DILLON CONSULTING

Corporation of the City of Oshawa

Fire Master Plan

Final Draft Report

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Acronyms

Acronyms	
A.C.T.	Authenticity, Courage and Trust
A.H.J.	Authority Having Jurisdiction
A.N.S.I.	American National Standards Institute
A.P.C.O.	Association of Public Safety Communications Officials
A.S & E.	Academic Standards and Evaluation
C.A.C.C.	Central Ambulance Communications Centre
C.A.F.C.	Canadian Association of Fire Chiefs
C.B.R.N.	Chemical, Biological, Radiological or Nuclear
C.E.M.C.	Community Emergency Management Coordinator
C.F.A.I.	Commission on Fire Accreditation International
C.F.O.	Chief Fire Official
C.F.P.O.	Chief Fire Prevention Officer
C.F.S.E.M.	Comprehensive Fire Safety Effectiveness Model
C.I.	Critical Infrastructure
C.N.	Canadian National
C.P.	Canadian Pacific
C.P.C.	Commission on Professional Credentialing
C.P.S.E.	Centre for Public Safety Excellence
C.P.S.T.	Child Passenger Safety Technician
C.R.A.	Community Risk Assessment
C.R.R.P.	Community Risk Reduction Plan
C.R.T.C.	Canadian Radio-television and Telecommunications Commission
C.T.M.	Critical Task Matrix
C.U.P.E.	Canadian Union of Public Employees
D.F.C.	Deputy Fire Chief
D.R.T.	Durham Region Transit
E.O.C.	Emergency Operations Centre

Acronyms	
E.M.C.P.A.	Emergency Management and Civil Protection Act
E.R.F.s	Emergency Response Facilities
E.R.P.	Emergency Response Plan
E.R.U.s	Emergency Response Units
E.V.T.	Emergency Vehicle Technician
F.C.	Fire Chief
F.M.P.	Fire Master Plan
F.P.	Fire Prevention
F.P.C.	Fire Prevention Captain
F.P.I.	Fire Prevention Inspector
F.P.O.	Fire Prevention Officer
F.P.P.A.	Fire Protection and Prevention Act
G.I.S.	Geographic Information Systems
G.T.A.	Greater Toronto Area
H.I.R.A.	Hazard Identification and Risk Assessment
I.A.F.F.	International Association of Firefighters
I.F.S.A.C.	International Fire Service Accreditation Council
I.M.S.	Incident Management Systems
I.T.M.P.	Integrated Transportation Master Plan
L.V.L.	Laminated Veneer Lumber
M.P.A.C.	Municipal Property Assessment Corporation
M.W.	Megawatt
n.d.	No Date
N.E.R.P.	Nuclear Emergency Response Plan
N.F.B.C.	National Farm Building Code
N.F.P.A.	National Fire Protection Association
N.I.S.T.	National Institute of Standards and Technology
O.A.F.C.	Ontario Association of Fire Chiefs
O.B.C.	Ontario Building Code

Acronyms	
O.F.C.	Ontario Fire Code
O.H.S.A.	Occupational Health and Safety Act
O.F.S.	Oshawa Fire Services
O.F.M.E.M.	Office of the Fire Marshal and Emergency Management
O.G.	Operational Guideline
O.P.	Official Plan
O.P.F.F.A.	Oshawa Professional Firefighters Association
R.O.P.	Region Official Plan
O.Reg.	Ontario Regulation
P.E.O.C.	Provincial Emergency Operations Centre
P.F.S.G.	Public Fire Safety Guideline
P.M.C.V.I.s	Periodic Mandatory Commercial Vehicle Inspections
P.S.H.S.A.	Public Services Health & Safety Association
P.T.S.D.	Post-Traumatic Stress Disorder
R.D.S.P.	Region of Durham Paramedic Services
R.T.C.	Regional Training Centre
S.C.B.A.	Self-Contained Breathing Apparatus
S.I.R.	Standard Incident Reporting
S.M.T.	Senior Management Team
S.O.R.	Statutory Orders and Regulations
S.T.I.	Shift Training Instructor
S.W.O.C.	Strengths, Weaknesses, Opportunities, Challenges
T.G.	Technical Guideline
T.O.	Training Officer
T.T.S.	Transportation Tomorrow Survey
U.L.C.	Underwriters Laboratory of Canada
U.S.	United States
V.O.	Vulnerable Occupancy
W.W.C.	Wounded Warrior Canada

Executive Summary

This fire master planning process was initiated by the City of Oshawa in response to **Report CS-19-07** approved by Council on January 21st, 2019. The scope of this project also included developing a companion Community Risk Assessment (C.R.A.) to address the municipality's legislative requirements contained in the new **Ontario Regulation 378/18**. This new regulation requires that all municipalities complete a C.R.A. no later than July 1st, 2024. The City of Oshawa is proactively completing the C.R.A. to inform this fire master planning process to comply with the mandatory requirements of this new regulation that state a municipality must **"use its community risk assessment to inform decisions about the provision of fire protection services"[1].**

The analysis within this F.M.P. has also considered the legislative requirements of the **Fire Protection and Prevention Act, 1997** (F.P.P.A.), that defines a municipality's legislated responsibilities to provide fire protection services, including that the City shall **"establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention; and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances"[2].** In our view, the City of Oshawa is currently compliant with the requirements of the F.P.P.A.

The analysis presented within this **Fire Master Plan** (F.M.P.) has been directly informed by a comprehensive stakeholder engagement process that has included opportunities for public consultation, interaction with members of Council and the Mayor, consultation with senior municipal and fire department staff and direct consultation with members of the Executive Board of the Oshawa Professional Firefighters Association, Local 465 (O.P.F.F.A.). The analysis has also been informed by a number of related plans and reports including the **Geographic Information System Emergency Services Response Capabilities Analysis Report** (2018 I.A.F.F. Report) prepared by the

[1] Ontario Regulation 378/18 Community Risk Assessments, Mandatory Use 1. (b)

[2] Fire Protection and Prevention Act, 1997 Part II Responsibilities for Fire Protection Services, Municipal Responsibilities, 2. (1) (a)(b)

International Association of Firefighters (I.A.F.F.) at the request of the Oshawa Professional Firefighters Association (O.P.F.F.A.) Local 465.

To further assist Council in determining the City's **"needs and circumstances,"** as defined by the F.P.P.A., this F.M.P. identifies four proposed strategic priorities. These priorities are intended to align Council's decision making process with the Comprehensive Fire Safety Effectiveness Model (C.F.S.E.M.) utilized by municipalities across the Province. This model prioritizes public fire safety education as the **first line of defence** in mitigating and/or preventing a fire. The **second line of defence** includes the use of fire safety standards and enforcement as strategies to proactively introduce more complex risk reduction and risk mitigation strategies to reduce the probability and consequences of a fire. The **third line of defence** includes providing emergency response that includes fire suppression capabilities. In our view, the provision of fire suppression services is the **"fail safe"** in the event that the first two lines of defence are unable to prevent the fire.

It is important to note that within the Province of Ontario there is currently **no legislative standard** that a municipality must achieve with regards to the delivery of fire suppression services. This F.M.P. references standards authored by the **National Fire Protection Association** (N.F.P.A.) representing current industry best practices. The City should be aware that compliance with the applicable fire suppression performance benchmarks **is not** a legislated requirement for the City.

At the request of Council, the scope of developing the proposed F.M.P. included four specific core objectives including:

- That the analysis be based on a 10-year plan, basing the forecasts on high growth, moderate growth and low growth to provide flexibility
- That the report include a response to the Geographic Information System Emergency Services Response Capabilities Analysis Report (2018 I.A.F.F. Report)
- That the F.M.P. review and assess the fire service levels and response times for the next 10 years and
- That the F.M.P. include analysis for future a Fire Station 7 with recommendations for its location.

These core objectives are consistent with the primary objective of this fire master planning process: to support Council's decision-making process with respect to the level

of fire protection services, and specifically the level of fire suppression services that Council deems necessary based on the City's needs and circumstances as defined by the F.P.P.A.

In response to these directions this F.M.P. identifies a predicted 10-year community growth plan that includes low, moderate and high growth projections developed by City staff. This information is utilized to inform the future fire suppression service level options and proposed locations for a future Fire Station 7 and Fire Station 8. This F.M.P. also includes a proposed implementation plan to link the projected community growth scenarios with the proposed fire suppression service levels, including the two proposed future additional fire stations.

Council also requested that this fire master planning process consider fire suppression service levels through the application of tiered approach. Through discussion with Council at the Council Workshop Session and presentation of Preliminary Findings these fire suppression levels were identified as 'gold, silver and bronze' to represent three tiers of service level options. Our research into preparing this F.M.P. was unable to identify a standard, guideline or municipal best practice which aligned to such a three-tiered categorization in order to respond to this request. As a result, this F.M.P. utilizes a peer comparison of seven municipalities / six municipal fire services (including the City of Oshawa and Oshawa Fire Services). These municipalities and fire services were selected based on similar geographical characteristics, comparable community fire risk, and available historical data analysis (in the form of G.I.S.-based emergency response models) previously prepared by Dillon Consulting. This municipal comparison analysis was applied to develop fire suppression service level rating categories that include 'below average' (e.g. bronze) 'average' (e.g. silver) and 'above average' (e.g. gold) fire suppression service levels as requested by Council. This analysis indicates that based on a review of historical statistical data (as opposed to modelled response data) the municipal comparator group average for deploying an Initial Arriving Company (first apparatus) including four firefighters arriving on scene within a four minute travel time is 64.2% of historical emergency incidents. Within the proposed fire suppression service level ratings this performance is rated as 'average'. The City of Oshawa's current performance is 74% of historical emergency incidents also rated as 'average'.

The municipal peer comparison also considered the historical emergency response performance assessed using G.I.S.-based modelling (and as previously completed by

Dillon Consulting) for the peer municipalities compared. This includes the Initial Arriving Company emergency response performance of deploying four firefighters arriving on scene within a four minute travel time. For this performance benchmark the municipal comparator average is 68.5% of historical emergency incidents compared to the City of Oshawa's 76% coverage of historical emergency incidents. Analysis of the Initial Full Alarm Assignment (assembled staffing emergency response to a single-family dwelling) capabilities of at least fourteen firefighters arriving on scene within eight minutes of travel time or less indicates a municipal comparator group performance of 46.7% in comparison to Oshawa's 56% of historical emergency incidents. The municipal comparison analysis identifies that the City of Oshawa currently exceeds the average fire suppression service levels of the comparator group for both the Initial Arriving Company and the Initial Full Alarm Assignment. The municipal comparator analysis is included as **Appendix C** to the F.M.P.

The 2018 I.A.F.F. Report recommends the hiring of four multi-role firefighters to staff an additional fire suppression apparatus at Fire Station 1. The implementation of this recommendation would require the City to hire 20 additional firefighters to maintain the recommended four firefighters on-duty at all times. Analysis of the existing fire suppression deployment capabilities of the O.F.S. identifies that within Fire Station 1's first-due response zone the Initial Arriving Company arrives on scene within four minutes to 78% of the historical emergency incidents, and the Initial Full Alarm Assignment of 16 firefighters arrives within eight minutes to 64% of historical emergency incidents. Both of these current performance measures exceed the comparator group average.

This F.M.P. includes six options for Council's consideration in its role to determine the appropriate level of fire suppression services for the community. These include the following:

Option 1: Includes implementing strategies to reduce the existing dispatch time and turnout time components of the O.F.S. current Total Response Time (comprised of dispatch time, turnout time and travel time combined). This should include a comprehensive review of the current alarm processing time for dispatchers to receive the emergency call and alert the firefighters to respond, and the turnout time for the firefighters to receive the emergency call and prepare to respond. Currently, the O.F.S.

exceeds the performance benchmarks included within the N.F.P.A. 1710 standard for both of these times.

Option 2: Includes implementing a rapid response apparatus at Fire Station 1 with a minimum staffing of two firefighters at all times. This is an alternative to the 2018 I.A.F.F. Report recommendation which proposes four additional firefighters on an additional apparatus at Fire Station 1. This option targets a more efficient and effective deployment model in response to the high volume of medical/resuscitator calls in the Fire Station 1's first-due response zone, and increases the total number of firefighters assigned to Fire Station 1 from the current minimum of four to six.

Option 3: Is aligned with the recommendation from the 2018 I.A.F.F. Report to add an additional fire suppression apparatus and four multi-role firefighters to Fire Station 1. Option 3 recommends that the additional firefighters staff the existing Rescue 25. It is our understanding that Rescue 25 may not be designed for this type of a front-line service and prior to implementing this option further review would be required to confirm the suitability of using Rescue 25 in this role. Alternately, if Rescue 25 was found to be unsuitable for this function, our next recommendation would be to purchase a new heavy rescue apparatus capable of deploying four firefighters for this role.

Option 4: This option includes the analysis of the projected 10-year community growth and proposed location of the future Fire Station 7. The implementation of this strategy will require the purchase of a new pumper/rescue apparatus and the hiring of twenty additional firefighters to staff the pump/rescue with a minimum of four.

Option 5: This option includes the analysis of the projected 10-year community growth and proposed location of future Fire Station 8. The implementation of this strategy will also require the purchase of a new pumper/rescue apparatus and the hiring of twenty additional firefighters to staff the pump/rescue with a minimum of four.

Option 6: This option illustrates the fire station relocations, additional fire stations, additional fire suppression apparatus and additional firefighters that would be required for the City to achieve compliance with the Initial Arriving Company and Initial Full Alarm Assignment deployment performance benchmarks contained within the N.F.P.A. 1710 standard. A scenario similar to this option was also presented within the 2018 I.A.F.F. Report.

Table 1 illustrates the findings of the municipal comparator analysis, the City's existing fire suppression capabilities and the predicted performance capabilities of the options presented within this F.M.P. for the Initial Arriving Company, and Initial Full Alarm Assignment (single-family dwelling) as defined by the N.F.P.A. 1710 standard that includes a 90% performance target.

Table 1: Summary Comparison of G.I.S. Modelled Results of Initial Arriving Company and Initial Full Alarm Assignment Emergency Response Coverage Analyzed within the F.M.P.

Scenario Analyzed	Below Average Service Level	Average Service Level	Above Average Service Level	Additional Operating's Costs	Additional Capital Costs
Municipal Comparator Group Average		✓			
City of Oshawa Existing Capabilities		✓		Existing	Existing
Option #1: Implement Total Response Time Improvements		✓		No Additional	No Additional
Option #2: Implement Rapid Response Apparatus, Station #1		✓		$1.63 M	$640 K
Option #3: Implement 2nd Apparatus at Station #1 (I.A.F.F.)		✓		$2.72 M	$150 K[3]
Option #4: Proposed Fire Station #7		✓ [4]		$2.72 M	$7.45 M
Option #5: Proposed Fire Station 8		✓ [5]		$2.72 M	$7.45 M
Option #6: Proposed N.F.P.A. 1710 Compliance (I.A.F.F.)			✓	$13.58 M	$41.45 M

[3] Assumes use of existing Rescue 25. Alternately there would be an additional cost of $750K for new heavy rescue apparatus.

[4] Provides coverage of proposed future growth in the low, moderate and high growth scenario. No historic calls exist within new development area. Future calls would occur in new development areas.

[5] Provides coverage of proposed future growth in the low, moderate and high growth scenario. No historic calls exist within new development area. Future calls would occur in new development areas.

The analysis within this F.M.P. illustrates that in comparison to the City's legislative requirements, current industry guidelines and industry standard the City of Oshawa is currently providing a level of fire protection services that is equal to, or better than the average of a comparator group of municipalities.

Administration

- **Council Recommendation #1**: That the following strategic priorities, as presented within the proposed Fire Master Plan, be adopted by Council in principle to guide all decision making related to the delivery of fire protection services within the City of Oshawa.

a) The City of Oshawa is committed to the annual review of a Community Risk Assessment to assess the fire safety risks within the community as the basis for developing clear goals and objectives for all fire protection services provided by the Oshawa Fire Services.

b) The Oshawa Fire Services will prioritize the optimization of the first two lines of defence, including public education and fire prevention, and the utilization of fire safety standards and fire code/building code enforcement as the foundation of providing a comprehensive fire protection program within the City of Oshawa.

c) The Oshawa Fire Services will specifically prioritize the delivery of fire and life safety programs in Group C- Residential Occupancies that include an enhanced Home Smoke Alarm/Carbon Monoxide Alarm Program; and

d) The City of Oshawa will continue to prioritize strategies that support the sustainability of fire protection services that provide the most effective and efficient level of services resulting in the best value for the community.

- **Council Recommendation #2 (completed)**: That Council consider allocating sufficient funding within the City's 2020 operating budget to hire an Assistant Deputy Fire Chief as referenced within the preliminary analysis of the fire master planning process.
- **Operational Recommendation #1**: That the job descriptions for all members of the O.F.S. including the senior management team, and all other members of the O.F.S. be reviewed and revised to clearly define the roles and responsibilities of all positions.

- **Operational Recommendation #2**: That an appointment by-law or a formal process to delegate authority to the Deputy Fire Chiefs in the event of the Fire Chief's absence, be developed and presented to Council for consideration and approval.
- **Operational Recommendation #3**: That consideration be given to a review of the current administrative support provided to the O.F.S. by the Strategic and Business Services Branch as discussed within the proposed Fire Master Plan.
- **Operational Recommendation #4**: That consideration be given to the creation of a new Administrative Support position within the O.F.S. as presented within the proposed Fire Master Plan.
- **Operational Recommendation #5**: That subject to Council's consideration and approval of the proposed Fire Master Plan that the Establishing and Regulating By-law 30-2001 be reviewed and updated as required.
- **Operational Recommendation #6**: That consideration be given to revising the current General Fees and Charges By-law 13-2003 to include additional fees for service as presented within the proposed Fire Master Plan.
- **Operational Recommendation #7**: That the O.F.S. develop a business plan and standardized agreement for the provision of emergency call taking and emergency dispatching (fire dispatching) as referenced within the proposed Fire Master Plan.
- **Operational Recommendation #8**: That the contents of all O.F.S. operating guidelines be reviewed to ensure there is no overlap of reference to a "policy" and "guideline" in the same document to provide clarity of the intent.
- **Operational Recommendation #9**: That consideration be given to developing a business case for a full-time dedicated information technology position dedicated to support the O.F.S., as presented within the proposed Fire Master Plan.
- **Operational Recommendation #10**: That priority be given to the confirmation and implementation of new software applications as presented within the proposed Fire Master Plan.
- **Operational Recommendation #11**: That the O.F.S. develop a department policy consistent with the City's Retention By-law 45-2002 that describes the required records management practices for each division within the O.F.S.

Fire Prevention and Education

- **Council Recommendation #3**: That subject to the results and findings of a comprehensive work load analysis for the Fire Prevention and Public Education Division staff, consideration be given to hiring one more fire prevention inspector in the short-term (i.e. 1 to 3 years) and an additional fire prevention inspector coordinated with the opening of the proposed future Fire Station 7.
- **Operational Recommendation #12**: That the O.F.S. prioritize the training of all staff designated as Chief Fire Officials through the Public Services Health & Safety Association.
- **Operational Recommendation #13**: That subject to consideration and approval of the proposed Fire Master Plan, the updated fire prevention policy be included within the establishing and regulating by-law as an appendix.
- **Operational Recommendation #14**: That consideration be given to further promotion of the Upgrade to Building and Fire Codes Grant Program as part of its continued commitment to fire-related risk reduction and risk mitigation strategies.
- **Operational Recommendation #15**: That consideration be given to increasing the number of Fire Inspectors (one more at a minimum) who are trained to complete building plans review, including O.B.C. General Legal and Fire Protection exams.
- **Operational Recommendation #16**: That consideration be given to implementing the proposed enhanced fire safety audit program as outlined in the Fire Master Plan.
- **Operational Recommendation #17**: That consideration be given to developing an enhanced Investigation Protocol and Report strategy whereby data gathered through the fire cause and origin process be used for the purposes of developing and implementing public education and fire prevention initiatives as presented in the proposed Fire Master Plan.
- **Operational Recommendation #18**: That consideration be given to implementing the proposed enhanced Alarmed for Life Program as outlined in the Fire Master Plan.

- **Operational Recommendation #19**: That consideration be given to further development and implementation of the current targeted fire inspection program as presented within the proposed Fire Master Plan.
- **Operational Recommendation #20**: That consideration be given to enhancing the tracking of all workload associated with the O.F.S. fire inspection/enforcement programs as presented within the proposed Fire Master Plan.
- **Operational Recommendation #21**: That consideration be given to enhancing the fire safety program for seniors (65+) within the community as presented within the proposed Fire Master Plan.
- **Operational Recommendation #22**: That consideration be given to implementing a targeted public education program as presented within the proposed Fire Master Plan.
- **Operational Recommendation #23**: That consideration be given to enhancing the tracking of all workload associated with the O.F.S. public education programs as presented within the proposed Fire Master Plan.
- **Operational Recommendation #24**: That consideration be given to developing a Community Risk Reduction Plan as a holistic approach to reducing risk within the City, as presented within the proposed Fire Master Plan.

Training

- **Operational Recommendation #25**: That O.F.S. require all staff who deliver training to be qualified to a minimum of the N.F.P.A. 1041 Instructor Level I, and that all dedicated training division staff be qualified to the N.F.P.A. 1041 Instructor Level II standards.
- **Operational Recommendation #26**: That the O.F.S. consider developing a comprehensive training plan based on the N.F.P.A. Professional Qualifications Standards as presented within the proposed Fire Master Plan.
- **Operational Recommendation #27**: That consideration be given to referencing the O.F.S. specialized rescue service levels in the proposed updated Establishing and Regulating By-law 30-2001.
- **Operational Recommendation #28**: That the current agreements pertaining to the provision of specialized fire rescue services to other municipalities be reviewed and updated to reflect the service levels provided by the O.F.S.

- **Operational Recommendation #29**: That the O.F.S. develop a business case that includes research into partnership opportunities for the development of a permanent training facility within the City of Oshawa that is capable of live fire training.

Fire Suppression

- **Council Recommendation #4 (completed):** That Council consider allocating sufficient funding within the City's 2020 operating budget to hire three firefighters as identified within the preliminary analysis of the fire master planning process.
- **Operational Recommendation #30**: That consideration be given to providing sufficient capital funding to complete alterations to Fire Station 1 to accommodate additional office space as presented within the proposed Fire Master Plan.
- **Operational Recommendation #31**: That consideration be given to upgrading all existing Fire Stations to provide separation and ventilation for firefighter protective clothing as described within the proposed Fire Master Plan.
- **Operational Recommendation #32**: That the O.F.S. prioritize the identification and implementation of strategies to reduce the dispatch time and turnout time components of the Total Response Time by a minimum of one minute (60 seconds) combined, to further enhance the department's emergency response fire suppression capabilities.

Fleet and Facilities

- **Council Recommendation #5**: That consideration be given to hiring an apprentice mechanic as presented within the proposed Fire Master Plan.

Communications

- **Council Recommendation #6 (completed)**: That Council consider allocating sufficient funding within the City's 2020 operating budget to fill the vacant position of Communications Officer as referenced within the preliminary analysis of the fire master planning process.
- **Operational Recommendation #33**: That consideration be given to developing a department Standard Operating Guideline for enhancing the utilization of the CriSys software to inform decision-making within the O.F.S.

- **Operational Recommendation #34**: That consideration be given to implementing global positioning tracking (G.P.S.) as presented within the proposed Fire Master Plan.
- **Operational Recommendation #35**: That consideration be given to conducting further analysis of potential radio system “dead zones” and options for minimizing any impact on firefighter communication.
- **Operational Recommendation #36:** That consideration be given to including capital costs when calculating cost recovery charges for the municipalities to which it provides emergency call taking and fire dispatch services.
- **Operational Recommendation #37**: That consideration be given to implementing the use of qualified part-time dispatchers as presented within the proposed F.M.P.
- **Operational Recommendation #38**: That consideration be given to ensuring that all staff assigned responsibility for dispatching fire department personnel and resources are trained and certified to N.F.P.A. 1061 Standard for Professional Qualifications for Public Safety Telecommunications Personnel – Levels I and II.

Emergency Management

- **Operational Recommendation #39**: That consideration be given to sustaining ongoing emergency management training to ensure sufficient staff within the City are trained at all times to manage a major emergency within the City.
- **Operational Recommendation #40**: That consideration be given to revising the appointment of the Community Emergency Management Coordinator (C.E.M.C.) as presented within the proposed Fire Master Plan.

1.0 Introduction

This **Fire Master Plan** (F.M.P.) has been developed for the City of Oshawa to respond to Report CS-19-07 approved by Council on January 18th, 2019. The analysis and recommendations contained within this F.M.P. are intended to provide Council with a **strategic planning framework** to inform the delivery of fire protection services within the City of Oshawa over the next ten-year community planning horizon. At the request of Council the analysis presented within this F.M.P. has considered the projected ten-year community growth in consultation with City staff to assess future growth in terms of low, moderate and high rates of growth.

The analysis presented within this F.M.P. has also been informed by the **Fire Master Plan Review & Community Risk Assessment** (2018 F.M.P. Update) prepared by the Oshawa Fire Services (O.F.S.) and presented to Council on July 13th, 2018, and by the **Geographic Information System Emergency Services Response Capabilities Analysis Report** (2018 I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) at the request of the Oshawa Professional Firefighters Association, Local 465 (O.P.F.F.A). Where applicable, specific references are included within this F.M.P. related to the recommendations of these reports.

Within the Province of Ontario the **Fire Protection and Prevention Act, 1997** (F.P.P.A.), **Occupational Health and Safety Act, R.S.O. 1990** (O.H.S.A.) and the new **Ontario Regulation 378/18 – Community Risk Assessments,** contain legislative requirements related to the delivery of fire protection services by municipalities. Where applicable, the analysis presented within this F.M.P. has considered the City's legislative requirements and where required, provides recommendations to address any gaps. The analysis and methodology presented within this F.M.P. has also been informed by current industry best practices including current **Public Fire Safety Guidelines** (P.F.S.G.s) authored by the **Office of the Fire Marshal and Emergency Management** (O.F.M.E.M.) and fire protection standards authored by the **National Fire Protection Association** (N.F.P.A.).

Completion of this **Fire Master Plan** recognizes the continued commitment of the City's Council and senior municipal staff in striving to achieve the most effective and efficient level of fire protection services resulting in the best value for the community.

2.0 Purpose and Scope

The purpose of developing this F.M.P. is to provide Council with a comprehensive and independent analysis of the current fire protection services and programs being provided by the O.F.S. The City's current Fire Master Plan (2013 F.M.P.) was completed in March of 2013. Since that time, growth within the City has exceeded projections provided by City staff to inform the 2013 F.M.P. As a result, the O.F.S. presented the 2018 F.M.P. Report to Council for consideration, and the O.P.F.F.A. completed the 2018 I.A.F.F. Report.

Subsequently, Council authorized this independent and comprehensive analysis to proactively respond to the new O. Reg. 378/18 Community Risk Assessments, and to consider the findings related to the existing and projected future fire related risks within the community. The scope of work for this project as detailed in the City's Request for Proposal C2019-045, is summarized as:

- Completion of a comprehensive stakeholder consultation process including Council, senior City staff, O.F.S. staff, members of the Executive of the O.P.F.F.A., community stakeholder groups and the broader community;
- Completion of a Community Risk Assessment, as required by O. Reg. 378/18 to inform the F.M.P.;
- Evaluation of all services and programs currently provided by the O.F.S. in comparison to the City's legislative requirements and current industry best practices;
- The identification of strategic priorities to guide Council's decision-making process related to the delivery of fire protection services; and
- To identify recommendations and options to further inform Council's decision-making process in striving to achieve the most effective and efficient level of fire protection services resulting in the best value for the community.

The primary objective of this F.M.P. is to present a comprehensive analysis of the City's fire protection **needs and circumstances** as defined by the F.P.P.A. to support decision-making with respect to community fire protection services and programs.

3.0 Related Plans and Reports

The City's Request for Proposal C2019-045 identifies a comprehensive list of related plans and reports that have been reviewed and considered in developing this F.M.P. The following sections provide a high level overview introducing the specific relevance to informing this F.M.P.

3.1 Oshawa Strategic Plan – Our Focus, Our Future, 2015-2019

The purpose of Oshawa's Our Focus, Our Future 2015-2019 strategic plan is described as "a strategic plan is about envisioning our future through words and pictures, and identifying how we are going to get there. The journey is driven by innovation and commitment, the ability to think and act differently, and to change with the times. It requires us to recognize and balance the difference between "wants" and "needs" and to be visionary and long-term thinkers, making fully informed decisions with all facets of society and future generations in mind"[6]. During the latter part of 2019, Council renewed its commitment to strategic planning by reviewing and updating the goals and objectives of the Our Focus, Our Future 2015-2019 plan.

Several of the proposed 2020-2023 updates have direct relevance to the preparation of this F.M.P. including:

- Ensure responsible, fair and affordable taxation recognizing the connection between wants, needs, priorities and means.
- Ensure a transparent annual budget process that promotes public engagement and literacy of municipal taxation and budgeting.
- Ensure quality core programs and services that are responsive to community needs.
- Enable public involvement in decision making, when appropriate.
- Seek regular feedback from customers about City services and programs via surveys, online input, public meetings and/or social media.

[6] City of Oshawa Our Focus, Our Future 2015-2019 Strategic Plan – Purpose of the Plan

- Take every opportunity to inform the public how Oshawa's public service supports our community on a daily basis through a commitment to core values, good governance and outstanding service.
- Continue to engage citizens, residents and stakeholders.
- Develop, fund and implement the Fire Master Plan and Community Risk Assessment and its recommendations.

3.2 2013 Fire Master Plan Report (2013 F.M.P.)

The 2013 Fire Master Plan report was presented to Council on December 18, 2012 through report CM-12-55-Fire Master Plan. This report was developed by Dillon Consulting and was endorsed by Council as recommended by City staff, by way of the following resolution "That Council endorse the Fire Master Plan provided in Attachment 1 of Report CM-12-55 dated December 13, 2012 as a strategic direction for Oshawa Fire Services over the term of the plan". This plan included a total of 31 recommendations that have served to guide the growth of the O.F.S. since that time. This has included the construction and staffing of a 6th Fire Station located at 2339 Simcoe Street North, implementation of additional performance indicators to track the department's activities and a more proactive approach towards the delivery of public education and fire prevention programs.

The findings of this report are referenced in the executive summary. Where applicable, any outstanding recommendations from this report have been considered in developing this subject F.M.P.

3.3 2018 Fire Master Plan Review & Community Risk Assessment Update (2018 F.M.P.)

The 2018 Fire Master Plan Review and Community Risk Assessment was prepared by the Fire Chief following current industry best practices that identify the importance of reviewing a fire master plan at the mid-point or five-year point of the projected ten-year life span.

This plan includes a summary of the status of the 31 recommendations presented in the 2013 F.M.P. including confirmation that 27 of these recommendations had been completed. The 2018 F.M.P. identifies that the four outstanding recommendations remain a priority for the O.F.S. and identifies eleven additional recommendations for

consideration. The analysis within the 2018 F.M.P. was informed by a Community Risk Assessment that was developed based on current industry best practices at that time. The findings of this analysis indicate that the "Risk for the City of Oshawa remains in the residential property stock", and that "Out of reported fires as per property classification, Group C residential fires continue to be the highest occupancy type involved at 76%, and increase of 3.9% in the 5-year review" .

The 2018 F.M.P. Report and accompanying Community Risk Assessment were developed prior to the adoption of the new O. Reg. 378/18 Community Risk Assessments regulation and subsequent release of Office of the Fire Marshal and Emergency Management Technical Guideline 02-2019 Community Risk Assessment. As such, the Community Risk Assessment analysis is not as comprehensive as required by the new O. Reg. 378/18, and would not to be deemed to be compliant with the requirements of the regulation. Where applicable, the analysis within this F.M.P. has considered the analysis and recommendations presented within the 2018 F.M.P. Report.

3.4 2018 Geographic Information System Emergency Services Response Capabilities Analysis Report (2018 I.A.F.F. Report)

The 2018 Geographic Information System Emergency Services Response Capabilities Analysis Report was prepared by the International Association of Firefighters (I.A.F.F.) at the request of the Oshawa Professional Firefighters Association, Local 465 (O.P.F.F.A), "This report summarizes the results of a station location, staffing, emergency vehicle travel time analysis, and workload analysis for Oshawa Fire Services at the request of Oshawa Professional Firefighters Association, I.A.F.F. Local 465". This report includes six recommendations relating to the existing fire suppression deployment model utilized by the O.F.S. and the existing fire related risks within the City.

This report was also prepared prior to the adoption of the new O. Reg. 378/18 Community Risk Assessments regulation. As such, the Community Risk Assessment analysis is not as comprehensive as required by the new O. Reg. 378/18, and would not be deemed to be compliant with the requirements of the regulation. Where applicable, the analysis and recommendations contained within this F.M.P. have informed the development of this F.M.P., including extensive consultation with the Executive Board of

the O.P.F.F.A. Local 465, and consultation with representatives of the I.A.F.F. located in Washington D.C., representing the authors of the 2019 I.A.F.F. Report.

A recommendation of the 2018 I.A.F.F. Report states that "O.F.S. should routinely perform risk and hazard assessments, along with a review of system demand, to identify the potential threats to the community so that stakeholders and decision makers can make informed decisions on how best to mitigate, or at least minimize, these threats". In our view, Council's commitment to developing this Fire Master Plan and the accompanying Community Risk Assessment, appropriately respond to this recommendation. Where applicable within this F.M.P., references are provided where the analysis has been informed by the 2018 I.A.F.F. Report and recommendations.

3.5 2018 M.N.P. Budget Review Report

In response to the Provincial government's planned spending reduction strategy announced in 2018 the City of Oshawa retained M.N.P. to assist the City "in identifying initiatives to obtain the 4% spending reduction, without impacting frontline services". This report includes three areas specifically applicable to this fire master planning process. These include overtime controls and sick time, fleet procurement and fleet mix and municipal benchmarking. Where applicable within this F.M.P., references are provided where the analysis has been informed by the M.N.P. Report.

3.6 2019 Fire Underwriters SurveyTM (F.U.S. Report)

The "Fire Underwriters Survey™ is a national organization administered by O.P.T.A. Information Intelligence, formerly C.G.I. Insurance Business Services, formerly the Insurers' Advisory Organization and Canadian Underwriters Association. F.U.S. provides data on public fire protection for fire insurance statistical work and underwriting purposes of subscribing insurance companies. Subscribers of Fire Underwriters Survey represent approximately 85 percent of the private sector property and casualty insurers in Canada". In 2019, F.U.S. conducted an assessment of the City of Oshawa fire protection services for the primary purpose of fire insurance grading and classification. In summary, this report identifies that the Public Fire Protection Classification (P.F.P.C.) has improved from a P.F.P.C. 3 to a P.F.P.C. 2 for all fire stations within the City since this type of assessment was last completed in 1999. This assessment identifies four areas including the fire department, water supply, emergency communication and fire safety control where further improvements could be considered to improve the existing

P.F.P.C. grading for the City of Oshawa. Where applicable within this F.M.P., references are provided where the analysis has been informed by the 2019 F.U.S. Report and recommendations.

4.0 Fire Master Planning Process

The development of this F.M.P. has been informed by **P.F.S.G. 03-02-13 Master Planning Process for Fire Protection Services**. This includes analysis of community fire risk and future community growth. The efficiency and effectiveness of each division within the O.F.S. have been analyzed, along with emergency response and station locations, staffing resources and deployment procedures, fire prevention and public education programs, apparatus and all related requirement, and service agreements. In our view, the guiding principles of P.F.S.G. 03-02-13, including the following, are applicable to this fire master planning process:

- The residents of any community are entitled to the most effective, efficient and safe fire services possible.
- The content of existing collective agreements will be respected and the collective bargaining process will be recognized as the appropriate channel for resolving labour relations issues under collective agreements and the Fire Protection and Prevention Act.
- Collective bargaining issues affecting public safety will be identified.
- Those responsible must work within these parameters in making recommendations for improving municipal fire services.

