City of Windsor

Fire Master Plan 2023

THE CITY OF WINDSOR
ONTARIO, CANADA

EMG Emergency Management Group

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EXECUTIVE SUMMARY

This Fire Master Plan (FMP) encompasses a comprehensive review of the Windsor Fire & Rescue Services' (WFRS) strengths, weaknesses, opportunities, and challenges. This FMP also consists of a review of the community through the development of a separate Community Risk Assessment (CRA) report. By conducting these reviews, the Emergency Management Group (EMG) was able to develop this 10-year master plan for the WFRS.

Benefits of Master Planning

The benefits of master planning are many, but the key advantages are:

- Having a clearer vision of what future needs are to be implemented and when.
- A guide that includes options and budgetary estimates for implementation.
- Prioritization of each project.
- The ability to communicate with staff, and internal and external stakeholders about the future goals of the organization.

The recommendations contained within this FMP document have been submitted to provide a set of strategies and goals for implementation that are aimed at assisting the city council in making decisions relating to the efficient allocation of WFRS resources and staffing. The recommendations provided by EMG have been broken down into the following timelines:

- Immediate: Urgently required to be addressed due to legislative or health and safety requirements.
- Short-term: 1 – 3 years
- Mid-term: 4 – 6 years
- Long-term: 7 – 10 years (and beyond)

Ultimately, the implementation of the recommendations will depend on the direction that the city council provides, as well as the allocation of associated resources and the ability to move forward with the associated recommendations contained within the document.

Overview of Master Plan Sections

Through the utilization of best practices, including applicable standards and legislation, this report was prepared by completing an assessment of the following areas:

- Community and Fire Department Overview
- Planning – future community growth and related service needs
- Risk Assessment of the community through the completion of the Office of the Fire Marshal's (OFM) CRA document
- Fire Department Divisions – Non-Suppression
- Fire Suppression, Communications, Recruitment and Retention and Health & Safety
- Facilities, Vehicles, Equipment and Water Supply
- Emergency Management Program
- Mutual, Automatic Aid and Fire Service Agreements
- Finance and Budgets
- Review of Previous Strategic and/or Master Plans and FUS Reports

Recommendations are noted within each section of the document. However, Section 10 of the document contains a quick reference recommendations chart that includes recommended timelines for implementation, along with any estimated costs and possible service enhancements to be realized with the implementation of each recommendation.

Scope of Requirements

As noted in the original Request for Proposal (RFP), the following generally describes the deliverables for this project:

Review the following:

- Staffing and staff training requirements;
- Fire prevention and public education activities;
- Fire apparatus and emergency response equipment condition, capability and replacement criteria;
- Communications and technology requirements;
- High-level station condition assessments;
- Succession planning;
- Fire protection agreements and automatic aid agreements entered into by the Windsor Fire &

Rescue Services;

- Standard Operating Guidelines (SOGs), Directives, and Policies; and
- Various other administrative aspects including, but not limited to, records management systems (RMS), information management, reporting, data analytics and business intelligence.

Create the following:

- CRA, per O. Reg.378/18; and Standard of Response Coverage plan.

With the previously noted key requirements in mind, based on the information received during the meetings, a review of supplied documentation and reference to industry standards and best practices, there is a total of 49 recommendations for consideration by the fire chief and council to guide the WFRS into the future.

Overview of Recommendations

Based on the information received during the meetings, review of supplied documentation and reference to industry standards and best practices, there are 49 recommendations for consideration and inclusion by the fire chief, senior management, and council to assist in the development of the plan.

More information surrounding each recommended option can be found within the section from which it is derived.

Each recommendation noted in the following chart has been presented in the order of timeline for implementation, along with estimated cost and a brief rationale for the recommendation. This will assist the fire chief and council in identifying budgetary needs for any recommendations requiring significant investments.

It must be emphasized that any cost estimates noted in this document can vary significantly based on when the option is implemented and the level of implementation, along with what is eventually recommended by the fire chief.

***Note**: A chart entailing all the recommendations, timelines for implementation, estimated costs and rationale in the order that they are presented in the document can be found in Section 10.*

Recommendations by Timelines

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
4	The City of Windsor needs to develop a comprehensive Community Risk Reduction Plan that aligns with the CRA and FMP related recommendations.	Staff time	Immediate (0-1 years)	The development and implementation of the CRRP will aid in prioritizing risks that will be lessened or mitigated. Answering the who, what, when, and how will assist in identifying risks.
6	That the WFRS initiate a Process Mapping study to identify redundancy and areas for improvement to optimize staffing in the Fire Prevention unit. • Along with a study pertaining to the roles and responsibilities of the Deputy Chief of Support Services with a lens to evaluate workload.	Cost for a study can be as much as $30,000.00 unless resources are available internally or from the City of Windsor.	Immediate (0 – 1 year)	Process mapping may contribute to up to 20% performance improvement. Increasing staffing and process mapping would allow the WFRS Fire Prevention Unit to meet anticipated future growth.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
9	WFRS conduct an audit to identify buildings requiring an inspection and to establish a frequency inspection schedule that would be manageable for WFRS, while optimizing community safety	Staff Time	Immediate (0 – 1 year)	Best practices for frequency inspection schedule arrange occupancy types by level of risk and prioritize level of risk commensurable with 1-yr, 2-yrs, or 3-yr inspection rotations.
10	WFRS revamp their proposed 2011 Fire Prevention policy through the lens of the NFPA 1730 and implement the updated policy with accompanying SOGs, detailing specific functions of fire inspection, fire investigation, and public fire and life safety education.	Staff Time	Immediate (0 – 1 year)	A policy would assist fiscal and operational monitoring of the section, as well as service delivery standard.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
11	Create a career path model for all specialized functions/positions within the WFRS.	Staff Time	Immediate (0 – 1 year)	Firefighting is a high-risk profession. Training is essential to enable firefighters to respond more efficiently to emergencies, reducing the property damage caused by fire, loss of life, and public hazards, as well as reducing personnel injuries. Although the WFRS has a career path model for recruit firefighters and officer promotion, there is limited documentation regarding career path modeling for other specialised positions, such as fire prevention officer, fire investigator, public educator, telecommunicator, or technical rescuer.
12	WFRS consider a review of its organizational Chart with a training - centric lens to ensure equitable training support to all WFRS divisions.	Staff Time	Immediate (0 – 1 year)	The WFRS Training Division should not be under the tutelage of any specific Deputy Fire Chief but rather between the two Deputy Fire Chiefs linked with a dotted line to leverage training support to the entire WFRS.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
14	WFRS Training Division ensures that any training props should be made to comply with NFPA 1402, Standard on Facilities for Fire Training and Associated Props.	Staff Time	Immediate (0 – 1 year)	NFPA 1402 provides guidance for the planning of fire service training centers, focusing on the main components necessary to accomplish general fire fighter training effectively, efficiently, and safely.
17	All in-house trainers supporting the annual suppression training program should be qualified to level 1 of the NFPA 1041: Standard for Fire and Emergency Services Instructor Professional Qualifications.	Staff Time	Immediate (0 – 1 year)	The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the training resource capacity of the WFRS
18	Suppression staff be trained to Fire and Life Safety Educator Level 1 and that the WFRS operations Division captains also be trained as Public Information Officer, under the NFPA 1035.	Staff Time	Immediate (0 – 1 year)	Suppression members contributes to public and life safety education through various WFRS initiatives. Suppression personnel and the WFRS in general would benefit from enhanced training in Public and Life Safety Education.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
19	WFRS Fire Prevention policy addresses training requirements and that the training requirements for Fire Prevention which is set at Level 2 of NFPA 1031: Standard for Professional Qualifications for Fire Inspector and Plans Examiner be added to the program development and delivery of the WFRS Training Division. Or at the very least, WFRS Training Division should vet the curriculum and arrange testing and certification to NFPA 1031 and 1035 for fire prevention officers.	Staff Time	Immediate (0 – 1 year)	Fire inspection is a strong program within the WFRS. Training development and delivery are like public and life safety education concerning external training and coordination by the WFRS Training Officer. With the adoption of Ontario Regulation 343/22 and the certification requirements for fire prevention personnel, WFRS would benefit from the Training Division assuming a monitoring role and a curriculum design role to assure candidates' success from the provincial testing.
21	WFRS Training Division, at the very least, be responsible for record keeping and monitoring of EMS training requirements.	Staff Time	Immediate (0 – 1 year)	The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
22	WFRS update their Probationary to First Class Promotional Process SOP to include details (steps-by-steps) regarding the process.	Staff Time	Immediate (0 – 1 year)	With respect to the firefighter increment promotional process, it is based on a three-year period for completion and the SOP identifies clear and concise objectives and goals for each increment. However, written details of the promotional process are lacking compared to the actual process diligently followed by the Training Division responsible for the firefighter increment process.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
23	EMG recommends that WFRS develops detailed SOP for each rank on the promotional process system, including Training Officer, Captain, and District Chief promotional processes.	Staff Time	Immediate (0 – 1 year)	With respect to the firefighter increment promotional process, it is based on a three-year period for completion and the SOP identifies clear and concise objectives and goals for each increment. However, written details of the promotional process are lacking compared to the actual process diligently followed by the Training Division responsible for the firefighter increment process. With respect to the officer promotional processes, EMG did not identify SOPs related to Training Officer, Captain, District Chief promotional processes, except for an SOP for firefighter increment process (GO 03.01- 2020). The current Human Resources promotional process SOP is lacking in detail and does not conform to the current process.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
26	A full pre-incident planning program should be implemented for vulnerable occupancies (nursing homes etc.) high-risk industrial properties, multi-unit dwellings, commercial business districts, institutional occupancies (hospitals, universities), assembly occupancies, office-type structures, international crossings, and airports.	Staff Time	Immediate (0 – 1 year)	To afford fire crews the ability to gain foreknowledge (intelligence) of the water supplies and features threats of individual buildings that they may be called upon to operate in.
44	Windsor update their emergency management training plan to ensure that existing and new staff are current with their required training as per their position within the plan.	Staff time	Immediate (0-1 year)	Keeping this plan up to date is a requirement under the Act.
27	The Department should establish annual training focussing on airport operations (including radio procedures), pre-incident planning, aircraft recognition and hazards, and aircraft rescue and firefighting operations for its crews.	Staff Time	Immediate to Short-Term (0 – 3 years)	Preparedness and safety issues for firefighters (who need to be intimately familiar with the risks and safety precautions to take).

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
28	The Department should review its emergency response protocols for tunnel and bridge operations in concert with allied agencies on both sides of the border with a view to strengthening relationships and updating procedures respecting rescue, crash, firefighting, derailment, hazardous material, and terrorism/border security response tactics and procedures.	Staff Time	Immediate to Short-Term (0 – 3 years)	Preparedness and safety issues for firefighters (who need to be intimately familiar with the risks and safety precautions to take).
29	The Department should undertake a comprehensive analysis of medical responses in respect of response times relative to EWEMS arrival, patient outcomes where WRES initiates life-saving measures, and other potential efficiencies that may be derived from such an analysis.	Staff Time	Immediate to Short-Term (0 – 3 years)	To establish and validate the business case for continuing involvement in this program and to assess the effectiveness of Departmental intervention efforts.
30	The Department should explore the notion of program cost-recovery (training, consumables, response) from the County for providing first-response medical services as a means of securing at least partial program cost recovery.	Staff Time	Immediate to Short-Term (0 – 3 years)	Reduce the impact of operational costs by identifying a revenue source.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
31	The Department should establish the necessary budget and training programs to implement the rescue disciplines of Confined Space Rescue, High Angle (Rope) Rescue, and Trench Rescue OR These services be deleted from the Establishing and Regulating Bylaw.	Staff Time	Immediate to Short-Term (0 – 3 years)	The current Council policy (as expressed in the E&R Bylaw) is that the department is to carry out these functions, however, it is neither equipped nor trained to do so, thus presenting liability on several fronts.
32	The Establishing and Regulating Bylaw should be updated to provide for the provision of Urban Search and Rescue (USAR) services as a Council-approved activity	Staff time only – but cost could be incurred if approved by council .	Immediate to Short-Term (0 – 3 years)	To bring the Bylaw into concurrence with current departmental practices.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
34	The Post Incident Analysis Report (PIAR) process and SOP should be refreshed to reflect current practices and formal PAIRs be conducted for incidents that meet a predetermined threshold. In addition, it's recommended that each PIAR be documented thoroughly and that an annual summary of all PAIRS occurring in a calendar year be prepared with all operational staff, and the training division so that lessons learned can be incorporated into future training sessions.	Staff Time	Immediate to Short-Term (0 – 3 years)	To allow for broader organizational learning opportunities.
35	The Department should undertake a review of the firefighting foam and other products used by the city to ensure that the products used are fluorinated chemical free and that they represent the best solution for current and future needs.	Staff Time	Immediate to Short-Term (0 – 3 years)	Firefighter safety and environmental protection.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
36	A staff-driven team should be established with a broad mandate for the review and analysis of newer technologies available in the Canadian marketplace for potential applications locally and in addition to the cache of equipment.	Staff Time	Immediate to Short-Term (0 – 3 years)	To facilitate the introduction of new technologies intended to increase efficiency and safety.
1	The Fire Administration brings forth a revised version of the E&R Bylaw for the Council's approval and ensures its annual review and updates.	Staff time	Short-Term (1-3 years)	Maintaining an up-to-date E&R Bylaw will guide the WFRS' operations and identify response guidelines, fire prevention, and public education programs and levels of training.
2	The Fire Administration reviews Bylaws that affect the daily operations of the fire department.	Staff time	Short-Term (1-3 years)	Having current Bylaws will reflect changing the circumstances of the City and meet Federal or Provincial Acts and Regulations.
3	Establish an SOP Committee representing all divisions of the WFRS that develops new SOPs and reviews current ones regularly.	Most costs will be about time spent by committee members.	Short-Term (1-3 years)	Establishing an SOP committee will aid in maintaining the information in the database to be current while allowing the participation of WFRS members to determine the fire department's operations.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
5	The City of Windsor's Building Department and WFRS should promote the advantages of installing residential sprinklers, which include saving lives and property.	Staff Time	Short-Term (1-3 years)	Historically no persons have died in residential fires where residential sprinklers were installed and activated during a fire, and sprinklers may reduce the risk to homeowners.
7	EMG recommends that WFRS re-evaluate the need for an additional Public and Life Safety Educator position within the Fire Prevention Division.	Cost associated with one FTE	Short-Term (1 – 3 years)	WFRS had two PFLSEs in the past. Previously, there may have been appropriate reasons to eliminate the position. However, given the renewed emphasis and demonstrated benefits of the first line of defence, re-instating the position within WFRS Fire Prevention would have added value to the WRFS and the City of Windsor.
8	WFRS Public Education Program be reviewed annually to help identify any areas for improvements.	Staff Time	Short-Term (1-3 years) ongoing	WFRS Public Education Program be reviewed annually to help identify any areas for improvements.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
13	Increase the WFRS Training Division staffing be increased by one Training Officer to meet anticipated growth and demands for training because of the Ontario Regulation 343/22 and introduction of an EV Battery plant within the municipality.	One Full-time Training Officer at a cost between $111,250.00 and $114,700.00	Short-Term (1 – 3 years)	Compounding factors contributing to inadequate staffing levels for the Training Division are the Ontario Regulation 343/22: Firefighter Certification, made under the Fire Protection and Prevention Act, 1997 and the building of an EV battery plant (Stellantis). These compounding factors are accruing workload to the Training Division and necessitate consideration for the increase staffing to the Training Division by one training officer.
15	EMG recommends a study to evaluate the benefit of relocating the Training Division as part of future expansion of the WFRS fire stations in view of including training facilities that would support revenue generation beneficial to sustain and support the WFRS training programs.	Study can be conducted in-house at limited costs. External consultant for such a study may cost upward of $50,000.00	Short-Term (1 to 3 years)	The current training facility is aging and has limited capacity to train to the current levels of service. Considering the Ontario regulation 343/22 and the expansion of testing and certification to all level of service provided by WFRS, it would be beneficial to evaluate current capacity of the Training Division facility vis-à-vis relocating to a new facility that would account for the required expansion of the Training Division to meet growing needs.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
16	All technical rescue training should be monitored through the WFRS Training Division in adherence to the NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications and in accordance with Ontario Regulation 343/22: Firefighter Certification. EMG also recommends that the WFRS aligns its technical operations and training to NFPA 2500: Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services.	Staff time and possible cost associated with an updating of records management programs.	Short-Term (1 – 3 years) To align with O.Reg. 343/22 deadline of 1st of July 2026	With the adoption of Ontario Regulation 343/22: Firefighter Certification, made under the FPPA, 1997, as of July 1st, 2026, all fire department will have to meet the certification requirements addressed in the regulation. The NFPA 2500 Standard is primarily used by emergency response agencies to guide their technical rescue training, equipment, and operations
20	WFRS dedicated fire investigators be concurrently certified to NFPA 1033 and NFPA 921. In addition, EMG suggests that fire investigation operations and training adhere to NFPA 1231: Standard for Fire Investigation Units and that the WFRS Training Division be responsible for monitoring, record keeping, testing, and certification to the said NFPA standards.	Staff time and costs for attending the NFPA courses	Short-Term (1 – 3 years) To align with O.Reg. 343/22 deadline of 1st of July 2026	NFPA 921 and NFPA 1321 documents complement NFPA 1033. Adherence to all three standards will assure best practices in training, equipment, and operations pertaining to fire investigation functions. training resource capacity of the WFRS

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
33	The Department should re-establish a Marine Unit with a properly sized vessel that affords the ability to provide fire attack/control, rescue, and spill mitigation along the City's waterfront.	If approved. There would be costs associated with the level of equipment and training required.	Short-Term (1 – 3 years)	To establish a more complete fire rescue response and environmental protection capability to safeguard the recreational and commercial boating community and protect the waterfront.
37	A permanent staff position should be created with a responsibility to develop and monitor quality assurance and related practices that will keep Windsor Fire and Emergency Services at the forefront of the delivery of fire protection services across the spectrum of services that meet the needs of the ratepayers of the City of Windsor.	Approximate cost of new position $50,000 to $70,000.	Short-Term (1 – 3 years)	A proactive measure that will allow for data monitoring and QA practice implementation at a greater rate/degree than is currently being conducted.
39	Train and certify the Windsor Fire Communicators to the OFM requirements.	Staff time and cost of training course.	Short-Term (1 – 3 years)	Staff time, which could incur overtime for course attendance off site.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
45	Windsor develop and/or review essential Continuity of Operations Plans/Business Continuity Plans for the internal operations of the municipal administration.	Staff Time	Short-Term (1-3 years)	Review and updating of such a plan is a key resource for the city.
46	EMG recommends that all Automatic Aid, Mutual Aid and Fire Protection/Service Agreements be reviewed annually and revised if necessary. All parties involved should pay particular attention to adherence, and regularly defined review periods and or expiry dates identified. Also, a page listing the dates of review and areas revised should be an addendum to any of the revised agreements and associated bylaws.	Staff Time	Short-Term (1 to 3 years)	Having a current bylaw and agreements in place better reflect enhanced service levels in providing fire protection services.
47	That all joint training opportunities be engaged in wherever possible.	Staff Time	Short-Term (1 to 3 years)	If a technical rescue call requires additional resources from outside the WFRS, a plan will already be in place ahead of time. It reduces the response time of these agencies if agreements are in place in advance, as pre-response approvals will not be required.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
48	The Fire Chief annually review the building infrastructure replacement plan to ensure it meets municipal growth patterns and the current fire department locations remain relevant to community needs and emergency response.	Staff time initially. Cost depending on needs.	Short-Term (1-3 years) ongoing	Review recommended to ensure services are meeting the needs of the department and community.
49	The Fire Chief annually review the fleet replacement schedule to update projected costs and currency.	Staff time initially. Cost depending on needs.	Short-Term (1-3 years) ongoing	Review recommended to ensure services are meeting the needs of the department response capabilities.
38	Consideration should be given to adding four Platoon Chief positions to the organizational structure of the department.	Approximate cost of a Platoon Chief would be $130,000, plus benefits	Short to Mid-Term (1-6 years)	As the population of the city increases and annual call volumes exceed 10,000 incidents, the Platoon Chief (one per shift) will allow for greater operational oversight while reducing the administrative workload on the District Chiefs. This position will increase command presence on the fireground, potentially reducing the span of control issues and increasing the efficiency of the Command Team.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
40	Station #1/HQ is running out of space and will no longer be able to effectively house all the department's vehicles, equipment, and staff quarters. As such, there is a real need for either a full upgrade/expansion of the present facility, or the building of a new fire station. Fire prevention and communications are to be part on the new facility.	For a facility the size of HQ, the cost would be approx. $10 to $20 million dollars or more depending on size and timing of project.	Short to Mid-Term (1 – 6 years)	An upgrading of the present facility would in most cases be a short-term fix and will most likely fail to meet the demands of the department. The cost of such upgrades could cost almost as much as the cost of a new headquarters. The building of a new headquarters should consider future growth expectations, along with incorporating new technologies to make the facility both energy efficient and safer for staff.
41	Station #4 should be relocated because of the construction of a new Canada Customs truck inspection plaza at the foot of the Ambassador Bridge.	Stations – approx. $4 to $6 million each.	Short to Mid-Term (1 – 6 years)	Station 4 is the oldest fire station. Relocation and a new building would be opportunistic, given the construction of the new Customs Plaza's impact on the current location of Fire Station #4

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
42	To plan for the new fire station in District 7 or District 6 over the long term, the Fire Chief should work with the Planning Department to verify where the growth will occur and in what timeline.	Stations – approx. $4 to $6 million each. Fire trucks – approx. $800,000 to $1,000,000 each. Plus 20 staff for each new station.	Short to Mid-Term (1 – 6 years)	By doing this, a growth-based plan can be developed in relation to the station builds. This new construction and staff hiring for the new fire stations is a long-range plan that will most likely take place over the next ten years (or perhaps longer, depending on the city's growth).

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
24	Twenty new firefighting positions should be hired in the short term, and twenty additional firefighters be hired in the medium term to address the current and future community risks that exist. One of these crews should be assigned to Station 7 in the City's east end; the other to Station 4.	Firefighter would initially start at 4th class, which is approximately $70,000 plus benefits. (Costing for one full-time first-class firefighters is approximately $105,000, plus benefits).	Short to Long-Term (1 – 10 years)	This will supplement existing staffing levels allowing greater depth of response and a greater ability to rotate firefighters into rehab at major incidents; provides for greater firefighter safety and potential for injury prevention, thus reducing WSIB and overtime costs.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
43	The Maintenance facility is outgrowing the demands of the Department. As such, a new maintenance facility should be built in the long term to meet future demands. This new maintenance facility could also be factored into the construction of the new headquarters.	Cost of a new facility or part of the new HQ could range from approx. $1 million as part of HQ, to $5 to $10 million (or more) as a stand-alone facility.	Mid to Long-Term (4 – 10 years)	The idea of a new HQ that would bring Training, Fire Prevention and Fleet Maintenance into one building would reduce the overall cost of building two separate facilities.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
25	An update of the human resources element of this Fire Master Plan should be conducted in 2030 to evaluate the need to hire an additional 20 firefighters based on community growth and risk as they will have developed to that point in time.	Firefighter would initially start at 4th class, which is approximately $70,000 plus benefits. (Costing for one full-time first-class firefighters is approximately $105,000, plus benefits).	Long-Term (10 years)	To assess the impact of community growth on response times, response depth, WSIB, and overtime costs that develop over the medium to longer term.

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ACRONYMS

ALS	Advanced Life Support
BCP	Business Continuity Plans
CAD	Computer Aided Dispatch
CAFC	Canadian Association of Fire Chiefs
CAO	Chief Administrative Officer
CBRNE	Chemical, Biological, Radiological, Nuclear, and Explosives
CEM	Comprehensive Emergency Management
CFPO	Chief Fire Prevention Officer
COOP	Continuity of Operations Plans
CRA	Community Risk Assessment
CRRP	Community Risk Reduction Plan
CRTC	Canadian Radio-television and Telecommunications Commission
EMG	Emergency Management Group Inc.
EMPCA	Emergency Management and Civil Protection Act
EOC	Emergency Operation Centre
ERS	Emergency Response Services
ESU	Emergency Service Unit
EWEMS	Essex-Windsor Emergency Medical Services
FESO	Fire and Emergency Services Organization
FMP	Fire Master Plan

ACRONYMS

FPPA	Fire Protection and Prevention Act
FSRI	Fire Safety Research Institute
FUS	Fire Underwriters Survey
HAZMAT	Hazardous materials
IMS	Incident Management System
KPI	Key Performance Indicator
LMS	Learning Management System
LWC	Lightweight construction
MOU	Memorandum of Understanding
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
OAFC	Ontario Association of Fire Chiefs
OBC	Ontario Building Code
OFC	Ontario Fire Code
OFM	Office of the Fire Marshal
OHSA	Occupational Health and Safety Act
PFAS	Per- and poly-fluoroalkyl substances
PFLSE	Public Fire and Life Safety Educator
PIA	Post -incident analysis
PIAR	Post-Incident Action Review
PPE	Personal protective equipment

ACRONYMS

PTSD	Post-Traumatic Stress Disorder
RFP	Request for Proposal
RMS	Records Management System
SCBA	Self-contained breathing apparatus
SOG	Standard Operating Guideline
SOP	Standard Operating Procedure
SWF	Standard workload flow
SWOT	Strengths, Weaknesses, Opportunities, and Threats
USAR	Urban Search and Rescue
WFRS	Windsor Fire & Rescue Services

Introduction

INTRODUCTION

Project Methodology

EMG has based its review process on the City of Windsor's (the City) initial RFP and the response document submitted by EMG. The specific scope of work noted (in the RFP) was reviewed and included into each section of this document. The FMP review was completed by utilizing best practices, current industry standards, and applicable legislation as the foundation for all work undertaken.

EMG also utilized quantitative and qualitative research methodologies to develop a strong understanding of current and future needs and circumstances of the community.

Overall, the methodology involves a considerable amount of research, documentation review, and data analysis, along with stakeholder consultation. This is followed by the submission of draft reports and related recommendations. The final product is a living document that provides a high-level strategic direction for City Council and the WFRS.

To accomplish the scope of requirements, EMG has:

- Reviewed the Establishing and Regulating (E&R) By-law.
- Reviewed applicable municipal, provincial, and federal legislations.
- Reviewed planning department documents regarding community and areas of jurisdiction growth projections over the next 10-20 years.
- Reviewed any previous risk assessment, council's strategic priorities, and other pertinent documents.
- Prepared a CRA and considered the Community Risk Profile including community building stock, industry, care occupancies, transportation networks, etc.
- Reviewed current service agreements with neighbouring municipalities and any other current documents.
- Gathered information on operational requirements including past and current response statistics (call volumes/response times) to analyze trends, staff availability/needs and response capabilities, etc.
- Reviewed service administration including staffing, organizational structure, policies and procedures, administrative support, record keeping and information management/technology, purchasing and inventory control, public and media relations, and customer service.
- Toured the City of Windsor fire stations conducting a location/response analysis.
- Examined fire vehicles, apparatus, and equipment, including the maintenance program.
- Reviewed Fire Service policies, procedures, and emergency response operational guidelines,

training programs and records.

- Collected information on the fire prevention program including education programs, inspection reports/data, enforcement data, and investigations.
- Identified and compared industry best practices relating to fire and emergency services performance measurement.
- Reviewed current job descriptions, promotional policy, succession planning and demographics.
- Reviewed the operational and capital budgets along with reserves and current revenue generation programs within the emergency services and the city (development fees).

Based on the previously noted criteria, through meetings with members of Council, the City's Senior Leadership Team, firefighters, and community stakeholders, the consulting team was able to complete a thorough review of elements that are working well and areas requiring improvement within the WFRS. Data provided by WFRS was reviewed in relation to all the previously noted items contained in the Windsor RFP. This review culminated in a total of 63 recommendations.

Performance Measures and Standards

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

- The *Fire Protection and Prevention Act (FPPA).*
- The OFM Communiques.
- The *Ontario Occupational Health and Safety Act (OHSA)*, with reference to the National Institute for Occupational Safety and Health (NIOSH).
- The Ontario Fire Service, Section 21, Advisory Committee Guidance Notes.
- The National Fire Protection Association (NFPA) standards:
    - NFPA 1001 – Standard for Fire Fighter Professional Qualifications
    - NFPA 1002 – Standard for Fire Apparatus Driver/Operator Professional Qualifications
    - NFPA 1021 – Standard for Fire Officer Professional Qualifications
    - NFPA 1031 – Standard for Professional Qualifications for Fire Inspector and Plan Examiner
    - NFPA 1033 – Standard for Professional Qualifications for Fire Investigator
    - NFPA 1035 – Standard on Fire and Life Safety Educator, Public Information Officer, Youth Fire Setter Intervention Specialist and Youth Fire Setter Program Manager Professional Qualifications
    - NFPA 1041 – Standard for Fire Service Instructor Professional Qualifications
    - NFPA 1061 - Professional Qualifications for Public Safety Telecommunications

Personnel

- NFPA 1072 – Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications
- NFPA 1201 – Standard for Providing Fire and Emergency Services to the Public
- NFPA 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems
- NFPA 1225 – Standard for Emergency Services Communications
- NFPA 1500 – Standard on Emergency Services Occupational Safety, Health, and Wellness Program
- NFPA 1710 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Emergency Services
- NFPA 1730 – Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations
- NFPA 1901 – Standard for Automotive Fire Apparatus
- NFPA 1911 – Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles

- Fire Underwriters Survey (FUS) technical documents

Project Consultants

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

- Lyle Quan, Fire Service Consultant/ VP of Operations - Project Lead
- Phil Dawson, Fire Service Consultant – Co-lead
- Guy Degagne, Fire Service Consultant
- Rick Monkman, Fire Service Consultant
- Monty Armstrong, Fire Service Consultant
- Everett Cooke, Fire Service Consultant
- Larry Brassard, Fire Service Consultant
- Darryl Culley, President

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

SECTION 1

Community & Fire Department Overview

SECTION 1: COMMUNITY & FIRE DEPARTMENT OVERVIEW

This FMP for the WFRS analyses and identifies current and probable community fire risks and needs over the next 10 years and beyond. This will greatly assist City Council in considering service levels and associated resources, which will then enable the fire chief with future planning relating to staffing and response, fire and life safety programming, and asset management. To ensure a comprehensive review is conducted, this review has examined and researched all aspects of WFRS operations including planning, fire prevention, training and education, communications, apparatus and equipment, human resources, station suitability and location, and large-scale emergency preparedness.

1.1 Community Overview

Windsor is located in southwestern Ontario, on the south bank of the Detroit River directly across from Detroit, Michigan, United States. The city's population was 229,660 at the 2021 census, making it the third-most populated city in Southwestern Ontario, after London and Kitchener. The Detroit–Windsor urban area is North America's most populous trans-border metropolitan area. The Ambassador Bridge border crossing is the busiest commercial crossings on the Canada–United States border.

Known as the "Automotive Capital of Canada", Windsor's industrial and manufacturing heritage is responsible for how the city has developed through the years.

Based on the 2021 Statistics Canada information, the enumerated population of Windsor, was 229,660, which represents a change of 5.7% from 2016. This compares to the provincial average of 5.8% and the national average of 5.2%[2].

The land area of Windsor (City) is 146 km^2, and the population density is 1,572 people per km^2.

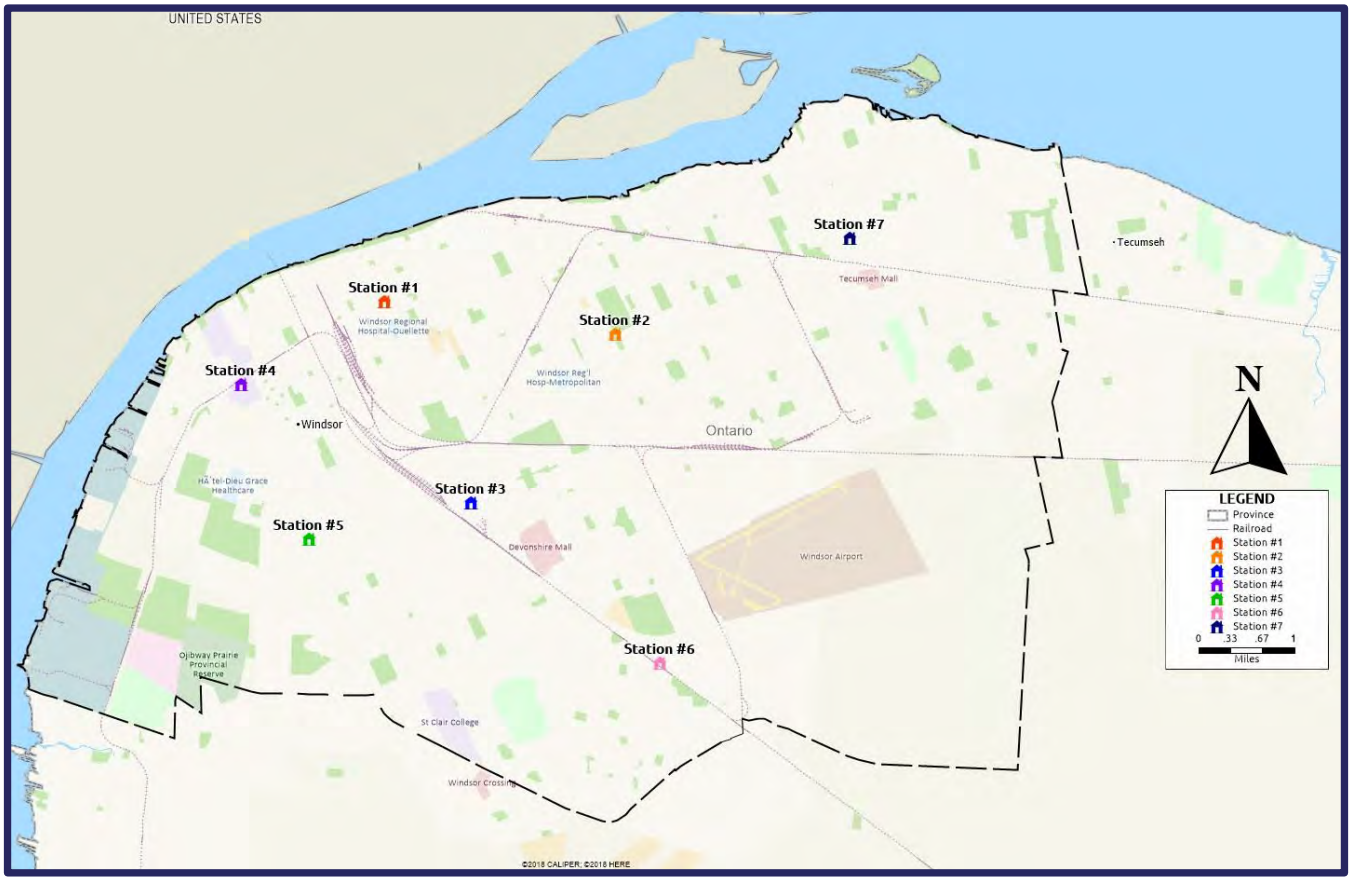
1.2 Fire Service Composition

The WFRS consists of approximately 300 staff located throughout seven fire stations. Headquarters (station #1) is also the location of senior management (fire chief, and deputy chiefs), and administrative staff. The Fire Prevention Division is located on the same property but in a separate building. The WFRS Training and Apparatus Divisions are located off site at 2885 Kew Drive.

[2] Profile table, Census Profile, 2021 Census of Population - Windsor, City (CY) [Census subdivision], Statistics Canada, Retrieved 12 March 2023, https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Windsor&DGUIDlist=2021S0503559&GENDERlist=1,2,3&STATISTIClist=1&HEADERlist=0

Based on the type of fire department, reference to the NFPA 1710 for Career Fire Departments will be used as a guide to such things as staffing and recommended response times.

FIGURE #1 – FIRE STATION LOCATIONS



Even though the focus of this review and its related recommendations are to assist the WFRS with identifying areas for improvement; it must be noted that the fire service and its staff are 100% committed to meeting the fire and life safety needs of the community. Along with this, the fire chief and senior staff are also focused on ensuring the training, equipment, and safety needs of department staff are also met.

There is no doubt that the staff of WFRS are utilizing the equipment and resources as efficiently and effectively as possible. However, there is always room for improvement, and this is the impetus of this master plan document (and the recommendations contained within).

SECTION 2

Planning

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 emergency services. The initial phase of such planning efforts is to identify the strengths, weaknesses, opportunities, and threats affecting the department and the community it serves.

2.1 Community Safety – Four Lines of Defence

The OFM's community safety model revolves around three specific lines of defence - Public Education, Safety Standard and Enforcement, and Emergency Response. EMG views Emergency Management as the fourth, inclusive line of defence, and has added this into the overall concept of community safety.

- Public Education – educating residents has proven to be the most effective means in reducing and preventing the incidences of fire and property damage. Reducing the number of fires before they start and identifying how the city will continue to meet the fire education needs while the city grows. More information on this topic can be found in Section 4.
- Safety Standards and Enforcement – ensuring that the inspection and enforcement of fire codes occur so buildings meet the required safety standards. More information on this topic can be found in Section 4.
- Emergency Response – the availability of well trained and well-equipped firefighters to respond and effectively mitigate the incident is the last defence. The staff, equipment and fire station locations impact how the emergency is mitigated. More information on this topic can be found in Section 5.

- Emergency Management – a city is legislated to have an emergency preparedness program to ensure the safety of the residents of the community by having a training, education, response, and mitigation plan in place for any possible emergency the community may encounter. More information on this topic can be found in Section 7.

Along with these four lines of defence, the following industry best practices help to inform a fire department of industry expectations. Neither the NFPA and/or the FUS are legislated requirements, and do not have to be followed, but utilizing them to improve a community's fire service is encouraged by EMG.

2.2 National Fire Protection Association (NFPA) 1201

The NFPA Standard 1201 – *Standard for Providing Fire and Emergency Services to the Public* makes note of the services that should be offered and how they are to be delivered based on the composition of an emergency service.

Section 4.3.5 notes:

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

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

To provide an emergency service 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 emergency services. NFPA 1710 refers to goals and expectation for career emergency services that has been incorporated into the evaluation of the emergency services' response and staffing needs. More discussion in relation to the 1710 standard will be presented in Section 5.

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

The strengths and weaknesses portion of a SWOT analysis are based on an internal review that identifies what is working well, along with recognizing areas for improvement. The opportunities and threats portion of the SWOT are related to external influences and how these influences affect the operations and response capabilities of an emergency service.

2.3.1 Strengths

- Windsor benefits from having 7 fire stations, which has worked well for the Fire Department in relation to responding to calls for service within the community.
- The department has a full-time Training Division and Fire Prevention Division to ensure that the mandated fire safety inspections and public education needs are being met.
- The WFRS has strong relationships with its partner emergency services (police and EMS), along with mutual and automatic aid agreements in place with other fire services to assist with general response needs.

2.3.2 Weaknesses

- Some of the fire stations need upgrades to ensure they continue to meet the needs of the service in relation to equipment storage, shower facilities, and removal of firefighters' gear from diesel exhaust contamination.
- With the OFM legislated mandatory training and certification requirements for all positions within the fire service, even more training will be required (by all fire departments in Ontario).

2.3.3 Opportunities

- WFRS has a history of engaging in partnerships with bordering departments for such things as joint training, cross border responses, mutual aid and fire service agreements that benefit both communities.
    - Continuing to build on these partnerships will improve available options regarding future training and certifications requirements.
- Recommendations are being made in this report (see Section 6) to consider the consolidation of fire stations to reduce costs, while continuing to provide adequate or improved level of service to the community.

2.3.4 Threats/ Challenges

- The threat of climate change and its impact on weather patterns is an increasing challenge for communities, dealing with inclement weather incidents, such as freezing rain/ice storms. As they are becoming more commonplace, they need to be part of the emergency response program for each community.
    - These changes in climate conditions, along with the resulting frequency and severity of incidents, has also predicated the need for a larger response component to these emergencies.

All these noted challenges need to be monitored, evaluated, and reported to Council by the fire chief to ensure that WFRS is meeting the needs and expectations of the community.

2.4 By-laws and Operating Guidelines

2.4.1 Governance and Establishing & Regulating By-law

To assist the fire administration in meeting the needs and expectations of the council, the E&R By-law must be updated annually to identify changes based on the city's requirements and the fire department's overall operational needs. The E&R By-law must align with the expectations of the *FPPA* of 1997.

The E&R By-law is council's direction to the WFRS and prescribes what services to provide. Council is responsible for setting the level of service within a city; the E&R By-law fulfills this requirement. The current E&R By-law was updated in 2014, making this a nine-year-old document. It is a best practice that by-laws affecting fire department operations be reviewed annually or as significant changes occur. Doing so will ensure that the fire chief's noted service levels, expectations, and authority align with the community's needs.

Draft by-laws should be vetted by the city's solicitor before the council's passing, as part of any by-law update process.

The fire chief should also consider bringing the E&R By-law forward to newly sitting councils every four years. This allows new council members to understand the level of service provided to the community and the council's responsibility to fund this level of service as set by council.

In collaboration with the fire chief, City Council should establish an objective, definitive response time in the E&R By-law. NFPA recommends completing assessments to evaluate a baseline for a department's response time goal. This review will offer an understanding of how the department has been performing and identify areas for possible improvement in station location, vehicle, and staffing distribution.

The E&R By-law should reflect new legislation, changes in the types and levels of response, and training expectations. Consideration should also include reference to such guidelines and standards as:

- Section 21 Firefighter Guidance Notes
- OFM Guidelines concerning staffing and response recommendations.
- *FPPA* of 1997
- Related NFPA Standards deal with:
    - Training
    - Fire prevention and public safety programs
    - Fire department response goals and program objectives

- Communications and vehicle dispatching
- Response times.
- Fleet and Maintenance

By incorporating these guidelines and standards, WFRS will ensure that staffing, training programs, fire prevention, public education initiatives, apparatuses and equipment, dispatch and communication, and response to the community adhere to industry best practices.

While the current by-law includes the department's primary goals and objectives and Mission Statement, these should be updated to align with current fire service trends and renamed Mission, Vision, and Values Statements. Once established, post these in every fire station to promote the level of service provided by WFRS.

The updated by-law should refer to the OFM, *Regulation 378/18*, Community Risk Assessments, which came into effect on July 1st, 2019. This regulation specifies the need for an annual review and the production of a new document every five years. It should also identify the Community Risk Reduction Plan (CRRP) that needs to be developed and initiated as part of the CRA.

The *FPPA* requires fire departments to have a smoke alarm program. The program, including its purpose, goals, and expected outcomes, should be included in the new document.

Other items found within the current by-law for consideration to be changed or added onto may include:

- Include all applicable NFPA standards.
- Reference the Ministry of Labour's Section 21 Guidance Notes.
- List the branch(es) each deputy fire chief is responsible for (i.e., Operations, Support Services).
- Include the OFM's three lines of defence:
- Public Fire Safety Education
- Fire Safety Standards and Enforcement
- Emergency Response
- Identify the frequency of fire inspections per NFPA 1730 or FUS.
- Develop and include a fire prevention policy outlining all activities the division shall provide.
- Consider changing the name of the Division of Fire Prevention to Fire Prevention and Risk Reduction Division.
- Review, update, and include the organizational chart.
- Identify the level of service provision for technical rescues and HAZMAT incidents, including

elevator rescue.

- Include response times goals, anticipated benchmarks identified, and goals established based on NFPA 1710.
- Identify who is responsible for fire investigations and their required NFPA qualifications, including certification. The current by-law does not identify fire investigations being a Division of Fire Prevention responsibility.
- Make mention of Asset and Record Management Programs and retention policies.
- Make mention of any Memorandum of Understanding (MOU), Response or Automatic or Mutual Aid Agreements in place.
- Include a list of dispatching agreements and associated by-laws in the appendix.
- Medical responses include the agreement with the Windsor Regional Hospital to provide cyanide antidote for persons suffering from smoke inhalation.

2.4.2 Assessment of Current Fire Services By-laws

Other by-laws reviewed for this FMP include the following:

- Mutual Aid By-law 207-2005 *(discussed in Section 8)*
- Development Charges By-law 1-2021 *(Discussed in Section 9)*
- The Fees and Charges By-law 40-2021 *(Discussed in Section 9)*
- Fireworks By-law 136-2004
- Short-Term Accommodation By-law 115-2022

Fireworks By-law 136-2004

The City of Windsor's By-law 136-2004 regulates the sale and discharge of fireworks. Due to the age of the by-law, it should be reviewed and updated to include specifics regarding consumer fireworks (recreational usage), display fireworks (public high hazard), and those released during a show or music concert (pyrotechnic special effects fireworks).

The municipal authority to control fireworks rests within the Ontario Fire Code O. Reg. 213/07, Division B, Part 5, ss 5.2.

The following should be Included in a Fireworks By-law:

- The enforcement of the by-law would be under the jurisdiction of the By-law Department.
- Reference and enforce the Ontario Fire Code, Section 5.2 - Explosives, Fireworks and Pyrotechnics.
- Reference the *Explosives Act of Canada*.

- Referencing the federal regulation regarding the training required to set off commercial and pyrotechnic fireworks should be included in the document. Doing so will direct those who need this training and education and assist them in locating the supporting information. The by-law should list the differentiation between the consumer, display, and pyrotechnic fireworks, as listed in the *Explosives Act, R.S. c. E-15*.
- The by-law should include the importance of fire safety while setting off fireworks. Therefore, it would also be appropriate to have safety information on the proper method of setting off fireworks and the equipment worn by those setting off consumer fireworks. Along with this document, it will also be essential to outline the need for some form of extinguishment that should be readily available such as a pail of water and a fire extinguisher or garden hose.
- The current by-law identifies when fireworks may be legally discharged, including Victoria Day, Canada Day, and New Year's Eve. Expand the list of events to include Civic Holiday Weekend (Simcoe Day) and religious-based holidays such as Diwali.
- The beach areas and parks are common locations for parties in the summer, and a section should discuss discharging fireworks along the beach areas year-round.
- Include a requirement that all those discharging high hazard/commercial type fireworks complete the National Fireworks Certification Program (NFCP).
- The document should include when fireworks should not be discharged, such as during winds exceeding a pre-determined speed.
- A guide on how to set off "Family Fireworks" should be made available (i.e., use a pail of sand to place the firework in, have a charged garden hose close by or a fire extinguisher, keep children away from the discharge area, etc.).
- WFRS would be responsible for completing the site inspections of the high-hazard fireworks event. For discharging high-hazard ordinances, the WFRS should conduct a pre-event assessment of the site to ensure it complies with the application by a member of the WFRS that has completed the NFCP course.
    - There should be two post-event inspections of the area adjacent to the discharge zone to look for unexploded ordinances. One assessment occurs the night of the display and the second occurs the following morning during daylight hours.
- Include in the by-law that a fire apparatus with four firefighters stands by at the site of high-hazard firework displays.
- The Fees and Services By-law includes pre- and post-discharge inspections and the standby fire crew.

Short-Term Accommodations By-law 115-2022

Unlike so many municipalities in Ontario, the City of Windsor has implemented a by-law regulating short-term accommodation operations.

A few points about short-term accommodations:

- There could be an unknown number of unregistered short-term accommodations operating in the City.
- They may not meet the requirements of the Ontario Building Code (OBC) and Ontario Fire Code (OFC). Violations include not having proper exits; inadequately sized basement windows; lacking smoke alarms, CO alarms, fire extinguishers, fire escape plans; etc.
- Property owners may not understand their responsibilities regarding fire safety and fire code.
    - Include in the by-law the requirement to have annual fire inspections.
    - WFRS should review its Fire Prevention and Enforcement resources regarding adequate staffing to inspect all the short-term accommodations in the city for OFC violations.
- Due to the number of short-term accommodations, WFRS may not have the resources to complete these inspections along with the other inspection requirements of the City.
- WFRS and the Building Department should establish and advertise a method (reporting line) to identify possible illegal locations in cooperation with By-law enforcement.

Considering these points, the WFRS, in cooperation with By-law, Planning and Building Departments, amend the by-law regulating these units. The document should identify the responsibilities of the fire department.

2.4.3 Policies, Directives, & Standard Operating Procedures

Fire department SOGs and SOPs have immense value for a department. They are the foundation of a fire department's success, guiding and giving direction on appropriate operations.

The WFRS has SOPs in place. To ensure all the SOPs are current, they need to be reviewed and revised on an ongoing basis as circumstances change. Some fire departments review a third of their SOPs annually; adopting this procedure provides the entire set of documents to receive a full review every three years.

Reviewing the SOPs can be a detailed and very involved process. Writing new SOPs and maintaining existing ones is a daunting task to leave to the responsibility of a single person. Establishing a committee that meets regularly to develop new SOPs and review older ones would relieve some of the pressures placed on the Chief Officers. The development of a structured SOP Committee that creates its Terms of Reference would be a great benefit to the WFRS in several ways:

- Updated and current SOPs.
- Staff would be more involved in the fire department operations.
- Safer environment for members to work.

The Section 21 Committee is part of the *OHSA* initiative for firefighter safety. A good source of information is Section 21 Guidance notes which are kept current by a provincial team of fire service personnel. The NFPA Standards are also an excellent resource for developing SOPs.

Section 2 - Recommendations

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
1	The Fire Administration brings forth a revised version of the E&R By-law for the Council's approval and ensures its annual review and updates.	Staff time	Short-term (1-3 years)	Maintaining an up-to-date E&R By-law will guide the WFRS' operations and identify response guidelines, fire prevention, and public education programs and levels of training.
2	The Fire Administration reviews By-laws that affect the daily operations of the fire department.	Staff time	Short-term (1-3 years)	Having current by-laws will reflect the changing circumstances of the City and meet federal or provincial Acts and Regulations.
3	Establish an SOP Committee representing all divisions of the WFRS that develops new SOPs and reviews current ones regularly.	Most costs will be about time spent by committee members.	Short-term (1-3 years)	Establishing an SOP committee will aid in maintaining the information in the database to be current while allowing the participation of WFRS members to determine the fire department's operations.

SECTION 3

Risk Assessment

SECTION 3: RISK ASSESSMENT

3.1 Community Risk Assessment Profile

Risk assessment is the process used to identify the level of fire protection required within the boundary of the city. It measures the probability and consequence of an adverse effect on health, property, organization, environment, or community due to an event, activity, or operation. Council has the authority to establish fire protection within their city. The fire chief is responsible for informing the council of all risks existing within the community. Based on this information, council can decide on the service level provided. Therefore, a risk assessment aims to provide an overview of identified risks within the community, along with suggested options for mitigation.

The Province of Ontario Regulation 378/18 CRA states *"…every city shall complete a CRA by July 2024, with renewal to occur every five years."* The regulation requires a review and update of the CRA annually.

The accumulation and analysis of the following factors will assist in applying this information in identifying potential risk scenarios. 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?
- To whom could it happen?
- Why could it happen?
- How likely could it happen?
- How bad would it be if it happened?
- What programs can aid in the mitigate or preventing any or all the above?

Once answered, these questions will frame the basis for formulating and prioritizing risk management decisions to reduce the likelihood of these incidents and mitigate their impact.

