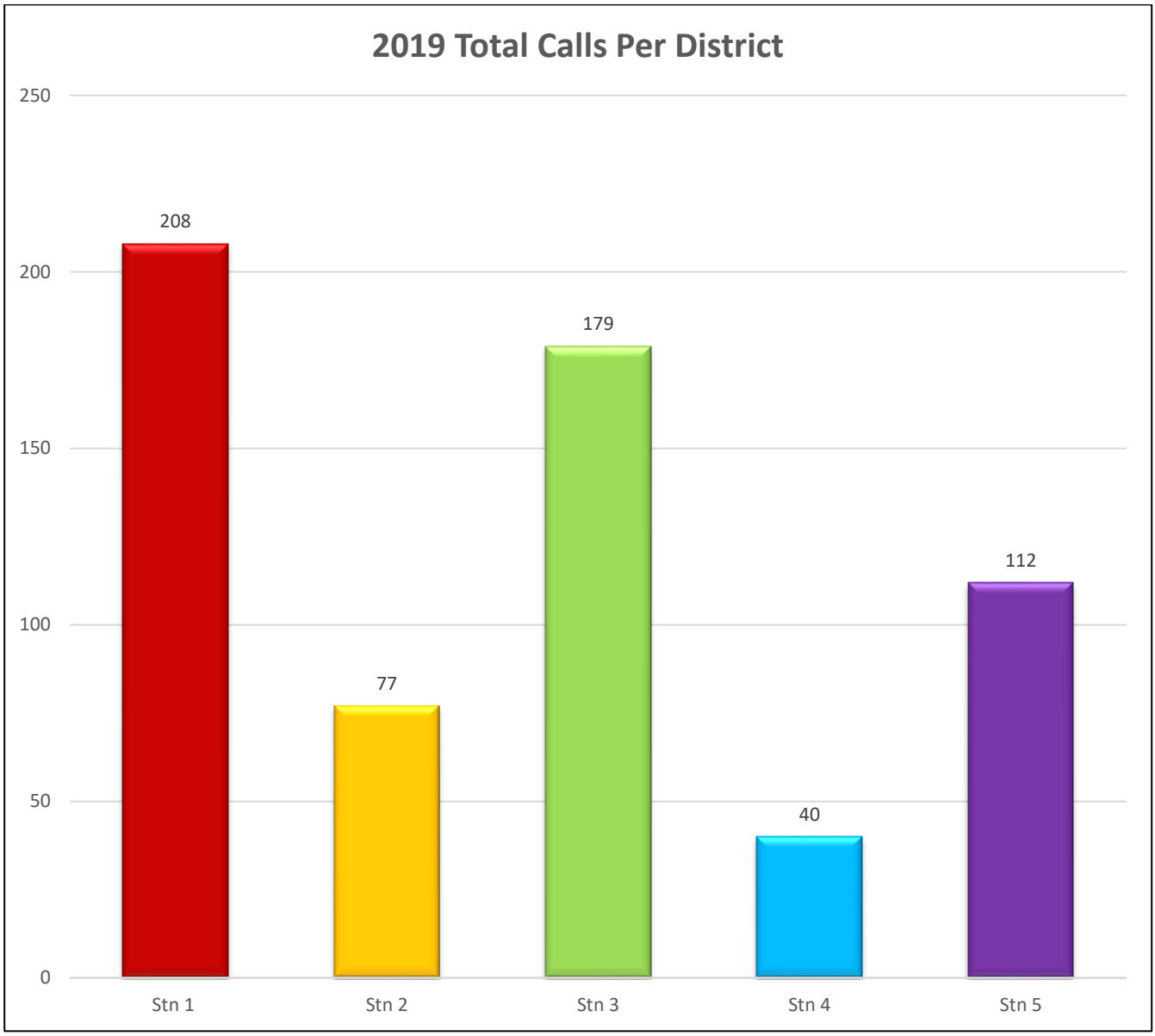
FIGURE #13: 2019 Call Types by Station



	Property Fires/Explosions	Over pressure rupture/explosion (no fire)	Pre-fire conditions/no fire	Burning (controlled)	CO Alarm Calls	Fire Alarm Activations	Public Hazard	Rescue	Medical/Resuscitator Call	Other Response
Stn 1	13	0	7	2	13	71	16	29	43	14
Stn 2	4	0	2	5	7	15	13	14	13	4
Stn 3	13	0	1	7	4	51	10	54	37	2
Stn 4	4	0	0	2	4	12	3	7	7	1
Stn 5	13	0	2	1	2	42	10	34	5	3

Additional charts for 2017 and 2018 are available in Appendix C.

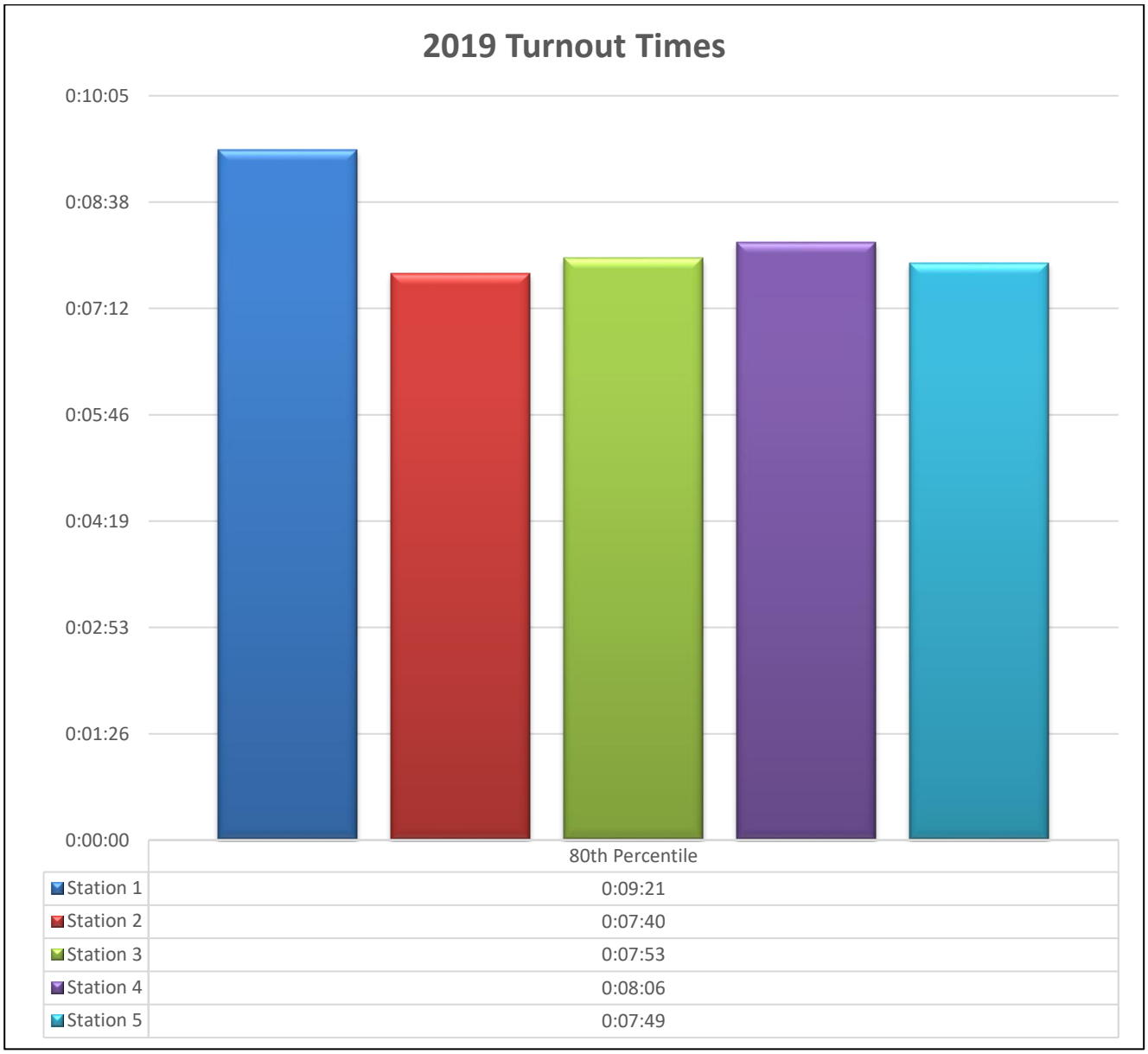
FIGURE #14: 2019 Total Calls Per District



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

FIGURE #15 illustrates the 80th percentile turnout times; this respresents the time it takes from when the firefighters are dispatched to when the first apparatus is in motion traveling to the location of the incident.

FIGURE #15: 2019 Turnout Times by Station



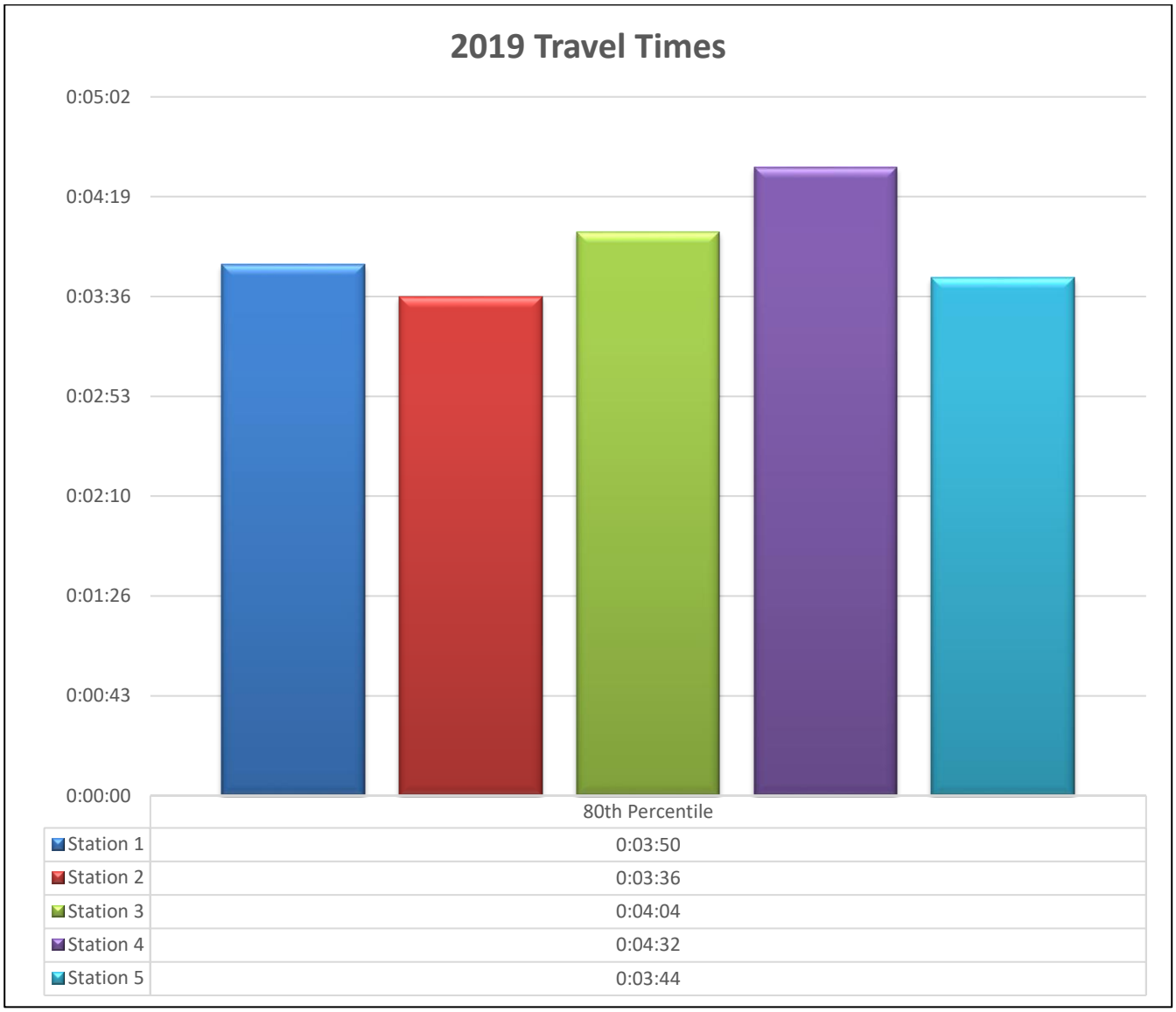
It must be noted the that turnout times illustrated in this graph do not include calls for service that are non-emergent in nature. The 2018 data may be viewed in Appendix C.

FIGURE #16: 2020 Turnout Times by Station

The data illustrated in FIGURE #16 is based on calls from January 1st until July 29th, 2020.

The following charts outline the 80th percentile travel times for each station. The travel time is measured from the time the apparatus leaves the station, to the time it arrives at the incident.

FIGURE #17: 2019 Travel Times by Station

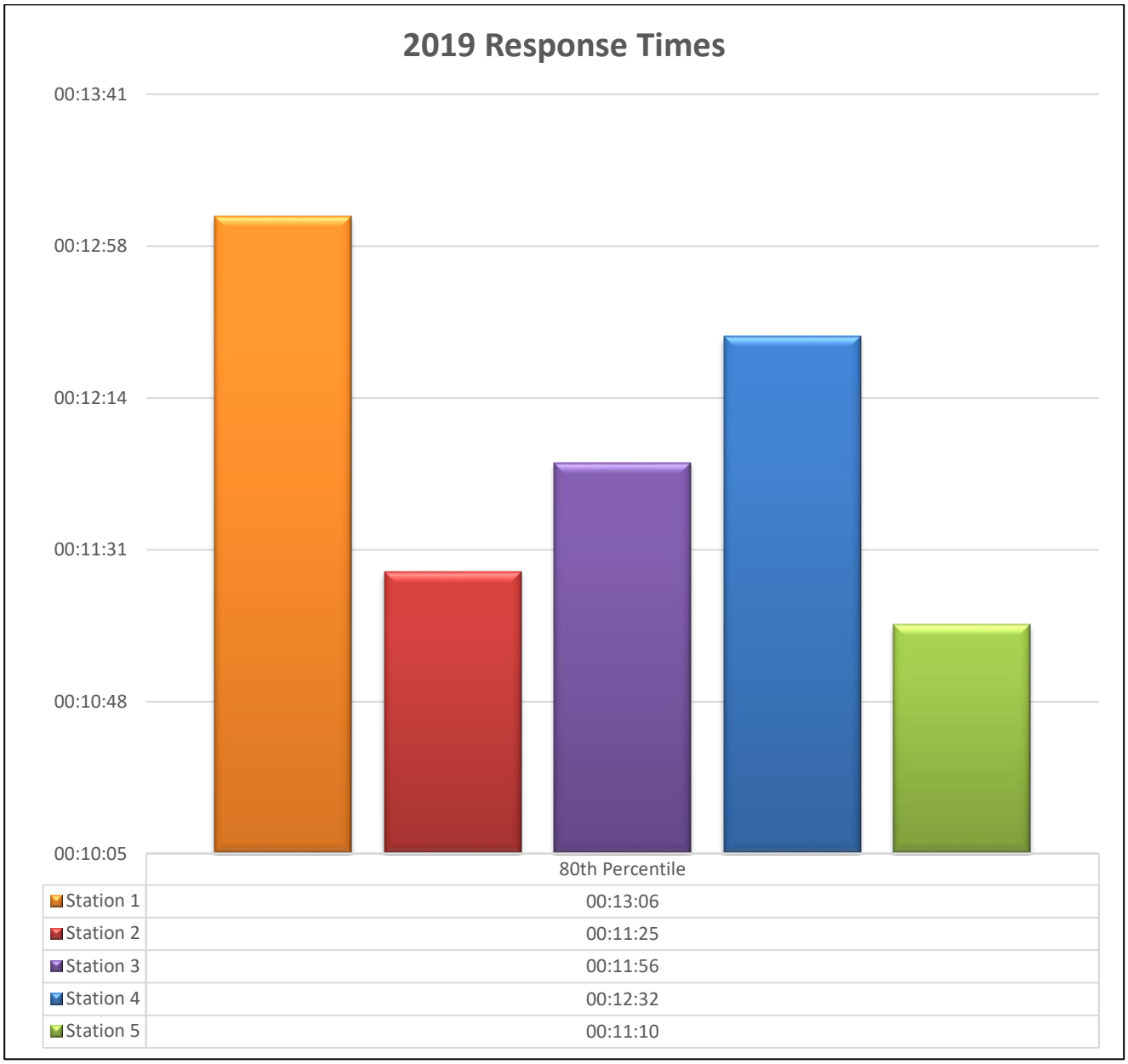


The travel times illustrated in this graph do not include calls for service that are non-emergent in nature. The 2018 data may be viewed in Appendix C.

FIGURE #18: 2020 Travel Times by Station

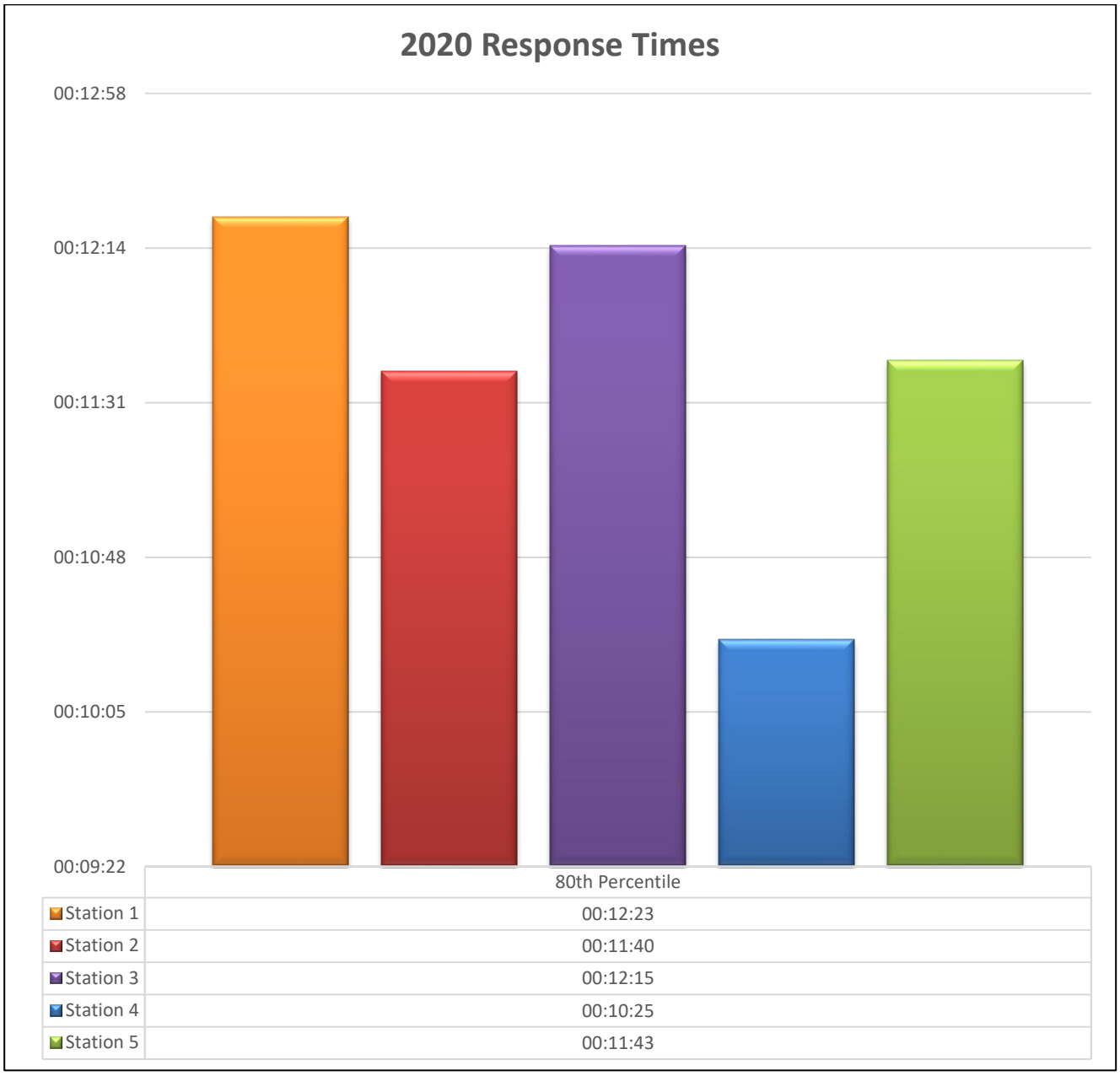
The data illustrated in FIGURE #18 is based on calls from January 1st until July 29th, 2020.

FIGURE #19: 2019 Response Times by Station



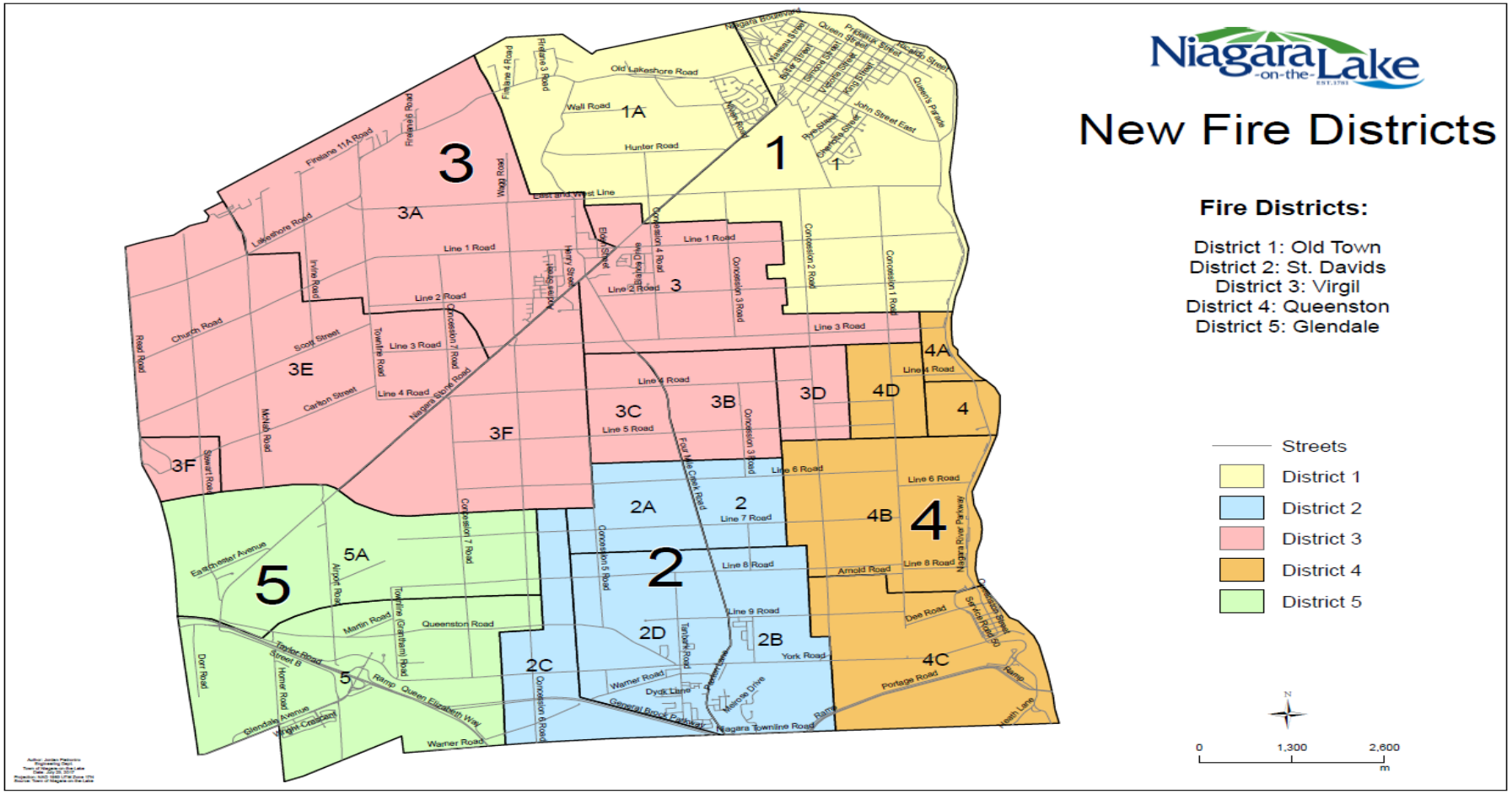
The response times illustrated in this graph do not include calls for service that are non-emergent in nature. The 2018 data may be viewed in Appendix C.

FIGURE #20: 2020 Response Times by Station



The data illustrated in FIGURE #20 is based on calls from January 1st until July 29th, 2020.

FIGURE #21: Response Zone Map



Another useful tool in measuring fire service response can be done through pinpointing where the bulk of the emergency responses are occurring. This clustering of responses will help to identify where the majority of calls are occurring, which will indicate if the present fire station locations are adequately positioned, or if there a shift in call locations that would suggest the possible need for the relocation of a fire station.