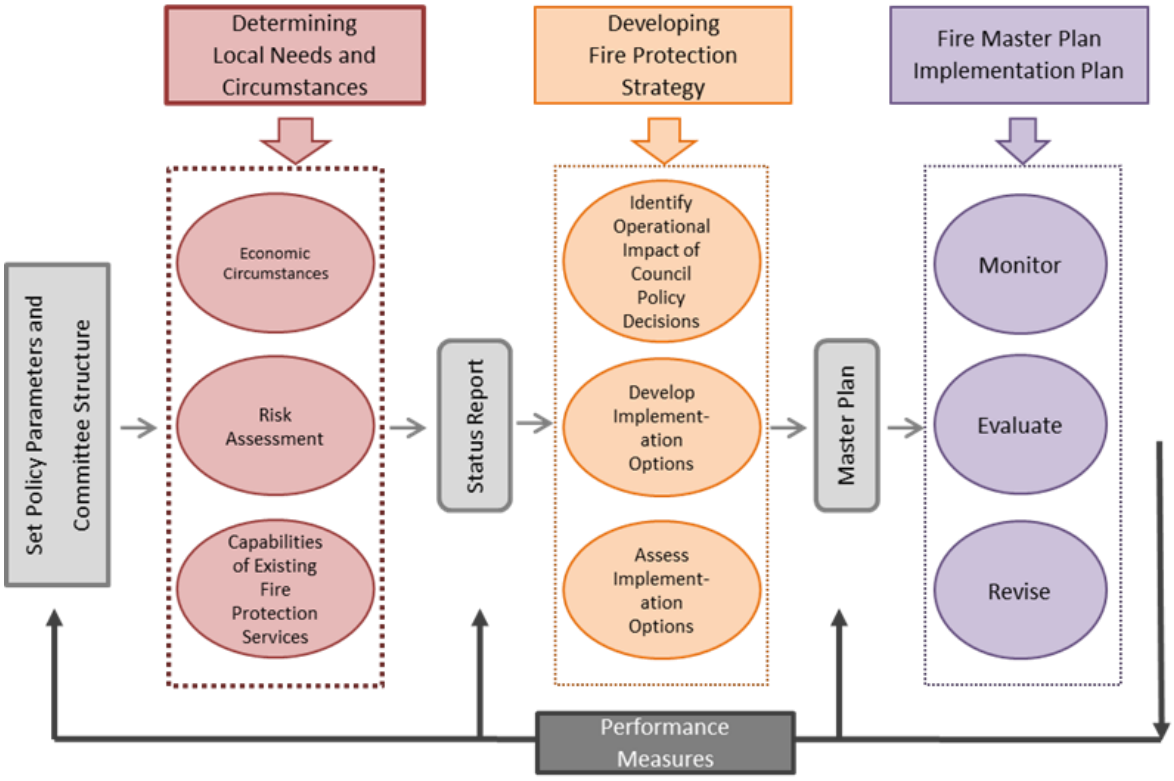
This F.M.P. has also been informed by **P.F.S.G. 01-01-01 Fire Protection Review Process** that identifies a number of factors to be considered in conducting the fire protection review process including:

- The overall objective of any fire protection program is to provide the optimum level of protection to the community, in keeping with local needs and circumstances.
- Extensive research has demonstrated that there are a variety of factors that will have an impact on the fire department's capacity to fulfill this objective.
- Conversely, there are many different options that a municipality may pursue to improve the efficiency and effectiveness of its fire protection system.
- Local circumstances will have a profound effect on which factors are most important for any one municipality, and what options are available for its fire protection system
- Selecting among these options is an extremely complex task.

- Success will require a combination of specialized expertise in fire protection, and a thorough appreciation of your municipality's economic, social and political circumstances.

Figure 1 reflects the framework for developing a Fire Master Plan for optimizing public fire safety.

Figure 1: Fire Master Plan Framework



4.1 Applicable Legislation

In addition to the Community Risk Assessment, the analysis and findings of this fire master planning process have been informed by the applicable legislation including the **Fire Protection and Prevention Act, 1997** (F.P.P.A.) the **Occupational Health and Safety Act, R.S.O. 1990** (O.H.S.A.), guidelines as authored by the **Office of the Fire Marshal and Emergency Management** (O.F.M.E.M.), industry standards as authored by the **National Fire Protection Association** (N.F.P.A.), and Dillon's knowledge of current industry best practices, as garnered from our experience in working with other municipalities across Canada.

4.1.1 Fire Protection and Prevention Act, 1997

Within the Province of Ontario, the relevant legislation for the operation of a fire department is contained within the Fire Protection and Prevention Act, 1997 (F.P.P.A.). In addition to promoting fire prevention and public safety, the F.P.P.A. is also the Act under which the **Ontario Fire Code** (O.F.C.) is regulated. While all legislation should be read and understood in its entirety, the following are applicable sections of the F.P.P.A. for reference purposes to this fire master planning process.

Table 2: F.P.P.A. Definitions – Part 1

Part 2	Definitions
Definitions	1.(1) In this Act, **"fire chief"** means a fire chief appointed under section 6 (1), (2) of (4); ("chef des pompiers") **"fire code"** means the fire code established under Part IV; ("code de prevention des incendies") **"fire department"** means a group of firefighters authorized to provide fire protection services by a municipality, group of municipalities or by an agreement made under section 3; ("service d' incendie") **"Fire Marshal"** means the Fire Marshal appointed under subsection 8 (1); ("commissaire des incendies") **"fire protection services"** includes fire suppression, fire prevention, fire safety education, communication, training of persons involved in the provisions of fire protection services, rescue and emergency services and the delivery of all those Services; ("services de protection contre les incendies") **"municipality"** means the local municipality as defined in the Municipal Act, 2001; ("municipalite") **"prescribed"** means prescribed by regulation ("prescript") **"regulation"** means a regulation made under this Act; ("reglement")

Part 2	Definitions
	"volunteer firefighter" means a firefighter who provides fire protection services either voluntarily or for a nominal consideration, honorarium, training or activity allowance; ("pompier volontaire")
Application of definition of firefighter	(3) The definition of firefighter in subsection (1) does not apply to Part IX. 1997, c. 4, s. 1 (2)
Automatic aid agreements	(4) For the purposes of this Act, an automatic aid agreement means any agreement under which, (a) a municipality agrees to ensure the provision of an initial response to fires and rescues and emergencies that may occur in a part of another municipality where a fire department in the municipality is capable of responding more quickly than any fire department situated in the other municipality, or (b) a municipality agrees to ensure the provision of a supplemental response to fires, rescues and other emergencies that may occur in a part of another municipality where a fire department situated in the municipality is capable of providing the quickest supplemental response to fires, rescues and other emergencies occurring in the part of the other municipality. 1997, c. 4, s. 1 (4)

Table 3: F.P.P.A. Definitions – Part 2

Part 2	Responsibility for Fire Protection Services
Municipal responsibilities	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.
Services to be provided	(3) In determining the form and content of the program that it must offer under clause (1)(a) and the other fire protection services that it may offer under clause (1)(b), a municipality may seek the advice of the Fire Marshal
Automatic aid agreements	(6) A municipality may enter into an automatic aid agreement to provide or receive the initial or supplemental response to fires, rescues and emergencies.
Review of municipal fire services	(7) The Fire Marshal may monitor and review the fire protection services provided by municipalities to ensure that municipalities have met their responsibilities under this section, and if the Fire Marshal is of the opinion that, as a result of a municipality failing to comply with its responsibilities under subsection (1), a serious threat to public safety exists in the municipality, he or she may make recommendations to the council of the municipality with respect to possible measures the municipality may take to remedy or reduce the threat to public safety.
Failure to provide services	(8) If a municipality fails to adhere to the recommendations made by the Fire Marshal under subsection (7) or to take any other measure that in the opinion of the Fire Marshal will remedy or reduce the threat to public safety, the Minister may recommend the Lieutenant Governor in Council that a regulation be made under subsection (9).

Part 2	Responsibility for Fire Protection Services
Regulation	(9) Upon the recommendation of the Minister, the Lieutenant Governor in council may make regulations establishing standards for fire protection services in municipalities and requiring municipalities to comply with the standards.
Fire departments	(1) A fire department shall provide fire suppression services and may provide other fire protection services in a municipality, group of municipalities or in territory without municipal organization. 1997, c. 4, s. 5 (1)
Same	(2) Subject to subsection (3), the council of a municipality may establish more than one fire department for the municipality. 1997, c. 4, s. 5 (2)
Exception	(3) The council of a municipality may not establish more than one fire department if, for a period of at least 12 months before the day this Act comes into force, fire protection services in the municipality were provided by a fire department composed exclusively of full-time firefighters. 1997, c. 4, s. 5 (3)
Same	(4) The councils of two or more municipalities may establish one or more fire departments for the municipalities. 1997, c. 4, s. 5 (4)
Fire chief, municipalities	6. (1) If a fire department is established for the whole or part of a municipality or for more than one municipality, the council of the municipality or the councils of the municipalities, as the case may be, shall appoint a fire chief for the fire department.
Same	(2) The council of a municipality or the councils of two or more municipalities may appoint a fire chief for two or more fire departments.
Responsibility to council	(3) A fire chief is the person who is ultimately responsible to the council of a municipality that appointed him or her for the delivery of fire protection services
Powers of a fire chief	(5) The fire chief may exercise all powers assigned to him or her under this Act within the territorial limits of the municipality and within any other area in which the municipality has agreed to provide fire protection services, subject to any conditions specified in the agreement.

Table 4: F.P.P.A. Definitions – Part 3

Part 3	Fire Marshal
Appointment of Fire Marshal	8 (1) There shall be a Fire Marshal who shall be appointed by the Lieutenant Governor in Council.
Powers of Fire Marshal	9.(1) the Fire Marshal has the power, (a) to monitor, review and advise municipalities respecting the provision of fire protection services and to make recommendations to municipal councils for improving the efficiency and effectiveness of those services. (b) to issue directives to assistants to the Fire Marshal respecting matters relating to this Act and the regulations. (c) to advise and assist ministries and agencies of government respecting fire protection services and related matters. (d) to issue guidelines to municipalities respecting fire protection services and related matters. (e) to co-operate with anybody or person interested in developing and promoting the principles and practices of fire protections services. (f) to issue long service awards to persons involved in the provision of fire protection services. (g) to exercise such other powers as may be assigned under this Act or as may be necessary to perform any duties assigned under this Act.
Duties of Fire Marshal	9.(2) It is the duty of the Fire Marshal, (a) to investigate the cause, origin and circumstances of any fire or of any explosion or condition that in opinion of the Fire Marshal might have caused a fire, explosion, loss of life, or damage to property. (b) to advise municipalities in the interpretation and enforcement of this Act and the regulations. (c) to provide information and advice on fire safety matters and fire protection matters by means of public meetings, newspaper articles, publications, electronic media and exhibitions and otherwise as the Fire Marshal considers available.

Part 3	Fire Marshal
	(d) to develop training programs and evaluation systems for persons involved in the provision of fire protection services and to provide programs to improve practices relating to fire protection services. (e) to maintain and operate a central fire college. (f) to keep a record of every fire reported to the Fire Marshal with the facts, statistics and circumstances that are required under the Act. (g) to develop and maintain statistical records and conduct studies in respect of fire protection services. (h) to perform such other duties as may be assigned to the Fire Marshal under this Act.

The F.P.P.A. includes a series of important Ontario Regulations (O. Reg.) that are very applicable to this fire master planning process including:

- **O. Reg. 213/07** – Ontario Fire Code (O.F.C.)
- **O. Reg. 365/13** - Mandatory assessment of requests and complaints
- **O. Reg. 364/13** - Mandatory inspections and fire drills in Vulnerable Occupancies
- The new **O. Reg. 378/18** – Community Risk Assessment

4.1.2 Occupational Health and Safety Act (O.H.S.A.)

The **Occupational Health and Safety Act, R.S.O. 1990** requires every employer to, "take every precaution reasonable in the circumstances for the protection of the worker"[7]. The O.H.S.A. provides for the appointment of committees, and identifies the **Ontario Fire Services Section 21 Advisory Committee** as the advisory committee to the Minister of Labour with the role and responsibility to issue guidance notes to address firefighter-specific safety issues within Ontario.

Firefighter safety must be a high priority considering all of the activities and services to be provided by a fire department. This must include the provision of department policies

[7] Occupational Health and Safety Act, R.S.O. 1990, c. O.1 Part III s. 25(2)(h)

and procedures, or Operating Guidelines (O.G.s) or alternatively Operating Procedures (O.P.s) that are consistent with the direction of the O.H.S.A. Section 21 Guidance Notes for the fire service.

4.2 Applicable Public Fire Safety Guidelines

The F.P.P.A. also includes defining the roles and responsibilities of the O.F.M.E.M. This includes assigning specific powers to the O.F.M.E.M. that include "To issue guidelines to municipalities respecting fire protection services and related matters". At this time, the O.F.M.E.M. is conducting a comprehensive review of all P.F.S.G.s. During this review process, the O.F.M.E.M. has informed the fire service that the current P.F.S.G.s may be referred to for reference purposes. Where applicable, this F.M.P. will identify relevant P.F.S.G.s for reference.

4.2.1 Three Lines of Defence

Under the leadership of the O.F.M.E.M., the Province of Ontario has developed what is known as the Comprehensive Fire Safety Effectiveness Model (C.F.S.E.M.) as detailed through P.F.S.G. 01-02-01. This includes a fire protection planning strategy known as the **Three Lines of Defence**. Historically, the fire service has focused on firefighters and fire suppression. The Three Lines of Defence model recognizes that there are steps that can be taken to reduce the risk of a fire including the probability of a fire occurring and the consequence of that fire.

The Three Lines of Defence model includes:

I. **Public Education and Prevention**
II. **Fire Safety Standards and Enforcement**
III. **Emergency Response**

These are further defined as:

I. Public Education and Prevention:

Educating residents of the community on means for them to fulfill their responsibilities for their own fire safety is a proven method of reducing the incidence of fire. Only by educating residents can fires be prevented and can those affected by fires respond properly to save lives, reduce injury and reduce the impact of fires.

II. Fire Safety Standards and Enforcement:

Ensuring that buildings have the required fire protection systems, safety features, including fire safety plans, and that these systems are maintained, so that the severity of fires may be minimized;

III. Emergency Response:

Providing well trained and equipped firefighters directed by capable officers to stop the spread of fires once they occur and to assist in protecting the lives and safety of residents. This is the failsafe for those times when fires occur despite prevention efforts.

As outlined by the O.F.M.E.M., Public Education and Prevention means educating residents of the community on means for them to fulfill their responsibilities for their own fire safety as a proven method of reducing the incidence of fire. Only by educating residents can fires be prevented and can those affected by fires respond properly to save lives, reduce injury and reduce the impact of fires. Fire Safety Standards and Enforcement refers to ensuring that buildings have the required fire protection systems, safety features (including fire safety plans) and that these systems are maintained so that the severity of fires may be minimized. Emergency Response entails providing well trained and equipped firefighters directed by capable officers to stop the spread of fires once they occur and to assist in protecting the lives and safety of residents. This is the failsafe for those times when fires may occur despite public education and fire prevention efforts.

The C.F.S.E.M. emphasizes the importance and value of preventing a fire. This is important from both an economic and public safety perspective. At the same time, the C.F.S.E.M. ensures an appropriate level of health and safety for firefighters. The model also recognizes that developing programs and providing resources to implement the first line of defence (a proactive public education and fire prevention program) can be the most effective strategy to reduce and potentially minimize the need for the other lines of defence.

The analysis and recommendations contained within this F.M.P. prioritize the application of the "**Three Lines of Defence"** model for two main reasons. First, the scope of this F.M.P. is not limited to fire suppression in that this plan also considers and provides a review of fire prevention and public education with consideration to optimizing the first two lines of defence. Second, this plan is informed by a Community Risk Assessment, as required by Ontario Regulation 378/18 Community Risk Assessments.

4.3 Applicable Industry Standards

The **National Fire Protection Association** (N.F.P.A.) is an international non-profit organization that was established in 1896. The organization's mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus, codes and standards, research, training, and education. With a membership that includes more than 70,000 individuals from nearly 100 nations, N.F.P.A. is recognized as one of the world's leading advocates of fire prevention and an authoritative source on public fire safety.

N.F.P.A. is responsible for 300 codes and standards that are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation in the United States, as well as many other countries. It has more than 200 technical code and standard development committees that are comprised of over 6,000 volunteer seats. Members vote on proposals and revisions in a process that is accredited by the American National Standards Institute (A.N.S.I.).

Over the past decade the Ontario fire service has been transitioning to the use of N.F.P.A. standards to guide many of the services they provide.

An example of this would be the transition process from the previous Ontario Fire Services Standards to the N.F.P.A. Professional Qualifications (N.F.P.A. Pro-Qual) Standards announced by the O.F.M.E.M. in 2014. Where applicable, this F.M.P. will identify the specific N.F.P.A. standards that have been referenced. **Table 4** lists a sample of standards by division that may be described or referenced throughout this plan.

Table 5: Summary of Applicable N.F.P.A. Standards

Division	Applicable N.F.P.A. Standards
Fire Prevention	• N.F.P.A. 1730- Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition) • N.F.P.A. 1031 – Standard for Professional Qualifications for Fire Inspector and Plans Examiner (2014 Edition)

Division	Applicable N.F.P.A. Standards
	• N.F.P.A. 1035 – Standard for Professional Qualifications for Fire and Life Safety Educator, Public Information Officer, and Juvenile Firesetter Intervention Specialist (2015 Edition) • N.F.P.A. 1033 – Standard for Professional Qualifications for Fire Investigator (2014 Edition)
Training	• N.F.P.A. 1041 – Standard for Fire Service Instructor Professional Qualifications (2019 Edition) • N.F.P.A. 1403 - Standard on Live Fire Training Evolutions (2018 Edition)
Fire Suppression	• N.F.P.A. 1710 - Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) • N.F.P.A. 1001 - Standard for Firefighter Professional Qualifications (2019 Edition) • N.F.P.A. 1021 – Standard for Fire Officer Professional Qualifications (2020 Edition) • N.F.P.A. 1142 - Standard on Water Supplies for Suburban and Rural Fire Fighting (2017 Edition)
Communications	• N.F.P.A. 1221 - Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition) • N.F.P.A. 1061 - Professional Qualifications for Public Safety Telecommunications Personnel (2018 Edition)
Mechanical	• N.F.P.A. 1901 - Standard for Automotive Fire Apparatus (2016 Edition) • N.F.P.A. 1911 - Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles (2017 Edition)

4.3.1 National Institute of Standards and Technology

The **National Institute of Standards and Technology (N.I.S.T.)** was founded in 1901 as a non-regulatory agency within the United States (U.S.) Department of Commerce. N.I.S.T.'s mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

In April of 2010, N.I.S.T. released their Technical Note #1661 "**Report on Residential Fireground Field Experiments**" reflecting a collaborative research analysis conducted by leading fire service agencies. The analysis within this report investigated the effects of varying crew sizes, apparatus arrival times and response times on firefighter safety, overall task completion and interior residential tenability using realistic residential fires.

The result of a similar study identified in Technical Note #1797 "**Report on High-Rise Fireground Field Experiments**" was released in April 2013 that assessed the deployment of firefighting resources to fires in high-rise buildings. These studies are both examples of the technical research and analyses that are taken into consideration in order to develop and update the N.F.P.A. standards referenced within this F.M.P.

4.3.2 Commission on Fire Accreditation International (C.F.A.I.)

The **Centre for Public Safety Excellence** (C.P.S.E.) serves as the governing body for the two organizations that offer accreditation, education and credentialing: the C.F.A.I. and the **Commission on Professional Credentialing** (C.P.C.).

The **Commission on Fire Accreditation International** defines itself as an organization that is committed to assisting fire and emergency service agencies throughout the world in achieving excellence through self-assessment and accreditation in order to provide continuous quality improvement and the enhancement of service delivery to their communities.

The objective of the C.F.A.I. program is to define an accreditation system that is a credible, achievable, usable, and realistic model. The ultimate C.F.A.I. goal is to provide an accreditation process to improve the abilities of municipalities to both understand and recognize their respective community fire risks, provide balanced public/private involvement in reducing these risks and improve the overall quality of life for community members using the accreditation model. Of importance to this fire master planning

process is the C.F.A.I. strategy that seeks to achieve "**continuous improvement**" in the delivery of fire protection services.

4.4 Recommendations and Strategic Priorities

This F.M.P. is intended to provide Council and senior staff with a strategic planning tool to assist in the decision-making process for providing fire protection services over the next ten-year community planning horizon.

Options and recommendations are presented for Council's consideration and approval to clearly communicate the level of fire protection services to be provided to the community, including where applicable, proposed performance benchmarks for ongoing monitoring and evaluation of the services to be provided.

To provide guidance and clarity around approval and implementation of the recommendations presented within this F.M.P. a classification system has been included to identify the recommendations as either "**council**" or "**operational**" that are defined as follows:

Council Recommendations: These include recommendations that require the consideration and approval of Council related to a potential operating or capital financing impact or to inform a municipal policy decision including the setting of a municipal service level or where further direction to corporate staff may be needed.

Operational Recommendations: These include recommendations that can be administered and implemented by the Fire Chief through the authority delegated to this position though By-Law 29-2009. In some cases, this may require the Fire Chief to prepare further documentation and internal reporting to Council for approval. An example of this is updating the current Establishing and Regulating By-law. This is a process that can be led by the Fire Chief, and senior corporate staff, and through normal reporting, be brought to Council for consideration and approval.

4.4.1 Strategic Priorities

The fire master planning process is intended to provide a strong focus on developing and implementing strategies for providing the most effective and efficient delivery of fire protection services that provide the most value to a community. Through the experience of our clients, we have found that identifying guiding principles, or strategic priorities, to

guide the decision-making process is a valuable tool for a municipal Council when considering the recommendations of a Fire Master Plan.

Our analyses in preparing this F.M.P., including assessing compliance with applicable legislation, related reports and plans, current operations of the O.F.S., and knowledge of current industry best practices have been utilized to identify the following strategic priorities for Council's consideration as part of this fire master plan process.

I. **The City of Oshawa is committed to the annual review of a Community Risk Assessment to assess the fire safety risks within the community as the basis for developing clear goals and objectives for all fire protection services provided by the Oshawa Fire Services.**

II. **The Oshawa Fire Services will prioritize the optimization of the first two lines of defence, including public education and fire prevention, and the utilization of fire safety standards and fire code enforcement as the foundation of providing a comprehensive fire protection program within the City of Oshawa.**

III. **The Oshawa Fire Services will specifically prioritize the delivery of fire and life safety programs in Group C- Residential Occupancies that include an enhanced Home Smoke Alarm/Carbon Monoxide Alarm Program.**

IV. **The City of Oshawa will continue to prioritize strategies that support the sustainability of fire protection services that provide the most effective and efficient level of services resulting in the best value for the community.**

Council Recommendation #1: That the strategic priorities presented within the proposed Fire Master Plan be adopted in principle by Council to guide all decision making related to the delivery of fire protection services within the City of Oshawa.

4.5 Stakeholder Consultation

Internal and external stakeholder consultation is a core component of a comprehensive fire master planning process. The City's R.F.P. C2019-045 confirmed the importance of stakeholder consultation by specifically requiring the following elements of stakeholder consultation:

- One online survey
- One community based open house information session
- Community business and stakeholders
- One meeting with Council
- One meeting with senior staff
- One meeting with I.A.F.F. Local 465

At the request of Council the stakeholder consultation process, and specifically consultation with the Executive Board of the Oshawa Professional Firefighters Association, Local 465 was expanded to include two dedicated meetings with the consultant's team, including the Executive Board members in the preliminary findings process, and including the Executive Board members at the draft F.M.P. review process.

In our view, with the support of Council the stakeholder consultation process to develop this F.M.P. has exceeded municipal best practices, and resulted in providing a wide range of opportunities for all stakeholders to inform this F.M.P. A comprehensive overview of the stakeholder consultation process is attached as ***Appendix A.***

4.6 Community Risk Assessment

This section summarizes key aspects of the Community Risk Assessment (C.R.A.) and how the risk conclusions of the C.R.A. inform the comprehensive analysis of the existing, and future fire protection needs of the City of Oshawa through the development of a Fire Master Plan.

4.6.1 Methodology

The C.R.A. has been developed for the City of Oshawa to comply with **Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18)**, which requires municipalities in Ontario to identify fire related risks within the community through a comprehensive analysis of nine mandatory profiles (shown in **Figure 2**). To assist municipalities and fire departments in the process to develop a C.R.A., the O.F.M.E.M. has developed **Technical Guideline-02-2019 (T.G.-02-2019)**, which recognizes the value of understanding community fire risk, and the importance of developing fire risk reduction and mitigation strategies in addition to providing fire suppression services. The methodology and analysis utilized to develop a C.R.A. for the City of Oshawa has

been directly informed by T.G.-02-2019. as well as other current industry standards and best practices.

4.6.2 Risk Prioritization

The mandatory profile analysis resulted in a series of risk conclusion. These risk conclusions are referred to as a '**Key Finding**' or an '**Identified Risk**'. In specific circumstances, being those that involve additional jurisdictional or legislative considerations, a risk-related conclusion is referred to as a Special Consideration.

Risk conclusions referred to as an 'Identified Risk' were taken through a risk assignment process based on their probability and consequence as referred to within T.G.-02-2019. This resulted in each risk having a risk level (e.g., low, moderate, or high) assigned to assist in the prioritization of risks as part of this Fire Master Plan.

4.6.3 Risk Treatment Process

All risk conclusions were taken through a risk treatment process and aligned with the three lines of defence in order to inform the analysis and recommendations within this F.M.P. The risk treatment process is presented within **Figure 2**.

As detailed in the C.R.A., the risk treatment process includes the application of risk treatment options as identified by N.F.P.A. 1300 and T.G.-02-2019. The risk treatment options include:

1. **Avoid:** Implementing programs and initiatives to prevent a fire or emergency from happening
2. **Mitigate:** Implementing programs and initiatives to reduce the probability and/or consequence of a fire or emergency
3. **Accept:** No specific programs or initiatives will be implement. Accept the risk and respond if it occurs
4. **Transfer:** Transfer the impact and/or management of the risk to another organization or body

In addition to the four risk treatment options, each risk conclusion was reviewed through the lens of the "Five Es" as outlined in N.F.P.A. 1300, and the Institution of Fire Engineers' Vision 20/20 National Strategy for Fire Loss Prevention. They include:

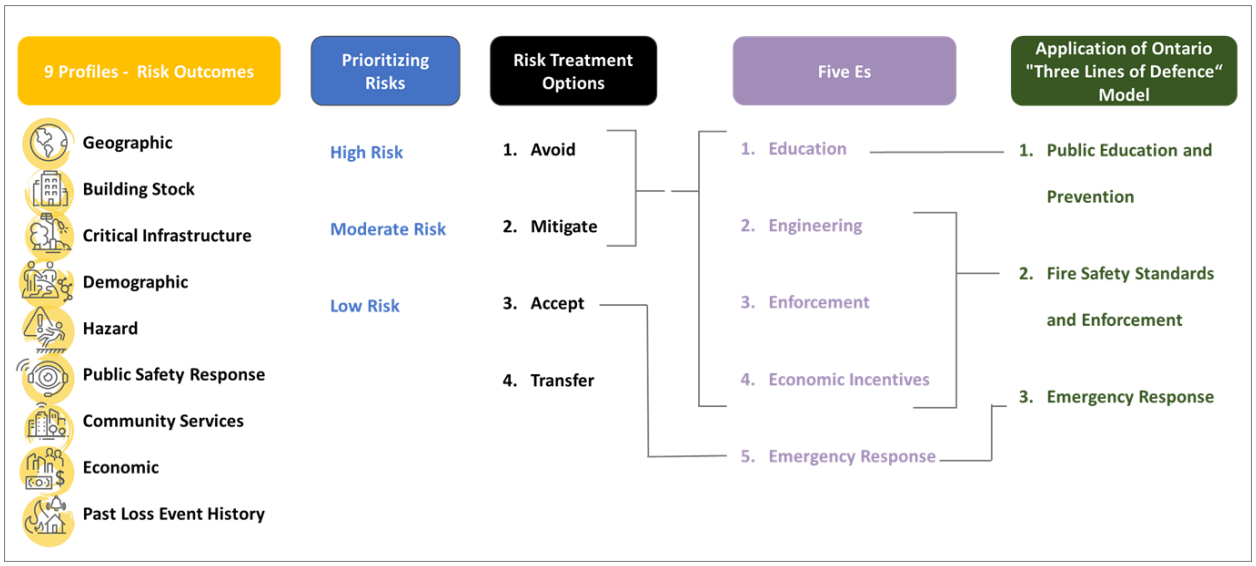
- **Education:** influences audiences to refrain from risky or unhealthy behavior or take positive action to reduce risk

- **Enforcement:** reduces risks through enforcing legislation through inspections and fines for noncompliance
- **Engineering:** includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths
- **Economic Incentives:** are typically offered to encourage better choices and changes in behaviour
- **Emergency Response:** effective emergency response can mitigate the effects of unintentional injuries and save lives

After the application of the risk treatment options and Five Es, the risk conclusions can be aligned with the three lines of defence. Where applicable, these risk conclusions are referenced throughout this F.M.P. through the application of the Three Lines of Defence model.

The Three Lines of Defence model recognizes that there are steps that can be taken to reduce the risk of a fire including the probability of a fire occurring and the consequence of that fire.

Figure 2: Risk Conclusions Application Process



The results of the risk treatment process for both the Identified Risks and the Key findings are shown in **Tables 5** and **Table 6**. The process and results are presented in a matrix format to indicate the ways in which the risks can be addressed by O.F.S. and ultimately for consideration within the analysis and recommendations of this F.M.P.

Table 6: Treatment Options and Five E's Categorization – Identified Risks

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	Increasing traffic congestion on the existing road network presents the potential for a delay in emergency response times.	Moderate	Accept					Yes
Geographic	Motor vehicle-related incidents on the existing road network represent 18.33% of the historical emergency responses of the Oshawa Fire Services.	High	Accept					Yes
Geographic	The presence of waterways within the City of Oshawa creates a potential need for specialized technical ice and water rescues.	Moderate	Mitigate Accept	Yes				Yes
Geographic	Activities at the Port of Oshawa have been identified as including the potential for dangerous goods transportation that may present a risk to the community.	**Special Consideration**	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	Group C - Residential Occupancies represent 93.41% of the City's existing property stock, and over the five year period from January 1st, 2014 to December 31st, 2018 were associated with 82.56% of the structure fires within the City.	High	Mitigate Accept	Yes	Yes	Yes		Yes
Building Stock	The 2016 Census data indicates that 62.60% of residential dwellings was built prior to the introduction of the 1981 Ontario Fire Code compared to 53.06% of residential building stock in the remainder of the Province.	High	Mitigate Accept	Yes	Yes			Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Building Stock	The City currently has 76 buildings defined by the O.B.C. as high-rise buildings with a floor level of 18 metres (59 feet) above grade, or 6 storeys. These buildings are distributed within the urban area with several located in the downtown area.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City has 91 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). These buildings are predominantly located in the commercial and industrial land use areas such as the area south of Highway 401 and along Taunton Road.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City of Oshawa currently has twenty-seven (27) registered vulnerable occupancies.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Critical Infrastructure	The Oshawa Executive Airport presents a number of unique fire related risks associated with aircraft, supporting infrastructure and the potential transportation of dangerous goods requiring specialized fire protection services.	**Special Consideration**	Mitigate Accept		Yes	Yes		Yes
Demographic	Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% of the City's total population.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	For the period from January 1st, 2014 to December 31s, 2018 there is a higher concentration of medical/resuscitator, false fire and fire/explosion incidents in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Table 7: Treatment Options and Five E's Categorization – Key Findings

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	Bridges, with restrictions or closures, have the potential to reduce the connectivity of the City's road network resulting in the potential for delays in emergency response times.	Accept					Yes
Geographic	Grade level rail crossings could create a physical barrier to the connectivity of the City's road network that can potentially result in a delays in emergency response times.	Accept					Yes
Building Stock	The City includes areas of building stock that have higher density and, as such, greater potential for exposure in the event of a fire.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	O.F.S. identified several properties within Oshawa as having an increased potential for high fire risk in regards to fuel load.	Mitigate	Yes	Yes	Yes	Yes	Yes
Building Stock	In addition to registered vulnerable occupancies the City has 65 schools and 13 identified daycare centres that represent higher fire life-safety risks.	Mitigate Accept	Yes	Yes	Yes		Yes
Building Stock	There are a number of identified heritage buildings within Oshawa, many of which were constructed prior to the introduction of the Ontario Fire Code.	Accept					Yes
Demographic	The 2016 Census data indicates that children aged 14 and under represent 16.66% of the City's total population.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Demographic	Of the City's total population, 28.68% fall into the age range of 45 to 64, representing a cohort aging towards the seniors demographic of 65 years or older.	Mitigate Accept	Yes				Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Demographic	The City's commuter population presents a factor that may impact traffic congestion, and the potential occurrence of motor vehicle accidents within the City.	Accept					Yes
Hazard	The City's 2018 Hazard Identification and Risk Assessment identifies hazards that could each impact the ability of the City to deliver fire protection services.	Mitigate Accept	Yes				Yes
Economic	The City has identified top employers that contribute to the economic vitality of the community. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the City.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018, the City averaged 78 structure fires per year.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group C – Residential occupancies account for 82.56% of total structure fires within the City, which is higher than the Province by 9.07% (73.49%).	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group F – Industrial occupancies account for 4.10% of total structure fires within the City.	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group E – Mercantile occupancies account for 13.00% of total structure fire loss within the City, higher than the Province by 8.14%.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	Most reported fire related civilian injuries (20) and fatalities (6) occurred in Group C – Residential Occupancies, with one (1) fatality occurring in an occupancy not classified within the O.B.C.	Avoid Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the leading cause of unintentionally set fires was due to misuse of ignition source at 31.03% (121 fires), compared to 29.96% in the Province.	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the second most common cause of unintentionally set fires was due to mechanical/electrical failure at 13.33% (52 fires), compared to 15.45% in the Province.	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 19.23% of fires had a reported ignition source of cooking equipment, which is 1.51% higher than the Province (17.72%).	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 20.26% of fires had a reported ignition source of open flame tools/smokers articles, which is 6.54% higher than the Province (13.72%).	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 10.26% of fires had a reported ignition source of exposure, which is 5.61% higher than the Province (4.65%).	Mitigate Accept	Yes	Yes	Yes		Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 21.82% of incidents did not have a smoke alarm present (compared to 17.31% in the Province).	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 43.32% of incidents had a smoke alarm present and operating compared to 44.57% in the Province.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	There is a higher concentration of lower median income in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.	Mitigate Accept	Yes				Yes
Past Loss and Event History	For the period from January 1st, 2014 to December 31st, 2018 there are higher concentrations of rescue incidents involving motor vehicle collisions and vehicle extrication along the King Street east/west (Highway 2) corridor and the Simcoe Street North corridor from Highway 401 to Highway 407. There is also a very high concentration of rescue calls along the Highway 401 corridor.	Accept					Yes

5.0 Oshawa Fire Services Overview

The Oshawa Fire Services (O.F.S.) is recognized within the industry as being a "Career Fire Department"[8]. This definition is based solely on the fire suppression deployment capabilities of the fire department that utilizes career (full-time) firefighters who are immediately available to deploy full-time firefighters comprising at least 50 percent of an initial full alarm assignment. Currently the O.F.S. utilizes only full-time firefighters and therefore the current fire suppression deployment model is comprised of 100 percent of full-time firefighters.