The completed CRA may identify gaps and areas where conditions vary from the desired outcomes. The data reviewed for each mandatory profile include:

Demographics Profile – Includes the age, gender, educational attainment, socioeconomic makeup, vulnerable individuals or occupancies, transient population, and 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 – Considers the waterways, highways, canyons and other landforms, railroads, wildland-urban interface, bridges, and other specific community features.

Building Stock Profile – potential high-risk occupancies whether residential, commercial, or industrial; building density; building code classifications; structure(s) age; 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, and cultural/ethnic groups.

Hazard Profile – human, technological, or natural hazards.

Economic Profile – Review the infrastructure, local employers and industries, institutions, community's tax base, and local attractions.

Past Loss/ Event Profile – consideration of the impact and frequency of an event; identify significant acute events with a low frequency but a high impact or small chronic events with a high frequency with a low impact.

The City of Windsor's CRA is a separate document from the FMP. When the fire chief has reviewed its contents and discussed it with council and the CAO, a CRRP should be developed and implemented. The CRA and the FMP contain all the information necessary for a risk reduction plan. All that is required is compiling and prioritizing the recommendations based on community needs and circumstances.

3.1.1 Provincial Community Risk Statistics

The first set of statistics noted is the most recent provincial data provided by the OFM compared with the most recent WFRS statistics.

Note: *Unfortunately, 2022 Provincial Statistics will not be available until late 2023.*

Provincial - Loss fires by Property Class

From 2017 to 2021, 53,337 fires with a dollar loss reported to the OFM.

- 73% of these fires occurred in residential occupancies.
- 28% occurred in vehicles.
- 7% of loss fires occurred in Industrial occupancies.
- 5% occurred on structures/properties not classified by the Ontario Building Code – this includes many non-structure property types – land, outdoor storage, and some structures ranging from barns to weather stations.
- 3% in assembly occupancies.
- 3% in mercantile occupancies
- 3% in business and personal services occupancies.
- 3% in occupancies classified under the National Farm Building Code
- 1% in care and detention occupancies.

The distribution of fire occurrence across property types has been relatively unchanged.

Provincial - Loss Fires Property class: Structures only

From 2017 to 2021, 34,327 Structure fires with losses were reported to the OFM.

- Fires in residential occupancies account for 73% of structure loss fires.
- Properties not classified by the Ontario Building code – 5%
- Industrial occupancies – 7%
- Assembly occupancies – 3%
- Mercantile – 3%
- Business and Personal Services – 3%
- Occupancies classified under the National Farm Building Code – 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 sources

Notably, in 9% of the structure loss fires, the cause was suspected of arson or vandalism (intentionally set).

Between 2017 and 2021, the ignition sources in other (not intentionally set) structure loss fires were:

- 24% undetermined
- 16% cooking
- 14% open flame tools, smoker's articles
- 10% miscellaneous
- 8% electrical distribution equipment – wiring
- 7% heating equipment, chimney, etc.
- 5% other electrical, mechanical
- 4% appliances
- 4% exposure fires
- 3% lighting - excluding candles
- 1% processing equipment
- 0% unknown, not reported

3.1.2 City of Windsor Fire Loss Statistics

The OFM provided the following for EMG's review. The following data is an overview of concerns within the City of Windsor from the highest to the lowest level for ease of reading. This information will assist in formulating and implementing fire prevention and public safety awareness initiatives.

City of Windsor Fire Loss by Property Classification

From the information received, the following building classifications for property loss are listed based on the number of fires in each occupancy from 2017 to 2022:

- Group C – Residential occupancies (804)
- Group D – Business and Personal Services (43)
- Group F – Industrial (39)
- Group E – Mercantile (26)
- Group A – Assembly (24)
- Group B – Care and Detention (8)
- Structures/Properties not classified by Ontario Building Code (1)
- Structures/Properties classified under National Farm Building Code (1)

The City of Windsor Reported Fire Cause

Assessing the possible cause of the fires is essential when identifying potential trends or areas to be considered for introducing additional public education on fire prevention initiatives as part of the community fire protection plan.

The leading causes of fires were:

- Undetermined (349)
- Misuse of Ignition Source/Material First Ignited (229)
- Arson (97)
- Unintentional Undetermined (87)
- Mechanical/Electrical Failure (86)
- Other Unintentional (44)
- Other (37)
- Design/construction/maintenance deficiency (35)
- Vandalism (14)
- Children playing (5)

City of Windsor Ignition Source Class

The leading ignition sources were:

- Undetermined (433)
- Cooking equipment (158)
- Open Flame Tools, Smoker's Articles (113)
- Miscellaneous (84)
- Electrical Distribution Equipment (57)
- Exposure (32)
- Appliances (31)
- Other Mechanical, Electrical (29)
- Heating Equipment, Chimney, etc. (23)
- Lighting equipment (18)
- Processing Equipment (5)

From the data above, most fires occur in residential occupancies, with the known leading cause and ignition source being undetermined.

3.2 Community Risk Assessment – Identified Risks

The following list outlines some of the risks to life safety and property. Now that the CRA is completed, the fire chief can put forward strategies to address the risks, including public education and Fire Code enforcement, within the level of fire service provision. These decisions will form the basis of the City of Windsor community risk mitigation strategies.

Note: *The following risks are discussed at length in the CRA and not in the order of their level of risk.*

Windsor Fire & Rescue Services - Continue monitoring response times and critical task assignments to ensure compliance with NFPA 1710, including the following:

- Achieve a turn-out time goal of 80 seconds.
- Continue working towards having four firefighters arrive on the scene within four minutes of travel time.
- Continue to have 14 firefighters arrive on the scene within an eight-minute travel time.

Bodies of Water –There is always the risk of incidents involving marine vessels, such as collisions, taking on water, and catching fire—injuries to the public due to the easy access to water recreation sites within the city. SOGs must comply with industry standards, regulations and legislation when responding to ice and water emergencies. A comprehensive public education program can also inform and educate the residents on the hazards of water recreation, thereby preventing and reducing the severity of incidents.

WFRS can only mitigate an ice and water rescue to the shore based/awareness level. WFRS should review the advantages of acquiring an inflatable raft, an airboat, or hovercraft to mitigate ice rescues that are a distance offshore or in remote areas.

Radio System – A fully interoperable public safety grade radio system is a requirement for modern-day fire service. Without this, the ability of all emergency services to communicate during an emergency is challenging. A comprehensive radio system audit that analyzes the range, infrastructure, and reliability should be completed.

Fire Stations – There are seven WFRS fire stations; a comprehensive evaluation is presented in this FMP document.

City of Windsor Anticipated Growth - New residential occupancies will increase the permanent and seasonal populous. As a result, there may be an increased demand for fire inspections and

public education events. The WFRS should review the time spent and the demands placed on fire prevention needs which may require additional resources to meet the demand and current industry standards and legislated requirements.

Technical Rescues – Trench, Motor Vehicle Incidents, Confined Space, Elevator, High and Low Angle, Ice Water – WFRS does not mitigate technical rescues such as confined space, trench, or low and high angle rope. There is no formal agreement with other fire and emergency agencies to mitigate these technical rescues. WFRS should enter a response agreement with other fire departments and agencies, or a third party specializing in mitigation of trench, low and high angle, and confined space rescues to minimize this risk and provide a level of service to the community. WFRS who are not part of the technical rescue team should be trained to the awareness level for all technical rescues and operations and technical levels for higher acuity events.

Domestic Terrorism/ Active Deadly Threat/ Mass Casualty Scenarios – These events are increasing across North America and involve emergencies affecting the public and critical municipal infrastructure. Developing programs of response, prevention, and education with Windsor Police and Essex-Windsor Emergency Medical Services (EWEMS) is a requirement for today's large urban centres.

Industries – The Windsor area is tied directly to the automotive industry. A new battery manufacturing plant is to open that manufactures electric vehicle batteries and provides employment for the area.

Demographics – The city has an increasing senior demographic that may eventually reside in a senior's residence—currently, over 70 vulnerable occupancies in the city require annual inspections. The owners of these institutions have several legislated requirements, including those within the *FPPA*, and require having a fire safety plan, training staff in its use, and having fire drills.

Increased Housing Density – with the infilling in the city's core area and new construction on the outskirts, increased residential density, the building of multi-family and high-rise buildings will continue. As such, the WFRS management needs to monitor their response capability to meet the NFPA recommendation of sufficient staffing on the scene.

NFPA 1710 recommends the critical tasking that requires 42 firefighters for a high-rise fire.

***Note**: As noted by the NFPA, a high-rise building is classed as any structure seven storeys above grade. This is consistent with the Life Safety Code definition of high rise as 75 feet (23 meters) in height, measured from the lowest fire department vehicle access to the floor of the highest occupiable storey.*

Building Stock – Along with existing and new residents living in the city come the increased possibility of having illegal second units and apartments. The City of Windsor's Zoning By-law and Official Plan authorize additional housing units in a detached dwelling and allow other residency units in an accessory building to the detached home. Secondary Dwelling Units and Garden Suites must be to OBC and OFC requirements. The City of Windsor should require every second and garden suite to be registered and licensed with the city and inspected by WFRS Fire Prevention personnel.

By-law 115-2022 regulates these accommodations; owners of these businesses must be aware that they must comply with municipal by-laws such as property standards and that there is to be no open-air burning.

The by-law should call for the registry of fire inspections of these locations. The city should require a Wood Energy Technology Transfer (WETT) inspection in places with wood-burning appliances available to clients.

Building Stock – Lightweight Construction – The OFM has identified the risks associated with occupancies using lightweight construction (LWC) practices. Municipalities are to inventory all building stock, including LWC practices. WFRS and the Building Department should collaborate to develop an ongoing list of all building stock based on the OBC Occupancy Classifications.

Failure to comply with this requirement is illegal and exposes the city to significant fines.

3.3 Community Risk Reduction Plan

With the CRA completed and all risks identified, the next step is to develop a CRRP. When properly applied, the CRRP coordinates emergency operations with prevention and mitigation efforts throughout the community and at the fire station level. The involvement of fire station personnel is critical for gathering local risk data and performing activities necessary to implement the CRRP.

Aside from the primary benefits to the community, a CRRP can positively impact the fire department. A CRRP improves firefighters' and emergency responder safety and occupational health, reducing line-of-duty deaths. This is partly due to the enhancements in the number of fire inspections and fire and life safety education events completed, enforcement of the OFC, and the reduction in the number of fires resulting from these measures.

In addition to firefighter safety, there are several other reasons why departments should begin the process of developing a CRRP, including:

- The presence of new and emerging hazards and managed risks makes the community safer.

- Declining budgets among fire departments and local governments improve resource allocation.
- To reflect the rapidly changing community demographics.
- Increases community engagement.
- May avoid potential ramifications of ignored or not fully addressed hazards.
- It better defines the fire department's purpose and value within the community beyond just fighting fires.

Through the completion of the CRA and this FMP, the fire chief has the components needed for the risk reduction plan. Utilizing the information and recommendations within the CRA and FMP forms the foundation of the CRRP.

After compiling the recommendations noted in both documents, the next step is to prioritize them based on the community's needs and circumstances. The key is to move forward with the recommendations, monitor the outcomes and evaluate what more, if anything, is still required to mitigate any ongoing concerns.

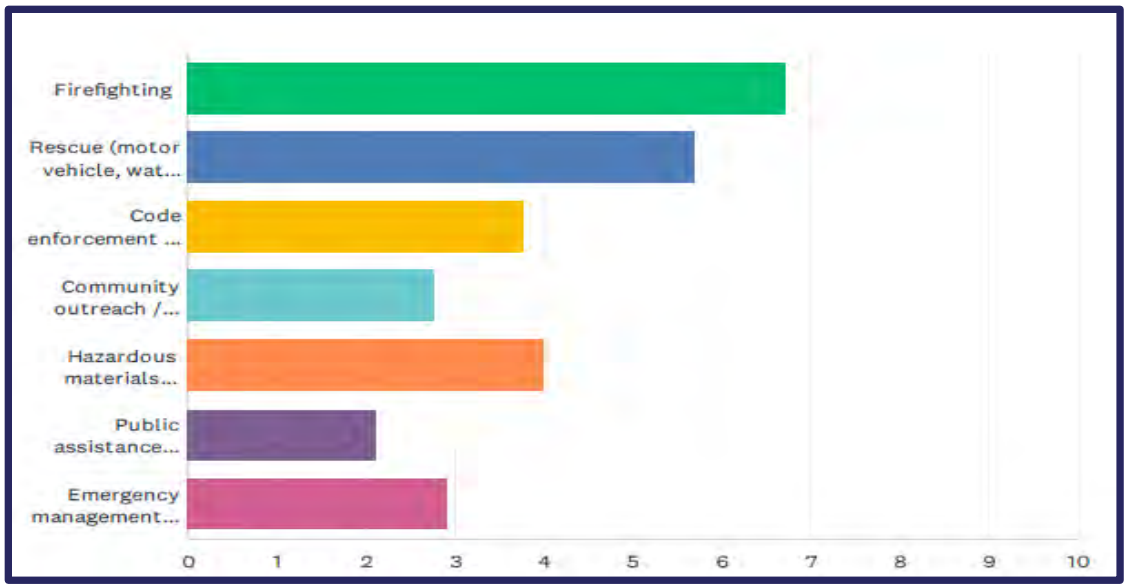
A successful CRRP can bring additional resources to the effort through partnerships within the fire department and the community. The community-based approach increases public safety because of the collective work within the community to understand, assess, and provide inclusive solutions to community safety issues.

3.4 Stakeholder Surveys

As part of completing an overall risk assessment and to get a complete understanding of how well the WFRS is meeting the needs of the community and its firefighters, both community and staff input were requested in the form of an anonymous survey. This input was helpful in developing recommendations to assist the city with future strategic decision making as it relates to the fire service. These surveys help to identify what is working well, along with possible areas for improvement.

3.4.1 External Surveys

Based on the information received from the external stakeholders, the following services are most important to the respondents:



Other information received included that the fire department is viewed as professional, and a good community partner by most of the respondents.

When external respondents were asked about what services are most important to them, the respondents noted the speed of which the fire department gets to them is the most important.

	EXTREMELY IMPORTANT	VERY IMPORTANT	IMPORTANT	NOT VERY IMPORTANT	NOT IMPORTANT AT ALL	TOTAL	WEIGHTED AVERAGE
How quickly WFRS gets to me if I have an emergency.	90.10% 91	5.94% 6	3.96% 4	0.00% 0	0.00% 0	101	1.14
Whether WFRS will visit my home to give me safety advice and/or fit smoke alarms.	12.87% 13	18.81% 19	31.68% 32	24.75% 25	11.88% 12	101	3.04
How much the fire services costs me as a tax payer.	25.00% 25	18.00% 18	29.00% 29	16.00% 16	12.00% 12	100	2.72
How well WFRS works with other agencies to provide wider community safety services.	39.00% 39	34.00% 34	17.00% 17	6.00% 6	4.00% 4	100	2.02
How often WFRS consults me about their services.	12.00% 12	17.00% 17	32.00% 32	29.00% 29	10.00% 10	100	3.08
How often WFRS provides community training opportunities (e.g. fire extinguisher training; school safety programs; older and wiser program; smoke alarms; fire escape planning).	27.72% 28	29.70% 30	28.71% 29	5.94% 6	7.92% 8	101	2.37
How visible WFRS is at local community events.	24.75% 25	24.75% 25	21.78% 22	20.79% 21	7.92% 8	101	2.62
Contacting assistance services (such as Red Cross or family services) after an emergency, as required.	38.61% 39	26.73% 27	24.75% 25	5.94% 6	3.96% 4	101	2.10
Timelines to any request for services or assistance from WFRS	44.55% 45	25.74% 26	24.75% 25	4.95% 5	0.00% 0	101	1.90
Purchasing and maintaining new and applicable equipment to ensure the department has reliable up to date equipment to safely deliver its services.	60.40% 61	17.82% 18	17.82% 18	3.96% 4	0.00% 0	101	1.65
Continued and relevant training to meet the needs of the community.	59.60% 59	22.22% 22	15.15% 15	2.02% 2	1.01% 1	99	1.63

3.4.2 Internal Surveys

Input from staff, the union executive, and council members was also garnered during this master plan review. Based on the information received from the internal stakeholders, there is a feeling that the department is doing a good job in serving the public, but more resources are still required to meet the growing demands for service.

The following general comments and concerns were noted by the respondents:

- There is an understanding that the future upgrading and relocation of stations will be required as the community grows and the fire department needs to expand to meet these growing needs.

    - It was also understood that with this growth, there will eventually be a need for additional (new) fire stations in areas of the city (specifically around the airport area) that are presently under served.
- More collaboration between divisions
- The need for more staff, equipment, and stations to better serve the public.
- A greater focus on training to meet the needs of recent OFM's mandate.
- Succession planning
- More diversity within the department
- A greater focus on fire safety education for the public

Overall, most of the staff are very proud of the services that they offer to the community, and they want to ensure that the department can continue to meet the needs of the community along with staff needs in relation to training, equipment, and facilities.

3.5 Residential Fire Sprinklers and Monitoring Fire Alarm Systems

The NFPA, the Canadian Association of Fire Chiefs (CAFC), and the Ontario Association of Fire Chiefs (OAFC) strongly support residential sprinkler systems to reduce the risk to life and property from fire. Because fire sprinklers react so quickly, they can dramatically reduce the heat, flames, and smoke produced in a fire. When properly installed and maintained, fire sprinklers help save lives, minimize damage, and make it safer for firefighters.

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

3.5.1 Facts About Home Fire Sprinklers

Automatic sprinklers are a highly effective and reliable element of total system designs for fire protection in buildings. Unfortunately, we must rely on American statistics due to the lack of Canadian statistics. Since there are so many similarities in building construction, however, the statistics are an accurate reflection of the Canadian experience.

According to NFPA Research, between the years of 2015-2019, 7% of reported home structure fires occurred in properties with sprinklers. These accounted for 1% of home fire deaths, 5% of home fire injuries, and 3% of home property loss.[3]

Source: U.S. Experience with Sprinklers[4]

- 85% of all U.S. fire deaths occur in the home.
- The civilian death rate per 1,000 reported fires was 89% lower in homes with sprinklers.
- The civilian injury rate per 1,000 reported fires was 27% lower in homes with sprinklers. Many injuries occurred in small fires that did not activate the sprinkler. In others, someone was injured while trying to fight the fire in the initial moments before the sprinklers operated.
- The rate of firefighter injury per 1,000 reported fires was 60% lower where sprinklers were present.
- There was a 24% increase in fires that were confined to the object or room of origin when sprinklers were present.

In 2021 some fire safety statistics[5] were released, which include:

- 40% of fire deaths happen in homes with no smoke alarm.
- 17% of home fire deaths occur due to a non-functional smoke alarm.
- 25% of smoke alarm failures with a deadly outcome occur due to a dead battery.
- $235 million per year in fire property damage caused by children.
- Smoke alarms decrease the risk of dying in a home fire by 50%
- Electric space heaters cause 80% of house fires, with deadly outcomes.
- Fire sprinklers can reduce the chance of death in homes by 80%
- According to the NFPA, firefighters in the US respond to a fire every 24 seconds.
- Fire sprinklers use less water than fire hoses.
- Sprinklers activate on an individual basis.
- The risk of property loss is reduced by 70% in homes with sprinklers.

[3] "U.S. Experience with Sprinklers", Marty Aherns, NFPA Research, accessed on October 30, 2023, https://www.nfpa.org/News-and-Research/Data-research-and-tools/Suppression/US-Experience-with-Sprinklers

[4] "U.S. Experience with Sprinklers," Marty Aherns, accessed on March 15, 2023.

[5] Safeatlast - The Latest Fire Safety Statistics - Stay Safe in 2021, Published January 30, 2021, Accessed February 24, 2023, https://safeatlast.co/blog/fire-safety/

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 to promote the installation of home sprinkler systems, the WFRS would be demonstrating a proactive approach to educating the public on another viable option for homeowners to help reduce the fire risk. As such, WFRS should investigate and implement this safety initiative as part of its fire prevention and fire and life safety education initiatives.

3.6 Next Steps

As the community grows, the frequency of calls and the need for service will grow. Based on this growth, there may be a future need for additional staff in the Fire Prevention Office, the Fire Suppression Division, and Training.

Supporting information relating to the staffing needs of each division can be found in the associated sections within this FMP document.

The provincial government has recently introduced updates to the *FPPA* outlining the responsibilities of a community and its fire department concerning service level expectations. The updates to the *Act* are:

- Mandatory training and certification for firefighters, fire officers, fire service instructors (training officers), and fire service inspectors (fire prevention inspectors).
- CRA reviewed annually, complete updated version every five years.
- Complete a mandatory inventory of all building stock, including identifying those with LWC components.

These updates will put an even more significant strain on fire departments to ensure proper training, reporting, and completion of CRAs.

Section 3 - Recommendations:

Rec #	Recommendation	Estimated Costs	Suggested Timelines for Implementation	Rationale
4	The City of Windsor needs to develop a comprehensive CRRP that aligns with the CRA and FMP related recommendations.	**Staff time**	**Immediate (0-1 years)**	The development and implementation of the CRRP will aid in prioritizing risks that will be lessened or mitigated. Answering the who, what, when, and how will assist in identifying risks.
5	The City of Windsor's Building Department and WFRS should promote the advantages of installing residential sprinklers, which include saving lives and property.	**Staff Time**	**Short-Term (1-3 years)**	Historically, no persons have died in residential fires where residential sprinklers were installed and activated during a fire. Sprinklers may reduce the risk to homeowners.

SECTION

4

Fire Department Divisions Non-Suppression

SECTION 4: FIRE DEPARTMENT DIVISIONS – NON-SUPPRESSION

This section of the FMP will review the WFRS's Organization Structure, Fire Prevention & Life Safety Division, and Training Division.

The FMP provides an analysis of the present staffing and deployment model with consideration of industry standards, including recommendations based on current and expected future identified service delivery requirements.

With respect to public fire and life safety education, inspection, and fire investigation, measurable targets and quantifiable areas for ongoing improvement have been developed based on NFPA 1730: *Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*, 2019 Edition.

4.1 Organization Structure

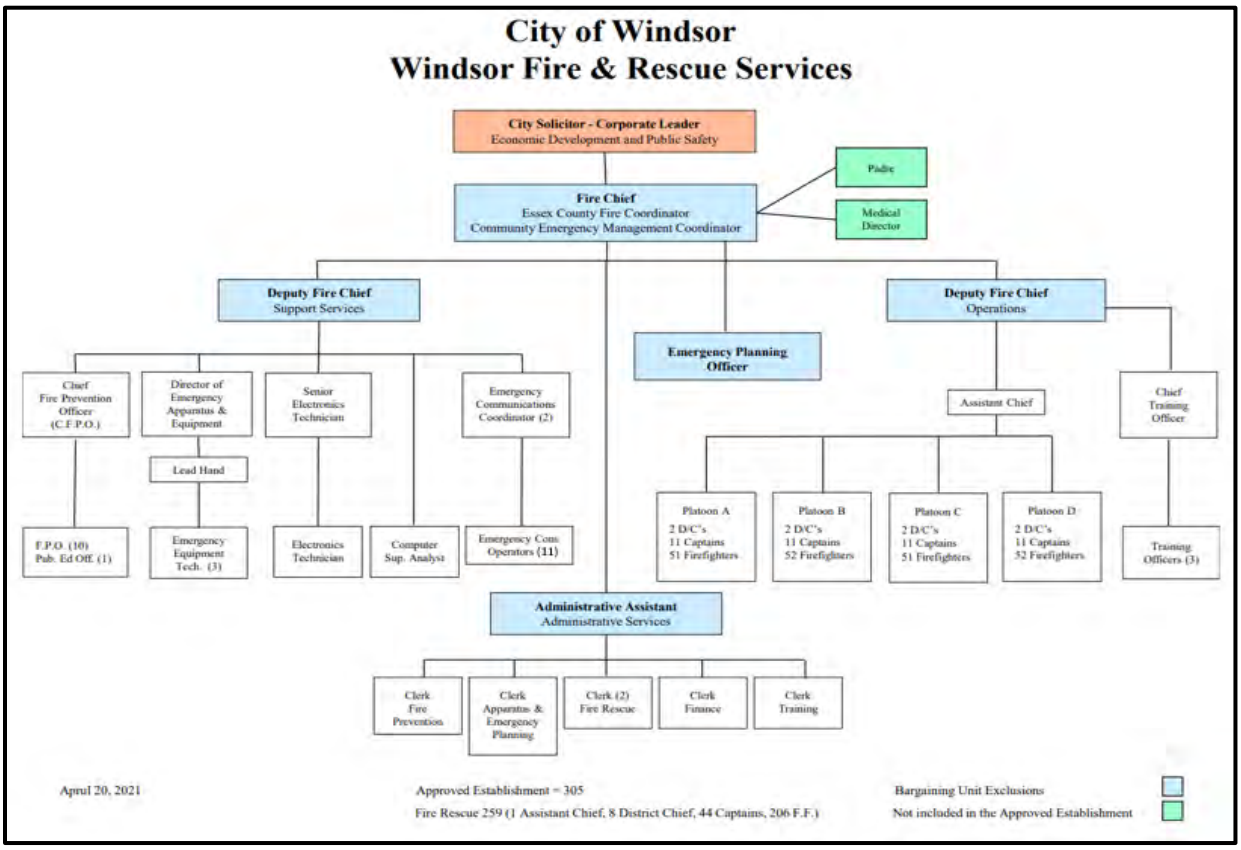
Historically, the fire department organization structure has been identified as a scalar organization[6]. The structure is predicated on establishing an unbroken line of authority where orders are issued from the highest levels of management on down through an established chain of command. A scalar organization can be visualized in the form of a pyramid. The WFRS organizational chart is a good example (Figure #1). At the top, you have the fire chief . Reporting to the fire chief are two deputy chiefs and an Emergency Planning Officer (EPO). The fire chief is responsible for the Administration Division. The Deputy Chief of Operations has an assistant chief reporting to them. The Deputy Chief of Operations is responsible for the Suppression Division and the Training Division. The Support Services Chief is responsible for the Prevention Division, the Apparatus Division, the Communication Division.

In the current organizational structure, the Administrative Division is clearly identified. This is an innovative concept. Many fire services undervalue the effectiveness and efficiency of administrative support to the fire chief and overall fire department. The technological tools available in the workplace allow managers and executives to be more autonomous than ever before. Online calendars, mobile devices, and email have all but eliminated the need for letters and day planners. Leaders at all levels have the tools in their pockets to manage their own schedules and easily respond to clients' and employees' questions. Yet, these are not the tasks

[6] Dr. Harry Carter, Firehouse, "Do You Know What an Organization Is?", accessed October 30, 2023, https://www.firehouse.com/leadership/article/11699296/applying-organization-to-fire-departments

top executive leaders are hired to perform. Organizations that employ talented administrative assistants to complete these tasks reap a wide range of benefits.

FIGURE #2 – 2021 WFRS ORGANIZATIONAL CHART



During the review, EMG noted that there is a good relationship within the WFRS leadership with clear expectations of roles and responsibilities. In a scalar structure, clear expectations are paramount to alleviate any operational roadblocks.

The current organizational chart places a considerable number of responsibilities on the Deputy Chief of Support Services. For instance, EMG's review of the Prevention and Training Divisions suggested a lack of Information Technology support. The Prevention Division could not provide data related to the number of investigations or inspections, stating problems with the current RMS and issues with the transition from one records management software to a new one. A similar issue was encountered with records management in the Training Division.

Further, EMG noted operational issues within the Prevention Division, which should be addressed at the Deputy level. For Instance, EMG noted that the Chief Fire Prevention Officer (CFPO) responds to many fire investigations due to staffing issues. This matter should be

addressed and mitigated at the Deputy level to allow the CFPO to focus on other administrative and supervisory-related duties.

EMG noted that inherent in the Deputy Chief of Support Services position is a wide range of responsibilities. The Prevention and Communication divisions have a broad spectrum of essential functions that may be overwhelming for one Deputy. Conducting a process mapping exercise would provide evidence-based support to the current structure or may provide support for the addition of a third Deputy Chief position. This is a common issue with a scalar organizational structure. It is the "doing" organization[7], in that the work of all divisions and/or platoons is directly involved in producing the prescribed levels of service for the fire service.

EMG's review of departmental organizational awareness suggested some breaking down of communication in the chain of command affecting overall operational performance. There appears to be a misalignment of the roles and responsibilities, as well as expectations in the Deputy Chief and CFPO functions, affecting the performance of the WFRS. The drawback is that the top management is not always accessible.[8]

In reviewing the organizational structure, roles, and responsibilities, EMG recommends that WFRS conduct a process mapping study pertaining to the roles and responsibilities of the Deputy Chief of Support Services with a lens to evaluate workload.

Furthermore, during the administrative review, EMG noted that the Fire Prevention Clerk and the Training Clerk report to the Administration Division. The reporting structure is nebulous. EMG's study suggested a partnership rather than a hierarchical reporting relationship. As indicated earlier, this miscommunication leads to roadblocks and inefficiencies. This may contribute to the RMS inconsistencies and the Prevention Division's inability to provide timely access to inspection or investigation reports or data.

EMG recommends considering reviewing the current organizational chart to include a clear reporting relationship between administrative clerks and Division heads.

4.2 Fire Prevention Division

The Fire Prevention division has a staffing complement of 13, including a CFPO, 10 Fire Prevention Officers, 1 Public and Life Safety Officer, and 1 Administrative Support Assistant.

[7] Montana, P. and Charnov, B., "Organizational Structures: Concepts and Formats", University of North Carolina, accessed October 30, 2023, https://ils.unc.edu/daniel/405/Montana11.pdf.

[8] MasterClass, "What Is the Scalar Principle? How the Scalar Chain Works," accessed October 30, 2023, https://www.masterclass.com/articles/scalar-principle

The 10 Fire Inspectors are certified to NFPA 1031 Level 2 which provides a more fulsome approach to conducting inspections because there is no limiting staff due to only having been certified to NFPA 1031, Level 1 only. Furthermore, EMG noted that all inspectors are certified to NFPA 1033: *Standards for Fire Investigator Professional Qualifications*. This also provides the department with a substantial cadre of fire prevention personnel to conduct fire investigations – overall a good use of staff and available resources.

EMG reviewed and evaluated the current fire inspection strategy and the public fire and life safety education program and is presenting a delivery model (for consideration by WFRS) based on needs as assessed against the current demand, the municipal plan, and the growth strategy.

Although the WFRS Organizational Chart aligns with the current E&R By-law (By-law 74-2014) with respect to the Administration being the responsibility of the fire chief, EMG recommends that WFRS amends the By-law 74-2014 to reflect reporting structure of the Administrative Assistant to be more in line with the Prevention Division.

Furthermore, EMG noted that the Prevention Division does not have a legal staff assigned. Given the size of the WFRS and the importance to the second line of defense, to wit fire safety standards and enforcement, as well as policy SOP PR 04.03-2016 Fire Prevention Inspection Procedures, the WFRS Prevention Division would benefit from having a legal staff assigned to the Division. Although EMG does not have data to evaluate court performance, it would be prudent to recommend that WFRS evaluate the benefits of hiring paralegal personnel to support enforcement measures by the WFRS Prevention Division.

EMG's review of the existing fire prevention programs focused on the identification of strengths, gaps, and areas for growth and improvement. When evaluating the Fire Prevention Division, it was apparent that its strength pertained to inspection functions. Although corporate policies, organizational operating guidelines, or procedures, and identified service levels refer to public fire and life safety education and fire investigation as the other pillars of the Fire Prevention Division, staffing for public fire and life safety education has recently been reduced to one Public Fire and Life Safety Educator (PFLSE) (staffing change occurred 4 -5 years ago). EMG's review of the public fire and life safety education programs revealed that WFRS is limited in the number of programs they can deliver.

The number of public fire and life safety education requests is continually increasing. For instance, the City of Windsor, as a university city, sees an average of 15,000 international students every year. The international student contingent is at risk with limited public life safety programs targeting this vulnerable segment of the population. Furthermore, the number of primary and secondary schools in the City of Windsor would warrant a dedicated public and life safety program coordination. However, with the increase in public education requests and the

current workload, one staff cannot provide adequate public education to schools and other vulnerable segments of the City's demographic profiles.

EMG recommends that WFRS re-evaluate the need for an additional PFLSE position within Fire Prevention.

EMG's review of the WRFS Fire Investigation program revealed that according to the Collective Agreement, fire investigators do not have to respond to calls for service after hours. The after-hours investigations often fall under the responsibility of the CFPO. Within WFRS, property fires/explosions account for 6.5 % of all incidents from 2019-2022 (Figure #4). Notwithstanding that, not all fires/explosions are investigated by Fire Prevention – 6.5% accounts for approximately 506 fires/explosions each year. WFRS ought to review its fire investigation policy and amend their Collective Agreement to ensure adequate response to fire investigations without relying heavily on the CFPO.

Fire investigation is essential to provide an informative overview of incidents in the municipality that would better inform public education and prevention in the reduction and elimination of emergency calls. For that reason alone, EMG recommends that WFRS review its fire investigation response and ensure adequate 24/7 response by fire prevention officers.

FIGURE #4 - FIRE/ EXPLOSION INCIDENTS AND TOTAL INCIDENT CALLS BETWEEN 2019-2022

	2019	2020	2021	2022
#Fire/ Explosion	400	427	536	661
Total incidents	7,751	6,711	7,468	8,521
% of Total Incidents	5%	6%	7%	8%

Concerning Public Fire and Life Safety Education, WFRS has a dedicated PFLSE staff responsible for public fire and life safety education functions. The WFRS had two PFLSEs in the past. One position was never replaced since. Building stock data provided for this review suggest that there are over 160 schools and over 280 care facilities in the City of Windsor. Notwithstanding Group C occupancies, it can be extrapolated that by the shear size of the City, there are many vulnerable occupancies, schools, and churches, as well as an aging population, a student population, and new immigrants, to warrant a robust public and life safety education program to meet the WFRS's obligations under the section 2 (1) (a) of *FPPA*, 1997.

EMG's review of the PFLSE program suggested that the program is not adequately staffed. For instance, the school program is limited; drills are not monitored at schools, only for vulnerable

occupancies. EMG recommends that the WFRS conduct a process mapping exercise to assess the adequate staffing needs of its Public Fire and Life Safety Education program to meet its needs and circumstances based on the WFRS legislated responsibility under the *FPPA*. In performing a process mapping exercise, the WFRS should consider referencing the Annex C: Sample Staffing Exercise worksheets found in the NFPA 1730: *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*.

4.2.1 Public Fire and Life Safety Education

The WFRS has several public education programs, including but not limited to a smoke alarm program called *Wake Up Windsor Get a Working Smoke* Alarm; an outreach program called *Community Outreach Program and Education (COPE)*; a TAPP-C program; school programs, including a Career Day program; and public education presentation upon request.

The WFRS also has several Public Fire and Life Safety programs, and the Division does follow a yearly calendar of events to ensure that public education is delivered throughout the community. To ensure WFRS is meeting its public education goals, EMG recommends that the WFRS Public Education Program be reviewed annually to help identify any areas for improvements.

EMGs review confirmed the strength of the WFRS Public and Life Safety Education Program is the community collaboration and support it receives. WFRS enjoys strong business community support for their public education programs.

Social media offers platforms to introduce your community to your fire department and inform residents about how to reduce their risk from fire and life safety hazards. These platforms can also be a great resource to recruit members and tell stories about your accomplishments[9]. WFRS utilizes community papers (including digital versions), Twitter, and the city website to supplement its PFLSE program advertising. Constituents can reach the WFRS Fire Prevention Section through their Twitter account for information, questions, and comments. If used creatively, social media can also help introduce the work of the fire department to a younger audience through community risk reduction outreach campaigns[10].

[9] US Fire Administration, "Using Social Media to Reach Out to Your Community," accessed October 30, 2023, https://www.usfa.fema.gov/blog/cb-120821.html

[10] Rachel Engel, Fire Rescue 1, "Going live: 'Captain Ben' utilizes social media for station tours, safety education, fire prevention outreach," accessed October 30, 2023, https://www.firerescue1.com/fire-products/fire-safety-for-children/articles/going-live-captain-ben-utilizes-social-media-for-station-tours-safety-education-fire-prevention-outreach-udwgDXqnesnZcZHr/

Another strength of the PFLSE program pertains to training and qualifications. All members of the WFRS Fire Prevention Section are successfully trained and certified to NFPA 1035: *Standard on Public Fire and Life Safety Educator, Public Information Officer, Youth Firesetter Intervention Specialist, and Youth Firesetter Program Manager Professional* Qualifications. WFRS meets the Ontario Regulation 343/22: *Firefighter Certification* that requires all firefighters performing PFLSE duties to be certified to the NFPA 1035 Professional Qualifications Standard as of July 1st,2026.

One issue with public fire and life safety education programs relates to senior programs. Other than request for presentations from local social service organizations, there is no program, to date, offered at local senior complexes, such as nursing homes, retirement homes, or autonomous elderly residents.

Another issue pertains to an inadequate record-keeping system to track all events associated with PFLSE. A robust record keeping system would assist in identifying weaknesses in the program and justify yearly budget adjustments to assure long-term sustainability of the program. These administrative issues could be avoided through a specific Fire Prevention policy accompanied by SOGs related to record-keeping practices.

4.2.2 Fire Inspections

During the Fire Prevention section review, EMG noted concerns over record-keeping practices. EMG noted duplication of records for each property classification from 15% to 50%. Table #1 illustrates the percentage of record duplication by addresses for each group of property classification. EMG was informed that the WFRS is replacing their record management AMANDA with ICO Fire RMS Software. EMG recommends that the WFRS conducts quality assurance on the data integrity before transferring the Fire Prevention files to the new RMS software.

TABLE #1: DUPLICATED RECORDS BY ADDRESSES FOR EACH OCCUPANCY CLASSIFICATION

Occupancy Classification	WFRS Data	WFRS Cleaned Data by EMG	Percentage of Duplicated Records
A	1257	966	25%
B	288	146	50%
C	6563	5549	15%
D	264	229	15%
E	839	655	22%
F	452	340	25%

EMG could not evaluate the WFRS Fire Prevention Section's inspection performance due to a lack of access to records. WFRS indicated that data could not be retrieved from the current AMANDA RMS software. Therefore, EMG could not conduct a gap analysis to identify possible discrepancies between the actual number of inspections versus the number of buildings requiring inspections.

The inability to conduct an inspection gap analysis and the inability to evaluate possible discrepancies is prompting EMG to recommend that WFRS conduct an audit to identify buildings requiring an inspection and to establish a frequency inspection schedule that would be manageable for WFRS while optimizing community safety. Best practices for frequency inspection schedules arrange occupancy types by the level of risk and prioritize the level of risk commensurable with 1-year, 2-year, or 3-year inspection rotations.

A review of the fire inspection workload indicated that an inspection requires approximately (on average) 6.5 hours to complete (Table #1), based on NFPA 1730: *Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*, 2019 Edition.

TABLE #2: FIRE INSPECTION AVERAGE COMPLETION TIME WORKSHEET

Task	Time to complete TASK	Administration Time	Travel Time	Follow up Time	Total Time
Inspection	3 hrs.	1 hr.	1 hr.	1.5 hrs.	**6.5 hrs.**

Based on the occupancy classification data used to complete the CRA (Table #1), EMG utilized the staffing assessment tool from NFPA 1730 to calculate staffing requirement to conduct inspections commensurate with requirements under *FPPA*, 1997 section 2 (1) (a). Without considering all other duties, the analysis of staff requirement to complete 7,885 inspections would require 9.4 full-time staff. With a frequency inspection schedule in place, EMG estimated the number of annually required inspections to be 3,515, which would translate into four full-time staff to meet the inspection needs effectively.

TABLE #3: 2023 WFRS RECORDED OCCUPANCY CLASSIFICATION

Occupancy Classification Based on 2023 Data		Number of Occupancies In 2023	Number with LWC since July 1st, 2022*	Number of Occupancies In 2024	Number with LWC*
Group A	Assembly	966			
Group B	Institutional	146			
Group C	Single-Family* including the following: Multi-Unit Residential, Motel/Hotel, Mobile Homes, and Trailers, Other	5,549	Single Family Houses are not required. All others are.		Single-family houses are not required. All others are.
Group D	Business and Personal Services	229			
Group E	Mercantile	655			
Group F	Industrial	340			
Occupancies not classified in the OBC, such as farm buildings. This section includes farms with businesses, residences, outbuildings, and commercial establishments.					
Total of all Occupancies		7,885			
Total of all occupancies with LWC components					

Note: *The data in TABLE #3 is from the City of Windsor's AMANDA computer program, and its accuracy cannot be confirmed.*

TABLE #4: FIRE INSPECTION TOTAL HOURS AND STAFFING WORKSHEET

Task	Average Number per Year	Average Time to Complete	Total # of Hours per Year	Number of Days per Year*	Personnel required for 60 Days of Work (total days for Inspections)
Inspection	7,885	6.5 hrs.	51,252.5 hrs.	2,136 days	9.4 staff

* Based on an 8-hour shift

**Based on personnel working on average 227days per year (based on 52 weeks, 13 statutory holidays, and an average of 4 weeks vacation [excluding sick time]): 2,136 days divided by 227 days = 9.4 staff/year.

Requirement considerations are based on NFPA 1730 worksheet.

From the staffing analysis conducted, the current WFRS fire inspection staffing would more than adequately meet the inspection needs of WFRS, given the establishment of an inspection frequency schedule. NFPA 1730 provides a minimum inspection frequency based on the risk matrix (High, Medium, and Low occupancy risk) illustrated in Table #5. Other entities, such as FUS offer suggested inspection frequency schedules that could benefit the WFRS in establishing a frequency schedule appropriate for their needs and circumstances.

TABLE #5: NFPA 1730 TABLE 6.7 MINIMUM INSPECTION FREQUENCY

Δ Table 6.7 Minimum Inspection Frequency

Occupancy Risk Classification	Frequency
High	Annually
Moderate	Biennially
Low	Triennially
Critical infrastructure	Per AHJ

4.2.3 Fire Investigation

Concerning fire investigation services provided by the WFRS, a fire investigation staffing exercise based on the NFPA 1730 was performed. The analysis was based on WFRS data from 2019-2022. The analysis indicated that, between 2019-2022, 6.75% of all emergency call types were for property fire/explosion (Table #6). Between 2019-2022, the WFRS responded to 2,024 property fire/explosion fires. Table #7 breaks down the number of property fire/explosion per year.

TABLE #6: PERCENTAGE OF PROPERTY FIRE/EXPLOSION AGAINST ALL CALL TYPES FROM 2019 THROUGH 2022

	2019	2020	2021	2022	Average
% of Fire Investigations	5%	7%	7%	8%	6.75%

TABLE #7: PROPERTY FIRE/ EXPLOSION FROM 2019 THROUGH 2022

	2019	2020	2021	2022	Total
# of Fires/ Explosions	400	427	536	661	2,024

The results of fire investigation assist in identifying trends that are used in the development of building and fire codes, public fire and life safety education, and fire prevention initiatives. Typically, fire investigation is part of the Fire Prevention Officer's role. Within WFRS, all ten fire prevention officers are trained to NFPA 1033, which is consistent with best practices recommended by NFPA 1730 and in adherence with Ontario Regulation 343/22: Firefighter Certification, made under the *FPPA*, 1997.

TABLE #8: FIRE INVESTIGATION TOTAL HOURS AND STAFFING WORKSHEET

Task	Average Number per Year***	Average Time to Complete****	Total # of Hours per Year	Number of Days per Year*	Personnel required to comprehensively investigate fires/explosions
Fire Investigation	506	70 hrs.	35,420 hrs.	1,476 days	7 staff

* Based on an 8-hour shift

**Based on personnel working on average 227days per year (based on 52 weeks, 13 statutory holidays, and an average of 4 weeks vacation [excluding sick time]): 1,476 days divided by 227 days = 7 staff/year

Requirement considerations are based on NFPA 1730 worksheet.

- ***Based on averaging data from 2019-2022 as per table 7.
- **** Table C.2.2(c) of NFPA 1730

EMG recommends that the fire investigation operations align with the new NFPA 1321: Standard for Fire investigation Unit expected to be released in 2024. In addition, aligning with NFPA 1730, all fire officers determining the preliminary origin, cause, and circumstances of any fire/explosion, securing the incident scene, and protecting evidence or potential evidence from damage or destruction should be trained to the job performance requirements of NFPA 1021.

4.3 Determination of Current Staffing Requirements

To assist fire departments in determining present and future staffing needs, NFPA 1730: *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations* outlines a five-step process within Annex 'C' of the standard. The five-step process involves a review of the following items:

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

By utilizing this five-step process the WFRS would be able to determine the fire prevention level based on the community's local needs and circumstances. EMG recommends that the WFRS revamps their proposed 2011 Fire Prevention policy through the lens of the NFPA 1730 and implement the updated policy with accompanying SOGs, detailing specific functions of fire inspection, fire investigation, and public fire and life safety education.

4.4 Training and Professional Development

With respect to objectives and goals identified in sub-section 1.1 of the WFRS Master Plan Proposal 150-22 document, the FMP evaluated current educational programs and identified benchmarks and targets including key deliverables based on WFRS fire protection delivery model and community needs. EMG also reviewed the WFRS Training Division's training model, capacity, and requirements and identified gaps in service and operating needs.

Measurable targets and quantifiable areas for ongoing improvement were developed based on WFRS levels of service applied against NFPA 1201: *Standard for Providing Fire and Emergency Services to the Public*; NFPA 1041: *Standard for Fire and Emergency Services Instructor Professional Qualifications*; NFPA 1006: *Standard for Technical Rescue Personnel Professional Qualifications*; NFPA 1401: *Recommended Practice for Fire Service Training Reports and Records*; NFPA 1402: *Guide to Building Fire Service Training Centers*; NFPA 1403: *Standard on Live Fire Training Evolutions*; and NFPA 2500: *Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services*.

The staffing exercise was based on a standard workload flow analysis (SWF) against the training job performance requirements identified in NFPA 1041.

The *FPPA*, 1997 identifies the responsibilities of a municipality in relation to fire protection services:

- 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.

To that end, Ontario municipalities adopt an E&R By-law identifying the level of services to be provided based on needs and circumstances. The E&R By-law informs the fire department about the type and level of training required. In the summer of 2022, Ontario Regulation 343/22 Firefighter Certification under the *FPPA* came into force, identifying that any firefighter performing a fire protection service is certified, at a minimum, to the corresponding certification standard set out in the regulation:

- 2 (1) Every municipality, and every fire department in a territory without municipal organization, must ensure that its firefighters perform a fire protection service set out in Column 1 of Table 1 only if, on or after the corresponding day specified in Column 3 of that Table,
    - (a) the firefighter performing the fire protection service is certified, at a minimum, to the corresponding certification standard set out in Column 2 of that Table.

In addition, Part III of the *OHSA* identifies the duties of employers stating that:

- 25 (2) Without limiting the strict duty imposed by subsection (1), an employer shall,
    - (a) provide information, instruction, and supervision to a worker to protect the health or safety of the worker,
    - (c) when appointing a supervisor, appoint a competent person; and
    - (h) take every precaution reasonable in the circumstances for the protection of a worker.

Complimenting the *OHSA* are the Section 21 Firefighter Guidance Notes that provide best practices for protecting the health and safety of fire service workers in Ontario. Of particular importance to training is Part 7 of the Guidance Notes.

EMG recommends a career path model for all specialised functions/positions within the WFRS. Firefighting is a high-risk profession. Training is essential to enable firefighters to respond more

efficiently to emergencies, reducing the property damage caused by fire, loss of life, and public hazards, as well as reducing personnel injuries. Although the WFRS has a career path model for recruit firefighters and officers' promotion, there is limited documentation regarding career path modeling for other specialised positions, such as fire prevention officer, fire investigator, public educator, telecommunicator, or technical rescuer.

A fire service can only provide adequate levels of protection to its community if it is professionally trained (and equipped) to deliver these services. Firefighters must be prepared to apply a diverse and demanding set of skills to safely meet the needs of a modern fire service. Whether assigned to Operations, Training, Fire Prevention (Community Risk Reduction), or Administration, staff must have the knowledge, skills, and abilities necessary to provide reliable fire protection services.

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

> 4.11.1 Purpose. *"The Fire and Emergency Service Organization (FESO) shall have training and education programs and policies to ensure that personnel are trained, and that competency is maintained to effectively, efficiently, and safely execute all responsibilities."*[11]

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."*[12]

NFPA 1500 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*

[11] National Fire Protection Association, "National Fire Protection Association 1201: Standard for Providing Fire and Emergency Services to the Public," accessed November 1, 2023, https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1201

[12] National Fire Protection Association, "National Fire Protection Association 1500: Standard on Fire Department Occupational Safety, Health, and Wellness Program, accessed November 1, 2023, https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1500

technology, position-specific development (firefighter, company officer, chief officer, telecommunicator, investigator, inspector, driver/operator, etc.)."[13]

The Commission on Fire Accreditation International (CFAI) has a specific section that evaluates the training component of a fire department. The CFAI states:

> *"Training and educational resource programs express the organization's philosophy 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."*

A review of the Training Division identified strengths, weaknesses, opportunities, and threats surrounding organizational structure, staffing, workload, on-shift training, training facilities, divisional training, record keeping, and promotional process. These issues will be addressed separately in the following sections.

4.4.1 Training Division Organizational Structure

As illustrated in the department organizational chart, the Training Division is under the tutelage of the Deputy Fire Chief Operations (Figure #5). The Training Division consists of one Chief Training Officer (CTO) and three Training Officers, as well as one training clerk.

> *" The Training Division is tasked with the development and facilitation of the necessary training curriculum required by all firefighters and staff, to ensure safe, efficient, and professional delivery of emergency services to our community, with an emphasis on safety and customer satisfaction"*[14].

Systemic of the fire service is the Training Division reporting to the Operations Division, due to the suppression-centric culture of the fire service. Unfortunately, this model tends to emphasize and prioritize training needs for the third line of defence – *Emergency Response* – at the expense of the first two lines of defence, including Line 1: *Public fire safety education* and

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[13] National Fire Protection Association, "National Fire Protection Association 1500: Standard on Fire Department Occupational Safety, Health, and Wellness Program

[14] Windsor Fire & Rescue Services, "Training," accessed August 1, 2023, https://www.windsorfire.com/divisions/training-recruiting/

Line 2: *Fire safety standards and enforcement*, as well as other divisions within the fire service, such as Telecommunications and Apparatus & Equipment Divisions.

EMG noted that the roles and responsibilities of the WFRS Training Division pertain to training and education needs associated with firefighting functions, including recruit training. Fire prevention, fire investigation, public education, telecommunications, emergency vehicle technician, technical rescue, and HAZMAT training are facilitated externally under the coordination of the Training Division. Although somewhat monitored by the WFRS Training Division, training scheduling and training administration other than suppression training, recruit training, firefighter increment training, and promotional process, rest with each specific WFRS Division, such as the WFRS Fire Prevention division.

This suppression-centric training model creates a decentralised training management system that results in questionable fiscal management of training, inequitable training delivery, and inefficient training record management that affect overall efficient and effective training and education operability of the WFRS.

At the very least, to ensure that the WFRS moves away from a suppression-centric culture, EMG suggests that the WFRS consider reverting to the October 2013 and 2018 organizational chart, where the Training Division was under the tutelage of the Deputy Fire Chief - Support Services.