FIGURE #22: 2018 Call Cluster Map

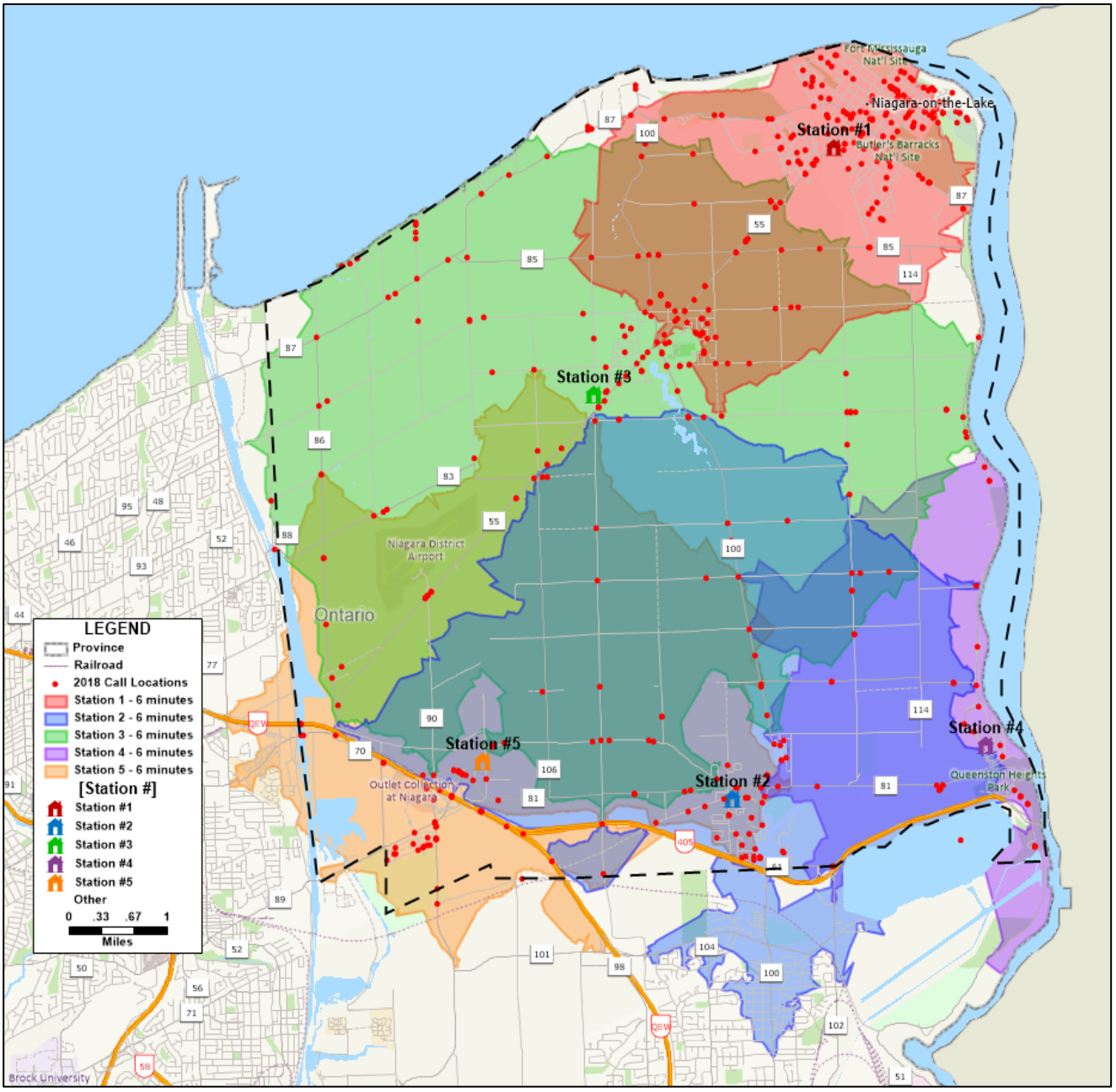


FIGURE #23: 2019 Call Locations Map

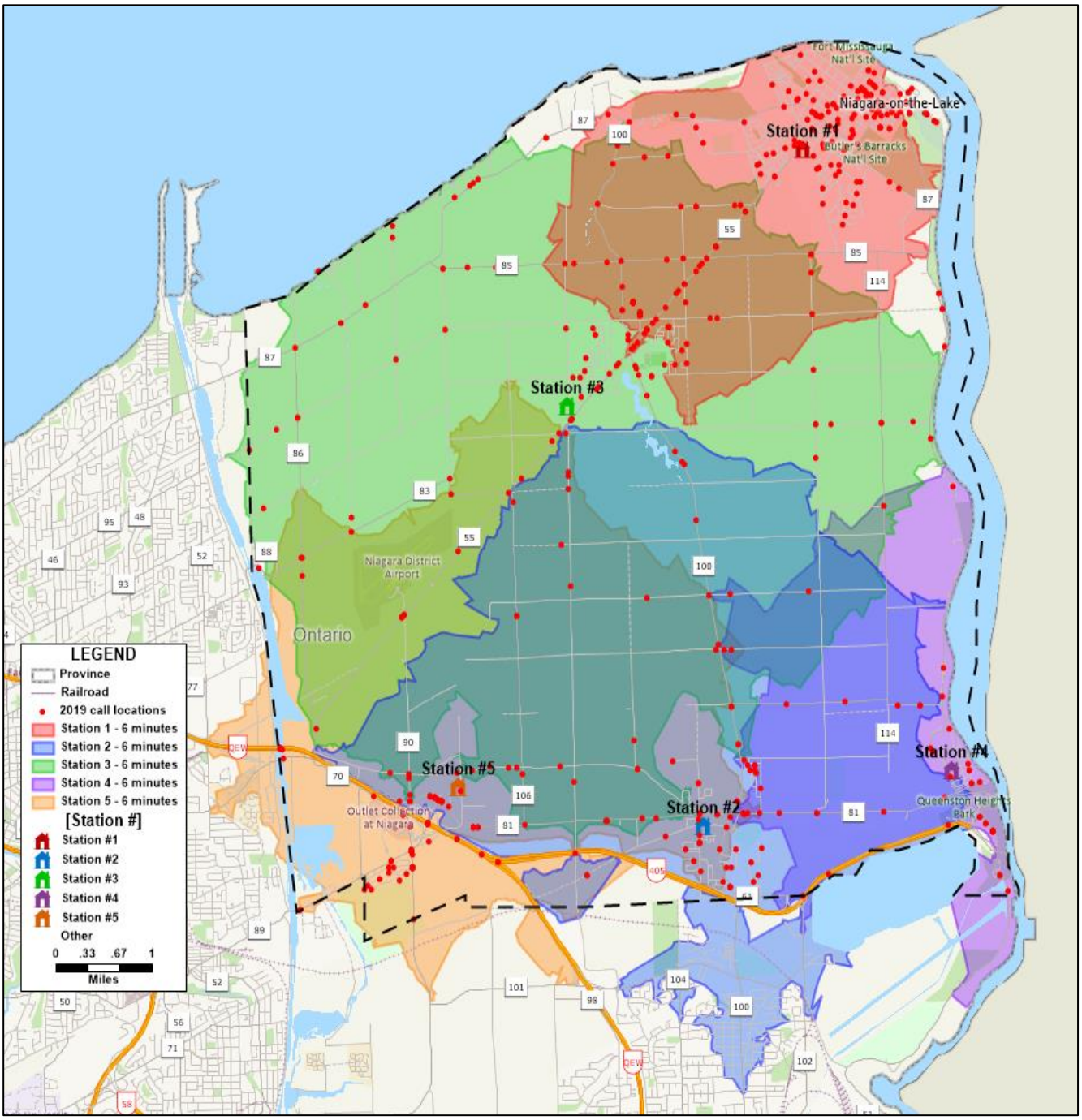


FIGURE # 23 illustrates that all the fire stations are well situated to respond to the bulk of the calls responded to by the Department.

Although the NFPA response times are not mandated, it would be beneficial for the Fire Chief to be have a response time goal supported by Council as a benchmark. As such, it is recommended that the Fire Chief present a response time goal for the approval of Council (which may reference NFPA 1720 – the expectation of 10 staff in 10 minutes (80th percentile)), and that performance measures are

continuously monitored. This recommendation is only meant to provide NOTLFES a goal/guideline to aim for, not as a mandated expectation.

5.2 Medical Responses

As illustrated in FIGURE #12, medical responses account for 17% of all calls responded to by NOTLFES. The department entered into a Tiered Response Agreement with Niagara Emergency Medical Services (NEMS) dating back to 2016. The current agreement states that the Department will respond to all types of medical emergencies based on a 10- or 15-minute time delay in the response by NEMS. The firefighters are trained to the Basic Life Support (BLS) through Heart & Stroke, which includes defibrillation. Due to the time frame from when the current agreement came into affect, it is recommended that the Fire Chief contact NEMS to discuss and update the tiered medical agreement.

5.3 Dispatching Services

NOTFLES receives its dispatching services from the St. Catharines Fire Services. Based on information received, along with a review of the dispatching data, it would appear that NOTLFES is receiving adequate dispatching services.

St. Catharines Fire Services is also responsible for activating the paging and real time texting (RTT) systems to alert the volunteer firefighters to respond. The NOTLFES uses the app, “I Am Responding” to communicate with the firefighters that there is a call. The app notifies the firefighters who are responding to the fire station/call. If responses are low, a call can then be put out for additional resources. This app is activated by the St. Catharines Fire Services.

The agreement with St. Catharines details a fee for services provided along with related infrastructure and operations activities. The current agreement with St. Catharines for call taking and fire dispatch reflects an effective strategy for the NOTLFES in providing these services.

Dispatch is supported by a CAD (computer aided dispatch) software program INFOR EnRoute that effectively assists with timely dispatch. Reports of each incident’s dispatch log are forwarded to the Town for review and records for future reference.

The agreement outlines that St. Catharines is working towards meeting the requirements of NFPA 1061, *Standard for Public Safety Telecommunications Personnel Professional Qualifications* and NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, which is used to identify dispatching service criteria.

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

The 911 Central Emergency Reporting Bureau (CERB) for Niagara-on-the-Lake is the Niagara Regional Police Service. Emergency 911 calls are directed to the police service and then directed to the emergency service that is required by the caller (i.e. ambulance or fire).

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

> *Canadians depend on the provision of reliable and effective 9-1-1 services to seek help in an emergency. As technology and consumers' needs evolve, so do consumers' expectations, related to 9-1-1 services. In the coming years, telecommunications networks across Canada, including the networks used to make 9-1-1 calls, will continue to transition to Internet Protocol (IP) technology. This will enable Canadians to access new, enhanced, and innovative 9-1-1 services with IP-based capabilities, referred to as next-generation 9-1-1 (NG9-1-1) services. For example, Canadians could stream video from an emergency incident, send photos of accident damage or a fleeing suspect, or send personal medical information, including accessibility needs, which could greatly aid emergency responders.*
>
> *In this decision, the Commission is setting out its determinations on the implementation and provision of NG9-1-1 networks and services in Canada. This will require coordination and collaboration between numerous stakeholders, including the Commission; telecommunications service providers that provide 9-1-1 services (TSPs); 9-1-1 network providers; the CRTC Interconnection Steering Committee (CISC); federal, provincial, territorial, and municipal governments; emergency responders; and public safety answering points (PSAPs). As such, in this decision, the Commission is making a number of recommendations in which all stakeholders will have a role to play, including the establishment of a national PSAP and emergency responder coordinating body.*
>
> *The Commission has determined that an incumbent local exchange carrier (ILEC) stewardship model under Commission oversight is the most appropriate with respect to the governance and funding of NG9-1-1, such that the ILECs will be responsible for the construction, operation, and maintenance of the NG9-1-1 networks, with Commission oversight, including through Commission approval of the ILECs' tariffs.*
>
> *The Commission **directs** all ILECs to establish their NG9-1-1 networks and to be ready to provide NG9-1-1 Voice service by **30 June 2020** wherever PSAPs have been established in a particular region.*

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

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

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

[Goals and Outcomes of Implementation]

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

4. *In paragraph 7 of Telecom Regulatory Policy 2014-342, the Commission indicated that Canadians should have access to new, enhanced, and innovative 9-1-1 services with IP-based capabilities, otherwise referred to as 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.*[18]

Current Condition

Dispatching Services:

- The current dispatch agreement with the St. Catharines Fire Services is working well and meeting the needs of NOTLFES.
- Niagara-on-the-Lake currently pays approximately $3.17 per capita for fire dispatching services based on 19,000 population and a rate of $60,367 in 2020. This is at the middle of the scale as other centres charge between $2.10 and $4.50 per capita (2020). Prior to the expiration of the current contract, the Fire Chief should take the opportunity to review the agreement and the services being provided, along with any concerns and bring these forward to the St. Catharines Fire Chief.
    - The current agreement which came into effect on January 1st, 2018 expires on December 31st, 2022.

Next-generation 9-1-1:

- As noted in the CRTC excerpt, June 2024 is a key date to work with. The Fire Chief must ensure that Niagara-on-the-Lake is a stakeholder at the steering committee table through direct involvement or as part of the regional committee for this implementation plan.
- The Town must understand that there will be significant expenses for the fire dispatch to implement NG9-1-1 and the St. Catharines Fire Department will likely increase fees for all fire departments it dispatches to cover these additional costs.

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

5.4 Vehicle Technology

The NOTLFES has endeavored to advance the technological perspective on the apparatus through the acquisition of iPads in some of the apparatus. These units are data enabled and will permit the responding crews to acquire information about the incident they are responding to, directly from the communications centre, including mapping, responding staffing levels, pre-incident plans, hydrant locations, and in some cases access to the internet. At present, not all apparatus have these units installed. They are only in the Pumpers and Chiefs' vehicles. In the near future, the aerials will also be equipped with the iPads and longer term an assessment will be made to determine whether to install them in the tankers and the Rescue.

In the future the NOTLFES should upgrade these units to a full Mobile Data Terminal function, which permit communications directly to the Communications Centre and many more features.

5.5 Radio System

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

Simplex vs Repeater Radio Signals

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

Analogue vs Digital

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

The NOTLFES radio system is operating on analogue technology, with a single repeater site located at the Niagara Region Water Tower on Henegan Road in Virgil. The Town is in the process of acquiring a back-up site at 745 Warner Road in St. Davids to ensure there is redundancies in the radio system in event of radio failure at the main transmission site. Further, the NOTLFES has been putting in place the infrastructure to upgrade the radio system to digital technology, adding a new level of radio transmission security.

The NOTLFES has recently upgraded all of its mobile and portable radios so that they are digitally compatible when the transition occurs. This includes the installation of range extenders in some of the apparatus to improve the level of radio coverage in larger structures.

With the new changes, NOTLFES has identified that additional training is required for the firefighters to make the optimum use out of the radio system and new equipment.

NOTLFES should conduct a needs assessment in the mid-term for a transition to digital technology, lining up with the changes that will occur with NG-911.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
12	The Fire Chief present a response time goal for the approval of Council, which may reference the NFPA 1720 – expectation of 10 staff in 10-minutes (80 percentile), and that performance measures are continuously monitored. Fire Chief to continue monitoring response times along with how many times, if any, a full response component was not amassed.	Staff time	Short-term (1 – 3 years)
13	It is recommended that the staffing levels be increased to a total of 30 firefighters at the Old Town (Station #1) and Virgil (Station #3) stations.	$100,000 to $130,000 including equipment and training	Short-term (1 – 3 years)
14	It is recommended that the NOTLFES review the firefighter station assignments to realign them so that firefighters may be assigned to stations closer to their place of residence. A policy should be developed that addresses this requirement in the future.	Staff time	Immediate (0 – 1 years)
15	The Fire Chief contact the NEMS to review and update the tiered medical agreement.	Staff time	Short-term (1 – 3 years)
16	NOTLFES move towards fully functioning mobile data terminals in all fire vehicles.	$10-20,000 per vehicle	Short-term (1 – 3 years)
17	It is recommended that the Town conduct a needs assessment in the mid-term for a transition to digital technology.	$15,000 – $20,000 for the audit	Mid-term (4 – 6 years)

SECTION 6 – Facilities

6.1 Fire Station Review

6.2 Fire Station Locations and Suitability for Growth

Section 6: Facilities

This section will assess facility needs and station locations - review existing facilities and provide recommendations for future locations relative to current and future service delivery demands and applicable standards, as well as consideration of potential needs for relocation or additional stations.

6.1 Fire Stations Review

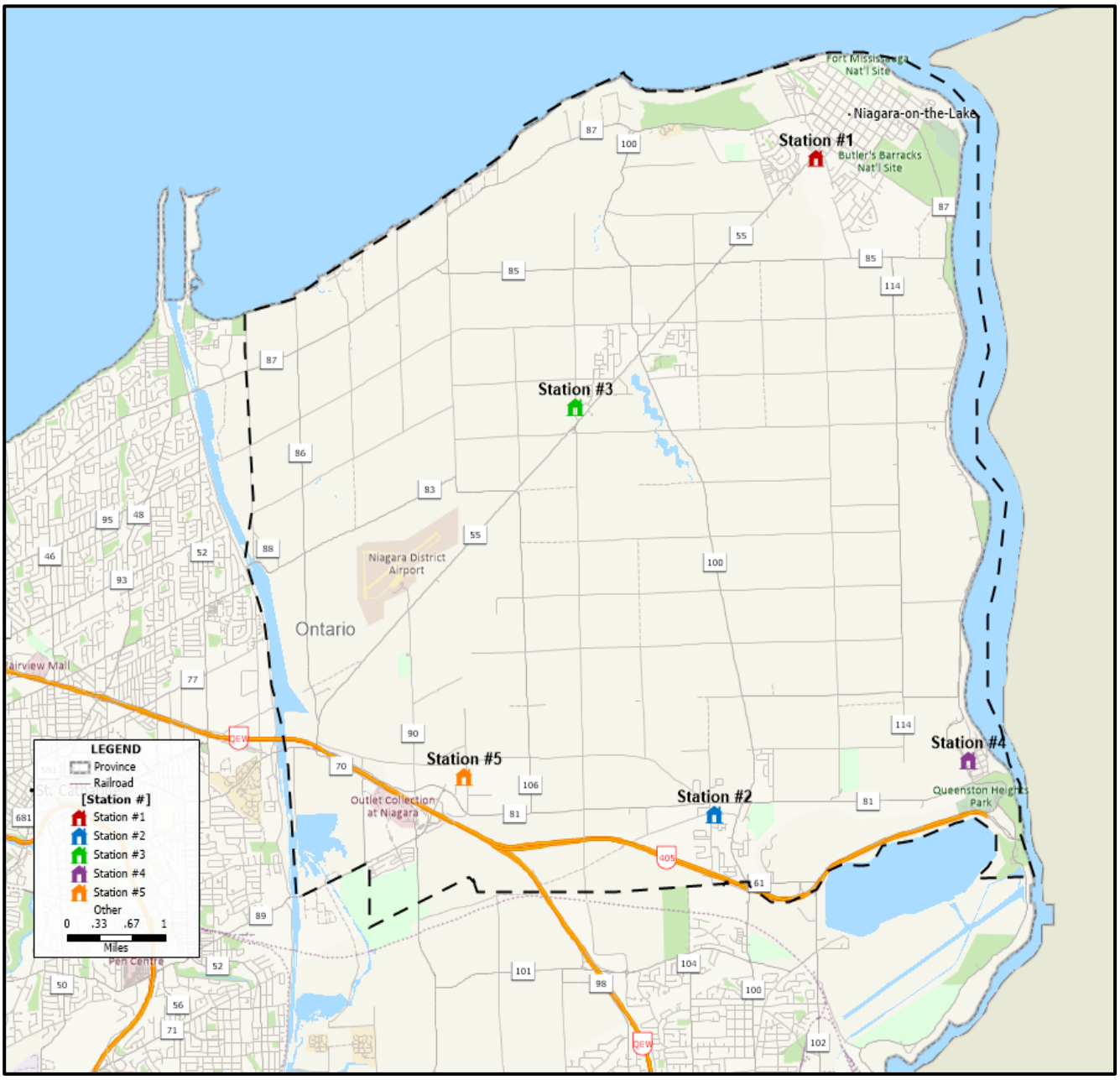
Fire stations should be positioned to offer the most efficient and effective response to the community they serve. Centering them within a determined response zone that is simply based on "timed" responses is not always the best option to implement. Fire station location depends on many factors such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

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

Niagara-on-the-Lake is served by 5 stations across the municipality as noted in FIGURE #23.

Station #1 is located in Old Town, Station #2 is in the rural village of St. Davids, Station #3 is in Virgil, Station #4 is in the historical village of Queenston, and Station #5 is in Glendale.

FIGURE #24: Station Locations

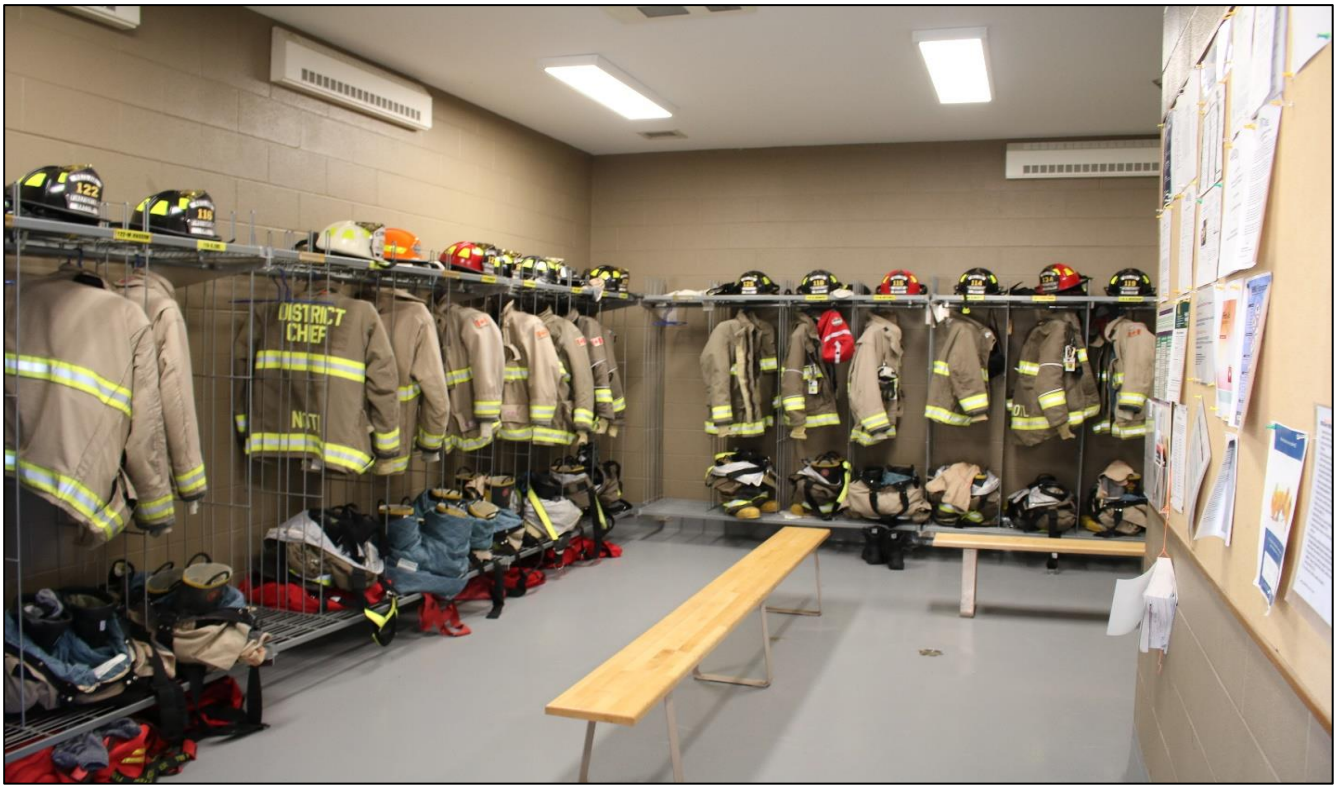


6.2 Fire Stations Locations and Suitability for Growth

6.2.1 Station #1

Station #1 is located at 22 Anderson Lane and serves the main downtown, residential, and tourist area of the Town. The station, built in 2000, is approximately 10,000 ft^2 and has three drive-through apparatus bays. The station is equipped with a separate bunker gear room, storage rooms, equipment maintenance room, breathing air bottle refilling station, training room, kitchen, gym, and washrooms with showers. The facility also has a couple of offices and a museum. This station is well situated to serve the downtown core and is equipped to meet the needs of the fire department well into the future.

The meeting room at Station #1 should be considered as a secondary location of the emergency operations centre.


DISTRICT
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6.2.2 Station #2

Station #2, built in 1984, is located at 745 Warner Road in the Village of St. Davids, which is primarily a residential area surrounded by agricultural land. The station is approximately 7,000 ft^2 and has a three-bay fire station with one drive-through bay, an office, and training room. It is attached to the community library. There are not any female showers at this station.

While the station has been well maintained and is meeting the needs of the Fire Department, it is recommended that a separate room be added for bunker gear storage to keep the gear from being contaminated by diesel exhaust.


Niagara on the Lake
PUBLIC
LIBRARY
St. Davids
Call the library
for access code
905-468-2023

6.2.3 Station #3

Station #3 is located at 1391 Concession 6 Road, in the rapidly growing Village of Virgil. Built in 2008 it has an approximate area of 10,300 ft^2 with 3 drive-through double deep apparatus bays. The station is well equipped with a separate bunker gear room, equipment maintenance room, training room, gym, washrooms with showers, a couple offices for the station officers, kitchen, etc. This station is well located and equipped to serve the Town for many years.

6.2.4 Station #4

Station #4 is located at 5 Dumfries Street in the Village of Queenston. Built in 1974, the 5,200 ft^2 building is the oldest of the fire stations in Niagara-on-the-Lake. The station has two apparatus bays (not drive-through) with the bunker gear stored at the back on the apparatus floor. The station has a training room, kitchen, and an office.