The O.F.S. is organized into six divisions including administration, fire prevention and public education, training, communications, mechanical and fire suppression. The current total complement of staff is 196 full-time equivalent positions including 3 non-union management positions and 193 uniformed staff who are all members of the Oshawa Professional Firefighters Association (O.P.F.F.A.), Local 465. The O.F.S. provides a wide range of fire protection services to the community, including public education programs, fire inspections and emergency response to medical, motor vehicle collisions and fire related incidents. The current fire suppression deployment model utilizes six fire station strategically located throughout the urban area of the City. **Figure 3** illustrates the geographical locations of the City's six current fire stations.

[8] National Fire Protection Association - N.F.P.A. Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the public by Career Fire Departments – Chapter 3 Definitions, Section 3.3.13 Career Fire Department.

SCUGOG

WHITBY

OSHAWA

CLARINGTON

LAKE ONTARIO

RAGLAN RD W

HOWDEN RD W

HOWDEN RD E

RITSON RD N

COLUMBUS RD W

COLUMBUS RD E

THORNTON RD N

SIMCOE ST N

HIGHWAY 407 W

HIGHWAY 407 E

WINCHESTER RD W

WINCHESTER RD E

BRIDLE RD

WILSON RD N

HARMONY RD N

Station 6

BRITANNIA AVE W

BRITANNIA AVE E

CONLIN RD W

CONLIN RD E

STEVENSON RD N

COLDSTREAM DR

Station 5

TAUNTON RD W

TAUNTON RD E

GRANDVIEW ST N

Station 3

DRYDEN BLVD

BEATRICE ST E

ROSSLAND RD W

TOWNLINE RD N

Station 1

ADELAIDE AVE W

ADELAIDE AVE E

SPARK RD N

CENTRE ST N

MARY ST N

Station 4

KING ST W

BOND ST W

BOND ST E

KING ST E

JOHN ST W

EULALIE AVE

GIBB ST

CELINA ST

OLIVE AVE

CHAMPLAIN AVE

HIGHWAY 401 W

HIGHWAY 401 E

BLOOR ST E

PARK RD S

SIMCOE ST S

FAREWELL ST

COLONEL SAM DR

WENTWORTH ST W

Station 2

PHILLIP MURRAY AVE

STEVENSON RD S

THORNTON RD S

CENTRE ST S

RITSON RD S

WILSON RD S

HARMONY RD S

TOWNLINE RD S

Fire Station

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 3: **C**URRE**NT**
CITY OF OSHAWA
FIRE **STATION**
LOCATIONS

Final Draft March 2020

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 250 500 1,000 m

N W E S

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-03

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Station Locations.mxd

6.0 Administration Division

This section of the F.M.P. describes the roles and responsibilities of the Administration Division, which provides strategic direction and overall administration and management to Oshawa Fire Services. This section also outlines and reviews the primary administration practices, department organizational structure, vision and mission, management roles and responsibilities, applicable by-laws, current service agreements, departmental standard operating guidelines, and records management procedures.

The current organizational structure of this division includes the Fire Chief and two Deputy Fire Chiefs. This division receives additional administrative support from the Corporate Strategic and Business Services group. The core functions of the O.F.S. Administration Division include:

- Oversee compliance with federal and provincial legislation, corporate policies, and department policies
- Oversee fire prevention and public education initiatives
- Oversee all department operational activities and manage related equipment
- Preparation and implementation of City-wide emergency management
- Oversee training and development
- Managing labour relations and human resource issues
- Department records management, including attendance and payroll

Support received from the corporate Strategic and Business Services group includes:

- Supporting project management
- Supporting budget management and financial cost controls
- Developing and implementing short and long-term strategic and business planning
- Developing, implementing and monitoring department continuous improvement process and best practices through lean methodologies
- Administration, attendance and payroll services for all staff
- Analyzing data and statistic collection
- Assisting with emergency management programs
- Managing human resource activities
- Assisting with administrative policy and procedure development
- Report writing

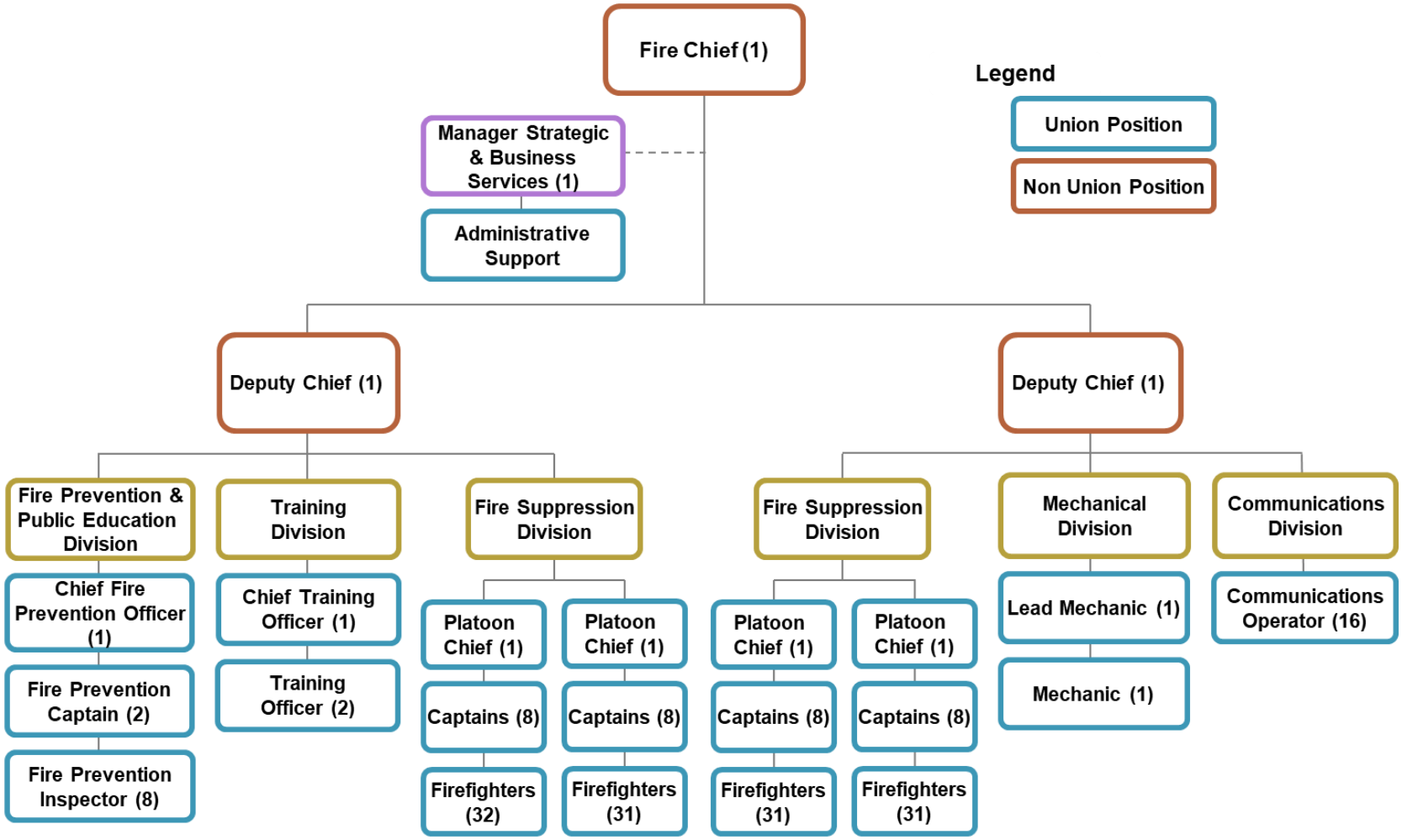
6.1 Existing O.F.S. Organizational Structure

Figure 4 illustrates the existing organizational and reporting structure of the O.F.S. Within this existing organizational structure, the Fire Chief and two Deputy Fire Chiefs are the only two non-union management positions. This structure places a significant amount of workload on these three positions to oversee a unionized workforce of 193 staff, including the strategic and daily responsibilities for delivering services to the public in the presence of a collective agreement.

This structure assigns one of the Deputy Fire Chiefs with direct responsibility for the Public Education/Fire Prevention Division and the Training Division, and the second Deputy Fire Chief with direct responsibility for the Communications and Mechanical Divisions. The Deputy Fire Chiefs currently share responsibility for overseeing the Fire Suppression Division. Currently, two of the fire suppression platoons are assigned to each of the Deputy Fire Chiefs. This distribution of the Fire Suppression Division requires a significant amount of communication and interaction between the Deputy Fire Chiefs to ensure consistency in the direction and priorities of this division. Based on our observations, this coordination appears to be working well.

The current organizational structure includes 11 full-time staff assigned to the Public Education/Fire Prevention Division, three full-time staff assigned to the Training Division, 161 full-time staff assigned to the Fire Suppression Division, two full-time staff assigned to the Mechanical Division and 16 full-time staff assigned to the Communications Division.

Figure 4: Existing[9] O.F.S. Organizational Structure



[9] Reflects staffing levels as of March 9th 2020

Table 7 illustrates the distribution of the existing full-time staff by division.

Table 8: Existing O.F.S. Staff Resources

Role/Division	# of Full-time Staff Resources	Union/Non-Union Position
Administration		
Fire Chief	1	Non-Union
Deputy Fire Chief	2	Non-Union
Fire Suppression		
Platoon Chief	4	Local 465
Captains	32	Local 465
Firefighters	125	Local 465
Training		
Chief Training Officer	1	Local 465
Training Officer	2	Local 465
Fire Prevention/Public Education		
Chief Fire Prevention Officer	1	Local 465
Fire Prevention Captain	2	Local 465
Fire Prevention Inspector	8	Local 465
Mechanical		
Lead Mechanic	1	Local 465
Mechanic	1	Local 465
Communications		
Communicators	16	Local 465
Total	196	

6.2 O.F.S. Mission Statement, Vision and Core Values

P.F.S.G. 03-02-13 “Master Planning Process for Fire Protection” identifies the importance of a mission statement for a fire department. A mission statement should clearly communicate the primary goal that members of the department are committed to achieving. Effective mission statements identify what an organization does, who it does it for, and how it does it.

The mission of Oshawa Fire Services is:

"To promote and protect the health and well-being of the community through adaptable and progressive education, prevention, and emergency services."

Mission statements are intended to be short, clear and powerful in defining an organization's purpose and primary objectives. They are intended to express why the organization exists to both internal and external stakeholders. The current mission of O.F.S. reflects these current industry best practices.

Often, fire departments will have a **vision,** in addition to a mission statement. A vision statement should identify a vision for the future that all individuals within the department can work towards. Vision statements can often remain the same while mission statements can evolve as the organization changes. The overall vision of O.F.S. is:

“To continually pursue and advance a level of professional excellence recognized as the model for the fire service.”

The current vision statement of O.F.S. also reflects current industry best practices for what a vision statement should identify and describe in what the fire service is aiming to be in future terms.

In addition to its mission and vision statements, O.F.S. upholds the core values of **Authenticity**, **Courage**, and **Trust.** It is our understanding that under the direction of the Fire Chief, the department has initiated a review of the current mission and vision statements of the department. Conducting this review as part of the Fire Master Plan implementation process would is consistent with current industry best practices.

6.3 O.F.S. Senior Management Team (S.M.T.)

The Senior Management Team of the O.F.S. includes the Fire Chief and two Deputy Fire Chiefs. This team is also supported by the Manager – Strategic and Business Services. Together, the O.F.S. S.M.T. provides strategic and daily oversight of all operations of the department including all divisions, budget, purchasing, emergency planning, labour relations, as well as developing, recommending and implementing strategies to sustain and enhance the level of fire protection services to the community.

6.3.1 Fire Chief

The responsibilities and authority of the Fire Chief are clearly defined within the Fire Service Establishing and Regulating By-law (By-Law 30-2001), attached to the Fire Master Plan as **Appendix B**. Corporately the Fire Chief reports to the Commissioner of Community Services and is responsible for administering and operating the overall delivery of the fire protection services which are defined through By-Law 30-2001 as pertaining administration, apparatus, communications, fire prevention, fire suppression, mechanical and training persons involved in the provision of fire protection services, rescue and emergency services. The Fire Chief has been appointed by Council through By-Law 20-2017, which provides the Fire Chief with the authority to fulfill his roles and responsibilities as designated by the F.P.P.A. As defined within the F.P.P.A. the Fire Chief reports to Council.

The analysis presented within this F.M.P. will illustrate that the current roles and responsibilities, and the workload assigned to the Fire Chief exceed the capacity of this position. Our review of the current job description for this position, and information garnered throughout the interview and data collection process to develop this F.M.P. clearly identifies an imbalance in the roles and responsibilities assigned to the Fire Chief. In part, this can be attributed with the department's continued growth including more complex reporting requirements and the need for enhanced performance management, however, it can also be associated with a work environment that includes the oversight of a large unionized workforce and the resulting labour relations.

Our review of the most recent job description for the Fire Chief identifies that there is a need to update the current job description to more clearly define the roles and responsibilities of this position. This review should consider further opportunities for the delegation of roles and responsibilities to the position of Deputy Fire Chief.

This review should recognize those areas where the delegation of further roles and responsibilities (e.g. management-related tasks) to unionized positions, including the associated authority to unionized positions such as the Chief Training Officer, Chief Fire Prevention Officer and Platoon Chiefs, is limited by the Collective Agreement with the O.P.F.F.A.

6.3.2 Deputy Fire Chiefs

The current organizational structure of the O.F.S. includes two full-time Deputy Fire Chiefs. As referenced previously within this F.M.P. the current organizational structure distributes the roles and responsibilities of these two positions by division. This includes one Deputy Fire Chief having direct responsibility for the Public Education/Fire Prevention Division and the Training Division, and the second Deputy Fire Chief having direct responsibility for the Communications and Mechanical Divisions. The Deputy Fire Chiefs currently have joint responsibility for overseeing the Fire Suppression Division.

Both positions report directly to the Fire Chief, however there is currently only one job description related to the position of Deputy Fire Chief. Examples of the core responsibilities of these positions include:

- Responsible for the day-to-day management, administration and command structure of fire services
- Lead department strategic planning by developing performance measures and budgetary controls
- Actively leads an inclusive and diverse workforce
- Develop and maintain statistical incident analysis that comply with legislative requirements implemented in accordance with appropriate policies, standards, procedures and agreements
- Establish and enforce rules, regulation, policies and procedures for efficient and effective delivery of Fire Services
- As Health & Safety Co-Chair for the corporation you will ensure health & safety standards are met as legislated and mandated by the Corporation of the City of Oshawa
- Act in the interest of the Corporation while promoting and maintaining open and collaborative labour relations with the Oshawa Professional Firefighters Association and members of the public

- Ensure effective teamwork, organizational performance, and continuous learning, which encourages innovation and collaboration

This job description also identifies that the positon of Deputy Fire Chief will assume the role and statutory responsibilities of the Fire Chief and CEMC in his/her absence. Our research into preparing this F.M.P. found that on January 19th, 2019 Council passed By-law 7-2019 appointing one of the Deputy Fire Chiefs as Acting Fire Chief in his absence. However, the By-law specifically states that it was only to be in effect on a temporary basis until the Fire Chief returned to work. In our experience, this process of appointing an Acting Fire Chief reflects municipal best practices. It also supports the need to consider having an ongoing appointment by-law that authorizes either of the Deputy Fire Chiefs to act in the position of Fire Chief should he/she be unavailable for any reason.

As referenced in the previous section, our review of the O.F.S. current senior management roles and responsibilities including the Fire Chief and Deputy Fire Chiefs, indicates that these positions, and this management team are unable to effectively sustain the current workload and roles and responsibilities that are assigned. In our view, there is sufficient evidence and workload to support hiring an additional senior qualified position to this management team. The result should reflect a revised senior management organizational structure, consideration of revised job descriptions and associated appointment by-laws.

6.3.3 Proposed Assistant Deputy Fire Chief

In our view, there is sufficient evidence to support the need for one additional full-time non-union management position. The proposed Assistant Deputy Fire Chief would report directly to the Deputy Fire Chiefs to provide a further depth of support to the overall administration and management of the O.F.S. In our view, the addition of this position will provide the opportunity for the Fire Chief and Deputy Fire Chiefs to become more proactive including a larger focus on strategic planning. A core component of the roles and responsibilities of this position should be to enhance the use of analytics in monitoring the ongoing operations of the department. This strategy would be beneficial to providing the Fire Chief and Deputy Chiefs with evidence-based information to inform further inform the strategic planning process and performance benchmarking of the department's services and programs.

The implementation of this position would also provide opportunity to enhance the department's due diligence in performance benchmarking, records management, operating guidelines and department polices and reporting to Council, and the community. Examples of the roles and responsibilities for this position should include:

- Oversee the development and maintenance of department policies and operating guidelines
- Manage the department's records management systems and information technology including utilizing internal databases to conduct statistical trend analysis and reports;
- Administer the Attendance Support Program
- Participate in quality assurance including "lean" methodology
- Participate as senior officer on call, and provide an enhanced depth to the department's incident command structure capacity

The 2018 F.M.P. Report included the following recommendation Complete a report to Council for the addition of one Assistant Deputy Chief through the annual operating budget process, recognizing the current span of control, 192 staff / 3 managers"[10]. On November 28th, 2019 the Community Risk Assessment and Fire Master Plan Update Report prepared by Dillon Consulting was presented to Council. The analysis within this F.M.P. supports the 2018 F.M.P. recommendation and continues to support the preliminary findings recommendation that was presented to Council at that time including:

Council Recommendation #2 (completed): That Council consider allocating sufficient funding within the City's 2020 operating budget to hire an Assistant Deputy Fire Chief as referenced within the preliminary analysis of the fire master planning process.

[10] Oshawa Fire Services 2018 Fire Master Plan & Community Risk Assessment, Recommendations page 92 #11.

6.3.4 Corporate Manager of Strategic and Business Services

As a member of the department senior management team, the Corporate Manager of Strategic and Business Services provides the O.F.S. with support in providing efficient financial, administrative, payroll, human resources and data management. This position also provides a link to achieving both the corporate and department strategic initiatives and the implementation of short and long-term departmental strategic goals and business planning. This position reports to the Director of Strategic and Business Services and works out of the Consolidated Operations Depot.

Examples of the core responsibilities of this position include:

- Assist directors and managers in providing strategic advisement on major departmental and corporate wide initiatives and special projects
- Provide leadership and advice on development of policy and procedures, quality standards and performance indicators at the department and branch level
- Provide overall direction for branch agreements
- Lead research, planning and implementation of department technology needs and special initiatives
- Provide assistance with corporate emergency planning and manage the emergency operations centre logistics

6.3.5 Job Descriptions – General

Our review identifies a number of variations in the level of detail and definition of the job descriptions available within the O.F.S. for all current full-time staff. In our experience, this is not uncommon, particularly when new positions have been added, or roles and responsibilities of existing staff have been revised. As such, we are recommending that consideration be given to reviewing and where applicable, revising the existing job descriptions for all O.F.S. positions following Council's review and approval of this F.M.P.

6.3.6 O.F.S. Senior Management Team Summary

Our review of the O.F.S. current senior management team roles and responsibilities, including current workload capacity, supports the need to consider hiring the proposed Assistant Deputy Fire Chief position. A critical element of this recommendation is that this position be hired and implemented as a "non-union" position. In our view, the hiring of this position should be coordinated with a review of all job descriptions of the senior management team. Where possible, this review should include more distinction to the specific divisional roles and responsibilities of the Deputy Fire Chiefs. Once completed, the revised job description should then inform the development of revised, new appointment by-laws for all members of the O.F.S. senior management team.

Operational Recommendation #1: That the job descriptions for all members of the O.F.S. including the senior management team, and all other members of the O.F.S. be reviewed and revised to clearly define the roles and responsibilities of all positions.

Operational Recommendation #2: That an appointment by-law or a formal process to delegate authority to the Deputy Fire Chiefs in the event of the Fire Chief's absence, be developed and presented to Council for consideration and approval.

6.4 O.F.S. Administrative Support

Administrative support for the O.F.S. is coordinated by the corporate Strategic and Business Services Branch. "This Branch is responsible for the provision of strategic services and business planning, budget/financial management, administrative and specialized services, technology initiatives while applying lean methodologies for business process improvements which contribute to the Community Services Department meeting its strategic goals and legal requirements"[11]. Currently, this includes providing two Administrative Assistants who are specifically assigned to provide administrative support to the O.F.S. as supervised by the Supervisor of Strategic Business Services, who works at the Consolidated Operations Depot.

[11] City of Oshawa Website https://www.oshawa.ca/city-hall/strategic-and-business-services.asp

The two Administrative support Staff directly assigned to the O.F.S. are unionized members of Canadian Union of Public Employees (C.U.P.E.) Local 251.

The primary duties of these staff include:

- Confidentially support the Fire Chief, Deputy Fire Chiefs, Chief Fire Prevention Officer and Chief Training Officer by preparing correspondence, reports, data preparation for analysis, transcribe, process and distribute high level meeting minutes for Senior Officers
- Facilitate confidential medical notes and incident accident reports on behalf of the Deputy Fire Chiefs
- Provide specialized administrative support through examination, interpretation and processing of various administrative requirements for O.F.S.
- Provide specialized administrative support to fire prevention by ensuring the integrity of various governmental and legal documents required by the O.F.M.E.M.
- Through forecasting, analyzing and administering fire service inventory, ensure critical emergency medical supplies, consumables, pending firefighter promotional regalia, insignia, collective agreement apparel and firefighter personal protective equipment inventories are administered, maintained, procured and distributed appropriately
- Ensure the integrity of the fire service by providing excellent, confidential customer service to members of the general public, fire services staff, various suppliers, lawyers, real estate agents, community partners, internal city staff, colleagues and councillors

The Strategic and Business Services Branch also provides the O.F.S. access to two financial clerks whose duties include:

- Ensuring the financial integrity of the community services department by performing financial functions, analyzing and assisting in annual budget process
- Ensuring accuracy of time sensitive payroll through extensive review, analysis and interpretation and compliance of various collective agreements and employment standards act
- Through compilation, verification and analysis of employee information, ensuring the accuracy and confidentiality of human resource activities

- Developing, designing and managing data integrity while implementing practices and procedures to ensure the accuracy and timeliness of statistical analysis and reporting
- Supporting departmental excellence and achievement through continuous improvement initiatives

In our experience, this assignment of staff and supervisory structure is quite unique. Our research and observations indicate a significant challenge related to the assignment of work and supervision of administrative and financial support staff. All of the administrative support staff are employed, or under the direction of the Strategic and Business Services Branch, whereas they complete work for the O.F.S. and specifically under the direction of members of the department's senior management team. This organizational model appears to be intended to integrate the administrative practices of the fire department with those of the corporation. There is some evidence of this success, however it appears it may be at the cost of an efficient and effective administrative support model for the fire department.

Based on our research and consultation, there is an identified need to further review how the two current administrative assistants are supervised on a daily basis and assigned fire department work. Their work is completed in a different location than that of the Supervisor of Strategic and Business Services, and yet they are assigned work on a daily basis by staff within the fire department. There is a potential for inconsistent direction and prioritization of the work. In our view, there is an identified need to review the administrative support needs of the O.F.S. This should include the benefits of continuing the current organizational model or assigning administrative support staff directly to the fire department.

Operational Recommendation #3: That consideration be given to a review of the current administrative support provided to the O.F.S. by the Strategic and Business Services Branch as discussed within the proposed Fire Master Plan.

6.4.1 Administrative Support Workload/Confidentiality

The research and analysis to prepare this F.M.P. indicates an increasing amount of work required to sustain the current reporting requirements of the O.F.S. in many areas. In these same areas, recent legislative changes are require more due diligence, records management, and reporting on behalf of the O.F.S. to maintain compliance. Examples of these areas include: firefighter training programs and record keeping; fire inspections

and issuance of Fire Code charges and prosecution; and public reporting in general; all of which are creating greater administrative workload for fire departments throughout the Province. Access to a larger pool of administrative support resources through the Corporate Strategic and Business Services group, may provide an effective solution to this increased workload.

Through the analysis of this option, we recommend that consideration be given to a new, non-union administrative support position within the O.F.S.

In our view, there is a need to reassign all confidential administrative work to a non-union positon within the O.F.S. This new position will also be assigned the roles and responsibilities for overseeing all administrative support staff and workload within the department. This includes all administrative support to the Fire Chief and Deputy Fire Chiefs related to reporting to Council, labour relations and personnel files. In our view, the creation of a new position such as the one recommended, would have a positive impact on workload of the two current administrative support staff.

Operational Recommendation #4: That consideration be given to the creation of a new Administrative Support position within the O.F.S. as presented within the proposed Fire Master Plan.

6.5 Municipal By-laws

The Municipal Act, and the Fire Prevention and Protection Act, permit the council of a municipality to enact a number of by-Laws to operate a municipality, including the fire department. In addition to meeting this legislative responsibility, by-laws provide the community with important information regarding the level of service that a municipality intends to provide. By-laws also provide municipal staff with the authorization to provide these services, as well as the responsibility to achieve the prescribed service level. By-laws common to a municipal fire service include the establishing and regulating by-law, appointment by-laws, and fees for service by-laws.

6.5.1 Establishing and Regulating By-Law 30-2001

The Municipal Act and the Fire Protection and Prevention Act, permit the council of a municipality to enact a by-law to establish and regulate a fire department. An Establishing and Regulating (E&R) By-law for a fire department should provide clear and accurate policy direction reflecting how a municipal council intends fire protection

services to function and operate. **P.F.S.G. 01-03-12 "Sample Establishing and Regulating By-law"** prepared by the O.F.M.E.M. provides a description of the primary issues to be addressed, as well as a template for developing an E&R By-law.

The primary areas identified by the O.F.M.E.M. to be included in an Establishing and Regulating By-law are:

- General functions and services to be provided
- The goals and objectives of the department
- General responsibilities of department members
- Method of appointment to the department
- Method of regulating the conduct of members
- Procedures for termination from the department
- Authority to proceed beyond established response areas
- Authority to effect necessary department operations

The City of Oshawa **By-law 30-2001** (attached as **Appendix B**) establishes and regulates the Oshawa Fire Services. In our view, the current by-law references the areas identified by P.F.S.G.01-03-12. In response to the analysis presented within this F.M.P., there are several areas where the City should consider further amendments. For example, the analysis within this F.M.P. includes recommendations for Council's consideration in adopting more defined service levels in several areas such as fire inspection and public education programs. Subject to Council's consideration and approval, these defined service levels should be included within an updated establishing and regulating by-law. This is an outstanding recommendation from the 2013 F.M.P. and again identified in the 2018 F.M.P. update report completed by the Fire Chief. As a result, this recommendation has been carried forward into this F.M.P.

Operational Recommendation #5: That subject to Council's consideration and approval of the proposed Fire Master Plan that the Establishing and Regulating By-law 30-2001 be reviewed and updated as required.

6.5.2 Appointment By-Law 20-2017

By-law 20-2017 pertains to the appointment of the City's Fire Chief. Having appointment by-laws is consistent with the provisions of the F.P.P.A. in order for a council to designate the individuals assigned to these positions and to provide them with the authority to fulfill their roles and responsibilities under the F.P.P.A.

6.5.3 Delegation of Authority By-Law 29-2009

By-law 29-2009 delegates various authorities to both the City Manager and the Fire Chief. The City Manager and Fire Chief are equally authorized to:

1. Enter into agreements for the provision of fire protection services to lands located outside Oshawa or to receive fire protection services from a fire department located outside of Oshawa.
2. Enter into an automatic aid agreement to provide or receive the initial or supplemental response to fires, rescues and emergencies.
3. Authority to pass by-laws to appoint persons as officers to enter upon land and into structures at any reasonable time to inspect the land and structures to determine whether by-laws enacted in accordance with the Fire Protection and Prevention Act are being complied with.

6.5.4 Fireworks By-Law 59-2014

By-law 59-2014 regulates the sale, storage, display and discharge of fireworks within Oshawa. The by-law requires that a permit be obtained prior to discharging the display of fireworks. All applications for such a permit are to be submitted to the Chief Fire Official (C.F.O.) for approval. Individuals who do not follow the provisions of this by-law could be subject to a fine of not less than $300 and not more than $5,000 for the first offence.

6.5.5 Open Air Burning By-law 73-2012

By-law 73-2012 details the requirements for open air burning, application process for an open-air permit, and identifies certain provisions for farms.

Residents of Oshawa are required to obtain a permit prior to starting an open-air fire. The Chief Fire Official has the authority to issue a Fire Permit if the conditions set out in the by-law are met, as well as revoke the permit at any given time. The cost to obtain a permit is $80.00 as described within the Annual Fire Permit application form found on the City's website.

This by-law does not prevent open-air fires on farms so long as it is in compliance with the provisions of the by-law, is located in a position that does not pose a fire risk to the occupants of any building and the C.F.O. have approved a permit prior to the setting of a fire.

Information about open air burning and interpretation of the Open Air Burning By-law can be found on the O.F.S. website.

6.5.6 Regional Mutual Fire Aid By-law 43-75

By-law 43-75 provides for the participation of the Oshawa Fire Service in Regional Mutual Fire Aid. The by-law authorizes the O.F.S. to leave the municipal boundary at the discretion of the Fire Chief to respond to calls for assistance from other municipal fire department.

6.5.7 Two-Unit Housing By-Law 91-2014

By-law 91-2014 provides for the registration of two-unit houses defined in the by-law as a detached house, semi-detached house or a row house which contains two residential units or an accessory apartment as prescribes by the **Zoning By-law 91-2014**. As described within the by-law, the City's Registrar may require the inspection of a two-unit house before registration to ensure that it complies with all standards such as those prescribed in the F.P.P.A. or Fire Code (O. Reg. 213/07).

6.5.8 General Fees and Charges By-Law 13-2003

By-Law 13-2003 enables the City to recover costs for the provision of various departmental services. Recoverable rates and fees used by the fire department are identified within Schedule B.3 of the by-law. Our review indicates that there are several services that the Oshawa Fire Services currently provides but does not charge for such as:

- Scheduled inspections
- Fire safety plan review
- Fire safety plan approval letter
- Fire access route applications
- Fire safety presentations (e.g. including fire extinguisher demonstrations)
- Inspections initiated by the O.F.S.
- Residential home fire safety awareness program

- Requests by homeowners of residential units (e.g. including smoke alarm placement)

As an example, our review indicates that the current rates and fees by-law does not identify fees for the review of Fire Safety Plans. The review of Fire Safety Plans can be a time consuming task. In our experience, we have found most municipalities charge for this work. The department should also consider cost recovery for the provision of smoke alarms and carbon monoxide alarms as part of the Alarmed for Life Program. Subject to Council's consideration and approval of the proposed F.M.P., further consideration should be given to including additional services and activities to the **General Fees and Charges By-law 13-2003.**

Operational Recommendation #6: That consideration be given to revising the current General Fees and Charges By-law 13-2003 to include additional fees for service as presented within the proposed Fire Master Plan.

6.6 Agreements

Within the fire service there are multiple approaches to sharing services or procuring services, including mutual aid, automatic aid, and fire protection agreements. The agreements to which the O.F.S. is a party are outlined in the section following.

6.6.1 Mutual Aid Agreement

The O.F.S. is an active participant in the Regional Municipality of Durham Mutual Aid Plan, as authorized by **By-Law 43-75**. As the largest municipality within the Region, the O.F.S. regularly facilitates a leadership role in supporting other fire departments within the Region. At this time, the Municipality of Clarington Fire Chief is assigned the role of Regional Fire Coordinator. Historically, this role has rotated with all of the municipalities in the region participating. Mutual aid agreements are predetermined plans that allow a participating fire department to request assistance from a neighbouring fire department. **P.F.S.G. 04-05-12 Mutual Aid**, provided by the O.F.M.E.M. identifies the information required to develop and approve these agreements.

There are two main scenarios when mutual aid agreements are activated:

1. A fire department may ask for mutual aid assistance when it is at the scene or has information that immediate assistance is required.

2. Fire departments may immediately request a simultaneous response from a participating fire department where distance and/or conditions dictate.

Mutual Aid Plans and the Regional Fire Coordinators also provide the point of access for municipalities to request assistance from the Provincial Emergency Operations Centre (P.E.O.C.) in instances such as responding to hazardous materials incidents including chemical, radiological or nuclear (C.B.R.N.) incidents.

Assistance under a mutual aid agreement is reciprocal and there are no fees involved for response. Mutual aid agreements are not intended to be used for day-to- day response, but rather for extraordinary emergencies which exhaust or exceed the response capabilities of a fire department.

6.6.2 Automatic Aid Agreements

In contrast to mutual aid agreements, automatic aid agreements are programs designed to provide and/or receive assistance from the closest available resource, regardless of municipal boundaries, on a day-to-day basis. **P.F.S.G. 04-04-12 Automatic Aid** describes the concept of these types of agreements.

The advantage of implementing an automatic aid program is that the person/persons experiencing the emergency receive fire services from the closest available provider (municipality). Automatic aid allows for the provision of seamless by supplying seamless integrated fire suppression services through the elimination of traditional municipal service boundaries. Automatic aid agreements provide benefits such as:

- An enhancement of the level of public safety
- A reduction of the critical element of time between the commencement of a fire and the application of an extinguishing agent to the fire by dispatching the closest available fire suppression resources
- The reduction of life, property and environmental losses
- The improvement of public and firefighter safety

Automatic Aid Agreements are typically created between two neighbouring communities to reduce initial response times by deploying firefighters from the closest fire station, regardless of municipal boundaries; to deploy additional firefighters to enhance the depth of response capabilities of the requesting fire department; or alternatively, to request a specific type of apparatus such as a tanker or an aerial apparatus to support the response of the requesting fire department.

6.6.2.1 Automatic Aid Agreement – Town of Whitby

The City of Oshawa and the Town of Whitby are parties to an automatic aid agreement, dated June 21st, 2016. The agreement provides for reciprocal emergency response services to the areas of the provincial highways located within each municipality that are more easily accessible by the neighbouring fire department. The automatic aid area covers three areas of Highway 401 and three areas of Highway 407 for incidents requiring fire, rescue, emergency, and/or dangerous condition response. This is a reciprocal agreement, with no costs associated for the provision of an automatic aid response. The term of the agreement is indefinite and is reviewed annually by the Fire Chiefs of both parties.

6.6.2.2 Automatic Aid Agreement – Municipality of Clarington

On March 9th, 2018 the City of Oshawa and the Municipality for Clarington entered into an automatic aid agreement which covers an area that includes a portion, or all of Highway 407 east and west between Harmony Road in Oshawa and Enfield Road in Clarington. This agreement allows for reciprocal emergency response to areas of Highway 407 that are more accessible by the neighbouring fire department. The term of the agreement is indefinite unless either or both signed parties agree to terminate. These municipalities have a second automatic aid agreement that was developed in 2002 to provide the same type of reciprocal services along the Highway 401 corridor. In our view, there would be merit in combining the two agreements into one automatic aid agreement. Incidents responded to along the Highway 407 and Highway 401 corridors can include fires, rescues or emergencies that occur within the defined automatic aid agreement area. Both of these agreements are reciprocal agreements, with no costs associated for the provision of an automatic aid response.

6.6.3 Communications Service Agreements

The Communications Division of the O.F.S. provides emergency call taking and emergency dispatching on behalf of the City of Oshawa. In addition, the City has developed service agreements for the provision of these services to the Town of Whitby and the Municipality of Clarington. The O.F.S. also provides emergency call taking and alerting for the Township of Scugog, Township of Uxbridge and the Township of Brock.

As such the O.F.S. currently provides communications (fire dispatching) services to six of the eight municipalities within the Region of Durham based on two different service levels and varying types of agreements. The only municipalities within the Region that the O.F.S. does not provide these services to are the Town of Ajax and the City of Pickering.