Improving on the current organizational structure, the WFRS should consider the Training Division as an extension of both the Deputy Fire Chief Operations and Deputy Fire Chief Support Services to assure equitable training support to all WFRS Divisions. EMG recommends that the WFRS consider a review of its organizational chart with a training -centric lens to ensure equitable training support to all WFRS divisions. The WFRS Training Division should not be under the tutelage of any specific deputy fire chief but rather between the two deputy fire chiefs linked with a dotted line to leverage training support to the entire WFRS.

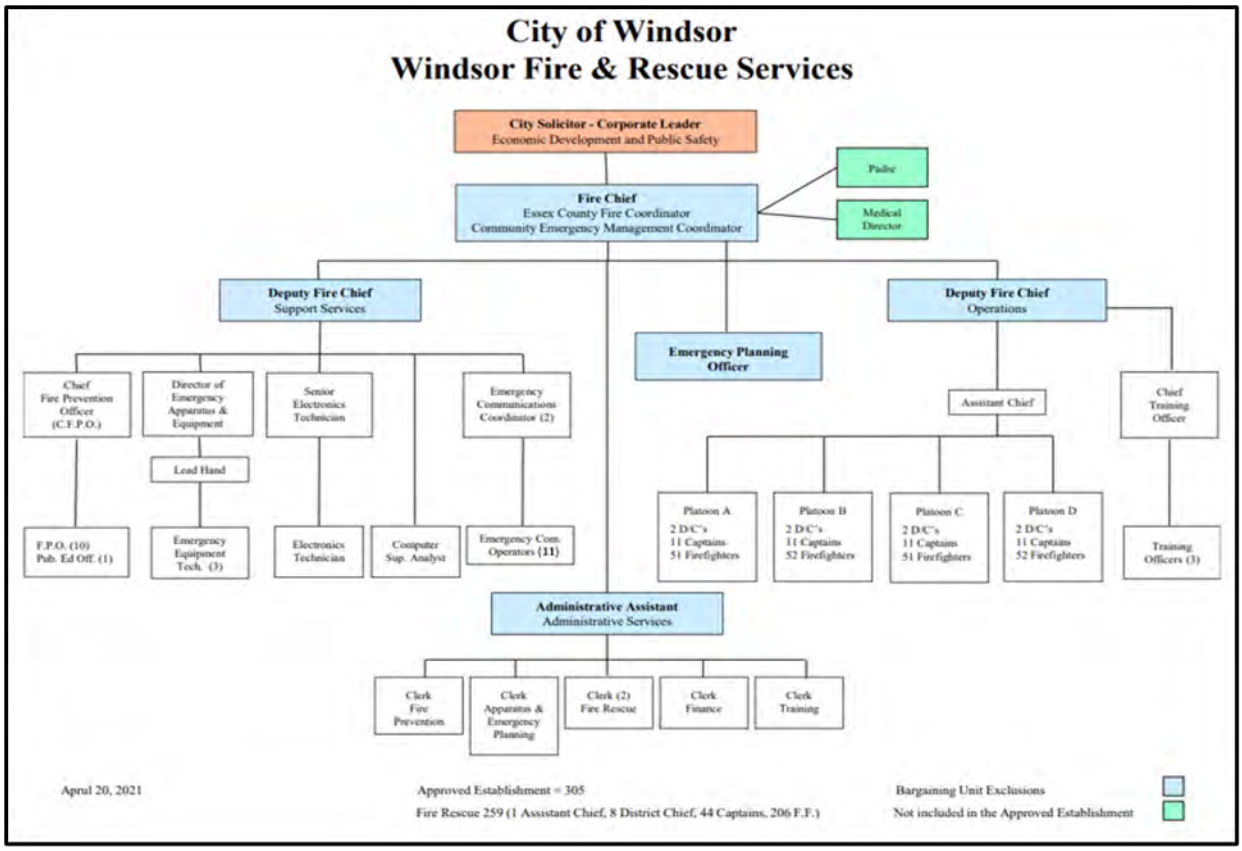
Further, the WFRS organizational chart should have a dotted line between the Training Clerk and the CTO. An advantage worth noting that demonstrates the progressive vision of the WFRS and support of the municipality is the recognition of the importance of clerical support.

One weakness often identified in an organization, especially with the recent introduction of technological tools where staff are more engaged in some form of clerical work, is the elimination of clerical assistant or administrative support. Clerical expertise brings skills such as organization, communication, and administration required to handle most clerical tasks in an organization. The WFRS Training Clerk allow the management, in this case the Chief Training Officer and Training Officers, to manage and supervise, respectively.

This administrative support model allows the Training Division to be staffed with personnel with strong administrative, organizational, and communication skills. These skills are imperative in

training due to extensive clerical works pertaining to curriculum development; organizational skills required for extensive scheduling needs for various programs being taught; administrative skills required to prioritize workload and managing extensive record keeping associated with training functions.

FIGURE #5 – TRAINING DIVISION REPORTING RELATIONSHIP



4.5 Staffing Levels and Workload

There are sixteen core fire protection services delivered by the Windsor Fire & Rescue Services, including firefighting, search and rescue, auto extrication (Basic and Heavy), emergency pre-hospital care response, technical rescue (including water, ice, vessel, confined space, trench, collapse, high angle), HAZMAT, fire prevention and safety inspections, community outreach/public education, and fire investigation.

Training pertaining to prevention and public fire and life safety education, emergency pre-hospital care response, and technical rescue, including HAZMAT, is provided externally. As identified earlier, the roles and responsibilities of the Training Division relates to developing, instructing, updating, and maintaining training programs for staff, including liaising with external training providers to facilitate training sessions.

All suppression training organization and scheduling is the responsibility of the WFRS Training Division. Although, the WFRS Training Division may be involved in some training delivery, most of the delivery is done by the platoons.

The WFRS Training Division is also responsible for recruit training, including recruitment administrative process, planning recruit training, scheduling training, and recruit training record management. In addition, the Training Division is responsible for the promotional preparation and testing for Training Officers, Captains, and District Chiefs, as well as the firefighter increment process.

When considering all the roles and responsibilities of the Training Division staff to meet the training goals and objectives of the WFRS, EMG conducted a SWF analysis to evaluate appropriate staffing level for the WFRS Training Division. The SWF was based on the NFPA 1041: *Standard for Fire and Emergency Services Instructor Professional Qualifications* (NFPA 1041).

According to the NFPA 1041, the management of fire service training programs requires a manager, regardless of fire service affiliation or instructor level, who can accomplish the following tasks[15]:

1. Budgeting
2. Resource management
3. Management of personnel
4. Management of instruction
5. Program evaluation
6. Training needs analysis
7. Scheduling
8. Goal setting
9. Networking with other training agencies
10. Technical writing
11. Effective verbal and written communication

These tasks fall under the responsibilities of the WFRS Chief Training Officer, assisted by three Training Officers.

The following is an excerpt of the roles and responsibilities of the CTO:

[15] National Fire Protection Association, "NFPA 1041: Standard for Fire and Emergency Services Instructor Professional Qualifications," 2019 Edition section E2 p.1041-25

1) Research, compile and update any information pertaining to the Department's accepted Training Manuals.

2) Prepare and give lectures pertaining to all subject related to the Fire Service. Supervise the training of all stations.

3) Maintain training records of all personnel.

4) Report to large fires to observe and evaluate firefighter tactics and to act as Safety Officer.

5) Prepare the Annual Report and Budget of the Training Division for presentation to the fire chief .

6) Be prepared to accept other related duties as assigned by his/her superiors. Prepare Standard Operational Procedures to cover all subjects related to the Fire Service.

7) Prepare and upgrade a training schedule as required.

8) Facilitate officer development by providing career counselling to potential officer candidates, such as conducting officer training programs, providing resource materials, and setting evaluation examinations.

9) Supervise, evaluate, and counsel personnel assigned to the Training Division.

10) Prepare and conduct examinations on any subject related to the Fire Service.

11) Review, instruct, and introduce any new techniques that may be beneficial toward upgrading the Department's training and operations.

12) Prepare, evaluate, and correct all training material, procedures, and programs to produce the highest possible standard of operations.

13) Identify the objectives and goals of the Division and report on the progress and effectiveness of his/her division in reaching its objectives and goals.

14) Actively participates on the various boards and committees such as Safety Committee, Accident Review Board, Recruit Selection Process, etc.

15) Exercises disciplinary authority over all Officers and Firefighters regarding Training operations. Will perform Occupational Health & Safety duties as outlined in the Corporation's Health and Safety Program.

16) Will perform other related duties as required.

The following is an excerpt of the roles and responsibilities of the Training Officers:

1) Develop, instruct, update, and maintain training programs.

2) Prepare and/or review learning outcomes to reflect the goals, procedures, and training needs of the fire service.

3) Organize and coordinate the delivery of fire service training such as: providing practical fire ground operations training, preparing, coordinating and distributing training schedules, organizing facilities, equipment and training materials, organizing presentations by guest speakers to enhance the quality of training programs, monitoring training sessions so that personnel receive training in accordance with training schedules and that the curriculum delivered matches lesson plans and desired learning outcomes.

4) Provide instruction to fire service personnel for increment testing and promotional processes.

5) Manage the training environment such as: utilizing and enforcing fire service guidelines, SOP's and related legislation and ensuring a safe training environment by establishing and developing safety plans for learning activities/scenarios, including an ongoing risk/hazard analysis to ensure the safest training environment possible.

6) Administer and review program evaluations so that recommendations for changes are identified and modifications to the program and materials can be made.

7) Assess the suitability and need for training programs and modify the programs so that the current and future needs of the fire service are met.

8) Research and evaluate fire service policies, operating guidelines, techniques, and equipment to ensure that they are current and valid and that they reflect the best practices of the fire industry.

9) Facilitate and analyze post-incident reviews so that training needs are identified, prioritized, and addressed through the development of suitable training programs.

10) Organize and conduct career development activities for fire service personnel such as providing resource materials to fire service personnel to facilitate their professional development.

11) Perform administrative duties such as establishing and/or maintaining training records, collecting, compiling, and analyzing training statistics and providing input on budget requirements relative to the Division.

12) Perform public relations and public education duties.

13) Attend emergency scenes and perform Incident Safety Officer duties (assess hazards, scan scene, neighbourhood, hydro dangers, etc.).

The following chart represents an approximation of the current WFRS Training Division SWF. According to EMG's review of the WFRS Training Division, the WFRS training program includes six training programs, including Suppression training, Recruit training, Promotional Process for Training Officers, Captains, and District Chiefs, and Firefighter Increment training.

Each program has various offerings. The estimated number of days to properly managed each of the six training programs a year would require 150 days/each program. Given that one person works on average 227days a year (based on 52 weeks, 13 statutory holidays, and an average of 4 weeks vacation), to properly manage the current training program, the WFRS would require 4 staff (workload divided by one-person work year [900 divided by 227 = 4 persons]). According to the SWF analysis, the current staffing structure of the WFRS Training Division does not meet the WFRS training needs.

Compounding factors contributing to inadequate staffing levels for the Training Division are the Ontario Regulation 343/22: Firefighter Certification, made under the *FPPA*, 1997 and the building of an electric vehicle battery plant (Stellantis)[16]. These compounding factors are accruing workload to the Training Division and necessitate consideration for the increase staffing to the Training Division by one training officer. EMG recommends that the WFRS Training Division staffing be increased by one Training Officer to meet anticipated growth and demands for training because of the Ontario Regulation 343/22 and introduction of an EV Battery plant within the municipality.

[16] Detroit Free Press, Eric D. Lawrence, "Chrysler parent Stellantis to build $4B EV battery plan in Windsor; 2nd plant coming to U.S.," accessed August 1, 2023, https://www.freep.com/story/money/cars/chrysler/2022/03/23/stellantis-ev-battery-plant-windsor-chrysler/7140007001/

TABLE #9: TRAINING SWF CALCULATION IN DAYS

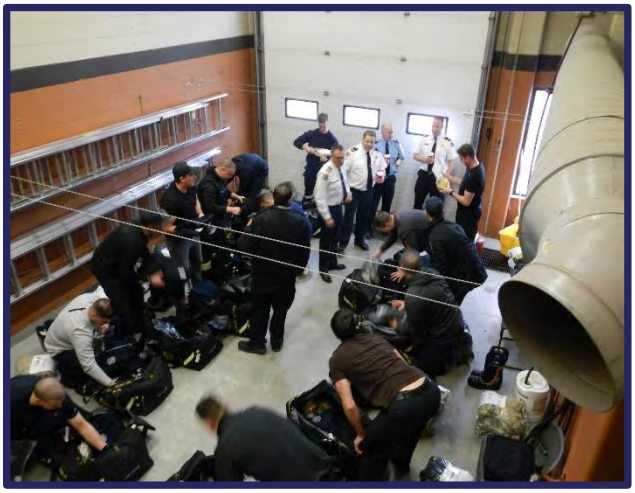
Responsibility/ Task	Description	Number of Days
Administration	Include all aspects of managing the program, including budgeting, recordkeeping, and reporting.	Administrative duties: 20 days
Scheduling	Preparation and posting of annual, weekly, and/or daily schedule.	Scheduling: 20 days
Direct Delivery	Several programs are the direct responsibility of the training officer to deliver, such as Recruit Orientation.	40 days
Marking		10 days
On-Shift Trainer Support	Support to 4 platoons at 4 stations.	10 days
Program Evaluation	Review and update of programs to assure currency of learning materials.	10 days
Training Needs Analysis	Evaluation of new programs to meet the needs of the department.	5 days
Coordination With External Training Providers	Several programs are offered by external training providers and require coordination with external agencies for smooth delivery.	5 days
Curriculum Development	Development of lesson plans for all training programs.	20 days
Training Facility	Maintenance of training facility to assure constant operational availability.	5 days
Equipment And Training Prop Maintenance	Maintenance of equipment in proper working order.	5 days

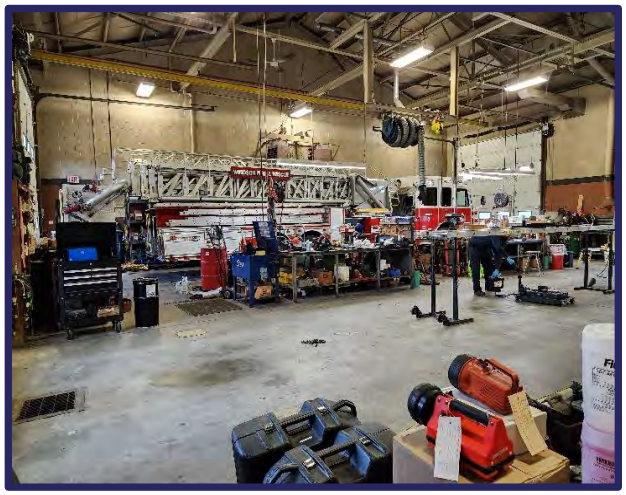
4.6 Training Facility

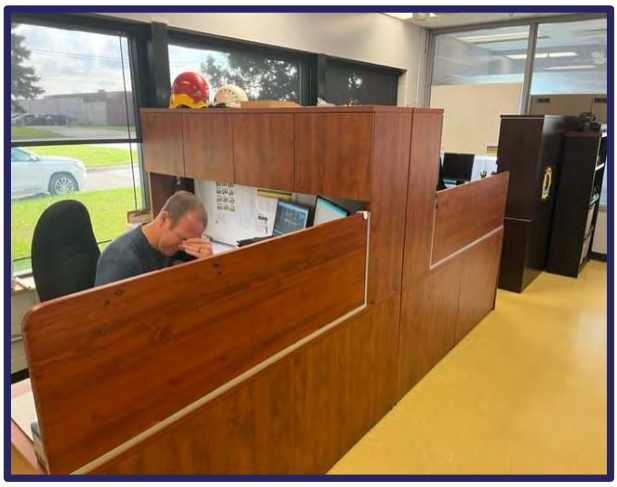
The WFRS Training Division shares a facility with the WFRS Apparatus & Equipment Division. The Apparatus and Training Division complex is located at 2885 Kew Drive. The Training Division shares the above with the Apparatus and Equipment Division.

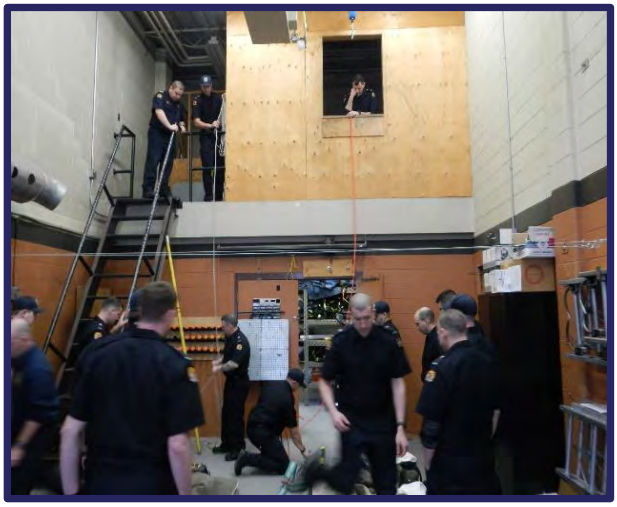
FIGURE #6 – WFRS APPARATUS & TRAINING DIVISION COMPLEX

The complex offers office space for all Training Division staff to manage the training programs. The complex has a classroom and bays areas set up for training. Although somewhat suitable for recruit training, the complex is not suitable for all required suppression training. The training tower offers some capacity for some suppression-related skill training.







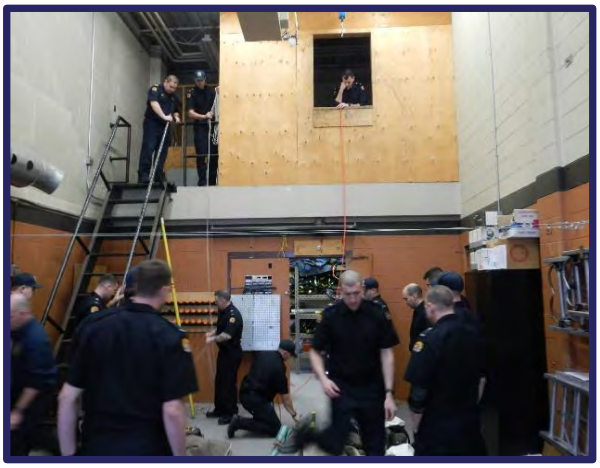


EMG applauds the WFRS collaboration with surrounding fire protection services and agencies in their acquisition of a multi-live fire training unit. There are inherent risks associated with live fire training. EMG suggests that any live fire training should comply with NFPA 1403: *Standard on Live Fire Training Evolutions*.

FIGURE #7 – WFRS MOBILE LIVE FIRE TRAINING UNIT

EMG noted that the training ground has several training props being used to enhance the skill sets of the firefighters. While these are great training opportunities, EMG recommends that the WFRS Training Division ensures that any training props should be made to comply with NFPA 1402, *Standard on Facilities for Fire Training and Associated Props* (Figure # 8).

FIGURE #8 – WFRS TRAINING COMPOUND PROPS



EMG notes that while there may be opportunities for the City of Windsor to expand its fire station needs; considerations to relocate and upgrade the training facilities to accommodate all suppression and technical training, as well as to meet future requirements because of Ontario Regulation 343/22, made under the *FPPA*, 1997 would benefit the WFRS. Cost associated with upgrades to the fire training compound could be levied against rental of the facilities by surrounding fire protection services and agencies. A partnership model with the surrounding fire protection services and agencies would be a great initiative benefiting the WFRS and surrounding fire services. A partnership would allow sustainable training for WFRS, while generating revenues for the City of Windsor.

The administrative and staffing support from the WFRS Training Division would need to be evaluated to assure sustainability and to assure there are no negative impacts on WFRS performance. For that matter, EMG recommends a study to evaluate the benefit of relocating the Training Division as part of future expansion of the WFRS fire stations in view of including training facilities that would support revenue generation beneficial to sustain and support the WFRS training programs.

4.7 Training Programs

4.7.1 HAZMAT Training

Appendix "A" of the City of Windsor E&R By-law 74-2014 identifies the core services provided to the community. With respect to hazardous materials (HAZMAT) incident calls, the level of service provided is at the Operations level and Technician level. In addition, the E&R By-law identifies WFRS as operating a provincial Level 3 – Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) response team through an MOU with the OFM.

WFRS Training Division is responsible for the record keeping management of the HAZMAT training received. The WFRS Training Division is not responsible for direct delivery of HAZMAT training to the WFRS HAZMAT team. With the adoption of Ontario Regulation 343/22: Firefighter Certification, it will become incumbent for the WFRS Training Division to become more engaged in personnel testing and certification. For consistency of training, testing, and certification, it would be prudent for the WFRS to have the WFRS Training Division develop, update, and maintain the HAZMAT training program, including the review of learning outcomes to reflect the goals, procedures, and training needs of the WFRS, while assuring adequate preparation for successful provincial testing for all WFRS staff.

4.7.2 Technical Rescue Training

Appendix "A" of the City of Windsor E&R By-law 74-2014 identifies the core services provided to the community. With respect to "Special Operations" as identified in the By-law, the By-law states:

> *"Rescue activities including "Shore Based" and "Vessel based" Water Rescue services and On Ice rescue activities."*
>
> - Note: - WFRS has two small vessels. As such the by-law should be updated to reflect this.
>
> *"Technical rescue activities including rapid intervention crews at emergencies, confined spaces entry and mitigation, building collapses, rescues involving the use of ropes from high angles and trench rescue.".*

EMG's review of Special Operations training revealed that the WFRS Training Division develops and delivers only land-based water rescue. Vessel- based and ice rescue training is not provided in support of the City of Windsor By-law 74-2014. In addition, the WFRS Training Division does not provide development, delivery, or records management for the technical activities mentioned in the City of Windsor 74-2014 By-law.

The WFRS has a provincial Urban Search and Rescue (USAR) team that provides building collapse technical rescue activities. Under an agreement with the OFM, the WFRS USAR team is deployable across the province. There are 36 members of the WFRS on this Special Operations team. The WFRS USAR team delivers its own training or coordinates training through external vendors.

EMG recommends that all technical rescue training should be monitored through the WFRS Training Division in adherence to the NFPA 1006: *Standard for Technical Rescue Personnel Professional Qualifications* and in accordance with Ontario Regulation 343/22: *Firefighter Certification*.

EMG also recommends that the WFRS aligns its technical operations and training to NFPA 2500: *Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services*. This standard specifies the minimum requirements for the WFRS identified levels of functional capability for conducting operations at technical search and rescue incidents while minimizing threats to rescuers.[17]

4.7.3 Auto Extrication Training

Appendix "A" of the City of Windsor E&R By-law 74-2014 identifies the core services provided to the community. With respect to Auto Extrication operations, the By-law 74-2014 stipulates:

> "*Auto Extrication activities at the "basic" and "heavy" levels to provide access to injured and entrapped persons involved in transportation emergencies. This involves the prevention, control and extinguishments of fires, controlled relocation & removal of materials and freeing trapped persons from the entrapment and making them accessible for removal.*"

EMG's review identified that the WFRS Training Division scrutinizes the current Auto Extrication curricula. However, the Training Division is not involved in direct delivery of the training. The WFRS Auto Extrication team consists of 10 members. The members are involved in their own training delivery. EMG also noted that the current auto extrication curricula do not meet the NFPA 1006 and NFPA 2500 requirements for auto extrication and vehicle search and rescue, respectively. With the adoption of the Ontario Regulation 343/22, certification to the appropriate levels will be required by the 1st of July 2026. Although the WFRS is diligently working at addressing their shortcomings pertaining to mandated certification, it is imperative that the WFRS Training Division assumes the responsibilities associated with testing and certification to meet provincial guidelines from the Accreditation, Standards, and Evaluation Section of the OFM.

4.7.4 Recruit Training

The WFRS has a well developed and designed Recruit Training program. The WFRS Training Division is extensively involved in the program. The recruit training is the collaborative responsibility of the WFRS Training Division, senior management, station captains, and crews. This is a concerted team effort. The onboarding process occurs throughout the probationary

17 National Fire Protection Association, "NFPA 2500: Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services," accessed August 1, 2023, https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=2500.

period of one year. The training is supported by a Recruit Binder, Jones and Bartlett curriculum handbooks, individual laptop, and associated technology to facilitate a quality training.

Each recruit is provided a binder helping them navigate through their training and mentoring to become a well-informed and competent member of the WFRS. The process includes a thorough orientation to the service, including station visits, policy and operating procedures review, equipment distribution, and training overview. The training program includes suppression, fire behaviour, fire prevention, emergency pre-hospital care responses, and HAZMAT. All components meet NFPA 1001 firefighter professional qualification requirements. The 2022 Recruit Class video affirms that WFRS Training Division dedication and professionalism to WFRS Recruit Training[18] .

A review of the WFRS Recruit program indicated that the program is successful, leading to positive experiences for recruits. EMG noted that the onboarding allowed for a stress-free and welcoming experience, easing the new recruits' transition to an unfamiliar environment, and facilitating the development of a relationship with cohorts.

4.7.5 Fire Suppression Training

Firefighting training adheres to NFPA 1001: *Standard for Fire Fighter Professional Qualifications*. The training curriculum follows the Jones and Bartlett *Fundamentals of Firefighter Skills* manual. This is one of the authoritative training manuals with respect to firefighting training. The WFRS Training Division is responsible for creating the annual training schedule for skill maintenance. Using Jones and Bartlett training materials, the knowledge and skill requisites are then delivered in-house by each platoon.

The platoon captains are responsible to record training completed on the WFRS Learning Management System (LMS) (CriSys and ICO). The WFRS is currently transitioning its LMS from CriSys to ICO. The basic firefighting skills training curriculum meets the needs of the WFRS.

The WFRS has a robust firefighting training and firefighting maintenance training program. EMG noted that in-house trainers do not consistently have formal techniques of instruction training. EMG recommends that all in-house trainers supporting the annual suppression training program should be qualified to level 1 of the NFPA 1041: *Standard for Fire and Emergency Services Instructor Professional Qualifications*. The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the training resource capacity of the WFRS.

[18] "Recruit Class of 2022." YouTube. May 11, 2022. Video, https://www.youtube.com/watch?v=jlBnbHsR0uo.

4.7.6 Fire Prevention and Fire and Life Safety Education Training

The WFRS Training Division has limited involvement with Fire Prevention and public fire and life safety education training delivered to staff. Most related training is provided externally, and the WFRS Training Division's role involves some coordination of the external training, as well as record management.

With respect to Public Fire and Life Safety Education, the City of Windsor By-law 74-2014 addresses the importance of public fire and life safety education, however, training is dependent on availability of external relevant training. Consideration should be given to develop internal capacity to train to NFPA 1035: *Standard on Fire and Life Safety Educator, Public Information Officer, Youth Firesetter Intervention Specialist and Youth Firesetter Program Manager Professional Qualifications*.

EMG applauds that public fire and life safety education training aligns with NFPA 1035. EMG recognizes that WFRS Fire Prevention Division personnel are all trained and certified to PFLSE levels 1 and 2, as well as Public Information Officer. In addition, EMG recommends that suppression staff be trained to PFLSE Level 1 and that the WFRS operations Division captains also be trained as Public Information Officer, under the NFPA 1035.

With the adoption of Ontario Regulation 343/22, made under the *FPPA*, 1997, it will become incumbent on the WFRS Training Division to take a more active role in testing and certification to NFPA 1035. This will require development and maintenance of a robust curriculum to assure a successful certification program for WFRS. It is becoming essential for the WFRS to evaluate the impact of Ontario Regulation 343/22 on the WFRS Training Division's workload.

Fire inspection is a strong program within the WFRS. Training development and delivery are like public fire and life safety education concerning external training and coordination by the WFRS Training Officer. EMG recommends that the WFRS Fire Prevention policy addresses training requirements and that the training requirements for Fire Prevention which is set at Level 2 of NFPA 1031: *Standard for Professional Qualifications for Fire Inspector and Plan* Examiner be added to the program development and delivery of the WFRS Training Division. Or at the very least, WFRS Training Division should vet the curriculum and arrange testing and certification to NFPA 1031 and 1035 for fire prevention officers.

4.7.7 Fire Investigation Training

Like other specialty functions within the WFRS, Fire Investigation training relies on external training. Training aligns to the job performance requirements of NFPA 1033. EMG noted that there is no specific training to NFPA 921: *Guide for Fire and Explosion Investigations*. Qualification for NFPA 921 is essential because it is the companion guide to the NFPA 1033.

Although the Ontario Regulation 343/22 sets the fire investigator certification requirements to NFPA 1033, EMG recommends that WFRS dedicated fire investigators be concurrently certified to NFPA 1033 and NFPA 921. In addition, EMG suggests that Fire Investigation operations and training adhere to NFPA 1231: *Standard for Fire Investigation Units* and that the WFRS Training Division be responsible for monitoring, record keeping, testing, and certification to the said NFPA standards.

4.7.8 Emergency Pre-Hospital Care Response Training Program

As per the City of Windsor 74-2014 By-law, the WFRS emergency pre-hospital care responses and medical acts or other first aid / CPR services are maintained as per local tiered response agreement with EWEMS and under the supervision of the WFRS local Base Hospital Medical Director. A divisional Assistant Chief is the liaison for "Second Chance" who is a certified EMS provider and vendor for the City of Windsor.

The Assistant Chief also liaises with the Medical Director to assure adequate training is provided in-house by medical specialists who are WFRS firefighters. The WFRS EMS instructional team consists of 8 specialists. The WFRS Training Division does not liaise with the EWEMS or is a member of the EMS Steering Committee. However, the Chief Training Officer is a member of the WFRS Joint Health and Safety Committee. EMG recommends that the WFRS Training Division, at the very least, be responsible for record keeping and monitoring of EMS training requirements.

4.7.9 WFRS Training Program

Currently, the WFRS training program involves formal and informal training adhering to NFPA Professional Qualifications standards. Consideration should be given for all training curricula to align with specific knowledge and skill requisites of the NFPA Professional Qualifications standard relevant to the WFRS identified level of services. The suggested training is summarized in the following table.

Level of Service	NFPA Pro-Quals Standard	Qualification Level
Firefighting	NFPA 1001	O. Reg. 343/22
Technical Rescue	NFPA 1006 and NFPA 2500	Technician Level & O. Reg. 343/22
HAZMAT	NFPA 1072	Operations Level Responder & O. Reg. 343/22
Fire Inspection	NFPA 1031	Level 2 & O. Reg. 343/22
Public and Life Safety Education	NFPA 1035	Level 1, Level 2, and PIO & O. Reg. 343/22

Level of Service	NFPA Pro-Quals Standard	Qualification Level
Fire Investigation	NFPA 1033 and NFPA 921, as well as NFPA 1321	O. Reg. 343/22
Training	NFPA 1041	Level 1 and Level 2 & O. Reg. 343/22
Safety Officer	NFPA 1521	O. Reg. 343/22
Officer	NFPA 1021	O. Reg. 343/22
Pump Operator	NFPA 1002	O. Reg. 343/22

4.8 Training Documents and Training Records

WFRS training reports and records should align with NFPA 1401: *Recommended Practice for Fire Service Training Reports and Records*. The WFRS Training Division is currently transitioning from CriSys LMS to ICO LMS. The WFRS benefits from a robust and LMS to support record keeping and online training. The WFRS Training Division also supports training to the new ICO LMS to streamline the transition. EMG applauds the WFRS initiative to support the LMS transition.

4.9 Promotional Process

NFPA 1021: Standard for Fire Officer Professional Qualifications defines promotion as: "*the advancement of a member from one rank to a higher rank by a method such as election, appointment, merit, or examination*."[19].

EMG interviews with staff and management highlighted the importance given to the promotional process from the point of view of management seeking the best person to promote to supervisory rank and personnel in the context of their career advancement[20].

A solid job description is a first step, as well as an essential component of a successful promotion process. The job description at the very least should include the necessary skills, the

19 National Fire Protection Association, "NFPA 1021: Standard for Fire Officer Professional Qualifications," 2020 Edition, p.1021-8

20 Jack Abraham, Fire Rescue 1, "What is the Best Fire Service Promotional Process?" accessed November 1, 2023, https://www.firerescue1.com/fire-products/fire-department-management/articles/what-is-the-best-fire-service-promotion-process-QtgE4bROggmDxwNB/

necessary work performance requisites, the necessary qualifications, and who is eligible[21]. As a result of a review of the various WFRS job descriptions, EMG suggests that a qualification section be added to the WFRS job description format.

Another vital component is a written SOP. WFRS does have an SOP for promotional process – SOG HU 05.01-2016 – Retirement Notification & Promotional Process.

In addition, the design of the promotion process should be based on subjective and objective decision-making approaches for best results in selecting candidates for promotion. For instance, pre-screening of résumés against job functions from the job description with a weighted rubric is an excellent example of a subjective and objective decision-making approach. The WFRS utilizes a combination of promotional process systems to evaluate and select successful candidates.

However, the WFRS has one SOP pertaining to their promotional process and one SOP related to firefighter increment promotional process. EMG's review of the promotional process for Training Officer, Captains, and District Chief, as well as firefighter increment promotional process (from probationary to first class), identified a robust process involving training for personnel wishing to be promoted, as well as testing involving, a written exam, a practical exam, and an oral examination in front of a senior management team for the captain promotion and district chief promotion processes. A similar process is in place for personnel wishing to be promoted to a training officer position.

With respect to the firefighter increment promotional process, it is based on a three-year period for completion and the SOP identifies clear and concise objectives and goals for each increment. However, written details of the promotional process are lacking compared to the actual process diligently followed by the Training Division responsible for the firefighter increment process. EMG recommends that the WFRS update their Probationary to First Class Promotional Process SOP to include details (steps-by-steps) regarding the process.

With respect to the officer promotional processes, EMG did not identify SOPs related to Training Officer, Captain, District Chief promotional processes, except for an SOP for firefighter increment process (GO 03.01- 2020). The current Human Resources promotional process SOP is lacking in detail and does not conform to the current process. EMG recommends that WFRS develops detailed SOsP for each rank on the promotional process system, including Training Officer, Captain, and District Chief promotional processes.

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21 Jack Abraham, Fire Rescue 1, "What is the Best Fire Service Promotional Process?" accessed November 1, 2023, https://www.firerescue1.com/fire-products/fire-department-management/articles/what-is-the-best-fire-service-promotion-process-QtgE4bROggmDxwNB/

Section 4 - Recommendations

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
6	The WFRS initiate a Process Mapping Study to identify redundancy and areas for improvement to optimize staffing in the Fire Prevention unit. • Along with a study pertaining to the roles and responsibilities of the Deputy Chief of Support Services with a lens to evaluate workload.	Can be as much as $30,000 unless resources are available internally or from the City of Windsor.	Immediate (0 – 1 year)	Process mapping may contribute to up to 20% performance improvement. Increasing staffing and process mapping would allow the WFRS Fire Prevention Unit to meet anticipated future growth.
7	WFRS re-evaluate the need for an additional PFLSE position within the Fire Prevention Division.	Cost associated with one FTE estimated at $100,000, plus benefits (depending on starting range of the new PFLSE).	Short-Term (1 – 3 years)	WFRS had two PFLSEs in the past. Previously, there may have been appropriate reasons to eliminate the position. However, given the renewed emphasis and demonstrated benefits of the first line of defence, re-instating the position within WFRS Fire Prevention would have added value to the WRFS and the City of Windsor.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
8	WFRS Public Education Program be reviewed annually to help identify any areas for improvements.	**Staff time**	**Immediate (0 – 1 year)**	The benefit of an annual review ensures the inclusive reach of all demographic groups in the community, pertaining to race, gender, and age.
9	WFRS conduct an audit to identify buildings requiring an inspection and to establish a frequency inspection schedule that would be manageable for WFRS, while optimizing community safety.	**Staff time**	**Immediate (0 – 1 year)**	Best practices for frequency inspection schedule arrange occupancy types by level of risk and prioritize level of risk commensurable with 1-year, 2-year, or 3-year inspection rotations.
10	WFRS revamp their proposed 2011 Fire Prevention policy through the lens of the NFPA 1730 and implement the updated policy with accompanying SOGs, detailing specific functions of fire inspection, fire investigation, and public fire and life safety education.	**Staff time**	**Immediate (0 – 1 year)**	A policy would assist fiscal and operational monitoring of the section, as well as service delivery standard.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
11	Create a career path model for all specialized functions/positions within the WFRS.	**Staff time**	**Immediate (0 – 1 year)**	Although the WFRS has a career path model for recruit firefighters and officer promotion, there is limited documentation regarding career path modeling for other specialised positions, such as fire prevention officer, fire investigator, public educator, telecommunicator, or technical rescuer.
12	WFRS consider a review of its organizational chart with a training-centric lens to ensure equitable training support to all WFRS divisions.	**Staff time**	**Immediate (0 – 1 year)**	The WFRS Training Division should not be under the tutelage of any specific deputy fire chief but rather between the two Deputy fire chiefs linked with a dotted line to leverage training support to the entire WFRS.
13	Increase the WFRS Training Division staffing by one Training Officer to meet anticipated growth and demands for training due to Ontario Regulation 343/22 and introduction of an electric vehicle battery plant within the municipality.	**One Full-time Training Officer at a cost between $111,250 and $114,700**	**Short-Term (1 – 3 years)**	Compounding factors contributing to inadequate staffing levels for the Training Division are the Ontario Regulation 343/22: Firefighter Certification, made under the *FPPA*, 1997 and the building of an electric vehicle battery plant (Stellantis). These compounding factors are accruing workload to the Training Division and necessitate consideration for the increase staffing to the Training Division by one training officer.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
14	WFRS Training Division ensures that any training props should be made to comply with NFPA 1402, *Standard on Facilities for Fire Training and Associated Props.*	**Staff time**	**Immediate (0 – 1 year)**	NFPA 1402 provides guidance for the planning of fire service training centers, focusing on the main components necessary to accomplish general firefighter training effectively, efficiently, and safely.
15	EMG recommends a study to evaluate the benefit of relocating the Training Division as part of future expansion of the WFRS fire stations in view of including training facilities that would support revenue generation beneficial to sustain and support the WFRS training programs.	**Study can be conducted in-house at limited costs. External consultant for such a study may cost upward of $50,000.00**	**Short-Term (1 to 3 years)**	The current training facility is aging and has limited capacity to train to the current levels of service. Considering the Ontario Regulation 343/22 and the expansion of testing and certification to all levels of service provided by WFRS, it would be beneficial to evaluate current capacity of the Training Division facility vis-à-vis relocating to a new facility that would account for the required expansion of the Training Division to meet growing needs.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
16	All technical rescue training should be monitored through the WFRS Training Division in adherence to the NFPA 1006: *Standard for Technical Rescue Personnel Professional Qualifications* and in accordance with Ontario Regulation 343/22: *Firefighter Certification*. WFRS aligns its technical operations and training to NFPA 2500: *Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services*.	Staff time	Short-Term (1 – 3 years) To align with O.Reg. 343/22 deadline of 1st of July 2026	With the adoption of Ontario Regulation 343/22: Firefighter Certification, made under the *FPPA*, 1997, as of July 1st, 2026, all fire department will have to meet the certification requirements addressed in the regulation. The NFPA 2500 Standard is primarily used by emergency response agencies to guide their technical rescue training, equipment, and operations
17	All in-house trainers supporting the annual suppression training program should be qualified to level 1 of the NFPA 1041: *Standard for Fire and Emergency Services Instructor Professional Qualifications*.	Staff time	Immediate (0 – 1 year)	The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the training resource capacity of the WFRS.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
18	Suppression staff be trained to Fire and Life Safety Educator Level 1 and that the WFRS operations Division captains also be trained as Public Information Officer, under the NFPA 1035.	**Staff time**	**Immediate (0 – 1 year)**	Suppression members contribute to public and life safety education through various WFRS initiatives. Suppression personnel and the WFRS in general would benefit from enhanced training in Public Fire and Life Safety Education.
19	WFRS Fire Prevention policy addresses training requirements and that the training requirements for Fire Prevention which is set at Level 2 of NFPA 1031: *Standard for Professional Qualifications for Fire Inspector and Plans Examiner* be added to the program development and delivery of the WFRS Training Division. Or at the very least, WFRS Training Division should vet the curriculum and arrange testing and certification to NFPA 1031 and 1035 for fire prevention officers.	**Staff time**	**Immediate (0 – 1 year)**	Fire inspection is a strong program within the WFRS. Training development and delivery are like public fire and life safety education concerning external training and coordination by the WFRS Training Officer. With the adoption of Ontario Regulation 343/22 and the certification requirements for fire prevention personnel, WFRS would benefit from the Training Division assuming a monitoring role and a curriculum design role to assure candidates' success from the provincial testing.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
20	WFRS dedicated fire investigators be concurrently certified to NFPA 1033 and NFPA 921. In addition, EMG suggests that fire investigation operations and training adhere to NFPA 1231: *Standard for Fire Investigation Units* and that the WFRS Training Division be responsible for monitoring, record keeping, testing, and certification to the said NFPA standards.	**Staff time and costs for attending the NFPA courses**	**Short-Term (1 – 3 years)** **To align with O. Reg. 343/22 deadline of 1st of July 2026**	NFPA 921 and NFPA 1321 documents complement NFPA 1033. Adherence to all three standards will assure best practices in training, equipment, and operations pertaining to fire investigation functions. training resource capacity of the WFRS
21	WFRS Training Division, at the very least, be responsible for record keeping and monitoring of EMS training requirements.	**Staff time**	**Immediate (0 – 1 year)**	The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the overall in-house tracking of programs.
22	WFRS update their Probationary to First Class Promotional Process SOP to include details (steps-by-steps) regarding the process.	**Staff time**	**Immediate (0 – 1 year)**	With respect to the firefighter increment promotional process, it is based on a three-year period for completion and the SOP identifies clear and concise objectives and goals for each increment. However, written details of the promotional process are lacking compared to the actual process diligently followed by the Training Division responsible for the firefighter increment process.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
23	WFRS develops detailed SOPs for each rank on the promotional process system, including Training Officer, Captain, and District Chief promotional processes.	Staff time	Immediate (0 – 1 year)	With respect to the officer promotional processes, EMG did not identify SOPs related to Training Officer, Captain, District Chief promotional processes, except for an SOP for firefighter increment process (GO 03.01- 2020). The current Human Resources promotional process SOP is lacking in detail and does not conform to the current process.

SECTION 5

Fire Suppression, Communications and Health & Safety

SECTION 5: FIRE SUPPRESSION, COMMUNICATIONS AND HEALTH & SAFETY

As has been noted, many fire departments in Ontario subscribe to the provision of fire protection services through three specific overarching strategies as ascribed by the OFM. These strategies are a) the delivery of public education programs intended to educate the community about fire risks, b) the enforcement of applicable legislation (the Ontario Fire Code) through applied inspection practices, and c) the delivery of effective fire suppression capabilities by the unique needs and circumstances of each particular community.

This section of the report focuses on the third strategy and perhaps the most visible aspect of the services provided by WFRS – emergency and fire suppression operations.

The analysis conducted by EMG included a review of all aspects of this Division including response data and other information that was made available to inform this report and generate the recommendations made.

5.1 WFRS Emergency Operations – Current State

There are currently 441 fire departments in Ontario with WFRS being one of the larger fully career-based departments currently serving their respective communities. Responding from seven fire stations with approximately 262 staff who are focused on the emergency response role, WFRS attend approximately 8,000 community emergencies annually and conduct thousands of hours of training to remain proficient in a variety of core skill sets.

FIGURE #9 – CITY WIDE RESPONSE DISTRICTS

The department's stations are strategically located approximately in the center of their respective response areas or zones as indicated on the following "District" map.

FIGURE #10 – STATION LOCATIONS

Stations 1, 2, 5, and 7 house two primary response vehicles each (Engine and Ladder), while stations 3, 4, and 6 are single truck stations (Engines or Rescue). Station 1 additionally houses

the Emergency Response Unit staffed by one firefighter. Stations 1 and 2 are also home stations for the two District Chief vehicles (Station 1: West Side District Chief, Station 2: East Side District Chief).

Anecdotally, Station 7 is perceived as somewhat of an island station by WFRS crews in that drive times for backup crews from adjoining stations are disproportionately long due to road configuration. This becomes more pronounced as the incidents move progressively in an easterly direction.

At the time of the preparation of this report, EMG understands that stations 1 and 4 are to be replaced, and there is potential to construct a new station in the near southwest area of the city. If this station comes to fruition, depending on its location, it could provide important backup for the Station 7 area as well as provide the necessary coverage for the development that occurs in that area.

The range of operational services provided has been developed as a result of a detailed risk assessment process and is endorsed by Council Policy as outlined in the E&R By-law. These services also coincide with the objectives of the Community Strategic Plan and include the following:

- Structural firefighting including rescue and interior fire attack
- Medical responses in support of paramedics
- Vehicle fire suppression on provincial highways and in-city roads/properties
- Grass and brush firefighting
- Limited (shore-based) marine firefighting
- Motor vehicle collision rescue on provincial highways and in-city roads
- HAZMAT response at the Technician and Specialist levels (Transportation incidents and the response to fixed sites including local industries, bridges, tunnels, and the airport)
- Other transportation incidents involving trains, aircraft, and watercraft
- Land-based water and ice rescue
- Public assistance responses (ambulance/police/public agency assistance)
- Mutual Aid responses to neighbouring communities for major fires
- Province-wide response for USAR and HAZMAT incidents upon request through the Provincial Operations Centre
- Public education and community risk reduction activities by in-service crews

5.2 Understanding Fire Behaviour / Fire Propagation Curve

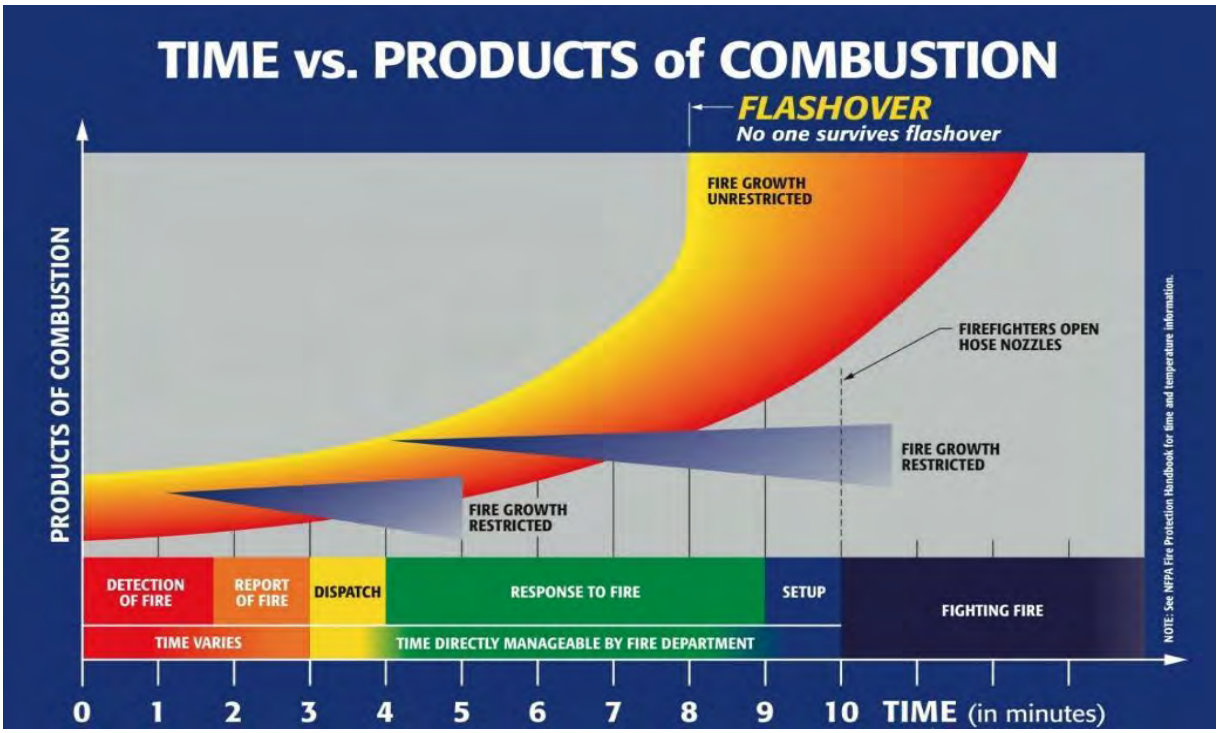
The suppression and extinguishment of fires are as dangerous as are complex, and the reader needs to have a foundational understanding of how fires develop and grow and the various influences that changing factors can have on outcomes. For this purpose, the discussion that follows will focus on fires that occur in residential structures (an average single-family dwelling) as these represent the greatest risk in terms of life safety to the residents of Windsor.

Except for an explosion that precedes a fire, once a fire inside a structure begins, it roughly doubles in size every 60 seconds where sufficient fuel (combustible materials – furniture, decorations, wall, floor coverings, etc.) and oxygen (air) are present.

Uninhibited, and without intervention efforts by the fire department, the fire will continue to grow, quickly consuming the fuel in the room of origin until it spreads to adjacent rooms or living spaces and eventually the combustible building elements as well, destroying the structure and its contents.

The diagram that follows depicts the fire propagation curve or continuing growth of the fire with the increasing passage of time. It is important to note that as the fire continues to grow, it produces vast amounts of toxic smoke and that temperatures within an enclosed area increase exponentially.

FIGURE #11 – FIRE PROPAGATION CURVE



One critical aspect of the fire continuum is the point at which "flashover" occurs. Flashover is understood to be a fire phenomenon wherein all the combustible items in a room (actually the superheated gases given off by the materials as they are exposed to radiant heat) ignite essentially at the same time, engulfing the room in fire from floor to ceiling. This is a non-survivable event for anyone.

Flashover times vary depending on the room configuration, air supply, and fuel "package" that is burning, but it has been documented to occur in as little as four to eight minutes in a modern structure. In older buildings, flashover can take 20 minutes or more to occur.

It becomes imperative, therefore, for fire departments to respond quickly once a fire is detected and for firefighting efforts to be initiated in as short a time as possible.

The diagram denoting the Fire Propagation Curve on the previous page illustrates the following variable time elements present in every fire:

- 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.
    - Drive Time – the time from when the crew advises dispatch that they are responding until the time that they report on the scene.
- Setup Time – the time it takes for the fire crews to stretch hose lines, connect to fire hydrants, etc. as they prepare to attack the fire.
- Fighting the Fire – actual time it takes to extinguish the fire.

The first two variables are outside of the control of the fire department and generally have the biggest impact on outcomes. The presence of working smoke alarms is naturally an issue that can impact the first variable and so not only do these devices save hundreds of lives every year in Ontario, but they also notionally afford the fire department a better opportunity to respond quickly and initiate rescue and intervention actions.

EMG also notes that external environmental factors can have an impact on fire growth, and in particular wind direction and velocity can significantly alter fire behaviour in a building.

5.3 Standards Defining Response Criteria, Levels, and Depth

Ontario has no defined criteria for any aspect of the provision of fire protection services at the community level apart from "Guidelines" developed for health and safety under the *OHSA*. None of the current 80 Guidelines - or "Guidance Notes" - directly address the issue of standardized response or staffing levels for fire services.