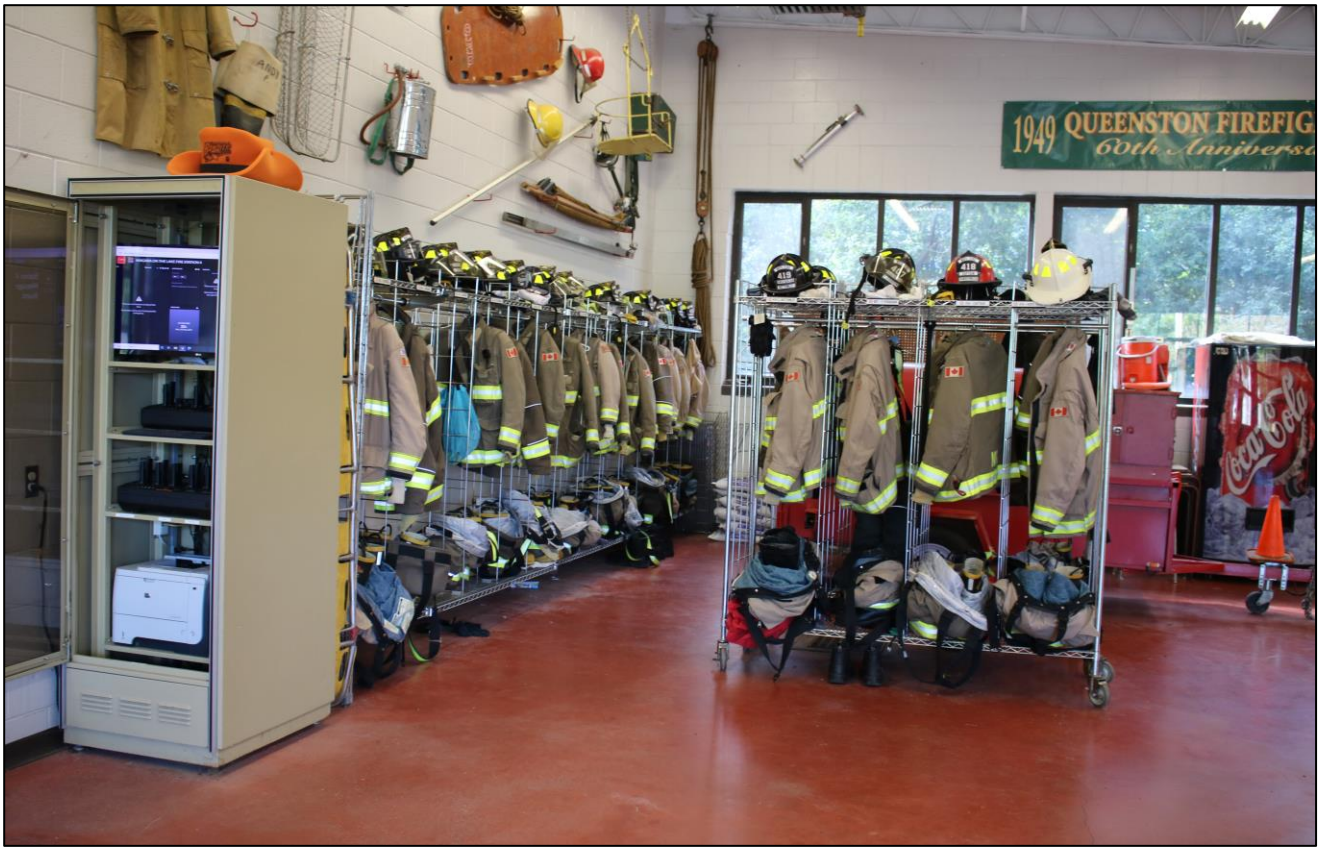
Overall, the station is in fair condition, however, there were noted areas of cracks in the interior block walls, exterior brick, and the appearance of settling at a side door. These issues appear to be consistent with the age of the building and should be monitored closely.

Due to the building shifting, the one exterior door as a visible gap at the floor and separation between the floor and the block wall.

It should be confirmed that the floor drains in the apparatus bays are equipped with an oil separator to ensure oil does not enter with public water system.

As the station does not have the capacity to store the bunker gear in a specially designed negative air room, the station should be equipped with an at source diesel exhaust system to reduce the build-up of toxic materials on the bunker gear. Modern stations also include an automatic backup power generator and amenities such as shower/locker room for female firefighters, fitness facilities, and proper space to clean and decontaminate equipment, all of which are not present at this station.

The next below shows the bunker gear stored on the apparatus floor behind the trucks.



It is also reported that this station requires major HVAC repairs that have been postponed pending a decision on the future of this station.

Note the damaged brick and mortar joints throughout the structure.

6.2.5 Station #5

Station #5 is located at 350 Townline Road serving the Outlet Collection Mall, Niagara College campus, White Oaks Resort, and other hotels, and light industry/commercial development. This station also serves portions of the QEW and Hwy 405. Built in 2005 this station is approximately 9,000 ft^2 with 3 double deep apparatus bays.

The Town has previously rented an apparatus bay and office to Niagara EMS for the deployment of paramedics as seen in the photo, however, they have since moved to their own location.

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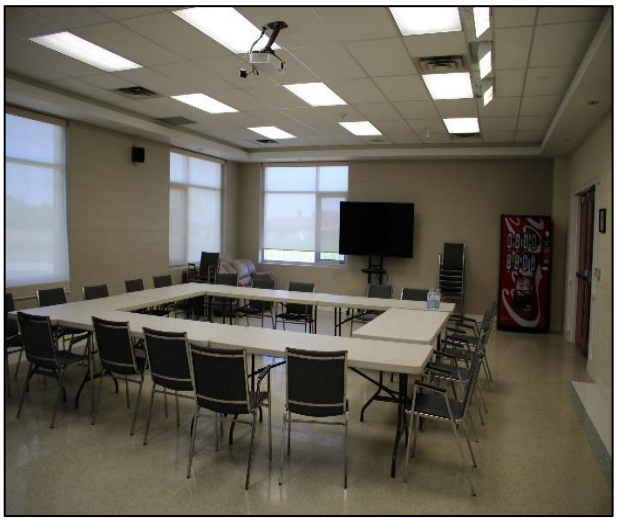
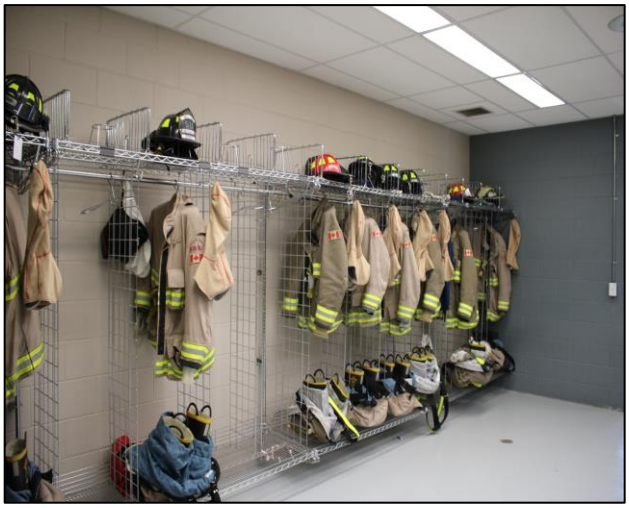
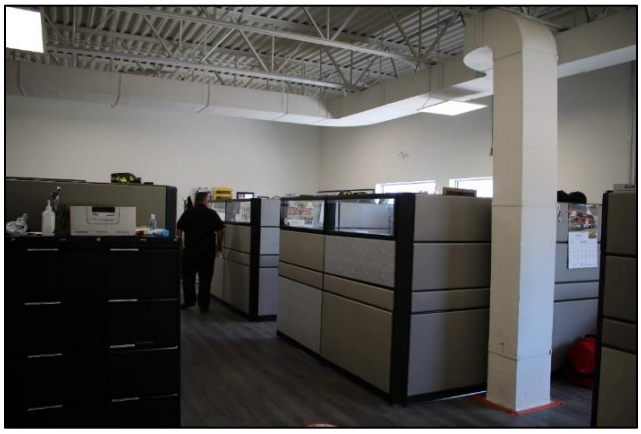


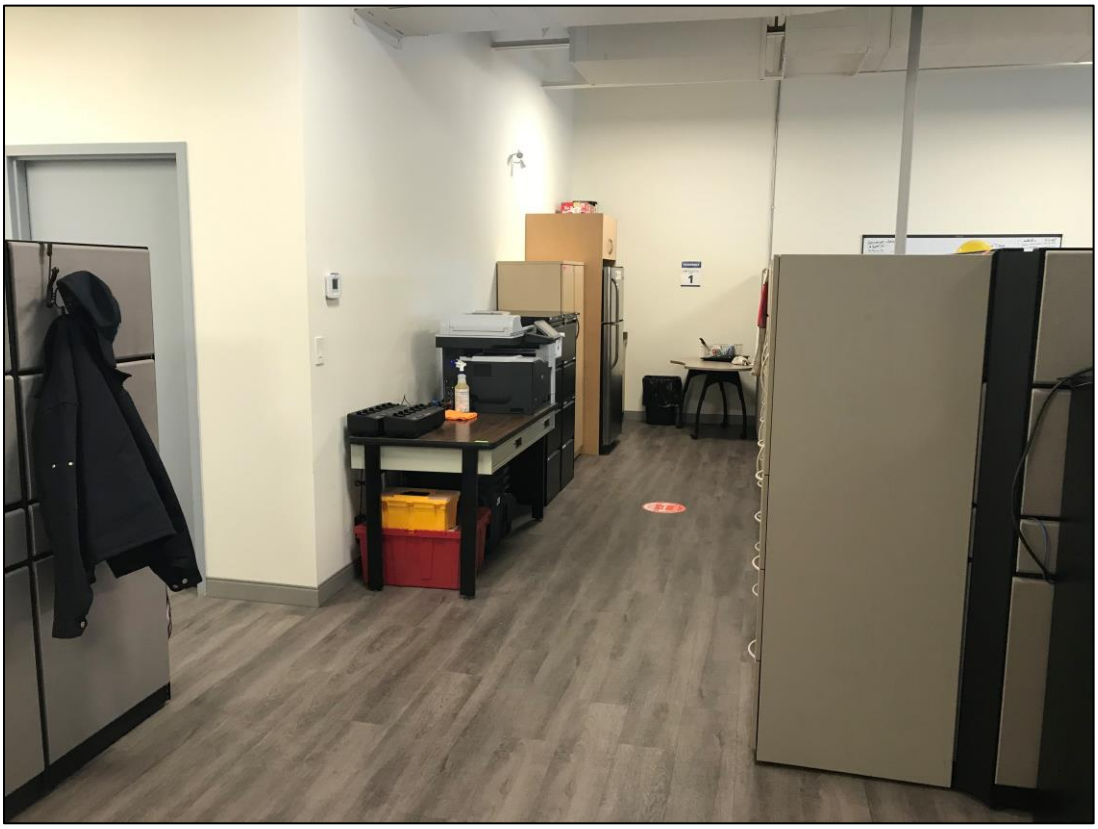


6.2.6 Headquarters

Headquarters is located in the Public Works building behind Town Hall on Four Mile Creek Road in Virgil. The office space is on the second floor of the back part of the building using various corridors and is not designed for public access. The space is made up of cubicles and a small meeting room.



Presently, the space is adequate but lacks capacity to grow and the location presents a number of challenges. The space is not easily accessible by the public or firefighters. Further, as it is a 4 to 5 minute walk from the vehicle parking increasing time to respond to an emergency and is separated from the day to day operations. Typically, it is encouraged that the fire department headquarters be easily accessible for both firefighters and the public.



In Section 5, turnout time and response time is discussed. Station #1 in the downtown area of Niagara-on-the-Lake has an extended turnout time, especially Monday to Friday when on-call

firefighters are often working, at school or otherwise unavailable. This station also has the added challenges of traffic congestion as this area has a large tourism influx. These challenges are nearing the point of requiring a full-time crew Monday to Friday day shifts at a cost of $500-600,000 per year to have one apparatus staffed.

One of the benefits that NOTLFES has is that all of its officers and administration staff are also firefighters. This includes the Fire Prevention Officers and the Administrative Support person.

Having the staff from the existing Headquarters relocated to Station #1 would allow personnel to assemble as a crew on a fire apparatus and respond to calls, thus reducing the turnout time of the initial response. It also extends the timeline where the fire department will have to consider a composite model.

Station #1 has adequate land behind the station that could be utilized to construct a headquarters building on the property. Building a fire department headquarters at Station #1 may cost $1-1.5 M dependent upon the structure's features and functionalities, however the deferred hiring of career firefighters would cover those funds in 2 to 3 years. Further, the Headquarters staff could utilize some of the facilities in the station that are not frequently used during office hours, such as the training room, instead of adding a conference room in the new headquarters.

FIGURE #25 identifies the land that could be considered for a replacement fire department headquarters. A covered walkway or corridor could link the headquarters with the fire station.

The additional benefit will be the ability of Public Works to move into the current space vacated by the Fire Department. It is recommended that a new Headquarters be built on land adjacent to Station #1 Old Town.

To address the concerns of the lengthy turnout time (time from page to first truck responding), NOTLFES should look at moving the headquarters staff into Station #1 on a temporary basis, until the new Headquarters is built. It should be noted that this is only a temporary solution, as the move would cause disruption to the volunteer firefighting force, their officers, and training room.

FIGURE #25: Proposed Location for New Headquarters Building

In Niagara-on-the-Lake the population density is approximately 128 people per km^2. However, as much of the population is clustered in communities creating a higher population density, we have used the Suburban response criteria in the following maps of 10 firefighters in 10 minutes.

The following maps illustrate a 6-minute travel time, which provides for a 4-minute turnout time when the call is received.

FIGURE #25 demonstrates the 6-minute travel time from the current station locations. As can be seen, with the exception of some very small areas, the Town is extremely well covered in fire response capabilities. Further, it is noted there is a very high level of overlap in the southern portion of the Town.

6.2.7 Station #2 and Station #4 Amalgamation

Station #2 St. Davids and Station #4 Queenston are in close range, approximately 4,800 metres (6-minute travel time) apart.

Documents provided to Emergency Management & Training show that discussions started as early as 1971 to integrate the two stations for various reasons. Further reports in 1996 and 2006 recommended the integration of the two stations.

The integration would see the current firefighters from the two stations being retained to work together in a larger, more flexible fire station.

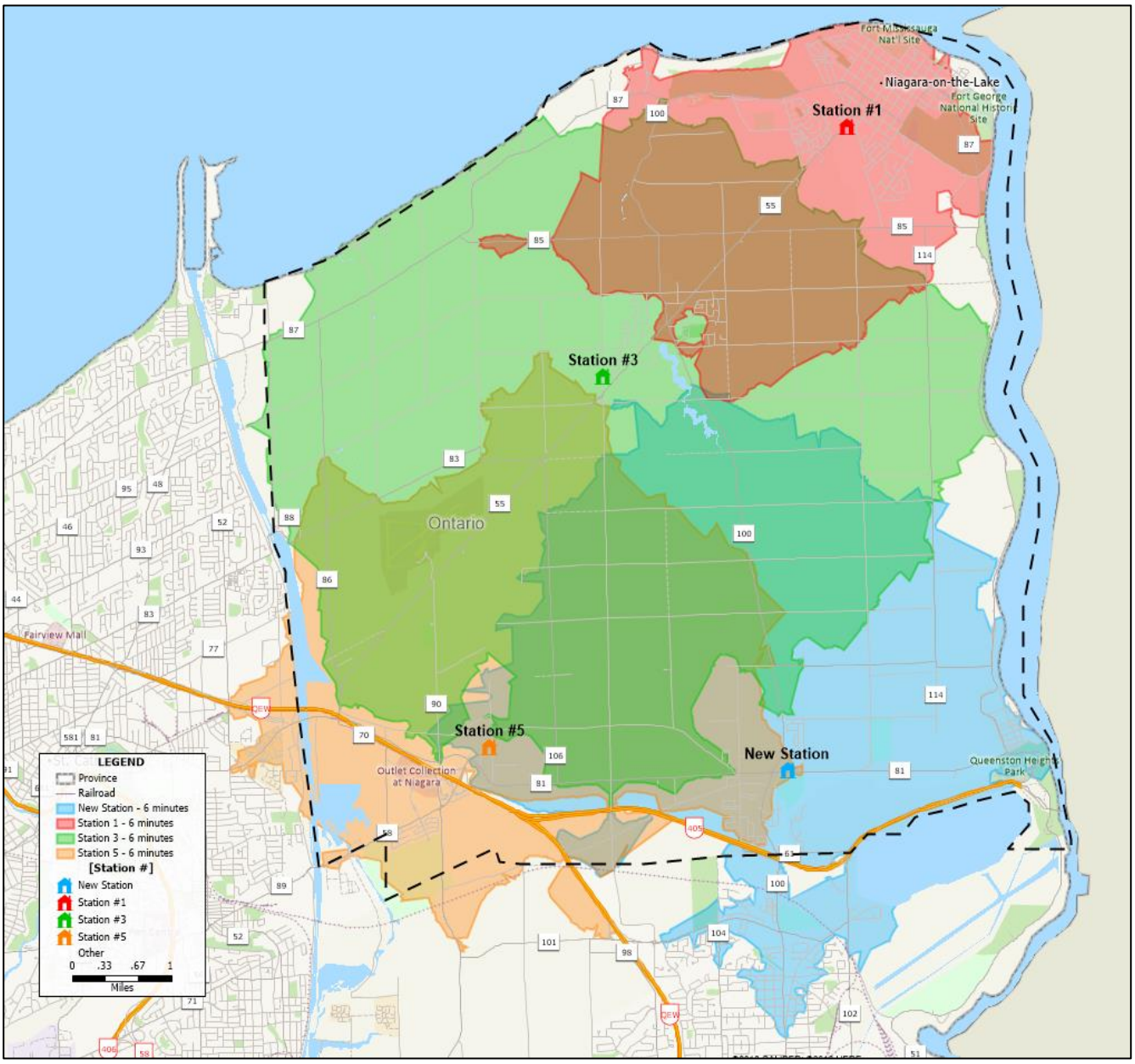
There are, a number, of benefits of integrating two of the small stations with less call demand. These include:

- Integration of the firefighters into a larger capable fire station. FUS provides no insurance rating credit to a fire station with less than 15 active firefighters, which could be a real possibility in the smaller stations. Integrating the firefighters into a single station creates a larger resource capability.
- Integration of training is more efficient with one larger station than with two smaller stations.
- There can be cost containment by evaluating the apparatus needs of a combined station vs two separate stations. Currently there are 5 apparatus between the two stations. This could be reduced by 1 or 2 apparatus. For example, the Town should have three tankers to ensure adequate water supply for a rural structure fire and meet the tanker shuttle accreditation requirements. By utilizing combination Pumper/Tankers, a very flexible apparatus, the Town would have both the capability to respond to rural fires as well as full pumper capability in the areas with hydrants. Therefore, a new station could be equipped with a Pumper/Rescue, a Pumper/Tanker, and a quick response truck for medical calls, brush fires, etc.
- A new building would meet current standards for fire station design including cancer risk mitigation (proper showers, bunker gear room, washer/dryer for bunker gear, area to properly clean SCBAs, diesel fumes extraction, etc.
- An opportunity in building a new station would be to design the training room to be a fully functional and purpose-designed emergency operations centre. This location could then become the primary emergency operations centre.

Three station locations were examined for the amalgamated station.

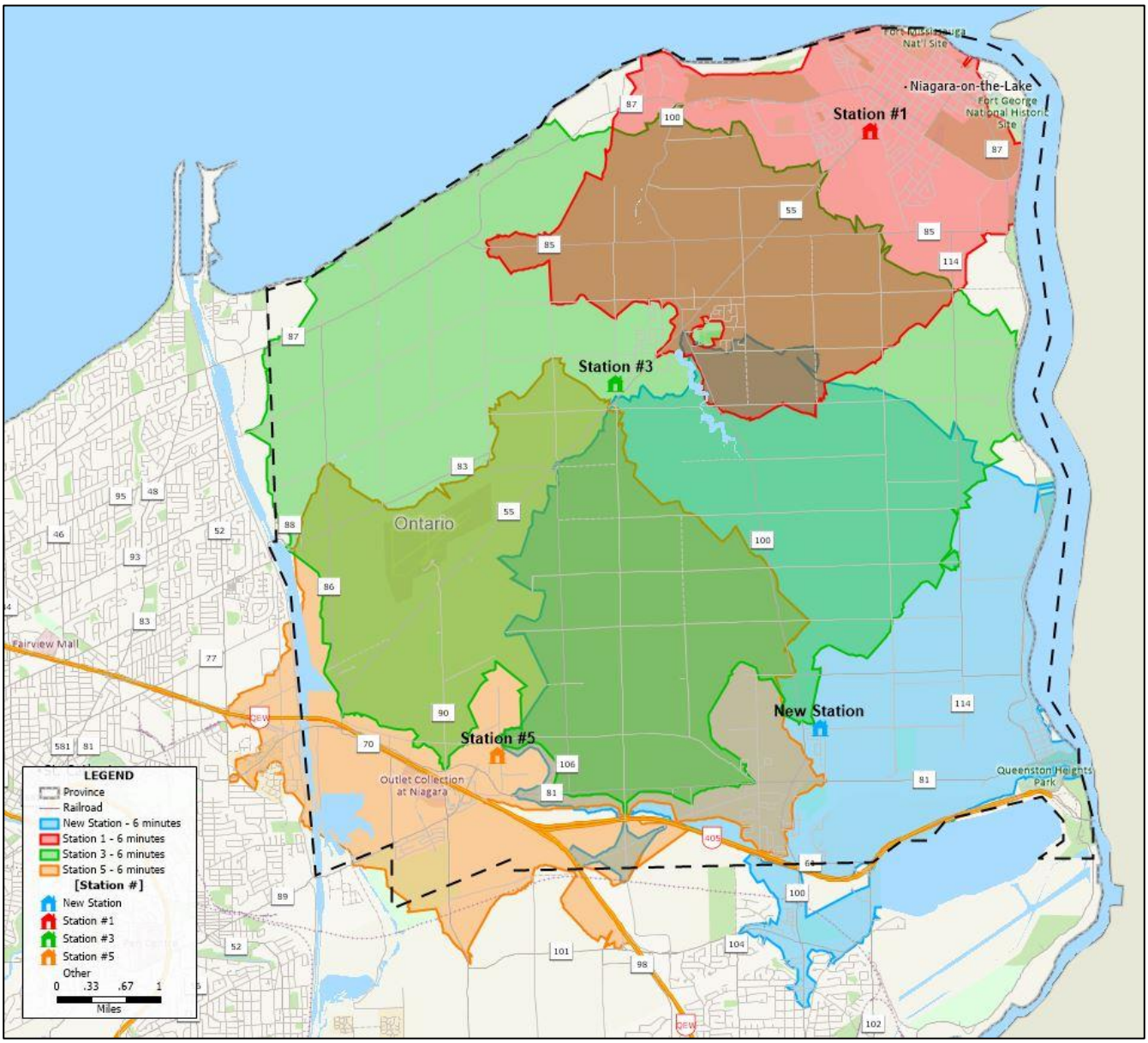
Option 1 is on York Road between Concession 3 and Four-Mile Creek Road. Using this as a potential location, Figure #26 shows the six-minute travel time, demonstrating its ability to cover the southeast of the Town.

FIGURE #26: Station Location Map with Amalgamated Stations 2 and 4 at York Rd/ Concession 3



Option 2 is on Line 9 Road and Concession 3 Road. Figure #27 demonstrates the six-minute travel from this location. This location provides the best coverage of the southeast area of the Town, however, the differences of all three options are within a minute of each other and therefore the location alone should not be the sole deciding factor. Other factors will include availability of land, size of the land space available, cost of the land, ability to design a long-term station that meets modern standards, etc.

FIGURE #27: Station Location Map with Amalgamated Stations 2 and 4 at Line 9 Road/ Concession 3



Option 3 is to use the current Station #2 location with renovations to meet the requirements of an amalgamated station. Figure #28 demonstrates the six-minute travel time from the current station.

Renovations would require the addition of two apparatus bays. In addition, other renovation requirements to bring it up to modern standards and those of an amalgamated station (e.g. increased firefighter complement from combining the two station) would include:

- Four apparatus bays (modern standards are for drive-through bays)
- Bunker gear room

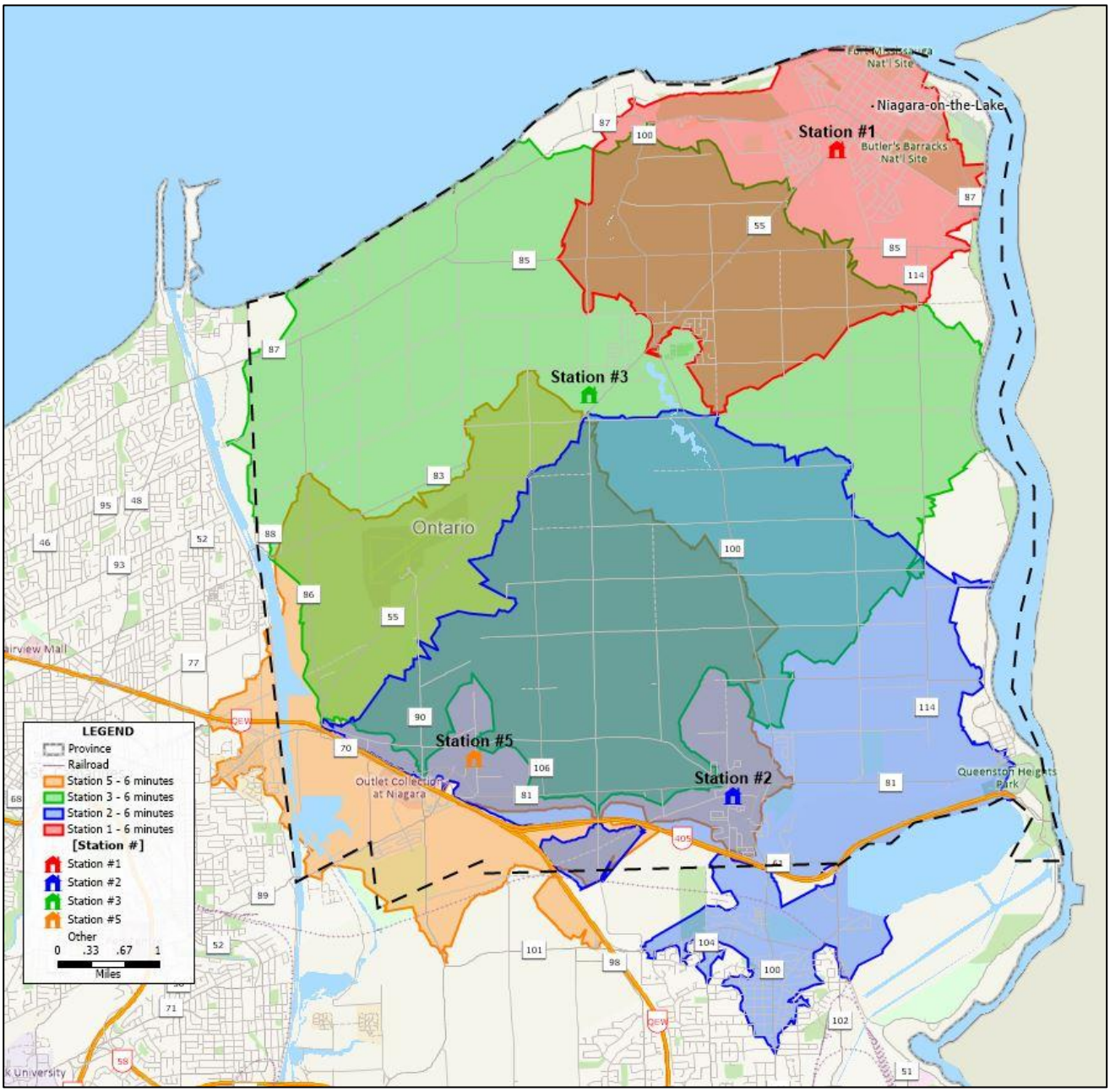
- Clean maintenance room for cleaning/disinfecting and repairing items such as face masks, self contained breathing apparatus (SCBA), medical equipment, etc.
- Maintenance room for mechanical equipment such as generators, fans, small pumps, extrication equipment, etc.
- Bunker gear cleaning room (special washer)
- Training room large enough for the combined firefighter complement
- Office space
- Shower facilities for male and female firefighters
- Locker room for male and female firefighters
- Automatic backup generator
- Proper apparatus floor drainage with oil separators
- Diesel fume extraction
- Fitness room

Using the current Station #2 location, it would appear that the amount of property available for the additional floor space to the structure is limited. There is also a branch of the NOTL Library system in the building, which limits the space available, potentially resulting in the relocation of the library should the fire station be expanded to meet the new needs. Consideration would have to be given to the costs of renovation as they may outweigh any advantages found in renovating this structure.