As a service provider to other municipalities the O.F.S. has demonstrated a high degree of quality and competence in the delivery of emergency call taking and emergency dispatching and compliance with current industry best practices. The analysis presented within this F.M.P. will further discuss the due diligence required on behalf of the City to sustain this high degree of skill and competency in sustaining its responsibilities has a service provider. Based on our research and analysis, the O.F.S. has developed a reputation for providing cost effective and efficient emergency call taking and emergency dispatching as a service provider to other municipalities. In our view, this supports a strategy to further consider the extension of these services to all municipalities within the Region of Durham. The first step in this process should be to develop a standardized agreement that clearly defines the services to be provided and the cost associated. The 2019 M.N.P. Report identified that the City of Oshawa does not currently include the capital costs of providing emergency call taking and emergency dispatching in the total fees associated with providing fire dispatching to other municipalities. The 2019 M.N.P. Report suggests that further investigation be conducted to define a business case for including these costs. In our view, this should be considered within a review of all existing agreements to inform a new standardized agreement.

Operational Recommendation #7: That the O.F.S. develop a business plan and standardized agreement for the provision of emergency call taking and emergency dispatching (fire dispatching) as referenced within the proposed Fire Master Plan.

Once the proposed business plan and standardized agreement for the provision of emergency call taking and emergency dispatching (fire dispatching) has been considered and approved by Council, the City's next step should be to consider developing a further business case for offering emergency call taking and emergency dispatching (fire dispatching) services to all municipalities within the Region.

6.6.4 Tiered Response Agreement

The history of tiered response agreements relates directly back to the development of the provincial wide 911 system. Within the City of Oshawa, the current tiered response agreement defines the levels of services and authority for O.F.S. to respond to emergency medical incidents in support of the Durham Region Emergency Medical Services (D.R.E.M.S.) that are dispatched through the provincially managed Central Ambulance Communications Centre (C.A.C.C.). The current Tiered Response Agreement was reviewed and updated in 2007 as described in report FA-07-206-CM. As a result of this review, the medical response protocols of the O.F.S. were revised to include:

- Respiratory arrest (absence of breathing)
- Cardiac arrest (absence of pulse)
- Unconsciousness
- Motor vehicle collisions with E.M.S. attending
- Profuse and uncontrollable bleeding (not including nose, vaginal, rectal, or catheter site bleeds)
- In all cases, a tired response will be requested within one (1) minute of E.M.S. dispatch, and in conjunction with the new response criteria, when the E.M.S. response time is anticipated to be greater than ten (10) minutes for the following emergency requests for services:
    - Acute chest pain and/or shortness of breath (not on calls originating from long-term medical care or medical facilities).

Report FA-07-206-CM indicates that “Oshawa Fire Services along with most other municipalities have responded to medical assist incidents since the early 1990’s. These calls for assistance have increased significantly over the years and now account for over 5,000 calls representing 54% of total responses”[12]. Our research indicates that for the period from January 1st, 2006 to December 31st, 2011 medical calls represented 40% of the total emergency all volume for the O.F.S. (2013 F.M.P.).

[12] City of Oshawa Report FA-07-206-CM dated November 7, 2007

For the period from January 1, 2014 to December 31, 2018, medical calls have declined to 26.04% of the total emergency call volume for the O.F.S. (2018 C.R.A). This represents a decline of approximately 28% over the past five-year period.

6.6.5 Specialized Rescue Agreements

As indicated within the review of the Communications Service Agreements, the O.F.S. has demonstrated a high degree of proficiency in many areas, one of which is the provision of specialized rescues. These include elevated rope rescue, confined space rescue, trench rescue, building collapse stabilization and hazardous materials response, and water or ice rescue. The O.F.S. has developed its skills and competencies in these specialized rescues in response to identified risk within the community. As a result, the O.F.S. has developed agreements with several neighboring communities based on fee for service model. The 2013 F.M.P. recommended that the O.F.S. promote the development of automatic aid agreements for the provision of Technical Rescues (Specialized Rescue Agreements) with neighbouring communities. This information presented in the following sections will illustrate that the O.F.S. has successfully developed these agreements with the Town of Uxbridge, Town of Whitby, Township of Brock and the Municipality of Clarington.

6.6.5.1 Specialized Fire Rescue Agreement – Township of Uxbridge

This agreement outlines the terms, criteria and cost for the City of Oshawa to provide the Township of Uxbridge with specialized fire rescue services. The agreement itself commenced January 2019 and ends December 2020 (a two-year term) with automatic renewal every year for an additional term of one year. It defines specialized rescue as a “technician level” rescue which may involve elevated rope rescue, confined space rescue, trench rescue, building collapse stabilization and hazardous materials response. Specialized rescue services as per this agreement do not include water or ice rescue.

6.6.5.1 Specialized Fire Rescue Agreement – Town of Whitby

This agreement outlines the terms, criteria and cost for the City of Oshawa to provide the Town of Whitby with specialized fire rescue services. The agreement commenced January 2018 and ends December 2019 (a two-year term) with automatic renewal every year for an additional term of one year.

It defines specialized rescue as a "technician level" rescue which may involve elevated rope rescue, confined space rescue, trench rescue, building collapse stabilization and hazardous materials response. Specialized rescue services as per this agreement do not include water or ice rescue.

6.6.5.2 Specialized Rescue Agreement – Township of Brock

This agreement outlines the terms, criteria and cost for the City of Oshawa to provide the Township of Brock with specialized rescue services. The term of the agreement is indefinite and is to be reviewed annually by the participating fire chiefs. It defines specialized rescue as the provision of high/low angle rescue, confined space rescue, trench rescue and hazardous materials response.

6.7 Operating Guidelines, Procedures and Policies

Current industry best practices reflect the use of policy documents as a tool to communicate very detailed direction to staff related to how specific tasks are to be completed to safely and effectively deliver fire protection services. Alternatively, Operating Guidelines are used to communicate guidance to staff on how specific tasks should be completed to safely and effectively deliver fire protection services.

P.F.S.G. 04-69-13 Co-ordination, Development, Approval, and Distribution of Standard Operating Guidelines for Various Disciplines, describes a guideline as "a statement written to guide the performance or behaviour of departmental staff, whether functioning alone or in groups." The intent of Operating Guidelines can be summarized as to:

- Enhance safety
- Increase individual and team effectiveness
- Improve training efficiency
- Improve orientation for entry-level staff
- Improve risk management practices
- Prevent/ avoid litigation
- Create objective post-incident evaluations
- Permit flexibility in decision making

The O.F.S. has developed an extensive list of Operating Guidelines (O.G.s) to provide direction to staff within all divisions of the fire service. **Policy No. 1-1 "Operational Guidelines"** last revised in 2019, provides clear direction on the purpose and procedures for developing and approving O.G.s. The O.F.S. Operating Guidelines are divided into the following categories:

- Policy
- Procedure
- Tools and Equipment
- Training
- Communications
- Fire Prevention
- Mechanical

Individual manuals and corresponding indexes have been developed to separate these documents into categories. O.F.S. personnel are also guided by Regional Operational Guidelines describing an entry control system, radio transmission procedures and an accountability system, applicable to all regional fire service personnel at emergency incidents where mutual or automatic aid agreements have been activated.

Our review of the current O.G. index indicates that the O.F.S. has developed a comprehensive list of operating guidelines that reflect the content of what would be expected within a department such as the Oshawa Fire Services. There is a significant level of detail within the O.G.s for a range of topics covering the extent of activities taking place within the fire service. However, there are several O.G.s that refer to "policy" and "guideline" within the same document. Industry best practices reflect that the use of the term "policy documents" should provide minimal room for interpretation or application whereas "operating guidelines" recognize that there can be a need for interpretation or variance as a result of the conditions that may be present. It is therefore recommended that the formats of the O.G.s are clarified to clarify the application of these documents and to ensure there is no overlap such as within the title section that currently refers to "Policy/Guideline" in the same document.

Many of the current O.G.s have been reviewed or updated recently. The O.F.S. has also implemented a committee to oversee the review and development of department O.G.'s. There will be a need to further review all existing O.G.s and complete revisions where necessary.

For example, **Fire Prevention Operational Guideline No. 18 – Fire Safety Plan Review and Approval,** last revised in 2014, provides direction for the review and approval of fire safety plans applicable to all Fire Prevention Officer/Inspectors assigned to the review of Fire Safety Plans. This O.G. was last revised prior to the announcement that recent legislated changes require all Chief Fire Officials approving fire safety plans for buildings containing care occupancies, care and treatment occupancies or retirement homes, must successfully complete mandatory training as approved by the Fire Marshal. This new requirement could be included within a revised operating guideline for fire safety plan review.

Operational Recommendation #8: That the contents of all O.F.S. operating guidelines be reviewed to ensure there is no overlap of reference to a "policy" and "guideline" in the same document to provide clarity of the intent.

6.8 O.F.S. Annual Reports

The O.F.M.E.M.'s "**Optimizing Public Fire Safety**" model recognizes the importance of ongoing monitoring, evaluation, and revisions to the fire protection services approved by Council. Many fire services utilize annual reports to council as a tool to provide a high degree of accountability and transparency on behalf of the fire chief in reporting to the community and council on the level of fire protection services provided. This regular reporting process is also an ideal opportunity to report on key performance indicators, update the fire related by-laws and provide further value in identifying changes or trends within the community.

The City's 2018 Annual Report captures key activities and statistics for each division within the O.F.S. The report highlights that in 2018, the O.F.S. launched "My Smoke Alarm Works," a campaign to raise public awareness about smoke alarms. The initiative consisted of key social media messaging shared by many community organizations and the media. Additional public education events were held within the community, with the assistance of community partners.

The report identifies that there were 15 major fire occurrences in 2018 requiring 15 or more firefighters to be dispatched, with reported damages in excess of $200,000. Additional highlights include an increase in emergency call volume over the last five years and the O.F.S. completed a total of 24,683 training hour's department wide.

The 2013 F.M.P. included a recommendation for the department management team to continue the practice of developing high quality, informative annual reports. In our view, the 2018 O.F.S. Annual Report reflects an example of current industry best practices.

6.9 Post-Traumatic Stress Disorder Prevention Plan

First responders including firefighters are at an increased risk to suffer from Post-Traumatic Stress Disorders (P.T.S.D.) due to the nature of their work. The Supporting Ontario's First Responders Act requires fire departments to establish a Post-Traumatic Stress Disorder Prevention Plan (P.T.S.D.) and provide the Ministry of Labour with information about their plans. Under the Supporting Ontario's First Responders Act, there is a presumption that a diagnosis of P.T.S.D. for certain workers is work related. Details relating to the Plan are to be shared within the workplace in an effort to prevent P.T.S.D.

As an employer of workers covered by the Supporting Ontario's First Responders Act, the City of Oshawa is required to have a Post-Traumatic Stress Disorder Prevention Plan. Our research indicates that the City of Oshawa has a P.T.S.D. Prevention Plan in place to ensure their workers have access to care. This plan is contained within **Policy 1-105**. It provides an overview of the risk factors, signs and symptoms of P.T.S.D., as well as O.F.S. P.T.S.D. prevention and response initiatives. The joint O.P.F.F.A. / O.F.S. Peer Support Team provides immediate and ongoing support to crews that have responded to traumatic events.

As an area of ongoing research and development, workplace wellness should be considered as an ongoing priority for the Fire Service. Behavioural health is a critical component of workplace wellness that requires funding and employer support. In an effort to enhance its level of care and support for its first responders, the O.F.S. along with several other fire departments within the Reginal Municipality of Durham, has partnered with Wounded Warrior Canada (W.W.C.) along with several other fire departments within the Region of Durham. The W.W.C. provide clinical support and a variety of mental health resources such as group-based trauma programs, animal assisted therapy, resiliency training and research to individuals and families affected by operational stress injuries.

This is a positive step forward and highlights that the O.F.S. is proactively striving to ensure that firefighters are provided with access to mental health care and treatment.

6.10 Records Management/Information Technology

The research and consultation conducted into preparing this F.M.P. indicates that the O.F.S. is currently in the process of researching several new software applications for use by the department. It is our understanding that a preferred software application has been identified for inventory management, fire prevention and training records management. Research is also underway into evaluating learning management systems for use in the department's training program. Software tools such as these are critical elements of effective and efficient administration functions. They are also directly related to a municipalities due diligence for maintaining accurate and current records for all activities within the department, and specifically training records for firefighters and fire safety inspection records.

This fire master planning process has identified existing gaps in the department's ability to collect and conduct comprehensive analysis of data. This includes the type of data presented within the C.R.A. and data such as training records to monitor and track all training within the department. A further example of the existing gaps is in the level of detail and analysis presented within the department's annual report.

The O.F.S. is currently limited in its ability by the technology it has, and/or reliance on other city departments to complete analysis (e.g. fire suppression G.I.S. Modelling). On a go forward basis, the department will needs to review the C.R.A. within 12 months from the day the C.R.A, is completed and as required by O. Reg. 378/18. The 2018 F.M.P. Report included the following recommendation **"Explore opportunities to obtain a license through Environics to develop comprehensive data collection and analysis for fire prevention statistics and public education"**[13]. In our view, this type of data would be very supportive of the findings of the C.R.A. and the ability of the O.F.S. to provide a more comprehensive analysis of fire-related risks at a more granular neighborhood level. It is recommended that in addition to moving forward with the purchasing of new software applications and the implementation of strategies to support mobile work stations for fire prevention inspectors that consideration be given to

[13] Oshawa Fire Services Fire Master Plan & Community Risk Assessment 2018 Report – Recommendations, page 92 5.

developing a dedicated full-time information technology positon dedicated to support the O.F.S.

Operational Recommendation #9: That consideration be given to developing a business case for a full-time dedicated information technology position dedicated to support the O.F.S., as presented within the proposed Fire Master Plan.

An important component of fire department administration is overseeing records management and reporting. **P.F.S.G. 04-60-12 Records Management** provides a comprehensive overview of an effective and efficient records management program including the appropriate use and protocol by division of the records management systems in place; record retention schedules; standards for record quality; protocols for record security and integrity of hard-copy and electronic records; and outline other applicable codes, standards or industry best practices that apply (e.g., Municipal Act, 2001, Municipal Freedom of Information and Protection of Privacy Act, 1990).

The retention practices of the O.F.S. are governed by the City's Retention **By-law 45-2002,** which outlines a records management retention schedule for all records within the care and control of the City of Oshawa. Departmental records are archived and filed within scheduled destruction and retention dates in compliance with the retention by-law.

Our review of the current O.F.S. operating guidelines and policies did not identify internal guiding documents for the management of fire service documents and records. Records management plays a role in every division of a fire department for a variety of reasons including, but not limited to, operations emergency response, firefighter training records, as well as measuring the effectiveness of fire prevention and public education programs.

Operational Recommendation #10: That priority be given to the confirmation and implementation of new software applications as presented within the proposed Fire Master Plan.

Operational Recommendation #11: That the O.F.S. develop a department policy consistent with the City's Retention By-law 45-2002 that describes the required records management practices for each division within the O.F.S.

6.11 Administration Division Summary

The analysis of the Administration Division indicates that the work load within this division has exceeded the current capacity of the staff assigned. The result is a shift towards more reactive leadership than pro-active. In part, this can be associated with new regulations requiring a higher degree of due diligence on behalf of the department's senior management team to plan for and sustain compliance. The workload within this division can also be directly linked to the increasing amount of non-union management workload and due diligence that is required in the administration and management of the Collective Agreement. As a result, the Administration Division has completed, or is in the implementation stage for 27 of the 31 recommendations from the 2013 F.M.P.. The following recommendations with respect to the Administration Division are presented for Council's consideration and approval:

Council Recommendations:

- **Council Recommendation #1**: That the following strategic priorities, as presented within the proposed Fire Master Plan, be adopted by Council in principle to guide all decision making related to the delivery of fire protection services within the City of Oshawa.

a) The City of Oshawa is committed to the annual review of a Community Risk Assessment to assess the fire safety risks within the community as the basis for developing clear goals and objectives for all fire protection services provided by the Oshawa Fire Services.

b) The Oshawa Fire Services will prioritize the optimization of the first two lines of defence, including public education and fire prevention, and the utilization of fire safety standards and fire code/building code enforcement as the foundation of providing a comprehensive fire protection program within the City of Oshawa.

c) The Oshawa Fire Services will specifically prioritize the delivery of fire and life safety programs in Group C- Residential Occupancies that include an enhanced Home Smoke Alarm/Carbon Monoxide Alarm Program.

d) The City of Oshawa will continue to prioritize strategies that support the sustainability of fire protection services that provide the most effective and efficient level of services resulting in the best value for the community.

- **Council Recommendation #2 (completed)**: That Council consider allocating sufficient funding within the City's 2020 operating budget to hire an Assistant

Deputy Fire Chief as referenced within the preliminary analysis of the fire master planning process.

Operational Recommendations:

- **Operational Recommendation #1**: That the job descriptions for all members of the O.F.S. including the senior management team, and all other members of the O.F.S. be reviewed and revised to clearly define the roles and responsibilities of all positions.
- **Operational Recommendation #2**: That an appointment by-law or a formal process to delegate authority to the Deputy Fire Chiefs in the event of the Fire Chief's absence, be developed and presented to Council for consideration and approval.
- **Operational Recommendation #3**: That consideration be given to a review of the current administrative support provided to the O.F.S. by the Strategic and Business Services Branch as discussed within the proposed Fire Master Plan.
- **Operational Recommendation #4**: That consideration be given to the creation of a new Administrative Support position within the O.F.S. as presented within the proposed Fire Master Plan.
- **Operational Recommendation #5**: That subject to Council's consideration and approval of the proposed Fire Master Plan that the Establishing and Regulating By-law 30-2001 be reviewed and updated as required.
- **Operational Recommendation #6**: That consideration be given to revising the current General Fees and Charges By-law 13-2003 to include additional fees for service as presented within the proposed Fire Master Plan.
- **Operational Recommendation #7**: That the O.F.S. develop a business plan and standardized agreement for the provision of emergency call taking and emergency dispatching (fire dispatching) as referenced within the proposed Fire Master Plan.
- **Operational Recommendation #8**: That the contents of all O.F.S. operating guidelines be reviewed to ensure there is no overlap of reference to a "policy" and "guideline" in the same document to provide clarity of the intent.
- **Operational Recommendation #9**: That consideration be given to developing a business case for a full-time dedicated information technology position dedicated to support the O.F.S., as presented within the proposed Fire Master Plan.

- **Operational Recommendation #10**: That priority be given to the confirmation and implementation of new software applications as presented within the proposed Fire Master Plan.
- **Operational Recommendation #11**: That the O.F.S. develop a department policy consistent with the City's Retention By-law 45-2002 that describes the required records management practices for each division within the O.F.S.

7.0 Fire Prevention and Public Education Division

The minimum legislative requirements for the delivery of fire protection services are outlined within the F.P.P.A., which state that a municipality should "**Establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention**"[14] and "**Provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances**."[15]

To further assist municipalities in understanding the definition of what the minimal acceptable fire prevention and public education programs are, the O.F.M.E.M. developed **P.F.S.G. 04-40-03** and **04-40-12 Selection of Appropriate Fire Prevention Programs**. Although these P.F.S.G.s are currently under review, they continue to provide valuable insight into identifying the minimal acceptable fire prevention and public education programs including:

- A simplified risk assessment
- A smoke alarm program
- The distribution of fire safety material
- Inspections upon complaint, or when requested to assist with code compliance

In our view, one of the reasons that the O.F.M.E.M. is currently conducting a review of all P.F.S.G.s is to update them to reflect changes to applicable legislation impacting the delivery of fire prevention and public education programs. Examples of such changes include revised smoke alarm and carbon monoxide alarm requirements and the new O. Reg. 378/18 requiring all municipalities to develop a C.R.A.

The analysis within this section has been informed by our knowledge of the current applicable legislation, including the new **Ontario Regulation 378/18: Community Risk Assessments,** the P.F.S.G.s developed by the O.F.M.E.M., and applicable N.F.P.A. standards.

[14] Fire Protection and Prevention Act, 1997 Part II, Section 2. (1) (a)

[15] Fire Protection and Prevention Act, 1997 Part II, Section 2. (1) (b)

Collectively, this information has been applied within this F.M.P. in defining the local **"needs and circumstances"**, as required by the F.P.P.A., for the delivery of fire prevention and public education programs within the City of Oshawa.

Integrating risk analysis into the fire master planning process, as outlined in **Ontario Regulation 378/18: Community Risk Assessments**, empowers a municipality with the opportunity to assess alternative community fire risk mitigation and reduction strategies. Examples of fire risk reduction strategies may include enhancing a fire inspection program within a specific building occupancy classification; developing a public education program for an identified at-risk demographic within the community, such as seniors; or introducing local requirements for residential sprinklers. These types of risk reduction and risk mitigation strategies recognize that there are **proactive alternatives to increasing fire suppression** capability within a community.

7.1 Fire Prevention and Public Education Industry Best Practices

The fire prevention and public education services provided by the Oshawa Fire Services should be guided by industry best practices and the most current legislative requirements. Primarily, these include the mandatory requirements of the F.P.P.A, N.F.P.A. 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations and the N.F.P.A. Fire and Life Safety Ecosystem.

7.1.1 N.F.P.A. 1730: Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition)

N.F.P.A. has recently updated the **Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations**. This standard establishes its criteria through six chapters:

1. Organization
2. Community Risk Assessment
3. Fire Prevention Inspection and Code Enforcement Activities in Existing Occupancies
4. Plan Review
5. Investigations

6. Public Education Programs

The focus of this standard is to ensure that a fire prevention division has a Community Risk Reduction Plan (C.R.R.P.) in place and that it is based on the local **"needs and circumstances"** established through a Community Risk Assessment (C.R.A.). A C.R.R.P. is then used to establish resources and programs that are designed to mitigate and/or reduce identified fire risk. For example, the N.F.P.A. 1730 standard identifies a minimum fire inspection frequency cycle which could be refined based on the local context. The supporting appendices of N.F.P.A. 1730 provide exercises to identify staffing resource needs, taking into account required tasks and time demands.

The analysis and methodology included within this F.M.P. integrates the intent of developing a C.R.R.P. as referenced within N.F.P.A. 1730. Where applicable, this F.M.P. will present risk reduction and risk mitigation strategies to optimize the use of the **"three lines of defence"** in response to the identified **"key findings"** and **"identified risk"** included in the C.R.A. to enhance the existing fire prevention and public education programs and services provided by the O.F.S. The focus of the N.F.P.A. 1730 Standard is consistent with the current industry trends to further emphasize fire prevention and public education services and programs through the application of the first four "E's" (education, enforcement, engineering and economic incentive) of community risk reduction and risk mitigation planning.

7.1.2 N.F.P.A. Fire and Life Safety Ecosystem

The **N.F.P.A. Fire and Life Safety Ecosystem** is a framework of eight elements that work in conjunction with one another with the collective goal of risk reduction. Together, they promote the prevention of fires and other hazard-related loss, injuries and fatalities. The eight components that comprise this framework include:

1. Government responsibility
2. Development and use of current codes
3. Referenced standards
4. Investment in safety
5. Skilled workforce
6. Code compliance
7. Preparedness and emergency response
8. Informed public

This ecosystem is premised on the notion that the cause of all life safety incidents can be traced back to the breakdown of one or more of these components. The Fire and Life Safety Ecosystem recognizes that fire prevention is multifaceted and there are various key components that need to work in tandem in order to cultivate an environment and culture of fire safety. This F.M.P. supports a multifaceted approach to fire prevention and, where applicable, will present strategies to enhance existing fire prevention and public education programs and services provided by the O.F.S.

7.2 Existing Fire Prevention and Public Education Staff Resources

Within the current organizational structure of the O.F.S. one of the Deputy Fire Chiefs is directly responsible for the oversight of all fire prevention and public education activities. This division includes a Chief Fire Prevention Officer (C.F.P.O.), two Fire Prevention Captains (F.P.C.), and eight Fire Prevention Inspectors (F.P.I.). The C.F.P.O. is directly responsible for all activities within this division including the administration and leadership of all staff assigned to this division.

7.2.1 Chief Fire Prevention Officer

The roles and responsibilities of the C.F.P.O. include overseeing the development, delivery and monitoring of the effectiveness of the department's current public education and fire prevention programs and services. This is a senior leadership position within the department, requiring a high degree of technical skills and experience related to the Ontario Building Code (O.B.C.), Ontario Fire Code (O.F.C.), and the F.P.P.A. Further examples of specific roles and responsibilities of this position include:

- Assigning work to all staff within the division including facilitating required training, scheduling and performance evaluation
- Developing fire and life safety strategies and implementing fire and life safety programs
- Developing and implementing fire inspection programs with the goal of seeking compliance with all legislative requirements
- Assigning personnel to conduct and prepare fire inspection and fire investigation reports, and directly responsible for making recommendations for prosecution as may be required

- Ensures accurate record keeping and files are maintained and files with appropriate agencies as may be required
- Represents the O.F.S. on professional associations including Accessibility Committee, Inclusion & Diversity Committee and Canada Day Committee, and the Durham Region Fire Prevention Officers Association

7.2.2 Fire Prevention Captains

The current organizational structure of this division includes two fire prevention captains. These positions report directly to the C.F.P.O. and have direct responsibility for specific public education and fire inspection activities. Each prevention captain provides direct supervision and coordination of all activities, assigning work to a platoon of four fire inspectors.

The roles and responsibilities of this position as found within the 2013 Fire Master Plan include:

- Supervision/mentoring of Fire Prevention Inspectors
- Development and implementation of training programs for Fire Prevention Inspectors
- Coordination and approval of vacation/overtime in lieu/holiday lieu
- New construction inspections, site plan agreements, plans review
- Back up inspections for Repair Garages/Salvage Yard business licenses
- Assist F.P.I.'s where necessary
- Fire Code Enforcement (O.F.C. charges)
- Fire Safety Plan Approvals
- Community Partnership Awards
- Junior Firefighter Program
- Fire Prevention Week

As referenced previously within this F.M.P. there will be a need to review all existing job descriptions subject to Council's consideration and approval of this F.M.P.

7.2.3 Fire Prevention Inspectors

At present, there are seven fire prevention inspectors and one fire prevention officer within the fire prevention and public education division of the O.F.S. According to the most recent job description, these individuals are responsible for performing the following duties:

- Conduct comprehensive inspections of new and existing buildings for compliance with the Ontario Fire Code, the Ontario Building Code and applicable municipal by-laws, review plans, research and compile written reports, and maintain a permanent record of each inspection
- Prepare and deliver public education and public relations programs, promoting fire safety and fire prevention via lectures, events and demonstrations
- Prepare documents relative to the enforcement of the F.P.P.A. and municipal by-laws, give testimony and present evidence in court to substantiate infractions or violations
- Act as an Assistant to the Fire Marshal, under the provisions of the F.P.P.A.
- Investigate and determine cause of fires
- Keep detailed notes of investigations
- Prepare and submit daily activity reports and related information to the Chief Fire Prevention Officer
- Develop and deliver fire safety training to internal and external customers
- Perform other duties as assigned

7.2.4 Staff Roles and Responsibilities

Research and consultation indicate that the turnover and addition of new staff to this division has had an impact on the overall level of experience within the division. For example, the C.F.P.O. is still new to his new roles and responsibilities and there are other staff at a more junior level in the range of experience.

The current roles and responsibilities of staff within this division balance the existing training and experience of the staff with the primary functions they have been assigned. For example, one of the F.P.I. has primary responsibility for conducting all new construction and plans review. Whereas there are three F.P.I. who share responsibility for overseeing all vulnerable occupancies within the City.

There are also two F.P.I. whose primary responsibilities are delivering the department's public education programs, but who also have fire inspection responsibilities for specific occupancy types such as schools, daycares and other occupancies.

Our review indicates that this current distribution of roles and responsibilities appears to be working well for the division. The findings of the C.R.A., including the identification of fire-related risks and the implementation of proposed risk mitigation and risk reduction strategies included within this F.M.P., may require further review of the current assignment of roles and responsibilities within this division.

7.3 Applicable Training and Qualifications

In 2013, the O.F.M.E.M. announced that the Ontario fire service would be adopting the **N.F.P.A. Pro-Qual Standards** to replace the previous Ontario Fire Services Standards (O.F.S.S.). The previous O.F.S.S. had been developed by the Ontario Fire Chiefs Association (O.A.F.C.) in partnership with the O.F.M.E.M. to provide guidance to the training and qualifications of fire department staff.

To assist municipalities in this transition a "**Grandfathering Policy**" was developed by the O.F.M.E.M. to facilitate the process of implementing the N.F.P.A. Pro-Qual Standards. The O.F.M.E.M. grandfathering policy stated that "in order to exempt anyone from having to start over in any program and in order to give recognition for training and education already completed and for experience already gained".[16] The N.F.P.A. Pro-Qual Standards are now recognized as the industry best practices for training and qualifications related to the delivery of public education and fire prevention programs and services within the Province of Ontario.

7.3.1 Applicable N.F.P.A. Pro-Qual Standards

The applicable N.F.P.A. Pro-Qual Standards as they pertain to roles and responsibilities of fire prevention and public education staff are outlined in **Table 8**. These standards reflect current industry best practices in Ontario.

[16] O.F.M.E.M. 2013 Grandfathering Policy
http://www.mcscs.jus.gov.on.ca/english/FireMarshal/FireServiceResources/Communiques/OFM_Com_2014-04at.html

Table 9: Applicable N.F.P.A. Pro-Qual Standards

N.F.P.A. Standard	Qualification	Description
N.F.P.A. 1031 – Standard for Professional Qualifications for Fire Inspector and Plans Examiner	Fire Inspector I	An individual at the first level of progression who has met the job performance requirements specified in this standard for Level I. The Fire Inspector I conducts basic fire inspections applies codes and standards.
N.F.P.A. 1031 – Standard for Professional Qualifications for Fire Inspector and Plans Examiner	Fire Inspector II	An individual at the second or intermediate level of progression who has met the job performance requirements specified in this standard for Level II. The Fire Inspector II conducts most types of inspections and interprets applicable codes and standards.
N.F.P.A. 1031 – Standard for Professional Qualifications for Fire Inspector and Plans Examiner	Fire Inspector III	An individual at the third and most advanced level of progression who has met the job performance requirements specified in this standard for Level III. The Fire Inspector III performs all types of fire inspections, plans review duties, and resolves complex code-related issues.
N.F.P.A. 1033 – Standard for Professional Qualifications for Fire Investigator	Fire Investigator	An individual who has demonstrated the skills and knowledge necessary to conduct, coordinate and complete fire investigations.
N.F.P.A. 1035 – Standard for Professional Qualifications for Fire and Life Safety Educator,	Fire and Life Safety Educator I	The individual who has demonstrated the ability to coordinate and deliver existing

N.F.P.A. Standard	Qualification	Description
Public Information Officer, and Juvenile Firesetter Intervention Specialist		educational programs and information.
N.F.P.A. 1035 – Standard for Professional Qualifications for Fire and Life Safety Educator, Public Information Officer, and Juvenile Firesetter Intervention Specialist	Fire and Life Safety Educator II	The individual who has demonstrated the ability to prepare educational programs and information to meet identified needs.
N.F.P.A. 1035 – Standard for Professional Qualifications for Fire and Life Safety Educator, Public Information Officer, and Juvenile Firesetter Intervention Specialist	Fire and Life Safety Educator III	The individual who has demonstrated the ability to create, administer, and evaluate educational programs and information.

At a minimum, all staff resources conducting fire inspections should have the skills and competencies included within the N.F.P.A. 1031 – Fire Inspector Level I. It is recommended that staff performing fire inspections involving more complex issues and requiring interpretation of various legislation and O.F.C. and O.B.C. requirements be qualified to N.F.P.A. 1031- Fire Inspector Level II. In our experience, successful completion of courses in addition to N.F.P.A. 1031 Level I and II requirements including O.F.C. Parts 2 & 6, Part 4, Parts 3 & 5, Courtroom Procedures, and Effective Inspections of Commercial Cooking Equipment are necessary to ensure fire prevention and public education division staff are trained to effectively perform their role and responsibilities. Staff responsible for conducting fire investigations should have the skills and competencies included in N.F.P.A. 1033- Standard for Professional Qualifications for Fire Investigator.

Fire investigations are discussed in greater detail in **Section 7.6.6** of this F.M.P. At a minimum, all staff resources responsible for developing and delivering public education programs should have the skills and competencies included within the N.F.P.A. 1035 – Fire and Life Safety Educator I.

Only personnel designated as Chief Fire Officials (C.F.O.) have the authority to approve fire alternative solutions, compliance alternatives, compliance equivalency, fire safety plans, life safety studies and fire drill scenarios. Fire chiefs are designated as C.F.O.s by virtue of their position. It is industry best practice that any delegation of such authority be done in writing. Recent legislated changes require all Chief Fire Officials approving fire safety plans for buildings containing care occupancies, care and treatment occupancies or retirement homes, to successfully complete mandatory training as approved by the Fire Marshal. At this time, the only training that has been approved by the O.F.M.E.M. is offered through Public Services Health & Safety Association (P.S.H.S.A.).

7.4 Existing Fire Prevention Division Staff Training and Qualifications

As part of the data collection process for this F.M.P, documentation provided by the O.F.S. was utilized to determine the level of training of fire prevention and education division resources. **Table 9** below summarizes the current training of the staff resources available to deliver fire prevention and public education programs and activities.

Through the interview process for this F.M.P., it was noted that due to a number of retirements within the fire prevention division, there are a number of newer personnel within this division who require further training, specifically in the area of public education and fire investigations. This F.M.P. identifies a number of areas where further training of fire prevention staff will be required to optimize the efficiency and effectiveness of the existing staff resources. This will require an investment of time for the identified staff to attend training sessions to attain further qualifications, and further financial investment on behalf of the municipality for staff attendance and course fees.

All fire prevention personnel have been trained to N.F.P.A. 1031, Standard for Professional Qualifications for Fire Inspector and Plan Examiner, Level I and there are nine staff who have been trained to N.F.P.A. 1031, Level II.

There are six staff trained to N.F.P.A. 1035, Level I and five trained to N.F.P.A. 1035, Level I and II. Through the grandfathering process, some individuals were granted equivalency with the standards based on knowledge (i.e. courses) or experience (i.e. five or more years' experience in a related role).

Table 10: Existing Fire Prevention Division Staff Training and Qualifications

Position	N.F.P.A. 1031 Level I	N.F.P.A. 1031 Level II	N.F.P.A. 1031 Level III	N.F.P.A. 1035 Level I	N.F.P.A. 1035 Level II	N.F.P.A. 1035 Level III	N.F.P.A. 1033	Commercial Cooking	Courtroom Procedures	B.C.I.N. Legal Course	B.C.I.N. Fire Protection Course
Chief Fire Prevention Officer	x	x						x	x	x	x
Fire Prevention Captain	x	x		x	x			x	x	x	x
Fire Prevention Captain	x	x						x	x	x	x
Fire Prevention Officer	x	x		x	x			x	x	x	x
Fire Prevention Inspector	x	x		x	x			x	x	x	x
Fire Prevention Inspector	x	x						x	x	x	x
Fire Prevention Inspector	x	x		x	x		x	x		x	
Fire Prevention Inspector	x									x	
Fire Prevention Inspector	x	x		x	x		x	x	x	x	
Fire Prevention Inspector	x	x		x							
Fire Prevention Inspector	x			x	x						

Source: Oshawa Fire Services

With regards to the approval of fire safety plans, one staff member has received training through the Public Services Health & Safety Association (P.S.H.S.A.) and two others are currently enrolled.

This training is available through an e-learning course available by contacting the P.S.H.S.A. There is value in ensuring multiple individuals attain this training in order to facilitate vacation, sick time and succession planning.

Operational Recommendation #12: That the O.F.S. prioritize the training of all staff designated as Chief Fire Officials through the Public Services Health & Safety Association.

This analysis highlights the current level of training and qualifications of those staff that are directly responsible for the day to day delivery of these services and programs. Based on our review of the applicable N.F.P.A. Pro-Qual Standards, and our knowledge of current industry best practices, **Table 10** outlines the recommended training and qualifications objectives for those staff assigned to develop and deliver fire prevention and public education programs and services. These recommendations recognize that in some instances specific training and qualifications are not currently readily available such as the N.F.P.A. 1031 – Fire Inspector Level III. When training for these higher standards becomes available, it should be made accessible to department senior staff such as the Chief Fire Prevention Officer.