The primary piece of legislation governing fire services in Ontario is the *FPPA, 1997* and it provides for municipalities to set their levels of service to meet their own local "needs and circumstances" so it remains totally within the realm of the City Council to set the level of service that it deems proper for the protection of the city.

As outlined in Section 2 of this report, Windsor Council has expressed its policy surrounding the fire department administration and function, and thus the level of service, through language contained in the Fire Department E&R By-law. This is also expressed during the annual budget process.

Concerning fire suppression services, the E&R By-law (most recently revised in 2014) states the following:

> *"Fire suppression services shall be delivered in both offensive and defensive mode and shall include search and rescue operations, forcible entry, ventilation, protecting exposures, salvage and overhaul as appropriate with existing resources.*

The By-law then goes on to specify key performance indicators (response times) and other criteria such as special operations that are to be performed by WFRS.

Municipal councils, when defining and articulating service levels, must provide the appropriate resources that enable the policies they set to be followed and safely implemented by staff.

5.3.1 OHSA Section 21 Guidance Notes and NFPA Standards

In Ontario, the *OHSA* provides for the establishment of sector-specific committees whose purpose is to liaise with the Ministry (of Labour and Skills Development) to review safe labour practices. The Fire Service Section 21 Committee is made up of representatives from all elements of the sector and is one of the most proactive and prolific of all the sector committees. The Fire Service Section 21 Committee has researched and published 80Guidance Notes on a variety of topics intended to inform and guide fire departments. While not precisely "law", these guidance notes are referenced by Ministry of Labour investigators during complaint and workplace injury or death investigations.

In the absence of written regulations respecting certain elements of the delivery of fire protection services being engrained in law in this province, the fire service is consigned to reference what is widely accepted as other industry best practices - the NFPA standards – as they may be applicable.

EMG notes that *some* NFPA standards have been adopted in Ontario[22], notably firefighter training and qualification standards NFPA 1001, 11021, 1031, 1041, etc., and some aspects of selected standards regarding personal protective clothing.

For reference, the following two tables list the applicable fire service "Section 21 Guidance Notes" created under the authority of the *OHSA*, and the most relevant NFPA standards as they relate to WFRS fire suppression activities.

TABLE #10: OHSA SECTION 21 GUIDANCE NOTES

Guidance Note Number	Subject Matter
Section 1 – Apparatus and Equipment	
1-1	Fire Apparatus Occupant Safety
1-2	Apparatus Inspections and Maintenance Program
1-3	Backing Fire Apparatus
1-4	Archived
1-5	Life Safety Rope and Equipment
1-6	Inspections of Chains, Webbing, Wire Rope, and Extrication Tools
1-7	Electrical Equipment and Cords
1-8	Safety Considerations for New Apparatus
1-9	SCBA Air Cylinder Handling

[22] Province of Ontario, "O. Reg. 343/22: Firefighter Certification," accessed November 1, 2023, https://www.ontario.ca/laws/regulation/r22343

Guidance Note Number	Subject Matter
Section 2 - Communications	
2-1	Incident Command
2-2	Crew Integrity
2-3	Radio Communications
2-4	Incident Safety Officer
2-5	Archived
2-6	Archived
2-7	Reporting Exposures to Biological, Chemical, and Physical Agents
Section 3 - Environment	
3-1	Controlling Exposure to Diesel Exhaust
3-2	Asbestos
3-3	Heat and Cold Stress
3-4	Radiofrequency Awareness
3-5	Exposure to Noxious Weeds
Section 4 – Personal Protective Equipment	
4-1	Firefighters Protective Equipment
4-2	Eye Protection
4-3	Archived
4-4	Personal Alert Safety Systems
4-5	Archived
4-6	Archived
4-7	Wildland Firefighting and Personal Protective Equipment
4-8	Care, Maintenance, Inspection, and Replacement of Structural Firefighting Personal Protective Equipment
4-9	Respiratory Protection Program
4-10	Hearing Protection

Guidance Note Number	Subject Matter
4-11	Fall Protection from Elevating Devices
4-12	Archived
4-13	Personal Protection during Fire Investigations
4-14	Infection Prevention and Exposure Control Practices
Section 5 – Personal Accountability	
5-1	Firefighter Accountability and Entry Control
5-2	Considerations for Working Alone
Section 6 - Procedures	
6-1	Hygiene and Decontamination
6-2	Firefighting Near Water
6-3	Water or Ice-Related Emergencies and Training
6-4	Rope Rescue
6-5	Confined Space Rescue
6-6	Rapid Fire Progression
6-7	Driving Skills for Emergency Apparatus Response
6-8	Firefighter Safety During Lightning Storms
6-9	Hazardous Material / CBRNE Response
6-10	Traffic Safety and Control
6-11	Rapid Intervention Teams
6-12	Rehabilitation During Emergency Operations
6-13	Archived
6-14	Safe Roof Operations
6-15	Medication and Drug Exposure
6-16	Machinery/Electrical Lockout During Emergency Response
6-17	Clandestine Drug Labs

Guidance Note Number	Subject Matter
6-18	Unprotected Lightweight Building Construction
6-19	Hybrid/Electric and Electrical vehicle Safety
6-20	Electrical Hazards in Rescue and Fire Situations
6-21	Aircraft Firefighting Hazards
6-22	Ventilations Saws
6-23	Safety During Salvage and Overhaul
6-24	Building Collapse During Fire Situations
6-25	Safety Considerations for Fire Department Tankers
6-26	Structural Firefighting – Fire Streams and Ventilation
6-27	Fires in Industrial Dust Collectors. Hoppers and Bins
6-28	Rescue from Collapsed Trench
6-29	Prevention of Falls from Fire Apparatus
6-30	Pesticide Storage Fires
6-31	Agricultural Silos
6-32	Elevator Rescue
6-33	Hazards Created by Abandoned Buildings
6-34	Solar Photovoltaic Systems
6-35	Wind Turbines
6-36	Limiting Exposure to Fire Gases
6-37	Active Attacker Events
6-38	Carbon Dioxide Hazards
6-39	Hydrogen Sulfide Chemical Suicides
6-40	Working at Heights
6-41	Safety Around Helicopters
6-42	Training with Artificial Smoke

Guidance Note Number	Subject Matter
6-43	SCBA Air Management and Work Cycles
6-44	Hoarding Conditions
6-45	Pre-Incident Planning
Section 7 - Training	
7-1	Safe Training
7-2	Archived
7-3	Training Plans
7-4	Firefighter Survival Training and Self-Rescue Training
7-5	Live Fire Training Considerations for Training in Acquired Structures
7-6	Training Centres
7-7	Ground Ladders
Special Section 21 Committee Instructional Notes / Ministry of Labour Fire Service Directives	
Special (S.21)	Cancer Prevention Checklist
Special (MOL)	PTSD Prevention Program

TABLE #11: SELECTED APPLICABLE NFPA STANDARDS:

NFPA Standard Number	Subject Matter	Related S.21 Guidance Note (or other Legislation)
NFPA 472	Standard for Competence of Responders to Hazardous Materials/ Weapons of Mass Destruction Incidents	6-9 O.Reg. 343/22
NFPA 1001	Standard for Fire Fighter Professional Qualifications	O.Reg. 343/22
NFPA 1002	Standard for Fire Apparatus Driver/Operator Professional Qualifications	6-25, 6-26 O.Reg. 343/22
NFPA 1006	Standard for Technical Rescuer Professional Qualifications	6-3, 6-4, 6-5 O.Reg. 343/22
NFPA 1021	Standard for Fire Officer Professional Qualifications	O.Reg. 343/22
NFPA 1081	The standard for Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services	4-9
NFPA 1142	Standard on Water Supplies for Suburban and Rural Fire Fighting	6-26
NFPA 1401	Recommended Practice for Fire Service Training Reports and Records	7-3
NFPA 1500	Standard of Fire Department Occupational Safety, Health, and Wellness Program	4-10, 7-3
NFPA 1521	Standard for Fire Department Safety Officer Professional Qualifications	2-4
NFPA 1561	Standard on Emergency Services Incident Management System and Command Safety	5-1
NFPA 1620	Standard for Pre-Incident Planning	6-45
NFPA 1670	Standard on Operations and Training for Technical Search and Rescue Incidents	6-3, 6-4, 6-5
NFPA 1710	The standard for the Organisation and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments	6-26
NFPA 1851	Standard on the Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting	4-8, 6-1
NFPA 1858	Standard on Selection, Care, and maintenance of Life Safety Rope and Equipment for Emergency Services	1-5
NFPA 1901	Standard for Automobile Fire Apparatus	1-8, 4-11, 6-10, 6-29

NFPA 1911	Standard for Inspection, Maintenance, Testing, and Retirement of Automobile Fire Apparatus	1-2
NFPA 1936	Standard on Powered Rescue Tools	1-6
NFPA 1971	Standard on Protective Ensembles for Structural Firefighting and Proximity Fire Fighting	4-1, 6-1
NFPA 1982	Standard on Personal Alert Safety Systems	4-4
NFPA 1983	Standard on Life Safety Rope and Equipment for Emergency Services	1-5, 6-5

5.3.2 Analysing NFPA 1710 – Standard for the Organization and Deployment of Career Fire Departments.

Perhaps one of the most significant NFPA standards that is cited concerning career or full-time fire departments such as Windsor is the NFPA 1710 standard - *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*.

The NFPA document is a very comprehensive document, and to provide the reader with a clearer focus on what the ultimate goals for emergency response criteria are, the NFPA suggests that staffing levels and response times should be used as primary performance measures (NOTE: Response times are discussed in Section 6.4 – Fire Response Data.).

When considering the fire response needs of a community, the fire propagation curve as previously illustrated presents a general understanding of how fire can grow within a furnished residential structure over a short period. 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 reviewing the response times of the fire department, the following impacting factors are important considerations:

- The distance between the fire stations and the response location

- The layout of the community
- Impediments such as weather, construction, traffic jams, lack of direct routes (rural roads), level railway crossings
- Notification time
- Reaction/drive time of the firefighters

Concerning the common house fire scenario, the Department should endeavour to meet the stated minimum response standards based on a response to a 2,000 ft^2 single-family dwelling. The dwelling (noted in the NFPA 1710 Standard) does not have a basement or other exposures (buildings close enough to each other to create a greater possibility for fire spread). It should be noted that most single-family residences in Windsor are built close enough to neighbouring properties to create an exposure risk for potential fire spread. Most also have a basement which must be considered by the department in its response efforts (finished basements, secondary apartments).

NFPA 1710 recommends a minimum of 16 firefighters be sent on an initial response for a single-family dwelling fire (17 if an aerial is used). The following table outlines the minimum tasks of the firefighters at a residential structure fire and the staffing required to complete each. Climate plays a large role in staffing at a fire as extreme temperatures diminish the physical abilities of those fighting the fire.

TABLE #12: NFPA 1710 INITIAL STAFFING REQUIRED AT A RESIDENTIAL STRUCTURE FIRE

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

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

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

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

All the previous information noted in the NFPA 1710 standard supports the need for each initial responding crew to be made up of four personnel. This provides for what is known as the "two in/ two out rule." In essence, for a team of two firefighters to enter a burning building with a hose line, there also needs to be two firefighters outside to assist and/or prepare for conducting a search and rescue as noted in NFPA 1710, sections 3.3.53.1 and 5.2.4.1.1.

NFPA 1710 (3.3.53.1)

- *Two members of the initial attack crew, positioned outside the IDLH (immediately dangerous to life and health), trained and equipped as specified in NFPA 1407 who are assigned for rapid deployment (i.e., two in/two out) to rescue lost or trapped members.*

NFPA 1710 (5.2.4.1.1)

The following section continues to support the need for at least four firefighters on the scene before any interior firefighting and/or rescue operations can occur.

- *Subsection 3: Establishment of an effective water flow application…with each handline operated by a minimum of two (2) members to effectively and safely maintain the line.*
- *Subsection 5: Provision of at least one victim search and rescue team with each such team consisting of a minimum of two (2) members.*

To add to this initial attack and support team for a total of four firefighters, there is also the requirement of another four members for a rapid intervention crew:

- *Subsection 8: At a minimum, an initial rapid intervention crew (IRIC) is assembled from the initial attack crew and, as the initial response arrives, a full and sustained rapid intervention crew (RIC) established (4).*

Highrise Fires & Staffing Requirements

If the single-family residence fire represents a "simple" fire scenario, it follows that it is reasonable to examine the requirements of a different fire scenario presenting a more serious threat to firefighters; one that is all too present in the City of Windsor – the high-rise risk.

The Table that follows outlines the resources required for a working fire within a high-rise structure about 75' or 23 m.

NFPA 1710, Article 5.2.4.4.1 states:

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

TABLE #13: NFPA 1710 INITIAL STAFFING FOR A HIGH-RISE FIRE

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

Function	Staffing Required
9. Provision of two or more evacuation management teams to assist and direct building occupants with evacuation or shelter actions, with each team consisting of a minimum of two members.	2
10. Provision of one or more members to account for and manage elevator operations.	1
11. Provision of a minimum of one trained incident safety officer.	1
12. Provision of a minimum of one officer two floors below the fire floor to manage the interior staging area.	1
13. Provision of a minimum of two members to manage member rehabilitation and at least one of the members to be trained to the ALS level.	2
14. Provision of an officer and a minimum of three members to conduct vertical ventilation operations.	4
15. Provision of a minimum of one officer to manage the building lobby operations.	1
16. Provision of a minimum of two members to transport equipment to a location below the fire floor.	2
17. Provision of one officer to manage external base operations.	1
18. The establishment of an initial medical care component consisting of a minimum of two crews each with one member trained to the ALS level, capable of providing immediate on-scene emergency medical support, and transport that provides rapid access to civilians or members potentially needing medical treatment. NFPA 1710 asks for four, members to be assigned to this task.	No staff required as this would be handled by Ambulance
Total effective response force, a minimum of 38 (38 due to the non-implementation of #18), 39 if the building is equipped with a fire pump.	38

Currently, the total on-duty minimum staffing per platoon for WFRS is 51 personnel. **It is crucial to note that the tables included in this section of the report identify the suggested *minimum* number of personnel that should be assigned on an *initial* response to the report of a fire.**

Additional resources are most certainly to be requested by the Incident Commander for any incident where a "working fire" is encountered. The location of victims who were overcome by the fire, or persons to be rescued by firefighters, will greatly complicate operations and require the response of additional fire crews to assist in the mitigation of the incident. Aside from

rescue, smoke migration, and fire spread will demand much more in terms of fire department resources.



NFPA 1710 also suggests minimum staffing requirements for two other commonly encountered types of structure fire responses – open-air strip malls (28 firefighters needed on the first alarm response), and garden-style apartments (28 firefighters needed on the first alarm response).

Typically, a fire department will set specific practices in place that direct response levels on 1st alarms, 2nd alarms, and so on, and in WFRS' case, these are built into the communications Computer Aided Dispatch System (CAD). WFRS are not meeting the parameters established in NFPA 1710 concerning the depth of the initial response to any of the identified response types defined by the standard.

5.4 Fire Response Data

While the entire scope of work undertaken by the team at WFRS is vital to the community, emergency response stands out as perhaps the most critical in terms of protecting the health and vitality of the community from the immediate threat that an uncontrolled fire represents. Indeed, the very roots of the organization are tied to one or more dramatic and devastating fires that occurred in the mid-1800s.

Every community wants an efficient firefighting force that can be called upon day and night, and that will respond quickly and efficiently to any threat that is occurring. Time is the adversary of all firefighters, and it is with this in mind that the City has entrenched Key Performance Indicators (KPIs) related to response time within the fire departments "Establishing and Regulating By-law". The By-law states:

"Key Performance Indicators Include: 4-minute response time (+60 seconds for call processing) 90% of the time for initial responding apparatus, 8 minutes (+60 seconds for call processing) for the second responding apparatus, and 11 minutes (+60 seconds for call processing) for the first arriving incident commander (chief officer)."

As part of their existing quality assurance processes, fire department administrators monitor this KPI regularly.

TABLE #14: AVERAGE RESPONSE TIMES, 90TH PERCENTILE

2014	2015	2016	2017	2018	2019	2020	2021
7:15	7:21	6:36	7:01	Not available	6:40	6:38	6:34

Response times are one of the most critical elements in terms of providing the most effective fire suppression and rescue service possible. The length of time it takes for fire crews to arrive at a fire incident and begin intervention measures is directly proportionate to the amount of damage being caused by the fire.

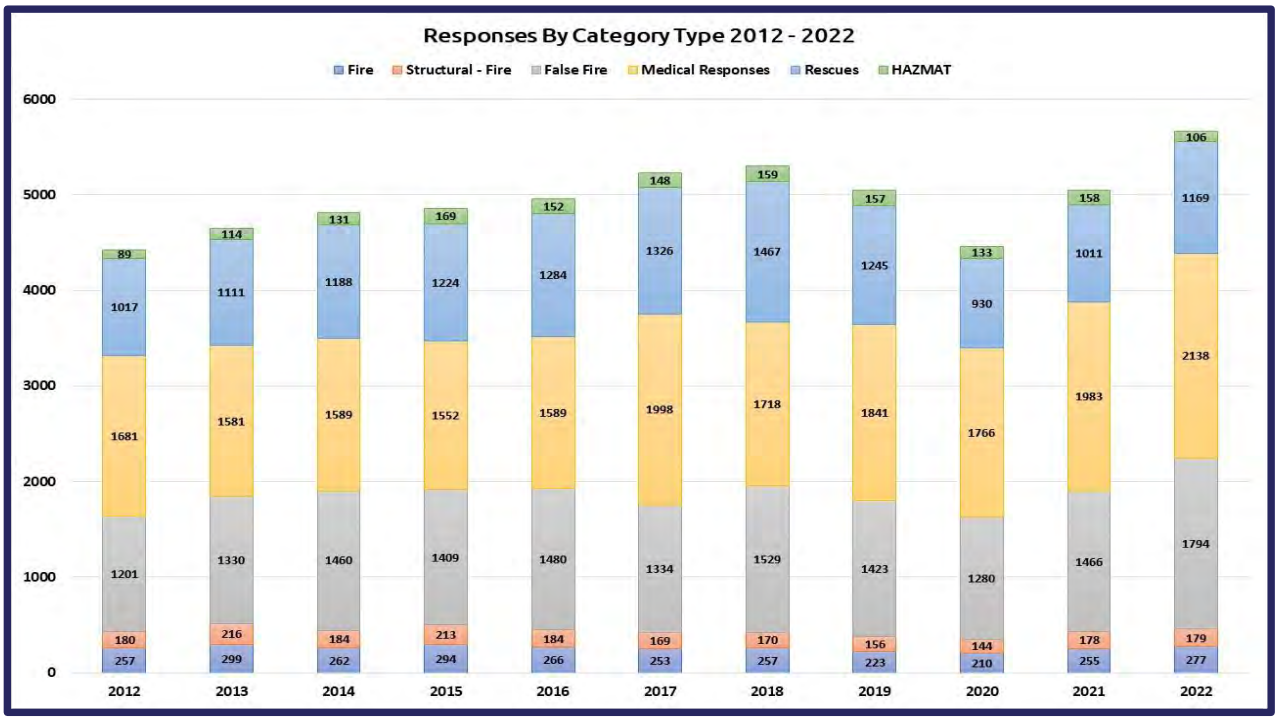
The previously noted NFPA 1710 Standards sets out a performance measure (response time target for the first arriving apparatus) of 6:39 (includes call answering, dispatch, and turnout time allotments – included in the WFRS times noted), 90% of the time. The data provided demonstrated that the WFRS has been achieving this target appreciably every year since 2019.

Note: Data for the year 2018 was not available due to a technical omittance in the data collection process; 2022 data was not available at the time of this report.

5.4.1 Total Number of Incidents

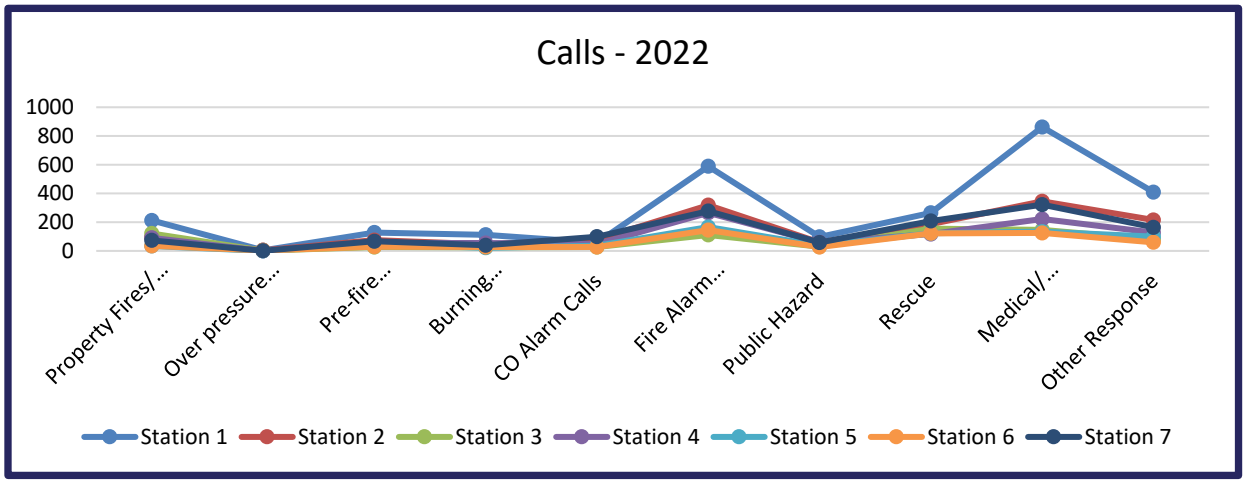
In 2022, the WFRS responded to 8,454 incidents, an increase of 27.6% - or 1,831 incidents - over the number of incidents responded to in 2012. A review of the data made available to EMG revealed that the number of incidents has steadily risen each year (except 2020 – perhaps attributable to the first year of the COVID-19 pandemic) and extrapolating the continuing growth and demand for services from the community, the department will surpass 10,000 responses by the year 2032.

TABLE #15: RESPONSES BY CATEGORY TYPE 2012-2022



Significant increases in the false alarm category (increased by 49%) and medical response category (increased by 27%) are noted over the years indicated. Total response activity (service demand) by station is illustrated by the graph that follows.

FIGURE #12 - 2022 RESPONSES BY TYPE/STATION



On average, the WFRS responds to 23 incidents daily.

5.4.2 Incidents by Type

For reporting purposes (to the OFM), incidents are broken down into ten incident types – fires or explosions, over-pressures, pre-fire conditions, controlled burning, CO alarm responses, fire alarm activations, public hazard, rescues, medical responses, and "other". The frequency of each incident by category changes somewhat from year to year, and the 2022 breakdown by type is illustrated below.

TABLE #16: 2022 RESPONSES BY TYPE

	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	2022
Property Fires/ explosions	212	95	121	91	34	35	73	**661**
Over pressure rupture/ explosion (no fire)	4	4	2	0	0	3	1	**14**
Pre-fire conditions/ no fire	128	75	27	55	45	29	67	**426**
Burning (controlled)	112	46	25	55	22	27	39	**326**
CO Alarm Calls	57	77	27	47	36	27	99	**370**
Fire Alarm Activations	589	318	111	265	166	145	277	**1871**
Public Hazard	98	58	29	59	36	27	58	**365**
Rescue	265	187	155	117	123	122	208	**1177**
Medical/ Resuscitator Call	862	345	146	222	134	125	322	**2156**
Other Response	409	215	80	127	100	60	164	**1155**
Totals	2736	1420	723	1038	696	600	1308	8521

The continued growth in the number of false alarms is problematic because these must be treated as actual fires from the onset, and the response to these represents both a waste of resources and a risk in terms of the diversion of resources that might otherwise be available for genuine emergencies. The increased risk to firefighters and the general public in terms of the potential to become involved in a collision with fire trucks responding under emergency conditions is a very real and present hazard as well.

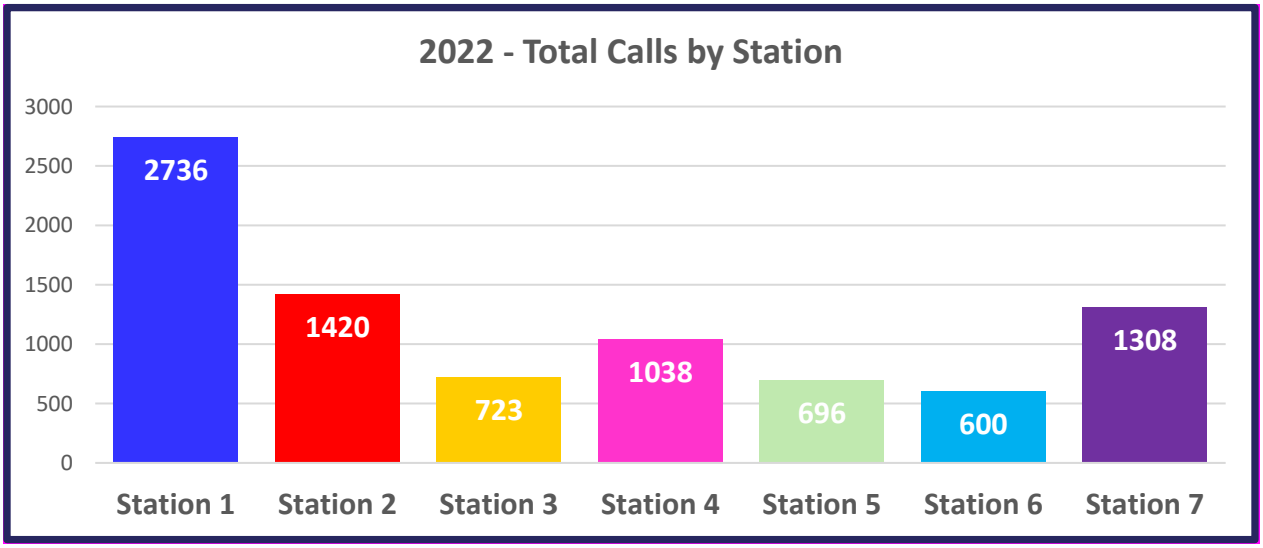
WFRS and the City have been proactive in terms of providing disincentives to property owners that experience frequent false alarms (through cost recovery efforts outlined in the fees by-law), and yet these statistics continue to climb.

Some fire services have introduced a practice whereby only the first responding vehicle on an alarm activation (with no confirmation of fire by someone on site), responds with lights and sirens – the other apparatus responding do so under normal driving conditions thereby lessening the risk of a collision without impairing response times.

6.4.3 Incident Responses by Station

In terms of response activity by station, stations 1 and 2 in the downtown core area remained the most active in terms of overall responses in 2022, with Station 7 in the east end of the city being the next busiest. This pattern has been consistent for the last 5 years.

FIGURE #13 – 2022 TOTAL RESPONSES BY STATION



As noted elsewhere in this report, Station 7 is somewhat more isolated than the other stations and consequently, backup trucks from adjoining stations can take longer to arrive for significant incidents. The WFRS adjusted station truck crew assignments slightly such that both the Engine

and Ladder at this station are routinely crewed by a minimum of five firefighters (compared with a minimum crew size of four on other Engines and Ladder trucks in the city).

Other Data Points of Note

TABLE #17: NUMBER OF CIVILIAN FIRE DEATHS

2014	2015	2016	2017	2018	2019	2020	2021
2	1	3	1	2	5	1	2

TABLE #18: RESIDENTIAL FIRE FATALITIES PER 100,000 POPULATION

2014	2015	2016	2017	2018	2019	2020	2021
0.95	.047	1.38	0.45	0.45	2.20	0.43	0.87

Figures 12, 13, 14, and 15 are HEAT maps that graphically illustrate *where* the greatest concentration of incidents are occurring within the city.

FIGURE #14 – 2019 -2021 CALL CONCENTRATION DENSITY MAP

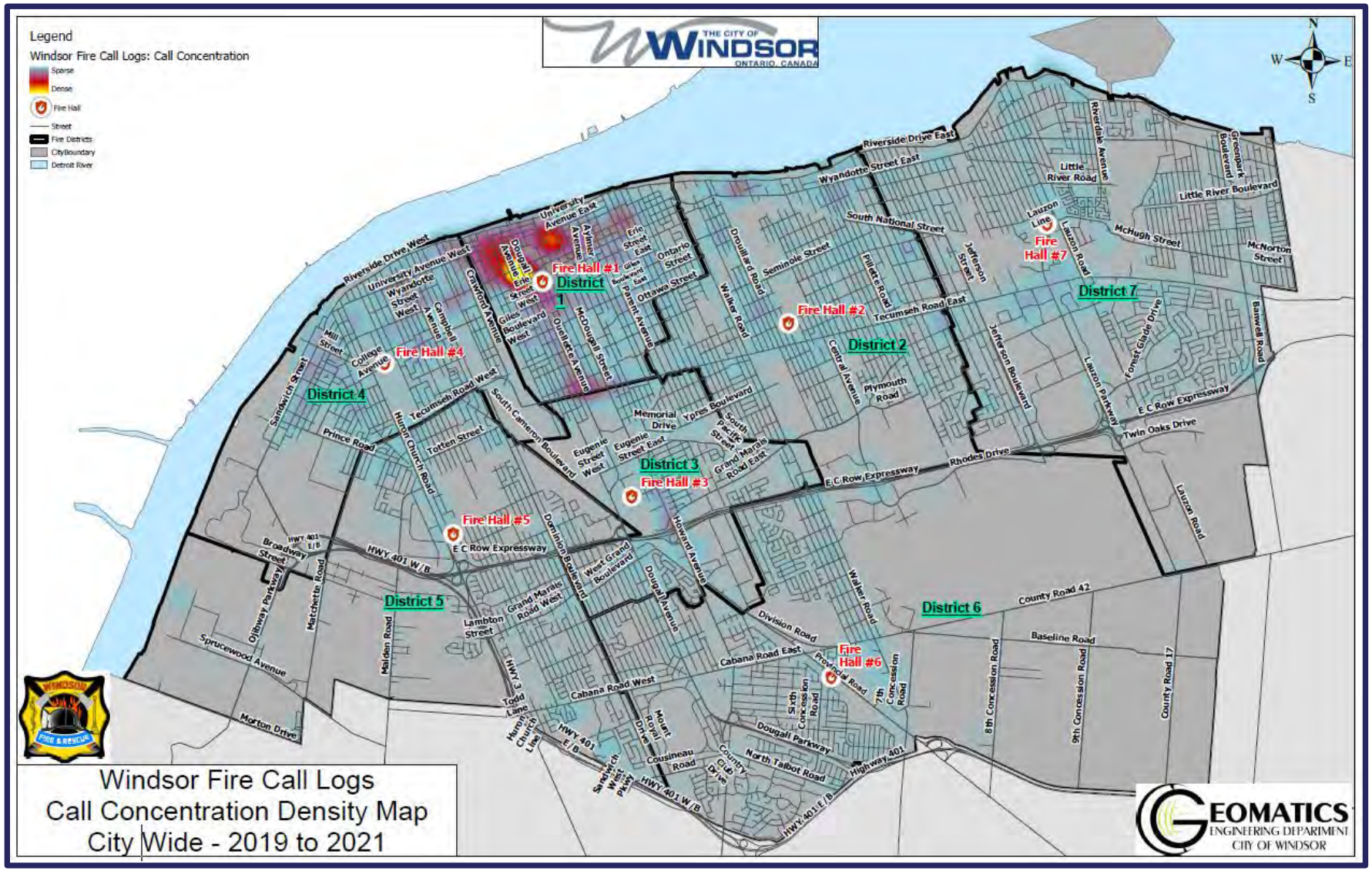


FIGURE #15 – 2019 - 2021 FIRE ALARM ACTIVATION CALL DENSITY MAP

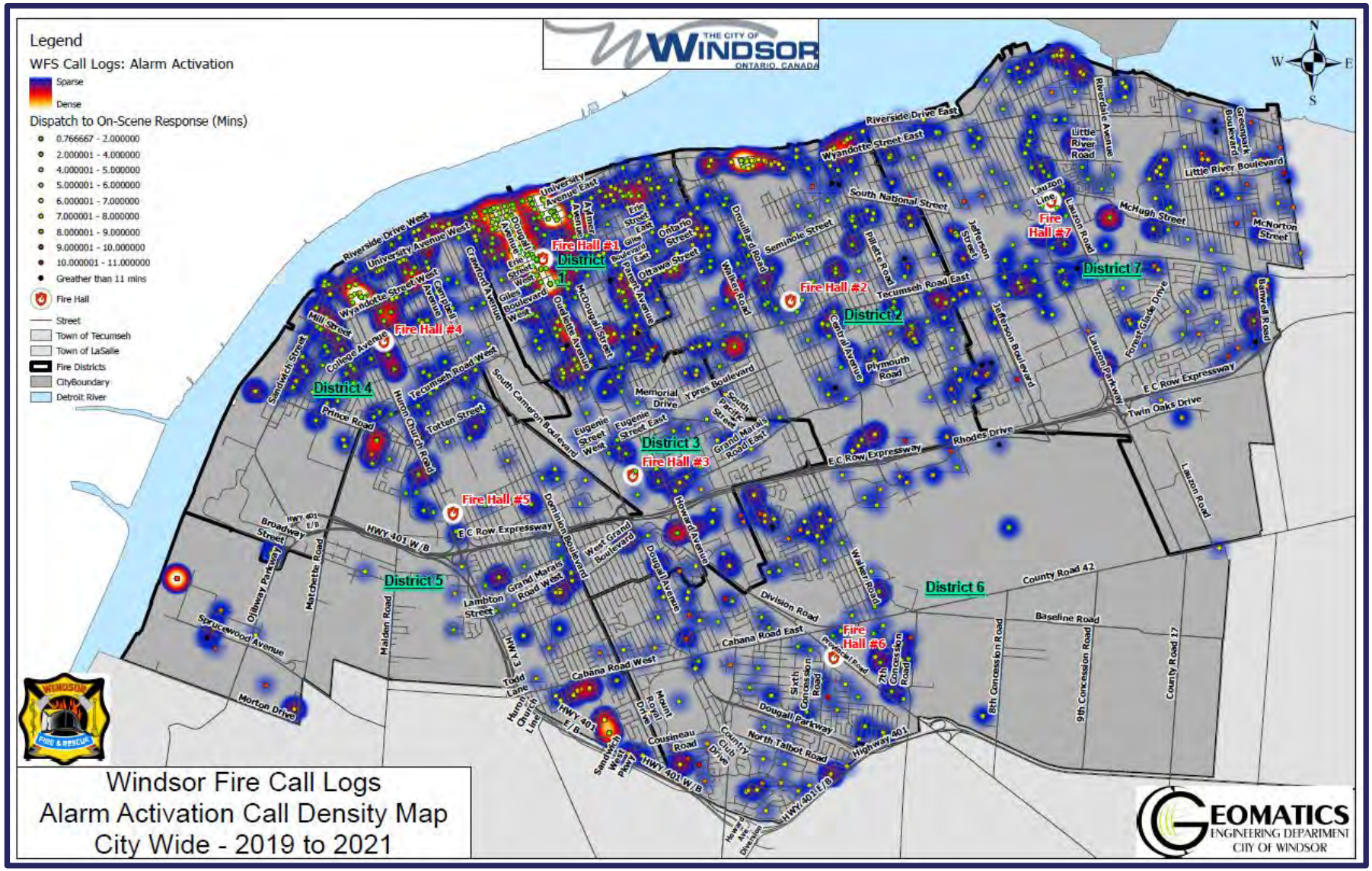


FIGURE #16 – 2019 – 2021 MEDICAL CALL DENSITY MAP

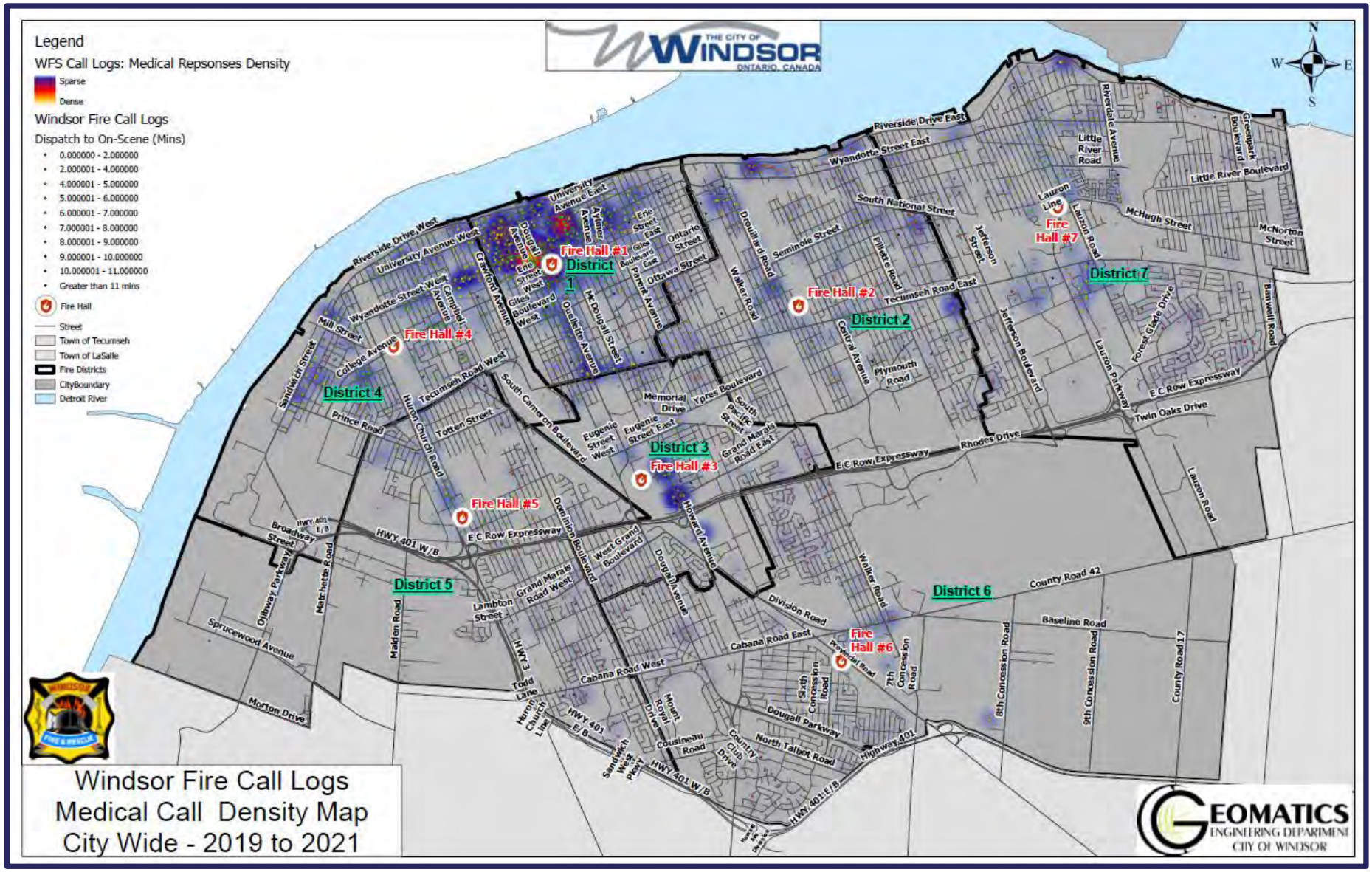
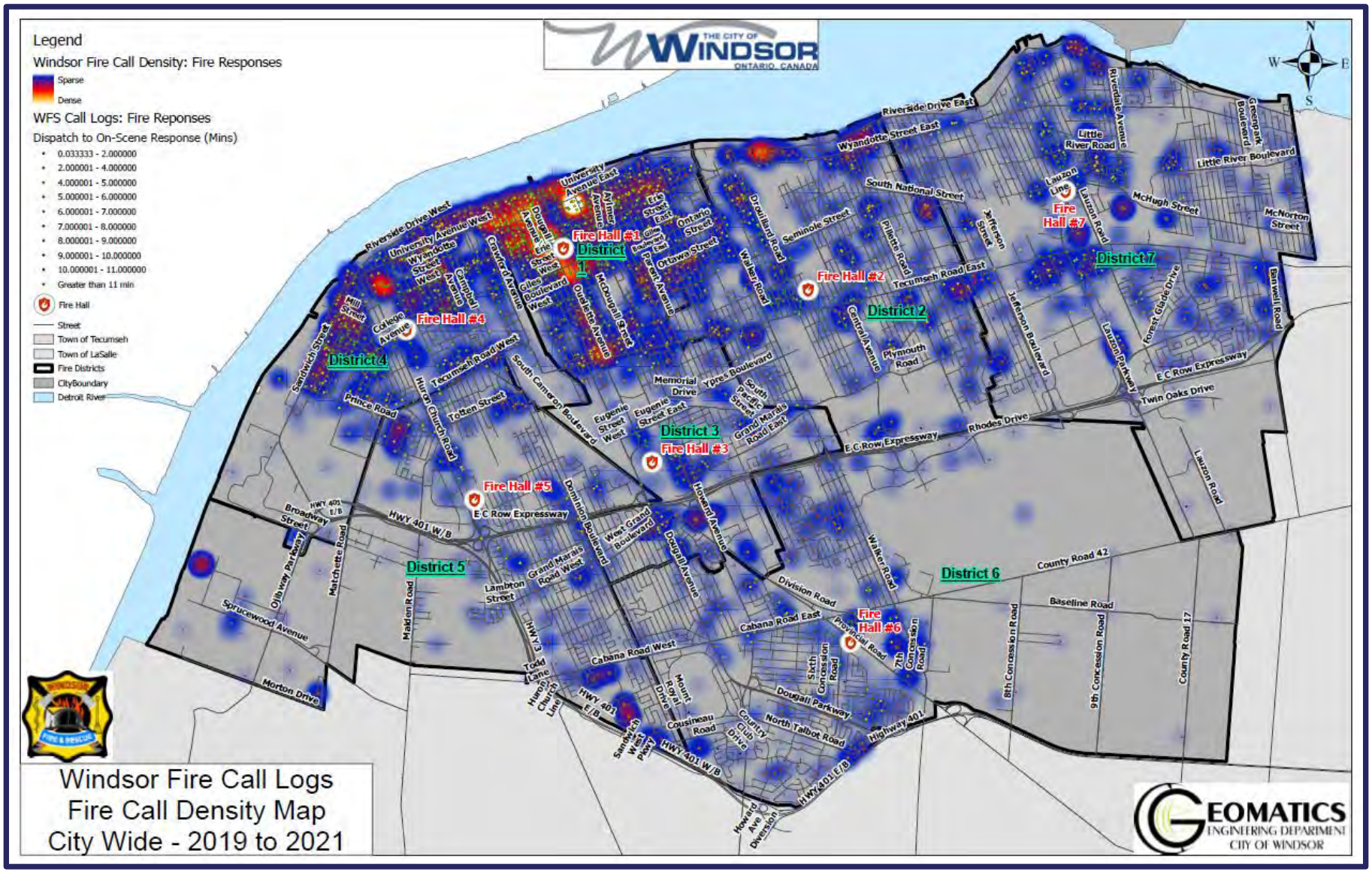


FIGURE #17 – 2019-2021 FIRE CALL DENSITY MAP



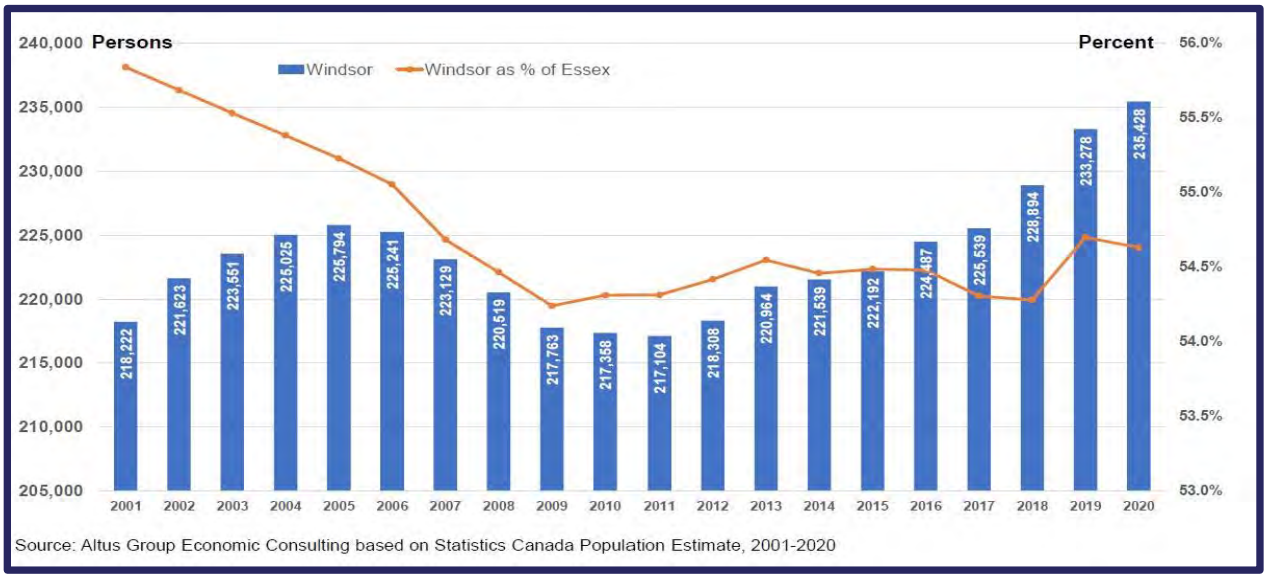
5.5 Community Growth and Intensification

Communities throughout Ontario continue to grow, and currently, Ontario's population is projected to grow 43.6 per cent, or almost 6.6 million, over the next 24 years, from an estimated 15.1 million on July 1, 2022, to almost 21.7 million on July 1, 2046.[23].

Concerning the city itself, census data shows a population of 210,875 in 2011; 217,195 in 2016; and 229,660 in 2021; the latter being a 5.7% increase[24].

In 2021, Windsor had 87,840 residential households.

FIGURE #18 – CITY OF WINDSOR POPULATION GROWTH



Continued growth estimates by planning staff estimate that this trend will continue with an estimated increase of 8.6% between the years 2020 and 2041, bringing the population of the City of Windsor to 239,989 by the year 2041[25]. One projection in the same report suggested that the population of the city could increase by almost 40,000 people in that same time frame.

[23] Statistics Canada and Ontario Ministry of Finance Projections, https://www.ontario.ca/page/ontario-population-projection, accessed March 28, 2023.

[24] Statistics Canada, "2021 Census of Population geographic summary: Windsor, City (CY) [Census subdivision], Ontario, accessed on March 18, 2023, https://www12.statcan.gc.ca/census-recensement/2021/search-recherche/productresults-resultatsproduits-eng.cfm?LANG=E&GEOCODE=2021A00053537039

[25] City of Windsor/Altus Group Economic Consultants, Multi-Residential Interim Control By-law Report, January 2022

Most of this growth is forecasted to take the form of mixed-use properties including housing taking the built form of single-family dwellings and apartment complexes.

WFRS staff have observed much of the recent growth is occurring in mid-rise (4-6 storey) construction which aligns with the province's overall community planning strategies that promote the notion of "intensification" (sometimes referred to as "densification") in respect of urban land use. Planning staff has also advised that significant industrial and "Eds and Meds" type development is also anticipated.

Together with the focus on intensification, Windsor is looking to infilling opportunities for low and medium-density development, notable on the City's southeast side. EMG's understanding is that some of this will occur in advance of large-scale infrastructure projects which will ultimately be necessary to properly service this area of the community.

Stormwater management is a concern as well, as is the propensity for high-water events in areas of the community which may be located below traditional lake levels.

It is important to underscore the impact that this has and will have on the fire department's depth of response capacity (incident staffing).

As has been noted, firefighting operations are labour-intensive undertakings, and they become more so as the effort moves above (or below) grade level. It takes more staff, and more time to bring the necessary tools and implements to bear on a fire when this equipment must be manually transported "up". For this reason, the notion of response time by the fire department becomes secondary to the length of time it takes to place initial fire attack lines into operation. This additional time allows a fire in its growth stage to intensify, multiplying the extinguishment operation that must be brought to bear on fire in this type of environment.

Apart from this, it is important to understand the impact of new 24-hour occupied developments (i.e., the NextStar Energy facility and the new hospital) will have on incident response volumes. While Ontario's fire services are well situated to deal with traditional fire and rescue-related challenges, the ongoing development of battery-related technology is still evolving.

There will be pressure from the development community to reduce certain aspects of the municipal standards that all communities utilize to define and design their communities. Road width will be one of these.

EMG suggests that these attempts should be resisted as narrower roads will significantly impact access in emergencies – notably in the winter months when snow removal becomes a challenge. As the following photo illustrates, snowpack and accumulation can narrow road widths by four meters or more making it very difficult for large apparatus to access neighbourhoods.

If this happens, the risk of bigger, more destructive fires becomes more prevalent, and in newer building types (i.e., combustible multi-storey buildings) this is a recipe for disaster.

Photo: snow-narrowed roadway.

5.6 Staffing

The arbitration award of 2013 that saw the working conditions of firefighters change (the move to a shorter workweek) had an unquestionable impact on fire department operations. Though carefully and creatively managed at the time, the net effect of this change alone eventually resulted in fewer staff being rostered across the now engrained four-platoon shift schedule. As has become standard practice across Ontario for career-based fire departments, firefighters in Windsor work on a 24-hour shift schedule. While call volumes continued to rise, staffing was essentially stagnant except in 2015 when eight new personnel were brought on board (two additional staff per shift).

On any given day, the WFRS fields 12 large apparatus across the city's seven stations – six engine companies, four ladder companies, one rescue company, one Emergency Service Unit (ESU), and one tanker truck (for rural operations).

The CRA recently completed for the City of Windsor attempts to quantify the risks in terms of building stock and this information taken together with future community growth expectations over the next 10 years along with increasing incident response volumes provides ample evidence that increased investment in the fire services is warranted.

Other Relevant Data Points

TABLE #19: FIRE SUPPRESSION STAFF PER 1,000 POPULATION

2014	2015	2016	2017	2018	2019	2020	2021
1.16	1.2	1.193	1.169	Not available	1.138	1.117	1.123

TABLE #20: TOTAL NUMBER OF FULL-TIME STAFF

2014	2015	2016	2017	2018	2019	2020	2021
290	298	303	303	303	304	304	305

5.6.1 Work Cycles

Structural firefighting is labour intensive work. Wearing and working in the protective clothing ensemble adds considerable weight to their physical frame; increases their core temperature, blood pressure, and respiration rates; and can place extreme demands on their cardio-vascular system – all the while exposing them to the many carcinogens that are present at a fire. The

physical exertion of pulling hoses, raising ladders, and carrying and using heavy, cumbersome equipment is exhausting.

During interviews conducted by EMG with operational staff, one of the concerning themes that emerged was that fire crews routinely are forced (by circumstances) to regularly return to fireground activities without adequate rehabilitation periods at major incidents.

Many fire services like WFRS have established the practice of rotating crews operating at major incidents into a formal rehabilitation sector at a longer duration incident after they expend one or two air cylinders (each with a working time of 20-30 minutes). This, helps to ensure that the firefighters are provided with time to recuperate before being reassigned to another fireground task.