This structure was built in 1984; the lifespan of a fire station is 30 to 40 years. With this structure already 36 years old, any funds spent on it might be better directed at a new structure in a different location and possibly repurpose the current station for other needs of the municipality. An engineering/architectural assessment of the station would be required to determine the feasibility of it being expanded and renovated to meet the requirements of a combined station and current standards.

There could also be the perception that rather than an amalgamation of stations 2 and 4 is taking place, that it is simply a closure of Station #4. This could impact firefighter morale, retention, and engagement of Station #4 firefighters.

FIGURE #28: Station Location Map with Amalgamated Stations 2 and 4 at Station #2



Using the current Station #2 location would add approximately 1 minute to the response capabilities of a combined station location on York Road, placing the Niagara Parkway just outside of the 6-minute travel time.

Regardless of which of the three options is selected, it is recommended that the Town of Niagara-on-the-Lake amalgamate stations 2 and 4 into a larger station in both size and firefighter numbers.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
18	It is recommended that a new Headquarters be built on land adjacent to Station #1 Old Town.	$1 to 1.5 million	Short-term (1 - 3 years)
19	It is recommended that the Town of Niagara-on-the-Lake amalgamate stations 2 and 4 into a larger station in both size and firefighter complement.	$2.5 to 3.5 million	Mid-term (4 – 6 years)

SECTION 7 – Apparatus & Equipment

Section 7: Apparatus & Equipment

7.1 Fire Apparatus - New and Replacement Schedules

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

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

7.1.1 FUS – Vehicle Replacement Recommendations

The *Medium Sized Cities/Communities* section (outlined in blue) is the recommendation for vehicle replacement for a town the size of Niagara-on-the-Lake. This allows for up to a 20-year replacement cycle, in which the fire vehicle can be utilized as second-line response status. It is recommended that all first-line units still be replaced by a new or younger unit when it reaches 15 years of age.

TABLE #9: FUS Vehicle Replacement Chart

Apparatus Age	Major Cities [3]	Medium Sized Cities [4] or Communities Where Risk is Significant	Small Communities [5] and Rural Centres
0 – 15 Years	First-line	First-line	First-line
16 – 20 Years	Reserve	Second-line	First-line
20 – 25 Years [1]	No Credit in Grading	No Credit in Grading Or *Reserve* [2]	No Credit in Grading Or *Reserve* [2]
26 – 29 Years [1]	No Credit in Grading	No Credit in Grading Or *Reserve* [2]	No Credit in Grading Or *Reserve* [2]
30 Years [1]	No Credit in Grading	No Credit in Grading	No Credit in Grading

1. *All listed fire apparatus 20 years of age and older are required to be service tested by a recognized testing agency on an annual basis to be eligible for grading recognition (NFPA 1071)*
2. *Exceptions to age status may be considered in small to medium sized communities and rural centre 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.*

FUS definition of first-line, second line and reserve is:

- ***First-line is the first fire truck utilized for response at the fire station***
- ***Second-line is the next truck to be used if the first-line unit is tied up at a call, and***
- ***Reserve is the vehicle kept in the fleet to be put into service if a first-line or second-line vehicle is out of service.***

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

By ensuring that the vehicles are being replaced on a regular schedule, the Town is also demonstrating due diligence towards ensuring a dependable response fleet for the Fire Department and the community it serves. This will keep the community's fire rating in good stance, which can also reflect on commercial and residential insurance rates.

Some fire services are no longer operating stand alone Rescue apparatus but instead going towards Pumper-Rescues or a smaller Rapid Response type of apparatus. It has been found that such apparatus are more versatile and eliminates one dimensional apparatus. A rapid response vehicle is similar to an urban interface/wildland apparatus. Rapid response apparatus has been found to be very versatile and cost effective and some models are able to carry up to 5 firefighters.

7.1.2 NFPA – Vehicle Replacement Recommendations

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

general purpose fire department vehicles, most communities refer to their town's vehicle replacement policies.

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

NOTL, has in the past, deferred the replacement of vehicle beyond the recommended standards, which have affected the overall fleet age and reliability. The NOTLFES 2020 Apparatus Replacement Schedule (Appendix H) ensures the fleet is kept current and allows for appropriate planning and budgeting.

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

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

For the most part, the NOTLFES is well-equipped with pumper trucks, aerial ladders, rescues, and tankers. There also appears to be a sufficient level of support vehicles and equipment to meet the general needs of the Department. Replacement schedules are identified in the capital forecast for the fire trucks. It is worth noting that some fire departments place their tanker trucks on a 20-year replacement cycle due to the lack of use and mileage put on these specific units. To help with replacement forecasting, this is a vehicle type that can be considered 2nd line vehicle and may not require replacement at the 15-year mark.

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

In 2020 the NOTLFES received delivery of a new aerial-platform from Rosenbauer which has been assigned to Station #1, Old Town (shown in the following photo).

2020 Aerial-Platform Assigned to Station #1 Old Town

7.2 Maintenance

NOTLFES does not have its own in-house mechanical division to complete repairs and testing to its vehicles and equipment. This is handled in the following manner:

- Firefighting staff are expected to complete all weekly and monthly inspections and testing of vehicles and equipment.
- If any mechanical repairs are required for a vehicle, it is contracted out to a third-party facility/mechanic that has an Emergency Vehicle Technician (EVT).

When planning for future fire stations, consideration should be given to adding facilities to house a fleet maintenance division. This could be in the form of building a station on a lot of property that is large enough to facilitate additional bays/parts storage area and offices being added to the structure, or the inclusion of the maintenance bays at the time of the structure's build. This branch would also be responsible for the testing and repairs of the ancillary equipment.

7.2.1 Maintenance - Small Equipment

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

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

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

7.3 Equipment

Tracking the completion of annual testing should be an organization's priority to ensure the functionality of equipment for the front lines. This tracking capability will allow the fire department to confirm that apparatus and equipment testing can be scheduled accordingly to minimize frontline apparatus being unavailable.

Every year, firefighters in ever-increasing numbers are being diagnosed with cancer. A contributing factor to their illness has been proven to be the contaminants that adhere to the bunker gear during firefighting operations. After a fire, the bunker gear should be packaged and sent for cleaning to reduce this risk. Three of the stations have commercial washing machines for this cleaning. It is during this time that the firefighter requires a replacement set of bunker gear until theirs is returned from cleaning. Ensuring that the cleaning of gear is a high priority after fires and that firefighters have access to properly fitting bunker gear during the cleaning process will assist the Department in meeting its goals within its decontamination and hygiene program. The fire chief should monitor the number of times that calls occur where firefighters lack access to bunker gear because it is being cleaned and develop a protocol to minimize those occurrences.

When used for interior structural firefighting, bunker gear has a life span of 10 years as stated in NFPA 1851, *Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

An important tool in fighting fires that involve alcohol based products is foam. The NOTL area is well known as a great location in the making of wines and the production of spirits. Foam develops a covering layer over the product and assists in smothering the products burning. Currently the

department uses FireAid foam products and has a cache of approximately 25 to 30 pails of foam concentrate available.

Some departments have acquired trailers that carry large amounts of foam and may have foam application nozzles mounted on them such as found in the picture below.

Such acquisitions are costly ($30-60,000) and funds could be raised within the community through donations from service groups and the winery and distillery industry as the foam units are primarily required to fight fires at these locations. In some cases pre-used units may become available at a significantly lower cost.

The NOTLFES CSA Z94 Respiratory Protection Program is overseen by the Department. The state of the Self-Contained Breathing Apparatus (SCBA) is nearing their end of life cycle and will be replaced in 2021, pending budget approval. It is recommended that when considering procurement of new SCBA there should be consideration into the interoperability with fire service partners. As the SCBA are replaced, it is anticipated that each firefighter will be assigned their own face mask. This will ensure more hygienic, proper fit.

Fire Administration is in the process of establishing 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 will be accomplished through the Firehouse computer program that was recently acquired.

When there is a power interruption there is not an automatic power back up system at any of the stations. There are portable generators that may be placed in service to provide power to the station. The downfall to having portable generators is that firefighters must attend the fire station if there is a power failure, move the generator into place, connect it to the station's electrical system, and then start it. If the power failure is caused by a weather-related event that creates emergency calls (summer storms, ice storms, flooding), then the firefighters have this additional demand at the same

time as responding to calls. There might be times when there is a power failure in the immediate vicinity of the fire station and no firefighters are aware of it and therefore no one attends the station to establish temporary power supply. It is recommended that permanently fixed stand-by generators be installed in all of the fire stations that start-up immediately upon detecting a power failure.

7.4 Hydrants and Dry Hydrants

The Town supplies water to the populated areas as well as some rural areas and as such has installed approximately 1,300 to 1,400 hydrants. The fire service relies on the use of these hydrants to draw water from in an emergency.

It is recommended that all fire hydrants be inspected and tested as required in Articles 6.6.5.2. through 6.6.5.7. of Ontario Regulation 213/07 of the *Municipal Act*, and NFPA 291, *Recommended Practises of Fire Flow Testing and Marking of Hydrants*. The failure of a hydrant to operate as required may present catastrophic results and expose the Town to risk of litigation.

When a fire hydrant is out of service, repairs should be completed in an expedited manner, notifying the fire department of such breakages and the anticipated time to complete the required repairs.

There are numerous wineries and industries throughout the Town that have private water supply systems including private hydrants. A number of the wineries also have dry hydrants at their locations which is another source of water. These too are to be maintained in accordance with industry regulations and standards.

7.4.1 Couplings and Hose

Modern fire hydrants have three ports for attaching fire hose when required. The two ports on the side are 65mm (2 ½”) in diameter and the large steamer port on the front may vary in size from 100 mm to 150 mm (4” to 6”). Normally the large steamer port has threads on it, in which fire services attach large diameter water supply hose ranging in size from 100 mm to 150 mm. The water supply hoses do not have threads but storz couplings or lug locks in which to attach the hoses together. To attach a hose with these coupling to a hydrant requires the fire service to use an adaptor to allow the hose to be attached.

Many municipalities are now ordering new or replacement fire hydrants with storz couplings on the large steamer ports so the need for an adaptor to be used is illuminated. If an adaptor is not available to be used on the hydrants, then the firefighters are unable to attach the hose to the steamer port and may have to resort to finding a smaller adaptor and attach it to the 65mm port.

It is the policy of NOTL that any new hydrant installation includes steamer ports that have the storz connection on them.

The NOTLFES currently uses 4” (100mm) water supply lines on their apparatus. When a fire occurs a constant flow of water supply is key to saving a structure. In many incidents the amount of water supplied becomes an issue and may result in additional fire loss due to the shortage. There are many significant heritage sites within NOTL; if they caught fire, getting the fire extinguished quickly to preserve the structure is paramount. To aid in attaining adequate water supply could be as simple as increasing the size of the supply hoses used. The aerial devices in use by the NOTLFES have large capacity pumps and as such require strong water supply to maximize their operation; going from a 4” (100 mm) supply line to a 5” (125 mm) supply line will make a difference. They could have the same sized 4” (100 mm) storz couplings.

Water supply hoses with a diameter of 5” (125 mm) or greater have a very worthwhile purpose during relay pumping water along long farm laneways.

TABLE #10: Water Capacity and Weight Based on 30M (100’) Length Hose

Hose Size	Volume	Gallonage (Litres)	Weight
4” (100 mm)	15,080 Cu. In.	54.36 Imp. Gal. (247.33 L)	544.76 lbs. (247.61 kg)
5” (125 mm)	23,562 Cu. In.	84.93 Imp. Gal. (386.43 L)	851.19 lbs (386.90 kg)

It is recommended that the NOTLFES acquire 5” (125 mm) supply lines with 4” (100 mm) storz couplings to be assigned to the aerial devices.

7.4.2 Superior Tanker Shuttle Accreditation

Many fire services have attained their Superior Tanker Shuttle Accreditation and in doing so, FUS reduces insurance rates within that community, which represents a small savings to the residents. The Tanker Shuttle Accreditation demonstrates that the fire department can aggressively attack rural fires as the department can maintain a consistent large volume of water flow in areas without fire hydrants. Part of the process is to ensure Tankers have adequate and nearby locations with which to refill, using regular hydrants, dry hydrants, cisterns, streams, or the lake (preferably with a dry hydrant). The Town should also maintain and expand the water source infrastructure that may be needed to improve the access to water supplies in rural areas such as dry hydrants and cisterns.

The NOTLFES has not attained this accreditation in the past. It is recommended that the NOTLFES contact Fire Underwriters to acquire their Superior Water Shuttle Accreditation.

The NOTLFES should reference NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting* to see what enhancements could be achieved in their operations.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
20	It is recommended that the NFPA 1901 and ULC S-515-12 and other related NFPA standards relating to vehicle design, replacement, and refurbishing, be utilized.	Staff time	Short-term (1 - 3 years) and ongoing
21	It is recommended that permanently fixed standby generators be installed in all stations that start-up upon detecting a power failure.	$80,000 to 100,000 each	Short to Mid-term (1 - 6 years)
22	It is recommended that all fire hydrants be inspected and tested as required in Articles 6.6.5.2. through 6.6.5.7. of Ontario Regulation 213/07 of the *Municipal Act*, and NFPA 291, Recommended Practises of Fire Flow Testing and Marking of Hydrants. Further, NOTLFES work in conjunction with the NOTL Water Department to convert the steamer ports over to storz couplings.	Staff time and costs	Short-term (1 - 3 years)
23	It is recommended that the NOTLFES acquire 5" (125 mm) supply lines with 4" (100 mm) storz couplings to be assigned to the aerial devices.	$20,000 to $25,000	Short-term (1 - 3 years)
24	It is recommended that the NOTLFES contact Fire Underwriters to acquire their Superior Water Shuttle Accreditation. Further, the Town should also maintain and expand the water source infrastructure that may be needed to improve the access to water supplies in rural areas such as dry hydrants and cisterns.	Staff time plus fees $5,000 for accreditation. Infrastructure costs to be determined.	Short-term (1 - 3 years) and ongoing

SECTION 8 – Emergency Management

8.1 Emergency Management Program

Section 8: Emergency Management

8.1 Emergency Management Program

As mandated by the *Emergency Management and Civil Protection Act* (EMCPA), all municipalities in Ontario must have an emergency response plan and an emergency planning program. For every community in Ontario, there must also be an identified Community Emergency Management Coordinator (CEMC); currently this duty falls to the Fire Chief of the Town. Both Deputy Fire Chiefs are the Alternate CEMCs for the Town, and all three officers have completed the required training for the position.

Work is required to update the Emergency Response Plan along with emphasis on annual training exercises to ensure that the ERP is reviewed and practiced on a regular basis. The most recent ERP document is dated 2015. The Provincial Emergency Management Office notes that all emergency plans are to be reviewed and updated annually.

NOTLFES has a draft Emergency Response Plan update ready for review by Council, however, due to the state of emergency put in place in response to the COVID-19 pandemic, it has not yet been submitted to Council.

Recently, the responsibility of updating the document has been transferred to the Deputy Fire Chief – Community Risk Reduction.

After review of the current ERP, consideration should be given to the inclusion of outside agency's emergency plan being included in the appendix such as flood plans, outside agencies contact lists, conservation authorities, and EMS.

The primary and secondary Emergency Operations Centres (EOC) are not very functional spaces. The primary EOC is located at the Town Offices within the Council Chamber, with there being no official secondary EOC. At present, one could be established in a board room possibly at the works yard. Neither location has a standby generator for emergency power in the event of a power loss. It should be noted that within this FMP, in Section 6, there is discussion of establishing both the primary and secondary EOCs at a different location where they will be more functional.

The Town consider adding a purpose built EOC/Training Room in a future municipal building which could include a consolidated Station 2/4 if the Town constructs a new station. As the highest community risks are in the Old Town area it is recommended that the EOC not be located in that portion of the Town.

It is recommended that a fixed, standby generator be obtained to provide power to the Town Offices and Council Chamber in the event of a loss of power.

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
25	It is recommended that the Town consider adding a purpose built EOC/Training Room in a future municipal construction.	To be determined	Short to Mid-term (1 - 6 years)
26	It is recommended that a standby generator be obtained to power the Town Offices and Council Chamber in the event of a loss of power.	$80,000 to $100,000	Immediate (0 - 1 year)

SECTION 9 – Mutual Aid, Automatic Aid, and Fire Protection Agreements

9.1 Mutual Aid and Automatic Aid

Section 9: Mutual Aid, Automatic Aid, and Fire Protection Agreements

Mutual aid, automatic aid, and fire protection agreements are programs used to:

- Support a community's fire department at times when local resources are exhausted
- Offer quicker response coverage to areas that may be closer to a bordering fire department's response area than that of the host department
- Create an automatic response by bordering fire departments to properties that are closer to their fire stations than that of the host fire department

9.1. Mutual and Automatic Aid

NOTLFES is a member of the Region of Niagara Mutual Aid Plan which includes Niagara Falls, St. Catharines, Welland, Port Colborne, Fort Erie, Thorold, Pelham, Grimsby, West Lincoln, Wainfleet, and Lincoln.

The Region's Mutual Aid Plan is comprehensive and all encompassing to handle any emergency situation that may arise and the resources available to mitigate the situation. It was last updated in 2019.

The Plan's "Appendix G" outlines the means of, and the resources available, to mitigate a Chemical Biological Radiological Nuclear Explosive (CBRNE) incident by implementing the Niagara Fire Services CBRNE Team.

The Town of Niagara-on-the-Lake has entered into automatic aid agreements with Niagara Falls and St. Catharines for support in the event of technical rescues such as ice/water, trench, confined space, and low/high angle. Joint training opportunities with the fire services providing the technical rescue response would allow the firefighters to understand what to expect upon their arrival and what they might provide in support of the responding team prior to their arrival.

Entering into these response agreements has saved a considerable amount of funds for the Town, saving in expenses for training, and equipment and apparatus purchases. These agreements appear to be serving the community well and should be reviewed on an ongoing basis to identify any required revisions.

Recommendation(s)

No recommendations in this section.

SECTION 10 – Finance, Budgeting, and Capital Investment Plan

10.1 Operating and Capital Budgets
10.2 Development Charges Program
10.3 Fees By-Law

Section 10: Finance, Budgeting, and Capital Investment Plan

10.1 Operating and Capital Budgets

NOTLFES 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. The Fire Chief and his administrative team are constantly reviewing ways of finding cost saving efficiencies for the department.

NOTLFES' capital forecast fluctuates on an annual basis based on the equipment that has been identified for replacement (each year).

During the review of the budget process for both operating and capital, it was evident that NOTLFES is well configured in both areas. This would also indicate an adequate level of support by Council and the Town's senior management team for assisting the Fire Department in meeting its service goals.

When reviewing this section, one of the key areas that EMT looks for is whether actual operating expenditures are identified and tracked by the Department. During the review of the operating budget, it was noted that all key accounts and operating sections are identified, such as:

Operating Budget Line Items:

- Staffing related costs
- Training
- Fire Prevention and related Fire Safety Education
- Vehicle and equipment maintenance
- Station maintenance

Capital Budget Line Items:

- Vehicle replacement
- Station repairs of significant expense
- Equipment replacement (for large cost items that are not covered in the operating budget)

Operating Budget

A review of the operating budget for NOTLFES shows that all general expenses and related revenues are accounted for. To assist in offsetting the operating expenditures of the Department, it is recommended that the NOTLFES take advantage of any opportunities in acquiring grants for training and equipment purchases. Many fire departments have taken advantage of the available grants and have saved the municipality thousands of dollars.

Capital Forecasts

NOTLFES has proposed a 15 to 20-year replacement cycle for the fire trucks that is based on the FUS and NFPA recommendations for frontline vehicles. As such, recommendation #20 (it is recommended that the NFPA 1901 and ULC S-515-12 and other related NFPA standards relating to vehicle design, replacement, and refurbishing, be utilized) should be adopted, which correlates with the 2020 NOTLFES Apparatus Replacement Schedule (Appendix # H).

At times, based on budgetary considerations, there are fluctuations (increases) in replacement cycles. In view of that, the Fire Chief should continue working with the Finance Department to ensure that the vehicle replacement cycle be adhered to as closely to the FUS recommendations as possible.

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

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

This applies even when there are less than eight units; there should be a replacement vehicle designated for up to eight vehicles for back up if one of those units goes out of service.

The Fire Chief and his staff are working hard to ensure that equipment is being replaced and/or upgraded on a regular cycle and as needed.

It is recommended that the Town establish a reserve account for capital purchases based on a capital asset policy.

10.2 Development Charges Program

The Town of Niagara-on-the-Lake has enacted a Development Charges By-Law (5072-18) and the current by-law, became effective on January 1st, 2019. Fees are charged to those that wish

to develop land and these funds are dedicated to specific services the Town provides in a reserve account for that service. The said funds must be used for capital projects that are necessitated by the development of lands that have increased the need of enhanced service provision in that area of the Town.

Within Schedule “B” of the by-law it outlines the amount of funds that will be dedicated towards fire protection and these amounts are dependent on the type of development taking place (i.e. detached residential vs. apartments vs. commercial).

10.3 Fees By-Law

A means of generating revenue to offset the operating costs of the fire department is through a fees structure for services provided by the department.

The Town has a Fire Service User Fees and Services Schedule, embedded within the E&R By-Law for the invoicing of services provided by the NOTLFES. It is not a common practise to have the fees structure and invoicing included within an E&R By-Law. Many municipalities have a stand-alone Fees By-law which encompasses all of the fees the municipality charges for services rendered. This would outline the fees for every department of the Town.

Another form of revenue generation is the invoicing of all fire responses to the appropriate insurance companies through a third-party. Many fire services in the province have implemented such means to aid in offsetting the cost of operating the fire service.

The question is raised by many residents that the fire department’s services are paid through their taxes. While this is true, fire services have had to opt to invoicing for all services that are normally provided at no extra charge.

Within insurance policies for both vehicles and structures, there are provisions for the payment of services provided by fire departments.

The user fees and service charges are listed within the E&R By-Law and are found to be very inclusive of all probabilities and possibilities that involves the NOTLFES. It is recommended that the fees schedule for services provided by the NOTLFES be reviewed annually to ensure they meet current standards.

While there is a fees structure for services rendered, there are areas of service provision that could be incorporated into the fees structure, including:

- Inspection for fireworks & pyrotechnics displays/events
- Inspections for liquor licences
- Inspections for daycare, foster care, and group homes
- Inspections of shows/special events especially where a large tent is in use
- Technical rescues
- Response to all vehicle fires as identified in the OFMEM Standard Incident Report (non-residents only)
- Fire watch (i.e. standby at large fires after the fire is extinguished to ensure it does not re-ignite)
- All motor vehicle collisions (non-residents only)
- Administrative charge for invoicing
- Copies of fire reports
- Burn permits
- Outdoor solid fuel appliances (once a by-law is established)

Recommendation(s)

Rec #	Recommendation	Estimated Costs	Suggested Timeline
27	It is recommended that the NOTLFES take advantage of any grants that may be available for training or equipment purchases.	Staff time	Short-term (1 – 3 years)
28	NOTLFES investigate contracting a third-party firm to recover insurance funds that are available from structure fires.	Revenue generation	Short-term (1 – 3 years)
29	It is recommended that the fees schedule for services provided by the NOTLFES be reviewed annually to ensure they meet current standards.	Staff time	Short-term (1 – 3 years)

SECTION 11 – Review of Previous MFP

Section 11: Review of Previous FMPs and Reports

11.1 Building from the Previous FMPs and Reports

Listed below are the recommendations submitted in the 1999 and 2006 Master Plans. Most of the recommendations have been or are in the process of being actioned, as appropriate. Of note, there are numerous FMPs and Reports dating as far back as 1971 that recommended the need for the amalgamation of stations 2 & 4.

There are two other reports that are presently active – an internal report on the possible amalgamation of stations 2 & 4 and the 2020 Stabilization and Growth Plan. In 2020 Council commissioned a consultant to complete a Service Delivery Review of all the Town's departments and to make recommendations of service efficiencies that could be achieved.

11.1.1 1999 – 10 Year Master Plan

Recommendations

1. The Fire Chief be authorized to proceed with the purchase of land as identified in this report and known as Part Lot 156, Roll #15-040-01 (0.79 acres) in the Town of Niagara-on-the-Lake, for future consideration to relocate the District 33 (Virgil) Fire Station – Completed.

2. The Fire Chief be authorized to secure approximately 1 acre of property on Town owned land on the corner of York Road and Townline Road in the Town of Niagara-on-the-Lake known as Part 2 of Plan 30R-7347 for future consideration of a fifth Fire Station to serve the Glendale Area as defined in this report - Site was not selected, 350 Townline Rd was selected for Station #5.

3. The Fire Chief be authorized to establish a Building Committee consisting of the Fire Chief, 4 District Chiefs, one member of Council appointed by the Lord Mayor and the Chief Administrative Officer to review plans in preparation for construction of a new station in the year 2002 and investigate a building that would temporarily locate a first response team of fire fighters and apparatus to the Glendale Area by the summer of 2000. – Completed – Station 5.