Table 11: Training and Qualification Objectives for Fire Prevention and Education Division Staff

Divisional Task	Proposed Professional Qualifications
Fire Inspections	N.F.P.A. 1031 – Fire Inspector Level II B.C.I.N.- General Legal and Fire Protection
Plan Examination	N.F.P.A. 1031 – Plan Examiner Level II
Fire Safety Plan Approval	As approved by the O.F.M.E.M. (P.S.H.S.A. course)
Fire Investigations	N.F.P.A. 1033 – Investigator
Public Education Program Design and Evaluation	N.F.P.A. 1035 - Fire and Life Safety Educator Level II
Public Education Program Implementation	N.F.P.A. 1035 - Fire and Life Safety Educator Level II
Media Interviews and Advisories	N.F.P.A. 1035 - Public Information Officer

Source: Oshawa Fire Services

7.5 Fire Prevention Policy

In our experience, a fire prevention policy is a valuable tool, reflective of current industry best practices and providing clear direction and clarification to department personnel. The policy communicates the council approved service expectations for the prevention and public education division. Policies, particularly in the area of fire prevention and public education activities and programs are necessary to define performance goals and objectives; inform trend analysis; and inform ongoing monitoring of these services to the public.

The components of a **fire prevention policy** are provided in **P.F.S.G. 04-45-12 Fire Prevention Policy** which presents a framework for developing a fire prevention policy. An example of the purpose of a fire prevention policy includes:

- To establish policies and procedures for fire department personnel for fire prevention, public education programs and activities as a primary means of protecting lives and property from fire
- To maintain compliance with the minimum fire prevention and public education activities as required by the F.P.P.A, 1997

A fire prevention policy should also describe the following fire prevention and fire safety education programs and services such as:

- Fire inspection activities
- Fire code enforcement
- Fire and life safety education
- Fire investigation and cause determination
- Fire loss statistics
- Fire department operational guidelines identifying how, when and where activities will be conducted

7.5.1 O.F.S. Fire Prevention Policy

The O.F.S. fire prevention policy is contained within Fire Prevention (F.P.) Operating Guideline #01, last revised September 2014. This policy provides a short description of the fire prevention and public education services provided by the O.F.S. which include the following:

- Plans examination, and building inspections of new and renovated construction in conformance with **F.P. Operating Guideline #02**
- Development and delivery of fire safety public education programs, participation in public education community events, delivery of fire safety presentations, and fostering of community partnerships and media relations to support fire safety messaging in conformance with **F.P. Operating Guideline #04**
- Inspections of existing buildings to ensure compliance with the Ontario Fire Code and applicable by-laws as per **F.P. Operating Guideline #05**
- Investigations of fires in conformance with **Operating Guideline #10**
- Enforcement of Ontario Fire Code and by-law requirements through prosecution efforts in conformance with **Operating Guideline #12**
- Support of Oshawa Fire Services Divisions through fire prevention related presentations, the provision of fire safety technical knowledge, and other duties as assigned

The analysis and recommendations contained within this F.M.P. will require the department to review the department's current fire prevention policy. This should include its transition from a department operating guideline to a department policy document. Subject to Council's consideration and approval of this F.M.P., this review should consider including the proposed fire safety inspection and public education performance benchmarks in an updated fire prevention policy. Once updated, consideration should also be given to including the updated fire prevention policy in the proposed updated establishing and regulating by-law as an appendix.

Operational Recommendation #13: That subject to consideration and approval of the proposed Fire Master Plan, the updated fire prevention policy be included within the establishing and regulating by-law as an appendix.

7.6 Existing Fire Inspection and Enforcement

At a minimum, a fire inspection program must comply with the requirements of the following regulations and directive:

- **Ontario Regulation 365/13:** Mandatory Assessment of Complaints and Requests for Approval
- **Ontario Regulation 150/13 -** Enhancing Fire Safety in Occupancies Housing Vulnerable Ontarians
- **Ontario Regulation 364/13 –** Mandatory Inspection – Fire Drill in Vulnerable Occupancy
- **Fire Marshal's Directive 2014-03:** Inspections of All Buildings

A summary of the above mentioned regulations and directives are found in **Section 7.6.3**. A fire inspection program is a core element of the first two **"lines of defence".** The current fire inspection program of the O.F.S. consists of fire inspections based upon receipt of a request or a complaint and a proactive routine inspection cycle based on historical fire risk.

7.6.1 Request or Complaint Inspections

In compliance with **Ontario Regulation 365/13: Mandatory Assessment of Complaints and Requests for Approval**, upon receipt of a complaint or request for assistance to comply with the Fire Code, the O.F.S. will perform a fire safety inspection. This regulation requires that fire safety assessments, and inspections, if necessary, be undertaken for:

1. Every building or property for which a fire safety complaint is received
2. Every building or property for which a request for assistance to comply with the Fire Code is received and the involvement of the Chief Fire Official is required

Our review indicates that **O.G. #05 – Inspection Operating Guideline** describes the O.F.S. approach and the procedures to follow when conducting all fire safety inspections, while **O.G. #17 – Fire Prevention Complaints** describes the method for documenting and prioritizing fire safety complaints. Fire prevention staff prioritize complaints based on their severity and are to report the status of the complaint to their fire prevention captain within five working days of receipt.

By-law 13-2003 authorizes fees and charges for the following inspection types:

1. Fire inspection as part of a real estate transaction for a single-family dwelling
2. Requested inspection
3. Residential occupancies (upon request) includes apartment complex / condominium, hotel/motel etc.
4. Re-inspections where there is no compliance and all subsequent inspections
5. Miscellaneous inspections not otherwise specified

As the City continues to grow the O.F.S. continues to see an increasing amount of complaints on an annual basis. In 2019, there were 459 complaints received by the department requiring an investigation/inspection by the O.F.S. Depending on the nature and validity of the complaint, the workload associated with this requirement can be significant. In part, the broader use of social media and news articles is associated with the increasing number of complaints as the public becomes more aware of fire safety. Research indicates that responding to requests and complaints currently consumes approximately 35% of the total existing workload capacity of this division. The increasing volume of complaints is challenging the department's ability to respond within the current five working day performance benchmark.

7.6.2 Routine Fire Inspections

In comparison to responding to a request or complaint, routine fire inspections are proactive inspections conducted by the department in response to identified fire risks. Historically routine fire inspections have been guided by previous risk profiles and analysis of fire related risks. Within this F.M.P. the focus of routine fire inspections will be informed by the identified **"key findings"** and **"identified risk"** defined by the Community Risk Assessment.

In the past, O.F.S. has maintained a list of occupancy types which it routinely inspects, including those where a mandatory annual inspection is required by **Ontario Regulation 150/13 - Enhancing Fire Safety in Occupancies Housing Vulnerable Ontarians**. Having a routine inspection cycle in addition to completing request or complaint fire inspections is consistent with the City's legislative requirements and current industry best practices. **Table 11** illustrates a summary of the O.F.S. current fire inspection program.

This summary indicates that the current fire inspection program focuses primarily on responding to complaints or requests as required by legislation. As mentioned in **Section 7.6.1**, completing complaint and requests inspections currently accounts for 35% of the total workload within the division. The second largest percentage of the division's current workload is assigned to plans review and new construction inspections, representing 15% of the total workload. Residential rental housing consumes 10% of the division's current workload. A large portion of the division's current inspection program is also related to the City's current business licence process requiring the O.F.S. to be involved with all new business licence requests, including any change in ownership, or on a two-year inspection cycle. Proactive, or routine fire inspections currently account for approximately 1% of this division's total workload. The full summary of the historical fire inspection / enforcement workload is presented and further discussed in **Section 7.8** below.

Table 12: Existing Routine Fire Inspection Cycle

Group	Occupancy Type	Current Inspection Frequency
A	**Assembly**	Business licensing - all new businesses, ownership changes, or every 2 years All others - complaint or request
B	**Care/Detention**	Vulnerable Occupancies – annually All others - complaint or request
C	**Residential**	
	Low/rise multi-family	Complaint or request
	High/rise multi-family	Complaint or request
	Two unit residential	Complaint or request
	Seniors residential	Compliant or request
	Boarding, lodging, rooming	Annually
	Group homes	Complaint or request
	Hotels/motels	Complaint or request
	College/university housing	Complain or request

Group	Occupancy Type	Current Inspection Frequency
	Student rental housing	2 years, or ownership change
D	**Business**	
	High/rise office	Complaint or request
	Low/rise office	Complaint or request
	Business licence	2 years, or ownership change
E	**Mercantile**	
	Shopping centres	2 years, or ownership change
	Shops/stores	Complaint or request
F	**Industrial**	
	F1-High Hazard	Complaint or request
	F2-Medium Hazard	Complaint or request
	F3-Low Hazard	Complaint or request

Source: Oshawa Fire Services

7.6.3 Increased Regulation

Since 2013, there have been a number of stand-alone regulations made under the Fire Protection and Prevention Act which directly relate to fire safety inspections. In addition, the Fire Marshal issued Directive 2014-003, establishing a standard for fire departments to follow when performing fire safety assessments and inspections upon request or complaint. A summary of these regulations and directive follows.

7.6.3.1 Ontario Regulation 150/13 Enhancing Fire Safety in Occupancies Housing Vulnerable Ontarians

Ontario Regulation 150/13 - Enhancing Fire Safety in Occupancies Housing Vulnerable Ontarians was filed on May 9, 2013. This regulation introduced amendments to the O.F.C. that came into force on January 1, 2014. The O.F.M.E.M. led the development of this new regulation in consultation with a Technical Advisory Committee of industry experts. This regulation is intended to enhance fire safety in occupancies that house vulnerable occupants. The legislation applies to care, care and treatment and retirement homes that are regulated under the **Retirement Homes Act.**

7.6.3.2 Ontario Regulation 364/13 – Mandatory Inspection – Fire Drill in Vulnerable Occupancy

Ontario Regulation 364/13 – Mandatory Inspection – Fire Drill In Vulnerable Occupancy also requires that a fire inspector observe a fire drill scenario representing the facility's lowest staffing complement (as approved by the Chief Fire Official), conduct a fire safety inspection (utilizing the Annual Inspection Checklist which forms part of **O.F.M.E.M. Directive 2014-002: Vulnerable Occupancies – Fire Drill Scenarios, Fire Drill Observations, Fire Safety Inspections,** as a minimum level of inspection), and then update the O.F.M.E.M.'s Vulnerable Occupancy Registry, as appropriate.

7.6.3.3 Ontario Regulation 365/13- Mandatory Assessment of Complaints and Requests for Approval

Ontario Regulation 365/13- Mandatory Assessment of Complaints and Requests for Approval requires the Chief Fire Official to assess a complaint about the fire safety of a building to determine if conducting a fire safety inspection of all or part in a building is warranted.

The regulation further requires Chief Fire Officials to determine whether or not a fire safety inspection is required when a request is made for approval under the fire code. As with complaints, the Chief Fire Official has been empowered to assess requests for approval to determine if a fire safety inspection is required.

Through consultation with the O.F.M.E.M. it is our understanding that the intent of this regulation is not for the Chief Fire Chief to cause a fire safety inspection to be conducted as the result of every complaint or request for approval received, but rather to assess each complaint and request to determine if an inspection is necessary.

7.6.3.4 Fire Marshal's Directive: 2014-003

Fire Marshal's Directive: 2014-003 provides direction to all Assistants to the Fire Marshal to follow with respect to performing request or complaint inspections and was intended to provide a uniform standard for all fire departments to follow when conducting fire safety inspections and assessments. The directive references **P.F.S.G. 40D-03 Inspections upon Request or Complaint** and **O.F.M. T.G.-01-2012: Fire Safety Inspections and Enforcement**.

These regulations and directives have added to the workload of municipal fire department prevention divisions. As noted in the C.R.A., the City of Oshawa has 27 registered Vulnerable Occupancies, each requiring the O.F.S. to perform fire safety inspections and witness a fire drill on an annual basis. Additional training is required for those individuals responsible for approving the fire drill scenarios and fire safety plans for these facilities. Research indicates that the mandatory inspection and fire drills for the City's 27 registered Vulnerable Occupancies currently accounts for approximately 2% of the division's total workload.

7.6.4 Fire Safety Audits

Policy #1-41 – In-Service Inspections of Multiple Dwelling Units and High-Rise, describes a policy for the collection of data during in-service inspections conducted by on duty firefighters of multiple dwelling units and high-rises. This policy was last revised in 2008.

The utilization of on-duty full-time firefighters is becoming an increasingly utilized strategy in the province to optimize the utilization of available staff resources for the delivery of fire prevention and public education programs. One approach to developing such a staff resource strategy being implemented by other municipalities within the province is to develop a recruit training program whereby new firefighter recruits are provided with training to have the appropriate skills and competencies to provide fire prevention and public education services in addition to the required firefighter training. This includes training new recruits to the N.F.P.A. 1031 – Fire inspector I and N.F.P.A. 1035 – Fire and Life Safety Educator I. The current O.F.S. recruit training strategy does not train new firefighter recruits to N.F.P.A. 1031 or 1035 unless they have been hired as a fire inspector. As indicated in previous sections of this F.M.P. there are opportunities for the O.F.S. to further optimize the efficiency and effectiveness of current staff resourcing including on duty firefighters. This will require an investment of time for the identified staff to attend training sessions to attain further qualifications, and further financial investment on behalf of the municipality for staff attendance and course fees.

There is also an opportunity for the O.F.S. to consider revising **Policy #1-41** to include in-service fire safety inspections for specific occupancy types prioritized by the risk outcomes of the C.R.A. in addition to multiple dwelling units and high-rises.

7.6.5 Fire Safety Enforcement

The **O.F.M.E.M. T.G. 01-2012 Fire Safety Inspections and Enforcement** outlines recommended fire safety inspection and enforcement practices for fire departments in Ontario and provides municipalities with strategies, particularly related to enforcement of the Ontario Fire Code in situations where achieving compliance has or may be more difficult to achieve. **O.F.M.E.M. T.G. 01-2012 Fire Safety Inspections and Enforcement** is intended to assist municipalities in efficiently and effectively meeting fire safety and enforcement responsibilities. Historically, enforcement was not commonly used by municipalities working with property owners to achieve compliance with the Ontario Fire Code. This trend is changing across the province with the support of the O.F.M.E.M., in part through the introduction of this O.F.M.E.M. Technical Guideline.

Dillon's review of this guideline indicates that it supports the direction of the first two lines of defence as a means to optimize the level of fire protection services within a community. In our experience, there is substantial value to utilizing a variety of techniques to assist a property owner achieve compliance with the O.F.C. Engaging and educating the public about its responsibility to comply with the O.F.C. is often enough to bring about compliance, however, there are instances where enforcement may be necessary.

Through the interview process for this F.M.P. we learned the O.F.S. utilizes Fire Safety Orders and Summons to Court under Part III of the Provincial Offences Act for matters of non-compliance with the Ontario Fire Code, in keeping with O.F.M.E.M. T.G. 01-2012. City legal staff provide support to process charges against property owners found in contravention of the O.F.C. as the result of a fire investigation. The City has increased enforcement options recently, with some success, although it should be noted that enforcement through the court system can be time consuming for a fire department. In our view, there would be value in tracking benchmarks associated with enforcement activity within the City. Examples of benchmarks include:

- Fire department personnel time spent enforcing the Ontario Fire Code, specifically time spent preparing for court, attending court, document preparation, issuing certificates of offence, preparing fire safety inspection orders
- Legal and City staff time spent enforcing the Ontario Fire Code
- Number of convictions vs. charges brought before the court

- Amount of penalty awarded on conviction
- Jail time imposed

Some jurisdictions choose to publish details relating to enforcement by the fire service, when appropriate and in accordance with the communications policy, in an effort to educate the public with the aim of changing human behaviour to reduce fire risk.

Another enforcement option made available to fire department under the Provincial Offences Act is the use of Certificate of Offence, commonly known as a ticket or a Part I. **Ontario Regulation 52/15: Proceedings commenced by a Certificate of Offence** was filed on March 11, 2015, expanding the number of ticketable offences under the Ontario Fire Code. In our experience, the use of tickets by fire departments has received mixed reviews across the province. In our view, there is value in discussing this option with the City's legal department, to determine if, under the right circumstances, this enforcement tool may be appropriate. The training involved to prepare a Part I ticket is minimal and is available through by contacting the O.F.M.E.M. Research indicates that a large portion of the divisions current administrative functions estimated at approximately 15% of the division's current workload is directly related to fire safety enforcement including the preparation of fire inspection reports, fire safety orders and enforcement records. As mentioned earlier in this section, tracking of specific benchmarks would assist the O.F.S. in evaluating the effectiveness of its fire inspection and enforcement practices.

7.6.6 Fire Investigations and Cause Determination

Investigating the origin and cause of a fire is the legislated responsibility of a municipal fire service. **N.F.P.A. 1033 Standard for Professional Qualifications for Fire Investigators** sets outs the required skills and knowledge to competently conduct fire scene investigations. Where fires meet specific criteria, the local fire department can request assistance from the O.F.M.E.M. to conduct these investigations. The criteria and process for this request are contained in **Fire Marshal's Directive 2019-001**, which was updated in May 2019.

The review completed for this F.M.P. indicates that the O.F.S. has several O.G.'s, policies and procedures describing the department's activities with regards to fire investigations.

These include:

- **Policy #1-32** – Fire Prevention Notification/Scene Security
- **Fire Prevention O.G. #11** – On-call Investigation Schedule
- **Procedure #2-30** – Vehicle Fire Investigations
- **Procedure #2-09** – Arson Investigations if Cause Cannot be Determined or if Arson Suspected

Policy#1-32 establishes a policy for requesting fire prevention personnel to respond to fire investigations. Our review indicates that this policy reflects the criteria for notification of the O.F.M.E.M. as set out in Fire Marshal's Directive 2019-001. The data provided by O.F.S. with respect to fire prevention division personnel training and qualifications, indicates two fire inspectors have been trained to **N.F.P.A. 1033 Standard for Professional Qualifications for Fire Investigators**. Additional training may be necessary to ensure all personnel included in the on-call rotation set out in Fire Prevention O.G. #11- On-call Investigation Schedule, are qualified to perform investigation responsibilities and there are sufficient staffing levels to maintain this level of service. Research indicates that fire investigations and origin and cause determination currently account for approximately 3% of the division's total workload.

The findings of fire investigations can help a fire department develop public education and fire prevention initiatives tailored to the fire incidents experienced locally. For example, should it be discovered through the investigation process that fires in multi-unit dwellings are spreading beyond the room unit of origin within a jurisdiction, reviewing the department's fire safety inspection protocol for multi-unit residential occupancies specifically relating to fire separations, or increasing public education messaging around the importance of keeping fire doors closed at all times, may be warranted.

7.6.7 Fire Safety Plans

Fire safety plans are required for select occupancy types identified within the O.F.C. These occupancies include Group A – Assembly occupancies, and Group B – Care or Detention occupancies. All remaining major occupancy groups (e.g., Group C – Residential, Group F – Industrial, etc.) also require fire safety plans depending on their occupancy load or other building-related features such as storeys below grade.

The O.F.C. also details the content requirements of a fire safety plan. These requirements include emergency procedures in the case of a fire such as use of the fire alarm, notifying the fire department, and instruction and evacuation of occupants. Fire safety plans must also designate supervisory staff, and details relating to fire drills, control of fire hazards, and maintenance of building facilities. Fire Safety Plans provide an avenue for the training of building staff in the case of a fire incident; for example, the role of care providers at a long-term care facility in an evacuation procedure.

Recent legislated changes require all Chief Fire Officials approving fire safety plans for buildings containing care occupancies, care and treatment occupancies or retirement homes, to successfully complete mandatory training as approved by the Fire Marshal[17]. At this time, the only training that has been approved by the O.F.M.E.M. is offered through Public Services Health & Safety Association (P.S.H.S.A.).

Within O.F.S., **F.P. Operating Guideline #18 – Fire Safety Plan Review and Approval** sets out the process whereby all reviews and approvals of fire safety plans for new and existing occupancies within the City of Oshawa are conducted. This includes procedures for the inspection, submission, review, rejection, approval and enforcement of fire safety plans.

7.6.8 Building Pre-Incident Planning

The process of pre-incident planning is intended to provide a proactive awareness within fire departments about key building features, possible hazards, and other pertinent characteristics about an existing occupancy. Pre-fire planning is typically conducted by on-duty fire suppression staff with information provided from a variety of sources including existing information from the City, information gathered from the building owner, and site visits. The value of a building pre-fire planning is to provide site specific hazards and information to fire suppression crews in advance of responding to an emergency incident.

In our view, priority should be given to the pre-planning of occupancies identified by the **"key findings"** and **"identified risk"** defined by the Community Risk Assessment.

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[17] Source: "Mandatory Training", Ministry of the Solicitor General website, last updated: November 18th, 2016, https://www.mcscs.jus.gov.on.ca/english/OfficeFireMarshal/CareOccupanciesCareandTreatmentOccupanciesandRetirementHomes/QuestionandAnswers/MandatoryTraining.html

These provide valuable insight into the fire related risks within the community, and specifically, the types of building occupancies that should be prioritized for pre-incident planning.

Pre-fire planning activities at the O.F.S are guided by **O.G. 2-52 – Building Pre-Incident Planning** which provides for the accurate collection and recording of information for the preparation of pre-incident plans to facilitate building familiarization. The O.F.S. has developed several operating guidelines for responding to incidents at specific sites or buildings due to their unique layout, location or operations that take place within them. There are operating guidelines for the following facilities:

- **O.G. 2-39 – White Feather Farms**
- **O.G. 2-35 – Raglan Welding**
- **O.G. 2-02 – General Motors**
- **O.G. 2-05 – Oshawa Centre**
- **O.G. 2-06 – Lakeridge Health Corporation (Oshawa)**
- **O.G. 2-07 – Airport Response**

O.G. 2.02- General Motors will likely require revision due to recent to plant closure, with consideration of access for emergency vehicles, key holder information, etc.

7.6.9 Plans Review

Approval of plans for new construction or site alternations from the perspective of fire protection is a critical component of fire prevention. The degree of plans review performed by a fire prevention division varies between jurisdictions. Building plans can be reviewed for sprinkler, fire alarm and detection, and suppression systems; and site plan and subdivision approval for items affecting fire services, such as fire department access and water supply. Building plans review involves the evaluation of design plans before construction begins and can be related to actual construction or to a new manufacturing process. Plans review includes evaluating architectural, structural, mechanical, electrical, and/or fire protection drawings to ensure compliance with a variety of codes and standards, including the Ontario Building Code.

Determining the level of plans review performed by fire prevention divisions is a decision that requires discussion and collaboration between the fire, building and legal departments. The plans review process within a municipality is intended to ensure proper construction and appropriate built in fire protection systems, which are vital to

both building occupant and first responder safety. The current building plans review process of the O.F.S. involves the review of all life safety systems, emergency exits, signage, lighting and more. Fire prevention staff perform Building Code inspections as well as Fire Code inspections and are documented as building inspectors for the items they inspect, in keeping with best practices and legislative requirements. The current plans review model has contributed to a positive working relationship between the O.F.S. and building department and has provided fire prevention personnel with more intimate knowledge of new and existing buildings which can be shared with suppression staff.

Fire department personnel who are appointed as building inspectors for the purpose of conducting O.B.C. plan reviews or inspections involving components of fire suppression and detection systems, are required to complete O.B.C. General Legal and Fire Protection examinations and obtain a Building Code Identification Number (B.C.I.N.). While this training is not required for all fire safety inspections, it does provide the same immunity from liability afforded to building inspectors. It was confirmed through the data collection process that there is one fire prevention inspector dedicated to the building plans review process and this individual has completed O.B.C. General Legal and Fire Protection courses. In our view, there would be value in ensuring at least one other individual within the fire prevention and public education division obtains training to complete building plans review to facilitate succession planning, vacation and sick time. In our experience, providing an opportunity to shadow the work of the existing resource performing this function within the O.F.S. would aid the learning process.

The City of Oshawa has developed the defined Urban Growth Centre Community Improvement Plan for all lands within the designated Urban Growth Centre, with more specific details available on the City's website. The Community Improvement Plan includes provisions for the Upgrade to Building and Fire Codes Grant Program, whereby property owners are eligible for reimbursement of up to 50% of the costs for upgrading existing properties to current building and fire codes to a maximum of $10,000 per municipal address within the defined Urban Growth Centre.

This program further illustrates the City's commitment to fire and life safety in an area of the City that has been identified by the analysis within the C.R.A. as having a higher probability and consequence in the event of a fire. The City would benefit from further

promotion and utilization of this program as an element of its commitment to fire-related risk reduction and risk mitigation strategies.

Operational Recommendation #14: That consideration be given to further promotion of the Upgrade to Building and Fire Codes Grant Program as part of its continued commitment to fire-related risk reduction and risk mitigation strategies.

Operational Recommendation #15: That consideration be given to increasing the number of Fire Inspectors (one more at a minimum) who are trained to complete building plans review, including O.B.C. General Legal and Fire Protection exams.

7.6.10 Registered Two Unit Houses, Residential Rentals, Group Homes and Lodging Houses

Two unit houses may also be referred to as granny flats, in law suits, accessory apartments, basement apartments and other titles describing a second contained unit created within either a single-family or semi-detached dwelling. Although two unit homes are not a new concept, in recent years, many jurisdictions have seen an increase in the number of these dwelling units. As the population continues to grow, it is expected this trend will continue. The City of Oshawa is amongst a large number of Canadian cities that have introduced by-laws addressing concerns relating to parking, building, fire and electrical safety, noise, property standards and zoning requirements.

By-law 41-2001, the Two Unit Houses Registration By-law, requires all two unit houses within Oshawa to be registered with the City, a process which includes a fire safety inspection if the registration falls under Section 9.8 of the O.F.C. (second unit in existence on or before July 14, 1994). Further, **Business Licensing By-law #120-2005**, last amended July 2019, and specifically Schedule K, addresses the requirements for residential rentals within the vicinity of Durham College and the University of Ontario Institute of Technology. **By-law 78-2006, Group Home Registration** and **Bylaw 94-2002, Lodging House Licensing By-law** provide specific registration and licensing requirements.

In our experience, the registration and licensing requirements within the aforementioned by-laws are similar to those found in other jurisdictions. The City's website provides fire safety information to tenants and requirement checklists landlords. Unfortunately, even with these by-laws and registration and inspection requirements in place, inspection

staff may never be able to ensure all rental properties are maintained to a constant state of compliance with the Ontario Fire Code or that all properties being used as residential rentals, group homes and lodging houses are registered or licensed. Maintaining the registry and assessing complaints as per O. Reg.365/13, Mandatory Assessment of Complaints and Requests for Approval are evidence of the City's further commitment to fire and life safety within these occupancies.

7.6.11 False Alarms

For the period from January 1st, 2014 to December 31st, 2019 C.O. False Alarms (6.19%) and False Fire Calls (15.81%) accounted for 22% of the total emergency call volume of the O.F.S. One strategy the O.F.S. has implemented to target the reduction of these types of incidents has been to adopt a cost recovery strategy to reduce the amount of nuisance alarms it receives. **By-law 13-2003** provides the City with the authority to charge a fee for false alarms and the O.F.S. **Operating Guideline 1-102 – Reporting and Billing False Alarms**, establishes a policy for the reporting, documenting and invoicing of false alarm responses.

As per the policy, the O.F.S. charges a fee for the third and any subsequent false alarm response in one calendar year. After the second false alarm, the C.F.P.O. is responsible for assigning a fire prevention inspector to visit the owner of the building to inform them that the O.F.S. has attended two false alarms and the next one will result in a charge. After the third false alarm, the C.F.P.O. assigns a Fire Prevention Inspector to conduct a complete Fire Code inspection of the building.

Rates and Fees By-law 13-2003, Schedule B.3 describes the fees applicable to "preventable fires or alarms services" which have been developed based on communication received from the Ministry of Transportation (M.T.O.).

In our view, the O.F.S. has established a strategy for addressing nuisance alarm calls through the use of enforcement, however, in our experience, other jurisdictions have had success using a slightly different approach.

These jurisdictions choose to mail a form letter to building owners in the event of two false alarms, rather than making an on-site visit. This correspondence can be prepared by administrative support staff, ensures the warning to the property owner has been documented and is less taxing on fire inspection personnel.

7.7 Existing Public Education Program Review

Public education programs provided by the O.F.S. are currently coordinated by one of the Fire Prevention Captains who has attained the **N.F.P.A. 1035 – Standard for Professional Qualifications for Fire and Life Safety Educator, Public Information Officer, and Juvenile Firesetter Intervention Specialist Level II** qualifications. Two fire inspectors on this captain's platoon are also qualified to the N.F.P.A. 1035 Level II and are assigned to the delivery of the department's current public education program. It should be noted that these fire prevention inspectors are not fully dedicated to delivery public education programs, they are assigned other task including vulnerable occupancy fire inspections, residential rental housing inspections and day care inspections. In total, five current staff within the division have attained the N.F.P.A. 1035 Level I qualification, and six have attained the N.F.P.A. 1035 Level II qualifications.

The delivery of public fire and life safety materials is administered through community programs in-person (e.g. Fire Prevention Week, Community Safety Day, Fire Chief for a Day Contest, etc.), fire hall tours, via social media tools, the fire services' website, local media and through local events.

The O.F.S. website provides valuable information related to a wide range of life safety related topics including home escape planning, kitchen safety, power failure safety, electrical safety, candle safety, smoking hazards, fire extinguishers, carbon monoxide and smoke alarms.

Research indicates that the current public educational programming is comprehensive and targets specific demographics based on their unique situations, occupations and needs, with numerous programs and resources dedicated to educating seniors, students, children, personal support workers (e.g. Children's Aid Society worker training), vulnerable occupants and people with disabilities. Examples of the specialized educational programs the department provides are presented in **Table 12**.

Table 13: Existing Public Education Program Summary

Program Name	Audience	Description
Think Ahead	Children and Youth with Special Needs	The Think ahead program is geared towards families living in Oshawa who care for children with special needs. The program includes a home visit where firefighters provide families with information about fire education, fire prevention and emergency planning and perform smoke and carbon monoxide alarm checks. This home visit is also an opportunity for firefighters to receive information about the special needs of the child or youth to ensure the most effective response is provided in the event of a fire or other emergency.
TAPP-C Arson Prevention Program	Children and Youth	The TAPP-C Arson Prevention Program is a juvenile firesetter intervention program for children and youth, ages 2 through 17. In this program, fire service and mental health professionals work with the child and family to change dangerous firesetting behaviours.
Junior Firefighter Camp	Children and Youth	Located at Fire Station 5, the Junior Firefighter Camp provides children ages 10-12 with fire and life safety skills such as fire prevention and use of a fire extinguisher. Campers also have the opportunity to learn firefighter basic skills such as how to use a fire hose and tie ropes and knots. In addition to firefighting basic skills and information children have the opportunity to participate in recreational activities, and games throughout this week-long camp.
Elementary School Programs	Grades 1, 3, 5 and 7	This program focuses on children at the JK/SK/Gr.1 level in providing introduction into fire safety messaging including the importance of smoke alarms, home escape planning, how to call 911 and to crawl low

Program Name	Audience	Description
		under smoke. At the Grade 3 level Students learn about the fire triangle and the science behind fire. Also reinforces the importance of smoke alarms, carbon monoxide alarms and escape planning. In Grade 5 the Hazard House is used to identify hazards in the home (electrical, cooking safety, two ways out of every room, playing with matches and lighters) and in Grade 7 the focus is on what can go wrong when you misuse fire, penalties, how fast fire spreads, proper charging of electronic devices.
Secondary School Programs	Grades 9 to 12	The focus is on career planning, and the "What's Cooking for Teens" program.
Post-Secondary School Programs	Personal Support Workers	Fire and life safety presentation and importance of fire drills.
Day Care Programs	Staff and children	General fire and life safety presentation.
Seniors Program	Seniors Demographic	Every year, June is dedicated as Seniors Month. During the month fire prevention staff set up information tables at senior citizen centres throughout the city, take part in the annual "Swing into Summer" day put on by the City of Oshawa. The O.F.S. has also partnered with Meals on Wheels to do a fire safety check of their client's homes when lunch time meals are delivered.
Apartment Safety Presentations	High-rise Tenants	Held throughout the year on request. Fire safety information is provided to tenants relating to prevention, detection and escape focusing on multi-unit residential concerns.
It Happened on Your Street	Neighbours	This is a program aimed at the neighbours of situation where a fire incident occurred. Soon

Program Name	Audience	Description
		after a fire incident fire crews provide residents in the immediate vicinity of the fire with fire safety and prevention information.
Community Outreach	City-wide	Fire prevention and on duty suppression staff attend community businesses and events to provide fire safety and prevention information and answer any questions the public may have.
Industrial Seminars	Group F-Occupancies	Fire prevention staff provide a one day seminar for regional industry and business staff. The program provides specific fire safety, prevention and planning information for facility and staff safety.
Realtors Seminar	Real Estate Agents	This is a seminar aimed to educate realtors relating to single, multi-unit and converted/ converting properties. Information is provided on Fire Code requirements, retrofit requirements, Building Code requirements and licensing.

In addition to these highlighted programs, the O.F.S. supports the Regional Safety Village and partners with other fire departments to deliver a fire safety program to Grade 2 students while they are attending the village. The O.F.S. also has a mobile “Hazard House” that is used throughout the year at public events and as part of various programs as a tool for demonstrating fie and life safety messages.

The O.F.S. also provides fire extinguisher training on a request basis from businesses within the City to train employees in the proper use of fire extinguishers.

Each June the O.F.S. also sponsors a “Community Fire Safety Day” where the community can learn about fire safety, watch demonstrations by firefighters, there is also a jumping castle and other activities. Attendance includes a free BBQ sponsored by a local Harvey’s restaurant.

In addition to these programs the O.F.S. facilitate a “Junior Fire Chief” contest for grade 6 and 7 students where they submit an essay on fire safety. The essays are graded and

finalists present them to fire services staff. One Junior Fire Chief is selected from the finalists. The Junior Fire Chief receives various prizes awarded to them at an assembly at their school (bicycle, helmet, hoodie, and tablet). The Junior Fire Chief also rides in the Santa Claus and Fiesta Week parades. At all public education events the O.F.S. distributes a wide range of pamphlets regarding public fire and life safety information.

In summary, the O.F.S. has developed a comprehensive public education program that targets a wide range of demographics and opportunities to inform residents and employees of the community on fire and life safety. In our view, this program exceeds the municipality's legislative requirements and represents an example of current industry best practices. Research indicates that the development and delivery of the department's current public education program accounts for approximately 14% of this division's total workload.

7.7.1 Car Seat Clinics

Through the interview process, we learned the O.F.S. facilitates "Car Seat Clinics" at various times throughout the year when on-duty firefighters are available to check the installation of care seats. While we commend the O.F.S. commitment to public safety in this regard, we recognize the liability involved in ensuring children's car seats are installed in accordance with manufacturer's instructions. In our experience, fire departments and police departments in many jurisdictions have discontinued offering this service because of liability concerns.

If the City does determine that this is a service it wishes to offer its residents, we would recommend ensuring those responsible for facilitating car seat clinics have successfully completed Child Passenger Safety Technician (C.P.S.T.) training. Our research suggests the training required is typically offered in a two day format, requiring successful completion of both practical and written examination.

Our research also suggests that there is at least one child car seat installation contractor within the Region where residents could be directed for assistance for this service. In our view, the time being spent on this initiative should be reallocated to the enhanced fire safety audit program.