The WFRS senior management are aware of the long-term health effects of working till fatigue sets and should be commended for working with on scene staff, as much as possible to alleviate situations in which fatigue may set in through the rotation of staff. Like all professional athletes, physical exertion requires replenishment of fluids, rest, and the ability to disconnect from the activity being conducted for adequate rest periods.

There can be linkages between overtime costs and the specific issue of fatigue, as such, it would be worth evaluating if these possible linkages exist within WFRS.

TABLE #21: OVERTIME COSTS OPERATIONS/SUPPRESSION DIVISION 2018-2022

Year	Budget	Actual
2018	1,213,331	1,442,732
2019	1,346,350	1,578,936
2020	1,346,350	1,646,358
2021	1,346,350	2,310,424
2022	1,346,350	4,446,672

Other Relevant Data Points

TABLE #22: RATE OF EMERGENCY SCENE INJURIES – FIREFIGHTER (EXCLUDING EXPOSURES)

2014	2015	2016	2017	2018	2019	2020	2021
5.7%	5.9%	6.6%	5.8%	7.4%	7.7%	5%	10.1%

To meet immediate staffing needs as described in this section of the report, EMG recommends that 20 new firefighting positions be hired in the short-term, and 20 additional firefighters be hired in the mid-term to address the current and future community risks that exist.

If Station 8 materializes in the southeast corner of the city, eight of the firefighters currently assigned at Station 7 (as fifth crew members on the Engine and Ladder trucks) could be reassigned as part of one of the groups of 20 firefighters noted. This would bring the apparatus staffing assignments at Station 7 into alignment with the other stations and serve as a cost mitigation strategy for the recommended hiring in that one of the groups could be reduced from 20 new FTEs to 12 in number.

One of these crews should be assigned to Station 7 in the City's east end; the other to Station 4. EMG suggests that these crews could staff smaller, more maneuverable mini-pumpers (squads) to relieve wear and tear on larger apparatus for medical calls and carry mission-specific equipment (SEE ALSO Section 5.8.1 – Marine Unit).

Note that this recommendation does not include staff that would be required if a new Station 8 is constructed on the southeast side of the city.

5.7 Unique Community Operational Risks

The City of Windsor has several unique risks that are present within the City's boundaries and fire department response area. These include the international borders at the Ambassador Bridge and the (soon to be completed) Gordie Howe International Bridge, the Michigan Central Railway tunnel, and the Detroit-Windsor automobile tunnel that traverse under the Detroit River, the University of Windsor campus, the Chrysler production facility, the Windsor Airport, the soon to be combined hospital campuses, the NextStar Energy battery plant, and a variety of occupancies housing vulnerable Ontarians (nursing homes, homes for the aged, etc.) to name but a few.

To illustrate the impact of these unique facilities, WFRS responded to 436 incidents at university-owned properties between 2012 and 2022.

Photos: Unique community shown: University of Windsor, Chrysler Canada Plant, and Home for Vulnerable Ontarians.

A significant fire at any of these properties has the potential to affect a great many people and impact the economic vitality of the city.

One aspect that some of these risks share are unusually large floor areas and large open floor spaces with relatively few natural openings. A fire in such an area can cause a large volume of smoke to accumulate. This presents an extreme ventilation challenge in terms of the fire department's ability to remove smoke and replace it with fresh air. To the credit of WFRS, the do have a large capacity exhaust fan at their disposal for just such incidents.

The proliferation of abandoned or vacant properties within the City presents a special hazard for firefighters in that advanced fires in these properties can occur before the fire department receives notification, and there is always the question of whether vagrants and others may be inside. Firefighters must then risk entering what may be an ill-maintained structure, weakened by exposure to the elements, in an often-vain attempt to search for someone who may or may not be present. A "No Search" policy for these structures is not viable because frequently squatters are located inside these buildings. Maintaining these structures in a secure state is a never-ending challenge for property owners in many cases, yet it is a responsibility imposed on them by legislation[27].

Pre-Planning visits by fire department staff can go a long way in preparing for fires at all of these risks, and while currently, the department does building-specific or area-specific familiarisation, there is no formal or extensive pre-planning effort currently conducted.

NFPA 1620 – *Standard for Pre-Incident Planning* provides an informative text for developing such a process. EMG recommends that WFRS implement such a program in the short-term for vulnerable occupancies (nursing homes, etc.) high-risk industrial properties, multi-unit

[27] Province of Ontario, O. Reg. 213/07: Fire Code, subsection 2.4.7 Vacant Buildings," accessed November 2, 2023, https://www.ontario.ca/laws/regulation/070213

dwellings, commercial business districts, institutional occupancies (hospital, university), assembly occupancies, and office type structure, the international crossings, and the airport.

Though not the same, WFRS completes response plans for special events planned and held throughout the city. These response plans summarise the specifics of the event and general response concerns. These plans vary in complexity and generally provide a degree of intelligence sharing for operational crews that may be called upon to respond to the event itself, or nearby properties. This could be considered a best practice; however, the content could be enhanced with additional information from allied agencies such as police and EMS where this is made available.

5.7.1 Windsor International Airport – YQG

Windsor International Airport (YQG) spans 2,200 acres of land, of which approximately 1,100 acres have been identified as surplus. This surplus has been designated for a variety of commercial aviation, non-aviation, and industrial development, which is outlined in the 20-year Airport Master Plan from 2010.[28]

Photo: Airport main terminal building and control tower.

As it currently sits, the airport stands as an important transportation hub, being used by regular Air Canada, Porter, Sunwing, and Flair airline passenger services. It is a significant economic driver for the community and could become even more so as the vision of it becoming a "cargo village" continues to come into clearer focus.

The airport property is also home to several important business interests that maintain a physical presence at the facility including AAR Aircraft Services, Centario Aviation, Gateway

[28] Windsor International Airport, "Land Development", accessed November 2, 2023, https://flyyqg.ca/business/land-development/

Aviation, Skylinks Express, and WCS Aviation. In addition, the site is the home of the Windsor Flying Club and the Canadian Aviation Museum.

The airport operates its own Emergency Response Services (ERS) and as such, it has primary response duties for any incident involving the many types of aircraft utilizing the Airport. WFRS responds as a backup to the airport ERS crews in the case of an aircraft incident, but typically this takes the form of responding to an identified perimeter staging area only. Regular inter-agency training between ERS and WFRS is not regularly scheduled, though the Department does participate in live emergency response drills periodically as required by Transport Canada regulations.

It is not uncommon for aircraft to encounter emergencies immediately after take-off or on approach to airport properties, making an off-airport crash scenario conceivable.

Between 2012 and 2022, WFRS responded to 54 incidents at the airport. Annual training focussing on airport operations (including radio procedures), pre-incident planning, aircraft recognition and hazards, and aircraft rescue and firefighting operations for its crews should be renewed.

5.7.2 Bridges and Tunnels

Being an international border community, Windsor has several components of infrastructure inventory that pose unique threats in terms of operational responses for fires, HAZMAT incidents, and even rescue situations.

Photos: Windsor-Detroit railway and automobile tunnel.

Between 2012 and 2022, WFRS attended 27 incidents related to the tunnels and 36 incidents related to the Ambassador Bridge.


Photos: Ambassador Bridge and Gordie Howe Bridge (under construction).

A crash or derailment – particularly one involving a rescue of trapped persons or the release/spill of hazardous goods – will present a significant challenge to first responders on several fronts including emergency access, water supply, ventilation of smoke or noxious fumes, patient egress from the site, and, depending on the location, inter-agency cooperation, and communications with U.S. counterparts. Inject an element of national security into the equation, and the incident will have the propensity to expand exponentially.

EMG recommends that WFRS review its emergency response protocols for tunnel and bridge operations in concert with allied agencies on both sides of the border to strengthen relationships and update procedures respecting rescue, crash, firefighting, derailment, hazardous material, and terrorism/border security response tactics and procedures.

5.8 Special Operations

The Fire Department E&R By-law ascribes additional duties to the department including medical responses, vehicle extrication, water and ice rescue, rescue from building collapses, and the response and mitigation of HAZMAT incidents. The department has embraced most of these disciplines and is continually building upon skill sets and equipment inventories to properly and safely conduct each of these activities.

5.8.1 Medical Responses

Medical-related responses accounted for almost 26% of the incidents undertaken by Windsor firefighters in 2022. These responses draw heavily on available resources and are provided to enhance and safeguard the quality of life enjoyed by ratepayers. Medical responses are aimed at improving patient outcomes in terms of their recovery from accidents and illnesses, particularly in the area of cardiac emergencies and trauma-related injuries.

Windsor fire crews have a very positive working relationship with EWEMS and directly supports that service in providing pre-hospital care, although there is currently no direct financial incentive for doing so.

EMG recommends that WFRS undertake a comprehensive analysis of medical responses in respect of response times relative to EWEMS arrival, patient outcomes where WFRS initiates life-saving measures, and other potential efficiencies that may be derived from such an analysis.

EMG is aware of other jurisdictions in Ontario where fire departments are compensated for cost recovery by the local EMS provider and recommends that WFRS explore this issue further as a means of securing at least partial program cost recovery.

5.8.2 Urban Search and Rescue and Hazardous Materials Teams

Concerning the response to building collapses and HAZMAT response, the Department has partnered with the Province of Ontario through MOUs with the OFM to provide these services to other communities in Ontario in exchange for annual funding for operational needs and training support.

The USAR Team is one of only four such teams in the Province, and similarly, the HAZMAT Team is one of only six that are part of the Provincial Response Plan for these types of emergencies.

Photo: WFRS USAR Team joint training with Ottawa Fire Services.

EMG has reviewed both of these MOUs and notes each is contemporary in construction and is affording the department with the support it requires for these two disciplines.

5.8.3 Other Rescue Disiplines

Noteworthy is the fact that the E&R By-law also provides that the Department should be providing Confined Space Rescue, Trench Rescue, and High Angle Rope Rescue; however it is not doing so, and these services are not immediately available in the City of Windsor. Each of these rescue disciplines and the rescue situations they contemplate are "high risk, low frequency" events, and are very demanding in terms of both training requirements and the equipment necessary to perform each.

EMG recommends that WFRS establish the necessary budget and training programs to implement these rescue disciplines, or that these services be deleted from the E&R By-law.

In addition, EMG notes that the E&R By-law does not specifically mention the involvement of the WFRS USAR program with the Provincial Response Program, and this should be added to the next iteration of the By-law.

5.8.4 Marine Unit

Given the proximity of the City to the international border that bisects the Detroit River, the recreational boating activity and commercial boating activity that occurs on the river, and the collective risk that these represent, the absence of WFRS assets to assist with emergencies on the river represents a gap in the fire protection and rescue capabilities currently available. In addition, the potential role that such a unit could play in shoreline and environmental protection cannot be overstated especially when considering that the City's drinking water supply originates with the river. WFRS' current water rescue operations are limited to shore-based rescues and overland flood threats. However the department does not effect water resuces on the Detroit river. EMG recommends that this be better clarified in the E&R By-law.

Photos: Windsor's waterfront and pleasure craft fire.

Additionally, the Windsor Yacht Club (east and west Harbour), Riverside Harbour, the Lakeview Park Marina, and the east side port operations all present significant risks in terms of fire, fire propagation, and the associated environmental concerns should a fire or fuel spill occur in this

area. The limitations of land-only-based fire response and suppression present a formidable challenge.

Photos: areas along the city's westerly shore.

Photos: Windsor Port Authority area along the west shore.

EMG notes that the department did at one time operate a marine unit, but the unit was disbanded in the early 1980s and the assets related to this unit were disposed of.

EMG recommends the re-establishment of a marine Unit with a properly sized vessel that affords the ability to provide fire attack/control, rescue, and spill mitigation along the City's waterfront.

REVIEW

Photo: Canadian manufactured fireboat operated by Kingston Fire

Notionally, the marine unit could be "incident staffed" by an additional crew of properly trained firefighters assigned to Station 7 (presuming the vessel would be located/docked at Lakeview Park Marina) who would respond to traditional responses to bolster the Station 7 personnel in an additional response vehicle (i.e., mini-pumper/squad).

Photo: example of smaller format engine/squad with full capacity pumping capability.

The re-establishment of the WFRS marine unit will create and enhance opportunities to foster inter-agency relationships with agencies whose core missions complement that of the fire department. The Windsor Port Authority, Windsor Police, EWEMS, Coast Guard (both Canadian and U.S.), Detroit Fire, U.S. Department of Homeland Security, and the Canada Border Services Agency are but some of these agencies.

For complete disclosure, it must be understood that the training required for those who would staff such a unit is somewhat complex and will require careful planning to ensure federal boating regulations are strictly adhered to.

5.9 Fire Service Best Practices

Fire services in Ontario, including Windsor's, have evolved dramatically since their inception some 180 years ago. Each fire department grows and changes with its particular community's demographics and risk profile to meet community expectations and requirements. And while virtually all fire departments operate similarly, using similar tools, they all have their unique characteristics and practices based on their experience and community idiosyncrasies.

In terms of operational nuances that are individualized to Windsor, EMG examined several other components of the WFRS fireground delivery model as it exists and where changes might be made.

5.9.1 Operational Guidelines

The vast majority of fire services prescribe their practices through multiple documents referred to as "Operational Guidelines". WFRS currently have approximately 240 SOPs, some of which are stale-dated and overdue for review or revision. Best practices suggest a three-year review cycle for these important documents.

In many departments, the term Standard Operating Policy/Procedure has given way to "Standard Operating Guideline" (to be less prescriptive and more flexible) and more recently to "Operating Guideline" (in recognition of the changing needs for a more flexible and customized approach to individual emergencies with the understanding that certain elements of a process need to be homogenous and remain consistent from an efficiency and safety perspective).

It should be noted that any such document issued by the department effectively becomes an "order" authorized by the fire chief, and therefore may be considered as written instructions from the employer as required by Sections 25 and 26 of the *OHSA* (with all of the implications that this portion of the legislation conveys).

There are several procedural documents that EMG suggests could be consolidated as well as several existing policies that seem redundant. There are additional documents entitled Notices, Orders and Safety Alerts which are issued from time to time.

EMG has reviewed the WFRS SOPs, and concerning operational issues, several topics should be reviewed and updated by WFRS. These include but are not limited to:

- Rural Water Supply Operations
- Response to Chemical Suicides
- Marine Emergencies
- Response to Potentially Violent Situations (active shooter, terrorism)

- Response to Suspected Clandestine Drug Labs and Grow Operations
- Water/Ice Rescue Operations
- Railway Emergencies
- Tunnel/Bridge Response
- Airport Responses/Aircraft Emergencies
- Adverse Weather Events and Operations
- Hostile Fire Events
- Cold Weather Pumping Operations
- Crew Resource Management
- Child in Need of Protection
- Notebooks
- Fluorinated Chemicals

EMG notes the existence of the *OHSA* Section 21 Guidance Notes mentioned previously and an attempt should be made to conduct a gap analysis to ensure each of these is reflected in some way in the Department's doctrine.

5.9.2 Operational Strategies and Tactics

The collective history and experience of the WFRS have created a well-founded "extinguishment culture" within the operations section of the department and a firmly established reputation of being aggressive in terms of its approach to fire suppression and rescue activities. This is commendable.

5.9.3 Incident Command

To its credit, WFRS utilizes and follows the "Blue Card Command" program for its incident management needs. This program is recognized as one of the best such programs in North America for protecting communities and providing for safe and effective fireground operations. Every line and Chief officer within the WFRS environment is a beneficiary of this program and the department has its instruction staff who are regarded as subject matter experts.

5.9.4 Post-Incident Analyses

The importance of continual learning is important for any individual, and so it follows that most major incidents yield important lessons to be learned and shared within the organization. Integration of lessons learned into training programs is also important if the organization is expected to improve.

WFRS employs a Post-Incident Action Review (PIAR) process that is described in some detail in SOP FI 01.01-2017. While this SOP describes three levels of post-incident analysis, the process is not being followed as originally developed.

Currently, "tailboard debriefings" with individual crews do frequently occur as led by the company officer, and in the case of a significant incident, a senior chief officer will meet with the Incident Commander to review radio traffic and operational issues that arose. Together, they dissect the incident response details. The senior chief documents these, however, this is where the learning stops. A more detailed analysis as described by the SOP for a "Level 2 or 3" post-incident analysis (PIA)

does not appear to be done by practice. Information is not currently shared widely with the organization as a whole or the Training Division.

EMG recommends that the PIAR SOP be refreshed to reflect current practices and that formal PIARs be conducted for incidents that meet a predetermined threshold. In addition, it is recommended that each PIAR be documented thoroughly and that an annual summary of all PIARS occurring in a calendar year be prepared with all operational staff, and the Training Division so that lessons learned can be incorporated into future training sessions.

5.9.5 Fluorinated Chemicals, Firefighting Foam, Protective Clothing

Recently, much has been made about firefighting foams as many contain per- and poly-fluoroalkyl substances (PFAS) generally known as fluorinated chemicals. These compounds are harmful to the environment and can cause adverse health effects in humans. Currently, the WFRS utilize at least two types of Class A/B firefighting foams (name brands: FireBull A/B, and FireAde).

More introductory information about this issue can be found here:

Per- and poly-fluoroalkyl substances (PFAS) - https://www.canada.ca/en/health-canada/services/chemical-substances/other-chemical-substances-interest/per-polyfluoroalkyl-substances.html

Firefighting Foam & PFAS: What You Need to Know - Vanguard - https://vanguard-fire.com/firefighting-foam-pfas-what-you-need-to-know/.

It is important to understand that many firefighting foams for airport applications also contained PFAS at one point in time, so it would be prudent for WFRS to investigate what product it and the airport crews both use currently and have used previously.

The use of fluorinated chemicals has permeated everyday life in a variety of consumer products in the world as well (e.g., Teflon), and the Section 21 Committee is currently developing a Guidance Note for fire departments on this subject matter.

Very recently, it has been determined that virtually every manufacturer of firefighter protective clothing utilizes PFAS when constructing the turnout coats and pants that every firefighter in North America currently wears. WFRS are currently monitoring developments respecting this issue closely.

5.10 WFRS Emergency Operations – Future State

The creation of this FMP is intended to guide the future development of services provided by WFRS. Change in our lives occurs, and being prepared for the future cannot be a passive activity. Technology in particular will impact the future of WFRS, as will the ability to keep abreast of, and in some cases ahead of, impending change.

5.10.1 Technology

Technology is advancing at a rapid rate and every fire department struggles to one degree or another to keep abreast of changes that might make them more efficient or operationally more effective. In recent years, firefighters have seen vast improvements in technologies they are already using. Thermal imagers, personal protective clothing, battery-powered rescue tools, and voice communications are ready examples of how WFRS is keeping pace with these advances.

Mobile Data Terminals, Unmanned Reconnaissance Vehicles (drones), training simulators/virtual reality trainers, fireground deployed lasers (for measuring building movement), firefighter location and physiology monitoring, Compressed Air Foam (CAF), and robotics are examples of technology yet to be exploited to their full potential in Windsor.

This does not suggest that WFRS is poorly equipped – the opposite is true. Our review of the Department's operations reveals the organization to be generally well-equipped and well-prepared for the taskings they have been given, and yet change is occurring around us at an amazing pace. It would be prudent for WFRS to establish a team of staff members whose mandate is to investigate new technologies as they become available to the marketplace and evaluate whether they have deployment potential in Windsor. In some cases, it will be important to engage members of other corporate business units (i.e., Information Technology staff) to form part of the investigative team.

EMG recommends that a staff-driven team be established with a broad mandate for the review and analysis of newer technologies available in the Canadian marketplace for potential applications locally and for the addition to the WFRS cache of equipment.

5.10.2 Quality Assurance, Compliance, Emerging Practices

As entities become more and more sophisticated, their need for data and analysis becomes more complex. WFRS are no different in this respect and EMG believes there is a need to permanently establish a position within the organization that can focus on quality assurance initiatives such as monitoring statistics and KPIs; conducting PIAs and further analyzing and operationalizing recommendations from a broad corporate perspective; participating in recruit and officer development activities and developing and revising operational guidelines.

Monitoring current legislative and regulatory impacts on the organization and constantly examining fire service best practices are also part of keeping pace with a world that is constantly evolving to meet the needs of ratepayers.

Whether this person is a uniformed member, a civilian member, a deputy chief, a manager, an executive officer to the fire chief, or some other position is not as important as their ability to think strategically, constructively, and critically, and to be able to articulate their thoughts orally and in writing cohesively. This person must have the authority from the fire chief to execute their duties and

the respect and trust of the rank and file to effectively track data and develop sound business plans and introduce new business practices that are relevant and applicable to the fire service of tomorrow.

EMG recommends that a permanent staff position be created with a responsibility to develop and monitor quality assurance practices keeping WFRS at the forefront of the delivery of fire protection services that meet the needs of the ratepayers of the City of Windsor.

5.10.3 Additional Operational Oversight

The increasing volume of responses will likely necessitate that another level of supervision is added to the departmental hierarchy as 2030 approaches. The addition of the position of Platoon Chief to the shift rotation (4 FTEs) may provide the opportunity for increased oversight by another senior staff officer at significant incidents, lessening the burden on the Assistant Deputy Chiefs and District Chiefs, to a degree, while enhancing accountability. The Platoon Chief would also serve to lessen the administrative burden on the District Chiefs, freeing them up for more operationally oriented duties.

EMG recommends that, in the long-term, consideration be given to adding Platoon Chiefs (4) to the organizational structure of the department.

5.10.4 Encampments, Illicit Drug Use, Illegal Immigration

Increasingly, communities in all parts of Ontario are dealing with the real effects of a variety of social and health-related issues. Operationally, these all have the potential to impact the ability of WFRS to respond to community needs and a broader lens is necessary to ensure that Windsor firefighters are prepared to continue in their role as community helpers. Being a part of conversations and offering to be a part of solutions in many instances can be a nexus for change, and so EMG urges all members of the department to engage in these types of issues while maintaining a focus on community health and safety.

Community interaction and engagement are not restricted to those working specifically in Public Education activities, rather, each member of the department needs to contribute to solutions. Whether this means being a regular contributor at a community table, or simply conducting walkabouts with other service providers in disenfranchised or marginalized areas of the city, every such action contributes to a better Windsor.

The key element is to be engaged – it is not a job for someone else; it is a job for everyone.

5.11 Communications

The Windsor Fire and Rescue Emergency Communications Services is a state of the art resource centre that provides dispatching services to the City of Windsor and surrounding municipalities within Essex County, including Lakeshore, Leamington, Essex, Tecumseh and Amherstburg.

The communications staff work on a platoon system with three on duty during the day shifts that can go down to a minimum of two. Night shifts are staffed with two personnel. However, the desired staffing goal is to always have three on duty. This would provide a supervisor and two dispatchers on all shifts.

Windsor is moving towards meeting NFPA 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, but currently, none of the dispatchers are certified to this standard. This is something that will need to be addressed in the future to meet the OFM training and certification regulation for all fire department personnel.

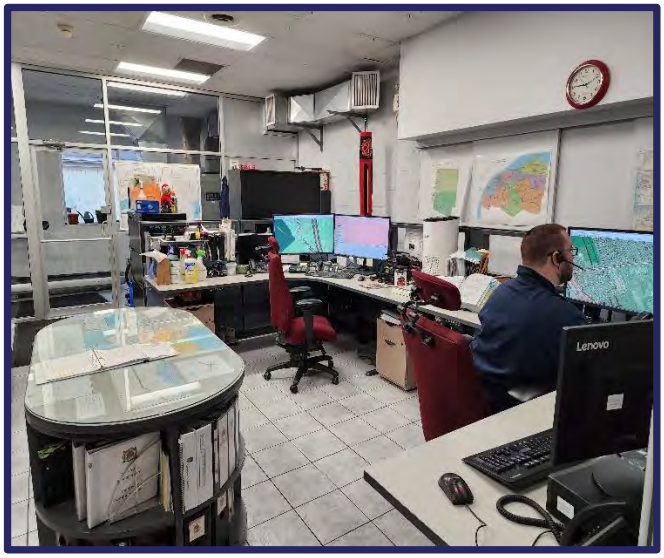
The NFPA 1221 notes the following dispatching requirements:

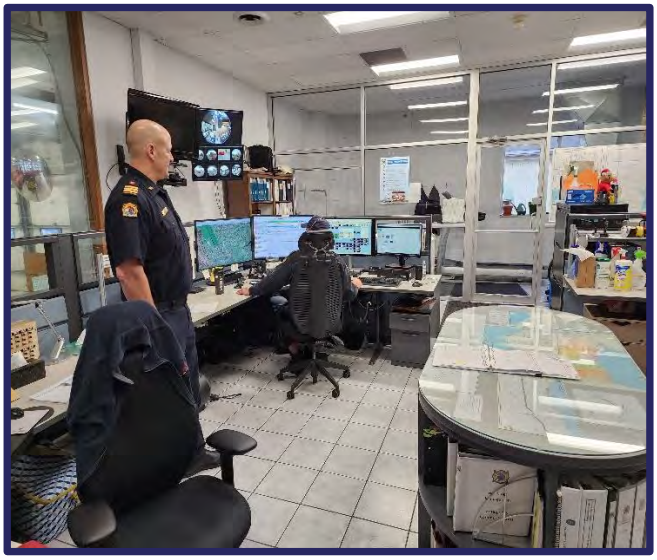
- 7.2.1 – Telecommunicators shall meet the qualification requirements of NFPA 1061 – Professional Qualifications for Public Safety Telecommunications Personnel, as appropriate for their position.
- 7.3.1.1 – The Authority Having Jurisdiction shall ensure enough telecommunicators are available to affect the prompt receipt and processing of alarms and events needed to meet the requirements of Section 7.4.
- 7.4.1 – 95% of alarms received on emergency lines shall be answered within 15 seconds and 99% of alarms shall be answered within 40 seconds. (For documentation requirements, see 12.5.2.)
- 7.4.1.1 - Compliance with 7.4.1 shall be evaluated monthly using data from the previous month.

Dispatch is supported by a proper CAD software (CrySis) program that effectively assists with timely communication.

The Windsor dispatch centre is meeting the needs of the present staffing and dispatching levels, and it does have all the general amenities for staff well-being (see photos). However, the space is somewhat congested and does not allow for any future growth. Being that the communications centre is located on the first floor of WFRS headquarters, it is somewhat secure, but would most likely not meet the present standards for emergency services communications centres. This is something that will need to be implemented when a new headquarters is being designed and built.

The Windsor backup for dispatching is the Windsor Police Service.





Photos: Windsor Dispatch Centre.

Dispatchers are trained to NFPA 1061: *Standard for Public Safety Telecommunications Personnel Professional Qualifications*. However, due to the lack of training accessibility and availability, training is delivered via a 12-week in-house training program. EMG recommends that consideration be given to augmenting the present training through the utilization of the online Telecommunicator training offered through the Association of Public-Safety Communications Officials (APCO) Canada. Further, all Communicators should be trained and certified to the OFM requirements.

Being a Communications Operator is inherently stressful; dealing with upset or rude callers in traumatic situations, answering after-hours calls, and dispatching their own fire apparatus takes a toll on personnel. It is common for communications centers to have personnel off on stress leave due to Post-Traumatic Stress Disorder (PTSD). The City of Windsor has an Employee Assistance Program to aid those suffering from PTSD or other mental illnesses, and should be commended for this proactive, wellness initiative.

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

- Schedule breaks in a room that is away from the radio/phone console.
- Present opportunities to eat lunch away from the dispatch console.
- Present a chance to get some fresh air.
- Have an exercise bicycle available for use during quiet time as exercise is known to relieve stress.
- Train a firefighter to take over the communication operator's role for a brief period, so the operator may step away from the center and walk around the station during their break.

WFRS has implemented some of these initiatives, such as access to exercise facilities and a quiet room.

5.11.1 Next-Generation 9-1-1

The Next-generation 911 program is a mandated change to the 911 infrastructure, requiring upgrades to new technologies, to be in place by March 2025. Further information will be provided later in this report. While it is still not clear what changes will be required in the 911 system at local fire departments that purchase dispatch services from a Public Safety Answering Point or Secondary-Public Safety Answering Point, there should be consideration for potential financial impacts.

In June of 2017, the Canadian Radio-television and Telecommunications Commission (CRTC) created regulations regarding the Next-generation communications for 9-1-1 centres. This modern technology will:

> *"…enable Canadians to access new, enhanced, and innovative 9-1-1 services with Internet Protocol (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."*[29]

The following is an excerpt from the CRTC website regarding the program and its benefits for enhancement to public safety communications.

Establishment of new deadlines for Canada's transition to next-generation 9-1-1

The Commission sets out determinations in relation to new deadlines and other matters for the implementation and provision of next-generation 9-1-1 (NG9-1-1) networks and services in Canada, so that Canadians can access new, improved, and innovative emergency services with Internet Protocol-based capabilities. The Commission aims to maintain the NG9-1-1 framework roadmap for the establishment of NG9-1-1 networks and the introduction of NG9-1-1 Voice, albeit with new, extended deadlines.

Specifically, the Commission directs NG9-1-1 network providers, by March 2022, to, among other things, establish their NG9-1-1 networks, complete all NG9-1-1 production onboarding activities, and be ready to provide NG9-1-1 Voice, wherever public safety answering points (PSAPs) have been established in a particular region.

The Commission also directs telecommunications service providers (TSPs) to (i) make the necessary changes to support NG9-1-1 Voice in their originating networks that are technically capable of supporting NG9-1-1 Voice, including completing all NG9-1-1 production onboarding activities and

[29] Government of Canada, Canadian Radio-television and Telecommunications Commission, "Telecom Regulatory Policy CRTC 2017-182, Next-generation 9-1-1 – Modernizing 9-1-1 networks to meet the public safety needs of Canadians", last modified June 1, 2017, https://crtc.gc.ca/eng/archive/2017/2017-182.htm

testing activities, by 1 March 2022; and (ii) begin providing, by 1 March 2022, NG9-1-1 Voice to their customers served by networks that are technically capable of supporting NG9-1-1 Voice, wherever PSAPs have been established in a particular region.

With respect to the implementation and provision of real-time text (RTT)-based NG9-1-1 Text Messaging (NG9-1-1 Text Messaging), the Commission is not establishing new deadlines as part of this decision. Instead, the Commission requests that, once standards are sufficiently advanced with respect to RTT callback and bridging, the CRTC Interconnection Steering Committee (CISC) file a report with the Commission with recommendations related to the provision of NG9-1-1 Text Messaging for all stakeholders.

Further, the Commission directs, among other things, incumbent local exchange carriers (ILECs) to decommission their current 9-1-1 network components that will not form part of their NG 9-1-1 networks by 4 March 2025 or earlier if all the TSPs and PSAPs in an ILEC's operating territory have completed their transition to NG9-1-1.[30]

NG 9-1-1 Considerations

All municipalities must understand that there will be significant expenses for the fire dispatch to implement NG 9-1-1 and the WFRS will likely need increased fees for all fire departments it dispatches to cover these additional costs.

5.12 Rehabilitation and Wellbeing

The issue of the prevention of occupational disease is at the forefront of many fire service efforts to safeguard the well-being of its staff. Recently, the World Health Organization reclassified firefighting as its highest level of occupational risk for cancer. Cancer, in particular, is widely regarded as the most serious threat to firefighter health and wellness in contemporary fire service culture. In March of this year, the province added thyroid and pancreatic cancer to the existing list of 17 cancers covered under the presumptive legislation provisions relative to WSIB claims.

WFRS have taken a very proactive approach to this issue operationally by establishing a staffed "Emergency Support Unit" whose mandate is to provide on-scene firefighter rehabilitation (Rehab) services, air re-supply, and decontamination (Decon) services at significant incidents.

Similarly, cardiac health is as important to firefighters as cancer prevention, and the notion of firefighter physical fitness seems to be well-engrained in WFRS culture. That said, participation in any fitness regime is currently a voluntary notion for firefighters in Windsor. Even though the fitness

[30] Government of Canada, Canadian Radio-television and Telecommunications Commission, "Telecom Decision CRTC, Establishment of new deadlines for Canada's transition to next-generation 9-1-1", last modified June 4, 2021, https://crtc.gc.ca/eng/archive/2021/2021-199.htm

regime is voluntary, annual physician-conducted physicals are conducted annually, and auditory checks are made available to operations staff.

5.12.1 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.

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

It was noted during the fire station visits that all of the WFRS stations are equipped with a diesel exhaust extraction system 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 the station, the health concern has been greatly reduced.

In reviewing the PPE (also known as structural firefighting ensemble) program, it was noted the gear that is nearing ten years of age is being replaced proactively. 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:

> 1.1.2 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*".

Cancer prevention may begin at the scene of a structure fire. The bunker gear becomes laden with contaminants and smoke, and off-gas for some time after a fire. Through decontamination of firefighters at the scene of the fire and prohibiting wearing dirty gear back to the station or transporting it in the cab of the truck, further cancer prevention is accomplished. The department

should invest in some on-scene decontamination equipment and bags for transporting the bunker gear back to the station.

Apart from contamination of a firefighter's PPE, it is also necessary to decontaminate clothing worn beneath the firefighting ensemble, which is likely to become contaminated. This is another area in which WFRS has been proactive by installing washing machines and dryers at every station.

A fire department exposure report is completed each time a firefighter is exposed to the products of combustion.

5.12.2 Mental Well-Being

Like law enforcement, paramedics, and military personnel, firefighters are regularly exposed to critical incidents. A critical incident can be described as:

- A near miss that threatened the health and safety of a member of the Department. This can include a situation where a member of the department experienced an event that could have resulted in significant harm or was a close call for which they narrowly escaped significant harm.
- The suicide or attempted suicide of a co-worker.
- The sudden death of a fellow firefighter.
- The loss of a patient after a rescue attempt.
- The death or a critical incident involving a child.
- A prolonged rescue or incident with excessive media coverage.

Being regularly exposed to horrific events can lead to critical incident stress. Critical incident stress can best be described as a normal reaction to an abnormal traumatic incident. Exposures to critical incidents can impact firefighters later in life and it is essential to have a formal record of critical incidents to assist a firefighter for a workplace injury if they are struggling due to PTSD.

Mental health takes on a crucial importance in high-stress, high-risk work settings, such as those in which first responders operate, where their own functioning has serious implications for the health, safety, and security of the public they serve.

Municipalities generally have employee assistance programs, but these tend to have gaps when dealing with long-term mental health injuries because of continued exposure to extraordinary events. To hep address these noted concerns, WFRS has $30,000 annually that goes towards physician-supported peer team. And every person in the department has been trained on Road To Mental Readiness (RTMR) program.

Section 5 - Fire Suppression Recommendations

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
24	Twenty new firefighting positions should be hired in the short-term, and 20 additional firefighters be hired in the mid-term to address the current and future community risks. One of these crews should be assigned to Station 7 in the City's east end; the other to Station 4.	Firefighter would initially start at 4th class, which is approximately $70,000 plus benefits. (Cost for one full-time first-class firefighters is approximately $105,000, plus benefits).	Short- to long-term (1 – 10 years)	This will supplement existing staffing levels allowing greater depth of response and a greater ability to rotate firefighters into rehab at major incidents; provides for greater firefighter safety and potential for injury prevention, thus reducing WSIB and overtime costs.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
25	An update of the human resources element of this FMP should be conducted in 2030 to evaluate the need to hire an additional 20 firefighters based on community growth and risk as they will have developed to that point in time.	Firefighter would initially start at 4th class, which is approximately $70,000 plus benefits. (Cost for one full-time first-class firefighters is approximately $105,000, plus benefits).	Long-term (10 years)	To assess the impact of community growth on response times, response depth, WSIB, and overtime costs that develop over the mid- to long-term.
26	A full pre-incident planning program should be implemented for vulnerable occupancies (nursing homes, etc.) high-risk industrial properties, multi-unit dwellings, commercial business districts, institutional occupancies (hospitals, universities), assembly occupancies, office-type structures, international crossings, and airports.	Staff time	Immediate (0 – 1 year)	To afford fire crews the ability to gain foreknowledge (intelligence) of the water supplies and features/ threats of individual buildings that they may be called upon to operate in.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
27	The Department should establish annual training focussing on airport operations (including radio procedures), pre-incident planning, aircraft recognition and hazards, and aircraft rescue and firefighting operations for its crews.	Staff time	Immediate to Short-term (0 – 3 years)	Preparedness and safety issues for firefighters (who need to be intimately familiar with the risks and safety precautions to take).
28	The Department should review its emergency response protocols for tunnel and bridge operations in concert with allied agencies on both sides of the border with a view to strengthening relationships and updating procedures respecting rescue, crash, firefighting, derailment, hazardous material, and terrorism/border security response tactics and procedures.	Staff time	Immediate to Short-term (0 – 3 years)	Preparedness and safety issues for firefighters (who need to be intimately familiar with the risks and safety precautions to take).
29	The Department should undertake a comprehensive analysis of medical responses in respect of response times relative to EWEMS arrival, patient outcomes where WRES initiates life-saving measures, and other potential efficiencies that may be derived from such an analysis.	Staff time	Immediate to Short-term (0 – 3 years)	To establish and validate the business case for continuing involvement in this program and to assess the effectiveness of Departmental intervention efforts.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
30	The Department should explore the notion of program cost-recovery (training, consumables, response) from the County for providing first-response medical services as a means of securing at least partial program cost recovery.	Staff time	Immediate to Short-term (0 – 3 years)	Reduce the impact of operational costs by identifying a revenue source.
31	The Department should establish the necessary budget and training programs to implement the rescue disciplines of Confined Space Rescue, High Angle (Rope) Rescue, and Trench Rescue OR these services be deleted from the E&R By-law.	Staff time	Immediate to Short-term (0 – 3 years)	The current Council policy (as expressed in the E&R By-law) is that the department is to carry out these functions, however, it is neither equipped nor trained to do so, thus presenting liability on several fronts.
32	The Establishing and REgulating By-law should be updated to provide for the provision of Urban Search and Rescue (USAR) services as a Council-approved activity	Staff time	Immediate to Short-term (0 – 3 years)	To bring the By-law into compliance with current departmental practices.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
33	The Department should re-establish a Marine Unit with a properly sized vessel that affords the ability to provide fire attack/control, rescue, and spill mitigation along the City's waterfront.	Costs associated with the level of equipment and training required.	Short-term (1 – 3 years)	To establish a more complete fire rescue response and environmental protection capability to safeguard the recreational and commercial boating community and protect the waterfront.
34	The Post Incident Analysis (PIAR) process and SOP should be refreshed to reflect current practices and formal PAIRs be conducted for incidents that meet a predetermined threshold. In addition, it is recommended that each PIAR be documented thoroughly and that an annual summary of all PIARS occurring in a calendar year be prepared with all operational staff, and the training division so that lessons learned can be incorporated into future training sessions.	Staff time	Immediate to Short-term (0 – 3 years)	To allow for broader organizational learning opportunities.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
35	The Department should undertake a review of the firefighting foam and other products used by the city to ensure that the products used are fluorinated chemical free and that they represent the best solution for current and future needs.	Staff time	Immediate to Short-term (0 – 3 years)	Firefighter safety and environmental protection.
36	A staff-driven team should be established with a broad mandate for the review and analysis of newer technologies available in the Canadian marketplace for potential applications locally and in addition to the cache of equipment.	Staff time	Immediate to Short-term (0 – 3 years)	To facilitate the introduction of new technologies intended to increase efficiency and safety.
37	A permanent staff position should be created with a responsibility to develop and monitor quality assurance and related practices that will keep WFRS at the forefront of fire protection services delivery across the spectrum of services that meet the needs of the ratepayers of the City of Windsor.	$50,000 to $70,000.	Short-term (1 – 3 years)	A proactive measure that will allow for data monitoring and quality assurance practice implementation at a greater rate/degree than is currently being conducted.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
38	Consideration should be given to adding four Platoon Chief positions to the organizational structure of the department.	A Platoon Chief would be $130,000, plus benefits	Short- to mid-term (1-6 years)	As the population of the city increases and annual call volumes exceed 10,000 incidents, the Platoon Chief (one per shift) will allow for greater operational oversight while reducing the administrative workload on the District Chiefs. This position will increase command presence on the fireground, potentially reducing the span of control issues and increasing the efficiency of the Command Team.
39	Train and certify the Windsor Fire Communicators to the OFM requirements.	Staff time and cost of course.	Short-term (1 – 3 years)	Ensures that the communications staff are meeting OFM requirements.

SECTION 6

Fire Station Review

SECTION 6: FACILITIES, VEHICLES, EQUIPMENT & WATER SUPPLY

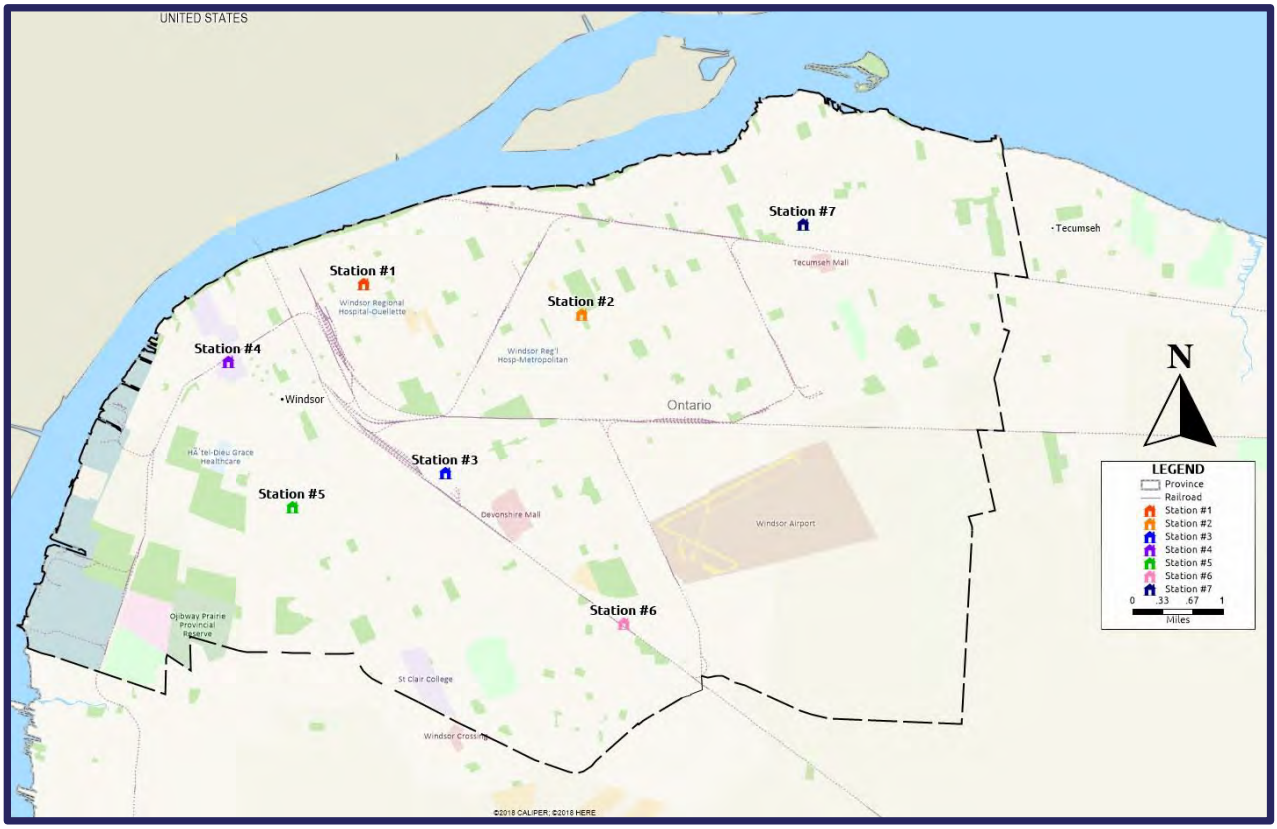
This section will assess facility needs and station locations. It will review existing facilities and provide recommendations for any future locations relative to current and future service delivery demands and applicable standards.

6.1 Fire Stations Review

Fire stations should be positioned to offer the most efficient and effective response to the community they serve. A recap of Figure #10 illustrates the current location of the WFRS fire stations. Centering them within a determined response zone that is simply based on timed responses is not always the best option to implement. Fire station locations depend on many factors such as key risks within the response zone, future growth of the community, and station staffing (full-time or volunteer firefighters). Another consideration is the geographical layout of the community that can include natural barriers or divides such as water that may make it necessary to have some stations located within proximity of each other.

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.

FIGURE #19 – FIRE STATION LOCATIONS



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

- Post-disaster engineered structure
- Emergency back-up power supply that energizes the entire station
- Gender-neutral washrooms, locker rooms, showers, and dormitory
- Barrier free access
- Negative pressure bunker gear storeroom
- Vehicle exhaust extraction system
- Water runoff separation tanks in the apparatus floor
- Emergency eye wash and decontaminations station
- Offices for the station officer and firefighters
- Study/training/meeting room
- Communications office (radio system to receive fire calls)

- Information Technologies room (i.e., phone, computer, radio, etc.)
- Kitchen with commercial appliances with fire extinguishing range hood and lunchroom
- Drive-through apparatus bays
- Lounge
- Fitness room
- Tool/repair room
- Station supply storeroom
- Clean maintenance room for cleaning/disinfecting and repairing items such as face masks, SCBA, medical equipment, etc.
- Bunker gear extraction machine and dryer
- Domestic washing machine and clothes dryer
- Emergency gas shut-off to cooking equipment including gas barbeques if connected to the building.
- Given that the station would be a 40–50-year investment, consideration of a new station must include amenities that may be required in the future.
- Red/green lights at the overhead doors to notify the drivers when the overhead door is fully open, and it is safe to leave the station.
- Safety sensors on the overhead doors

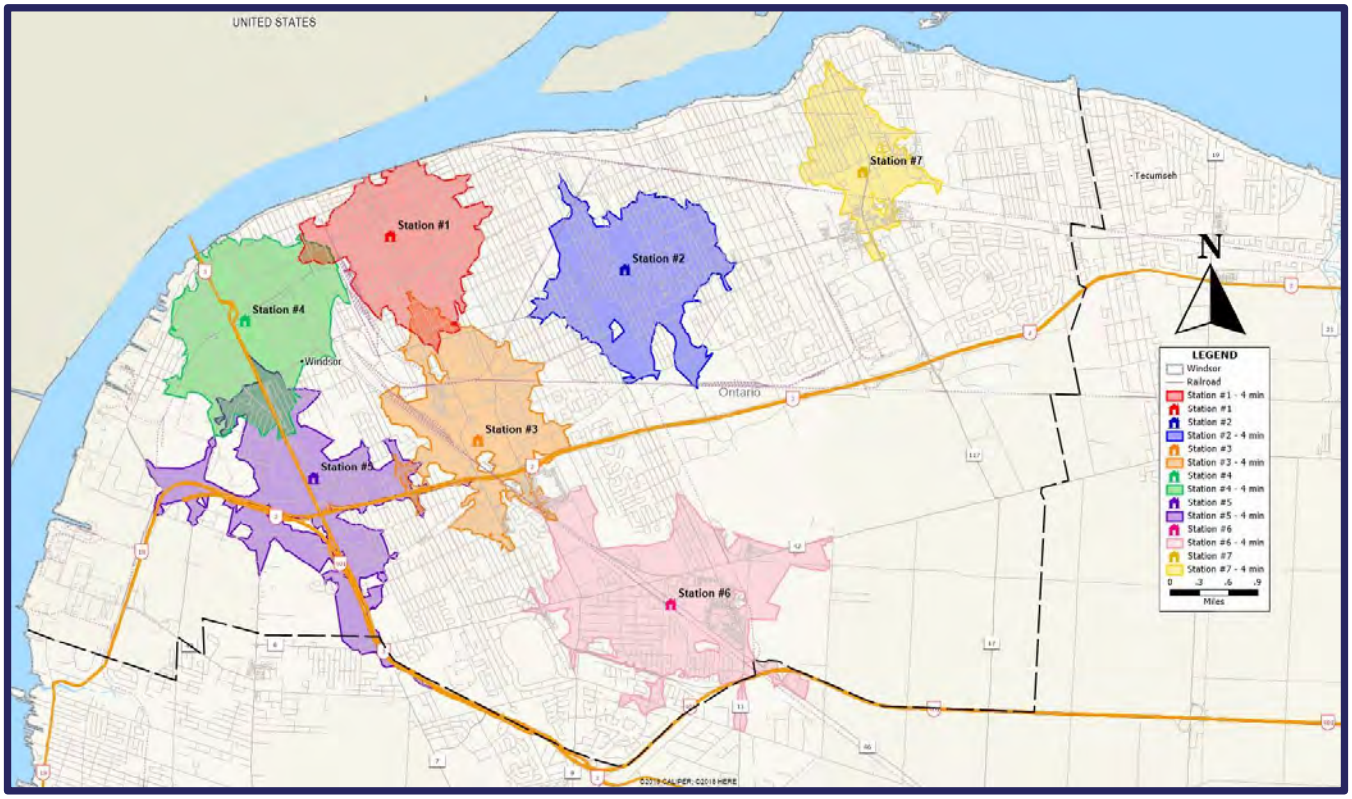
During a review of the WFRS' existing facilities, it was identified that many of these features were found at most of the fire stations. As such, the fire stations are well set up in relation to staff and equipment accommodations.

In the following map, the shaded areas around the fire station denotes response time zones for 4-minute drive time coverage by the crews which is related to the NFPA 1710 response time standard for career departments.

The response mapping and related response data supplied in this document should not be taken in isolation. A full in-depth study should be completed along with an annual report submitted to Council by the fire chief with an update on the key performance measures and expectations. This type of reporting will identify if response times are increasing, and if so, may help to identify why. Increasing response time may be attributed to increased population growth within a certain area.

The present goal of WFRS is to respond within 4-minutes travel time, 70% of the time. Even though this is short of the NFPA 90th percentile recommendation, it is a credit to the WFRS that they do have a response goal criterion in place.

FIGURE #20 – DRIVE TIME OF 4-MINUTES FROM THE FIRE STATIONS



As can be seen in Figure #20, the western portion of Windsor is well covered, but the southeast and northeast sections of the city have a large, uncovered area. Based on the present population of the city in the northeast section, along with the number of calls in this area (Station #7 responded to over 1,100 calls in 2021, which makes it the third busiest station in Windsor), this appears to be an area that is underserviced. Further considering planned growth in the area, an eighth station will be required.

6.1.1 Windsor Fire Stations

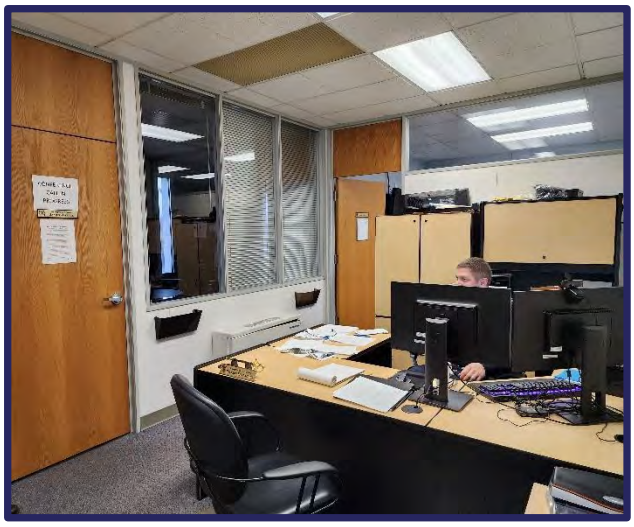
During site visits conducted on each of the stations, it was evident that they are generally well configured and equipped. No issues with housekeeping were noticed at any of the fire stations.