4. The Fire Chief and Steering Committee be authorized to reconvene three years from the time of this report being submitted to review location of Station #2 (St. Davids) and Station #4 (Queenston) to consider the following options based on the Fire Marshals Report of 1996 and the Steering Committee's research of 1999. – There is no evidence to show this was completed although Option # 1, below, was completed.

Option #1: Provide the appropriate staffing and apparatus for five stations within the boundaries of Niagara-on-the-Lake. – Completed.

Option #2: Upon completion of construction of the new Glendale Station (Station #5) would become sub-stations of Station #2 (St. Davids). Staffing and apparatus would be relocated to best serve our needs of the day. – Not completed.

Option #3: Close and sell Station #2 (St. Davids) and Station #4. Amalgamate both stations and build a new station between St. Davids and Queenston as proposed in the 1996 Fire Marshals Report. – Not completed.

11.1.2 2006 Master Plan – 5 Year Plan

Recommendations

1. Acquire a suitable site and construct a new fire station in Virgil as soon as possible. – Completed.

2. Acquire updated Records Management software in 2006 – Completed in 2017.

3. Evaluate the resources needed to perform inspections and to deliver training. – Completed.

4. Evaluate our ability to meet Rural Water Supply certification requirements. – Unknown.

5. Increase the authorized manpower in Districts 2, 4, and 5 as soon as possible. – Completed.

6. Adopt criteria to establish a stand a-lone Fire District – Completed.

7. Maintain the existing five fire station configuration – Completed.

8. Begin to create a Reserve Fund to meet future building maintenance and replacement requirements. – No reserves established.

9. Maintain adequate reserve to meet apparatus and equipment replacement requirements. – No reserves established.

10. Replace the Self-Contained Breathing Apparatus (SCBA) in 2009. – Completed.

11. Continue the review of fleet maintenance procedures, particularly as they apply to fire apparatus. – No evidence this review was completed.

12. Review this Plan in 2009. – No evidence this review was completed.

11.1.3 FES-20-001 Queenston Fire Station

Recommendations

This group of recommendations will be addressed within a staff report to Council upon review of this FMP and the Station Location Assessment Section in particular.

1. Council direct staff to provide an analysis of the St. Davids fire station facility and operations.

2. Council direct staff to report back on the viability of consolidating the Queenston fire station and St. Davids fire station.

3. Council direct staff to develop a funding strategy for the potential construction of a new consolidated fire station.

4. Council direct staff to investigate potential locations for the new fire station and report on the operational impact of each location.

5. Council direct staff to request that the Master Fire Plan Steering Committee ensure that the recommendations outline in this report are prioritized during the planning process.

11.1.4 2020 Stabilization & Growth Plan

Recommendations

Realignment of Reporting Structure:
1. Proceed with reclassification of the Fire Prevention Officer to Deputy Fire Chief in order to realize organizational and performance improvements by gaining stability in key leadership positions – Completed.

2. Proceed with transitioning responsibility for the Municipal Emergency Management Program to the Deputy Fire Chief – Community Risk Reduction – Completed.

3. Return to full staffing by filling the currently vacant Deputy Fire Chief in order to increase overall performance levels. – Completed.

4. Work with HR Generalist to review the competitiveness of the compensation and hours of work of the Fire Prevention Officer and Training Officer positions in order to address turnover – Ongoing as part of the 2021 budget.

Vision, Mission and Values:

1. The development of a mission, a vision and core values will be prioritized immediately – Completed.

2. Moving forward, all actions will be aligned with the core values of the department – Completed/ongoing.

3. Funding will be requested through a future Council Report outlining a department rebranding initiative, in order to assist in the creation and acceptance of the new mission, vision and core values. – Completed.

Community Risk Assessment:

1. Staff are in the early stages of the development of the Community Risk Assessment with a target completion of Q1 of 2020. – Completed.

Mobile Data Terminals:

1. Pending approval in the 2020 Capital Budget, the purchase and installation of MDTs will begin in Q1 of 2020 – Completed.

2. Uploading of digital pre-plans and property access information will occur in Q2 of 2020 – Ongoing.

Apparatus Redeployment:

1. Through data portal, continually evaluate the current deployment of apparatus to identify ideal allocation of resources. – Ongoing.

2. Pending the approval of the replacement of Pump 3, Rescue 3 will be relocated to Queenston to operate as Rescue 4, thus extending its useful life. - Will see completion upon receipt of the 2021 Pumper from Fort Garry Industries.

3. Pending the approval of the replacement of Pump 3, the current Pump 3 will become a secondary pumper operating out of Station 3 extending its useful life. - Will see completion upon receipt of the 2021 Pumper from Fort Garry Industries.

4. Pending the approval of the replacement of Pump 5 as part of the 2021 Capital Budget, the elimination of the Heavy Rescue response model will be complete – Ongoing as part of the 2021 Budget.

Apparatus Purchasing:

1. Pending the approval of the 2020 Capital Budget, proceed with the purchase of a CAFS Rescue-Pumper for Station 3. – Ongoing – Decision made to not install as CAFS in the new apparatus but a Class A foam system.

2. Pending the approval of the 2020 Capital Budget, proceed with the purchase of a Light Rescue Squad for Station 3. – Ongoing.

Volunteer Firefighter Compliment:

1. Through the data portal, identify the current location and travel time of all current volunteer firefighters in order to determine what re-deployment opportunities exist. – Ongoing – re-deployment will be a result of outcome of station consolidation decision.

2. Through the management of the Attendance Policy and mandatory Retirement Policy, identify the projected impact of the application of these policies during the next 24-month period. – Completed – Recruitment planned for the second quarter of 2021.

3. Review appropriate personnel distribution among stations to determine whether appropriately balanced. – Ongoing – Station 3 may see an increase in the number of firefighters.

Resource Deployment:

1. Review information available through the data portal and Community Risk Assessment in order to identify further potential efficiencies in the deployment of resources. – Ongoing – Actions have been taken to reduce deployment to burn complaints, alarm calls, etc.

2. Utilize the data portal to continue to identify opportunities for operational efficiencies. – Ongoing.

3. Initial information available through the data portal has identified a facility that has cost NOTLFES over $16,000 so far in 2019 in false alarm responses. Staff have begun to develop strategies to reduce the occurrences of incidents at this occupancy in 2020. – Changed cost recovery schedule to allow for nuisance and malicious false alarm invoicing.

Public Education Team:

1. Explore the viability of a Volunteer Public Education Division (similar in structure to the existing Volunteer Firefighter model) that provides fire safety and emergency management information to elementary schools, community groups, and the public during public events such as festivals, Emergency Preparedness Week activities and Fire Prevention Week activities. – Currently on hold due to the pandemic.

Officer Development – Volunteers:

1. Working with HR Generalist, professional development sessions will be scheduled for Company Officers covering employee motivation and engagement training, diversity in the workplace training, conflict resolution, delegation, and leadership. – Ongoing – Have completed two sessions at two hours each, additional sessions planned to be held in 2020

2. Administration will explore formal mentorship opportunities to better prepare officers for progression through the ranks. – Has not begun due to pandemic.

Leadership Training (Volunteers - All Ranks):

1. Develop a leadership doctrine that provides a basis for teaching NOTLFES personnel internal ways of operating. - Has not begun due to pandemic.

2. The Leadership Doctrine will closely align with the Mission, Vision and Values development outlined earlier in this document. - Has not begun due to pandemic.

Partner with Regional Training Centre:

1. Work with our regional partners to formalize participation in the Regional Training Centre. - Has not begun due to pandemic.

2. Work with the Academic Standards & Evaluation Unit of the Office of the Fire Marshal & Emergency Management to streamline the candidate application process. - Has not begun due to pandemic.

Data Analytics and Decision Support:

1. The Fire Chief will utilize available data to address emerging and forecasted risk facing the Town. - Ongoing

Administration Process Improvements:

1. The realignment of staff will better position NOTLFES to manage the workload of the administration and consequently, reduce turnover. - Completed

2. Monitor changes to ensure appropriate division of labour is realized. - Ongoing

3. Work with the Agriculture Committee to streamline and modernize the Open-Air Burn approval process in 2020. - Completed

Inventory Management:

1. Develop an apparatus preventive maintenance and inspection program that better projects fleet maintenance requirements, repairs, and respective costs. - Ongoing

2. Utilize Firehouse Records Management System to centralize maintenance, repair and testing records. - Ongoing

3. Update the Fleet Replacement Program to ensure that replacement costs are appropriately indexed to better project replacement values. - Completed

Evaluate the Potential for Accreditation through the Centre for Public Safety Excellence (CPSE):

1. NOTLFES will continue to identify and implement opportunities for improvement, while evaluating the viability of pursuing Accreditation through CPSE. – Completed – Council has endorsed the pursuit of CFAI Accreditation.

11.1.5 Service Delivery Review in 2020

Recommendations

1. Improve the hydrant inspection process. – Water Department will need to develop a plan – will likely be addressed during the CFAI process.

2. Plan for fleet asset replacement. - Underway

3. Design a comprehensive Fire Master Plan. – To be completed in 2020.

4. Establish a dedicated Emergency Operations Centre. – To be addressed in the FMP.

5. Relocate Fire & Emergency Services management. – To be addressed in the FMP.

6. Explore expanded Automatic Aid Agreements. – All Technical Rescues are now covered by either Niagara Falls or St. Catharines Fire Services.

7. Obtain accreditation to drive performance improvement. – Ongoing – with accreditation completed early in 2022 as the target date.

11.2 Conclusion

After reviewing the many previous reports and plans, EMT has found that many of the recommendations have either been completed or in the process of being completed. Unfortunately, the pandemic has caused a delay in the implementation of the more recent initiatives for an unknown length of time.

Based on the number of previous plans and reviews that focus on the fire service, recommended direction was provided and in some cases the same items were brought forward multiple times without being completed for one reason or another.

As with reports dating back to 1971 including this FMP, the amalgamation of the Queenston and St. Davids stations has been earmarked for review and implementation if so chosen by Council to move forward with this significant change in the NOTLFES.

Recommendation(s)

No recommendations noted for this section.

SECTION 12 – Summary

12.1 Conclusion

12.2 Recommendations and Estimated Costs

Section 12: Summary

12.1 Conclusion

NOTFLES staff are truly dedicated to the community they serve. Council, 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, the NOTLFES is endeavoring to offer the most efficient and effective service possible.

Over recent years there have been a number of personnel changes within the Administration of the Department. With the most recent changes now in place, it is very evident that the NOTLFES is moving in an established direction with goals in place.

The new Administrative and Leadership team have brought about a number of operational changes and new objectives in the spirit of improving operations, fiscal responsibility, and service delivery to the residents and visitors to NOTL.

Change though, can be difficult to accept when some things have been done the same way for many years. It will be inherent upon the leadership team to educate the members of the Department on why the changes are being made, what to expect, what the proposed outcomes will be, and a timeline to reach that point. Adjustments may be required along the way.

Firefighters also have responsibility in working towards the outcome. Where challenges exist, it is important for the firefighters to not only provide their opinion, but to bring forth potential options and solutions.

All costs and associated timelines to the following recommendations are approximations that can be implemented through prioritization between the Fire Chief, CAO, and Council.

Most FMPs are 7- 10-year documents with a review to be conducted at the five-year point. Due to some of the specific recommendations made in this document, it is advisable that the Fire Chief view this as a “living document”, conducting more frequent reviews of the recommendations, and bringing forward updates to Council, as required.

12.2 Recommendations and Estimated Costs

The following chart provides further overview of the recommendations found throughout this report along with any estimated costs that may be incurred.

Rec #	Recommendation	Estimated Costs	Suggested Timeline
Section 1: Community and Fire Department Overview			
No recommendations for this section.			
Section 2.6: Commission on Fire Accreditation International			
1	It is recommended that NOTLFES prioritize and allocate staff time to pursue its accreditation with the CFAI.	Staff time	Short to Mid-term (1 - 6 years)
Section 3.2.2: Future Needs			
2	Continued emphasis on additional staff time spent in fire prevention activities. In addition to public education, there should be emphasis placed on assessing building stock within the community to identify types and number of hazards that may exist.	Staff time	Short-term (1 - 3 years) and ongoing
Section 3.4: Residential Fire Sprinklers			
3	Work with developers and the public to encourage Home Sprinkler Systems and make this initiative an ongoing part of its fire prevention program and community risk reduction efforts.	Staff time	Short-term (1 - 3 years) and ongoing
Section 3.6: Review of Draft Community Risk Assessment			
4	It is recommended that the CRA be completed as per *Ontario Regulation 378/18 and the Fire Protection and Prevention Act 1997 (FPPA) by July 1, 2024.*	Staff time	Short-term (1 - 3 years)
Section 4.3.3: Certification			
5	The Department should continue its ongoing efforts towards certification for staff for each position (that requires or recommends certification) and ensure that certifications are maintained.	Staff time	Short-term (1 - 3 years)

Section 4.4: Fire Prevention and Public Education			
6	Hire a part-time Fire and Life Safety Educator to focus on community public education and Volunteer Public Education Coordination. An option is to utilize the Administrative Assistant, who is already trained as a Fire and Life Safety Educator.	$40,000 - $50,000/year Option $7,500 salary top up	Short-term (1 - 3 years)
7	Hire a full-time Fire Prevention and Public Education Officer to focus on Bed and Breakfast occupancies, hotels, long and short-term licensed rentals, secondary occupancies, restaurants, and other commercial buildings, as well as public education.	$95,000/year for salary and benefits plus $40,000 for a vehicle.	Mid-term (4 - 6 years)
Section 4.5.1: Considerations for Full-time Firefighters			
8	Relocate headquarters staff to Station #1 to provide immediate call response from Monday to Friday office hours to reduce the turnout time for calls in the Old Town. This would be a temporary measure until a new headquarters could be built adjacent to Station #1.	Minor renovations	Immediate (0-1 year)
9	Trial a duty crew model for 2021 on weekends, during the prime tourist season (e.g. June to September) and select long weekends/special events (e.g. Christmas Parade) to assess its impact on reducing turnout time.	$20-$30,000	Immediate (0-1 year)
Section 4.5.2: Recruitment and Retention of Volunteer Firefighters			
10	A review of the volunteer firefighter compensation package should be undertaken.	Costs based on review outcome	Short-term (1 - 3 years)
Section 4.6.1: Cancer Prevention			
11	Diesel exhaust ventilation systems should be installed in all the NOTLFES fire stations.	$20,000 to 30,000 per bay	Short-term (1 - 3 years)
Section 5.1.2: Response Data			
12	The Fire Chief present a response time goal for the approval of Council, which may reference the NFPA 1720 – expectation of 10 staff in 10-minutes (80 percentile), and that performance measures are continuously monitored.	Staff time	Short-term (1 - 3 years)

	Fire Chief to continue monitoring response times along with how many times, if any, a full response component was not amassed.		
Section 5.1: Fire Suppression/Emergency Response			
13	It is recommended that the staffing levels be increased to a total of 30 firefighters at the Old Town (Station 1) and Virgil (Station 3) stations.	$100,000 to $130,000 including equipment and training	Short-term (1 - 3 years)
14	It is recommended that the NOTLFES review the firefighter station assignments to realign them so that firefighters may be assigned to stations closer to their place of residence. A policy should be developed that addresses this requirement in the future.	Staff time	Immediate (0 - 1 years)
Section 5.2: Medical Responses			
15	The Fire Chief contact the NEMS to review and update the tiered medical agreement.	Staff time	Short-term (1 - 3 years)
Section 5.4: Vehicle Technology			
16	NOTLFES move towards fully functioning mobile data terminals in all fire vehicles.	$10-20,000 per vehicle	Short-term (1 – 3 years)
Section 5.5: Radio System			
17	It is recommended that the Town conduct a needs assessment in the mid-term for a transition to digital technology.	$15,000 – $20,000 for the audit	Short-term (1 - 3 years)
Section 6.2.6: Headquarters			
18	It is recommended that a new Headquarters be built on land adjacent to Station 1 Old Town.	$1 to 1.5 million	Short-term (1 - 3 years)
Section 6.2.7: Station 2 and Station 4 Amalgamation			
19	It is recommended that the Town of Niagara-on-the-Lake amalgamate stations 2 and 4 into a larger station in both size and firefighter numbers.	$2 to 3 million	Mid-term (4 - 6 years)
Section 7.1.2: NFPA – Vehicle Replacement Recommendations			

20	It is recommended that the NFPA 1901 and ULC S-515-12 and other related NFPA standards relating to vehicle design, replacement, and refurbishing, be utilized.	Staff time	Short-term (1 - 3 years) and ongoing
Section 7.3: Equipment			
21	It is recommended that permanently fixed standby generators be installed in all stations that start-up upon detecting a power failure.	$80,000 to 100,000 each	Short to Mid-term (1 - 6 years)
Section 7.4: Hydrants and Dry Hydrants			
22	It is recommended that all fire hydrants be inspected and tested as required in Articles 6.6.5.2. through 6.6.5.7. of Ontario Regulation 213/07 of the *Municipal Act*, and NFPA 291, Recommended Practises of Fire Flow Testing and Marking of Hydrants. Further, NOTLFES work in conjunction with the NOTL Water Department to convert the steamer ports over to storz couplings.	Staff time and costs	Short-term (1 - 3 years)
Section 7.4.1: Couplings and Hose			
23	It is recommended that the NOTLFES acquire 5" (125 mm) supply lines with 4" (100 mm) storz couplings to be assigned to the aerial devices.	$20,000 to $25,000	Short-term (1 - 3 years)
Section 7.4.2: Superior Tanker Shuttle Accreditation			
24	It is recommended that the NOTLFES contact Fire Underwriters to acquire their Superior Water Shuttle Accreditation. Further, the Town should also maintain and expand the water source infrastructure that may be needed to improve the access to water supplies in rural areas such as dry hydrants and cisterns.	Staff time plus fees $5,000 for accreditation. Infrastructure costs to be determined.	Short-term (1 - 3 years) and ongoing
Section 8.1: Emergency Management Program			
25	It is recommended that the Town consider adding a purpose built EOC/Training Room in a future municipal construction.	To be determined	Short to Mid term (1 - 6 years)

26	It is recommended that a standby generator be obtained to power the Town Offices and Council Chamber in the event of a loss of power.	$80,000 to $100,000	Immediate (0 - 1 year)
Section 9: Mutual Aid, Automatic Aid, and Fire Protection Agreements			
No recommendations for this section.			
Section 10.1: Operating and Capital Budgets			
27	It is recommended that the NOTLFES take advantage of any grants that may be available for training or equipment purchases.	Staff time	Short-term (1 - 3 years)
Section 10.3: Fees By-law			
28	NOTLFES investigate contracting a third-party firm to recover insurance funds that are available from structure fires.	Revenue generation	Short-term (1 - 3 years)
29	It is recommended that the fees schedule for services provided by the NOTLFES be reviewed annually to ensure they meet current standards.	Staff time	Short-term (1 - 3 years)
Section 11: Review of the Previous FMPs and Reports			
No recommendations for this section.			

SECTION 13 – Appendices

Appendix A: Definitions and References
Appendix B: Stakeholder Surveys
Appendix C: Historical Response Data
Appendix D: Five-Step Staffing Evaluation Process
Appendix E: PFSG - Recruitment and Retention of Volunteer Firefighters
Appendix F: Provincial CRA Guideline
Appendix G: FUS Technical Document on Elevated Devices
Appendix H: 2020 Apparatus Replacement Schedule

Section 13: Appendices

Appendix A: Definitions and References

Automatic Aid Agreements – *Fire Protection and Prevention Act*, 1997 (FPPA 1997)

4. For the purposes of this *Act*, an automatic aid agreement means any agreement under which,

a) a municipality agrees to ensure the provision of an initial response to fires, rescues and emergencies that may occur in a part of another municipality where a Fire Department in the municipality is capable of responding more quickly than any Fire Department situated in the other municipality; or

b) a municipality agrees to ensure the provision of a supplemental response to fires, rescues and emergencies that may occur in a part of another municipality where a Fire Department situated in the municipality is capable of providing the quickest supplemental response to fires, rescues and emergencies occurring in the part of the other municipality. 1997, c. 4, s. 1 (4).

- *Automatic aid is generally considered in other jurisdictions as a program designed to provide and/or receive assistance from the closest available resource, irrespective of municipal boundaries, on a day-to-day basis.*

Commission of Fire Accreditation International Community Definitions:

- Suburban – an incorporated or unincorporated area with a total population of 10,000 to 29,999 and/or any area with a population density of 1,000 to 2,000 people per square mile
- Rural – an incorporated or unincorporated area with a total population of 10,000 people, or with a population density of less than 1,000 people per square mile.

National Fire Protection Association (NFPA) Documents:

- NFPA 1201 - Standard for Providing Fire and Emergency Services to the Public
- NFPA 1500 – Standard on Fire Department Occupational Safety and Health Program, 2013 editions
- NFPA 1720 – Standard for the Organization and Deployment of Fire Suppression Operations, Medical Operations, and Special Operations to the Public by Career Departments
- NFPA 1720 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments.

Municipal Responsibilities (FPPA 1997)

2. (1) Every municipality shall,

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

Mutual Aid

a) Mutual aid plans allow a participating Fire Department to request assistance from a neighbouring Fire Department authorized to participate in a plan approved by the Fire Marshal.
b) Mutual aid is not immediately available for areas that receive fire protection under an agreement. The municipality purchasing fire protection is responsible for arranging an acceptable response for back-up fire protection services. In those cases where the emergency requirements exceed those available through the purchase agreement and the backup service provider, the mutual aid plan can be activated for the agreement area.

Public Fire Safety Guidelines:

- PFSG 04-40A-12, Fire Prevention and Public Safety Education; Simplified Risk Assessment March 2001
- PFSG 04-41-12, Fire Prevention and Public Safety Education; Community Fire Safety Officer/Team, January 1998
- PFSG 04-87-13 on Fire Station Location, September 2004

Shared Responsibilities (FPPA 1997)

FPPA notes that.

1. Two or more municipalities may appoint a community fire safety officer or a community fire safety team or establish a Fire Department for the purpose of providing fire protection services in those municipalities

Volunteer Firefighter (FPPA 1997)

- Means a Firefighter who provides fire protection services either voluntarily or for a nominal consideration, honorarium, training or activity allowance. (“pompier volontaire”) 1997, c. 4, s. 1 (1); 2001, c. 25, s. 475 (1).”

Appendix B: Stakeholder Surveys

The following survey was presented to internal stakeholders:

Niagara-on-the-Lake Fire & Emergency Services

Fire Master Plan – Internal Staff Survey

Emergency Management & Training Inc. (EMT) have been hired to prepare a Fire Master Plan for the Niagara-on–the-Lake Fire & Emergency Services. Your feedback is necessary in assisting EMT in developing this document for the fire department. The intent of this document is to provide a fire service review to guide operational improvements and enhance how services are provided throughout the community.

Please take the time to complete this survey. Your confidential responses will help to ensure focused action that continues to meet the diverse needs of our staff and residents. As such, we ask that you complete the survey on Survey Monkey. The results will be collated into one document for our use in developing the report.

Please go online and complete the survey before September 10th, 2020.

Questions:

1. What are the things that make you most proud of the NOTLFES (i.e. the level of professionalism, community involvement or making a positive difference within the community)?

2. How do you think most people living in Niagara-on-the-Lake perceive the Fire Department and why?

3. What would you say are the top three issues facing the NOTLFES today?

4. There are nine core services that the NOTLFES delivers. Which services do you believe are most valued by the community? Please rank in order of priority from 1 (most important) to 9 (least important). *Please use each number **only once** and use all nine numbers.*

____ Fire fighting
____ Auto extrication
____ Fire origin and cause investigations
____ Fire prevention and safety inspections
____ Community outreach / Public education
____ Hazardous materials and technical rescue response (awareness / shore based level)
____ Public assist / Non-emergency responses
____ Emergency planning
_____ Medical assist and response

5. Are there any other services that you believe the NOTLFES should provide and why?

6. What improvements does the NOTLFES need to make to its services to be more efficient and what do you believe would be the outcome by implementing these efficiencies?

7. If it were up to you, what would the Fire Department be like 10 years from today and why?

8. Are there any other comments/suggestions that you would like to add that would help to improve the services the NOTLFES delivers to the community and to the firefighters?

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

Rick Monkman
Fire and Emergency Services Consultant

rmonkman@emergencymgt.com

During the FMP process, feedback was gathered from both the community in the form or an online survey and a meeting with those from the community who have utilized the services of the NOTLFES.

The following survey was presented to the external stakeholders:

Niagara-on-the-Lake Fire & Emergency Services
Fire Master Plan – Public Engagement

Niagara-on-the-Lake Fire & Emergency Services (NOTLFES) has a proud tradition of assisting residents and effectively responding to emergency situations.

NOTLFES is made up of a Fire Chief, 2 Deputy Chiefs, a Training Officer, a Fire Prevention Officer, and an Administrative Assistant along with 110 dedicated volunteer firefighters. The Department responds to approximately 600 - 700 emergency incidents each year from 5 fire stations.

In our ongoing efforts to ensure that we are meeting the needs of our community we are creating a community-driven Fire Master Plan to guide operational improvements and enhance how the service is provided throughout the community.

To accomplish this, we have engaged Emergency Management & Training Inc. (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, Community Risk Assessments, and fire service reviews. Therefore, most of all, we need your assistance. 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.

Please completed the surveys by September 10th, 2020 on SurveyMonkey.

Questions:

1. What is your general impression of the Niagara-on-the-Lake Fire & Emergency Services in relation to its level of professionalism, community safety, Fire Prevention and Public Education programs?

a) Have you had any interaction with NOTLFES staff in relation to Public Education Initiatives, and if so, how did you find this interaction?