7.7.2 Alarmed for Life Program

Under the authority of the F.P.P.A., the Ontario Fire Code requires a working smoke alarm to be installed on each level of a dwelling unit, as well as outside of all sleeping areas. Responsibility for installation and maintenance of the smoke alarm lies with the owner/landlord. To assist the fire department in fulfilling its responsibility for the provision of a smoke alarm program, **P.F.S.G. 04-40B-03: Smoke Alarm Program** outlines the objectives of an effective one. These objectives include all or a combination of the following:

- Providing smoke alarm and home fire escape planning information
- Promoting regular testing and maintenance of smoke alarms
- Providing or replacing smoke alarms and/or batteries
- Encouraging residents to regularly maintain their smoke alarms
- Educating residents about the legal requirements for smoke alarms
- Enforcement of all legislation relating to smoke alarms
- Effectively tracking and evaluating your smoke alarm program
- Modifying the program where necessary to ensure success

Ontario Regulation 194/14- Carbon Monoxide Alarms made under the F.P.P.A. came into force on October 15, 2014 introducing new requirements for the installation, testing and maintenance of Carbon Monoxide Alarms (C.O. Alarms). As a result, fire services within the province have also been tasked with monitoring compliance with this new regulation. Current industry best practices indicate that fire services are revising their previous home smoke alarm programs to include assessing compliance with this new regulation.

The O.F.S. Alarmed for Life Program is described within **Policy No. 54: Alarmed for Life Program**, last revised in 2018. This policy provides a description of what the Alarmed for Life program is and the processes included in its delivery.

This program consists of fire suppression crews conducting door-to-door visits of homes in their assigned areas which are based on targets established by senior management and assigned to each crew by the C.F.P.O. on an annual basis. Crews provide fire safety educational materials and if requested by the homeowner, will provide information on the testing and maintenance of alarms, as well as install them where needed. Firefighters will continue to return to their assigned areas to visit homes on their list until they have spoken with the homeowner or resident. If smoke alarm

deficiencies are observed while in the home, firefighters follow the procedures established through fire prevention **O.G. No. 09: Smoke Alarm Compliance**.

The analysis of smoke alarm status following a fire included within the C.R.A. identified two **"key findings"** related to smoke alarms that include:

- Over the five-year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 21.82% of incidents did not have a smoke alarm present (compared to 17.31% in the Province).
- Over the five-year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 43.32% of incidents had a smoke alarm present and operating compared to 44.57% in the Province.

These **"key findings"** highlight the importance of a proactive and aggressive smoke alarm and carbon monoxide alarm program in the City of Oshawa. At the time of preparing this F.M.P. the department was conducting a review of **Policy No. 54: Alarmed for Life Program** and the revisions implemented in 2018. **Table 13** illustrates the number of occupancies that were visited in 2018 and 2019. This analysis indicates that in 2018 the on-duty fire suppression crews visited a total of 1,409 occupancies. In 2019, the on duty fire suppression crews were instructed to complete the remaining 2018 visits that they had been assigned. This included a total of 74 additional occupancies.

Table 14: Alarmed for Life Program Statistics

Occupancy Type	2018	2019
Single-family dwellings	981	66
2-Unit Residential	203	5
Rooming Houses	40	0
Residential above commercial	12	0
Multi-unit residential	173	3
Total	**1,409**	**74**

Source: O.F.S.

Table 14 illustrates the observations of the on-duty crews while conducting the Alarmed for Life Program. This analysis further confirms the **"key findings"** of the C.R.A. that indicates approximately 25% of the occupancies visited were non-compliant for having working smoke alarms on every floor. This analysis also highlights the number of smoke alarm and carbon monoxide alarms that were provided and installed by the O.F.S. as part of this program.

Table 15: Alarmed for Life Program

Program Component	2018		2019	
	Yes	No	Yes	No
Home Escape Plan	1096	275	64	10
Smoke Alarm on every floor	1151	163	66	8
Carbon Monoxide Alarm on every floor	985	275	56	14
Batteries less than 10-years old	1143	205	61	9
Batteries installed by O.F.S.	385	937	20	45
Smoke Alarms/CO Alarms Installed	776		38	

Source: O.F.S.

This F.M.P. supports the further review of **Policy No. 54: Alarmed for Life Program** and the introduction of more comprehensive and proactive strategies to target improving compliance with the applicable regulations for smoke alarms and carbon monoxide alarms.

7.7.3 Existing Public Education Program Frequency

Table 15 illustrates a summary of the current performance benchmarks for delivering the department's current formalized public education programs.

Table 16: Existing Public Education Program Summary

Program	Existing Performance Benchmark
Think Ahead Program	On-Request
Tapp-C Prevention Program	On Request
Junior Firefighter Camp	Annually (summer)
Elementary School Programs (Grades 1,3,5 and 7)	Annually
Secondary School Programs	Annually
Post-Secondary School Programs	Annually
Day Care Programs	Annually
Seniors Programs	Annually
Distribution of Public Education Materials	Annually/On Request
Alarm for Life Program	Annually/On Request
Source: O.F.S.	

7.8 Historical Fire Inspection, Enforcement & Public Education Workload

Table 16 illustrates a summary of the department's historical fire inspection/ enforcement workload. This analysis highlights the current focus that the O.F.S. assigns to Group C-Residential Occupancies. It should be noted that the O.F.S. has recently revised its role in the business licence process to include only inspections when there has been an identified change in use. It is expected that this will result in lees business licence inspections in 2020 and going forward. This analysis illustrates that Group A-Assembly occupancy, Residential Rental By-law, new construction and complaint/ request inspections are all very similar in the workload associated.

The lower number of Group F - Industrial occupancy inspections conducted in 2018 is directly related to the O.F.S. initiating a targeted proactive fire inspection program targeting Group C-Residential occupancies within the older downtown core area.

Table 17: Historical Fire Inspection/Enforcement Workload

Inspection/Enforcement Activity	2014	2015	2016	2017	2018	2019
Group C-Residential Occupancy Inspections	548	1,062	2,486	3,433	2,709	2,834
Business License Inspections	386	954	455	812	632	568
Group A-Assembly Occupancy Inspections	89	305	558	501	580	576
Residential Rental By-law Inspections	209	267	368	330	391	544
New Construction Inspections	174	404	532	455	860	505
Complaint/Request Inspections	317	299	373	373	441	459
Group F- Industrial Occupancy Inspections	114	114	193	186	11[18]	173
Occupancy/L.C.B.O. Inspections	17	21	0	12	7	14
Plan Review/Approval	194	189	213	300	182	144
Burn Permits	16	23	10	13	15	15
Immediate Threat to Life Orders	0	0	0	0	13	7
Fire Safety Plan Approvals	72	72	160	118	104	158
Hoarding Complaints	16	6	2	6	12	15

Source: O.F.S.

The N.F.P.A. 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition) provides a comprehensive process for assessing workload and staff resource needs to deliver fire inspection and public education programs. At this time, the O.F.S. does not regularly track all tasks and work load of staff within this

[18] The decline in proactive industrial occupancy inspections in 2018 is due to a shift in focus whereby the proactive inspection program focused on the historical fire risk and residential occupancies.

division. As a result it is difficult to assess whether the division currently has sufficient staff resources to deliver the existing, and any proposed enhanced fire prevention and public education services and programs.

Table 17 illustrates the finding of a collaborative analysis of existing workload within the division through consultation with the C.F.P.O. Based on our research and consultation this analysis appears to be a relatively accurate distribution of current work load within this division.

Table 18: Historical Fire Inspection/Enforcement Workload

Major Activities	Current Percentage of Workload
Group C-Residential Occupancy Inspections	20%
Group B – Vulnerable Occupancies	2%
Business License Inspections	4%
Group A-Assembly Occupancy Inspections	4%
Residential Rental By-law Inspections	7%
New Construction Inspections	6%
Complaint/Request Inspections	15%
Group F- Industrial Occupancy Inspections	2%
Occupancy/L.C.B.O. Inspections	1%
Plan Review/Approval	8%
Burn Permits	1%
Immediate Threat to Life Orders	1%
Fire Investigations	2%
Public Education Programs	14%
Administration (research, reporting/documentation, compliance orders)	12%
Immediate Threat to Life Inspections	1%

Major Activities	Current Percentage of Workload
Total	**100%**

Source O.F.S.

This F.M.P. includes a recommendation to review the current administrative support staff resources within the O.F.S. In our view, this review should have a focus on assessing opportunities to reassign, or revise this divisions current administrative processes to minimize the administrative workload of fire inspection and public education staff resources. The priority for these staff resources should be the delivery of fire inspection and public education services and programs, and not administrative tasks that could be assigned to administrative support staff.

7.9 Proposed Enhanced Fire Inspection/Public Education Services

The analysis and recommendations presented within this F.M.P. emphasise the importance of the first two lines of defence including the optimization of public education and prevention and the utilization of fire safety standards and enforcement. This F.M.P. places significant emphasis on these areas by recommending the following strategic priorities.

1. **The Oshawa Fire Services will prioritize the optimization of the first two lines of defence, including public education and fire prevention, and the utilization of fire safety standards and fire code enforcement as the foundation of providing a comprehensive fire protection program within the City of Oshawa.**
2. **The Oshawa Fire Services will specifically prioritize the delivery of fire and life safety programs in Group C- Residential Occupancies that include an enhanced Home Smoke Alarm/Carbon Monoxide Alarm Program.**

The analysis within this section has been directly informed by the **"identified risks"** and **"key findings"** presented within the companion Community Risk Assessment. The proposed fire inspection and public education recommendations have also been informed by the findings of 2019 F.U.S.

Report that states **"Oshawa Fire Services have been reviewed in the effectiveness of their practices with regard to Fire Safety Control, Fire Prevention, and Public Education. From the perspective of improving fire insurance classifications, increases in Fire Prevention/Public Education generally are considered the most cost effective way to improve fire insurance classifications, while also reducing the risk of fire by educating the public and enforcing fire safety measures in various occupancies found throughout the community"[19].** This report identifies that there is an opportunity for the City to further improve the current fire insurance grading by enhancing fire inspection frequencies and further use of fire code enforcement.

It should be noted that the 2018 I.A.F.F. Report includes a Risk Assessment. Although not compliant with the new O. Reg. 378/18 the findings of the I.A.F.F. Risk Assessment includes analysis of the City's demographic profile, historical response, risk probability, fatal fires and additional factors. However, the 2018 I.A.F.F. Report only considers how changes to the O.F.S. current **"third line of defence"** fire suppression deployment model should be revised. The I.A.F.F. Report does not consider, or recommend strategies that could target the **"first two lines of defence"** such as enhanced fire inspection/enforcement or public education programs that could reduce or mitigate the identified fire-related risks, and reduce the probability of a fire occurring.

7.9.1 Proposed Fire Inspection/Enforcement Program

The proposed fire inspection/enforcement program has been directly informed by the findings of the companion Community Risk Assessment and specifically the building stock profile **"identified risks"** that have been designated as **"high risk"**. These include the following:

- Group C - Residential Occupancies represent 93.41% of the City's existing property stock, and over the five year period from January 1, 2014 to December 31, 2018 were associated with 82.56% of the structure fires within the City.
- The 2016 Census data indicates that 62.60% of residential dwellings was built prior to the introduction of the 1981 Ontario Fire Code compared to 53.06% of residential building stock in the remainder of the province.

[19] Fire Underwriters Survey Report dated October 29, 2019

- The City currently has 76 buildings defined by the O.B.C. as high-rise buildings with a floor level of 18 metres (59 feet) above grade, or six storeys. These buildings are distributed within the urban area with several located in the downtown area.
- The City has 91 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). These buildings are predominantly located in the commercial and industrial land use areas such as the area south of Highway 401 and along Taunton Road.
- The City currently has twenty-seven registered vulnerable occupancies.
- Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% of the City's total population.
- For the period from January 1st, 2014 to December 31st, 2018 there is a higher concentration of medical/resuscitator, false fire and fire/explosion incidents in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.

Developing a more proactive fire inspection and enforcement program has also been informed by the **"key findings"** contained within the C.R.A. that indicate the following:

- The City includes areas of building stock that have higher density and, as such, greater potential for exposure in the event of a fire.
- O.F.S. identified several properties within Oshawa as having an increased potential for high fire risk in regard to fuel load.
- In addition to registered vulnerable occupancies the City has 65 schools and thirteen identified daycare centres that represent higher fire life-safety risks.
- Over the five year period from January 1st, 2014 to December 31st, 2018 the City averaged 78 structure fires per year.
- Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group C Residential occupancies account for 82.56% of total structure fires within the City, which is higher than the Province by 9.07% 73.49%.
- Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group F Industrial occupancies account for 4.10% of total structure fires within the City.

- Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group E Mercantile occupancies account for 13.00% of total structure fire loss within the City, higher than the Province by 8.14%.
- Most reported fire related civilian injuries (20) and fatalities (6) occurred in Group C-Residential Occupancies, with one (1) fatality occurring in an occupancy not classified within the O.B.C. (i.e. vehicle).
- Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the leading cause of unintentionally set fires was due to misuse of ignition source at 31.03% 121 fires), compared to 29.96% in the Province.
- Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the second most common cause of unintentionally set fires was due to mechanical/electrical failure at 13.33% 52 fires), compared to 15.45% in the Province.
- Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 19.23% of fires had a reported ignition source of cooking equipment, which is 1.51% higher than the Province (17.72%).
- Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 20.26% of fires had a reported ignition source of open flame tools/smokers articles, which is 6.54% higher than the Province (13.72%).
- Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 10.26% of fires had a reported ignition source of exposure, which is 5.61% higher than the Province (4.65%).
- Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 21.82% of incidents did not have a smoke alarm present (compared to 17.31% in the Province).
- Over the five-year period from January 1, 2014 to December 31, 2018, of the fire loss incidents in Group C – Residential occupancies, 43.32% of incidents had a smoke alarm present and operating compared to 44.57% in the Province.
- There is a higher concentration of lower median income in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.

In summary, **Group C-Residential Occupancies** represent the most vulnerable type of property stock in the City of Oshawa based on their age, historical fire loss, number of fire-related injuries and fatalities and overall percentage of property stock within the City. Group C-Residential Occupancies include a wide range of building types such as:

- Single-family dwellings
- Multi-unit stacked townhouses and low-rise multi-unit buildings
- Seniors residence buildings
- High-rise multi-unit buildings
- Boarding, lodging and rooming houses
- College/university and student rental housing
- Hotels and motels

For these building types the O.F.C. and O.B.C. include requirements for a wide range of fire and life safety systems dependant on factors such as building construction and intended use. As a result, the fire and life safety systems vary significantly between buildings classified as Group C-Residential occupancies. For example, single-family dwellings are required to install smoke alarms on every floor and outside of every sleeping area and to install a carbon monoxide alarm, in certain circumstances Whereas, a high-rise Group C-Residential occupancy is required to have a Fire Safety Plan; a fully integrated fire alarm system that is monitored, and other fire and life systems.

The proposed Fire Inspection/Enforcement Program includes the following strategies:

- **Fire Inspection/Enforcement Targets**
- **Enhanced Fire Safety Audit Program**
- **Enhanced Alarm for Life Program**
- **Targeted Fire Inspection Program**

The implementation of these strategies are consistent with current industry best practices and standards such as the **N.F.P.A. 1300 Standard on Community Risk Assessment and Community Risk Reduction Plan Development**.

This standard identifies the importance of developing a Community Risk Reduction Plan (C.R.R.P.) and the optimization of risk mitigation and risk reduction as the first two lines of defence in a comprehensive community fire prosecution plan.

7.9.1.1 Proposed Fire Inspection/Enforcement Targets

Table 18 illustrates the current fire inspection cycles of the O.F.S. based on the major building occupancies classifications identified within the O.B.C., the F.U.S. fire inspection frequencies and the inspection frequency targets/audit proposed by this F.M.P. Achieving the proposed fire inspection/audit targets will require the O.F.S. to re-consider all of its current programs and services and where possible realign the priorities of this division.

This will require the O.F.S. to further enhance its utilization of on-duty fire suppression staff to further assist in the delivery of the Multi-Unit Fire Safety Program, enhanced Alarm for Life Program and Fire Safety Audits. In our view, the O.F.S. should continue with the targeted fire inspections of Group C-Residential occupancies with priority to the areas of the City identified by the C.R.A.

Table 19: Proposed Fire Inspection Targets

Group	Occupancy Type	O.F.S. Current Inspection Frequency	F.U.S. Inspection Frequency	Proposed Inspection Frequency
A	**Assembly**	Business licensing - all new businesses, ownership changes, or every 2 years All others - complaint or request	6 months	2 Years
B	**Care/Detention**	Vulnerable Occupancies – annually All others - complaint or request	Annually	Annually
C	**Residential**			
	Low/rise multi-family	Complaint or request	6 Months	Fire Safety Audits Enhanced Alarm for Life Program Targeted Fire Inspection Program
	High/rise multi-family	Complaint or request	6 Months	
	Two unit residential	Complaint or request	6 Months	
	Seniors residential	Compliant or request	6 Months	Annually
	Boarding, lodging, rooming	Annually	6 Months	Annually
	Group homes	Complaint or request	Annually	2 Years
	Hotels/motels	Complaint or request	6 Months	3 Years
	College/university housing	Complaint or request	Annually	2 Years
	Student rental housing	2 years, or ownership change	Annually	2 Years

Group	Occupancy Type	O.F.S. Current Inspection Frequency	F.U.S. Inspection Frequency	Proposed Inspection Frequency
D	**Business**			
	High/rise office	Complaint or request	Annually	Fire Safety Audits
	Low/rise office	Complaint or request	Annually	
	Business licence	2 years, or ownership change	Annually	
E	**Mercantile**			
	Shopping centres	2 years, or ownership change	Annually	Fire Safety Audits
	Shops/stores	Complaint or request	Annually	
F	**Industrial**			
	F1-High Hazard	Complaint or request	3 to 6 Months	Complaint or request
	F2-Medium Hazard	Complaint or request	3 to 6 Months	Complaint or request
	F3-Low Hazard	Complaint or request	3 to 6 Months	Complaint or request

Source: O.F.S.

Recently, a jurisdiction within the G.T.A. developed a registry of high-rise apartments as a component of a program aimed at promoting fire safety in high risk apartment complexes. The registry can be viewed by the public and displays information relating to the last fire safety inspection at the building, including the date of the last inspection and status of compliance or non-compliance with the Ontario Fire Code. The registry enables tenants and prospective tenants to be informed about fire safety concerns within a specific building. In our view, there would be value in investigating a similar registry to build on the work the City has already done with two-unit homes, residential rentals, group homes and lodging houses.

7.9.1.2 Proposed Enhanced Fire Safety Audit Program

This strategy will require the O.F.S. to implement a new training program that in the short-term (1-3 years) would target the training of one firefighter on each crew to the qualifications of a Fire Inspector I. In the longer-term (3-5 years) priority should be given to training all O.F.S. firefighters to the Fire Inspector I, and Fire and Life Safety Educator I qualifications.

This strategy would revise **Policy #1-41 – In-Service Inspections of Multiple Dwelling Units and High-Rise** to also include Group D & E Occupancies. Enhancing this program allows the O.F.S. to further optimize the utilization of on-duty firefighters to conduct initial fire safety audits of specified occupancy types. In the event firefighters identify a significant fire and life safety concern they would have the ability to request an immediate response of a fire prevention inspector, or alternatively a follow up fire inspection by a fire prevention inspector.

Operational Recommendation #16: That consideration be given to implementing the proposed enhanced fire safety audit program as outlined in the Fire Master Plan.

7.9.1.3 Proposed Enhanced Fire Investigation Protocol and Reporting

The fire cause and determination process often enables the fire service to assess compliance with local by-laws as well as building and fire codes. Further assessment as to how building occupants reacted to the fire and the building's performance including fire protection features, can be used to shape a fire department's fire prevention and public education initiatives as well as fire suppression effectiveness. Each fire investigation provides an opportunity to educate the public in an effort to change human behaviour to reduce the risk of fire.

The **"key findings"** of the C.R.A. indicate a higher incidence of fires involving misuse of ignition source, open flame tools/smoker's articles, and cooking equipment within the City when compared with the rest of the province. These findings suggest that there would be value in developing public safety messaging and initiatives specific to these types of fires.

In our experience, information relating to fires, including the age and gender of the person(s) associated with the incident, also provides insight into the potential target audience(s) for the public education programs and fire prevention initiatives. This information is included in Standard Incident Reports (S.I.R.), which are submitted to the Office of the Fire Marshal and Emergency Management. Ensuring the information included in the S.I.R. is accurate and complete, should be a considered a priority for the O.F.S. In our view, using the data collected to inform fire prevention and public education activities is crucial to reducing and mitigating the fire risk within a community.

As mentioned in **Section 7.5.6** of this F.M.P, additional fire investigation training may be necessary to ensure sufficient staffing for fire investigations in keeping with O.F.S. **Policy 1-32** and **F.P. O.G. #11**. Training may also be necessary for those responsible for completing S.I.R. to ensure accuracy and completeness as well as reporting consistency amongst all O.F.S. personnel.

Operational Recommendation #17: That consideration be given to developing an enhanced Investigation Protocol and Report strategy whereby data gathered through the fire cause and origin process be used for the purposes of developing and implementing public education and fire prevention initiatives as presented in the proposed Fire Master Plan.

7.9.1.4 Proposed Enhanced Alarmed for Life Program

At the time of preparing this F.M.P. a comprehensive review of the existing Alarmed for Life Program was being conducted by the Fire Chief. It is our understanding that the proposed enhanced Alarmed for Life Program will include more comprehensive performance benchmarks. In our view this program should be fully integrated with targeted public education programs specifically in those areas of the City identified by the C.R.A. where a higher frequency of structure fires and false alarms have been occurring. Collectively these programs should have a shared vision of promoting the importance of smoke alarms, carbon monoxide alarms and home escape planning.

Operational Recommendation #18: That consideration be given to implementing the proposed enhanced Alarmed for Life Program as outlined in the Fire Master Plan.

7.9.1.5 Proposed Targeted Fire Inspection Program

In 2018 the O.F.S. implemented a targeted fire inspection program of Group C-Residential Occupancy in the older downtown core area of the City. The C.R.A. now provides a comprehensive analysis of the City's current **"identified risks"** and **"key findings"** that can be utilized to further inform a targeted fire inspection program. In our view one of the most significant benefits of conducting a Community Risk Assessment is to provide a comprehensive analysis of existing fire related risks in order prioritize fire prevention and public education program based on identified fire risk.

In our view a targeted fire inspection program should continue to prioritize Group C-Residential Occupancies identified by the C.R.A. as high risk.

Operational Recommendation #19: That consideration be given to further development and implementation of the current targeted fire inspection program as presented within the proposed Fire Master Plan.

7.9.1.6 Proposed Enhanced Fire Inspection/Enforcement Reporting

During the preparation of this F.M.P. the O.F.S. was able to provide an overview of the current fire inspection/enforcement programs. However, our research indicates that the department does not currently maintain detailed statistical information related to the workload of these programs. In some insistences there is also a gap in the goals and objectives of each program in defining how the success of the program could be monitored and evaluated on an ongoing, or annual basis. In our view this gap further supports the need for the O.F.S. to upgrades its information technology and software to improve its records management process and reporting.

Operational Recommendation #20: That consideration be given to enhancing the tracking of all workload associated with the O.F.S. fire inspection/enforcement programs as presented within the proposed Fire Master Plan.

7.9.2 Proposed Enhanced Public Education Program

The current public education program provided by the O.F.S. is comprehensive and in our view, reflects current municipal best practices. The C.R.A. does include two **"identified risks"** that should be considered to enhance the current public education programming provided by the O.F.S. These include:

- The 2016 Census data indicates that children aged 14 and under, represent 16.66% of the City's total population.
- Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% of the City's total population.

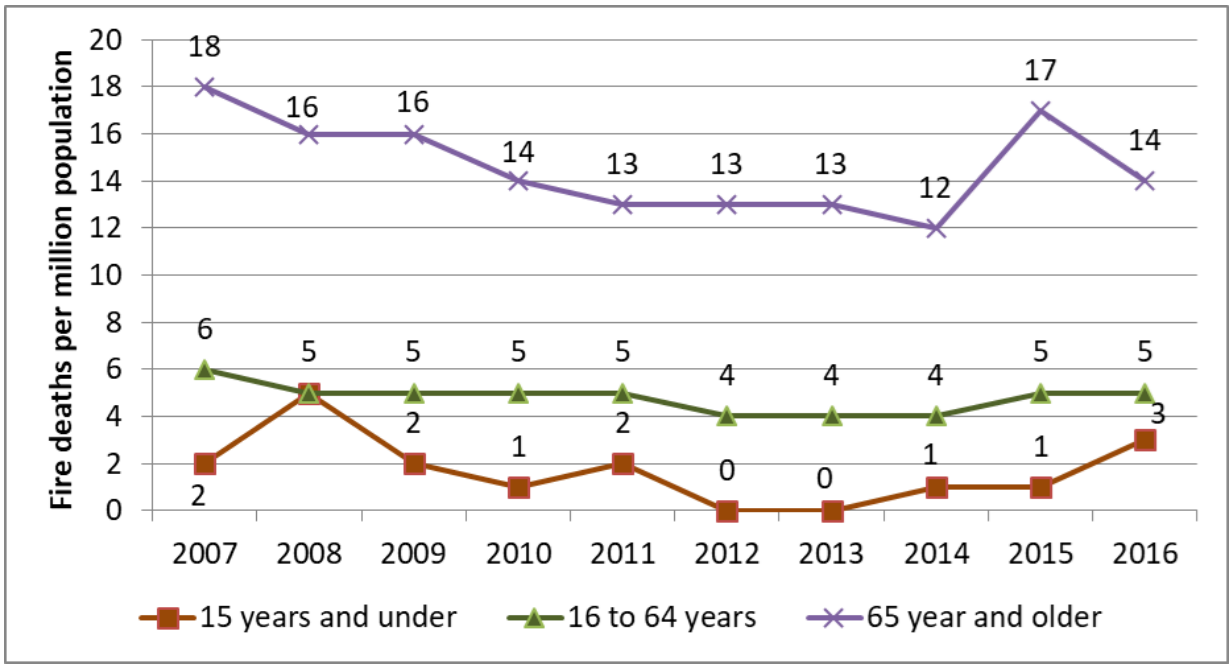
Developing a more proactive public education program should also been informed by the **"key findings"** contained within the C.R.A. that indicate the following:

- Of the fires occurring in the City over the five-year period from January 1, 2014 to December 31, 2018, the leading cause of unintentionally set fires was due to misuse of ignition source at 31.03% (121 fires), compared to 29.96% in the Province.
- Of the fires occurring in the City over the five-year period from January 1, 2014 to December 31, 2018, the second most common cause of unintentionally set fires was due to mechanical/electrical failure at 13.33% (52 fires), compared to 15.45% in the Province.
- Of the fires occurring within the City over the five-year period from January 1, 2014 to December 31, 2018, 19.23% of fires had a reported ignition source of cooking equipment, which is 1.51% higher than the Province (17.72%).
- Of the fires occurring within the City over the five-year period from January 1, 2014 to December 31, 2018, 20.26% of fires had a reported ignition source of open flame tools/smokers articles, which is 6.54% higher than the Province (13.72%).
- Of the fires occurring within the City over the five-year period from January 1, 2014 to December 31, 2018, 10.26% of fires had a reported ignition source of exposure, which is 5.61% higher than the Province (4.65%).

7.9.2.1 Proposed Enhanced Seniors Fire Safety Education Program

According to the 2016 census data presented within the C.R.A. seniors (those 65 years and over) represented 16.52% of Oshawa's total population. In addition, 28.68% of the total population fall into the age range of 45 to 64, representing a cohort aging towards the seniors demographic of 65 years of age or older. Seniors are considered to represent one of the highest fire risk groups across the province based on residential fire death rate (fire deaths per million of population) as shown in **Figure 5**.

Figure 5: 2007-2016 Residential Fire Death Rate by Age of Victim (O.F.M.E.M.)



Source: O.F.M.E.M.

In our view, these factors support the need for a dedicated senior's fire safety education program. Further utilization of existing community relationships and investigating additional partnerships may be an effective strategy for consideration towards enhancing the department's current senior's fire safety education program. The C.R.A. identified potential opportunities to formulate community partnerships for optimizing these partnerships such as at-home care and assisted living services to seniors (such as Home Instead Senior Care). In identifying occupants who are at increased fire risk due to unsafe living conditions (e.g. absence of a working smoke alarm) which may require follow up or inspection. These agencies could also be provided with educational materials for distribution among the seniors demographic.

Some jurisdictions have opted to work collaboratively with other service agencies to reach seniors and other "at risk" populations within the community. The program involves the agencies collectively preparing a checklist identifying safety issues each organization has authority to address. The checklists are to be utilized when home visits, inspections or nursing care is provided. The checklist includes contact information for each agency so that the individual noting the issue can forward his/her concern and trigger the appropriate follow up.

Agencies that have been involved in other communities include:

- Victorian Order of Nurses (V.O.N.)
- Community Care Access
- Ontario Home Health
- Meals on Wheels
- Health Units
- Fire departments
- Police departments
- Municipal building departments
- E.M.S.
- Retirement Home Regulatory Authority

These types of partnerships enhance the safety of seniors within a community, promote interagency collaboration and often assist in mitigating circumstances or situations which may lead to emergencies if left unchecked.

Operational Recommendation #21: That consideration be given to enhancing the fire safety program for seniors (65+) within the community as presented within the proposed Fire Master Plan.

7.9.2.2 Proposed Targeted Fire Safety Education Program

The C.R.A. provides valuable insight into the areas of the City where there has historically been a larger volume of carbon monoxide and false fire calls. These areas would benefit from targeted public education programs that could be integrated into the proposed enhanced Alarm for Life Program, or alternatively delivered through an outreach to established neighborhood groups, building owners, or through a social media campaign.

Operational Recommendation #22: That consideration be given to implementing a targeted public education program as presented within the proposed Fire Master Plan.

7.9.2.3 Proposed Enhanced Public Education Reporting

During the preparation of this F.M.P. the O.F.S. was able to provide a comprehensive overview of the department's current public education program. However, our research indicates that the department does not currently maintain detailed statistical information related to the amount of fire safety education material that is distributed on an annual basis, or statistics related to the number of people directly impacted by each program, or the workload associated with each program. In some instances there is also a gap in the goals and objectives of each program in defining how the success of the program could be monitored and evaluated on an ongoing or annual basis. In our view this gap further supports the need for the O.F.S. to upgrade its information technology and software to improve its records management process and reporting.

Operational Recommendation #23: That consideration be given to enhancing the tracking of all workload associated with the O.F.S. public education programs as presented within the proposed Fire Master Plan.

7.9.2.4 Community Risk Reduction Plan (C.R.R.P).

As referenced throughout this F.M.P. community risk reduction plans focus on a holistic approach to mitigating or preventing risk within a jurisdiction, utilizing the five E's namely: education, enforcement, engineering, economic incentive and emergency response. It also involves strategies that ensure the right resources are being used be it a targeted public education campaign for seniors or dispatching appropriate personnel and equipment to a medical call. This approach enables municipalities to provide fire protection services in an efficient and effective manner. Based on our research and observations of O.F.S., there would be value in developing a Community Risk Reduction Plan for the City.

A C.R.R.P. would build on the successes the O.F.S. and the City have already achieved, including:

- Two Unit, Residential Rentals, Group Homes and Lodging Houses by-laws
- Emergency Operations Centre Dashboard
- Existing partnerships with local agencies and organizations
- Improved F.U.S. ratings
- Community-based fire prevention model

Operational Recommendation #24: That consideration be given to developing a Community Risk Reduction Plan as a holistic approach to reducing risk within the City, as presented within the proposed Fire Master Plan.

7.9.3 Fire Prevention Division Staff Resource Summary

The proposed Fire Inspection/Enforcement Program and Enhanced Public Education Programs will have an impact on the current work load within this division. Recent changes to the amount of workload associated with the City's business licensing process will have some limited positive impact in reducing the current work load within the division. The department will also continue to develop further capacity as the more junior fire prevention inspectors gain further experience. However, these gains will not be sufficient to support the level of work load associated with the enhanced programs recommended. In our view, the O.F.S. should first seek to expand the administrative support for this division to minimize, wherever possible, the administrative tasks of the fire prevention inspectors. The O.F.S. should also be proceeding with strategies to optimize the utilization of on-duty firefighters to assist in mitigating the work load on the current fire prevention inspectors. This strategy is also consistent with the findings of the 2018 F.M.P. Report that recommended "Expand fire prevention and education programs by utilizing fire suppression staff and target the residential building stock"[20]

In our view, these two strategies will collectively assist in managing some of the additional workload associated with the proposed enhanced fire inspection/enforcement and public education programs. It will be critical for the O.F.S. to also begin a comprehensive process for tracking the existing workload of all staff within this division. In our experience, the results of a more comprehensive work load tracking process will allow the C.F.P.O and other members of the senior management team to monitor program effectiveness as well as the workload of division personnel.

Subject to the O.F.S. implementing more comprehensive work load analysis, we believe there will be an identified need to hire one more fire prevention inspector in the short-term (1 to 3 years) and an additional fire prevention inspector to be coordinated with the opening of the proposed Fire Station 7 in the future.

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[20] Oshawa Fire Services 2018 Fire Master Plan & Community Risk Assessment, Recommendations page 92 #6.

Council Recommendation #3: **That subject to the results and findings of a comprehensive work load analysis for the Fire Prevention and Public Education Division staff, consideration be given to hiring one more fire prevention inspector in the short-term (i.e. 1 to 3 years) and an additional fire prevention inspector coordinated with the opening of the proposed future Fire Station 7.**

7.10 Fire Prevention Summary

The analysis within this F.M.P. indicates that the O.F.S. is currently meeting its legislated fire inspection and public education responsibilities as required by the F.P.P.A. The current fire prevention and public education programs provided by the O.F.S. are predominantly based on the historical needs of the community versus being informed by an identifiable level of fire risk, or need within the community. The companion Community Risk Assessment provides the opportunity for the O.F.S. to align its fire prevention and public education with the **"identified risk"** and **"key findings"** of the C.R.A. analysis. Therefore, the recommendations for this division support a shift towards aligning the fire prevention and public education programs with the findings of the C.R.A. The recommendations presented also support the need for the department to implement a more comprehensive and ongoing process to assess the goals and objectives of each program with the associated workload. This process will provide for a more comprehensive reporting process to Council and the community, while also enabling the senior management team to monitor the effectiveness of each program, as well as the associated work load within the division.

In the short-term, this F.M.P. recommends implementing a process to realign the administrative support functions within this division to enhance the efficiency and effectiveness of fire inspection staff. This plan also recommends optimizing the utilization of on-duty firefighters to deliver basic fire prevention programs to further allow the more highly qualified fire inspection staff to conduct more complex and targeted fire inspections. In our view, these strategies can be implemented within the short-term 1-3 years of implementing this F.M.P. Subject to the O.F.S. implementing more comprehensive work load analysis, we believe there will be an identified need to hire one more fire prevention inspector in the short-term (1 to 3 years) and an additional fire prevention inspector to be coordinated with the opening of the proposed Fire Station 7 in the future.

Council Recommendations:

- **Council Recommendation #3**: That subject to the results and findings of a comprehensive work load analysis for the Fire Prevention and Public Education Division staff, consideration be given to hiring one more fire prevention inspector in the short-term (i.e. 1 to 3 years) and an additional fire prevention inspector coordinated with the opening of the proposed future Fire Station 7.

Operational Recommendations

- **Operational Recommendation #12**: That the O.F.S. prioritize the training of all staff designated as Chief Fire Officials through the Public Services Health & Safety Association.
- **Operational Recommendation #13**: That subject to consideration and approval of the proposed Fire Master Plan, the updated fire prevention policy be included within the establishing and regulating by-law as an appendix.
- **Operational Recommendation #14**: That consideration be given to further promotion of the Upgrade to Building and Fire Codes Grant Program as part of its continued commitment to fire-related risk reduction and risk mitigation strategies.
- **Operational Recommendation #15**: That consideration be given to increasing the number of Fire Inspectors (one more at a minimum) who are trained to complete building plans review, including O.B.C. General Legal and Fire Protection exams.
- **Operational Recommendation #16**: That consideration be given to implementing the proposed enhanced fire safety audit program as outlined in the Fire Master Plan.
- **Operational Recommendation #17**: That consideration be given to developing an enhanced Investigation Protocol and Report strategy whereby data gathered through the fire cause and origin process be used for the purposes of developing and implementing public education and fire prevention initiatives as presented in the proposed Fire Master Plan.
- **Operational Recommendation #18**: That consideration be given to implementing the proposed enhanced Alarmed for Life Program as outlined in the Fire Master Plan.