***Note**: no actual engineering/destructive testing was conducted on the buildings during this assessment. These were visual assessments only.*

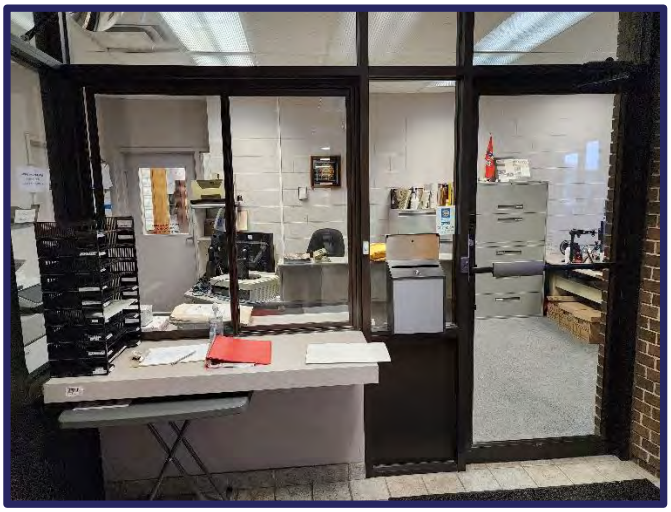
STATION #1 – HEADQUARTERS, ADMINISTRATION AND COMMUNICATIONS

This is a five bay, two-storey fire station with drive through capabilities. Station #1 is also the location of Administration, Fire Prevention, and the Communications Division.

General Office Set Up



Fitness Facilities



Kitchen

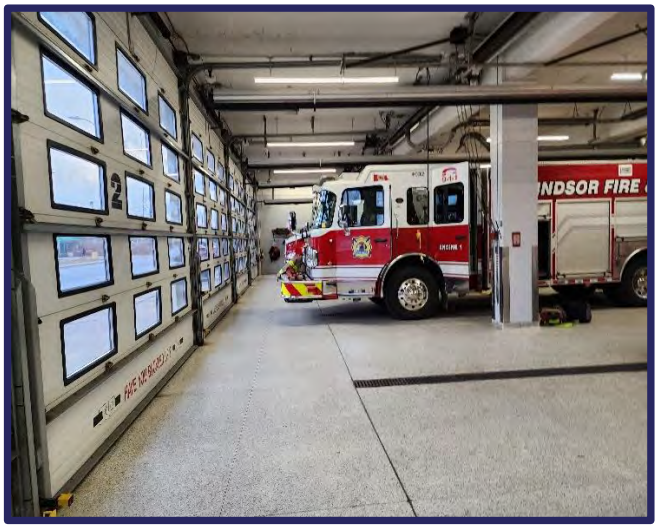
Crew Dormitory

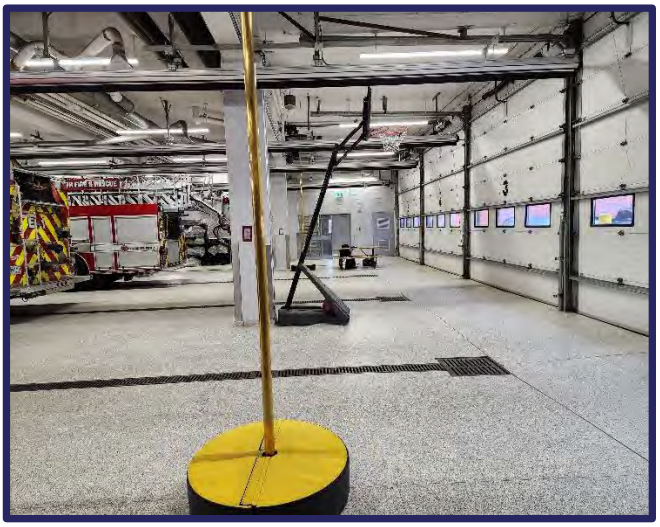
Bunker Gear Storage – in a separate room

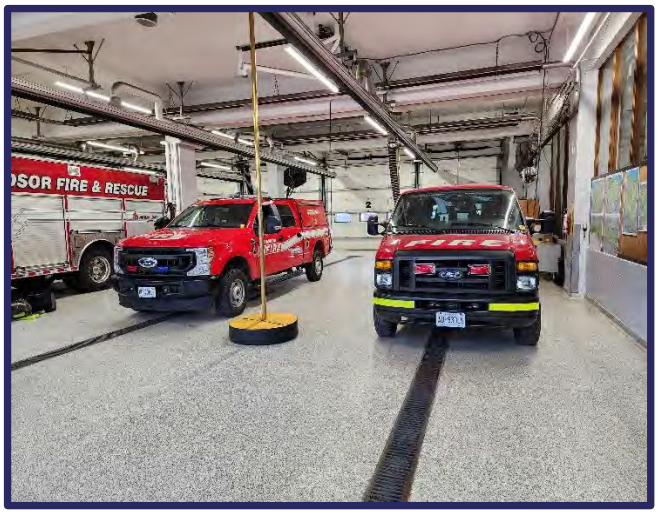
Gear Washing Extractor System

Washroom/Showers

Apparatus Floor – with diesel exhaust extraction system







Observations

The station was found to be in good condition. The crew quarters and apparatus area appear to be meeting the present needs of the suppression personnel. However, it was noted that the administration and communications/dispatch areas of the building are at full capacity and may not be capable of accommodating any future expansion.

During the review of this station staff also noted that they lose the heating and cooling systems on a regular basis. The basement floods. Plumbing issues remain constant, the building is not AODA accessible. Staff eat their lunches at their desks, because they have run out of office space (for a lunchroom). And not enough parking for staff.

Overall, the building does not have the capacity to service all of the current needs and will not be able to meet the demands of the future.

During interviews with the senior staff, it was noted that there is a 10-year capital replacement plan for a new headquarters building. EMG has been tasked to confirm whether a new location for fire headquarters is required. More information on this can be found later in this section.

STATION #2

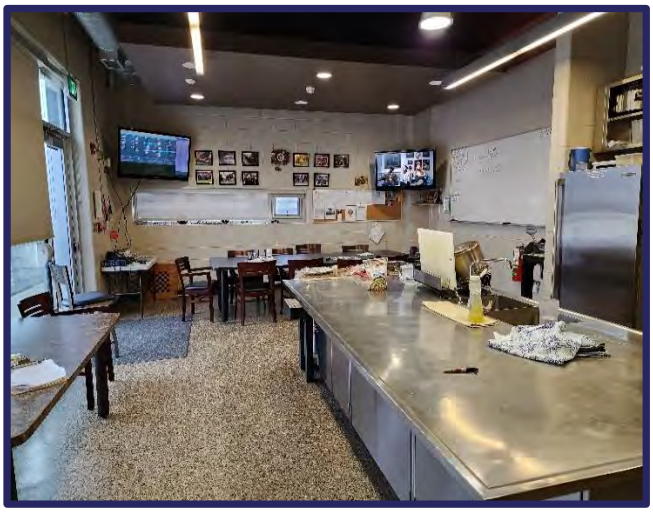
Station #2 is a three-bay drive through fire station. This is a two-truck response station with one engine and one ladder truck.

General Office Set Up

Rear of Fire Station

Kitchen Area

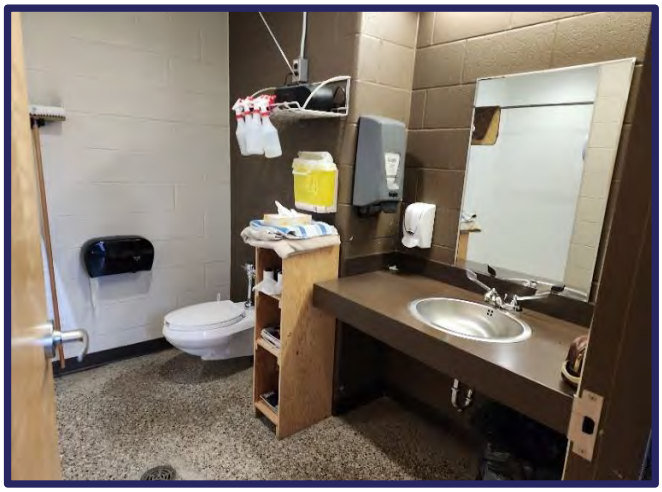
Kitchen/Meeting Area



Fitness Room

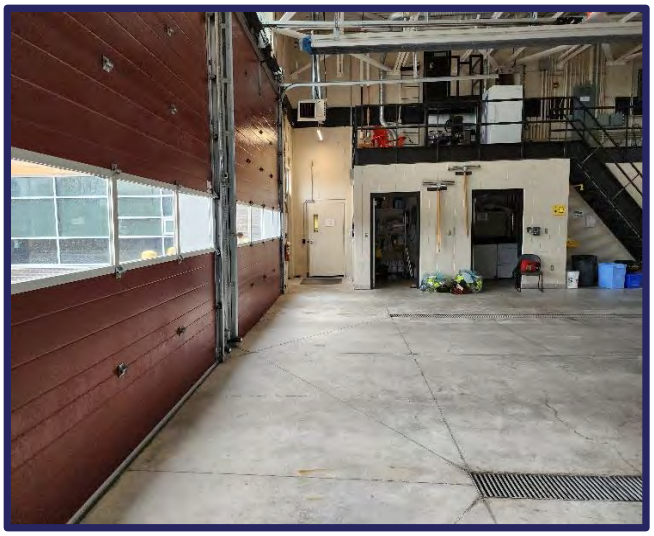
Crew Dormitory

Washrooms (with showers)



Bunker Gear (on apparatus floor open area)

Apparatus Floor (with diesel capture system)



Observations

This station was found to be in good condition. As can be seen in the photos, there is room for the crew quarters, and the apparatus area appears to be in good condition.

There is a special response unit also located at this station.

The only concern noted at this facility is the proximity of the firefighter's gear in relation to the vehicles. Due to the gear being stored in an open area, it is at risk of vehicle exhaust contamination.

STATION #3

This is a one truck station, with two bays that have drive through capability. The incident command unit is also housed at this station.

Rear of Station and Fuel Facility

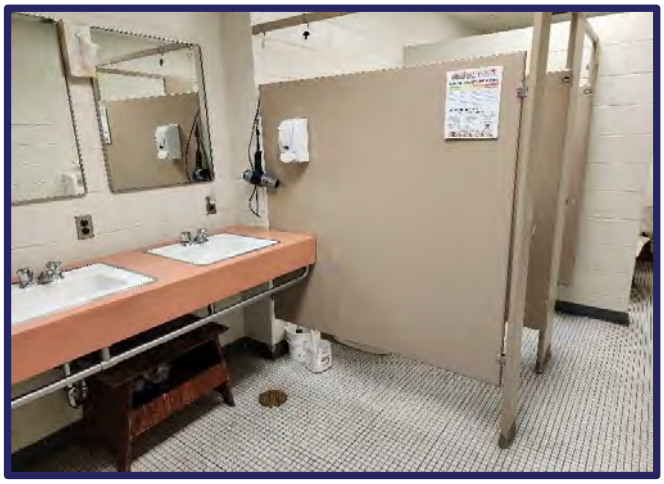
General Office Set Up

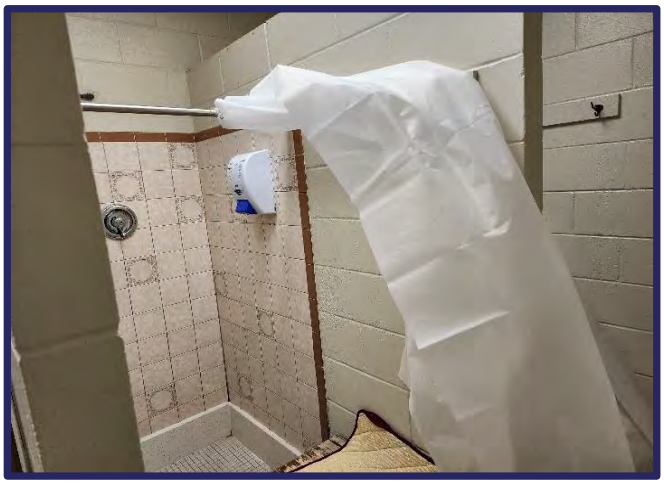
Kitchen Facilities

Crew Dormitory

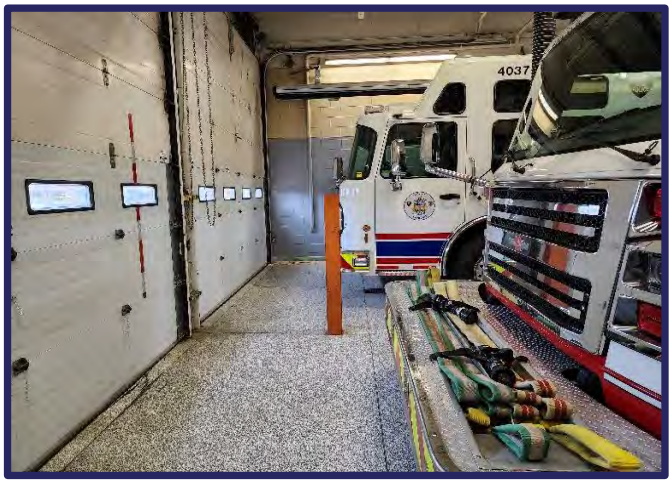
Fitness Room

Washroom with Showers

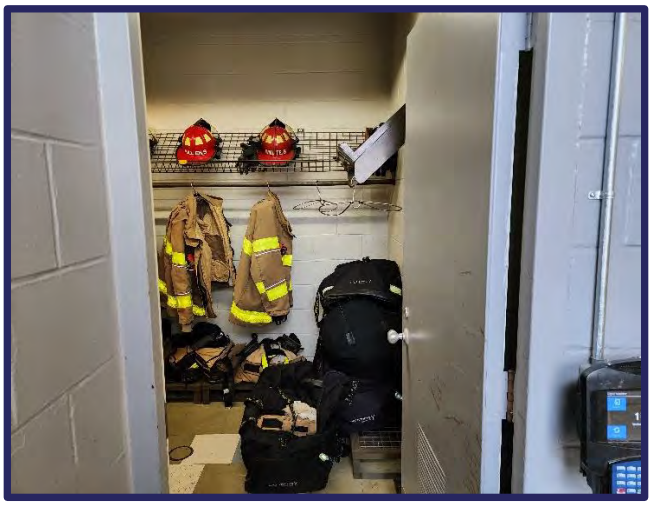




Apparatus Floor (with diesel capture system)



Bunker gear is stored in a side room from the apparatus floor.



Observations

This station was found to be in good condition. As can be seen in the photos, there is room for the crew quarters and the apparatus area appears to be in good condition with room for the vehicles and equipment storage.

The firefighter's turnout gear is in a separate area to protect the gear from possible diesel exhaust contamination.

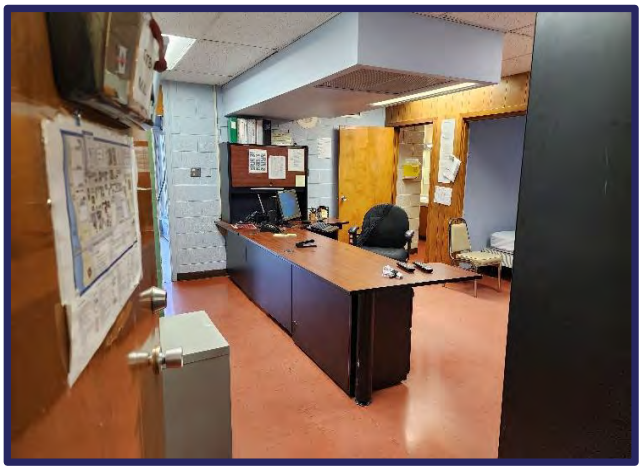
No concerns were noted with this facility.

STATION #4

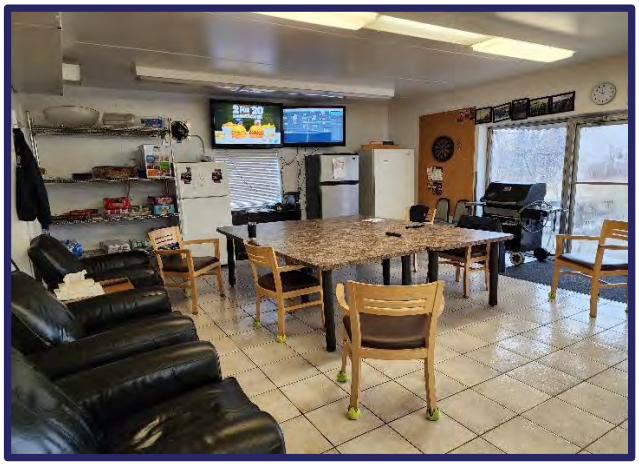
Station #4 is a three-bay drive through station. It is a one truck response facility that also houses the USAR/CBRNE (search and rescue/hazmat) unit.

Rear of Station

General Office Set Up



Kitchen

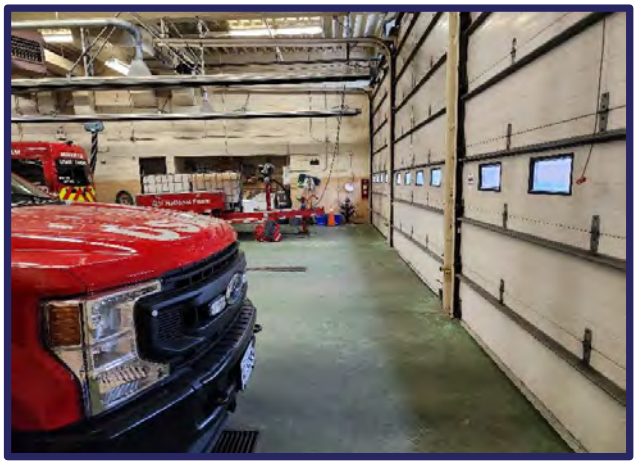


Fitness Room

Dormitory

Washroom – with showers

Apparatus Area – with diesel exhaust system



Observations

The station was found to be in good condition in relation to housekeeping.

Station #4 is one of the older fire stations. As can be seen in the photos there is room for the crew quarters and vehicle/equipment space in the apparatus area, however, there is no room for any additional staff and/or equipment.

The firefighter's gear is stored on the apparatus floor and is at risk of vehicle exhaust contamination.

No other concerns were noted at this station.

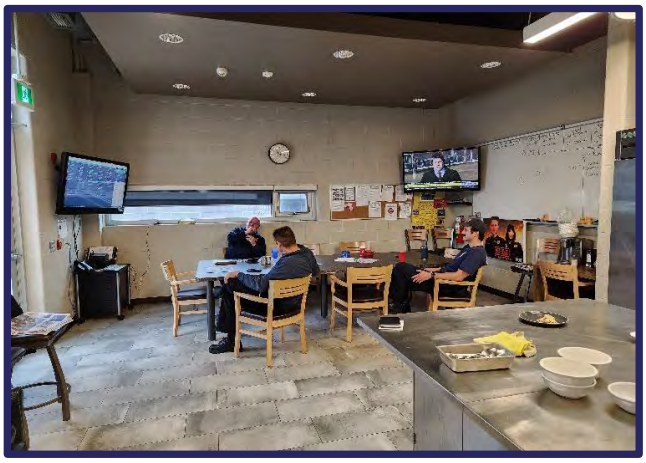
STATION #5

Station #5 is a three-bay drive through station. This is a two-truck response facility with one engine and one ladder truck.

Rear of Station

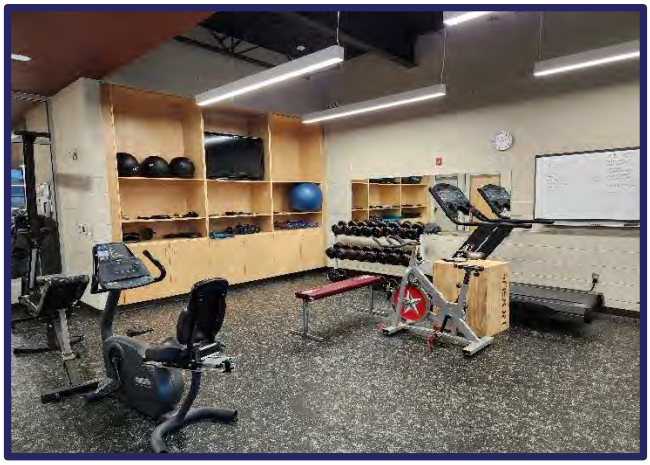
General Office Set Up

Kitchen



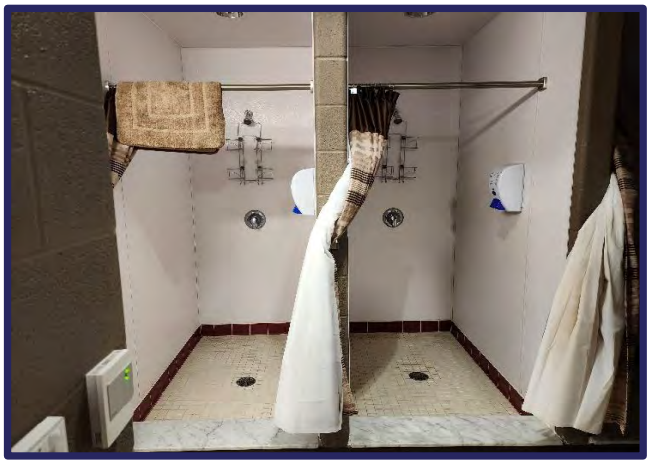
Fitness Room

Dormitory

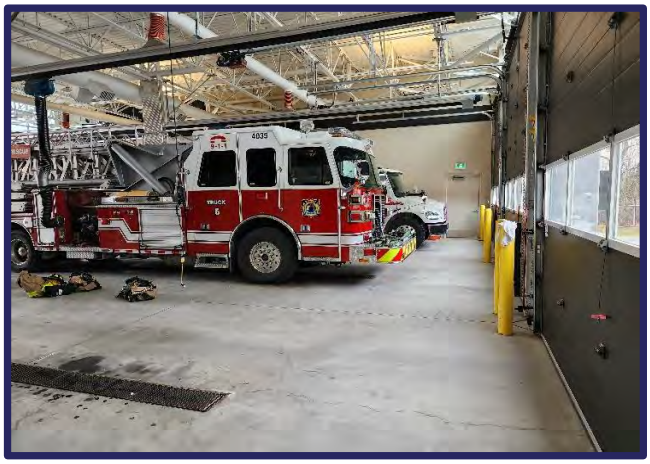


Washroom – with showers

Bunker Gear Storage (On Apparatus Floor & Washer/Extractor)



Apparatus Area – with diesel exhaust system



Observations

This station was found to be in good condition in relation to housekeeping. There is room for the crew quarters and vehicle/equipment space in the apparatus area.

The firefighter's gear is stored on the apparatus floor and is at risk of vehicle exhaust contamination.

No other concerns were noted at this station.

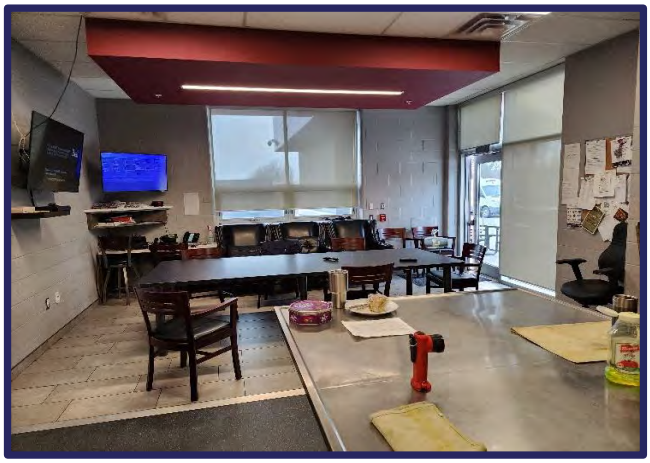
STATION #6

Station #6 is a two-bay drive though station. This is a one truck response facility.

Rear of Station

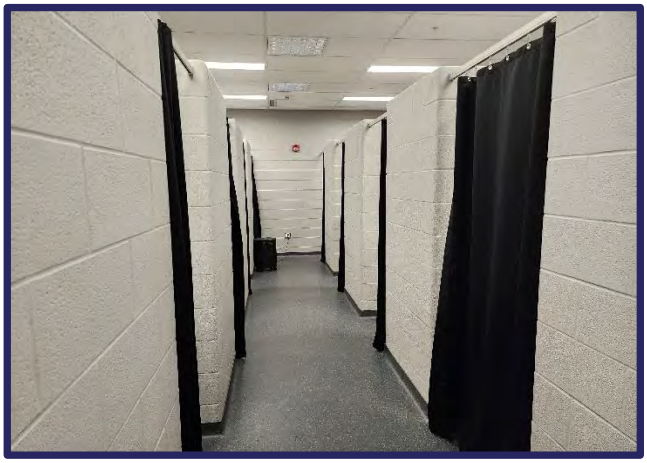
General Office Set Up

Kitchen



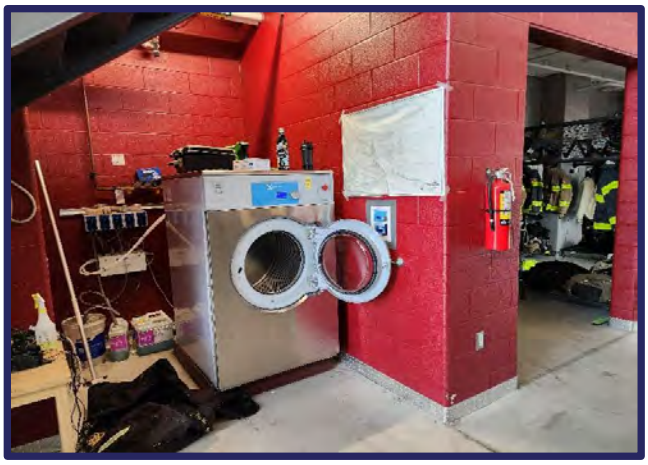
Fitness Room

Dormitory

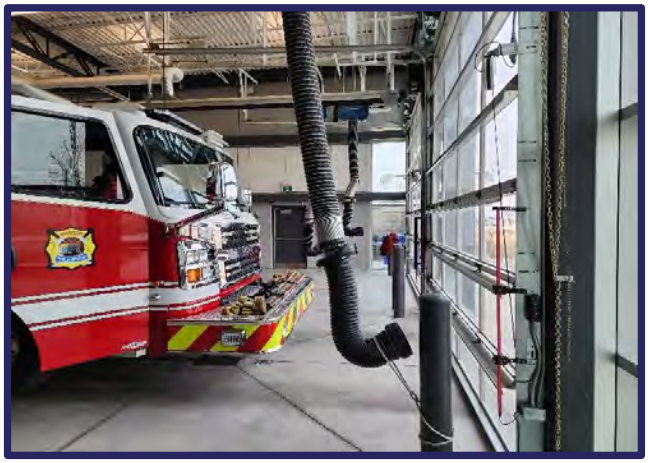


Washroom – with showers

Bunker Gear Storage (on apparatus floor with Washer/Extractor)



Apparatus Area – with diesel exhaust system



Observations

The station was found to be in good condition. There is room for the crew quarters and vehicle/ equipment space in the apparatus area.

No concerns were noted at this station.

STATION #7

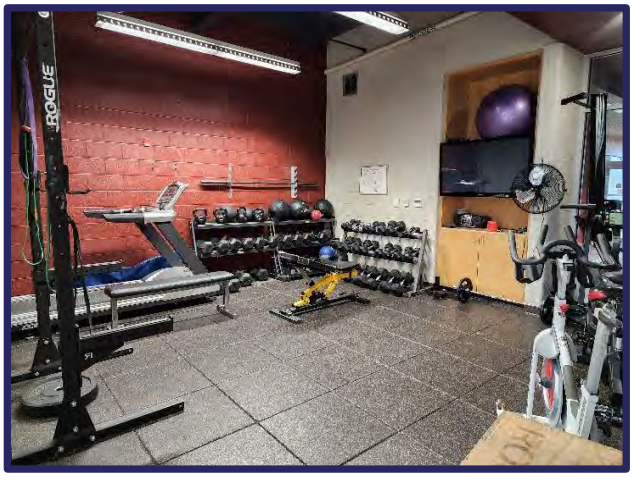
Station #7 is a three-bay station. This station is a two-truck response facility, with one engine and one ladder.

Rear of Station

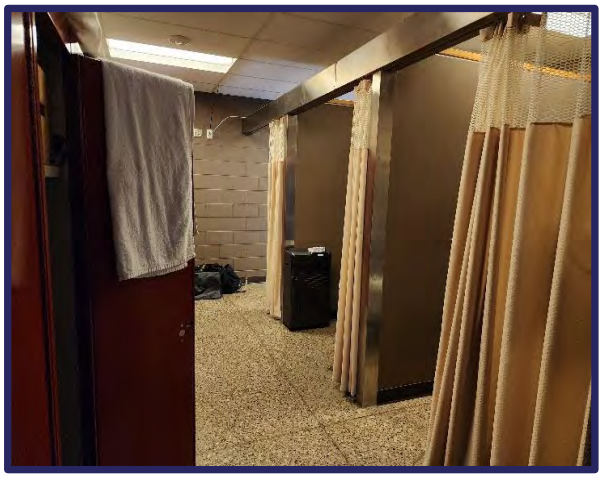
General Office Set Up

Kitchen

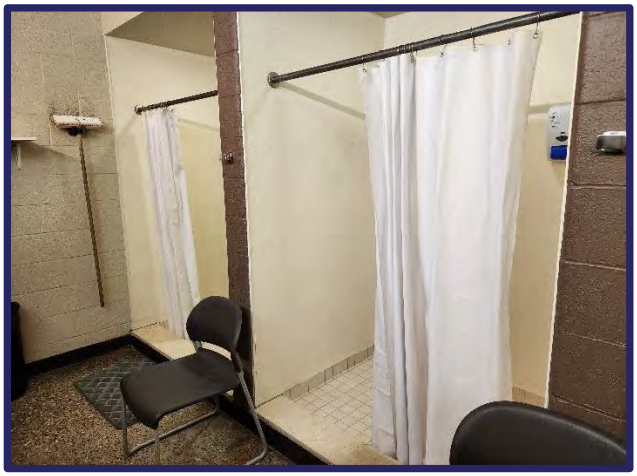
Fitness Room



Dormitory

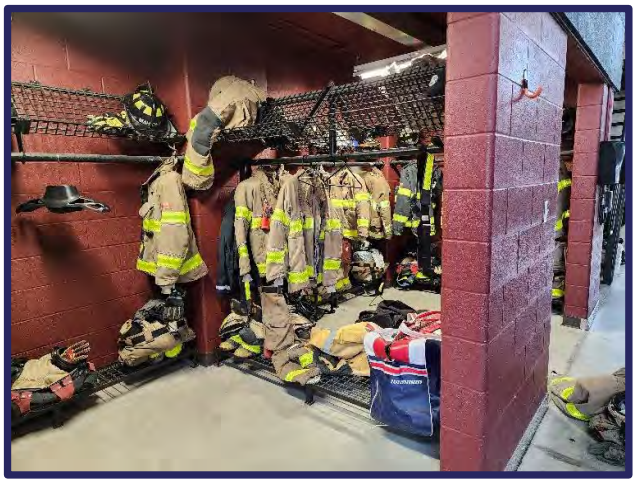


Washroom – with showers



Apparatus Area – with diesel exhaust system

Bunker Gear Stored on Apparatus floor



Gear washer/extractor

Observations

This station was found to be in good condition. There is room for the crew quarters and vehicle/ equipment space in the apparatus area.

One concern noted is the storage of firefighter's gear being in an open area on the apparatus floor. This exposes the gear to vehicle exhaust contamination.

No other concerns were noted.

6.2 List of Station Concerns

Overall, the fire stations are in good shape and are well maintained by the firefighters. There were a few common items noted for consideration:

- Firefighters gear being stored in an open area on the apparatus floor leaves it exposed to vehicle exhaust contamination.
- The Communications Operations Office is meeting the present needs, but space is limited and there is no room for growth.
- The Administration section at Station #1 is also at capacity.
    - As previously noted this station is a concern because they lose the heating and cooling systems on a regular basis. The basement floods. Plumbing issues remain constant, the building is not AODA accessible. Staff eat their lunches at their desks because they have run out of office space. The building does not have the capacity to service the department's (overall) current needs and will never meet the demands of the future.
    - No parking for staff.

6.3 Growth and Station Locations

Based on recent reports it is evident that growth, both in new areas along with infill within the city through the building of more residential high-rise, will continue in Windsor. As such, there needs to be a plan in place to ensure that the WFRS can keep up with the ongoing growth of the city.

Refer to Appendix 'A' for Fire Station Location Study

6.4 Type of Buildings and Options for Fire Stations

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

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

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

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

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

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

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

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

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

The City of Estevan was able to utilize a former car dealership and retrofit the building for the fire department.

EXTREME fire stations are a new concept that is a Canadian built product out of Lethbridge, Alberta. It is a modular-based building, built to seismic and building code standards, using high efficiency, energy code compliant HVAC systems and fire suppression systems; these are standard on EXTREME stations.

The positive aspects about EXTREME fire stations are that they are custom built at a factory and transported to the site where they are quickly placed onsite and ready for occupancy.

As noted already, a typical fire station has a life expectancy of 50 years before the cost/ benefit ratio starts to work against the city in terms of maintenance, basic function, and design. The EXTREME fire stations could exceed that life cycle because they are made from steel and aluminum and additional modules can also be added if the station needs to expand its footprint.

The West Conrad station is an example of the diversity of EXTREME fire station designs and how they can be designed and expanded to meet the customer's needs.

A partnership with non-profit organizations, EMS, or leasing of available space in a new fire station are options as municipalities become more innovative in how they incorporate a fire station into the community. This model may not work or be a fit in every community, but these options are worth exploring to decrease costs while simultaneously increasing the fire department's response capacity.

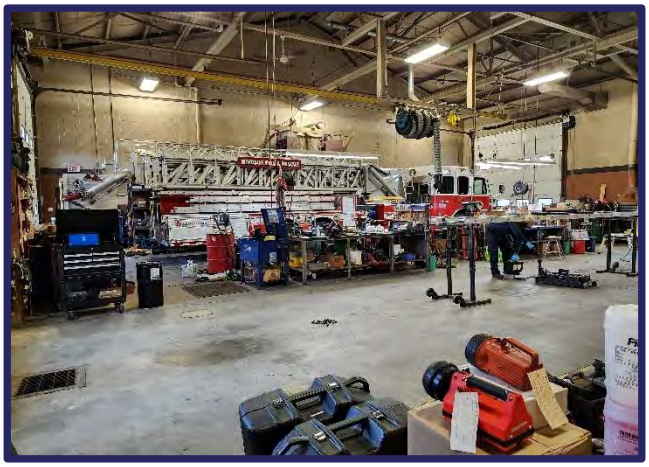
Prior to March 2021 a two-bay EXTREME fire station with appliances, diesel extraction system, exercise room and administration space were estimated to be $2.4 million. Unfortunately, the construction industry is experiencing unprecedented spikes in building materials like wood, cement and steel which creates challenges in projecting final price.

6.3.1 Fire Facilities Summary

Until council decides whether to upgrade or replace Station #4, EMG feels that the present location appears to meet the current response needs of the station #4 response zone. Therefore, construction in the same general vicinity is recommended.

6.4 Fire Apparatus and Equipment

WFRS has its own vehicle and equipment maintenance facility. This facility is also home to the Training Division. Head staff of the maintenance facility are Emergency Vehicle Technician qualified, along with any other qualifications that may be required to carry out the duties and responsibilities of the Maintenance Division.



This facility is also the location where such things as ladder testing, fire extinguisher inspection and refilling, breathing apparatus testing, maintenance and filling is also completed.

At the rear of the main building is another facility in which year-round pump and hose testing can be completed with the use of inground reservoirs.

This is a well managed facility that ensures the timely testing, maintenance, and replacement of equipment based on NFPA and/or manufacturer's recommendations.

This division also carries out work for neighbouring fire departments, such as Lakeshore Fire Department and Tecumseh Fire and Rescue Services, which is not only a revenue generating opportunity, but demonstrates a strong level of dedication on the part of WFRS in working with its neighbours.

As can be seen in the following pictures, the only concern noted during the review of this facility is the confined quarters that this work is carried out within. If any expansion of duties is considered, an expansion of this facility will be required.

Overall, this is a very well-run facility that takes pride in the work they do for the Department and its neighbours.

6.4.1 Fire Underwriters Survey – Vehicle Replacement Recommendations

Reliability of fire apparatus is critical to the successful operation of a fire service. Over the long-term, delaying the replacement of a vehicle is inadvisable as it will add to the overall maintenance costs and

the lack of reliability. The lack of current and reliable apparatus can influence insurance costs based on the emergency service's FUS rating. When assessing an emergency service's ability to respond and meet the needs of the community, FUS considers the age of a fire truck as one of its guidelines.

The 'Major Cities' section is the recommendation for vehicle replacement for a city the size of Windsor. This notes that first line duty vehicles are to be replaced at 15 years and allows for up to 20-years in which a vehicle can be placed in a reserve capacity.

TABLE #23: FUS VEHICLE REPLACEMENT RECOMMENDATIONS[32]

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 Duty	First Line Duty	First Line Duty
16 – 20 Years	Reserve	2nd Line Duty	First Line Duty
20 – 25 Years [1]	No Credit in Grading	No Credit in Grading Or *Reserve* [2]	No Credit in Grading Or 2nd Line Duty [2]
26 – 29 Years [1]	No Credit in Grading	No Credit in Grading Or *Reserve* [2]	No Credit in Grading Or *Reserve* [2]
30 Years +	No Credit in Grading	No Credit in Grading	No Credit in Grading

[1] All listed fire apparatus 20 years of age and older are required to be service tested by a recognized testing agency on an annual basis to be eligible for grading recognition (NFPA 1071).

32 Fire Underwriters Survey, "TECHNICAL BULLETIN, FIRE UNDERWRITERS SURVEY™, A Service to Insurers and Municipalities, INSURANCE GRADING RECOGNITION OF USED OR REBUILT FIRE APPARATUS," accessed January 31, 2022, https://fireunderwriters.ca/Downloads

[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 populated area (or multiple areas) with a density of at least 400 people per square kilometre; AND
- a total population of 100,000 or greater.

[4] Medium Communities are defined as an incorporated or unincorporated community that has:

- a populated area (or multiple areas) with a density of at least 200 people per square kilometre; AND
- a total population of 1,000 or greater.

[5] Small Communities are defined as an incorporated or unincorporated community that has:

- no populated areas with densities that exceed 200 people per square kilometre; AND
- does not have a total population in excess of 1,000.

Fire Underwriters Survey definition of First Line Duty, 2nd Line Duty, and Reserve is:

- 1st line is the first fire truck utilized for response at the fire station
- 2nd line is the next truck to be used if the 1st line unit is tied up at a call, and
- Reserve is the vehicle kept in the fleet to be put into service if a 1st line or 2nd line vehicle is out of service.

The FUS is reviewed by insurance companies. Provided that the emergency services adhere 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, Windsor is also demonstrating due diligence towards ensuring a dependable response fleet for the emergency services and the community it serves through its vehicle replacement schedule.

While WFRS does adhere to the recommended vehicle replacement schedule, it is understood by the Department that it can take up to two years (or more) for a fire truck to be built. As such, WFRS endeavours to plan its replacements with this timeline in mind.

6.4.2 Vehicle Technology

The WFRS should continue its efforts to advance the technological perspective on the fire apparatus through the ongoing use of tablets. These units are data enabled and will permit the responding crews to acquire information about the incident they are responding to directly from the Communications Centre including mapping, responding apparatus, pre-incident plans, hydrant

locations and access to the internet. Some data terminals can even open the overhead doors of the fire stations rather than a small remote control that can become lost. The City of Windsor's Information Technology Division would be responsible for supporting the operating systems.

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

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

6.4.3 Equipment and Maintenance

Ancillary equipment that is operational and safe to use is a necessity in firefighting. Equipment that is prone to failure need not be in service and should be replaced if it is unreliable. There is a requirement that many pieces of firefighting equipment be inspected and tested annually.

Some of the NFPA Standards include:

- NFPA 1851: Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting.
- NFPA 1852: Standard on selection, Care, and maintenance of Open-Circuit Self-Contained Breathing Apparatus.
- NFPA 1858: Standard on Selection, Care and Maintenance of Life Safety Rope and Equipment for Emergency Services.
- NFPA 1911: Standard for the Inspection, Maintenance, Testing and Retirement of In-Service Emergency Vehicles
- NFPA 1914: Standard for Testing Fire Department Aerial Devices.
- NFPA 1932: Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders
- NFPA 1937: Standard on Selection, Care, and maintenance of Rescue Tools.

The WFRS has a process in place for equipment maintenance and testing and should be commended for their ongoing efforts in this area.

The WFRS CSA Z94.4-11 Respiratory Protection Program is overseen by a staff within WFRS. FIT testing is completed as stated in CSA Z94.4-11. The department currently has hydrostatic testing completed on the SCBA tanks when required. The SCBA are also bench tested yearly to ensure their performance meets industry standards and manufacturers requirements.

6.5 Asset Management Program

Fire Administration has established an asset management program and specifically a master equipment life-cycle plan to ensure that equipment replacement is occurring where applicable. It is a common practice to tie this equipment to the parent apparatus. This could be accomplished through the entry of each item into a computer program. Purchasing a new apparatus with new fire hose, nozzles, and ladders will help in the long-term financial planning of equipment replacement while ensuring the equipment's reliability and longevity.

Many pieces of equipment have a predetermined life span as established in either the NFPA Standards and/or the manufacturer's guidelines. When it comes to the end of the life span, the items must be decommissioned, replaced with new items, and then disposed of in a manner that ensures they could not be used by any other outside interests for liability reasons. The asset management program should be designed to trigger notifications when an item is approaching the end-of-life span and plans should be in place for replacement (i.e., identified in the budget).

.6 Other New Technology

Drones

Technology is ever evolving within the fire service, with new pieces of equipment being added to the resources used by an incident commander. One such technology which has proven to be a valuable tool is the use of drones. Police services have been using them for some time to locate missing persons or document accidents and crime scenes.

The use of drones in the fire service is a growing trend as a multi-purpose tool that can assist with large scale assessments of fireground and hazardous material incidents, enhance search and rescue functions, and be used in pre-incident planning. Drones can cover a lot of ground thus allowing valuable fire services personnel to be utilized elsewhere. They have proven beneficial for HAZMAT incidents and large-scale emergencies as the drone can be quickly deployed and give the Incident Commander a live view of the incident. The reduction of risk to firefighting personnel is a significant benefit of drone technology along with the live view capabilities that provides invaluable information to the Incident Commander.

Drone pilots must follow the Canadian Aviation Regulations Part IX-Remotely Piloted Aircraft Systems that contain the rules for drones up to 25 kilograms. Advanced operations include flying in a controlled airspace, flying over bystanders, or flying within 30 meters of bystanders.

SCBA

New SCBA have built in telemetry systems that, like some portable radios, identify the location of the firefighter. New technology SCBAs can transmit GPS data, measure the amount of air in the SCBA cylinder, monitor the heart rate and level of exertion the fire fighter is being exposed to, as well as body temperature.

New technologies are being developed each year to protect the firefighters; these include the use of robotics to fight fires, which are being actively used in Europe and Asia. As the technology progresses it is important to monitor the benefits and opportunities to integrate these devices into the fire service.

6.7 Hydrants

The city has installed fire hydrants which are tested to ensure the status of operability. All fire hydrants should be inspected and tested as noted within, NFPA 24: *Standard for the Installation of Private Fire Service Mains Their Appurtenances,* along with NFPA 291: *Recommended Practises of Fire Flow Testing and Marking of Hydrants*. The hydrants should also be painted in colours appropriate to their flow rate, as identified in NFPA 291. The city should ensure that every hydrant is flushed each year. The failure of a hydrant to operate as required may present catastrophic results and expose the city to risk of litigation.

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

There are no dry hydrants within the city's boundaries.

The city does ensure that all fire hydrants are maintained and tested as recommended.

Section 6 - Recommendations

Rec #	Recommendations	Estimated Costs	Suggested Timeline for Implementation	Rationale
40	Station #1/HQ is running out of space and will no longer be able to effectively house all the department's vehicles, equipment, and staff quarters. • As such, there is a real need for either a full upgrade/expansion of the present facility, or the building of a new fire station. • Fire prevention and communications are to be part on the new facility.	For a facility the size of HQ, the cost would be approx. $10 to $20 million or more depending on size and timing of project.	Short to Mid-term (1 – 6 years)	An upgrading of the present facility would in most cases be a short-term fix and will most likely fail to meet the demands of the department. The cost of such upgrades could cost almost as much as the cost of a new headquarters. The building of a new headquarters should consider future growth expectations, along with incorporating new technologies to make the facility both energy efficient and safer for staff.
41	Station #4 should be relocated because of the construction of a new Canada Customs truck inspection plaza at the foot of the Ambassador Bridge.	Stations – approx. $4 to $6 million \	Short to Mid-term (1 – 6 years)	Station 4 is the oldest fire station. Relocation with a new building would be opportunistic, given the construction of the new Customs truck inspection plaza's impact on the current location of Station #4

Rec #	Recommendations	Estimated Costs	Suggested Timeline for Implementation	Rationale
42	To plan for the new fire station in District 7 and District 6 over the long term, the fire chief should work with the Planning Department to verify where the growth will occur and in what timeline.	Stations – approx. $4 to $6 million. Fire trucks – approx. $1,000,000 each. Plus 20 staff for each new station.	Mid to Long-term (4 – 10 years)	By doing this, a growth-based plan can be developed in relation to the station builds. This new construction and staff hiring for the new fire stations is a long-range plan that will most likely take place over the next ten years (or perhaps longer, 18 to 19 years, depending on the city's growth).
43	The Maintenance facility is outgrowing the demands of the Department. As such, a new maintenance facility should be built in the long-term to meet future demands. • This new maintenance facility could also be factored into the construction of the new headquarters.	Cost could range from approx. $1 million as part of HQ, to $5 to $10 million (or more) as a stand-alone facility.	Short to Mid-term (1 – 6 years)	Constructing a new HQ that combine Training, Fire Prevention and Fleet Maintenance into one building would reduce the overall cost of building two separate facilities and mitigate ongoing growth challenges.

SECTION 7

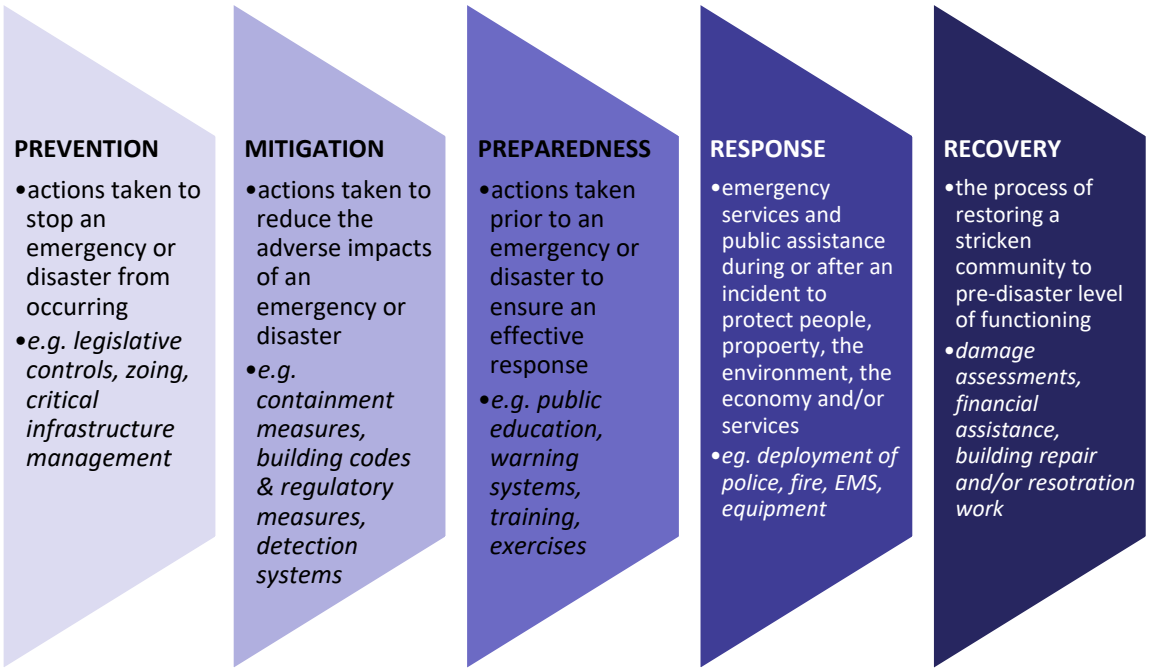
Emergency Management

SECTION 7: EMERGENCY MANAGEMENT

7.1 Emergency Management Program Overview

Emergency management and its incident management applications are strongly related to the fire service and its incident command systems. Emergency management is mandated within the *Emergency Management and Civil Protection Act (EMCPA)* and the supporting Regulation 380/04. The realm of emergency management has broadened since the inception of this *Act*. Municipalities are expected to prepare for a variety of disasters on all scales, including but not limited to weather related events, health emergencies, cybersecurity, civil disorder, and infrastructure failure.

Emergency management is centered on the *Five Components of Comprehensive Emergency Management (CEM).* CEM is an all-encompassing risk-based approach to emergency management that includes prevention, mitigation, preparedness, response, and recovery.



Understanding the potential risks for a community comes from completing a Hazard Identification and Risk Assessment (as detailed in the *EMCPA*). The legislation mandates that every city must have certain criteria pertaining to emergency management. Annual submissions are required for the province to meet the 12 compliance criteria.

The *EMCPA* establishes 12 criteria that a city must have to meet annual compliance. Table #26 lists these items in three general areas: Positions, Programs, and Plan Management. Positions include the four compliance items focused on having properly trained and qualified people in specific positions.

Programs list the three core compliance items that an emergency management program is built upon. Plan Management includes the remaining five items that serve to support and strengthen an emergency management program.

TABLE #24: EMCPA COMPLIANCE CRITERIA

Municipalities are encouraged to create Continuity of Operations Plans (COOP), also called Business Continuity Plans (BCP). A COOP/BCP is a plan developed and maintained to direct an organization's internal response to an emergency. These are plans that allow divisions or departments within the city to maintain operations during an emergency. A strong emergency plan will include a set of COOPs/BCPs that are routinely reviewed with the plan.

7.1.1 Current State

In review of the Windsor Emergency Management Program, they presented a detailed and thorough plan. The plan integrates Incident Management System (IMS) terminology, positions, and concepts. This keeps Windsor compliant with the requirements set out in the *EMCPA*. The plan identifies all required positions and committees and includes alternates for the positions.