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 Service gets to me if I have an emergency	☐	☐	☐	☐	☐
Whether the Fire Service will visit my home to give me safety advice smoke/CO alarm info	☐	☐	☐	☐	☐
How much the fire services costs me as a taxpayer	☐	☐	☐	☐	☐
How often the Fire Service provides community training opportunities (e.g. fire	☐	☐	☐	☐	☐

extinguisher training; school safety programs; smoke alarms; fire escape planning)					
How visible the Fire Service is at local community events	☐	☐	☐	☐	☐
Timeliness to any request for non-emergency services or assistance from the Fire Service	☐	☐	☐	☐	☐
Purchasing and maintaining new and applicable equipment	☐	☐	☐	☐	☐
Continued and relevant training	☐	☐	☐	☐	☐

3. What do you think are the top three issues facing our fire service today (barriers to providing service)?

_____

_____

_____

_____

_____

4. There are nine core services delivered by the NOTLFES. Which services are most important to you? Please rank in order of priority from 1 (most important) to 9 (least important). *Please use each number **only once** and use all nine numbers.*

____ Fire fighting
____ Auto Extrication
____ Medical assist and response
____ Hazardous materials and technical rescue response (awareness level)
____ Fire/Arson investigations
____ Fire prevention and fire safety inspections
____ Community outreach / Public education
____ Public assistance requests / Non-emergency responses
____ Emergency management and planning

5. Are there any additional services that you believe should be provided? If so, please specify.

_____

_____

_____

_____

6. Over the next 10 years, if you could implement up to three things to improve how the current services are provided by the NOTLFES, what would those things be?

1. _____

2. _____

3. _____

7. Have you directly received service from the NOTLFES?

☐ Yes

☐ No (If no, go to question 9)

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

_____

_____

_____

_____

_____

_____

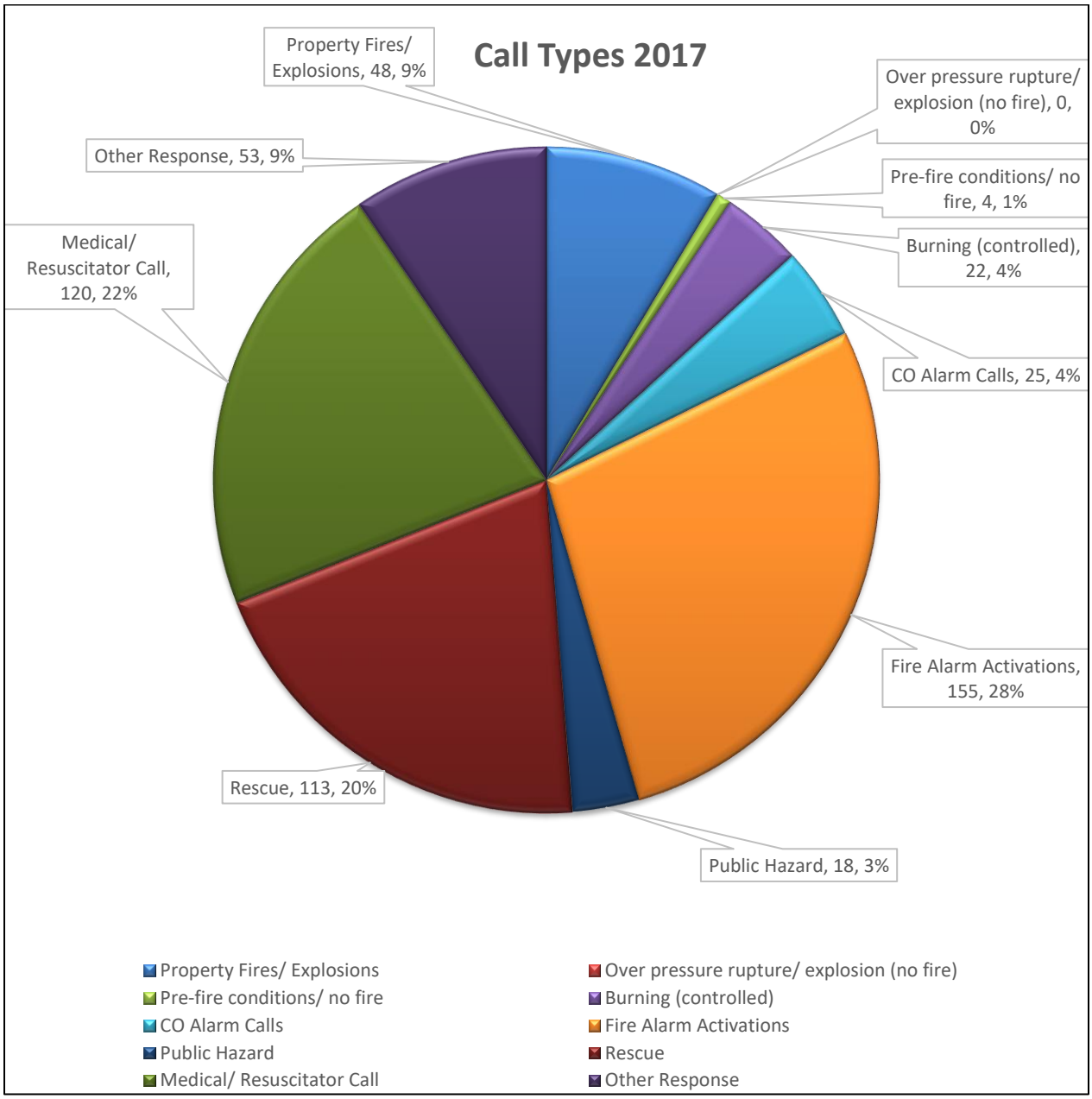
_____

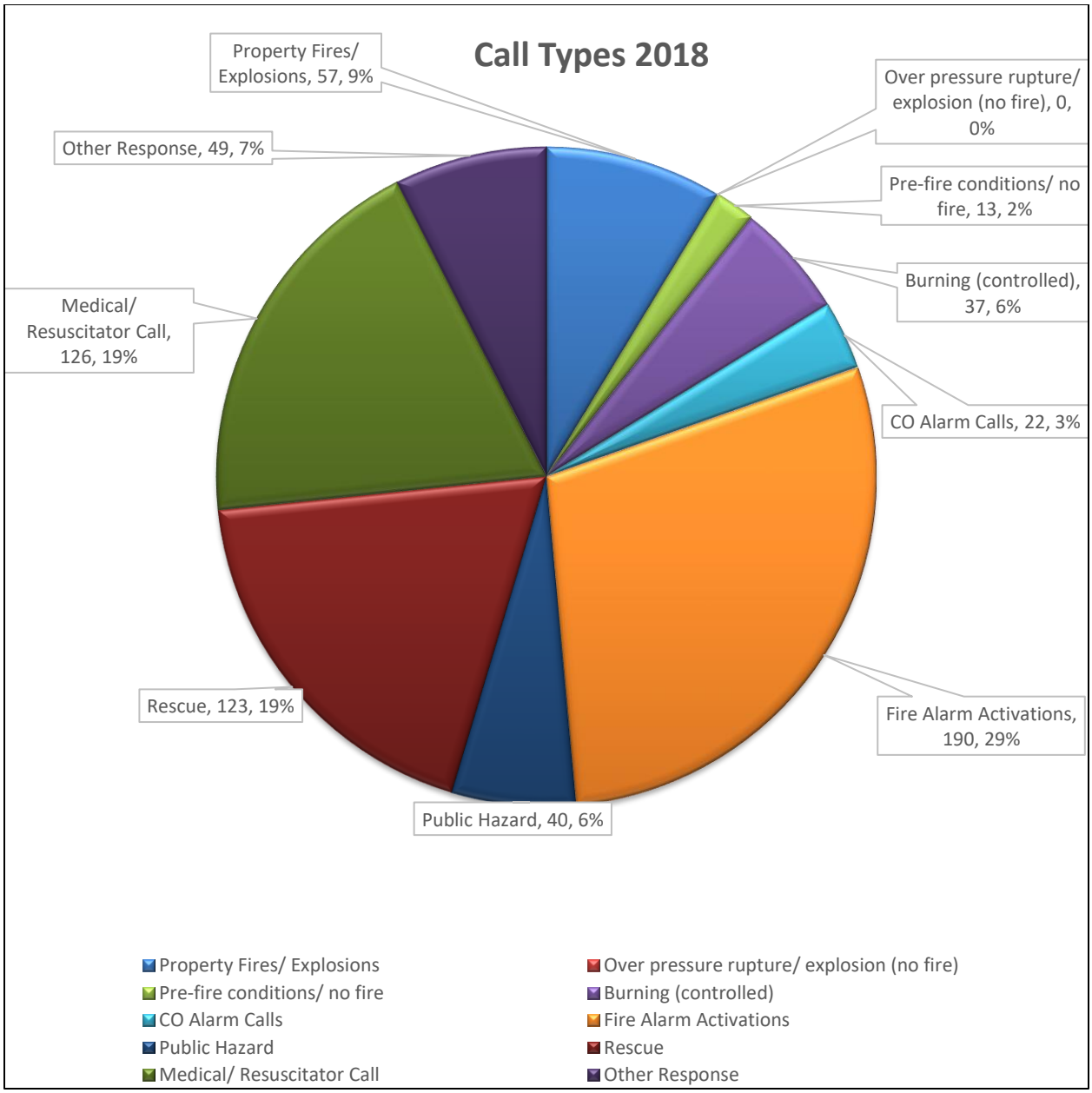
_____

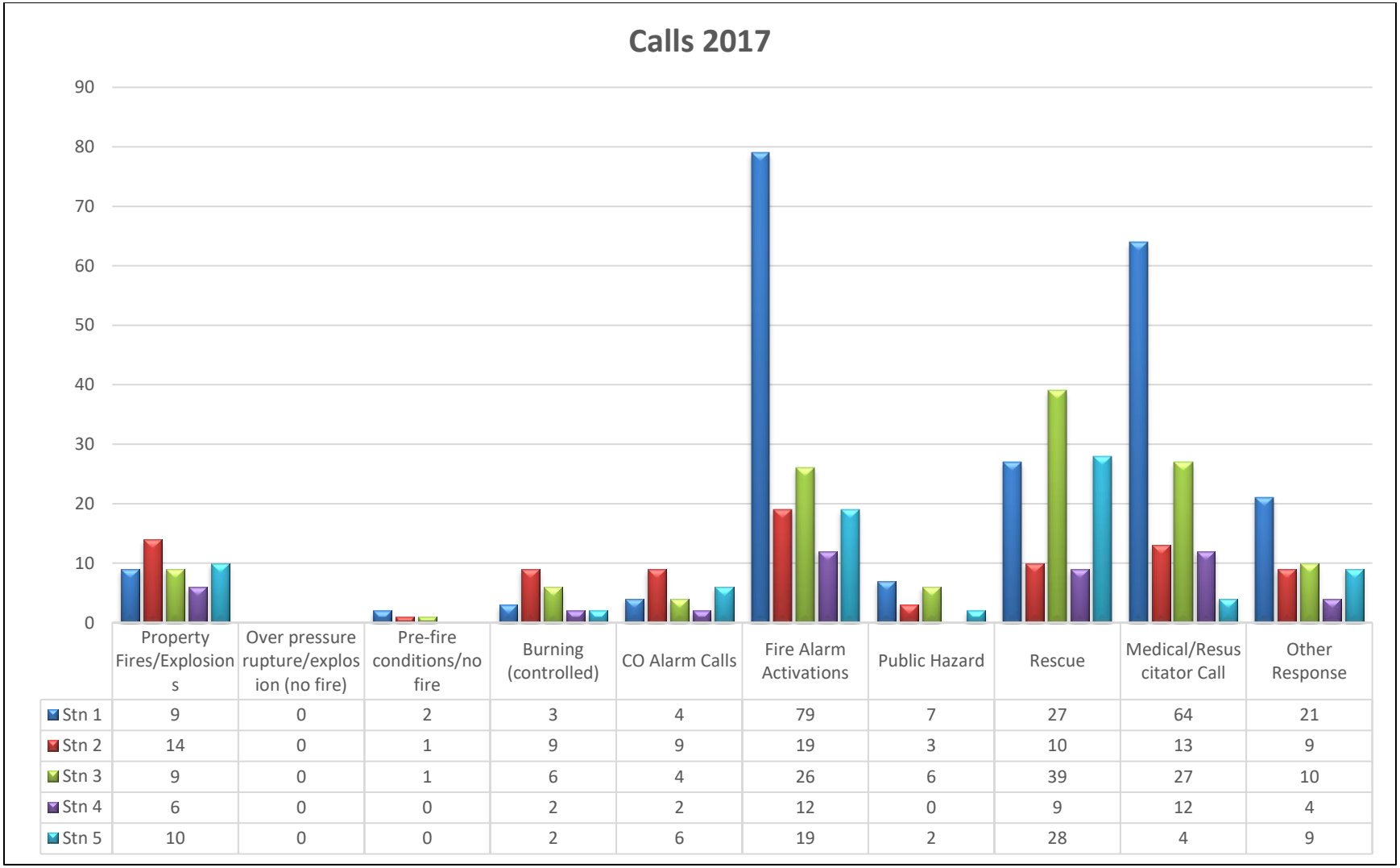
Thank you for completing this survey. Your feedback is greatly appreciated and will help to shape future service delivery efforts.

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

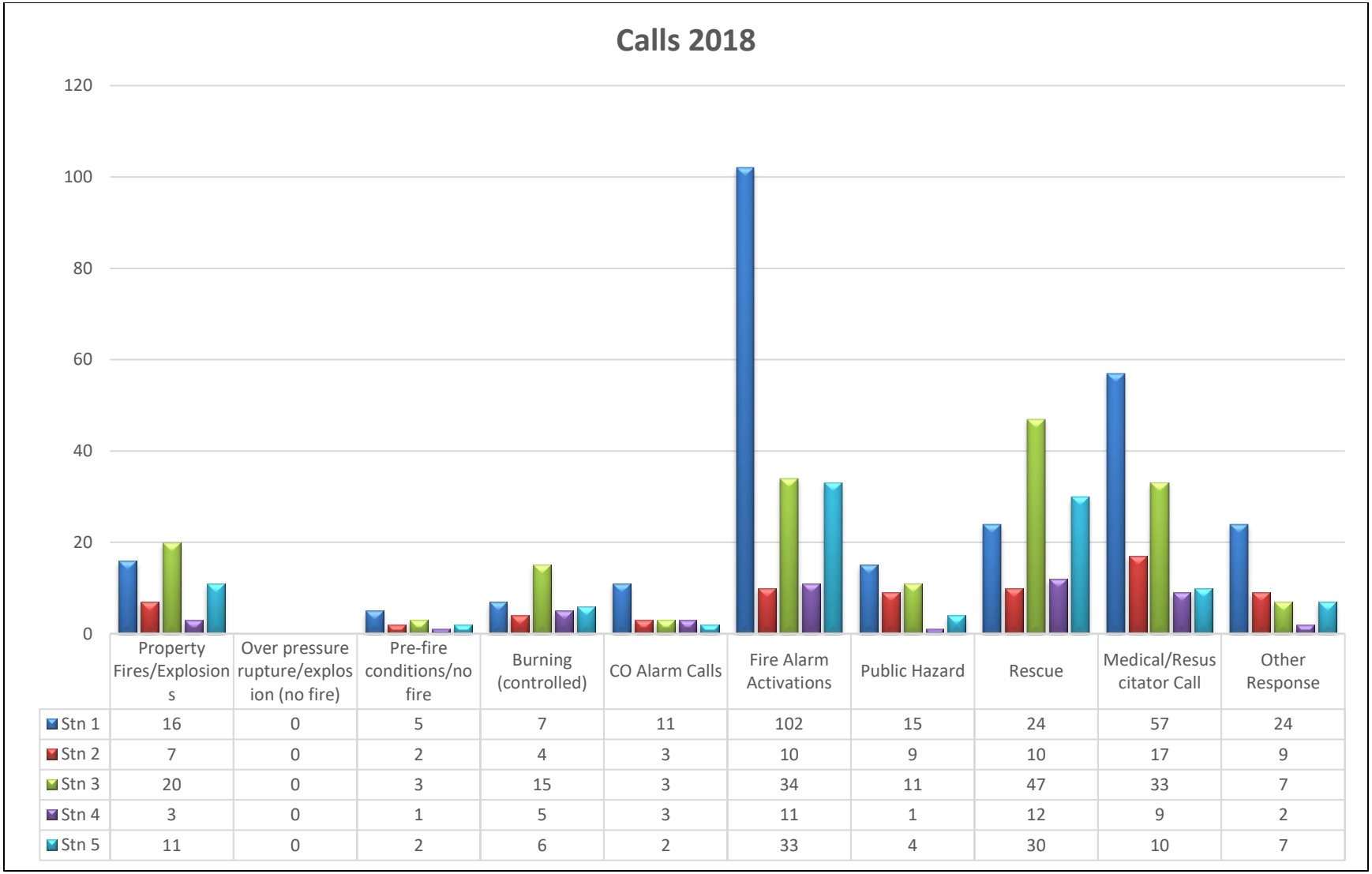
Appendix C: Historical Response Data



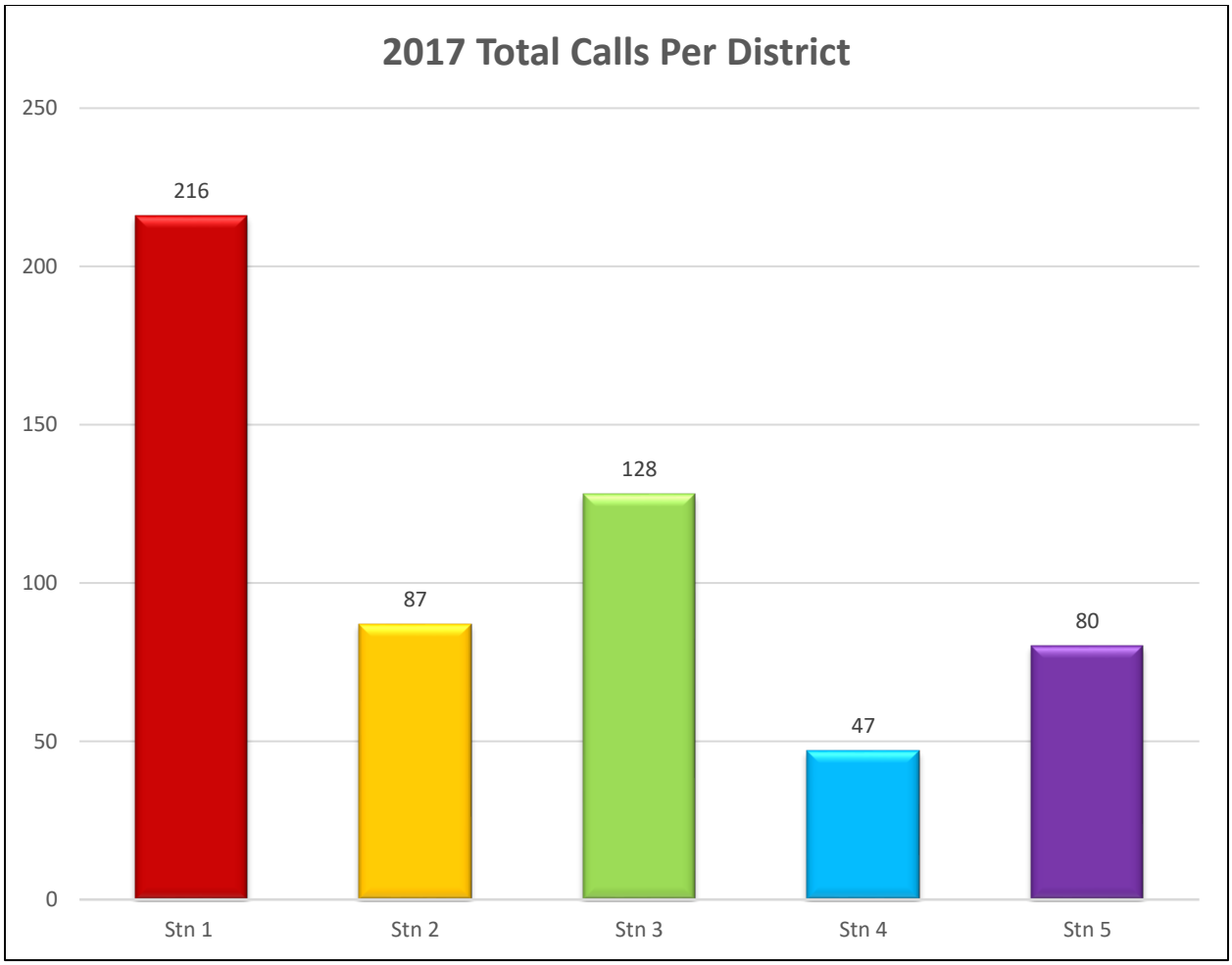

Call Types 2018
Property Fires/ Explosions, 57, 9%
Over pressure rupture/ explosion (no fire), 0, 0%
Other Response, 49, 7%
Pre-fire conditions/ no fire, 13, 2%
Burning (controlled), 37, 6%
Medical/ Resuscitator Call, 126, 19%
CO Alarm Calls, 22, 3%
Rescue, 123, 19%
Fire Alarm Activations, 190, 29%
Public Hazard, 40, 6%
Property Fires/ Explosions
Over pressure rupture/ explosion (no fire)
Pre-fire conditions/ no fire
Burning (controlled)
CO Alarm Calls
Fire Alarm Activations
Public Hazard
Rescue
Medical/ Resuscitator Call
Other Response

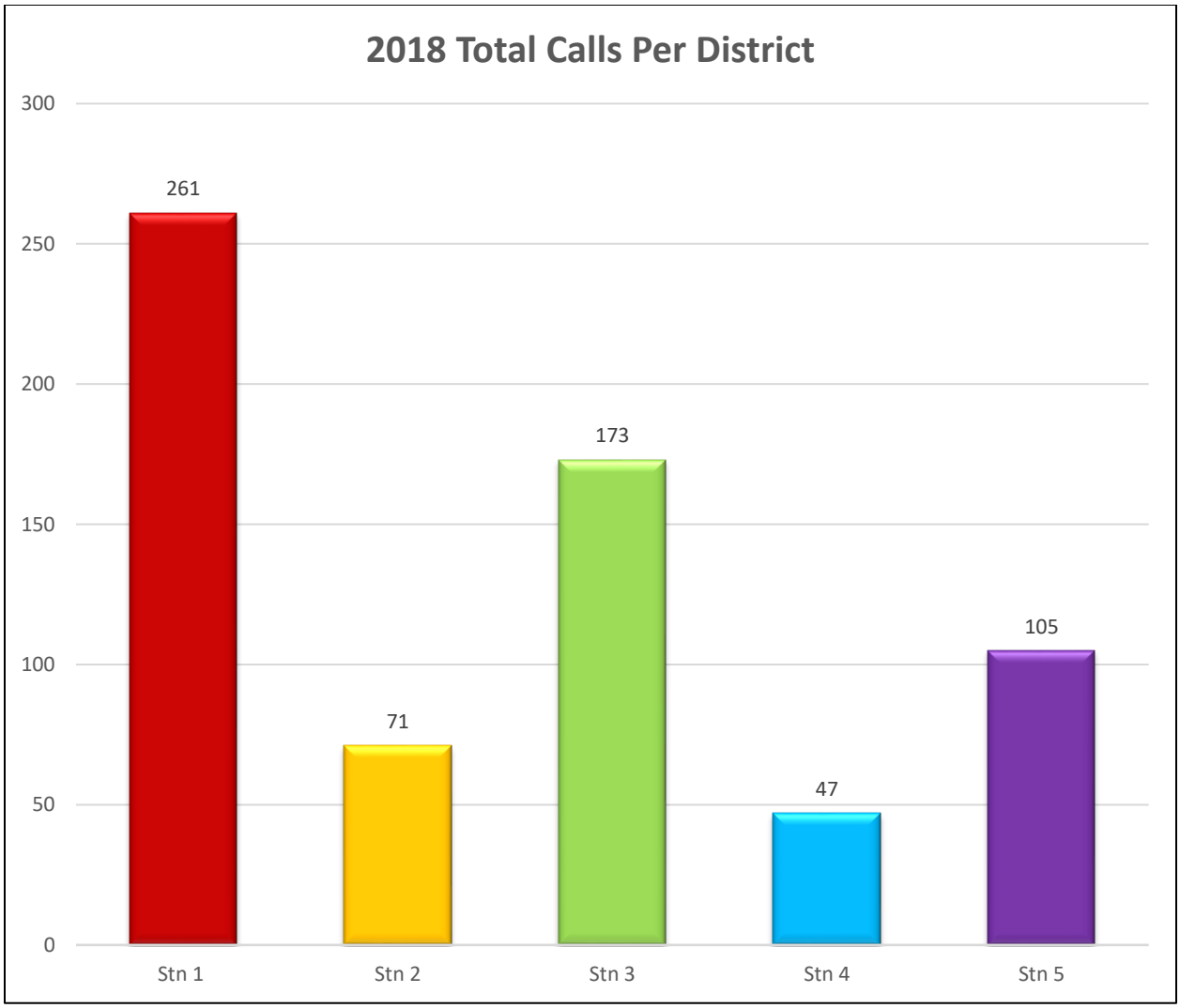


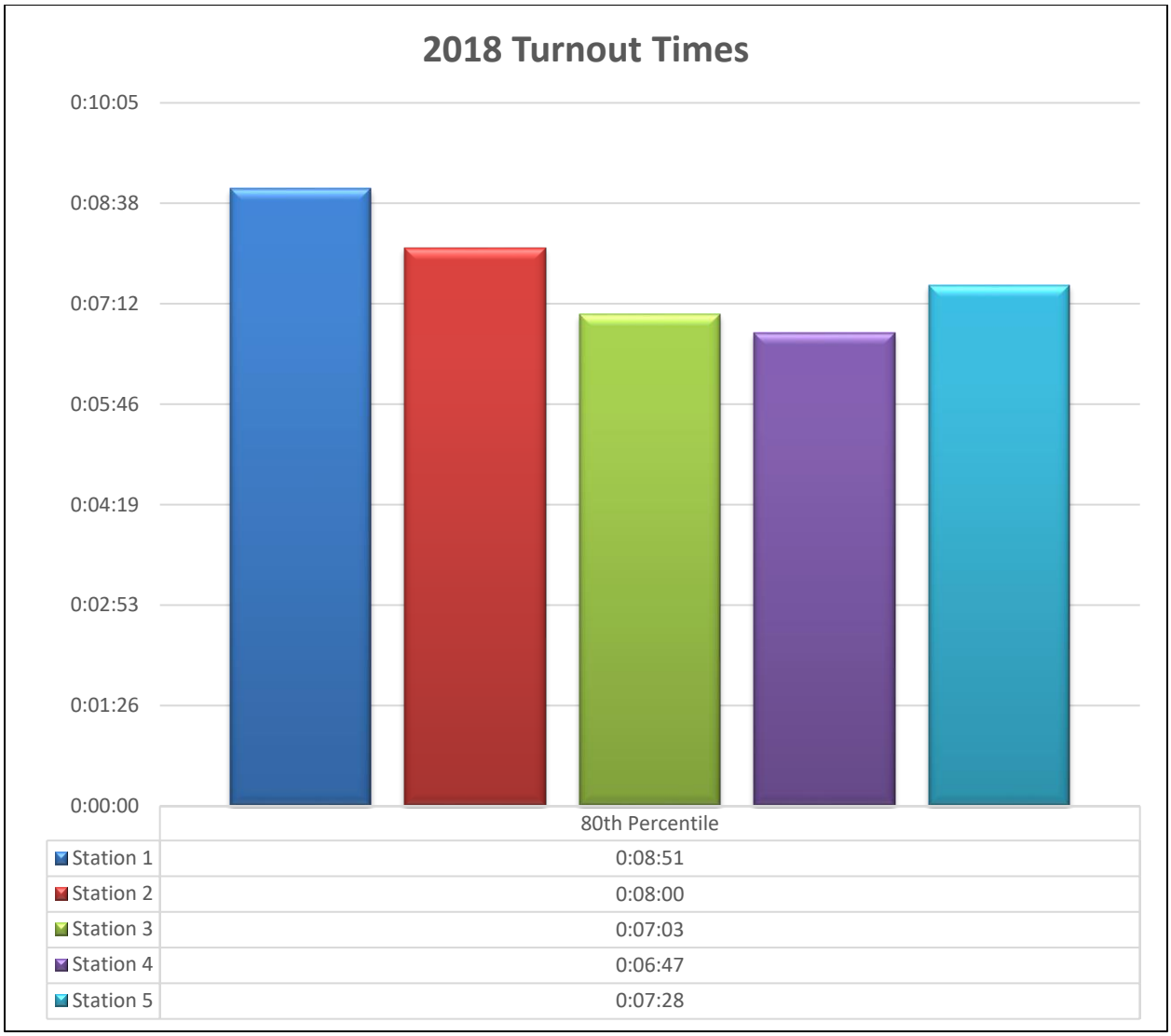
	Property Fires/Explosions	Over pressure rupture/explosion (no fire)	Pre-fire conditions/no fire	Burning (controlled)	CO Alarm Calls	Fire Alarm Activations	Public Hazard	Rescue	Medical/Resuscitator Call	Other Response
Stn 1	9	0	2	3	4	79	7	27	64	21
Stn 2	14	0	1	9	9	19	3	10	13	9
Stn 3	9	0	1	6	4	26	6	39	27	10
Stn 4	6	0	0	2	2	12	0	9	12	4
Stn 5	10	0	0	2	6	19	2	28	4	9