- **Operational Recommendation #19**: That consideration be given to further development and implementation of the current targeted fire inspection program as presented within the proposed Fire Master Plan.
- **Operational Recommendation #20**: That consideration be given to enhancing the tracking of all workload associated with the O.F.S. fire inspection/enforcement programs as presented within the proposed Fire Master Plan.
- **Operational Recommendation #21**: That consideration be given to enhancing the fire safety program for seniors (65+) within the community as presented within the proposed Fire Master Plan.
- **Operational Recommendation #22**: That consideration be given to implementing a targeted public education program as presented within the proposed Fire Master Plan.
- **Operational Recommendation #23**: That consideration be given to enhancing the tracking of all workload associated with the O.F.S. public education programs as presented within the proposed Fire Master Plan.
- **Operational Recommendation #24**: That consideration be given to developing a Community Risk Reduction Plan as a holistic approach to reducing risk within the City, as presented within the proposed Fire Master Plan.

8.0 Training Division

The O.F.S. Training Division oversees the training of all personnel to ensure that the legislated requirements of the F.P.P.A. and the O.H.S.A. are being met. Within the Province of Ontario, firefighter training is an area that has come under a high level of scrutiny over the past decade. The results of numerous inquests and investigations have concluded that firefighter training must be considered a priority for municipalities, in their role as employer, as fire service leaders, and as supervisors. The analysis within this section focuses on the delivery of training to the fire suppression division staff.

The analysis within this section first presents a discussion around training standards and the options fire departments have in providing training. This is followed by a discussion of training standards, processes, programs, and resources currently in place in regards to training. This includes: division organization and staffing, annual training program, specialized rescue training programs, company officer training, training facilities, and records management. Where gaps are identified in achieving compliance with industry best practices and legislated requirements, further strategies and recommendations are provided for consideration.

This fire master planning process highlights the relevance of assessing community fire risk as a component of determining the appropriate level of fire protection services to be provided. The information and analysis within this section will present the importance of linking the applicable training requirements of the O.F.S. staff with the level of fire suppression services to be provided by the O.F.S.

8.1 Training Standards in Ontario

As referenced previously within this F.M.P. in April 2013, the O.F.M.E.M. announced that the Ontario fire service would be adopting the National Fire Protection Association Professional Qualifications (N.F.P.A. Pro-Qual) Standards. In January of 2014, the O.F.M.E.M. distributed Communique 2014 – 04 to the Ontario fire service reflecting the grandfathering and transition process to the use of the N.F.P.A. Professional Qualifications Standards. A "**Grandfathering Policy**" was integrated into the transition to the N.F.P.A. Pro-Qual Standards process "in order to exempt anyone from having to start over in any program and in order to give recognition for training and education already completed and for experience already gained".

In May 2018, the Ministry of Community Safety and Correctional Services (M.C.S.C.S.) (now the Ministry of the Solicitor General) adopted **Ontario Regulation 379/18 – Firefighter Certification** under the F.P.P.A. that required every fire department to complete mandatory certification of fire service personnel involved in fire suppression including technical rescue services, communications (fire dispatch), fire prevention, public education and training. On October 5, 2018 this regulation was revoked.

The revoked **Ontario Regulation 379/18 – Firefighter Certification** reflected the recommendations of an inquest into two fatal fires in Whitby and East Gwillimbury. On April 29th, 2016 the verdict of that inquest recommended to the Ministry "to make a Regulation, pursuant to clause 78(1)9k) of the F.P.P.A., requiring mandatory certification and training, to recognized industry standards, for all personnel (as defined in the F.P.P.A.) whose primary job function is to perform: 1) fire inspections, 2) public education, and/or 3) communications (call-taking/dispatch)".

The required training and qualifications that were identified within **Ontario Regulation 379/18 – Firefighter Certification** are consistent with those included within the N.F.P.A. Pro-Qual Standards. As such, fire services across the Province are continuing to transition to the use of the N.F.P.A. Pro-Qual Standards, recognizing that this is not mandatory, and does not require certification as required by **the Ontario Regulation 379/18 – Firefighter Certification**. Use of the N.F.P.A. Pro-Qual Standards referenced in **Table 19** remain the current industry best practices in Ontario.

Table 20: Concordance of Ontario and N.F.P.A. Standards

Previous Ontario Standard	New N.F.P.A. Standard
Ontario Firefighter Curriculum	N.F.P.A. 1001 Standard – Level I and Level II
Company Officer Diploma Program	N.F.P.A. 1021 Standard – Level II
Fire Prevention Officer Diploma Program	N.F.P.A. 1031 Standard – Fire Inspector Level I
Training Officer Diploma Program	N.F.P.A. 1041 Standard – Fire Instructor Level II

To provide the training to attain the qualifications identified within these standards, there are several options available to departments including: Ontario Fire College (O.F.C.) and Regional Training Centres (R.T.C.s); outside or third party training; in-house training; and out of province training opportunities as outlined below.

8.1.1 Ontario Fire College and Regional Training Centres

One option is to enroll staff in training courses at the O.F.C. The O.F.C. is operated by the O.F.M.E.M. under the authority of the Ministry of the Solicitor General. Courses are scheduled on an annual basis and offered at the O.F.C. in Gravenhurst and various R.T.C.s across the province. Course fees are affordable, but given high levels of interest by all of the fire departments in Ontario, it can be challenging to enroll more than a few candidates in each program. This poses challenges for departments requiring training for a large number of candidates. This issue is further compounded as wait lists at the O.F.C. have increased for a variety of reasons in recent years. Courses generally run Monday to Friday, making overtime, travel costs and backfilling position requirements a notable budgetary consideration.

8.1.2 External or Third Party Training Organizations

The O.F.S. should also consider the use of retaining subject matter experts to provide training related to a particular N.F.P.A. standard, or specific training related to other department activities such as the use of the CrySis software. Because this training can be offered locally, there is greater scheduling flexibility, reducing overtime and eliminating travel costs.

Research indicates that municipalities should consider their due diligence in utilizing external organizations or individuals to provide training. There have been several inquests within the province over the past decade involving external or third party training providers. Recommendations from these inquests have identified the need for provincially regulated training qualifications and certification of external and third party organizations.

8.1.3 In-House Training

The O.F.S. should also consider the further training and qualification its own instructing staff to an N.F.P.A. standard and then have this staff resource deliver the training in-house. Curriculum development and the work associated with staying current with the standards is time consuming and staff intensive, requiring a level of expertise that may not be available within a fire department. However, the in-house option does provide opportunity for training to incorporate department specific considerations (e.g. O.G.s, community risks, etc.) as well as greater flexibility with respect to scheduling, reducing the need for overtime, backfilling and eliminating travel time.

Currently, the O.F.C. is exploring an option of approving learning contracts whereby fire services may train using O.F.C. course materials, which provides the benefit of certification ready courses without the cost of course development by the fire service and approval by the O.F.M.E.M.

8.1.4 Out of Province Training

Out of province learning opportunities provide an additional training option. While travel costs may make this option cost prohibitive, there are some courses that are not yet offered in Ontario (e.g., N.F.P.A. 1031 Level III, Plans Examiner I and II, N.F.P.A. 1035 Fire and Life Safety Educator, Level III, and N.F.P.A. 1041 Fire Instructor, Level III) that may be beneficial for staff.

8.1.5 Certification

The N.F.P.A. standards are intended to identify the required training for an individual to attain a recognized qualification related to a specific positions roles and responsibilities within the fire service. It is important for departments to note the distinction between “qualifications” and “certifications”. The N.F.P.A. training standards and related qualification **do not consider or require** certification. Certification is completed by third party organizations such as the International Fire Service Accreditation Congress (I.F.S.A.C.) or the Fire Service Professional Qualifications System (Pro-Board) which provide independent evaluation to measure individual performance as set by the standards. In Ontario, the legislation that requires an employer to train its staff is the Occupational Health and Safety Act.

Once qualification is obtained using one of options outlined in the sections above, the fire department may want to consider certification of their training curriculum. In circumstances where certification is desired, the curriculum must be approved by the O.F.M.E.M.’s Academic Standards and Evaluation (A.S & E.) section. Curriculum that has been approved by the A.S & E can then be used repeatedly to train firefighters in the same or other jurisdictions within the province. In Ontario, a fire department can contact the O.F.M.E.M. to schedule a certification evaluation to a particular N.F.P.A. standard. The certification process is then governed by I.F.S.A.C. and Pro-Board with the O.F.M.E.M. as the certifying organization in Ontario.

Some jurisdictions view the certification process as a method of evaluating and monitoring the effectiveness of internal training as well as to confirm the competency and proficiency of training participants.

In many cases, successful qualification to an N.F.P.A. standard for the knowledge portion requires a 60% score and the ability to satisfactorily demonstrate skills described in the standard. For certification, the knowledge score requirement is typically 70%, making it a more stringent evaluation of training and skills development. Determining the type of training or standards to be used and whether to qualify or certify staff are all considerations for the fire department.

In summary, fire services in Ontario have multiple ways to train and qualify staff, with certification regulated by the Province. It is important to note that while at this point in time neither qualification nor certification are required by legislation, recent inquests involving issues with fire prevention and firefighter training have highlighted the importance of qualification and certification as industry best practices. Revoked **Ontario Regulation 379/18 – Firefighter Certification** required training and certification for certain positions within a fire department. Although this regulation was recently passed then repealed, there is value to ensuring fire department staff are trained to a level of competency for the tasks they perform.

8.2 Existing Training Division Staff Resources

The existing staff resources within the training division responsible for meeting the key functions include a Deputy Fire Chief, Chief Training Officer (C.T.O.) and two Training Officers (T.O.). Fire Suppression Division staff play a key role in developing and coordinating the delivery of the firefighter training program. Within O.F.S., these roles include full-time firefighters in the role of Shift Training Instructor, Platoon Chiefs, and/or Captain. The Deputy Fire Chief oversees the delivery of training including providing leadership, direction, and support to the division including ensuring the delivery of training and development meets needs of all O.F.S. divisions. The subsections below provide an overview of the other division resources.

8.2.1 Chief Training Officer

Reporting to the Deputy Fire Chief, the responsibilities of the C.T.O. as detailed in the job description includes:

- Co-ordinating and managing all aspects of Fire Services Training Programs
- Preparing teaching plans and delivering lectures
- Conducting practical drills and exercises
- Performing on-going assessment of participants and providing feedback to trainees
- Assessing equipment, conducting and evaluating needs analysis of Fire Services and community
- Monitoring, evaluating and assessing programs and their impact
- Evaluating performance of instructors, preparing reports
- Setting, administering and marking examinations
- Preparing and revising draft standard operating guidelines
- Reviewing legislation and fire standards
- Assessing workload and assigning specific tasks
- Monitoring employee performance and providing feedback, providing guidance, technical advice and coaching

The C.T.O. oversees the training officers and operates on a Monday to Friday, eight-hour day schedule.

8.2.2 Training Officers

Within the Training Division, there are two full-time training officer positions. The training officers support the C.T.O. and delivery of training to the department staff. While there is currently no job description for the T.O. role, responsibilities are split across each T.O. as illustrated in **Table 20**. This includes, for example, the delivery of recruit training by both T.O.s with one each overseeing fire prevention and public education division training and the other communication division training. The T.O. positions operate on a four-day, ten-hour shift model. Through the stakeholder interviews with department staff held at the outset of the study it was noted that there appears to be a correlation between the advent of 24-hour shifts within fire suppression and increased turnover within the T.O. roles being experienced by the Training Division. This is a common challenge in full-time fire departments across the Greater Toronto Area and can result in

a challenge in finding qualified and interested candidates in the event of a vacancy. There is also a loss of legacy and institutional knowledge with position turnover.

Table 21: Training Officer Responsibilities

Training Officer 1	Training Officer 2
• Shifts 1A-2B • Pump Ops/Certification • Hazmat • Training Calendar (bi-monthly) • Fire Prevention and Public Education Division Training and Liaison • Equipment • Special Projects • Promotional Exams • Research and Development • Recruit Training	• Shifts 1B-2A • Technical Rescue • Red Cross • Training Calendar (bi-monthly) • Communication Division Training and Liaison • Equipment • Special Projects • Research and Development • Recruit Training

8.2.3 Platoon Chiefs

Platoon Chiefs within a fire department are typically directly responsible for ensuring that all firefighters including the company officers (captains) under their command receive the required training to sustain the skills and competencies commensurate with their individual and departmental roles and responsibilities.

O.F.S. platoon chiefs receive a monthly training package that outlines the subjects, number of hours, delivery method, and identified facilitator. As part of their assigned duties, platoon chiefs are required to review all training records of staff under their command and identify when training has not been completed and follow up with the captain and report to the training officer, as necessary. There is currently no operating guideline or policy in place that clarifies the role of the platoon chiefs in training records management.

8.2.4 Company Officers (Captains)

Company officers are directly responsible for delivery components of the department's training program, and ensuring that the training records of all firefighters under their

command are completed. This includes ensuring that all firefighters under their command are familiar with, and well trained on all apparatus, equipment and department guidelines/policies.

Company officers are also responsible to completing and submitting training records per **Operating Guideline No. 1-56 – Training**. Further discussion on training records management can be found in **Section 6.10 – Records Management/Information Technology.**

8.2.5 Shift Training Instructors

The use of on-duty fire suppression staff is a cost-efficient and operationally effective means of delivering training in a modern fire department. The Shift Training Instructor (S.T.I.) model provides assistance in delivering on-duty training, and specifically technical rescue training such as rope rescue, confined space rescue, hazardous materials response and ice/water rescue. This model has many positive outcomes. It is beneficial for operations staff as it enables professional development, succession planning, and also allows firefighters to share their passion for and knowledge of a specific emergency response scenario. As on-duty firefighters, the S.T.I.s are on the same schedule and platoon that they are training, resulting in the opportunity to provide consistent training to staff.

Within O.F.S., there are approximately 35 S.T.I.s, some of which are trained to N.F.P.A. 1041 Fire Service Instructor Level 1, and who deliver training related to:

- Rope rescue
- Confined space
- Trench/stabilisation
- Ice/swift water rescue
- Hazardous materials response
- Firefighter survival
- Auto extrication
- Elevator rescue
- Medical

It was identified as part of the internal consultation completed as part of the F.M.P. process that there is an opportunity to enhance the efficiency of the model by developing a clear vision for the program. This could include clear incorporation of the

goals and objectives of the S.T.I. program as part of a Comprehensive Annual Training Plan.

8.3 Existing Training Division Staff Training and Qualifications

The O.F.S. recognizes the importance and utilizes the N.F.P.A. Pro-Qual Standards as the foundation for informing the training program. The O.F.S. utilized the O.F.M.E.M. "Grandfathering Policy" to seek qualification for a number of department staff. A review of O.F.S. grandfathering letters of compliance identified that some fire department personnel qualified to N.F.P.A. 1041 Fire Service Instructor, N.F.P.A. 1021 Fire Officer, N.F.P.A. 1031 Fire Inspector, and N.F.P.A. 1001 Firefighter standards through this process.

Table 21 identifies the differences between the applicable N.F.P.A. 1041 Instructor Levels I, II and III, including the skills and competencies necessary to successfully achieve the requirements of each level. Each N.F.P.A. level is a progression of performance and capability.

Table 22: N.F.P.A. 1041 Standard

Training Level	N.F.P.A. 1041 Standard
Instructor I	A fire service instructor who has demonstrated the knowledge and ability to: • deliver instruction effectively from a prepared lesson plan, including instructional aids and evaluations instruments • adapt lesson plans to the unique requirements of the students and authority having jurisdiction • organize the learning environment so that learning and safety are maximized • meet the record-keeping requirements of the authority having jurisdiction
Instructor II	A fire service instructor who, in addition to meeting Instructor Level I qualifications, has demonstrated the knowledge and ability to: • develop individual lesson plans for a specific topic including learning objectives, instructional aids, and evaluations instruments • schedule training sessions based on overall training plan of authority having jurisdiction

Training Level	N.F.P.A. 1041 Standard
	• supervise and coordinate the activities of other instructors
Instructor III	A fire service instructor who, in addition to meeting Instructor Level II qualifications, has demonstrated the knowledge and ability to: • develop comprehensive training curricula and programs for use by single or multiple organizations, conduct organization needs analysis • design record keeping and scheduling systems • develop training goals and implementation strategies

Industry best practices indicate that an instructor should have successfully completed the N.F.P.A. training and level for a given standard in addition to the equivalent instructor qualification. For example, for a trainer to be qualified to deliver N.F.P.A. 1001 Level I training, they will have successfully completed N.F.P.A. 1001 Level I and N.F.P.A. 1041 Level I training. For a trainer to be qualified to deliver N.F.P.A. 1001 Level II training, they will have successfully completed N.F.P.A. 1001 Level II and N.F.P.A. 1041 Level II training.

Table 22 summarizes the current training and qualifications of the staff resources assigned to delivering and overseeing training programs to O.F.S. personnel.

Table 23: Current O.F.S. Training Division Qualifications

Position	N.F.P.A. 1041 Level I	N.F.P.A. 1041 Level II
Fire Chief	Yes	Yes
Deputy Fire Chief (Training)	Yes	Scheduled
Deputy Fire Chief	Yes	Yes
Chief Training Officer	Yes	Yes
Training Officer	Yes	Scheduled
Training Officer	Yes	Waitlist

At the time of writing this report, the Fire Chief, and one of the Deputy Fire Chiefs were trained to N.F.P.A. 1041 Instructor Level II with the second Deputy Fire Chief overseeing the Training Division scheduled to obtain N.F.P.A. 1041 Instructor Level II.

It was identified as part of this review that both Training Officers are trained to N.F.P.A. 1041 Level I with Level II training for one T.O. scheduled in 2020 and the other waitlisted. In addition, as mentioned, some of the S.T.I.s are trained to N.F.P.A. 1041 Level I and there is an objective to move towards requiring all staff who deliver training to be qualified to N.F.P.A. 1041 Level I.

The department should continue to implement training standards that require all staff who deliver training to be qualified to at least N.F.P.A. 1041 Instructor Level I, and all dedicated training division staff qualified to be qualified to N.F.P.A. 1041 Instructor Level II standards.

Operational Recommendation #25: That O.F.S. require all staff who deliver training to be qualified to a minimum of the N.F.P.A. 1041 Instructor Level I, and that all dedicated training division staff be qualified to the N.F.P.A. 1041 Instructor Level II standards.

8.4 Comprehensive Annual Training Plan

It is a legislated requirement of the City that a comprehensive annual training program be developed and delivered for the Fire Suppression Division. The annual training program must provide the required training to achieve and sustain the skills and competencies required to provide the Council approved service operations levels. As previously referenced in this F.M.P., there is an opportunity to update the Establishing & Regulating By-law to provide greater clarity in terms of service levels for O.F.S. This should include basic firefighting requirements as well as for specialized technical rescues which would then directly influence a training program. In addition to responding to established training levels, an annual training program must also address an employer's responsibilities as defined by the Occupational Health and Safety Act, specifically the Section 21 Guidance Notes.

In addition to responding to relevant standards, curriculum and health and safety requirements, a comprehensive annual training program should include the following core functions:

- Identification of training needs in relation to services provided
- Coordination/ scheduling of theoretical and practical training
- Monitoring and evaluation in relation to outcomes achieved

- Ongoing evaluation in relation to industry best practices and legislative requirements
- Oversight of program objectives and records management
- Ongoing assessment of program delivery for efficiency and electiveness

A best practice for ensuring a department is meeting these requirements is through the formulation and monitoring of an annual training plan. The O.F.S. currently utilizes a three-year training plan cycle to meet all legislated requirements, and job-related skills based on the O.F.S. levels of service and prioritizes the development and delivery of training to the Fire Suppression Division. The three-year training plan typically outlines four subjects for each month of the year and includes details on the applicable curriculum and operational guidelines. Incorporating the department's operational guidelines and policies should be a focus for all training sessions in addition to the use of recognized curriculum materials such as those available through I.F.S.T.A. and Jones and Bartlett.

To implement this plan, a monthly training package is issued to each Platoon Chief which outlines all required training for the month. **Policy No. 1-56 – Training** has been established to ensure that all uniformed staff are trained and company is maintained to effectively, efficiently, and safely execute all responsibilities. There is an opportunity to enhance the current three-year training plan approach by developing a consolidated Comprehensive Training Plan that includes performance goals and objectives. The proposed Comprehensive Training Plan should also include a clear vision and objectives for the Shift Training Instructor Program. To complement the proposed Comprehensive Training Plan, the department should develop a policy to identify training and qualification required to deliver training.

Operational Recommendation #26: That the O.F.S. consider developing a comprehensive training plan based on the N.F.P.A. Professional Qualifications Standards as presented within the proposed Fire Master Plan.

8.5 Specialized Rescue Training Programs

Oshawa Fire Services provides a number of different specialty emergency and rescue services which require specialized training. Some of these services include technical rescues which are considered those services that require a higher standard of training and competency beyond regular firefighter training. Although the frequency of incidents requiring technical rescues is lower than that of traditional firefighting, the technical and health and safety requirements are typically higher because of the increased risk to the first responders.

The three levels of training as established in **N.F.P.A. 1670 Standard on Operations and Training for Technical Search and Rescue Incidents** are:

1. **Awareness Level** – reflecting the minimum capability of organizations
2. **Operations Level** – reflecting the capability of organizations to respond, use equipment, and apply techniques to support and perform a technical rescue
3. **Technician Level** – reflecting the capability of organizations to not only provide the Operational Level services but also to coordinate, perform, and supervise a technical rescue

The following subsections present an overview of the existing services and training levels provided O.F.S., specialized fire rescue agreements, and operating guidelines that pertain to rescue services.

8.5.1 Specialized (Technical) Rescue Service Levels

Sustaining the high degree of training for all firefighters participating in specialized rescue responses, including qualifications in order to safely and efficiently provide these specialty technical rescue programs, requires substantial training resources. This includes proper training, equipment and opportunities for a range of specialty technical training resources such as hazardous materials response, confined space rescue and water/ice rescue. Sufficient numbers of personnel must also be trained, qualified, and available to deliver the specialty programs on a consistent basis, 24 hours a day, 7 days a week, 365 days of the year.

O.F.S. provides the following specialized rescue services:

- Water Ice / Water Rescue
- Hazardous Materials Response
- Confined Space Rescue
- Rope Rescue (high angle and low angle)
- Trench Rescue
- Vehicle (Auto) Extrication
- Elevator Rescue
- Building Shoring and Stabilization

In part because these resource implications are linked to the identified service levels, it is important that service levels for technical rescues are approved by Council and align with community risk (as explored in the Past Loss and Event History Profile of the Community Risk Assessment). **Table 23** presents the historical call volume for these services as identified in the C.R.A. for the period January 1st, 2014 to December 31st, 2019.

Table 24: Historical Specialized Rescue Incidents (Jan. 1, 2014 to Dec. 31, 2019)

Response Type	Number of Calls
High angle rescue (non-fire)	8
Low angle rescue (non-fire)	6
Persons Trapped in Elevator	67
Trench rescue (non-fire)	2
Vehicle Extrication	111
Water Ice Rescue	7
Water Rescue	10

As previously identified in the Administration Division review, there is an opportunity to update the E&R By-law. This should include establishing services levels for the O.F.S. as it pertains to technical rescues. As part of the data collection completed for this F.M.P., the rescue training programs and the service levels were identified by O.F.S. are presented in **Table 24**.

Table 25: Specialized Rescue Services Provided by O.F.S.

Program	Training/Service Level	Stations Trained
Water-Ice Rescue	Technician	Staff trained to either shored based or water based
Hazardous Materials Response	Technician	Various staff across stations
Confined Space Rescue	Technician	Station 3 Station 5
Rope Rescue	Technician	Station 3 Station 5
Trench Rescue	Technician	Station 3 Station 5
Auto Extrication	Technician	All Stations Trained in Auto Extrication
Elevator Rescue	Not Applicable	All Stations Trained in Elevator Rescue
Building Shoring and Stabilization	Operations	Station 3 Station 5

Where applicable, almost all rescue services are provided at a Technician Level. This includes all station staff trained to Technician Level for water-ice rescue and auto extrication. For confined space rescue, rope rescue, and trench rescue, staff at Stations 3 and 5 are primarily trained to Technician Level while other staff would be trained to an Awareness or Operations Level. While the Hazardous Materials unit is housed at Station 4, various staff across all stations are trained to the Technician Level for hazardous materials response.

Operational Recommendation #27: That consideration be given to referencing the O.F.S. specialized rescue service levels in the proposed updated Establishing and Regulating By-law 30-2001.

8.5.2 Ice-Water Rescue

Ice-water rescue services have been the subject of much discussion within the fire service as a result of a May 2017 Coroner's inquest into the death of two firefighters during training exercises. This inquest recommended that all ice/cold swift water rescue services training be put in abeyance until such time as the recommendations of the jury were addressed. The findings of the inquest highlight the need for stringent training requirements for firefighters to facilitate any type of rescue where water or ice is present. Information provided to fire departments across the Province by the O.F.M.E.M. through Communique 2017-06, dated October 10, 2017, which encouraged municipalities to assess their delivery of these types of specialized rescue services and specifically their respective Establishing and Regulating By-law. The presence of these elements identifies conditions that warrant very careful consideration of the services provided by any fire department.

As part of the review completed for this F.M.P, it was identified that the operational guidelines and the current Establishing and Regulation By-law, reflect the findings of the Coroner's Inquest.

They require that all staff involved be fully trained and qualified to conduct water and ice rescue services, and that they be tethered at all times to a fixed point such as shore or a boat.

Through consultation with senior department staff in regards to the department's current Surface Water/Ice Search and Rescue service level training and operations, emphasis was placed on the importance of ensuring the current training and qualifications of all firefighters participating in this type of specialized rescue were consistent with the applicable N.F.P.A. standards, such as N.F.P.A 1006 and 1670 and other applicable training requirements. In our view, Training Note #TRA 46 Water/Ice/Fast/Flood Rescue is comprehensive and reflective of best practices. It provides clear direction to all responding personnel regarding the conditions under which they are to proceed as either rescue or recovery mode; the rescue evolutions sequence; rescue procedures; equipment lists; equipment cleaning and maintenance requirements; information regarding hypothermia; command checklist; and training evolutions and illustrations

8.5.3 Specialized Fire Rescue Agreements

As discussed in **Section 6.6.5. - Specialized Rescue Agreements**, O.F.S. provides specialized rescue services to the Township of Uxbridge, Town of Whitby, Township of Scugog and Township of Brock. It is therefore important to note that O.F.S. responds to specialized rescue calls outside of the City of Oshawa in addition to which occur within the municipal boundary. Two of the agreements identify that O.F.S. are to be trained to the technician level.

As long as the O.F.S. provides this level of service within Oshawa, and under agreement outside of its boundaries, it is in the City's best interest to ensure sufficient staff are trained, qualified and equipped to perform specialty technical rescue. Ensuring personnel are competent through knowledge, training and/or experience is the City's responsibility as the employer under the O.H.S.A. Ensuring the level of training meets the level of service negotiated under the terms of an agreement reduces risk to both the first responder and the victim(s), while also limiting the liability to the City in any event. This requires sufficient human resources and equipment to provide the determined level of service at all times.

In addition, the agreements with the Town of Whitby and the Town of Uxbridge refer to the provision of building shoring and stabilization at a Technician Level. As identified in the above section, O.F.S. provides Building Shoring and Stabilization services reflecting an Operations Level. Additional equipment would be required to provide Technician Level building collapse stabilization services. Through the review conducted for the F.M.P., O.F.S. has identified the need to review and update the specialized fire rescue service agreements to reflect the service levels provided by O.F.S.

Operational Recommendation #28: That the current agreements pertaining to the provision of specialized fire rescue services to other municipalities be reviewed and updated to reflect the service levels provided by the O.F.S.

8.5.4 Operating Guidelines/Policies

Operating guidelines and policies can be used to guide operations, outline qualifications, and act as a training resource. **Table 25** lists some of the guidelines and policies applicable to the specialized rescue training programs (excluding those specific to tools and equipment).

Table 26: Specialized Rescue Program Guidelines/Policies

Specialized Rescue Program	Applicable Guideline/Policy
Water-Ice Rescue	• O.G. No. 1-#80 – Water/Ice/Fast/Flood Rescue (Revised 2019-03-21) • O.G. Training Note #Tra 46 – Water/Ice/Fast/Flood Rescue (Revised 2016-02-25)
Hazardous Materials Response	• O.G. No. 1-#33 – Hazardous Materials (Revised 2018-05-08)
Confined Space Rescue	• O.G. No. #2-14 – Technical Rescue/Confined Space Rescue (Revised 2015-12-15) • O.G. Training Note #Tra 41 - Confined Space Rescue (Revised 2016-12-05)
Rope Rescue	• O.G. No. #2-40 – Technical Rescue / Rope Rescue (Revised 2018-08-20)
Trench Rescue	• O.G. No. #2-34 – Technical Rescue / Trench (Revised 2012-06-04)
Auto Extrication	• O.G. No. 2-08 – Motor Vehicle Fires and Accidents (Revised 2011-11-25)
Elevator Rescue	• O.G. No. 2-62 – Elevator Rescue (Issued 2019-10-03)
Building Shoring and Stabilization	• O.G. No. 1-#90 – O.F.S. Shoring/Stabilization Guideline (Issued 2014-02-11)

These guidelines/policies reflect variability in the format and content. For example, O.G. No. #2-40 – Technical Rescue / Rope Rescue includes a section on training and a section on technical rope rescue instructors which specifically refers to the importance of competency and training. It also refers to the applicable N.F.P.A. training standards. Similar sections are not included in all guidelines/policies. Building on the recommendation to review and refine the policies and procedures as discussed in **Section 6.7 – Operating Guidelines, Procedures and Policies**, there is an opportunity to review all operational and training related guidelines to provide consistency in the references to required training and qualifications. This should include reference to applicable training levels and N.F.P.A. Standards.

8.6 Company Officer Training

The fire service is a paramilitary organization that relies on a rank structure to manage the roles and responsibilities of the organization and the operational services it delivers. This structure needs to include an appropriate span of control in order to be efficient and effective. A sufficient number of Company Officers are required to ensure the function of incident command can be implemented at all emergency scenes, and depending on the incident action plan, have sufficient additional officers to facilitate other roles required for successful incident command.

Municipalities are required to ensure that a sufficient number of supervisors (officers) are trained to oversee the workforce. Within the Occupational Health and Safety Act, Part III, Duties of Employers and Other persons, Section 12, subsection (2) states that: "Without limiting the strict duty imposed by subsection (1), an employer shall, "(c) when appointing a supervisor, appoint a competent person".

As an employer, the City is legislated by this section of the O.H.S.A. to ensure that all supervisors, which includes the role of incident commander, be competent.

The O.H.S.A. defines a "competent person" to mean a person who:

a) "is qualified because of knowledge, training and experience to organize the work and its performance
b) is familiar with this Act and the regulations that apply to the work
c) has knowledge of any potential or actual danger to health or safety in the workplace"

Within the O.F.S., a supervisor would be defined as any designated Chief Officer such as the Fire Chief, Deputy Fire Chiefs, Platoon Chiefs and Chief Training Officer, and any designated Company Officer such as Captains, Acting Captains or acting officers. Industry best practices reflect that a company officer training program should be ongoing as an element of a broader Officer Development Program. This strategy further supports succession planning and career development for future senior officers.

The **N.F.P.A. 1021 - Standard for Fire Officer Professional Qualifications** is a recognized best practice for this type of training. The O.F.S. recognizes the value of officer training programs and continues to access company officer training as provided through the Ontario Fire College.

To broaden the access to company officer training, in 2019 O.F.S. piloted an e-learning program through Navigate 2 Advantage Access to assist with the delivery of theory-based components for N.F.P.A. 1021 Level I Company Officer training. This e-learning was recently fully adopted and embedded into the department's company officer training program. The program also includes a formal mentorship process, whereby once a member is qualified as an acting captain, they function in the role of captain while being shadowed by their crew captain. This formal mentorship provides training opportunities related to dispatch and Standard Incident Reporting.

With the support of the Human Resources Department the O.F.S. has recently been including designated officers in the corporate TEAMS training program including participating in the Harvard Manage Mentor Program. This strategy supports both Company Officer development and succession planning.

As part of the review completed for this F.M.P., it was identified that there is currently no formal guideline or description of the Company Officer Training Program. Consideration should be given to incorporating details of the Company Officer Training Program, including pre-qualifications and skills as well as competency requirements within the proposed Comprehensive Training Program.

8.7 Incident Command Training

Incident command training is considered a core element of company officer training. Ontario Fire Service Section 21 Advisory Committee **Fire Fighters Guidance Note #2-1 – Incident Command** reflects the importance of incident command in relation to the outcome of emergency scene operations, and the skill development of the Officer so they can serve as an Incident Commander.[21] Guidance Note #2-1 describes the first action of employers to train all personnel in incident command, and requires the use of an Incident Command System (I.C.S.) during all incidents.

Incident Command Systems are an industry best practice designed to positively influence the outcome of an emergency scene operation and the health and safety of firefighters.

[21] Guidance notes to protect the health and safety of firefighters are developed by the Ontario Fire Service Section 21 Advisory Committee and distributed by the Ministry of Labour, Training, and Skills Development.

Incident command should be established by the first arriving officer and be sustained until the emergency is mitigated. The Incident Commander (I.C.) is responsible for all aspects of managing the emergency incident including developing an "Incident Action Plan" and managing all operations on scene. This includes:

- Establish immediate priorities, especially the safety of responders, other emergency workers, bystanders, and people involved in the incident
- Stabilize the incident by ensuring life safety and managing resources efficiently and cost effectively
- Determine incident objectives and strategies to achieve the objectives
- Establish and monitor incident organization
- Approve the implementation of the written or oral Incident Action Plan
- Ensure adequate health and safety measures are in place

Oshawa Fire Services responds to a wide range of emergency incidents, and recognizes the importance of incident command. Incident command is closely related to company officer training and succession planning, as the first arriving Oshawa Fire Services company officer assumes the role of I.C. Incident command procedures and operating guidelines have been established for the first arriving officer to assume incident command, and ensure tactical priorities are established.

The department appears to have a range of guidelines and procedures in place in regards to incident command:

- **O.G. #1-72 – Incident Command** (revised 2008-09-19)
- **O.G. #1-87 – Establishing Incident Command** (revised 2017-01-10)
- **O.G. #2-58 – Incident Command** (issued 2017-03-27, still marked as Draft)
- **O.G. Training Note #TRA 35 – Incident Command, Firefighter Accountability, and Rapid Intervention Teams** (revised 2019-03-20)

As part of the review completed for this F.M.P., it was identified O.G. #1-87 – Establish Incident Command is the complete guideline in place in regards to incident command. The previously discussed review and update of all O.F.S. policies and guidelines provides an opportunity to rescind any outdated guidelines.

Incident command training is currently delivered through an O.F.S. specific training program. This training program is guided by the previously referenced training note and predominantly consists of scenario-based training.

It is noted that the training note does not outline the requirements for successful completion of incident command training (for example, the number of hours doing scenario-based exercises). Consideration should be given to incorporating details of incident command training including pre-qualifications and skills and competency requirements within the proposed Comprehensive Annual Training Program.

8.8 Respiratory Protection Program

Section 21 Guidance Note #4-9 Respiratory Protection Program identifies that employers should develop and implement a respiratory protection program and appoint a program administrator. The Guidance Note also references what a respiratory protection program should address such as: program administration, documentation, and evaluation; program administrator training; training of persons administering fit testing; and selected and use of respirators.