Training is delivered within the IMS curriculum. It was reported to EMG staff that some staff are trained to either IMS 100, 200, or 300. Access to training post-pandemic should create more opportunities for WFRS and the Windsor Emergency Management teams to update and/or improve their training and education. This also was identified as an issue associated with the staffing turnover. New training delivery models are now available in the provincial emergency management curriculum. It is recommended that the City update their emergency management training plan to ensure that existing and new staff are up to date with their required training as per their position within the plan.

The emergency plan identifies a primary and secondary Emergency Operation Centre (EOC). Both the primary and alternate EOC locations have functioning services, including automatic generators and reliable internet. EOC operations are detailed within the Emergency Plan, including specific plans on managing the sites. It is suggested that in the annual review of the emergency plan, both EOC locations be reviewed for technological and preparedness currency. As the emergency management field broadens, so do opportunities to improve the functionality of EOC site services.

Windsor regularly meets with neighbouring municipalities and stakeholders. This relationship ensures continuity and communication during an emergency with bordering municipalities, regional partners, and other stakeholders (i.e., First Nations). Identifying possible partnerships and collaborative initiatives can benefit stakeholders. This may include automatic aid agreements, shared services and/or economy of scale partnerships, and bulk purchasing agreements.

Overall, the Windsor Emergency Management Program is well established, with a comprehensive plan. Continued work to maintain and enhance this program is expected and encouraged. Windsor would benefit from strengthening its core functions, scheduling reviews to identify and address issues, and based on its size, a focus on development and succession planning within its positions.

7.1.2 Emergency Planning Training and Exercises

Emergency planning and IMS are skills that need to be used regularly. Several training options as noted below, can be utilized to plan and exercise in IMS and the community's emergency plan activation.

EOC Activation**:** Planning for a practice activation of the primary and secondary EOC keeps staff orientated to their roles and all staff members that are expected to have a role in the EOC should participate in these practice sessions.

Discussion-Based Exercise**:** In Discussion-Based Exercises, the primary intent is to have dialogue regarding the emergency plan, procedures, by-laws, and any policies that could impact an emergency. The discussion sessions are low key, low pressure, and are a great tool for familiarization of plans, procedures, by-laws, and policies. The secondary intent of discussion-based exercises is to build confidence through familiarization amongst team players in the application of the plan. These discussion-based exercises are great tools to facilitate the learning process for the staff designated as alternates expected to fill a role in the EOC.

Discussion-based training is a great way to orientate new staff or existing staff that have not had a real opportunity to familiarize themselves with the emergency plan or organizational plans, by-laws, procedures, and policies.

Tabletop Exercise: These exercises are low cost with minimal stress. On the other hand, preparation can require some time to create a scenario that is relevant to the city. A tabletop exercise is generally led by one facilitator depending upon the complexity of the scenario. Tabletop exercises are great

ways to identify gaps in plans, policies, and procedures in the post-exercise discussions. To complete the exercise, an After-Action Report is completed to identify any shortcomings or deficiencies that need to be addressed.

Operations-Based Exercise**:** The primary intent is to deploy personnel and equipment in a drill, functional exercise, or a full-scale exercise. The disadvantage of an operations-based exercise is that they require a significant amount of time to plan and prepare for, as resources will be required from multiple agencies. Operations-based exercises generally reveal gaps and weaknesses in training, inter-agency communications, resource allocation, and operational procedures. Operations-based exercises include:

- Drills – These are exercises that are intended to evaluate a specific operation. For example, WFRS along with Paramedic Service may conduct a drill of a carbon monoxide leak in a vacation resort.
- Functional exercises – These exercises can be complex with a high degree of realism and are used to test plans, procedures, and policies in the training scenario which is at a single site. These exercises are used by agencies to test their capabilities of performing multiple functions.

Full-scale exercises: A complex exercise that tests multiple agencies in a single scenario at multiple sites. These exercises are in real time, highly realistic, and usually stressful for agency personnel participating in the exercise.

A full-scale exercise can take from 6-10 months to prepare for and require a significant investment in resources and funds. Several facilitators are required to ensure safety and compliance to the storyline of the exercise.

A full-scale exercise is developed with clear objectives to test multiple agencies. Upon completion of the exercise, a hot wash is conducted which is a formal discussion of the involved agencies performance during the exercise.

An After-Action Report and a formal Improvement Plan are prepared and distributed that identify actions required to address and improve performance.

Section 7 - Recommendations

Rec #	Recommendation	Estimated Cost	Suggested Timeline for Implementation	Rationale
44	Windsor update their emergency management training plan to ensure that existing and new staff are current with their required training as per their position within the plan.	Staff time	Immediate (0-1 year)	Keeping this plan up to date is a requirement under the *Act.*
45	Windsor develop and/or review essential COOPs/BCPs for the internal operations of the municipal administration.	Staff Time	Short-term (1-3 years)	COOPs and BCPs are key resources for the city.

SECTION 8

Mutual Aid, Automatic Aid & Fire Service Agreements

SECTION 8: MUTUAL AID, AUTOMATIC AID, & FIRE SERVICE 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 closer to a bordering fire department's response area than the host department.
- Create an automatic response by bordering fire departments to properties closer to their fire stations than the host fire department.

8.1 Mutual and Automatic Aid

Mutual aid is a reciprocal agreement whereby one department aids another in a significant incident. Mutual aid is not to be used to supplement shortcomings in fire protection. The Council of the responding fire service may serve to notice that the municipality they are responding to has identified an exposure risk and should take appropriate action to make corrections.

Automatic aid agreements allow fire stations from other jurisdictions that may be closer to an emergency event to respond either first or in conjunction with the local municipal fire department. Automatic aid is generally considered a program designed to provide and/or receive assistance from the closest available resource, regardless of municipal boundaries, allowing for a manageable and sustainable service level.

Automatic Aid and Response Agreements are an appropriate means of identifying areas of the home department's response capabilities and filling in any existing gaps. Response agreements may consist of responses to remote areas of a city or the provision of hazardous material or technical rescue teams.

These agreements are like the Mutual Aid Plan but differ as there is an expectation that a call for service will occur regularly and expected. Established within the agreement includes to what level of service will be provided by the responding department. Some examples are strictly for structure fires, whereas others may be an all-encompassing service. These are written agreements enacted through the council in the form of a by-law.

WFRS has two signed MOU agreements with the Province of Ontario – one for HAZMAT/CBRNE response, which expires in 2024, and the other for USAR, which expires in 2025. EMG has reviewed both documents.

WFRS also participates in the OFM's mutual aid program. It has response plans in place with the member departments of the County of Essex.

These include responses to:

- Town of Amherstburg
- Town of Essex
- Town of Kingsville
- Town of Lakeshore
- Town of LaSalle
- Town of Leamington
- Town of Tecumseh

All these documents were available for EMG's review during the development of this FMP.

WFRS is a member of the County of Essex Mutual Aid Plan and Program, which provides for all the district fire services. It was last updated in 2018. The Mutual Aid Plan and Program is a generic document and should better reflect the needs of the fire departments and municipalities. The City of Windsor's By-law 207-2005 directs WFRS that they may participate in the County of Essex Mutual Aid Plan and Program. The Mutual Aid document was last updated in 2018, with the next revision due in 2023.

The County of Essex Mutual Aid Plan aids in the mitigation of any emergency that may arise, identifying and providing the resources available to respond to the situation. It is reviewed and updated on a predetermined schedule, with the updated version forwarded to the OFM. WFRS is also the regional response unit concerning hazardous materials response by way of a contract with the Province of Ontario and the OFM. No other fire department in the area can take on such programs as hazardous materials response and technical rescue.

EMG notes that in support of mutual aid efforts across the Province of Ontario, the OFM requires fire departments to update their equipment lists to identify what apparatus they have and could be available for mutual aid purposes. However, it is incumbent upon each participating fire department to also have a clear understanding of what resources are available from its neighbouring fire department(s) and how to access these during times of need. This list should be an appendix of the County of Essex Mutual Aid Plan and Program, along with a list of the contact information of the participating fire departments, with annual updates.

When developing these automatic aid or response agreements, consideration should be given to the following when formalizing any agreement:

- The agreement should identify the resources that each fire department can provide.
- The agreement should identify and authorize the fire department to leave its jurisdiction for automatic aid.

- It should include the procedures in the identification of Incident Command.
- Fire departments must be equipped and trained to meet the functions they expect to perform in an emergency.
- All fire departments have the legal obligation to serve and protect their community before engaging in mutual aid activities, which must be clearly stated and outlined in the plan.
- Include liability coverage and indemnification provisions.
- Include fees associated with the agreement.
- Ensure that the Tariff of Fees By-law contains hazardous material and technical rescue responses at full cost recovery.

The effort that goes into maintaining these relationships directly benefits the citizens by saving lives, homes, and infrastructure, and keeping firefighters safe.

The standard review process seeks to identify considerations for improvements that support and strengthen the provision of fire protection services. That said, greater clarity is generally achieved for all parties by following a standard template, standardizing wording and structure for the various agreements.

It is also in the best interest that fire departments, in a fire protection agreement, automatic aid agreement, or mutual aid plan identify annual training sessions where firefighters get acquainted with the equipment of other departments. These combined training sessions also build the working relationship and morale between fire departments. Automatic aid and protection agreements bring fire departments together to work as a team for the benefit of the public. Without combined training sessions to practice as a team, the team cannot effectively function, and breakdowns can occur.

When the current agreements are revised and updated, include a defined commitment to regular training and designate the position accountable for completing this task. In addition, the agreements should lay out a commitment to ongoing meetings with senior fire department leadership. These mutual aid/automatic aid meetings allow fire chiefs and chief officers from the participating departments to discuss issues or gaps in response protocols and to identify a collaborative path that enhances fire protection for all participating agencies and communities. Another benefit of the mutual training session is the identification of gaps in equipment, communications, or training before a real emergency.

EMG recommends that all Automatic Aid, Mutual Aid, and Fire Protection/Service Agreements be reviewed annually and revised if necessary. All parties involved should pay particular attention to adherence, and regularly defined review periods and/or expiry dates identified. Also, a page listing the dates of review and areas revised should be an addendum to any of the agreements and associated by-laws, and that any and all joint training opportunities be engaged in wherever possible.

Section 8 - Recommendations

Rec #	Recommendation	Estimated Costs	Suggested Timelines for Implementation	Rationale
46	EMG recommends that all Automatic Aid, Mutual Aid, and Fire Protection/Service Agreements be reviewed annually and revised if necessary. All parties involved should pay particular attention to adherence, and regularly defined review periods and/or expiry dates identified. • A page listing the dates of review and areas revised should be an addendum to any of the revised agreements and associated by-laws.	Staff Time	Short-Term (1 to 3 years), and ongoing	Having current by-laws and agreements in place better reflect enhanced service levels in providing fire protection services.
47	Any and all joint training opportunities be engaged in wherever possible.	Staff Time	Short-Term (1 to 3 years) and ongoing	If a technical rescue call requires additional resources from outside the WFRS, a plan will already be in place ahead of time. It reduces the response time of these agencies if agreements are in place in advance, as pre-response approvals will not be required.

SECTION 9

Finance, Budgeting, Fees & Cost Recovery

SECTION 9: FINANCE, BUDGETING, FEES, & COST RECOVERY MECHANISMS

9.1 Finance and Budgets

Operating a fire department requires effective financial planning. Based primarily on municipal tax dollars, fire services are often reflective of the community they serve and the local resources available. Maintaining a responsive operational budget combined with informed long-term forecasting is also a requirement.

9.1.2 Long-term Planning

Fire department management requires both proper asset maintenance to assure expected life cycles, and long-term planning to meet expected growth and meet industry compliance. Typical planning focused on future investments centre on three main things: building infrastructure, apparatus, and capital purchases. Windsor provided EMG their respective plans for these items.

9.1.3 Building Infrastructure

Currently, Windsor operates seven fire stations, along with some satellite facilities that house fire prevention, training, and mechanics. In the documents provided to EMG, there are projected maintenance costs for each building.

With a proper forecast for infrastructure replacement in place, it is recommended that the fire chief annually review the building infrastructure replacement plan to ensure it meets municipal growth patterns and the current fire department locations remain relevant to community needs and emergency response. Proper financial planning is necessary to ensure that adequate reserves are in place to accommodate the costs associated with building replacement.

9.1.4 Apparatus Replacement

Windsor has a large fleet of vehicles and/or equipment. In documents provided to EMG, Windsor has projected fleet replacement plans in place. Of note, both the FUS and NFPA have recommendations for apparatus replacement schedules.

NFPA and FUS both recommend replacement of front-run units after 20 years. This same vehicle can then be put into a secondary role. As such, all front-run units should be scheduled for replacement at the 20-year stage with the back-up/ secondary units being replaced at 25 years. Once a pumper truck has passed the 25-year stage, no credit is given by FUS. It should be noted that although the FUS do take refurbishment of vehicles into consideration, no credit rating is assigned to vehicles over 30 years of age.

The 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.

WFRS has an operational replacement plan in place that aims at meeting NFPA and FUS criteria. The provided plan also estimated projected costs that will allow for budgetary planning and establishing reserves to accommodate the anticipated purchases.

It is recommended that the fire chief annually review the fleet replacement schedule to update projected costs and currency. This will account for inflation rates and manufacturing costs to better budget for replacement vehicles. To assist in maintaining the fleet, proper apparatus and vehicle maintenance schedules are necessary. It is recommended that, due to the size of their fleet, that WFRS implement an electronic tracking software system for apparatus and vehicle maintenance. This will help to ensure that the units are kept at optimal operating condition and fulfill the expected life cycle.

9.1.5 Capital Purchases

Equipment maintenance and replacement scheduling is essential to department and financial management. This includes planning for items sch as (but not limited to) PPE and bunker gear, SCBA and safety equipment, radio communications, hose and appliances, and specialty tools and equipment. WFRS communicated to EMG that there are plans in place.

Self-Contained Breathing Apparatus

WFRS currently has a stock of SCBA spread across the various fire stations. The department has a replacement schedule for these units based on annual need and budgeted accordingly.

Overall, WFRS appears to have identified both vehicle and equipment needs within their operating and capital budgets, along with plans for scheduled replacements, as required. At this time, EMG is simply recommending that the fire chief continue to review building and equipment replacement plans and costs on an annual basis to ensure that appropriate funds are in place when required.

Section 9 - Recommendations

Rec #	Recommendation	Estimated Cost	Suggested Timeline for Implementation	Rationale
48	The fire chief annually review the building infrastructure replacement plan to ensure it meets municipal growth patterns and the current fire department locations remain relevant to community needs and emergency response.	Staff time initially. Cost depending on needs.	Short-term (1-3 years) ongoing	Ensures services are meeting the needs of the department and community.
49	The fire chief annually review the fleet replacement schedule to update projected costs and currency.	Staff time initially. Cost depending on needs.	Short-term (1-3 years) ongoing	Ensures services are meeting the needs of the department response capabilities.

SECTION 10

Recommendations, Timelines & Associated Costs

SECTION 10: RECOMMENDATIONS, TIMELINES, & ASSOCIATED COSTS

10.1 Recommendations & Estimated Costs

During the review conducted by EMG, it was demonstrated that the WFRS staff are truly dedicated to the community they serve. Council and the fire chief are sincerely committed to ensuring the safety of the community and all personnel of the Fire Department. Based on the present staffing, equipment, and fire station's locations, WFRS is endeavoring to offer the most efficient and effective service possible. With that in mind, there is always room for improvement.

All costs and associated timelines are approximate estimates that can be implemented through prioritization between the fire chief and Council.

The following chart provides a detailed overview of the recommendations found throughout this report along with any estimated costs and suggested timelines for implementation. A section has also been added to the chart identifying the rationale of the recommendations presented by EMG. This FMP document is a culmination of 63 recommendations.

Due to some of the specific recommendations made in this document, it is advisable that the fire chief view this plan as a "living document", conducting frequent reviews of the recommendations, and bringing forward updates to Council annually, or sooner if required.

It is the responsibility of the WFRS management to ensure that all recommendations contained within this FMP and CRA document are noted, captured, and set up in a format that allows WFRS to continually monitor, evaluate and update each recommendation as needed. Part of a CRRP is to ensure that the loop is closed on recommendations.

Whether a recommendation is implemented, deferred, or rejected, all recommendations need to be addressed. By doing this, Fire Department management is ensuring that all opportunities to reduce risk within the community have been explored.

WFRS Recommendations Chart

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 2 – Planning				
1	The Fire Administration brings forth a revised version of the E&R Bylaw for the Council's approval and ensures its annual review and updates.	Staff time	Short-Term (1-3 years)	Maintaining an up-to-date E&R Bylaw will guide the WFRS' operations and identify response guidelines, fire prevention, and public education programs and levels of training.
2	The Fire Administration reviews Bylaws that affect the daily operations of the fire department.	Staff time	Short-Term (1-3 years)	Having current Bylaws will reflect changing the circumstances of the City and meet Federal or Provincial Acts and Regulations.
3	Establish an SOP Committee representing all divisions of the WFRS that develops new SOPs and reviews current ones regularly.	Most costs will be about time spent by committee members.	Short-Term (1-3 years)	Establishing an SOP committee will aid in maintaining the information in the database to be current while allowing the participation of WFRS members to determine the fire department's operations.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 3 – Risk Assessment				
4	The City of Windsor needs to develop a comprehensive Community Risk Reduction Plan that aligns with the CRA and FMP related recommendations.	Staff time	Immediate (0-1 years)	The development and implementation of the CRRP will aid in prioritizing risks that will be lessened or mitigated. Answering the who, what, when, and how will assist in identifying risks.
5	The City of Windsor's Building Department and WFRS should promote the advantages of installing residential sprinklers, which include saving lives and property.	Staff Time	Short-Term (1-3 years)	Historically no persons have died in residential fires where residential sprinklers were installed and activated during a fire, and sprinklers may reduce the risk to homeowners.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 4 – Fire Department Divisions – Non-Suppression				
6	That the WFRS initiate a Process Mapping study to identify redundancy and areas for improvement to optimize staffing in the Fire Prevention unit. • Along with a study pertaining to the roles and responsibilities of the Deputy Chief of Support Services with a lens to evaluate workload.	Cost for a study can be as much as $30,000.00 unless resources are available internally or from the City of Windsor.	Immediate (0 – 1 year)	Process mapping may contribute to up to 20% performance improvement. Increasing staffing and process mapping would allow the WFRS Fire Prevention Unit to meet anticipated future growth.
7	EMG recommends that WFRS re-evaluate the need for an additional Public and Life Safety Educator position within the Fire Prevention Division.	Cost associated with one FTE	Short-Term (1 – 3 years)	WFRS had two PFLSEs in the past. Previously, there may have been appropriate reasons to eliminate the position. However, given the renewed emphasis and demonstrated benefits of the first line of defence, re-instating the position within WFRS Fire Prevention would have added value to the WRFS and the City of Windsor.
8	WFRS Public Education Program be reviewed annually to help identify any areas for improvements.	Staff time	Immediate (0 – 1 year)	WFRS Public Education Program be reviewed annually to help identify any areas for improvements.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
9	WFRS conduct an audit to identify buildings requiring an inspection and to establish a frequency inspection schedule that would be manageable for WFRS, while optimizing community safety	Staff Time	Immediate (0 – 1 year)	Best practices for frequency inspection schedule arrange occupancy types by level of risk and prioritize level of risk commensurable with 1-yr, 2-yrs, or 3-yr inspection rotations.
10	WFRS revamp their proposed 2011 Fire Prevention policy through the lens of the NFPA 1730 and implement the updated policy with accompanying SOGs, detailing specific functions of fire inspection, fire investigation, and public fire and life safety education.	Staff Time	Immediate (0 – 1 year)	A policy would assist fiscal and operational monitoring of the section, as well as service delivery standard.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
11	Create a career path model for all specialized functions/positions within the WFRS.	Staff Time	Immediate (0 – 1 year)	Firefighting is a high-risk profession. Training is essential to enable firefighters to respond more efficiently to emergencies, reducing the property damage caused by fire, loss of life, and public hazards, as well as reducing personnel injuries. Although the WFRS has a career path model for recruit firefighters and officer promotion, there is limited documentation regarding career path modeling for other specialised positions, such as fire prevention officer, fire investigator, public educator, telecommunicator, or technical rescuer.
12	WFRS consider a review of its organizational Chart with a training - centric lens to ensure equitable training support to all WFRS divisions.	Staff Time	Immediate (0 – 1 year)	The WFRS Training Division should not be under the tutelage of any specific Deputy Fire Chief but rather between the two Deputy Fire Chiefs linked with a dotted line to leverage training support to the entire WFRS.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
13	Increase the WFRS Training Division staffing be increased by one Training Officer to meet anticipated growth and demands for training because of the Ontario Regulation 343/22 and introduction of an EV Battery plant within the municipality.	One Full-time Training Officer at a cost between $111,250.00 and $114,700.00	Short-Term (1 – 3 years)	Compounding factors contributing to inadequate staffing levels for the Training Division are the Ontario Regulation 343/22: Firefighter Certification, made under the Fire Protection and Prevention Act, 1997 and the building of an EV battery plant (Stellantis). These compounding factors are accruing workload to the Training Division and necessitate consideration for the increase staffing to the Training Division by one training officer.
14	WFRS Training Division ensures that any training props should be made to comply with NFPA 1402, *Standard on Facilities for Fire Training and Associated Props.*	Staff Time	Immediate (0 – 1 year)	NFPA 1402 provides guidance for the planning of fire service training centers, focusing on the main components necessary to accomplish general fire fighter training effectively, efficiently, and safely.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
15	EMG recommends a study to evaluate the benefit of relocating the Training Division as part of future expansion of the WFRS fire stations in view of including training facilities that would support revenue generation beneficial to sustain and support the WFRS training programs.	Study can be conducted in-house at limited costs. External consultant for such a study may cost upward of $50,000.00	Short-Term (1 to 3 years)	The current training facility is aging and has limited capacity to train to the current levels of service. Considering the Ontario regulation 343/22 and the expansion of testing and certification to all level of service provided by WFRS, it would be beneficial to evaluate current capacity of the Training Division facility vis-à-vis relocating to a new facility that would account for the required expansion of the Training Division to meet growing needs.
16	All technical rescue training should be monitored through the WFRS Training Division in adherence to the NFPA 1006: *Standard for Technical Rescue Personnel Professional Qualifications* and in accordance with Ontario Regulation 343/22: *Firefighter Certification*. EMG also recommends that the WFRS aligns its technical operations and training to NFPA 2500: *Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services*.	Staff time and possible cost associated with an updating of records management programs.	Short-Term (1 – 3 years) To align with O.Reg. 343/22 deadline of 1st of July 2026	With the adoption of Ontario Regulation 343/22: Firefighter Certification, made under the FPPA, 1997, as of July 1st, 2026, all fire department will have to meet the certification requirements addressed in the regulation. The NFPA 2500 Standard is primarily used by emergency response agencies to guide their technical rescue training, equipment, and operations

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
17	All in-house trainers supporting the annual suppression training program should be qualified to level 1 of the NFPA 1041: *Standard for Fire and Emergency Services Instructor Professional Qualifications*.	Staff Time	Immediate (0 – 1 year)	The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the training resource capacity of the WFRS
18	Suppression staff be trained to Fire and Life Safety Educator Level 1 and that the WFRS operations Division captains also be trained as Public Information Officer, under the NFPA 1035.	Staff Time	Immediate (0 – 1 year)	Suppression members contributes to public and life safety education through various WFRS initiatives. Suppression personnel and the WFRS in general would benefit from enhanced training in Public and Life Safety Education.
19	WFRS Fire Prevention policy addresses training requirements and that the training requirements for Fire Prevention which is set at Level 2 of NFPA 1031: Standard for Professional Qualifications for Fire Inspector and Plans Examiner be added to the program development and delivery of the WFRS Training Division. Or at the very least, WFRS Training Division should vet the curriculum and arrange testing and certification to NFPA 1031 and 1035 for fire prevention officers.	Staff Time	Immediate (0 – 1 year)	Fire inspection is a strong program within the WFRS. Training development and delivery are like public and life safety education concerning external training and coordination by the WFRS Training Officer. With the adoption of Ontario Regulation 343/22 and the certification requirements for fire prevention personnel, WFRS would benefit from the Training Division assuming a monitoring role and a curriculum design role to assure candidates' success from the provincial testing.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
20	WFRS dedicated fire investigators be concurrently certified to NFPA 1033 and NFPA 921. In addition, EMG suggests that fire investigation operations and training adhere to NFPA 1231: Standard for Fire Investigation Units and that the WFRS Training Division be responsible for monitoring, record keeping, testing, and certification to the said NFPA standards.	Staff time and costs for attending the NFPA courses	Short-Term (1 – 3 years) To align with O.Reg. 343/22 deadline of 1st of July 2026	NFPA 921 and NFPA 1321 documents complement NFPA 1033. Adherence to all three standards will assure best practices in training, equipment, and operations pertaining to fire investigation functions. training resource capacity of the WFRS
21	WFRS Training Division, at the very least, be responsible for record keeping and monitoring of EMS training requirements.	Staff Time	Immediate (0 – 1 year)	The benefits include improved teaching expertise and experience, improved delivery of program objectives, better trained personnel, as well as benefiting the
22	WFRS update their Probationary to First Class Promotional Process SOP to include details (steps-by-steps) regarding the process.	Staff Time	Immediate (0 – 1 year)	With respect to the firefighter increment promotional process, it is based on a three-year period for completion and the SOP identifies clear and concise objectives and goals for each increment. However, written details of the promotional process are lacking compared to the actual process diligently followed by the Training Division responsible for the firefighter increment process.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
23	EMG recommends that WFRS develops detailed SOP for each rank on the promotional process system, including Training Officer, Captain, and District Chief promotional processes.	Staff Time	Immediate (0 – 1 year)	With respect to the firefighter increment promotional process, it is based on a three-year period for completion and the SOP identifies clear and concise objectives and goals for each increment. However, written details of the promotional process are lacking compared to the actual process diligently followed by the Training Division responsible for the firefighter increment process. With respect to the officer promotional processes, EMG did not identify SOPs related to Training Officer, Captain, District Chief promotional processes, except for an SOP for firefighter increment process (GO 03.01- 2020). The current Human Resources promotional process SOP is lacking in detail and does not conform to the current process.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 5 Suppression				
24	Twenty new firefighting positions should be hired in the short term, and twenty additional firefighters be hired in the medium term to address the current and future community risks that exist. One of these crews should be assigned to Station 7 in the City's east end; the other to Station 4.	Firefighter would initially start at 4th class, which is approximately $70,000 plus benefits. (Costing for one full-time first-class firefighters is approximately $105,000, plus benefits).	Short to Long-Term (1 – 10 years)	This will supplement existing staffing levels allowing greater depth of response and a greater ability to rotate firefighters into rehab at major incidents; provides for greater firefighter safety and potential for injury prevention, thus reducing WSIB and overtime costs.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
25	An update of the human resources element of this Fire Master Plan should be conducted in 2030 to evaluate the need to hire an additional 20 firefighters based on community growth and risk as they will have developed to that point in time.	Firefighter would initially start at 4th class, which is approximately $70,000 plus benefits. (Costing for one full-time first-class firefighters is approximately $105,000, plus benefits).	Long-Term (10 years)	To assess the impact of community growth on response times, response depth, WSIB, and overtime costs that develop over the medium to longer term.
26	A full pre-incident planning program should be implemented for vulnerable occupancies (nursing homes etc.) high-risk industrial properties, multi-unit dwellings, commercial business districts, institutional occupancies (hospitals, universities), assembly occupancies, office-type structures, international crossings, and airports.	Staff time	Immediate (0 – 1 year)	To afford fire crews the ability to gain foreknowledge (intelligence) of the water supplies and features threats of individual buildings that they may be called upon to operate in.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
27	The Department should establish annual training focussing on airport operations (including radio procedures), pre-incident planning, aircraft recognition and hazards, and aircraft rescue and firefighting operations for its crews.	Staff time	Immediate to Short-Term (0 – 3 years)	Preparedness and safety issues for firefighters (who need to be intimately familiar with the risks and safety precautions to take).
28	The Department should review its emergency response protocols for tunnel and bridge operations in concert with allied agencies on both sides of the border with a view to strengthening relationships and updating procedures respecting rescue, crash, firefighting, derailment, hazardous material, and terrorism/border security response tactics and procedures.	Staff time	Immediate to Short-Term (0 – 3 years)	Preparedness and safety issues for firefighters (who need to be intimately familiar with the risks and safety precautions to take).

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
29	The Department should undertake a comprehensive analysis of medical responses in respect of response times relative to EWEMS arrival, patient outcomes where WRES initiates life-saving measures, and other potential efficiencies that may be derived from such an analysis.	Staff time	Immediate to Short-Term (0 – 3 years)	To establish and validate the business case for continuing involvement in this program and to assess the effectiveness of Departmental intervention efforts.
30	The Department should explore the notion of program cost-recovery (training, consumables, response) from the County for providing first-response medical services as a means of securing at least partial program cost recovery.	Staff time	Immediate to Short-Term (0 – 3 years)	Reduce the impact of operational costs by identifying a revenue source.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
31	The Department should establish the necessary budget and training programs to implement the rescue disciplines of Confined Space Rescue, High Angle (Rope) Rescue, and Trench Rescue OR these services be deleted from the Establishing and Regulating Bylaw.	Staff time	Immediate to Short-Term (0 – 3 years)	The current Council policy (as expressed in the E&R Bylaw) is that the department is to carry out these functions, however, it is neither equipped nor trained to do so, thus presenting liability on several fronts.
32	The Establishing and Regulating Bylaw should be updated to provide for the provision of Urban Search and Rescue (USAR) services as a Council-approved activity	Staff time only – but cost could be incurred if approved by council .	Immediate to Short-Term (0 – 3 years)	To bring the Bylaw into concurrence with current departmental practices.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
33	The Department should re-establish a Marine Unit with a properly sized vessel that affords the ability to provide fire attack/control, rescue, and spill mitigation along the City's waterfront.	If approved. There would be costs associated with the level of equipment and training required.	Short-Term (1 – 3 years)	To establish a more complete fire rescue response and environmental protection capability to safeguard the recreational and commercial boating community and protect the waterfront.
34	The Post Incident Analysis Report (PIAR) process and SOP should be refreshed to reflect current practices and formal PAIRs be conducted for incidents that meet a predetermined threshold. In addition, it's recommended that each PIAR be documented thoroughly and that an annual summary of all PAIRS occurring in a calendar year be prepared with all operational staff, and the training division so that lessons learned can be incorporated into future training sessions.	Staff time	Immediate to Short-Term (0 – 3 years)	To allow for broader organizational learning opportunities.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
35	The Department should undertake a review of the firefighting foam and other products used by the city to ensure that the products used are fluorinated chemical free and that they represent the best solution for current and future needs.	Staff time	Immediate to Short-Term (0 – 3 years)	Firefighter safety and environmental protection.
36	A staff-driven team should be established with a broad mandate for the review and analysis of newer technologies available in the Canadian marketplace for potential applications locally and in addition to the cache of equipment.	Staff time	Immediate to Short-Term (0 – 3 years)	To facilitate the introduction of new technologies intended to increase efficiency and safety.
37	A permanent staff position should be created with a responsibility to develop and monitor quality assurance and related practices that will keep Windsor Fire and Emergency Services at the forefront of the delivery of fire protection services across the spectrum of services that meet the needs of the ratepayers of the City of Windsor.	Approximate cost of new position $50,000 to $70,000.	Short-Term (1 – 3 years)	A proactive measure that will allow for data monitoring and QA practice implementation at a greater rate/degree than is currently being conducted.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
38	Consideration should be given to adding four Platoon Chief positions to the organizational structure of the department.	Approximate cost of a Platoon Chief would be $130,000, plus benefits	Short to mid-Term (1-6 years)	As the population of the city increases and annual call volumes exceed 10,000 incidents, the Platoon Chief (one per shift) will allow for greater operational oversight while reducing the administrative workload on the District Chiefs. This position will increase command presence on the fireground, potentially reducing the span of control issues and increasing the efficiency of the Command Team.
39	Train and certify the Windsor Fire Communicators to the OFM requirements.	Staff time and cost of course	Short-Term (1 – 3 years)	Staff time, which could incur overtime for course attendance off site.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 6 – Facilities and Vehicles				
40	Station #1/HQ is running out of space and will no longer be able to effectively house all the department's vehicles, equipment, and staff quarters. • As such, there is a real need for either a full upgrade/expansion of the present facility, or the building of a new fire station. Fire prevention and communications are to be part on the new facility.	For a facility the size of HQ, the cost would be approx. $10 to $20 million dollars or more depending on size and timing of project.	Short to Mid-Term (1 – 6 years)	An upgrading of the present facility would in most cases be a short-term fix and will most likely fail to meet the demands of the department. The cost of such upgrades could cost almost as much as the cost of a new headquarters. The building of a new headquarters should consider future growth expectations, along with incorporating new technologies to make the facility both energy efficient and safer for staff.
41	Station #4 should be relocated because of the construction of a new Canada Customs truck inspection plaza at the foot of the Ambassador Bridge.	Stations – approx. $4 to $6 million each.	Short to Mid-Term (1 – 6 years)	Station 4 is the oldest fire station. Relocation and a new building would be opportunistic, given the construction of the new Customs Plaza's impact on the current location of Fire Station #4

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
42	To plan for the new fire station in District 7 or District 6 over the long term, the Fire Chief should work with the Planning Department to verify where the growth will occur and in what timeline.	Stations – approx. $4 to $6 million each. Fire trucks – approx. $800,000 to $1,000,000 each. Plus 20 staff for each new station.	Short to Mid-Term (1 – 6 years)	By doing this, a growth-based plan can be developed in relation to the station builds. This new construction and staff hiring for the new fire stations is a long-range plan that will most likely take place over the next ten years (or perhaps longer, depending on the city's growth).

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
43	The Maintenance facility is outgrowing the demands of the Department. As such, a new maintenance facility should be built in the long term to meet future demands. • This new maintenance facility could also be factored into the construction of the new headquarters.	Cost of a new facility or part of the new HQ could range from approx. $1 million as part of HQ, to $5 to $10 million (or more) as a stand-alone facility.	Mid to Long-Term (4 – 10 years)	The idea of a new HQ that would bring Training, Fire Prevention and Fleet Maintenance into one building would reduce the overall cost of building two separate facilities.
Section 7 - Emergency Management				
44	Windsor update their emergency management training plan to ensure that existing and new staff are current with their required training as per their position within the plan.	Staff time	Immediate (0-1 year)	Keeping this plan up to date is a requirement under the Act.
45	Windsor develop and/or review essential Continuity of Operations Plans/Business Continuity Plans for the internal operations of the municipal administration.	Staff Time	Short-Term (1-3 years)	Review and updating of such a plan is a key resource for the city.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 8 - Fire Service Agreements				
46	EMG recommends that all Automatic Aid, Mutual Aid and Fire Protection/Service Agreements be reviewed annually and revised if necessary. All parties involved should pay particular attention to adherence, and regularly defined review periods and or expiry dates identified. Also, a page listing the dates of review and areas revised should be an addendum to any of the revised agreements and associated bylaws.	Staff Time	Short-Term (1 to 3 years)	Having a current bylaw and agreements in place better reflect enhanced service levels in providing fire protection services.
47	That all joint training opportunities be engaged in wherever possible.	Staff Time	Short-Term (1 to 3 years)	If a technical rescue call requires additional resources from outside the WFRS, a plan will already be in place ahead of time. It reduces the response time of these agencies if agreements are in place in advance, as pre-response approvals will not be required.

Rec #	Recommendation	Estimated Costs	Suggested Timeline for Implementation	Rationale
Section 9 - Finance				
48	The Fire Chief annually review the building infrastructure replacement plan to ensure it meets municipal growth patterns and the current fire department locations remain relevant to community needs and emergency response.	Staff time initially. Cost depending on needs.	Short-Term (1-3 years) ongoing	Review recommended to ensure services are meeting the needs of the department and community.
49	The Fire Chief annually review the fleet replacement schedule to update projected costs and currency.	Staff time initially. Cost depending on needs.	Short-Term (1-3 years) ongoing	Review recommended to ensure services are meeting the needs of the department response capabilities.

Appendices

Appendix 'A' – Fire Station Location Study

Appendix 'B' - Five-Step Staffing Process

Appendix 'C' – Call Response Data – 2020-2021

Appendix 'A'

Fire Station Location Study

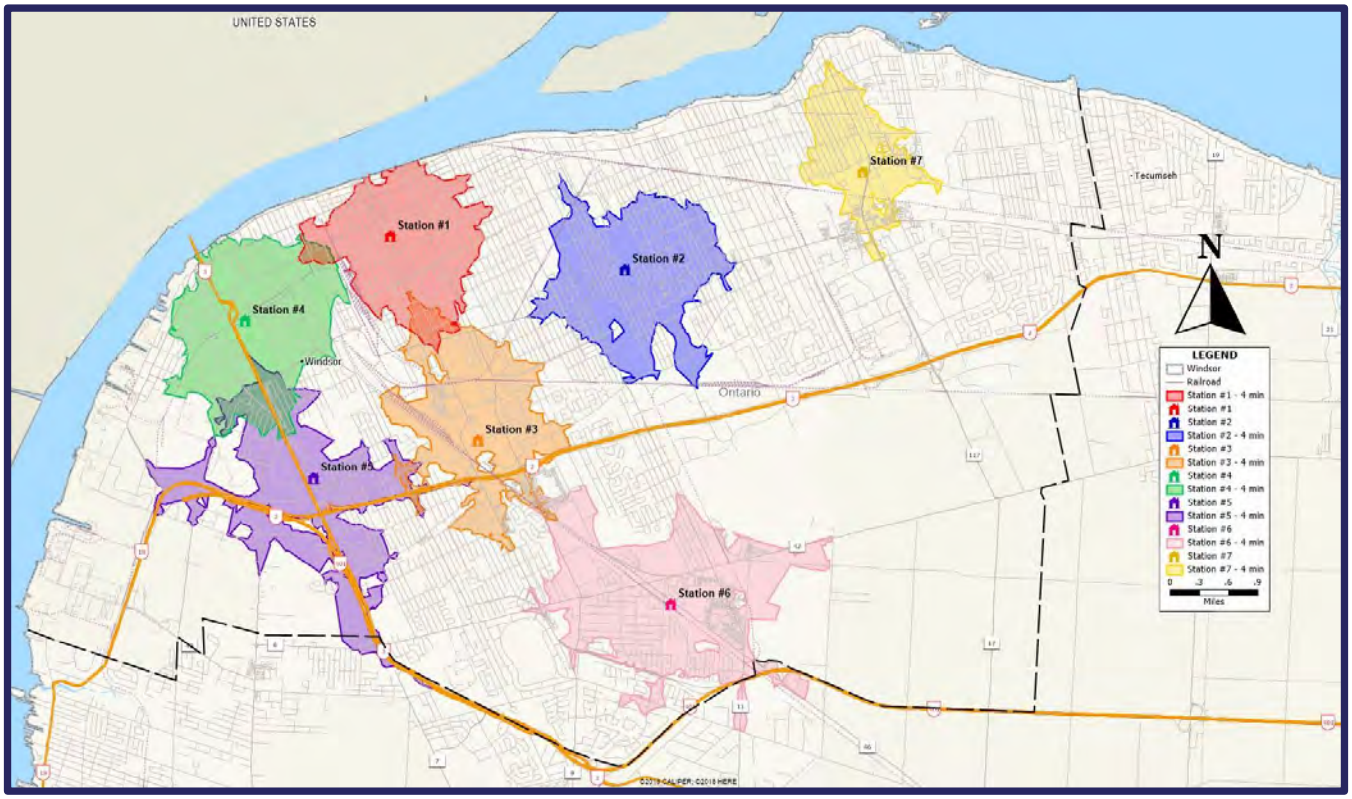
APPENDIX 'A' - FIRE STATION LOCATION STUDY

This section will assess each facility's present fire station locations and conditions. Recommendations for future stations relative to current and future service delivery demands (such as population growth and call volumes) and applicable standards will also be presented for consideration by the fire chief and city council.

Fire Stations Locations

Fire stations should be positioned to offer the most efficient and effective response to the community they serve. A recap of Figure A.1 illustrates the current location of the WFRS fire stations. Fire station locations depend on many factors, such as key risks within the response zone, future growth of the community and station staffing (full-time or volunteer firefighters).

FIGURE A.1 - DRIVE TIME OF 4-MINUTES FROM THE FIRE STATIONS



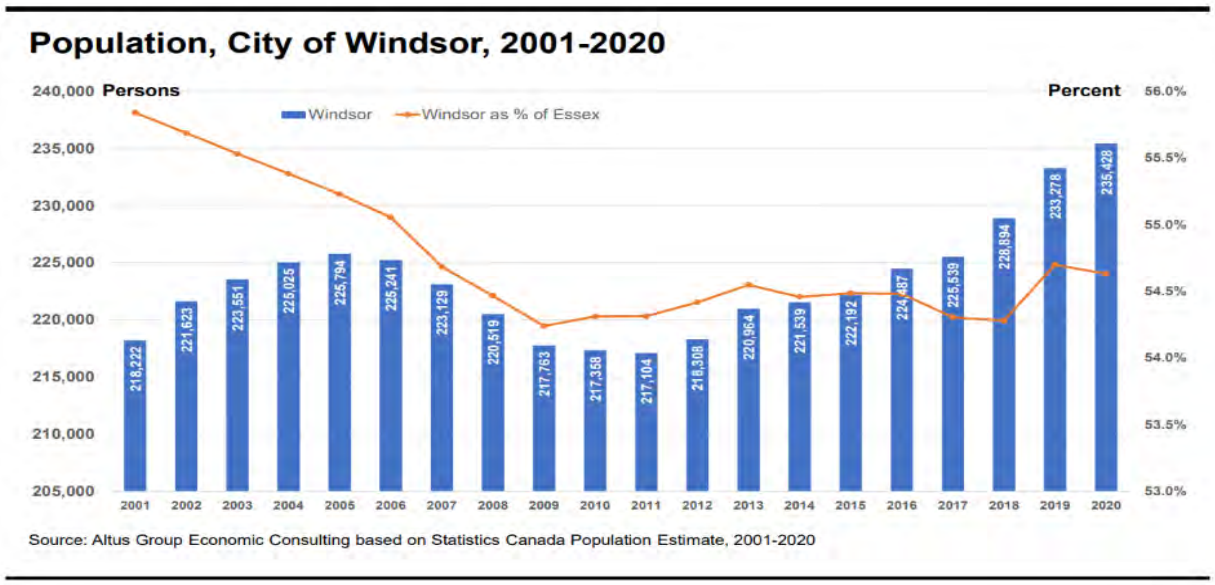
As shown in Figure A.1, the western portion of Windsor is well covered, but the southeast and northeast sections of the city have large, uncovered areas.

Growth and Station Locations

Recent reports show that growth in new areas and infill within the city through building more residential high-rises will continue in Windsor. As such, there needs to be a plan in place to ensure that the WFRS can keep up with the city's ongoing growth.

According to the City of Windsor Multi-Residential Interim Control By-law Study prepared for the City by Altus Group Economic Consulting in 2022, "*the city experienced a growth in population between 2001-2005. However, it lost population each year over the 2006-2011 period. Since 2012, the city's population has grown, with the growth rate increasing in the most recent past five years.*[34] *".* Figure A.2 shows the current increase trend.

FIGURE A.2 - CITY OF WINDSOR POPULATION TREND 2001-2020



The World Population Review and the Altus Group Economic Consulting suggest that the City of Windsor will see yearly population growth of approximately 0.59%, or about 3,000 people yearly. The city's population demographics are estimated to grow to 337,418 by 2035 (Table A.1).

[34] The City of Windsor Multi-Residential Interim Control By-law Study, Altus Group Economic Consulting, January 30, 2022, Page 1.

TABLE A.1 - WORLD REVIEW POPULATION TRENDS FOR THE CITY OF WINDSOR 2023-2035

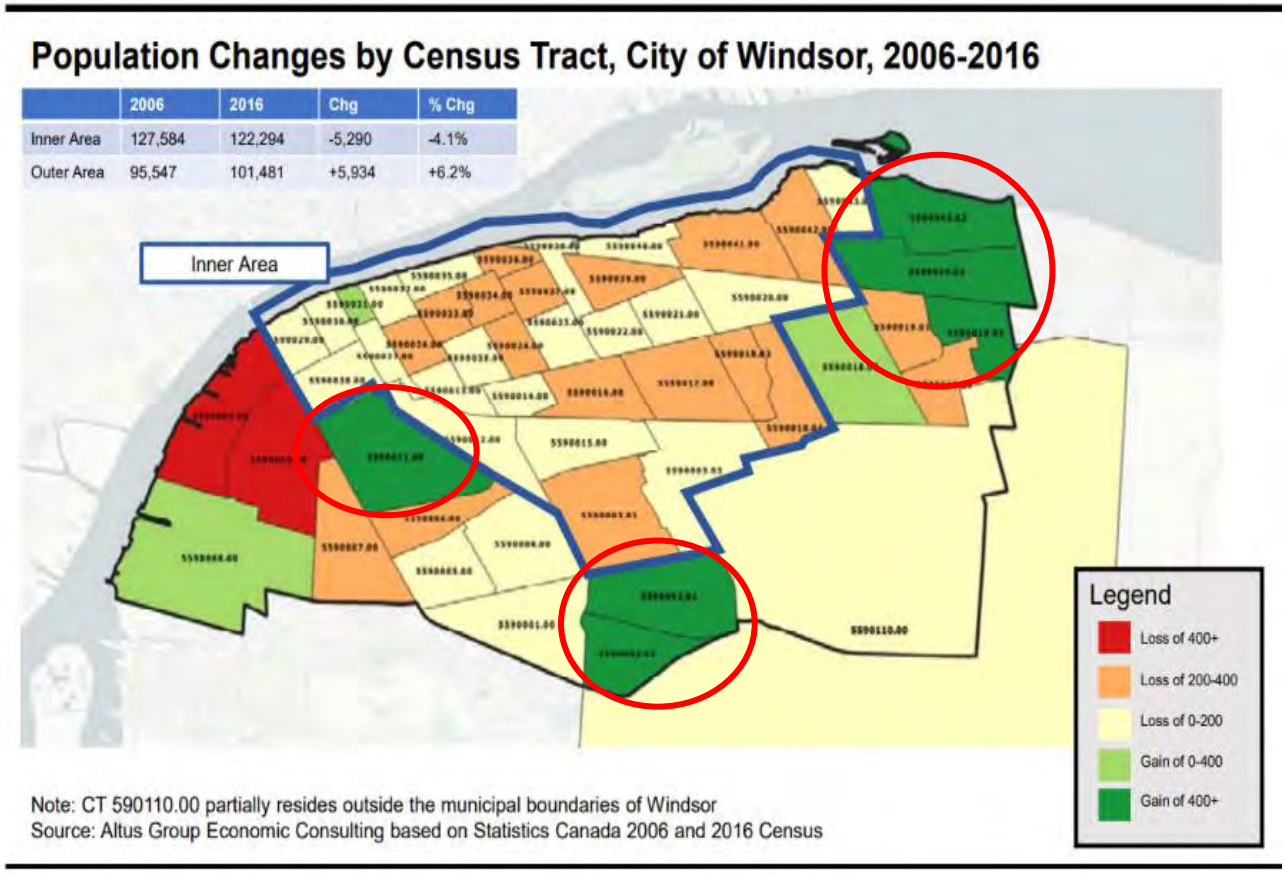
Windsor Population Data (Urban Area)

CSV JSON

Year	Population	Growth Rate	Growth
2035	377,418	0.83%	3,100
2034	374,318	0.84%	3,116
2033	371,202	0.85%	3,133
2032	368,069	0.86%	3,148
2031	364,921	0.87%	3,157
2030	361,764	0.88%	3,154
2029	358,610	0.88%	3,128
2028	355,482	0.87%	3,068
2027	352,414	0.85%	2,965
2026	349,449	0.81%	2,813
2025	346,636	0.76%	2,618
2024	344,018	0.7%	2,383
2023	341,635	0.62%	2,120

Worth noting is the change in population by area of the city. According to the 2022 Altus Group Economic Consulting's study, of the 52 Census Tracts (CTs) in the City of Windsor, 9 CTs experienced gains in population and more relevant to this fire station location study is the fact that 6 of the 9 CTs are located on the eastern, southern, or western edge of the city's boundary (Figure A.3).

FIGURE A.3 - CITY OF WINDSOR POPULATION CHANGES BY CENSUS TRACT 2006-2016



The city's inner area, identified by the thick blue line, saw a decline in population between 2006 and 2016, while the area outside the thick blue line (in red circles) witnessed an increase in population, approximating 6% for the same period. This population demographics support the current EMG Fire Station Location Study as to the benefits of relocation of Fire Station #4, relocation of WFRS Headquarters to District 7, and future fire station additions to the eastern and southeastern areas of the city.

Based on this growth, there will be an increase in call volumes based on (but not limited to) an increase in traffic, industry, and an aging population.

Fire Station Location Study and Methodology

EMG reviewed and considered historical WFRS response data from 2019 to 2021 and future fire and emergency protection trends. The response data would include increased service demands, demographics, risks, and incidents. Based on the overall call volume numbers, the historical data received was reviewed and analyzed based on the following:

- call demand by location
- number of firefighters responding
- response times
- call types (i.e., alarms, fire, medical, hazmat, etc.)

A series of data analyses were undertaken using GIS mapping software to plot response zones along with the response capability and coverage of the present locations and the inclusion of potential future stations. EMG conducted a geospatial analysis with the assistance of the City of Windsor Geomatics. The review, along with the mapping summaries, provided a pictorial explanation that supported the evidence for the fire station study, along with optimal site recommendations.

As noted, fire stations should be situated to offer the most efficient and effective response to their community.

The research methodology for the fire station study is based on the WFRS' performance against NFPA 1710 and a mixed-method research approach, using quantitative and qualitative research techniques and a non-probability sampling method. This research approach allows the subjective selection of sample data from incident responses from 2019 through 2021. The non-probability method is called purposive sampling, a methodology best suited to develop a performance-based suitability study of the WFRS fire station locations and/or anticipated relocation and potential new locations.

It is worth noting that using "real-time" data provided a more robust analysis of emergency response time performance in relation to response time data offered as best practice by the NFPA 1710 Standard.

In addition, this mixed method research approach is beneficial given the critical factors from the data collection surrounding specific phenomena associated with a downtown core, such as transient population, commercial, mercantile, and professional business types, business hours, population influx, traffic impact, etc. The mixed method research approach also excels analytically with factors not associated with typical residential neighbourhoods and factors that would impact response time given foreseen population intensification and increase in medium and high-density multi-occupancy buildings.

RESULTS OF FIRE STATION STUDY

Calls for service data between 2020-2021 indicate that WFRS responds to approximately 6,500 calls for service per year. The following table shows a breakdown of service calls for 2020 and 2021 per fire station.

TABLE A.2 - WFRS CALLS FOR SERVICE 2020-2021

Year 2021							
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Calls For Service	2,057	1,026	502	1,033	568	600	1,044
% Of Calls	30%	15%	7%	15%	9%	9%	15%
Year 2020							
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Calls For Service	1,776	1,036	446	855	522	522	1,006
% Of Calls	29%	17%	7%	14%	8%	8%	17%

The WFRS is a full-time fire department. Therefore, the NFPA 1710 (2020 Edition) *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments* will be utilized as the benchmark for this review. It should be noted that although the NFPA 1710 is not a mandated standard, it is recognized as an industry best practice. Fire departments should use NFPA standards as goals and guidelines to strive for.