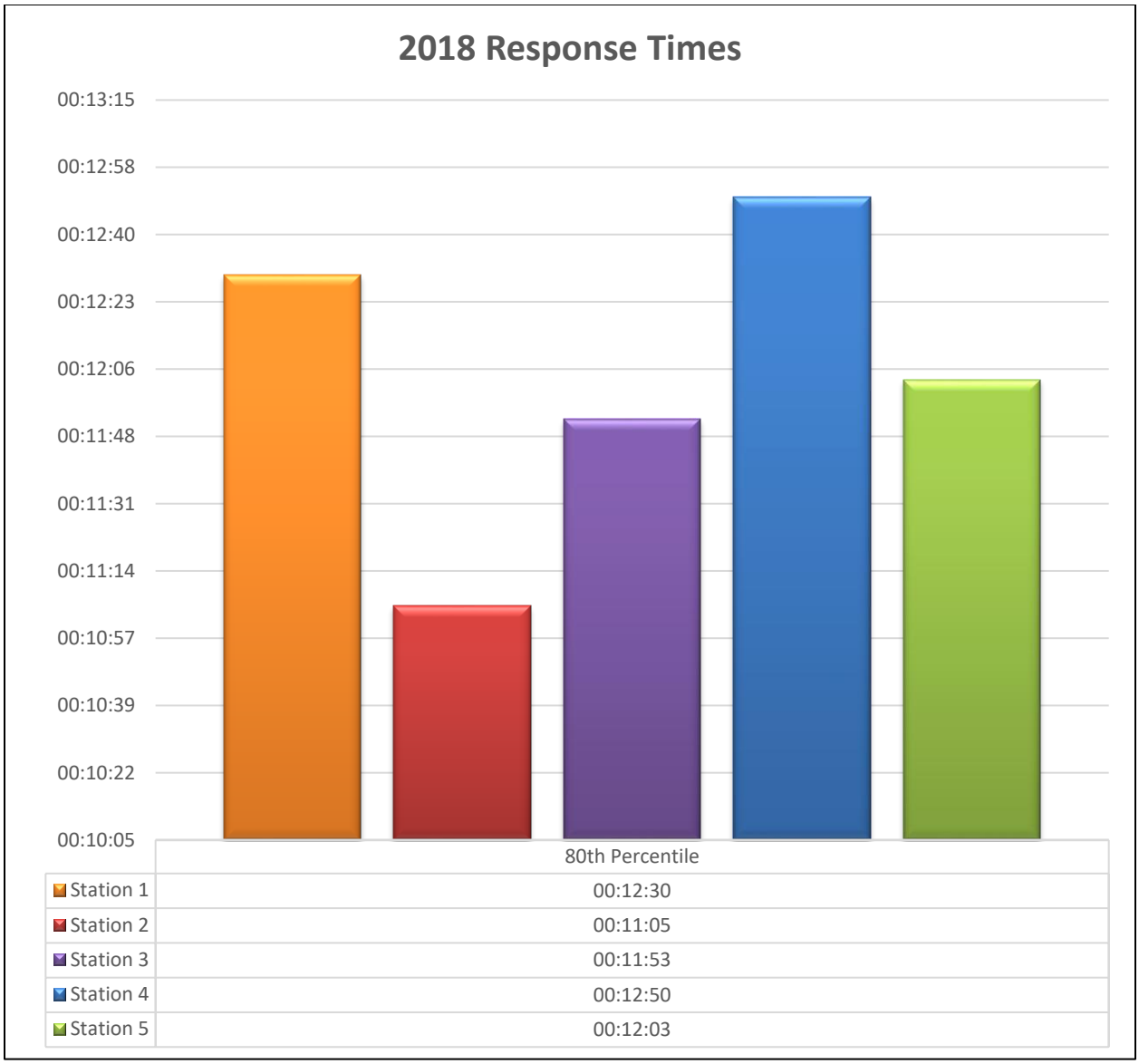


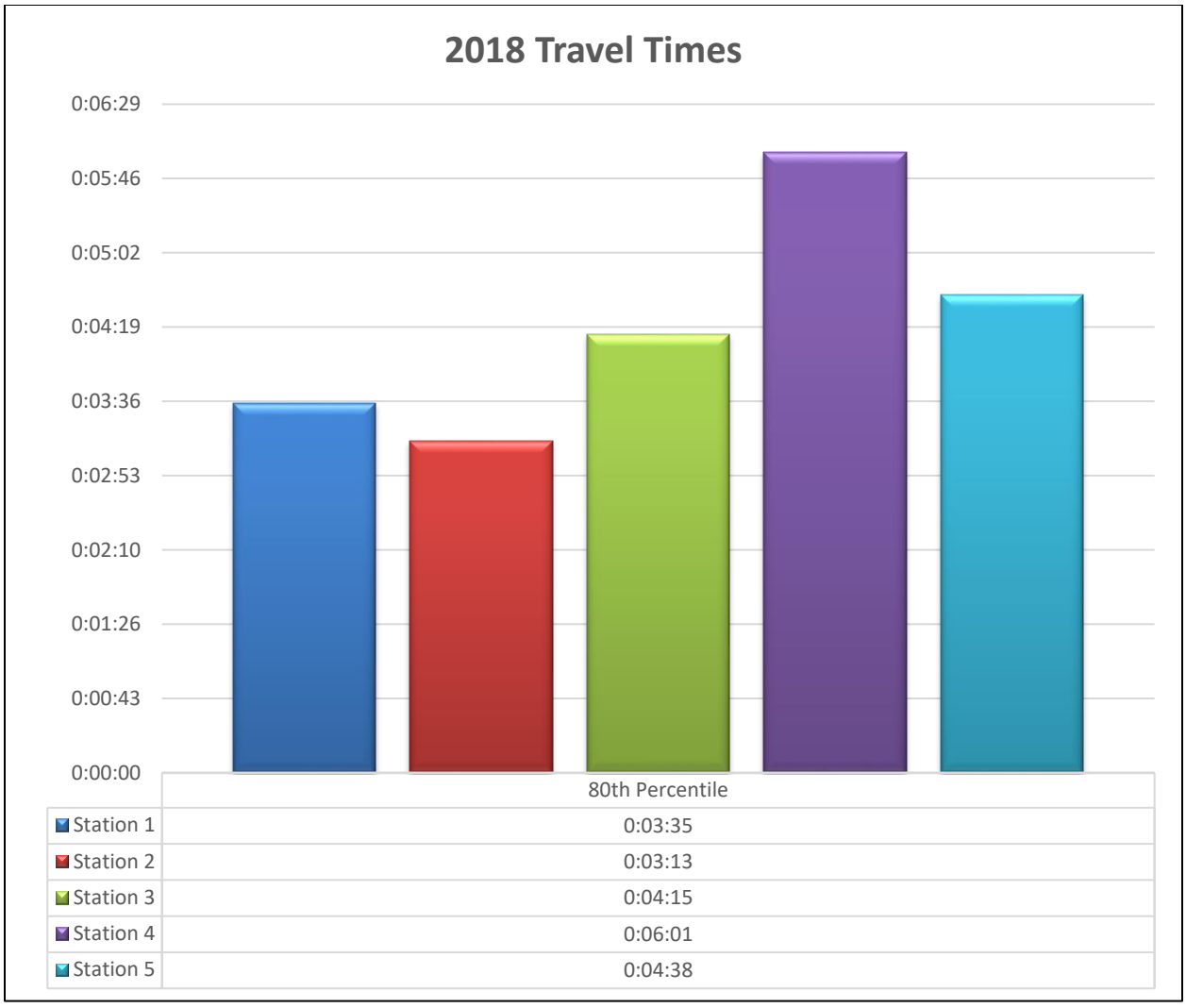
	Property Fires/Explosions	Over pressure rupture/explosion (no fire)	Pre-fire conditions/no fire	Burning (controlled)	CO Alarm Calls	Fire Alarm Activations	Public Hazard	Rescue	Medical/Resuscitator Call	Other Response
Stn 1	16	0	5	7	11	102	15	24	57	24
Stn 2	7	0	2	4	3	10	9	10	17	9
Stn 3	20	0	3	15	3	34	11	47	33	7
Stn 4	3	0	1	5	3	11	1	12	9	2
Stn 5	11	0	2	6	2	33	4	30	10	7


2017 Total Calls Per District
250
200
150
100
50
0
216
87
128
47
80
Stn 1
Stn 2
Stn 3
Stn 4
Stn 5


2018 Total Calls Per District
300
250
200
150
100
50
0
261
71
173
47
105
Stn 1
Stn 2
Stn 3
Stn 4
Stn 5


2018 Turnout Times
0:10:05
0:08:38
0:07:12
0:05:46
0:04:19
0:02:53
0:01:26
0:00:00
80th Percentile
Station 1 0:08:51
Station 2 0:08:00
Station 3 0:07:03
Station 4 0:06:47
Station 5 0:07:28


2018 Response Times
00:13:15
00:12:58
00:12:40
00:12:23
00:12:06
00:11:48
00:11:31
00:11:14
00:10:57
00:10:39
00:10:22
00:10:05
80th Percentile
Station 1 00:12:30
Station 2 00:11:05
Station 3 00:11:53
Station 4 00:12:50
Station 5 00:12:03



	80th Percentile
Station 1	0:03:35
Station 2	0:03:13
Station 3	0:04:15
Station 4	0:06:01
Station 5	0:04:38

Appendix D: Five-Step Staffing Evaluation Process

Step 1: Scope of Service, Duties, and Desired Outputs

Identify the services and duties that are performed within the scope of the organization. Outputs should be specific, measurable, reproducible, and time limited. Among the elements can be the following:

- Administration
- Data collection, analysis
- Delivery
- Authority/responsibility
- Roles and responsibilities
- Local variables
- Budgetary considerations
- Impact of risk assessment

Step 2: Time Demand

Using the worksheets in Table C.2.2(a)-(d), quantify the time necessary to develop, deliver, and evaluate the various services and duties identified in Step 1, taking into account the following:

- Local nuances
- Resources that affect personnel needs

Plan Review - Refer to Plan Review Services Table A.7.9.2 of the standard to determine Time Demand.

Step 3: Required Personnel Hours

Based on Step 2 and historical performance data, convert the demand for services to annual personnel hours required for each program *[see Table C.2.3(a) through Table C.2.3(e)]*. Add any necessary and identifiable time not already included in the total performance data, including the following:

- Development/preparation
- Service
- Evaluation
- Commute
- Prioritization

Step 4: Personnel Availability and Adjustment Factor

Average personnel availability should be calculated, taking into account the following:

- Holiday
- Jury duty
- Military leave
- Annual leave/vacation
- Training
- Sick leave
- Fatigue/delays/other

Example: Average personnel availability is calculated for holiday, annual, and sick leave per personnel member (see Table C.2.4).

Step 5: Calculate Total Personnel Required

Branch of the unassigned personnel hours by the adjustment factor will determine the amount of personnel (persons/year) required. Any fractional values can be rounded up or down to the next integer value. Rounding up provides potential reserve capacity; rounding down means potential overtime or assignment of additional services conducted by personnel. (Personnel can include personnel from other agencies within the entity, community, private companies, or volunteer organizations).

Correct calculations based on the following:

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

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

Appendix E: OFMEM Guidelines

PFSG 04-84-13

Volunteer Fire Service Personnel Recruitment and Retention

Public Fire Safety Guidelines	Subject Coding **PFSG 04-84-13**
Section **Fire Administration**	Date **October 2006**
Subject **Volunteer Fire Service Personnel Recruitment and Retention**	Page

Scope and Application:
This guideline provides municipal officials and Fire Chiefs of volunteers and composite fire services with a general overview of principles to consider in the recruitment and retention of volunteers.

There are many factors that contribute to the success of a volunteer recruitment and retention program. These include implementing organized marketing, recruitment, selection, hiring, training and retention plans.

Establishing and following a formal recruitment and retention program offers fire services the opportunity to increase the likelihood of finding, and keeping, the right people, doing the right tasks, at the right time.

Definition of Volunteer:
According to the *Fire Protection and Prevention Act* 1997, a Volunteer Firefighter is defined as "a Firefighter who provides fire protection services either voluntarily or for a nominal consideration, honorarium, training or activity allowance. ("pompier volontaire") 1997, c. 4, s. 1 (1); 2001, c. 25, s. 475 (1)."

The majority of fire departments in Ontario (450 out of 478) utilize the services of Volunteer fire service personnel. Recognized for their commitment and generosity, saving residents in Ontario more than an estimated one billion dollars annually, these professionals strive to provide skilled, competent and caring service.

Fire services that rely on volunteers to comprise, or enhance, their staffing capability continue to face the challenge of recruiting and retaining a sufficient number of capable and

experienced personnel. This impacts on the effective, efficient, safe and timely delivery of fire protection services.

Recruitment and Retention Program:

The Benefits

A coordinated, organized program demonstrates:

- how seriously the leadership takes the services provided and the individuals who provide that service,
- sound risk management principles,
- proactive vs. reactive leadership within the department, and
- leadership's commitment to recognize volunteers, families and employers who support volunteerism.

It identifies:

- shortfalls and availability of volunteers in the community and,
- the number, type and quality of volunteers required to meet current or future needs.

It allows planning for:

- recruitment and selection,
- retention and succession, and
- training and development of volunteers.

Responsibility for Recruitment

Recruiting and retaining volunteers does take effort. Creating a committee within the municipality and assigning specific tasks can create opportunities for others besides the leadership to contribute to the growth of the fire service and allows for a more concentrated effort.

Annual Recruitment and Retention Plan

An annual recruitment and retention plan is a cyclic, ongoing process that will assist the fire service in planning and focusing its efforts. It should be a logical consideration of the time of the year, changing commitments throughout the seasons, weather, and psychological impact of seasons, milestones in the department, annual events and other trends. This will prevent the department from coming up short in membership by not having good candidates to replace those leaving.

Policies and Guidelines

Fire service leaders benefit from having the necessary policies and procedures to ensure a safe, lawful, organized, empowering, non-discriminatory environment for their volunteers. No matter how large or small a department, policies and operating guidelines are essential management tools that set the standard for conduct and provide guidance for action. It is suggested that existing municipal policies, if available, be referenced.

Evaluation

Evaluation of the recruitment and retention program is necessary to identify strengths and areas to improve. It is an ongoing process that is built into all the components of the program.

Components in the Recruitment and Retention Cycle:

Pre-Recruitment

Prior to recruiting, it would be beneficial to conduct a needs assessment to determine the role and number of volunteers required. Completing a Community Profile will determine community members who may best fit those roles. Answering these questions prior to recruiting enables the fire services to target specific individuals for specific roles and may increase the chance of success.

Recruitment

To promote diversity and involve volunteers with different skill sets, knowledge and perspectives, more than one recruitment method is necessary. Regardless of the method and knowing the department is seeking the best possible candidates, effective marketing and communication strategies are necessary to draw the interest of potential volunteers.

Selection and Hiring

Once received and acknowledged, all applicants require screening to determine those who will move on to the next step in the hiring process.

The Fire Service takes great pride in service to communities. A screening process is essential in order demonstrate that the volunteers serve in the community's best interest. The leadership should decide which screening methods and tools are appropriate for their department and should ensure that they reflect human rights and privacy legislation and existing municipal policies.

Upon selection, a written agreement between the volunteer and the fire department will ensure that expectations and responsibilities for each side are clearly identified and agreed to.

Orientation and Probation

Fire Departments and their volunteers will benefit from having an organized system to orient, train and advance recruits. One of the most successful and safe approaches for developing volunteers and establishing a commitment is to initially offer specific tasks that allow them to become involved in a limited way, followed by opportunities to grow into a role with more responsibilities.

Ongoing Recruitment Efforts

Successful recruitment efforts should be ongoing throughout the year to ensure that there is a waiting list of interested individuals to draw from.

Ongoing Retention Efforts

Recruiting and training new volunteers is just the beginning. The long-term challenge is to create an environment in which individuals continue to be motivated, interested, challenged, supported and satisfied with the work they've accomplished. Factors that contribute to this environment include leadership practices, operating guidelines, recognition initiatives, support efforts, teamwork and fellowship.

Exit Processes

When an individual leaves the fire department, it is a good opportunity to solicit input to determine the department's strengths and opportunities for improvement. Exit processes should reflect understanding that, whether leaving on a positive or negative note, the volunteer and the fire department deserve fair and respectful treatment.

Resource Book:
The Application of Recruitment and Retention Principles:

The Volunteer Recruitment and Retention Resource Book that supports this guideline, was developed by the Ontario Fire Marshal's Office, in collaboration with representatives from the Ontario Fire Service.

This resource describes effective practices and strategies for recruitment and retention of Volunteer Fire Service personnel. It also provides a compilation of tools and templates that can be used to support the best practice or strategy. These may be photocopied or edited to meet the needs of the individual Fire Service.

A CD-ROM and printed copy of this resource has been made available to all Fire Services that maintain a volunteer complement. It can also be accessed and downloaded from the Ontario Fire Marshal's public access website http://www.mcscs.jus.gov.on.ca/.

Codes, Standards & Best Practices:

Codes, standards and best practices resources are available to assist in establishing local policy. All are available at http://www.mcscs.jus.gov.on.ca/.

Volunteer Resource Management
The following resources and links describe effective practices and strategies for Volunteer Resource Management. The principles and topics can be applied to the fire service.

The Canadian Code for Volunteer Involvement http://www.Volunteer.ca
HR Council for the Voluntary and Non-profit Sector http://www.hrvs-rhsbc.ca
Knowledge Development Centre, Canada Volunteerism Initiative http://www.kdc-cdc.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.

Additional References:
See also:
Office of the Fire Marshal's Public Fire Safety Guidelines

The following guidelines can be referenced when conducting a needs assessment to determine

the role, quantity and characteristics of Volunteers required by the fire service.

04-08A-03 Optimizing Rural Emergency Response
04-12-13 Core Services (Response and Support) and Associated Guidelines
04-40A-03 Simplified Risk Assessment

PFSG 04-87-13

Fire Station Location

Public Fire Safety Guidelines	**Subject Coding** ***PFSG 04-87-13***
Section ***General***	Date ***September 2004***
Subject ***Fire Station Location***	Page

Under Review

Purpose:

To assist communities in determining the best locations for their fire stations.

Introduction

Fire stations should be situated to achieve the most effective and safe emergency responses.

Fire stations represent a substantial municipal investment and should normally be located and designed to offer many years of service. As a community grows, it may become necessary to replace existing stations or add more stations to meet increasing public demands for emergency responses.

The best sites for fire stations will vary with local needs and circumstances and the fire protection services the municipality has selected to provide. Stations staffed by volunteer fire fighters may have some different considerations than those utilizing full time fire fighters.

Response Considerations

Distance and travel time are the primary influencing factors for selecting a fire station site.

Traditionally a circle was drawn around the proposed site to identify the station coverage area. Because the circle does not accommodate the normal right angle streets or roads, times will be more accurate if a diamond is used.

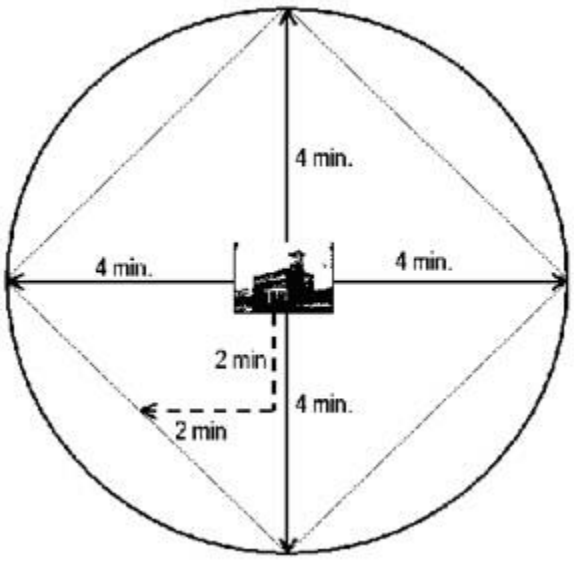
To plot the diamond, simply drive in each direction for the amount of time you have allowed for the response coverage, mark the point on a map and join the points using straight lines.

This procedure can then be repeated or modified for coverage that is beyond or less than the desired response times. This process will permit fire department managers to determine where response times are excessive, where impediments to the orderly movement of traffic exist and where specific high risks are located.

For example, the fire department reaches the downtown core in 3 minutes, the urban boundaries in 5 minutes, 75% of the rural area in 8 minutes and the remainder in 10 minutes. In the 8 to 10 minute areas specific additional fire prevention and public fire safety education programs may be warranted to help compensate for the longer response time.

The following diagram illustrates the differences between a circle and a diamond from a fire station that has used 4 minutes as the desired initial response time.

Please note that the circle will only reflect a true response of 4 minutes if the streets are straight from the fire station to the edge of the circle.



Computer Based Programs

There are several computer-based programs for identifying optimum locations for fire stations. While there are differences including data required, input and appearance, each of these programs identifies optimum fire station locations.

To determine optimum locations for fire stations using these programs, information such as the following must be entered:

- relative fire risk values for various areas, occupancies or properties
- desired response times for each identified fire risk
- information regarding the road network in the community including reasonable travel speeds, one-way streets, rail crossings, etc.
- emergency vehicles and personnel necessary to assemble fire attack teams

With the program tailored to the specific needs of a community, many fire response factors may be analyzed including:

- existing and proposed station locations based on desired response times
- best and alternate emergency response routes to specific locations
- ability of pumper, aerial, rescue and support crews to cover all parts of the community based on desired response times
- emergency response times for first, second and additional vehicles and personnel
- areas for potential automatic aid responses

A benefit of using a computer program is the ability of fire or municipal staff and council to evaluate fire station location needs (based on objective criteria).

Other Considerations

Fire stations should be located where they can serve the majority of the protection area they are assigned rather than for a specific hazard. For example, it may seem wise to place the fire station across from a nursing home. However, if the majority of responses are to the residential or commercial areas at the other side of the coverage area, the station should be situated closer to that area but still have the ability to arrive at the nursing home in the desired time.

Many volunteer stations are located in or very close to the geographic centre of the populated area of the community. This may increase response time when the volunteers have to come through the traffic to get to the station and then respond back through traffic to the emergency. Response times could be reduced by locating stations closer to the edge of the urban centre. Fire fighter response procedures could be altered to have some of the volunteers respond to the station for equipment while others go directly to the scene.

The practicability of sharing a facility should be assessed. It may be appropriate to locate the fire station with other emergency agencies or other municipal departments.

Municipalities may wish to consider the "temporary" placement of a station in a leased or rented building to address rapid growth in a specific area. An example of this could be the placement of a station in a vacant commercial or industrial unit for a period of time. At the same time, records should be kept to assess the efficiency and effectiveness of response from this location, so that Council may make an informed decision when it comes time to decide whether the location should be made "permanent".

Desirable Fire Station Site Criteria

The following is an initial check list for the selection of any fire station site:

- It may be advisable to have stations located a short distance up a side street rather than on a main street where the heaviest traffic exists. Access to and from site must have:
    - reasonable access to a major street or road
    - appropriate sight lines (no hills, physical obstacles)
    - no traffic impediments at any time of day
    - ability to have a second access to the site
    - maintained access (snow clearance, etc.)
- Assembly time for volunteers must not be negatively impacted.
- Impact on adjacent properties needs to be considered.
- Size of site must accommodate all expected activities of the fire service and allow for future expansion. (Parking, training, apparatus maintenance and equipment testing, etc.)
- Proximity to municipal services and required utilities (water, sewer hydro, telephone, gas)
- Costs.
    - acquisition of land
    - site preparation
    - building (leasing/renting may also be a consideration)

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.

See also PFSG:

04-01-12 Selecting Fire Suppression Capability
04-03-12 Service Providers
04-06-13 Codes, Standards, Acts, Regulations, Best Practices

Appendix F: Provincial Community Risk Assessment Guideline

OFMEM-TG-02-2019

Community Risk Assessment Guideline

Office of the Fire Marshal and Emergency Management

Abstract

The Office of the Fire Marshal and Emergency Management (OFMEM) has developed this guideline to assist municipalities and fire departments in a territory without municipal organization, to conduct community risk assessments and use its community risk assessment to inform decisions about the provision of fire protection services, in accordance with *Ontario Regulation 378/18* (*O.Reg. 378/18*), and the *Fire Protection and Prevention Act 1997 (FPPA).*

For further information or assistance contact the Public Safety Education Manager at 1-800-565-1842.

This guideline provides:

- An outline of recommended best practices to conduct a community risk assessment in order to make informed decisions about the provision of fire protection services;
- Descriptions of the nine mandatory profiles outlined in *O. Reg. 378/18* that must be addressed in the community risk assessment, including examples of where this data and information can be obtained;
- Worksheets that can be used or modified to document and analyse data/information related to the nine mandatory profiles that must be addressed in the community risk assessment in accordance with *O. Reg. 378/18*, and,

Worksheets that can be used or modified to assist in assigning risk levels and identifying preferred treatment options.

1.0 SCOPE

This document has been prepared by the Office of the Fire Marshal and Emergency Management to assist municipalities and fire departments in territories without municipal organization to conduct community risk assessments to meet the requirements of Ontario Regulation 378/18.

2.0 INTRODUCTION

Community risk assessments allow fire departments to make informed decisions about the types and levels of fire protection services they will provide based on identified risks.

Risk is defined as a measure of the probability and consequence of an adverse effect to health, property, organization, environment, or community as a result of an event, activity or operation.

By identifying all fire and life safety risks in their community and prioritizing them based on the probability of them occurring and the impact they would have if they occurred, fire departments are able to determine which risks to address and how best to address them. Risk assessments allow fire departments to ensure their levels of service, programs and activities for public fire safety education, Fire Code inspections and enforcement, and emergency response directly address the identified risks and are most effective at preventing and mitigating them.

The *Fire Protection and Prevention Act, 1997 (FPPA)* mandates that every municipality in Ontario shall establish a program which must include public education with respect to fire safety and certain components of fire prevention, and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances. In the fire service, these elements are commonly referred to as the Three Lines of Defence:

1. Public Fire Safety Education
2. Fire Safety Standards and Enforcement
3. Emergency Response

In order to meet these obligations, municipalities need to make informed decisions with respect to the types and levels of fire protection services they provide. This requires an understanding of the risks facing the community that can be identified through a community

risk assessment. Once identified, the risks can be prioritized to assist in making informed decisions about risk treatment options and the provision of fire protection services.

Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18) requires that every municipality and every fire department in a territory without municipal organization complete a community risk assessment and use it to inform decisions on the provision of fire protection services. The Community Risk Assessment is an in-depth and comprehensive assessment to inform fire protection service levels and requires the identification, analysis, evaluation and prioritizing of risk, based on nine mandatory profiles.

The regulation outlines a standard set of information profiles that must be considered when conducting a community risk assessment. The information and data gathered to address each of the profiles will assist in determining and prioritizing the risks to public safety in the community, and determining the fire protection services to be provided by municipalities and fire departments in territories without municipal organization to address those risks.

The mandatory profiles identified in Schedule 1 of O. Reg. 378/18 were determined from examining various current industry models on risk assessment. Many of these models provide comprehensive coverage pertaining to identification of data and information relating to community risks. However, it should be noted that these risk assessment models may or may not include all of the nine mandatory profiles as identified in Schedule 1 of O. Reg. 378/18. Municipalities and fire departments in territories without municipal organization may use other tools, models or guidelines to conduct their community risk assessments provided that their final community risk assessment meets all the requirements outlined in O. Reg. 378/18., including consideration of each of the nine mandatory profiles identified in Schedule 1 of the regulation (see Appendix E).

The Guideline provides suggestions as to how to record and analyze the data/information using the sample worksheets that are provided in the Guideline. Municipalities and fire departments in territories without municipal organization have flexibility to include any additional information (e.g. maps, charts, diagrams) they deem appropriate to best assist them in analyzing their data and information in order to make informed decisions on fire protection services.

The Emergency Management and Civil Protection Act (EMCPA) requires every municipality to conduct an all-hazards risk assessment, which informs continuous improvement of emergency management programs and improves public safety. A completed Hazard Identification Risk Assessment (HIRA) may provide some of the information/data required to fulfil the needs of a Community Risk Assessment under O. Reg. 378/18, although there will be specific fire related information that is not contained in the HIRA that will be gathered as

part of this process. The HIRA and the Community Risk Assessment are separate processes but should be viewed as complementary to one another.

Note: For the purposes of this guideline, the terms "fire department" and "fire departments" will be considered to include every municipality and every fire department without municipal organization.

3.0 CONDUCTING A COMMUNITY RISK ASSESSMENT

3.1 Identifying Risks – Mandatory Profiles

The first step in conducting a community risk assessment is to identify the various fire and life safety risks in the community. This can be done by gathering data about the make-up of the community and the activities occurring there.

O. Reg. 378/18 requires fire departments to consider the following profiles when completing their community risk assessment to ensure the risk assessment best considers all potential risks in the community:

1. Geographic Profile
2. Building Stock Profile
3. Critical Infrastructure Profile
4. Demographic Profile
5. Hazard Profile
6. Public Safety Response Profile
7. Community Services Profile
8. Economic Profile
9. Past Loss and Event History Profile.

Fire departments need to gather and review data and information about each of these profiles to identify the fire and life safety risks that could impact the community.

Worksheets 1 to 9 in Appendix A of this guideline can be used to record and organize the data and information for each profile. The worksheets can be filled in electronically. Fire and emergency risks and issues/concerns can be noted in the appropriate columns of each worksheet as they are identified. These worksheets can be modified or adapted to suit local needs based on available data or information.

A description of each profile, including potential sources of data and information for each, is provided below.

3.1.1. Geographic Profile

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

Physical features of the community may present inherent risks that need to be taken into account when determining the type and level of fire protection services that should be provided by the fire department. Physical features may also impact emergency response access and response times.

Identifying any geographic features that might have implications with respect to risk or response allows fire departments to consider these issues when determining appropriate types and levels of fire protection services.

For example, a lake may have implications with respect to water and/or ice rescue services and the equipment and training that would be required to provide those services. The lake may also impact emergency response access and response times to certain areas within the community. Additionally, a lake may be a seasonal tourist attraction and the associated activities may present unique risks that could influence decisions on specific public fire safety education and Fire Code inspection and enforcement programs and activities.

Where to find/collect this information

Information related to the Geographic profile may be obtained from:

- Local knowledge of the area and by using maps of the municipality's natural (i.e. lakes, rivers, etc.) and human-made (i.e. highways, bridges, railways, etc.) features, and
- Local municipal departments (i.e. highways/roads, conservation authorities, etc.) who should have information about the location and uses of geographic and physical features of the community.

3.1.2. Building Stock Profile

Building Stock profile refers to the types, numbers, uses, and ages of the various buildings within the community.

Fire departments should consider the potential fire risks associated with different types/classifications or uses of buildings given their prevalence in the community and the presence of fire safety systems and equipment at the time of construction. Older buildings typically do not contain the same fire safety and fire protection systems required in newer buildings. This may impact the fire risk in older buildings. Also, how buildings are used can influence the fire risks in each building. For example, industrial chemical storage facilities are likely to present higher fire risks than buildings containing commercial retail activities. The age and type of residential buildings (e.g. high-rise vs. single family dwelling vs. town/row houses) can influence the probability and consequence of fire in those buildings.

Past inspection practices and frequencies also can be a factor when considering risk associated with any particular building occupancy classification categories. For instance, a robust inspection program in higher risk occupancies can have a positive influence on mitigating some of the inherent risks associated with that particular type of building. Conversely, a lack of historical inspection data in relation to a particular occupancy classification category also should be considered when determining risk.

These building characteristics can have significant impact on the public fire safety education, Fire Code inspection and enforcement and emergency response activities the fire department may determine are necessary to address the risks.

Where to find/collect this information

O. Reg. 378/18 does not specify which source of this information has to be referenced to complete the risk assessment. Fire departments have the flexibility to choose which source they feel will provide the optimum level of detail they are most comfortable with as an accurate reflection of the building stock in their community. Consideration should be given to consistency in terms of data sources when conducting new risk assessments and annual reviews.

Information related to the Building Stock profile may be obtained from:

- Categorizing buildings in accordance with the Standard Incident Report (SIR) property classification system which corresponds with the Ontario Building Code (OBC) occupancy classification system. As the Ontario Fire Code (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 incidtnets.

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 Appendix A.

4.2 Consequence

The consequence of a fire or emergency is the potential losses or negative outcomes associated with the event. The application of professional judgment and reviews of past occurrences are important methods used for determining consequence levels. Estimating the consequence level of an incident or event should involve an evaluation of four components:

a. **Life Safety**: Injuries or loss of life due to occupant and 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.

Risk Level Matrix

Probability	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
ALMOST CERTAIN	Moderate Risk	Moderate Risk	High Risk	High Risk	High Risk
LIKELY	Moderate Risk	Moderate Risk	Moderate Risk	High Risk	High Risk
POSSIBLE	Low Risk	Moderate Risk	Moderate Risk	Moderate Risk	High Risk
UNLIKELY	Low Risk	Low Risk	Moderate Risk	Moderate Risk	Moderate Risk
RARE	Low Risk	Low Risk	Low Risk	Moderate Risk	Moderate Risk

Consequence

6.0 RISK TREATMENT OPTIONS

Once risk levels have been assigned, fire departments can determine how best to treat each risk and the resources required to do so.

Options for treating risks include the following:

1. Avoid the Risk

2. Mitigate the Risk
3. Accept the Risk
4. Transfer the Risk

6.1 Avoid the Risk

Avoiding the risk means implementing programs and initiatives to prevent a fire or emergency from happening.

For example, public fire safety education initiatives aim to change people's 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
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

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
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	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
Geographic Profile	Examples: Body of water impacts training, equipment for response	Accept Risk - Implement water/ice rescue training protocols, SOGs, and
	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
Demographic Profile		
Hazard Profile		
Public Safety Response Profile		
Community Services Profile		
Economic Profile		
Past Loss and Event History Profile		

Appendix B:

How the Risk Levels in the Risk Level Matrix were Determined

The risk levels in the Risk Level Matrix on page 15 were determined using the following methodology. The probability and consequence levels outlined in Table 1: Probability Level (page 13) and Table 2: Consequence Level (pages 14-15) have different definitions, but are given the same weighted numerical values[2] (see the numerical values in red below) to reflect the fact that ***probability and consequence are equally important***. While it is human tendency to place more weight on consequence than probability, using the same weighted numerical values ensures that probability and consequence are given equal value. This approach is consistent with current risk management industry practices. The risk levels in the Risk Level Matrix were determined by multiplying the numeric values for probability and consequence.

Risk Level Matrix

Probability	INSIGNIFICANT 1	MINOR 10	MODERATE 100	MAJOR 1,000	CATASTROPHIC 10,000
ALMOST CERTAIN 10,000	Moderate Risk 10,000	Moderate Risk 100,000	High Risk 1,000,000	High Risk 10,000,000	High Risk 100,000,000
LIKELY 1,000	Moderate Risk 1,000	Moderate Risk 10,000	Moderate Risk 100,000	High Risk 1,000,000	High Risk 10,000,000
POSSIBLE 100	Low Risk 100	Moderate Risk 1,000	Moderate Risk 10,000	Moderate Risk 100,000	High Risk 1,000,000
UNLIKELY 10	Low Risk 10	Low Risk 100	Moderate Risk 1,000	Moderate Risk 10,000	Moderate Risk 100,000
RARE 1	Low Risk 1	Low Risk 10	Low Risk 100	Moderate Risk 1,000	Moderate Risk 10,000

Consequence

Low Risk:	probability x consequence = **1**; 10; or 100
Moderate Risk:	probability x consequence = 1,000; 10,000; or 100,000
High Risk:	probability x consequence = 1,000,000; 10,000,000; or 100,000,000

[2] The numeric scale used here is taken from Dillon Consulting, *The Corporation of the City of Mississauga, Community Risk Identification: Introduction and Methodology,* July 2017.

Appendix C:

ONTARIO REGULATION 378/18

made under the

FIRE PROTECTION AND PREVENTION ACT, 1997

COMMUNITY RISK ASSESSMENTS

Mandatory use

1. Every municipality, and every fire department in a territory without municipal organization, must,

(a) complete and review a community risk assessment as provided by this Regulation; and

(b) use its community risk assessment to inform decisions about the provision of fire protection services.

What it is

2. (1) A community risk assessment is a process of identifying, analyzing, evaluating and prioritizing risks to public safety to inform decisions about the provision of fire protection services.

(2) A community risk assessment must include consideration of the mandatory profiles listed in Schedule 1.

(3) A community risk assessment must be in the form, if any, that the Fire Marshal provides or approves.

When to complete (at least every five years)

3. (1) The municipality or fire department must complete a community risk assessment no later than five years after the day its previous community risk assessment was completed.

(2) If a municipality, or a fire department in a territory without municipal organization, comes into existence, the municipality or fire department must complete a community risk assessment no later than two years after the day it comes into existence.

(3) A municipality that exists on July 1, 2019, or a fire department in a territory without municipal organization that exists on July 1, 2019, must complete a community risk assessment no later than July 1, 2024.

(4) Subsection (3) and this subsection are revoked on July 1, 2025.

When to review (at least every year)

4. (1) The municipality or fire department must complete a review of its community risk assessment no later than 12 months after,

(a) the day its community risk assessment was completed; and

(b) the day its previous review was completed.

(2) The municipality or fire department must also review its community risk assessment whenever necessary.

(3) The municipality or fire department must revise its community risk assessment if it is necessary to reflect,

(a) any significant changes in the mandatory profiles;

(b) any other significant matters arising from the review.

(4) The municipality or fire department does not have to review its community risk assessment if it expects to complete a new community risk assessment on or before the day it would complete the review.

Commencement

5. This Regulation comes into force on the later of July 1, 2019 and the day it is filed.

Schedule 1:
Mandatory Profiles

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

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

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

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

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

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

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

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

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

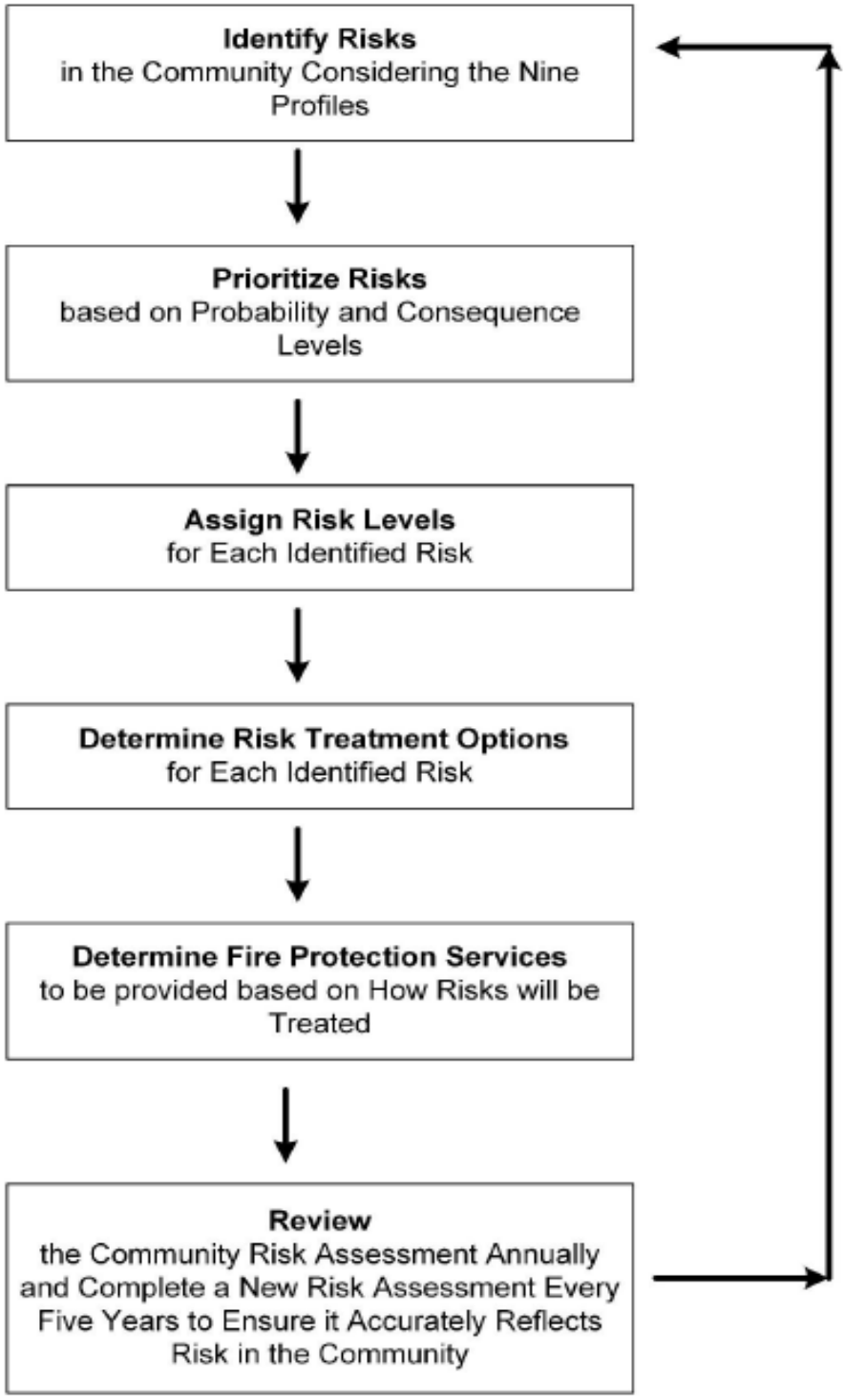
1. The number and types of emergency responses, injuries, deaths and dollar losses.

2. Comparison of the community's fire loss statistics with provincial fire loss statistics.

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

Appendix D:

Community Risk Assessment: Flow Chart



Appendix G: FUS Technical Document on Elevated Devices

Fire Underwriters Survey™

TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

LADDERS AND AERIALS: WHEN ARE THEY REQUIRED OR NEEDED?

Numerous standards are used to determine the need for aerial apparatus and ladder equipment within communities. This type of apparatus is typically needed to provide a reasonable level of response within a community when buildings of an increased risk profile (fire) are permitted to be constructed within the community.

Please find the following information regarding the requirements for aerial apparatus/ladder companies from the Fire Underwriters Survey Classification Standard for Public Fire Protection.

Fire Underwriters Survey

Ladder/Service company operations are normally intended to provide primary property protection operations of

1.) Forcible entry;
2.) Utility shut-off;
3.) Ladder placement;
4.) Ventilation;
5.) Salvage and Overhaul;
6.) Lighting.

Response areas with 5 buildings that are 3 stories or 10.7 metres (35 feet) or more in height, or districts that have a Basic Fire Flow greater than 15,000 LPM (3,300 IGPM), or any combination of these criteria, should have a ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed ladder companies.
When no individual response area/district alone needs a ladder company, at least one ladder company is needed if the sum of buildings in the fire protection area meets the above criteria."

The needed length of an aerial ladder, an elevating platform and an elevating stream device shall be determined by the height of the tallest building in the ladder/service district (fire protection area) used to determine the need for a ladder company. One storey normally equals at least 3 metres (10 feet). Building setback is not to be considered in the height determination. An allowance is built into the ladder design for normal access. The maximum height needed for grading purposes shall be 30.5 metres (100 feet).

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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.

Firefighting Assumptions

The requirements of this Part are based on the assumption that firefighting capabilities are available in the event of a fire emergency. These firefighting capabilities may take the form of a paid or volunteer public fire department or in some cases a private fire brigade. If these firefighting capabilities are not available, additional fire safety measures may be required.

Firefighting capability can vary from municipality to municipality. Generally, larger municipalities have greater firefighting capability than smaller ones. Similarly, older, well established municipalities may have better firefighting facilities than newly formed or rapidly growing ones. The level of municipal fire protection considered to be adequate will normally depend on both the size of the municipality (i.e., the number of buildings to be protected) and the size of buildings within that municipality. Since larger buildings tend to be located in larger municipalities, they are generally, but not always, favoured with a higher level of municipal protection.

Although it is reasonable to consider that some level of municipal firefighting capability was assumed in developing the fire safety provisions in Part 3, this was not done on a consistent or defined basis. The requirements in the Code, while developed in the light of commonly prevailing municipal fire protection levels, do not attempt to relate the size of building to the level of municipal protection. **The responsibility for controlling the maximum size of building to be permitted in a municipality in relation to local firefighting capability rests with the municipality. If a proposed building is too large, either in terms of floor area or building height, to receive reasonable protection from the municipal fire department, fire protection requirements in addition to those prescribed in this Code, may be necessary to compensate for this deficiency.** Automatic sprinkler protection may be one option to be considered.

Alternatively, the municipality may, in light of its firefighting capability, elect to introduce zoning restrictions to ensure that the maximum building size is related to available municipal fire protection facilities. This is, by necessity, a somewhat arbitrary decision and should be made in consultation with the local firefighting service, who should have an appreciation of their capability to fight fires.

The requirements of Subsection 3.2.3. are intended to prevent fire spread from thermal radiation assuming there is adequate firefighting available. It has been found that periods of from 10 to 30 minutes usually elapse between the outbreak of fire in a building that is not protected with an automatic sprinkler system and the attainment of high radiation levels. During this period, the specified spatial separations should prove adequate to inhibit ignition of an exposed building face or the interior of an adjacent building by radiation. Subsequently, however, reduction of the fire intensity by firefighting and the protective wetting of the exposed building face will often be necessary as supplementary measures to inhibit fire spread.

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
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Appendix H: 2020 Apparatus Replacement Schedule

NIAGARA-ON-THE-LAKE FIRE & EMERGENCY SERVICES - APPARATUS REPLACEMENT SCHEDULE

Pumper Replacement Cycle

Unit	Year	1 2020	2 2021	3 2022	4 2023	5 2024	6 2025	7 2026	8 2027	9 2028	10 2029	11 2030	12 2031	13 2032	14 2033	15 2034
FD06	2010	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
		P1						P3A					RESERVE		RETIRE	
FD07	2016	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		P2														
FD08	2003	17	18	19	20	21	22	23	24	25						
		P3	P3A					RESERVE		RETIRE						
FD09	2012	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		P4								P2A					RESERVE	
FD10	2008	12	13	14	15	16	17	18	19	20	21	22	23			
		P5		P2A						RESERVE			RETIRE			
FD11	1997	23	24	25	26	27	28	29								
		P2A		RESERVE				RETIRE								
FD14	1990	30	31													
		RESERVE	RETIRE													
FD??	2021	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
		REPLACE	P3													
FD??	2022		0	1	2	3	4	5	6	7	8	9	10	11	12	
			REPLACE	P5												
	2026						0	1	2	3	4	5	6	7	8	
						REPLACE		P1								
	2028								0	1	2	3	4	5	6	
							REPLACE		P4							
	2032												0	1	2	
													REPLACE	P2		

PUMPERS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
2% CPI	840,000	856,800	873,936	891,415	909,243	927,428	945,976	964,896	984,194	1,003,878	1,023,955	1,044,434	1,065,323	1,086,630	1,108,362	
15-Year Cycle (FUS)		840,000	856,800				927,428		964,896				1,044,434			4,633,558

Rescue Replacement Cycle

		26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
FD 16	1994	R4	RETIRE													
		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
FD 15	2004	R3		BECOMES SQ4			RETIRE									

RESCUES	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
2% CPI	690,000	703,800	717,876	732,234	746,878	761,816	777,052	792,593	808,445	824,614	841,106	857,928	875,087	892,589	910,440	
20-Year Cycle																0

LEGEND
- Add to Fleet
- Replacement
- 1st Run (15 Yrs)
- 2nd Run (20 Yrs)
- Exceeds FUS
- Strategic Reserve
- Retire

Aerial Replacement Cycle

FD 27	2020	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		L1														
FD 12	2007	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
		L5								RETIRE						
	2028									0	1	2	3	4	5	6
									REPLACE							

LADDERS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
2% CPI	1,400,000	1,428,000	1,456,560	1,485,691	1,515,405	1,545,713	1,576,627	1,608,160	1,640,323	1,673,130	1,706,592	1,740,724	1,775,539	1,811,049	1,847,270	
20-Year Cycle									1,608,160							1,608,160

NIAGARA-ON-THE-LAKE FIRE & EMERGENCY SERVICES - APPARATUS REPLACEMENT SCHEDULE

Tanker Replacement Cycle

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Unit	Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
FD 25	2019	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		T2														
FD 20	2013	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		T3														REPLACE

TANKERS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
2% CPI	375,000	382,500	390,150	397,953	405,912	414,030	422,311	430,757	439,372	448,160	457,123	466,265	475,591	485,102	494,805	
20-Year Cycle															494,203	494,203

Squad Replacement Cycle

FD 17	2017	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		SQ 1													RETIRE	
FD 28	2020	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		SQ 3														
	2025						0	1	2	3	4	5	6	7	8	9
						REPLACE	SQ 4									
	2032														0	1
														REPLACE	SQ 1	

SQUADS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
2% CPI	150,000	153,000	156,060	159,181	162,365	165,612	168,924	172,303	175,749	179,264	182,849	186,506	190,236	194,041	197,922	
20-Year Cycle					162,365								190,236			352,601

FD FLEET	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
15-Year Cycle	0	840,000	856,800	0	162,365	0	927,428	0	964,896	0	0	0	1,234,670	0	0	4,986,159
20-Year Cycle	0	0	0	0	0	0	0	0	1,608,160	0	0	0	0	0	494,203	2,102,363
ANNUAL COST	0	840,000	856,800	0	162,365	0	927,428	0	2,573,056	0	0	0	1,234,670	0	494,203	7,088,522