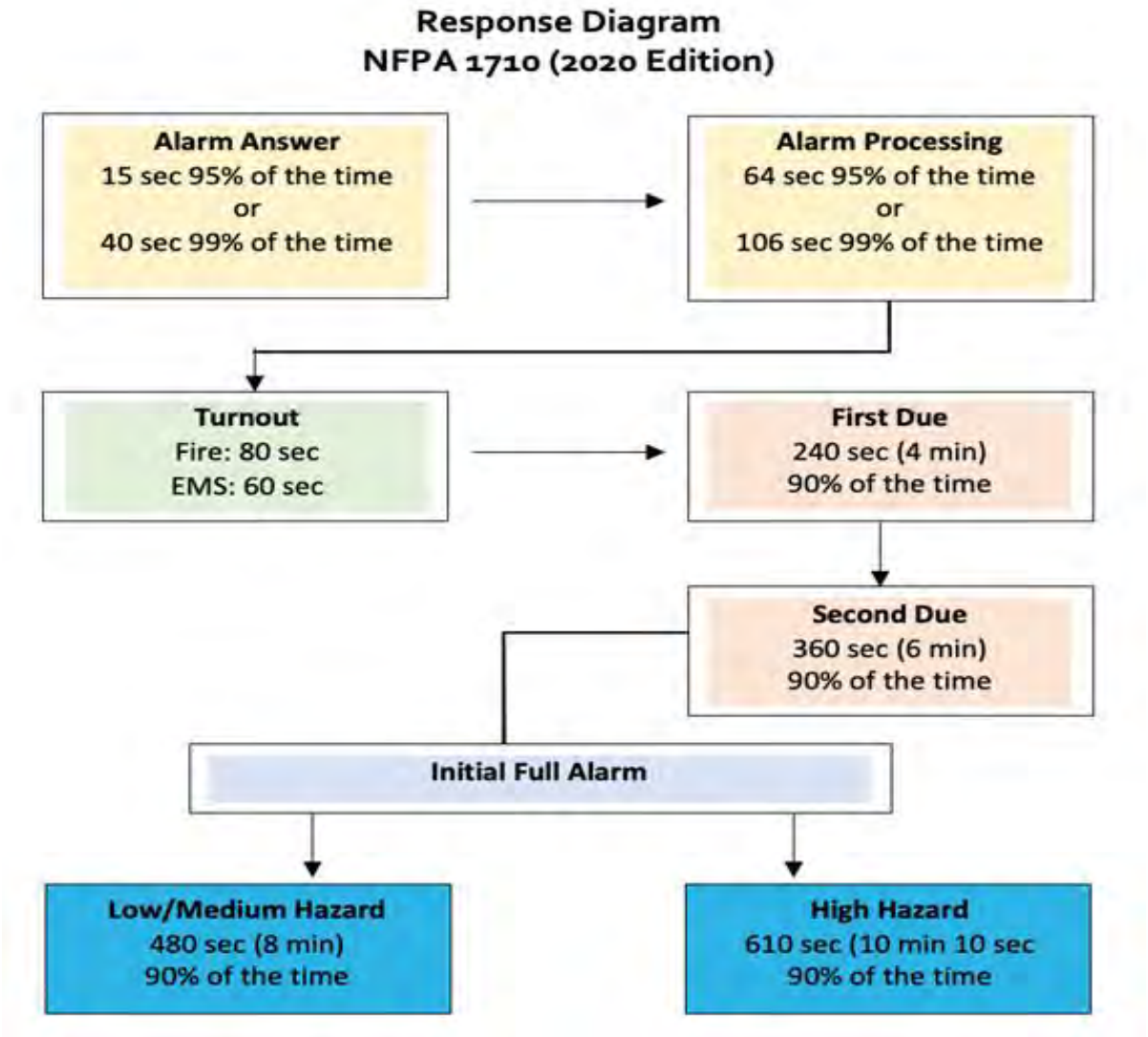
NFPA 1710 notes that the first responding apparatus shall be staffed with a minimum number of four members (one officer and three firefighters) to deal with the tactical hazards, high-hazard occupancies, high incident frequencies, geographical restrictions and other significant factors identified by the authority having jurisdiction (AHJ) (Figure A.4).

Clause 4.1.2.1 of the NFPA 1710 states: "The fire department shall establish the following performance objectives for the first-due response zones that the AHJ identifies:

- Alarm handling time completion in accordance with 4.1.2.3.
- 80 seconds turnout time for fire and special operations response and 60 seconds turnout time for EMS response.
- 240 seconds or less travel time for the arrival of the first engine company at a fire suppression incident.
- 360 seconds or less travel time for the arrival of the second company with a minimum staffing of four personnel at a fire suppression incident.
- For other than a high-rise, 480 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.
- For high-rise, 610 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident.

- 240 seconds or less travel time for the arrival of a unit with a first responder with an automatic external defibrillator (AED) or higher-level capability at an emergency medical incident.
- 480 seconds or less travel time for the arrival of an advanced life support (ALS) unit at an emergency medical incident, where this service is provided by the fire department provided a first responder with an AED or basic life support unit arrives in 240 seconds or less travel time."

FIGURE A.4 - RESPONSE DIAGRAM BASED ON NFPA 1710



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

EMG reviewed the WFRS 90th percentile priority calls for service data from 2020-2023. The results showed that the First Due apparatus travel time varies from 5 to 7 minutes. Many factors contribute to this KPI, such as geography, traffic, road map, etc. The performance will vary based on these factors. Data indicates that fire stations 1, 3, and 4 have better response times and fire station 5 has the least effective response time based on the 4-year average between 2020 and 2023 and on the 90th percentile suggested by NFPA 1710 (Table A.3).

TABLE A.3 - WFRS 90TH PERCENTILE RESPONSE TIMES BY CALLS FOR SERVICE 2020-2023

Year 2020							
Drive Time 90 Percentile	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
	5 min 17 sec	6 min 56 sec	6 min 45 sec	5 min 35 sec	7 min 28 sec	7 min 31 sec	7 min 10 sec
Year 2021							
Drive Time 90 Percentile	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
	5 min 09 sec	6 min 46 sec	6 min 27 secs	5 min 26 sec	7 min 25 sec	7 min 43 sec	7 min 19 sec
Year 2022							
Drive Time 90 Percentile	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
	5 min 11 sec	6 min 36 sec	6 min 25 sec	5 min 38 sec	7 min 57 sec	7 min 06 sec	7 min 14 sec
Year 2023							
Drive Time 90 Percentile	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
	5 min 15 sec	6 min 42 sec	7 min 02 sec	5 min 55 sec	7 min 33 sec	7 min 29 sec	7 min 43 sec
4-Year Average	5 min 13 sec	6 min 45 sec	6 min 40 sec	5 min 38 sec	7 min 36 sec	7 min 27 sec	7 min 21 sec

Concerning minimum staffing requirements, a review of the 2020-2021 calls for service data indicated that based on the 90th percentile, all fire stations have a minimum of four personnel on the first due apparatus. The results show that WFRS meets the minimum staffing requirements per NFPA 1710.

To provide the fire department with a more precise focus on the ultimate goals for emergency response criteria, 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 (previously illustrated with Figure A.4) 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

growth rate can be affected in several ways, which can increase or suppress the burn rate through fire control measures within the structure.

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

- The distance between the fire stations and response location.
- The layout of the community.
- Impediments such as weather, construction, traffic jams, and 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 significantly due to weather, road conditions, and time of day.

With respect to the NFPA 1710, minimum response standards are based on responding to a 2,000 sq. ft. 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). NFPA 1710 recommends a minimum of 16 firefighters on scene for a single-family dwelling (17 if an aerial is used), having the ability to call upon additional resources such as having other firefighters called out as soon as it is known to be an actual fire.

EMG review of the 2020-2021 calls for service data demonstrated that WRFS meets the minimum staffing requirements for First Due apparatus and minimum staffing for a standard structure fire.

TABLE A.4 - WFRS STAFFING BY CALLS FOR SERVICE 2020-2021

Year 2020-2021							
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
First Due Staffing	4	4	4	4	4	4	5
Year 2020-2021							
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Structure Fire Staffing	30	35	14*	27	24	27	29

**Small data sample contributing to the lower 90th percentile. Values are still within the staffing parameter suggested by NFPA 1710.*

A recap of Table #A.4 is being presented again to reiterate the minimum tasks of the firefighters at a residential structure fire and the staffing required to complete each task. Climate plays a prominent role in staffing at a fire as extreme temperatures diminish the physical abilities of those fighting the fire.

TABLE A.5 - NFPA 1710 (2020) STAFFING REQUIRED AT A RESIDENTIAL STRUCTURE FIRE

Function	Staffing Required
Establish Incident Command for the overall coordination and direction of the full alarm assignment.	1
Establish an uninterrupted water supply of a minimum 400 GPM (gallons per minute). (1,520 L/min) for 30 minutes with a supply line maintained by an operator.	1
Establish an effective water flow application rate of 300 GPM. (1,140 L/min) from two handlines, each of which has a minimum flow rate of 100 GPM. (380 L/min) with each handline operating by a minimum of two members.	4
The provision of one support member for each deployment attack and backup line to provide hydrant hook-up and assist in laying of hose lines, utility control and forcible entry.	2
Provision of at least one victim search and rescue team, with each such team consisting of two members.	2

Function	Staffing Required
Provision of at least one team consisting of at least two members to raise ground ladders and perform ventilation.	2
If an aerial device is used in the operations, one member functions as the aerial operator.	1
An initial rapid intervention crew assembled from the initial attack crew, and as the initial full alarm arrives, a sustained rapid intervention crew of four members.	4
Total effective response force with a minimum of 16 (17 if an aerial device is used). ** See asterisk below	17

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

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

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

Staffing Demands

EMG believes that minimum staffing requirements, as suggested by NFPA 1710, are satisfactory for WFRS. EMG reviewed personnel at calls for service between 2019-2021. The 90th percentile computed demonstrated that WFRS consistently responded with a crew of four firefighters at all calls. When reviewing staffing demands for specific calls such as fire, the data indicated a 90th percentile average of 27 firefighters responding to structure fires.

TABLE A.6 - 90TH PERCENTILE STAFFING BY CALLS FOR SERVICE 2019-2021

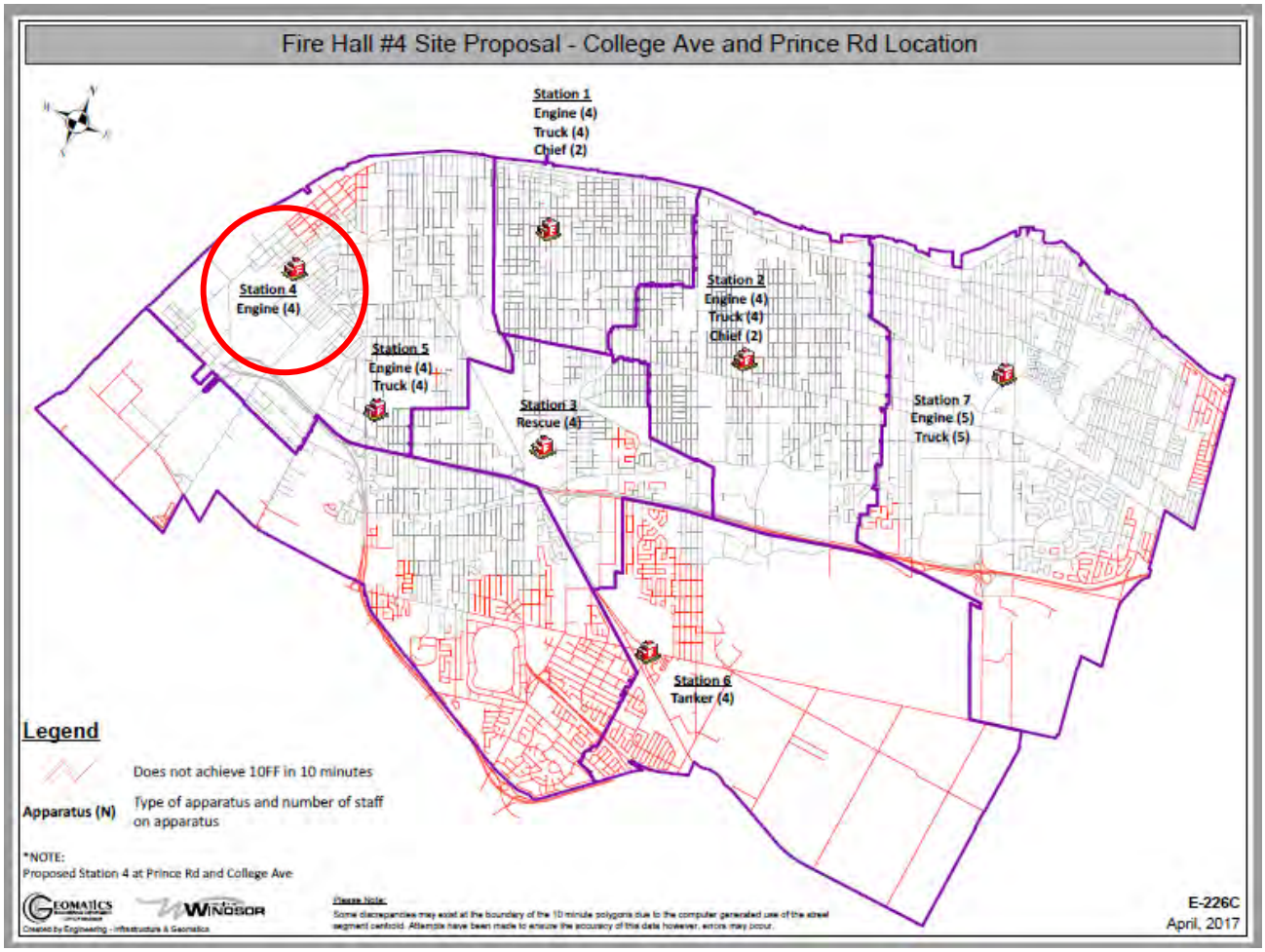
	STN 1 Fire Calls	STN 2 Fire Calls	STN 3 Fire Calls	STN 4 Fire Calls	STN 5 Fire Calls	STN 6 Fire Calls	STN 7 Fire Calls
90TH Percentile (2019-2021)	31	35	14	27	25	27	30
Average	27						

Fire Station Relocation Study

Succinctly, with respect to fire station relocations and the potential for new stations, based on response time as a KPI drawn from the NFPA 1710, EMG recommends the following:

1) The building of an eighth station in the city's eastern section, as this area is presently underserviced by WFRS.
2) The new eighth station also becomes the new headquarters, including accommodations for administration, communications, the training division, fire prevention, and fleet and equipment maintenance.
    a. The facility that houses training, fleet, and equipment maintenance has exceeded its allotted space, with no future room for growth.
    b. Fire prevention to be in a separate facility behind the present headquarters.
3) EMG reviewed the 2018 WFRS analysis of the potential relocation of Station #4 to maintain effective response times with the anticipated calls for service growth from constructing a new Customs Plaza.
    a. EMG recommends relocating Station #4 to the vicinity of College Avenue and Prince Road (2018 WINDSOR GIS map Figure A.5).

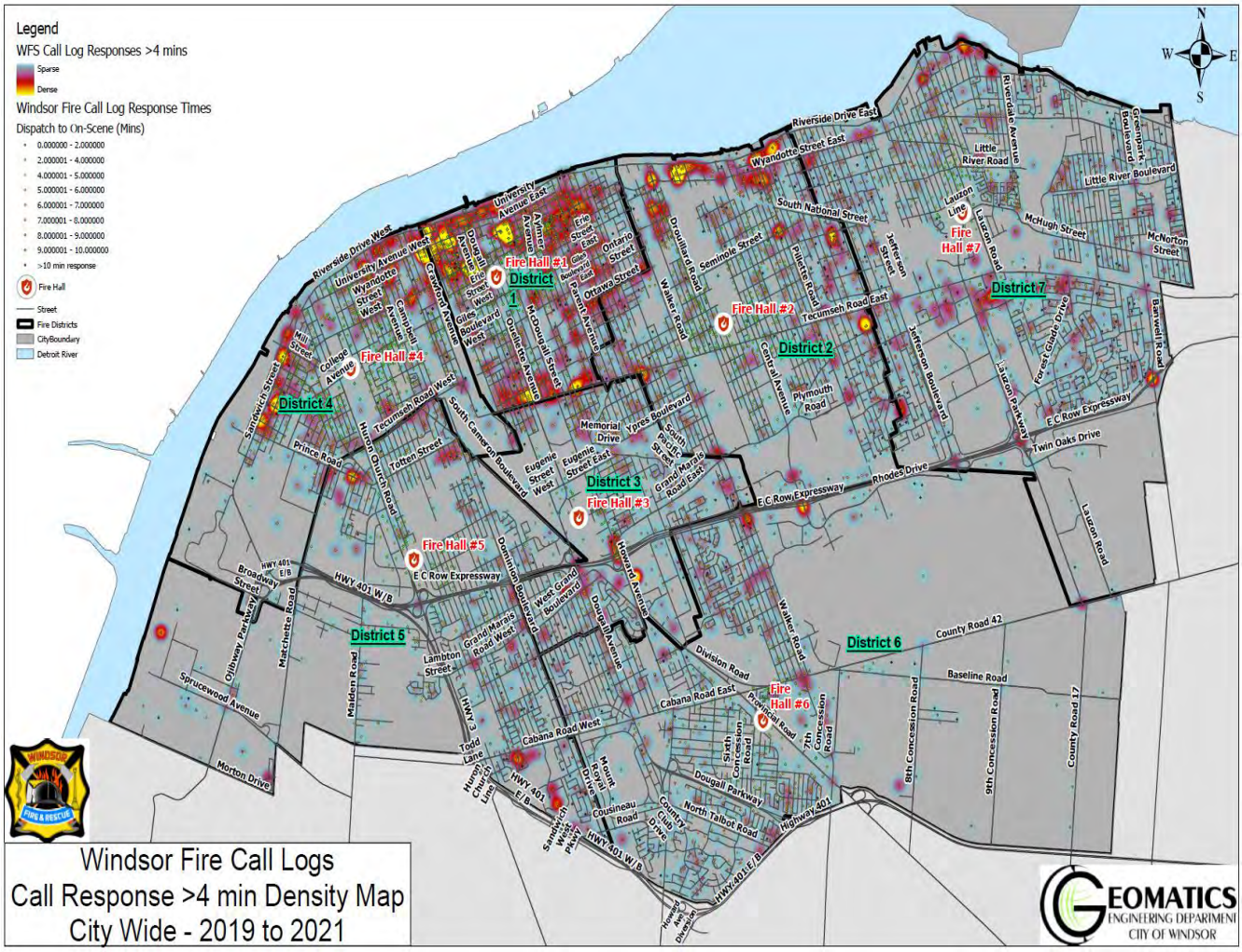
FIGURE A.5 - FIRE STATION #4 SITE PROPOSAL FROM THE 2018 CITY OF WINDSOR GIS STUDY



4) Long-term consideration (over 15 years), with anticipated industrial, commercial, and residential growth in the District 6 area, for a ninth station in the most southeast area of the City of Windsor boundaries.

The following map represents calls for service from the 2019-2021 data provided, depicting response times and call density. The geospatial representation and the EMG data analysis conducted and presented above support EMG's recommendations (Figure A.5).

FIGURE A.6 - GIS REPRESENTATION OF CALLS FOR SERVICE BY WFRS BETWEEN 2019-2021



FIRE STATION 1

Concerning Station #1 (HQ), data analysis showed that the fire station response time is the best for WFRS, with a 4-year average 90th percentile of 5 minutes and 13 seconds. The small boundaries (geographical factor) and downtown core characteristics are contributing factors. Given the composition and characteristics of Station #1 boundaries, as well as data analysis, EMG believes that relocation within the downtown core of the current fire station boundaries would have a limited impact on the quality of response to calls for service.

Moving away from the downtown core would drastically impact the quality of response to calls for service. Current response times for calls for service south of Giles Boulevard (east and west) represent a 25 - 66% increase in response time (from 1 minute and 30 seconds to 3 minutes more drive time). EMG

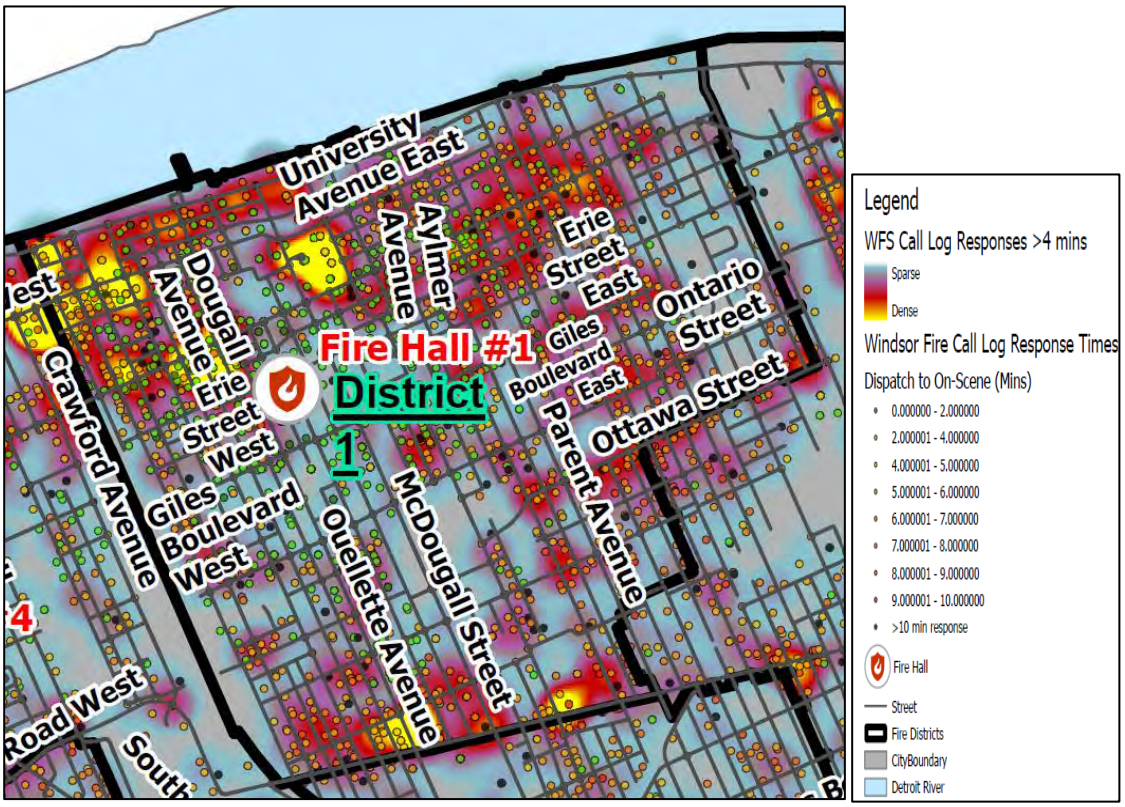
analysis indicates that relocation of Station #1 south of Giles Boulevard would significantly impact response times. Consequently, the relocation of Station #1 should remain near the downtown core, providing the best response time and access to the denser calls for service trends from the 2019-2021 calls for service data compiled and computed for this review (Figure A.6).

Given the age of the building (Station #1, built in 1971), replacement is viable. However, consideration should be given to replacing the station and moving the Administration Division. Consideration to move WFRS Headquarters is reinforced by the Altus Group Economic Consulting's Study findings, which stated CTs declined within the inner-City population areas between 2006 and 2016 (Figure A.3).

At present, most administration functions and support, such as Training, Prevention, and Senior Management, are scattered at different stations across the City of Windsor. WFRS Headquarters relocation plans are an opportunity to unify/amalgamate the Management, Telecommunication, Training, and Prevention Divisions. HQ does not have to be at Fire Station #1. Given real estate limitations in the downtown core, the decline in population demographics, and the concentration of calls for service, reconfiguring Station #1 into a general operations fire station may benefit fire protection operations.

With the recommendation of a new station in District 6, relocating HQ and support services to that location is a viable option.

FIGURE A.7 - FIRE STATION #1 CALLS FOR SERVICE 2019-2021



FIRE STATION 7

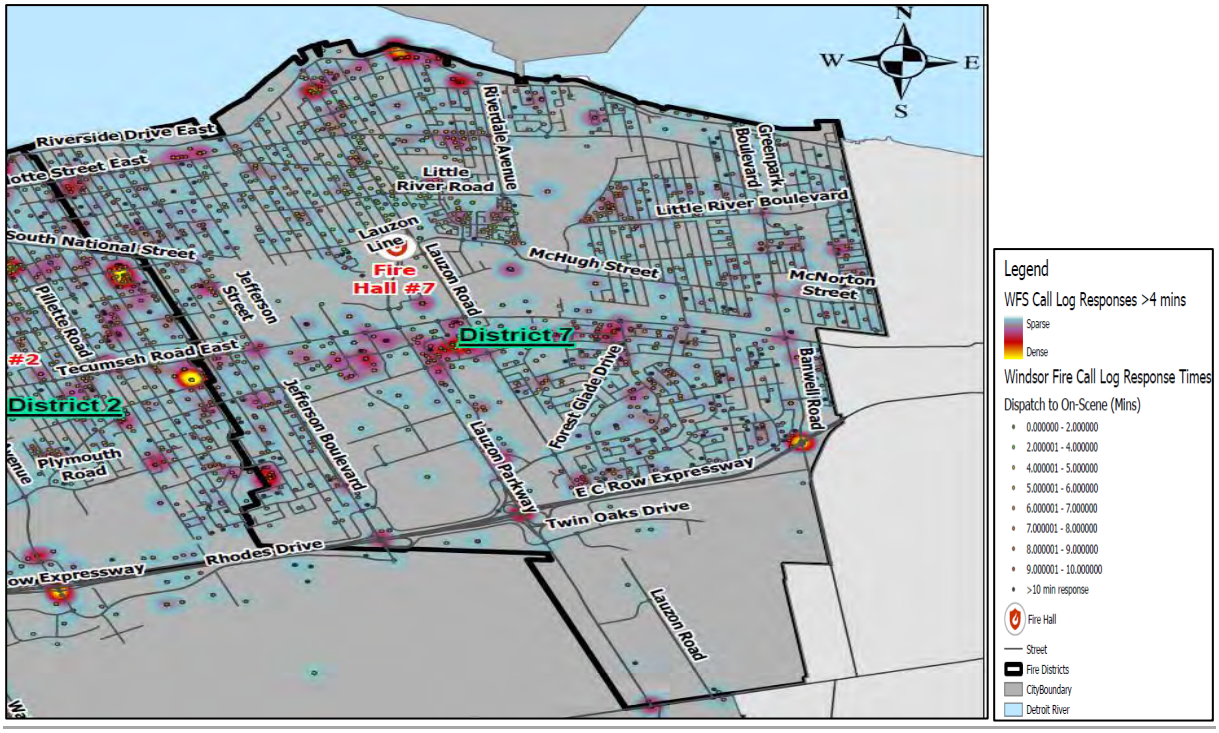
Concerning response time performance specifically, Station #7 is underperforming. One factor is the size of the geographical boundaries. The area south of Tecumseh Road East is highly residential, with substantial, dense areas of calls for service. The geographical distance within the district is a contributing factor to the elevated 90th-percentile response time.

A review of the 90th Percentile of Priority Calls for Service between 2020-2023 indicates that Station 7 has a 4-year average 90th percentile response time of 7 minutes and 21 seconds. The 90th percentile calculation represents the 3rd highest response time compared to all other six fire stations within WFRS. EMG analysis shows that adding a fire station south of Tecumseh Road East and in the vicinity of Lauzon Road in District 7 would improve response time by approximately 44% and levelling response time to within 6 minutes for both the current Station #7 and the new Station 8, which is the current response time standard for WFRS.

The Altus Group Economic Consulting's Study (Figure A.7) identified growth for the City of Windsor in the eastern and southern areas. Considering future development associated with the battery plant and City of Windsor airport and the decline of the inner city CTs, it would be strategically beneficial to consider the relocation of the WFRS Headquarters to the southeastern area of the city, where KPIs

showed that this would be an ideal location for an eighth fire station. Centralizing administrative services is also an excellent opportunity for the WFRS.

FIGURE A.8 - FIRE STATION #7 CALLS FOR SERVICE 2019-2021



FIRE STATION 4

Fire Station #4 is the oldest WFRS fire station and was built in 1964. EMG was informed of plans since 2018 for a station replacement and relocation. Given recent developments with the upcoming construction of a new Customs Plaza on the Canada-USA bridge within the Station #4 district, and considering the 2019-2021 calls for service data, (Figure #A.8). EMG does support the 2018 College Avenue and Prince Road proposed relocation report

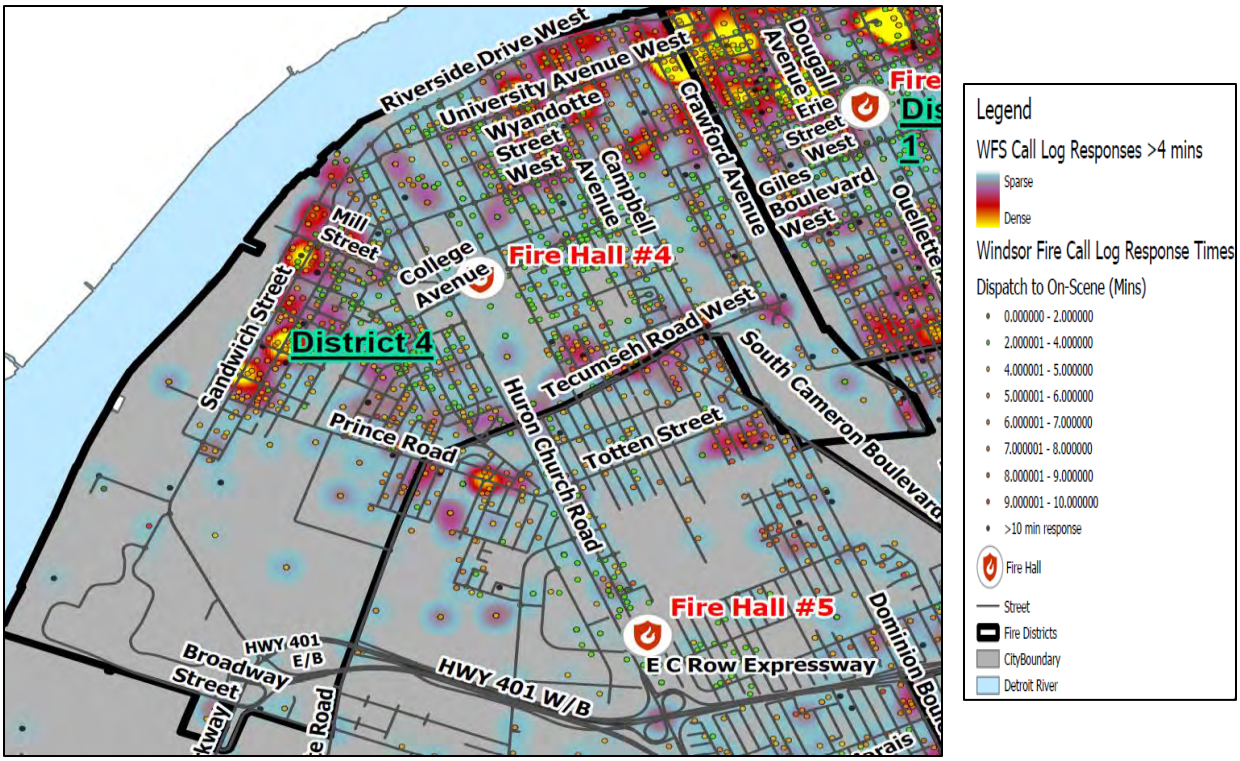
EMG analysis shows that relocating Station #4 to the corner of College Avenue and Prince Road would not significantly affect the current response quality to calls for service. The analysis demonstrated that the denser calls for service areas located in the northeast of District 4 boundaries would see a slight increase in response time of approximately 53 seconds or less. The 53 seconds would be for the most easterly portion of the district. The westerly part of the district would see an improvement in response time equivalent to approximately 20 seconds (the area west of Huron Church Road).

Where the 2018 study indicated that the relocation would disadvantage the Sandwich Street area of the City of Windsor, EMG's analysis indicated an improvement in response time of approximately 20 seconds. The improvement in response time west of Huron Church Road would benefit future growth in

the northwest corner of the District 4 boundaries because of the construction of the new Customs Plaza on the Canada-USA bridge.

The relocation of Fire Station #4 is also supported by the Altus Group Economic Consulting's Study, which indicated that one of the CTs that saw growth was in the western area of the City of Windsor.

FIGURE A.9 - FIRE STATION #4 CALLS FOR SERVICE 2019-2021



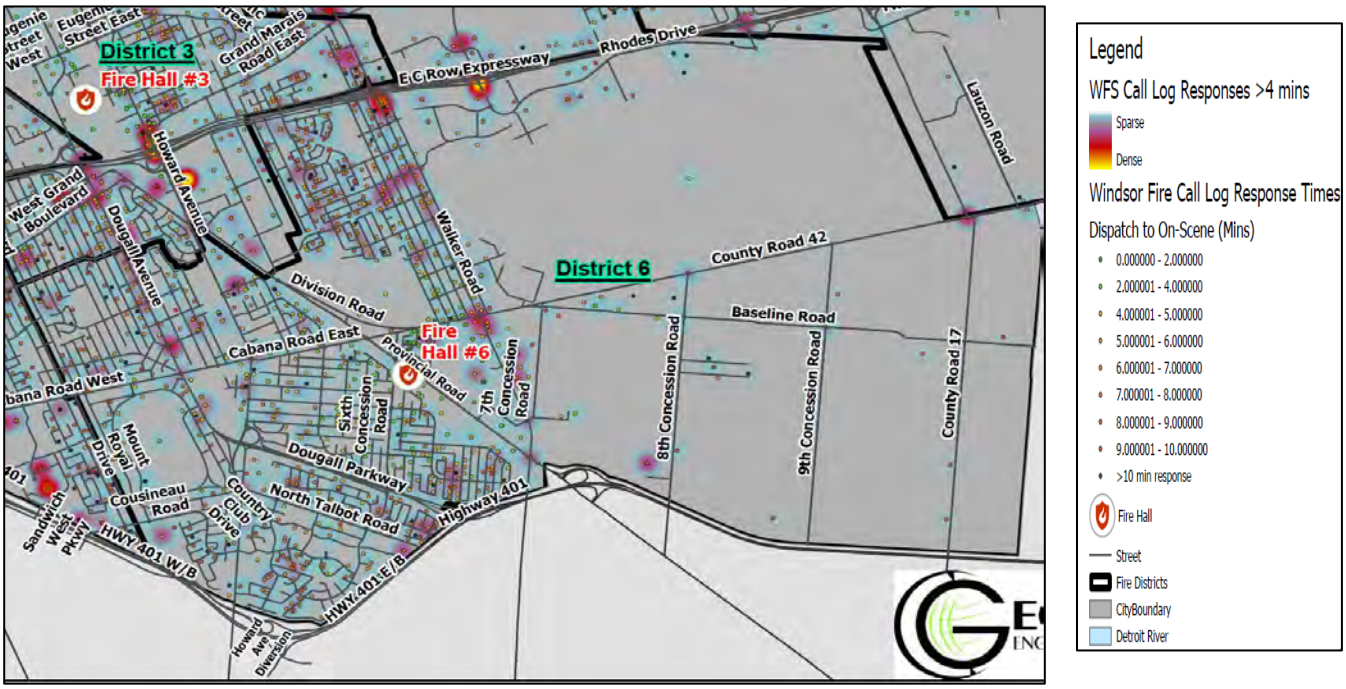
DISTRICT 6

Currently, response times, based on the 90th Percentile of Priority Calls for Service between 2020-2023, identify Station #6 with the second highest response times for calls for service, with a response time 4-year average of 7 minutes and 27 seconds. The Station #6 area is characteristically residential with the Devonshire Heights, South Windsor, and Roseland sub-divisions. Most of the calls for service originate in these residential areas. Station #6 responds to approximately 550 calls for service each year (8.5% of all calls for assistance). Long-term plans suggest industrial, commercial, and residential growth for District 6.

With a highly residential area west of Walker Road, an airport, and an underdeveloped rural area around Concessions 8th and 9th, as well as Baseline Road and County Road 17, with long-term growth, EMG anticipates opportunities for a ninth fire station to solidify fire protection services to the City of Windsor. This ninth station would be in the 10 to 20-year horizon based on population and industrial

growth in this area. The 2022 Altus Study and the performance analysis conducted by EMG support the ninth fire station. Given the outer-city limit population growth, long-term consideration for a strategically located fire station would suggest that the city's southern area would be ideal for expansion (table

FIGURE A.10 - FIRE STATION #6 CALLS FOR SERVICE 2019-2021



Note: *This is a long-range plan to be based on the actual growth of the City of Windsor. As such, this station may not be fully required/implemented until 2041 (approximately 18 to 19 years from now).*

FIGURE A.11 - PROPOSED LOCATIONS OF FIRE STATION #8 & FIRE STATION #9

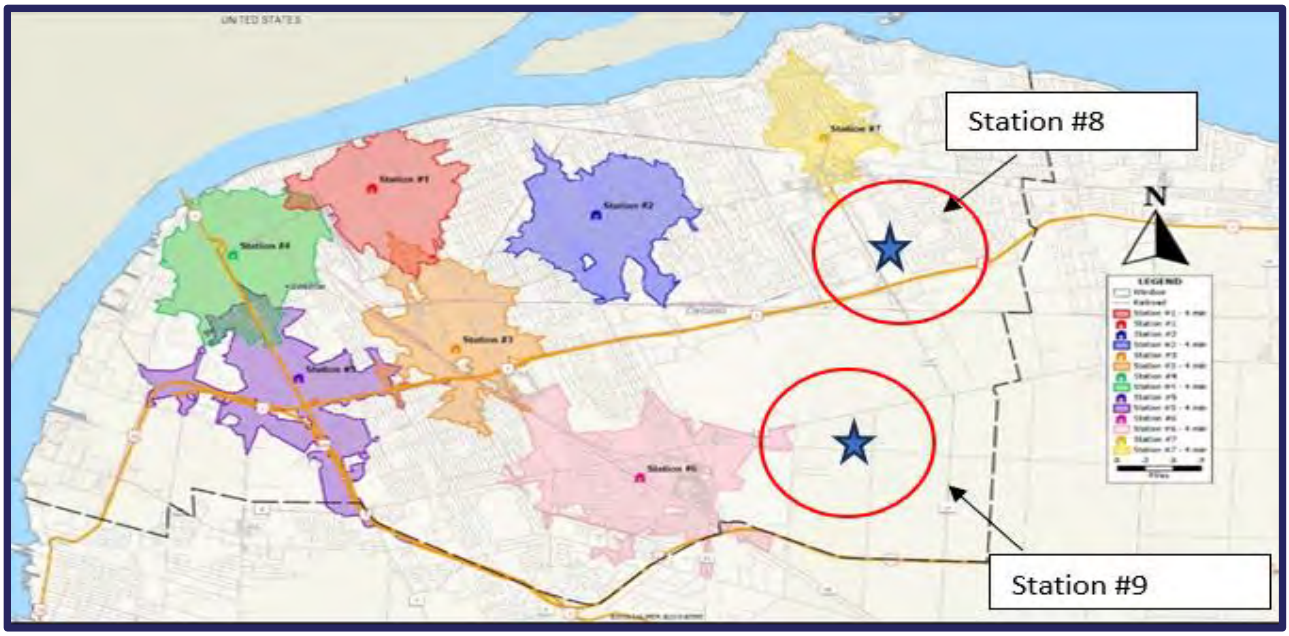
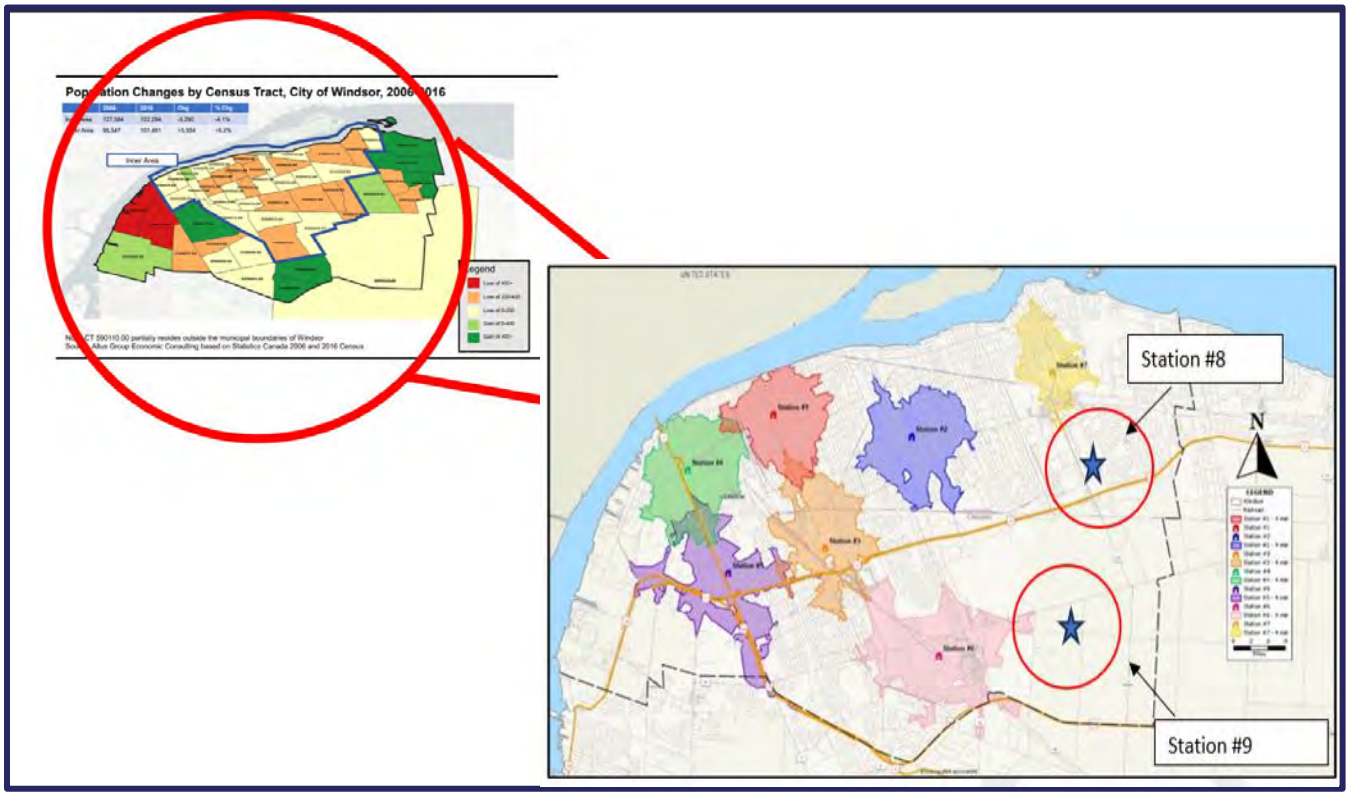


FIGURE A.12 - POPULATION GAINS AND LOCATION OF PROPOSED NEW FIRE STATIONS



Feasibility Study

With the recommendations for a new Station #8 based on the city's growth, EMG recommends that the fire chief work with the Planning Department to verify where the growth will occur and in what timeline. A growth-based plan can be developed in relation to the station builds (and the related timing of each station).

Building a new fire station can range from $4 million to as much as $6 million or more, depending on design, station size, accommodations, and whether it incorporates Leadership in Energy and Environmental Design (LEED) or other standards to consider environmental impact. This does not include the cost of new fire trucks and staff. As such, all of this must be considered to ensure that the station construction and staffing are accomplished in a manner that does not create an unnecessary burden on the city and its capital reserves.

The cost of a new headquarters has many variables, such as whether Training, Fire Prevention, and Fleet Maintenance are in the same facility, along with Administration and Communications. For Fleet Maintenance, this could entail removing and installing vehicle hoists and other

equipment at the present facility (into the new facility), along with square footage requirements for Training and Fire Prevention staff. Costs for such a facility can range from approximately $10 to 30 million.

Appendix ‘B’

5-Step Staffing Process

APPENDIX 'B' – FIVE STEP STAFFING 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 capital; 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 capital

(4) Impact of non-personnel resources (materials, equipment, vehicles) on personnel

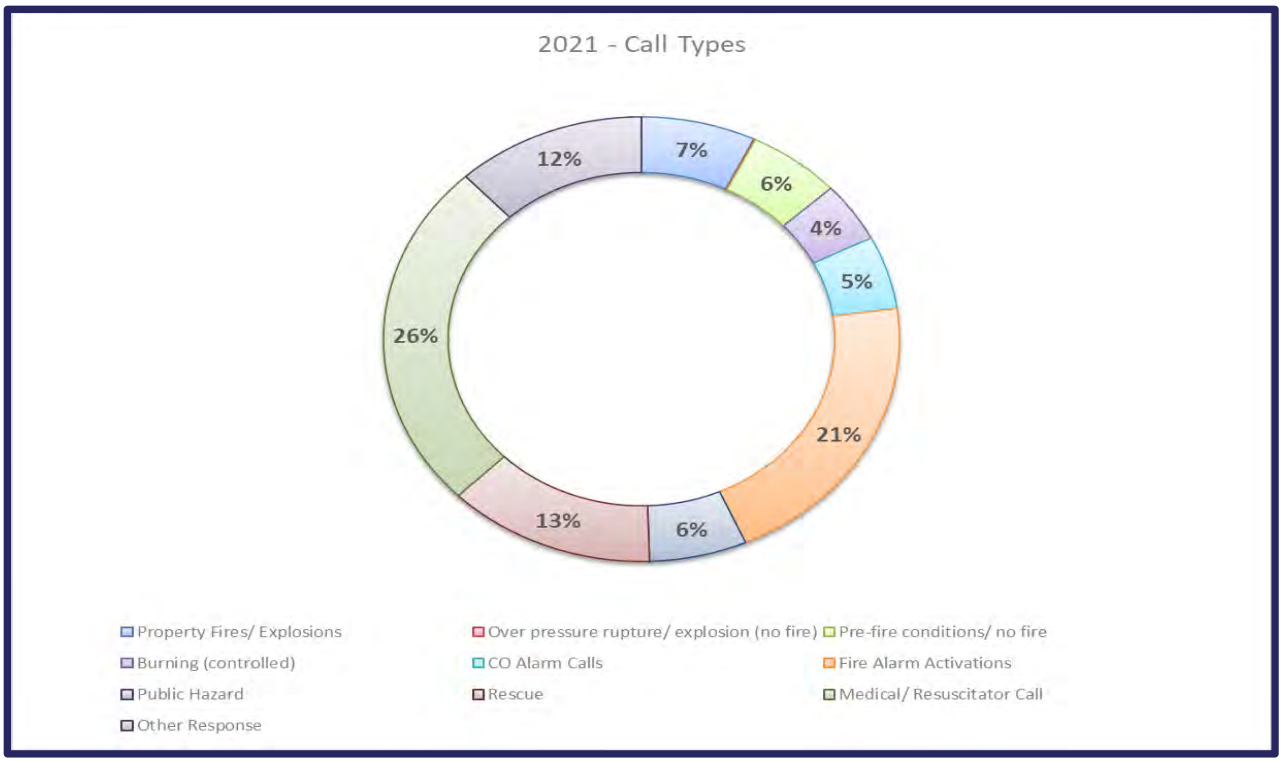
More information on this staffing equation can be found within the National Fire Protection Association 1730 standard. The Fire Prevention should assess the previous five steps and evaluate their present level of activity and the future goals of the Branches.

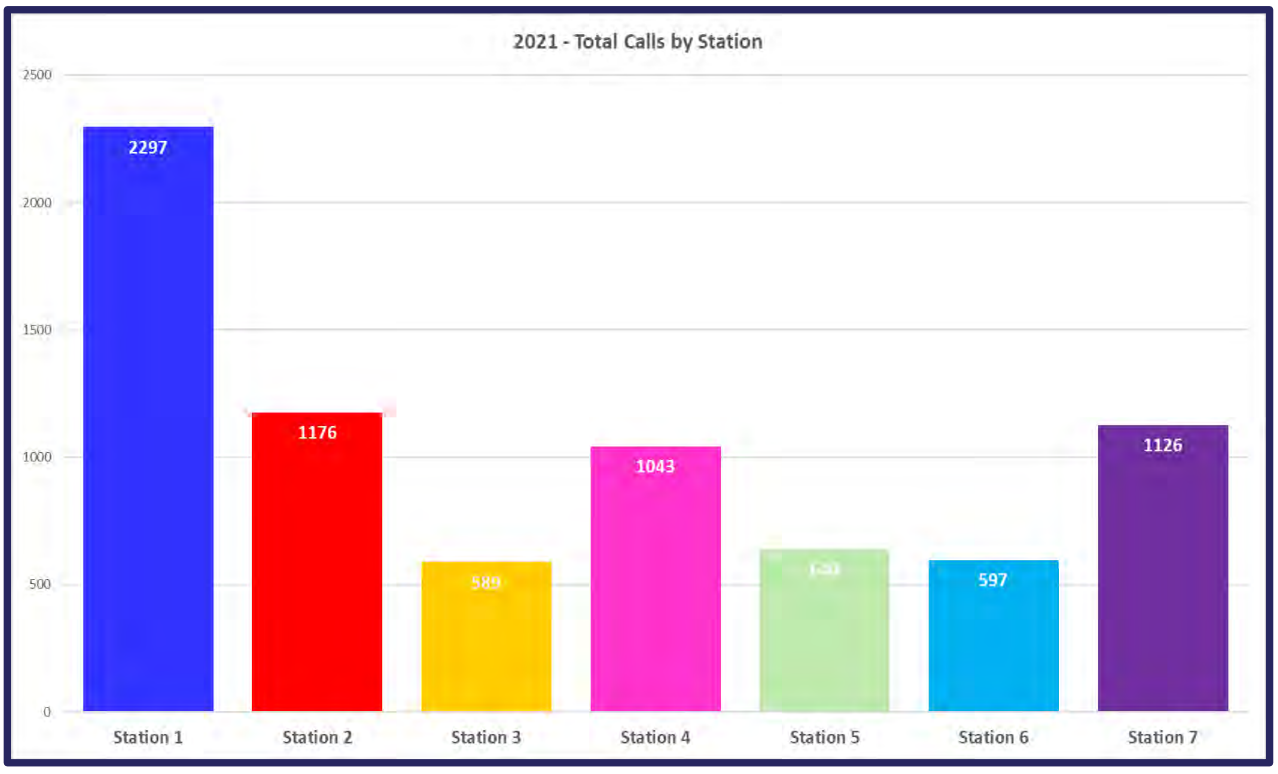
Appendix 'C'

Call Response Data 2020-2021

APPENDIX 'C' – CALL AND RESPONSE DATA 2020 - 2021

2021 Response Charts





2020 Response Charts