O.F.S. strives to meet the intent of the Guidance Note by having a number of guidelines in place that pertain to respiratory protection including:

- **O.G. #1-4 – Self-Contained Breathing Apparatus**
- **O.G. #1-73 – S.C.B.A. Technicians**
- **O.G. #2-33 – Air Bottle Refill**

Many findings within this F.M.P. identify the opportunity to introduce enhanced due diligence practices in areas such as records management, training, and comprehensive operating guidelines. There is an opportunity to review and update the Respiratory Protection Program into a comprehensive operating guideline to ensure that it is current and that the requirements of the program are being met.

8.9 Training Facilities

Training facilities are vital to delivering quality practical training on an ongoing basis, ensuring fire suppression staff have the necessary skills to handle all emergency incidents. Historically, as identified in the 2013 F.M.P. report, the O.F.S. had a dedicated training centre. The previous training centre was utilized by the O.F.S. approximately 100 days of the year. It was also used by other organizations and departments including Durham College's Pre-Service Firefighter program, Clarington Emergency and Fire Services, and Oshawa Licensing.

Amenities at the facility permitted for training related to live fires and flashovers, industrial fires, search and rescue, automobile extrication, pump operations, and rope rescue. This training centre reached the end of its lifecycle in 2006 and was closed with no plan for replacement.

For over a decade, O.F.S. has operated without a dedicated training facility, conducting training operations at multiple stations and with support from community partners as illustrated in **Table 26.**

Under the leadership of the Training Division the O.F.S. has developed an extensive list of professional relationships with partners in the community to access additional locations for training, such as apartment buildings, industrial occupancies and other public facilities.

Table 27: O.F.S. Training Locations and Amenities

Location	Training Amenity
AG Simpson	Technical Rescue Training
Jims Towing	Automobile Extrication
Durhamway Bus Lines	Vehicle Extrication and Stabilization
Tribute Communities	Trench Rescue Training
Northview REIT	Survival Training
Oshawa Executive Airport	Draeger Fire Prop
Delta Rae Homes	Search & Rescue, Fire Cause Determination
Delpark Community Center	Water Rescue Training

8.9.1 Live Fire Training

The purpose of live fire training is to provide realistic fire simulations under controlled conditions allowing for safe suppression training. Live fire training ensures that all suppression staff have sufficient exposure to the conditions that a firefighter may encounter in real life including simulated heat, humidity, restricted vision, and smoke conditions. This type of training also enhances the understanding of fire behaviour and smoke conditions in certain environments as they may relate to conditions such as “flashover”. Live fire training is especially pertinent to those departments with few fire-related calls. N.F.P.A. Standard 1403, Standard on Live Fire Training Evolutions sets out the requirements for departments to provide safe and effective live fire training exercises for suppression personnel. N.F.P.A. 1041 Level II is the recommended training standard for those who will be performing the roles of Live Fire Instructor and Life Fire Instructor in Charge. Based on our review of the training qualifications within the O.F.S., the Fire Chief, one of the Deputy Fire Chiefs and Chief Training Officer are the only individuals who currently have this level of training.

As mentioned previously, the Deputy Fire Chief responsible for the Training Division and one Training Officer are scheduled to complete this training during 2020, while the other Training Officer is on a waiting list. Until this training level is completed, it would be in the best interest of the O.F.S. to ensure only individuals trained and qualified to perform live fire training carry out these evolutions.

O.F.S. recognizes the importance of live fire training and as part of its training program conducts live fire training twice annually (facilitated through Shift Training Instructors). In the absence of a dedicated training facility, live fire training for O.F.S. is conducted through the use of a Draeger fire prop which is located at the Oshawa Executive Airport.

This prop is shared between O.F.S., Whitby Fire and Emergency Services, Clarington Emergency and Fire services, and Durham College. Without a dedicated municipally-owned training centre, training is subject to the availability and schedules of the facilities. Additional limitations result from the design of the current prop which is an 8 x 20 foot container; the configuration and design of this prop results in limited capacity to simulate live fire events.

Recognizing this gap in the ability to provide training opportunities that align with the risks within the community, O.F.S. has been actively exploring opportunities to temporarily site a new live fire training facility at the airport. Being able to provide this training locally eliminates the need for personnel and apparatus to travel outside of the City, minimizing overtime and backfilling requirements.

In our experience, many jurisdictions make their training facilities available to other fire and emergency organizations to recoup portions of capital and operating costs. With the pre-service firefighter program being offered in such close proximity, there is potential for type of mutually beneficial partnership

The 2018 F.M.P. Report included the following recommendation that the O.F.S. "Provide a business case for the acquisition of land and development of a Fire Training Facility"[22]. In our view, a dedicated training facility would provide the O.F.S. with the opportunity to deliver quality practical training for all members of the department to meet the needs of new recruits and also the ongoing need to train using live fire.

It should be noted that operating a training facility will increase the workload of the training division, especially if it is offered to external parties.

Operational Recommendation #29: That the O.F.S. develop a business case that includes research into partnership opportunities for the development of a permanent training facility within the City of Oshawa that is capable of live fire training.

[22] Oshawa Fire Services 2018 Fire Master Plan & Community Risk Assessment, Recommendations page 92 #11

8.10 Online Training

Access to online training programs can provide greater flexibility in delivering comprehensive training programs, and allow firefighters to train in their stations enhancing their availability to be readily liable to respond to an emergency. The O.F.S. has recognized the benefit of online training material to facilitate training to support a multitude of schedules and learning styles, and improving accessibility to training materials. Currently O.F.S. uses the e-learning platform Navigate 2 Advantage Access (through Jones and Bartlett) for N.F.P.A. 1021 Company Officer Level I training and for the 2nd Class Driver/Operator Program. The e-learning platform incorporates lectures and quizzes, which evaluate the learner's progress. Students utilize the required textbook throughout the duration of the course and complete workbook activities. The department also recently introduced the use of the e-learning platform for technical rescue training and hazardous materials response. This online platform content is based on applicable N.F.P.A. Standards. In addition, the training division manages a private YouTube channel and develops videos for training purposes, primarily related to new equipment familiarization, including use, operation, and maintenance. The department should continue to explore opportunities to expand the use of online training.

8.11 Division Records Management

Records management is an ongoing challenge for the fire service as fire departments use different methods of storing and updating records. As discussed within the **Administration Division** Review, software tools are directly related to a municipality's due diligence for maintaining accurate and current records for all activities within a department, including training records for firefighters. Currently there is no dedicated records management system in place to manage training records.

The current approach to records management for the training division includes a cumbersome, manual process requiring captains to email training records to a dedicated department address which are then inputted into an Excel sheet. The manual nature of this process can easily result in inconsistencies, errors, and gaps. To address this important challenge within the department, the City should consider obtaining a dedicated, digital records management system for O.F.S. training records.

A dedicated records management system will provide the O.F.S. with a mechanism to track course registrations and qualifications for all personnel and eliminate the duplication of records. A records management system allow for easy monitoring of course completions and gaps. Industry best practices reflect that the records management system process be contained within a standard operating guideline or department policy to help ensure consistency and clarity.

As recommended in the **Administration Division** Review, O.F.S. should develop a department policy consistent with the City's Retention By-law 45-2002 that describes the required records management practices for all divisions, including training. Regardless of what records management system or processes are in place, the department would benefit from a policy that clearly outlines processes and accountability in regards to training records.

8.12 Training Committee

Establishing a training committee within a fire department can help utilize department resources and prioritize training goals. The use of staff committees representing a wide range of skills, competencies, experience and authority is a recognized industry best practice. Of importance to this strategy is the development of clear terms of reference to ensure the mandate of the committee is clear.

Through the interview process of this F.M.P., we learned that the O.F.S. has recently been using an informal committee to assist in the review and update of department operating guidelines. At this time, this committee is defined as informal as there is no defined, or approved terms of reference that reference the roles and responsibilities of this committee and its membership. While the committee is still in its infancy, the intent is to meet on a monthly basis to discuss and review operational guidelines.

Committee members are expected to review the operational guidelines in advance of the meeting to ensure the efficiency of the meeting as well as promote time for fulsome discussion. Management has agreed to provide administrative support for these committee meetings.

Based on our research and knowledge of industry best practices it would be beneficial for the O.F.S. to develop a formal terms of reference for this committee.

During the process to develop this terms of reference consideration should also be given to either expanding the roles and responsibilities of this committee, or creating another committee that could be assigned the role of supporting the Training Division in developing the proposed Comprehensive Training Program. Including representation from stakeholders involved in delivering the department's training program such as Platoon Chiefs, Captains and Shift Training Instructors may be beneficial to informing the development and implementation of the program.

8.13 Training Division Summary and Recommendations

This F.M.P. identifies a number of areas where opportunities currently exist to further enhance the efficiency and effectiveness of existing staff resources such as training firefighters to the Fire Inspector I, and Public Educator Level I qualifications. The analysis within this section illustrates the wide range of training initiatives and programs that this division is currently supporting including those required to comply with the City's legislative health and safety requirements, and those required to support the department's current fire suppression services. This F.M.P. also highlights the need for the department to enhance its records management technology, and specifically its process of tracking and monitoring firefighter training. All of these items are going to require the City to consider further financial investment in the current training of staff resources across the department in the short-term to sustain and enhance the capabilities of all existing staff resources.

As a result of the review of the Training Division, the following recommendations are presented for Council's consideration and approval:

Operational Recommendations

- **Operational Recommendation #25**: That O.F.S. require all staff who deliver training to be qualified to a minimum of the N.F.P.A. 1041 Instructor Level I, and that all dedicated training division staff be qualified to the N.F.P.A. 1041 Instructor Level II standards.
- **Operational Recommendation #26**: That the O.F.S. consider developing a comprehensive training plan based on the N.F.P.A. Professional Qualifications Standards as presented within the proposed Fire Master Plan.

- **Operational Recommendation #27**: That consideration be given to referencing the O.F.S. specialized rescue service levels in the proposed updated Establishing and Regulating By-law 30-2001.
- **Operational Recommendation #28**: That the current agreements pertaining to the provision of specialized fire rescue services to other municipalities be reviewed and updated to reflect the service levels provided by the O.F.S.
- **Operational Recommendation #29**: That the O.F.S. develop a business case that includes research into partnership opportunities for the development of a permanent training facility within the City of Oshawa that is capable of live fire training.

9.0 Fire Suppression Division

To comply with the Fire Protection and Prevention Act, 1997 the City of Oshawa is required to **"provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances"**[23] which includes making an informed decision regarding the level of fire suppression services to be provided. The recently adopted O. Reg. 378/18: Community Risk Assessments was developed to assist Council in this decision making process and specifically requires that Council **"use its community risk assessment to inform decisions about the provision of fire protection services"**[24] including the level of fire suppression services to be provided.

The delivery of fire suppression services is recognized by the O.F.M.E.M. Comprehensive Fire Safety Effectiveness Model as the **"Third Line of Defence"**. This model also recognizes that **"due to a variety of influences, not all communities are capable of, or should consider delivering the same level of service"**[25]. To assist Council in this decision making process the methodology presented within this section considers the **"Risk Outcomes"** identified by the companion Community Risk Assessment, the applicable Public Fire Safety Guidelines (P.F.S.G.s) authored by the O.F.M.E.M. and current industry best practices as presented within the applicable National Fire Protection Association standards.

The analysis within this section has also considered the Geographic Information System Emergency Services Response Capabilities Analysis report (2018 I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) at the request of the Oshawa Professional Firefighters Association (O.P.F.F.A.), Local 465.

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[23] Fire Protection and Prevention Act, 1997, Part II Responsibility for Fire Protection Services, Municipal Responsibilities, Section 2. (1) (b)

[24] Ontario Regulation 378/18 Community Risk Assessments, Mandatory Use, Part 1 (B)

[25] Office of the Fire Marshal and Emergency Management, Public Fire Safety Guideline 04-01-12 Selecting Fire Suppression Capability

This report includes six recommendations related to the current and future delivery of fire suppression services within the City of Oshawa. The 2018 I.A.F.F. Report recommendations will be referenced where they have informed the analysis within this section.

9.1 Existing Fire Stations

Oshawa Fire Services currently operates from six fire stations located strategically throughout the City. All O.F.S. fire stations are equipped with the needs of full-time fire crews, such as apparatus bays, kitchen, dormitory, ready-room, washrooms/showers/lockers, fitness equipment and parking. In 2018, each of the six stations were outfitted with new backup power generators, to provide continued operations through events of power loss. This section of the Fire Master Plan provides an overview of the existing stations.

9.1.1 Fire Station 1

Fire Station 1 is located at 199 Adelaide Avenue West. It is a two-story station constructed in 1981, and currently houses one front-line firefighting crew and a Platoon Chief.



Station 1 functions as O.F.S. Headquarters with workspace for the Administration Division, Communications Division and some Fire Prevention staff (Chief Fire Prevention Officer and four Fire Prevention Inspectors). This includes office workspace for the Fire Chief, two Deputy Fire Chiefs, communications, and fire prevention staff. The Communications Division is located within a separate and secure space within the station. The station is currently at maximum capacity for office space. As identified within this Fire Master Plan, there is a need to provide office space for the new positions of Assistant Deputy Chief and Communications Officer. Modifications would be required at Station 1 to provide these workspaces.

The 24,000 square foot building is an older facility and, as such, modifications have been made over time to retrofit the facility to meet the evolving needs of a modern fire service such as retrofitting washrooms/showers for female firefighters. The kitchen is scheduled for renovation in 2020. Station 1 has three drive-through bays, with two currently used to store fire apparatus. The additional bay, originally an old mechanic bay, now holds a large wooden structural training prop. A prewash, extractor, and dryer are located off the apparatus bays for bunker gear maintenance. Station 1 also houses an S.C.B.A. cascade fill system. Firefighter protective clothing (bunker gear) storage is contained within a separated room, however, it does not appear that the room is adequately ventilated. Underground parking is available at Station 1 for staff, and additional parking is located adjacent to the building.

Operational Recommendation #30: That consideration be given to providing sufficient capital funding to complete alterations to Fire Station 1 to accommodate additional office space as presented within the proposed Fire Master Plan.

9.1.2 Fire Station 2



Fire Station 2 is located at 1111 Simcoe Street South. It is a 9,750 square foot two-storey building with a basement, and was constructed in 1982. The station houses two on duty firefighting crews operating a front-line pump and aerial apparatus.

Station 2 has two drive-through apparatus bays, outfitted with a direct-connect system to control diesel emissions. The bay doors were recently replaced at this station. Bunker gear storage is located in unventilated rooms without doors off the apparatus bay. There is additional storage at Station 2 for the inventory of O.F.S. bunker gear. Parking at Station 2 is limited.

9.1.3 Fire Station 3



Fire Station 3 is a one-storey building constructed in 1975, located at 50 Beatrice Street East. The 9,000 square foot station houses two firefighting crews that operate a front-line pump and aerial. The tanker is also stored at this station. When this unit is required for a call it is operated using two of the staff from the aerial unit. The facility includes office space, renovated kitchen, dormitories (at maximum capacity with the two crews), fitness area, lockers, washrooms, and adequate parking.

Station 3 has two drive-through apparatus bays, outfitted with a direct-connect system to control diesel emissions. Bunker gear storage is located off the apparatus bays in unventilated rooms without doors to separate the rooms from the apparatus floor.

9.1.4 Fire Station 4



Fire Station 4 is located at 50 Harmony Road North. It is a two-storey 6,500 square foot building opened in 1981. The station currently operates with one firefighting crew and a pump apparatus. This station is also the base for the HAZMAT command trailer, team and equipment.

Station 4 includes office space, renovated kitchen, dormitories, washrooms, two drive-through bays outfitted with a direct-connect diesel emission control systems, and adequate parking. Fitness equipment is accommodated in two areas, as space allows. Bunker gear storage is located off the apparatus bays in unventilated rooms without doors. There are additional areas within the bays used for fire hose maintenance and storage.

9.1.5 Fire Station 5



Fire Station 5 is located at 1550 Harmony Road North. It is a one-storey building constructed in 2006. The 17,900 square foot station currently operates with one firefighting crew who operate a front-line pump apparatus. A rescue apparatus is also housed at this station. If the Suppression Division is operating at two above minimum staffing, the rescue apparatus is staffed with those personnel. The Station also accommodates workspace for the Mechanical Division, Training Division, and some Fire Prevention / Public Education Division staff (Fire Prevention Education Officer and two Fire Prevention Inspectors.

Station 5 has offices, kitchen, dormitories, and washrooms, and four drive-through bays. A classroom provides training space within the station. There is also a tower used for high-angle rescue training. Two of the bays are used by the Mechanical Division for fleet and equipment maintenance. The bays are outfitted with a ceiling mounted air filtration system to control diesel emissions, as well as direct capture systems within the Mechanical Division bays. Bunker gear is stored off the apparatus bays in a negative pressure ventilated room with a door. This station is identified as one of the two gear washing stations, including a pre-wash, washer/extractor, and dryer used for the laundering and maintenance of bunker gear. This facility also includes air fill equipment and supplies. There is dedicated space in the bays for the Mechanical Division to do all fleet and equipment maintenance and additional storage for mechanical within the loft area. Additional rooms include a self-contained breathing apparatus (S.C.B.A.) maintenance room, and tool room. The built in generator at this station is fueled by natural gas.

9.1.6 Fire Station 6



Fire Station 6 located at 2339 Simcoe Street North. It is a one-storey building constructed in 2016, the newest of all the O.F.S. stations. The station was designed and built with materials and architectural style that complement the historical legacy of Windfields Farms, the property upon which the station and local community is located. The 10,675 square foot facility currently operates with one firefighting crew who operate a front-line pump apparatus. It also provides workspace for three Fire Prevention Division personnel (one Fire Prevention Officer and two Fire Prevention Inspectors).

Components of Station 6 include office space, living quarters (dorms, kitchen, ready-room, washrooms, showers, fitness area, etc.), and two drive-through bays outfitted with a ceiling mounted air filtration system to capture and control diesel emissions. As the facility is new, the station components reflect the needs of a modern full-time fire service, including gender separated facilities. Bunker gear storage located off the apparatus bays is separated and includes negative pressure ventilation. A decontamination shower is located on the apparatus floor. Adequate parking is provided outside the station. The built in generator at this station is fueled by natural gas and can be accessed from outside the station.

9.1.7 Fire Station Diesel Emissions

Within the fire service there is a growing recognition of health and safety concerns related to diesel exhaust emissions from major apparatus stored within a fire station. O.H.S.A. Section 21 Firefighter Guidance Note 3-1 – Reducing Exposure to Diesel Exhaust requires that employers must “make sure the fire station is adequately

ventilated by either natural or mechanical means so that the atmosphere does not endanger the health and safety of workers"[26].

This should include consideration of the installation and use of a diesel exhaust system for the apparatus floors of all fire stations. The exhaust system may be a direct capture type exhaust system (or 'direct connection' system) that connects diesel exhaust hose lines to the exhaust pipes of individual vehicles or alternatively ceiling-mounted exhaust systems. In our experience, the ceiling-mounted diesel exhaust systems are more effective. The direct connection systems are prone to human-error if they are not connected to the vehicle exhaust pipes at all time while in the station. The ceiling, mounted systems are more consistent with current industry best practices. The O.F.S. has recognized the health hazards of diesel emissions and has implemented direct capture or air filtration systems in all stations.

O.H.S.A. Section 21 Guidance Note 4-8 Care, Maintenance, Inspection and Replacement of Structural Firefighting Personal Protective Clothing (bunker gear) reference the importance of storage of this equipment. Municipal best practices for bunker gear storage reflects the use of separated, ventilated (exhausted to outdoors) storage rooms. Bunker gear at the older O.F.S. Stations (Stations 1 through 4) is not stored according to these recommended practices. Bunker gear at Stations 5 and 6 is stored separately and ventilated according to the modern municipal best practices.

The recommended practice of separated and ventilated bunker gear storage is considered critical to the life span of the gear and the long term health of the firefighters. It protects the bunker gear from exposure to diesel emissions, which can cause deterioration of the equipment over time. The bunker gear itself, after use at active calls, can also release toxins into the air of the station. It is therefore recommended that station revisions be considered to provide separate and exhausted storage for bunker gear within the fire station.

Operational Recommendation #31: That consideration be given to upgrading all existing Fire Stations to provide separation and ventilation for firefighter protective clothing as described within the proposed Fire Master Plan.

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[26] Occupational Health and Safety Act, Section 21 Firefighter Guidance Note 3.1 Reducing Exposure to Diesel Exhaust.

9.1.8 Station/Facility Repair and Renewal

One of the Deputy Chiefs liaisons with the City's Facilities Management Services for approved capital projects. Historically there have been challenges with getting capital improvements completed within the forecasted schedules, which can lead to further maintenance issues within the stations.

General facilities maintenance is the responsibility of the O.F.S. including maintenance renovations, and failures to building systems. Standard Operating Guideline **1-10 Station Maintenance** outlines established schedules and area responsibilities for station maintenance.

The facilities repair and maintenance is recorded in the database management system and assigned a priority. Standard procedure for reporting, managing, and tracking facility repairs is established in standard operating procedure **PR-49 Facility Repair system**.

9.2 Fire Suppression Guidelines and Standards

Within Ontario, there is no specific legislated standard that a community must achieve with regard to the type of firefighter (e.g. full-time, part-time or volunteer), number of firefighters, number of fire stations or the level of fire suppression services that must be provided. As referenced in the previous section of this plan the F.P.P.A. requires that the level of fire suppression services within the municipality is the role of the municipal Council. To assist municipal councils in this decision making process the F.P.P.A. assigns powers to the Office of the Fire Marshal and Emergency Management that include responsibilities **"to issue guidelines to municipalities respecting fire protection services and related matters"**[27]. The O.F.M.E.M. complies with this requirement through the issuance of Public Fire Safety Guidelines (P.F.S.G.), Fire Marshal's Directives, Technical Guidelines, Communiques and other forms of communication. At this time all P.F.S.G. are under review but have been authorized by the O.F.M.E.M. for continued use for reference purposes. Where applicable P.F.S.G.s

[27] Fire Protection and Prevention Act, 1997 Part III Fire Marshal, Powers of the Fire Marshal Section 9.(1) (d)

have been utilized within this F.M.P. to inform the analysis and to provide supporting reference documents.

As referenced throughout this F.M.P., in 2013 the Province of Ontario adopted the N.F.P.A. Pro-Qual training standards. N.F.P.A. standards have now become the foundation of firefighter training programs, professional qualifications and reference documents for firefighter safety as contained with the O.H.S.A. Section 21 Guidance Notes for the fire service.

The use of N.F.P.A. fire suppression standards **are not** a legislated requirement for the delivery of fire suppression services within Ontario. However, they provide a recognized industry best practice that is supported by industry leading research and broad stakeholder input into their development. Within this F.M.P. the **N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition)** has been utilized to inform the fire suppression service level analysis. This strategy is consistent with the I.A.F.F. Report with the exception that the I.A.F.F. Report was developed based on the previous 2016 Edition.

9.2.1 P.F.S.G. 04-08-10 Operational Planning: An Official Guide to Matching Resource Deployment and Risk

P.F.S.G. 04-08-10 - Operational Planning: An Official Guide to Matching Resource Deployment and Risk was released by the O.F.M.E.M. in January 2011 and includes a "**Critical Task Matrix**" (C.T.M.) to assist municipalities in determining the level of fireground staffing capabilities based upon low, moderate, high and extreme risks. The C.T.M. is defined by the O.F.M.E.M. as **"The Critical Task Matrix is based on the Incident Management System (I.M.S.). It will assist in identifying fireground staffing capabilities based upon low, moderate, high and extreme risk levels within your community. The Office of the Fire Marshal (O.F.M.) has identified the critical tasks from the Incident Management System that are used during fireground operations. These tasks are consistent with applicable legislation, industry best practices and the Ontario Fire College Curriculum."**[28]

[28] "Operational Planning: An Official Guide to Matching Resource Deployment and Risk Workbook," Ministry of the Solicitor General Website, Last Modified: May 5, 2017,

The C.T.M. further recognizes that within the I.M.S. that:

- Upon arrival and rapid size-up, the incident commander can upgrade or downgrade response
- Crews can be reassigned to other tasks once original assignments are complete
- Response protocols can be established with specific risk levels used to assist with pre-planning to obtain more resources based on the escalating nature of the emergency
- Fire departments perform rescue and building personnel conduct evacuations according to their approved fire safety plans
- Some tasks will never be assigned based on the tactical approach chosen by the incident commander (e.g. offensive versus defensive)

The C.T.M. (attached as ***Appendix D***) identifies a lower and upper range of the number of firefighters required to respond for each of the four risk levels. The actual number of firefighters within each range is based upon analysis of actual fires, the O.H.S.A. Section 21 Guidance Notes affecting firefighters, and industry best practices.

The Critical Task Matrix was informed by the N.F.P.A. 1710 and 1720 Standards in place at the time of its development. These standards are both identified in the reference section of P.F.S.G. 04-08-10. In contrast to these N.F.P.A. Standards the C.T.M. includes very broad lower and upper level incident response ranges to effectively, efficiently and safely conduct fire suppression operations. For example, to safely complete the tasks associated with a fire in moderate risk (Group C - Residential Occupancy) the C.T.M. identifies a range of 16 to 43 firefighters that would be required. In part this range is can be associated with the range of fire suppression resources that may be available in Ontario that include volunteer, part-time and full-time firefighters.

9.2.2 N.F.P.A. 1710 Standard (2020 Edition)

In contrast to the O.F.M.E.M. Critical Task Matrix the **N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire**

http://www.mcscs.jus.gov.on.ca/english/FireMarshal/FireServiceResources/PublicFireSafetyGuidelines/04-08-10at1.html

Departments (2020 Edition) provides fire suppression staffing performance benchmarks for municipalities that utilize only career (full-time) firefighters.

The N.F.P.A. 1710 Standard is designed for larger municipalities such as the City of Oshawa that, as a result of many factors, are operating their fire department utilizing only career (full-time) firefighters.

Relevant references from N.F.P.A. 1710 include the following:

- This standard applies to the deployment of resources by a fire department to emergency situations when operations can be implemented to save lives and property[29]
- The standard is a benchmark for most common responses and a platform for developing the appropriate plan for deployment of resources for fires in higher hazard occupancies or more complex incidents[30]

These N.F.P.A. 1710 references support the strategic priority of saving lives and property, as well as recognizing the standard as a **"benchmark"** for determining the appropriate level of resources based on the complexity and level of fire risk present. This standard identifies minimum firefighter deployment benchmarks based on the fire risks present within a range of building occupancy types.

It is important to note that this N.F.P.A. 1710 Standard is designed for application within a broad range of jurisdictions across North America. This standard was not specifically developed for the delivery of fire suppression services within the Province of Ontario that has a more stringent Fire Code and Building Code than may be found in other jurisdictions. For example, **Ontario Regulation 364/13** requires mandatory annual fire inspections and fire drills in vulnerable occupancies designated as a care and treatment occupancy, a care occupancy or a retirement home. Ontario also has mandatory requirements for sprinkler system installation in vulnerable occupancies, and

[29] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 1 Administration, Application Section 1.3.1

[30] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 1 Administration, Application Section 1.3.2

requirements for enhanced fire and life safety systems in other building occupancies such as high-rise buildings.

It is also important to note that the N.F.P.A. 1710 Standard requires that the fire suppression deployment model be informed by a formal Community Risk Assessment[31]. In Ontario, the development of a C.R.A. is now a mandatory requirement for all municipalities to comply with O. Reg. 378/18: Community Risk Assessments. The I.A.F.F. Report also recommends that the **"O.F.S. should routinely perform risk and hazard assessments, along with a review of system demand, to identify the potential threats to the community so that stakeholders and decision makers can make informed decisions on how to best mitigate, or at least minimize, these threats"**[32]. In our view, the City has responded to this recommendation by retaining Dillon Consulting to prepare a Community Risk Assessment as required by O. Reg. 378/18 to inform and develop this Fire Master Plan. Together these documents provide a comprehensive analysis of the City's **"needs and circumstances"** as required by the F.P.P.A. to assist Council in the decision-making process to determine the appropriate level of fire suppression services for the community. It is important to note that the I.A.F.F. Report was prepared prior to the Province adopting the new O. Reg. 378/18 and therefore **does not** include a comprehensive analysis of the nine mandatory profiles required for a Community Risk Assessment within the Province of Ontario.

The N.F.P.A. 1710 Standard includes the following fire suppression deployment models based on the type of building occupancy and potential fire risks present:

- Initial Arriving Company
- Second Arriving Company
- Single-Family Dwelling Initial Full Alarm Assignment
- Open-Air Strip Shopping Center Initial Full Alarm Assignment
- Apartment Initial Full Alarm Assignment
- High-Rise Full Alarm Assignment

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[31] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 5 Fire Department Services, Section 5.2.1.1 Fire Suppression Capabilities

[32] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Recommendations Page 8

9.2.2.1 Initial Arriving Company

The Initial Arriving Company is commonly referenced within the fire service as the initial responding apparatus deployed to respond to an emergency incident. Fire service leaders and professional regulating bodies have agreed that until a sufficient number of firefighters are initially assembled on-scene, initiating tactics such as entry into the building to conduct search and rescue, or initiating interior fire suppression operations **are not** safe practices. If fewer than four firefighters arrive on scene, they must wait until a second apparatus, or additional firefighters arrive on scene to have sufficient staff to commence these initial activities.

Within the N.F.P.A. 1710 Standard an **'Initial Arriving Company'** is referenced as an 'Engine Company' with a minimum staffing of four firefighters whose primary functions are to pump and deliver water and perform basic firefighting at fires, including search and rescue.

An Initial Arriving Company of four firefighters once assembled on-scene is typically assigned the following operational functions. The officer in charge shall assume the role of Incident Commander; one firefighter shall be designated as the pump operator; one firefighter shall complete the task of making the fire hydrant connection; and the fourth firefighter shall prepare an initial fire attack line for operation.

The assembly of four firefighters on the fire scene provides sufficient resources to safely initiate **limited fire suppression, or rescue operations**. This first crew of four firefighters is also able to conduct the strategic operational priority of "size-up" whereby the officer in-charge can evaluate the incident and where necessary, request additional fire suppression resources that may not have been dispatched as part of the initial alarm.

The **2018 I.A.F.F. Report** includes a recommendation that states **"O.F.S. should consider increasing staffing to five or six firefighters on frontline suppression apparatus to meet N.F.P.A. 1710 staffing objectives for response to tactical hazards, high-hazard occupancies, and in dense urban areas"**[33]. The N.F.P.A. 1710 Standard references these additional staffing levels in 'Chapter 5 - Fire

[33] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Recommendations Page 8

Department Services', for Engine Companies 'Sections 5.2.3.1.2' and '5.2.3.1.2.1' and for Ladder Companies 'Sections 5.2.3.2.3' and '5.2.3.2.2.1' for first-due response zones. These sections contain further reference to the need for this additional staffing to be a decision of the Authority Having Jurisdiction (A.H.J.) - therefore the City of Oshawa and the Oshawa Fire Services.

This recommendation has been reviewed with the City's Fire Chief, representing the A.H.J. as referenced in the N.F.P.A. 1710 Standard. The City's current fire suppression deployment model ensures the response of an **"Initial Arriving Company"** with a minimum staffing of four firefighters as referenced in the N.F.P.A. 1710 Standard 'Chapter 5 - Fire Department Services', for Engine Companies 'Section 5.2.3.1.1' for Engine Companies and 'Section 5.2.3.2.1' for Ladder Companies. The O.F.S. currently complies with this portion of the N.F.P.A. 1710 Standard by staffing all first-due apparatus (i.e. pumps) in each of the City's six existing fire stations with a minimum of four firefighters at all time. The O.F.S. also complies with the intent of the N.F.P.A. 1710 Standard for deploying additional resources including "In first-due response zones with tactical hazards, high-hazard occupancies, or dense urban areas, as identified by the A.H.J. these companies shall be staffed with a minimum of six on-duty members"[34] by deploying additional apparatus and staffing when these hazards or occupancies are identified.

The N.F.P.A. 1710 fire suppression deployment model for the initial arriving company requires a minimum of four firefighters arriving on scene with an 'Engine Company' within a four minute (240 seconds) travel time to 90% of the fire suppression incidents.

9.2.2.2 Second Arriving Company

The N.F.P.A. 1710 Standard (2020 Edition) includes a **new performance benchmark** for the deployment and arrival of the second responding apparatus. The standard does not reference a specific type of apparatus for the second arriving company but does require that it be staffed with a minimum of four firefighters. The term 'company' in this standard can be defined as "being usually organized and identified as engine

[34] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 5 Fire Department Services, Section 5.2.3.1.2.1 Fire Suppression Capability.

companies, ladder companies, rescue companies, squad companies or multi-functional companies"[35]

The N.F.P.A. 1710 fire suppression deployment model for the second arriving company requires a minimum of four firefighters arriving on scene with a 'Second Company' within a six minute (360 seconds) travel time to 90% of the fire suppression incidents.

9.2.2.3 Single-Family Dwelling - Initial Full Alarm Assignment

In comparison to the deployment of an 'Initial Arriving Company' the term **'Initial Full Alarm Assignment'** refers to "Those personnel, equipment, and resources ordinarily dispatched upon notification of a structure fire"[36]. An initial full alarm assignment represents the 'total' number of firefighters initially deployed to a structure fire.

In this deployment standard a single-family dwelling is defined as "a typical 2,000 ft^2 (186 m^2) two-story single-family dwelling without basement and with no exposures"[37]. This definition is a further example of the broad definitions utilized by the N.F.P.A. that in this instance may not necessarily represent the definition of a typical single-family dwelling in Ontario. Most single-single family dwellings in Ontario have basements to accommodate heating systems.

The N.F.P.A. 1710 fire suppression deployment model for an initial full alarm assignment to a single-family dwelling includes a minimum deployment of 16 firefighters (17 if an aerial device is used) described as the **'total effective response force'** arriving on scene within an eight minute (480 second) travel time to 90% of the fire suppression incidents in this occupancy type.

[35] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3 Definitions, Section 3.3.15

[36] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3 Definitions, Section 3.3.40 Initial Full Alarm Assignment

[37] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 5 Fire Department Services, Section 5.2.4.1.1

9.2.2.4 Open-Air Strip Shopping Center – Initial Full Alarm Assignment

In this deployment standard an open-air strip shopping center is defined as ranging in size from 13,000 ft^2 (1203 m^2) to 196,000 ft^2 (18,209 m^2). This deployment model is described as having a total effective response force of a minimum of 27 firefighters (28 if an aerial device is used).

This deployment model includes "the establishment of an initial medical care component consisting of at least two members capable of providing immediate on-scene medical support and transport that provides rapid access to civilians or members potentially needing medical treatment"[38]. In the City of Oshawa these services are provided by the Region of Durham Paramedic Services (R.D.P.S.). As such the total effective response force to be provided by the O.F.S. would be a minimum of 25 firefighters (26 if an aerial device is used) arriving on scene within an eight minute (480 second) travel time to 90% of the fire suppression incidents in this occupancy type.

9.2.2.5 Apartment – Initial Full Alarm Assignment

In this deployment standard an apartment is defined as a typical 1200 ft^2 (111 m^2) apartment within a three-story garden style apartment building. This deployment model is also described as having a total effective response force that includes a minimum of 27 firefighters (28 if an aerial device is used) and includes the same establishment of initial medical care as described in the open-air strip shopping center initial full alarm assignment deployment model that would be provided by the R.D.P.S.

The applicable deployment model for the O.F.S. would include an initial minimum deployment of 25 firefighters (26 if an aerial device is used) described as the 'total effective response force' arriving on scene within an eight minute (480 second) travel time to 90% of the fire suppression incidents in this occupancy type.

9.2.2.6 High-Rise - Initial Full Alarm Assignment

In this deployment model a high-rise building is described as having the highest floor greater than 75 feet (23 metres) above the lowest level of fire department vehicle access. This deployment model is described as having a total effective response force

[38] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 5 Department Services, Section 5.2.4.1 (9)

that includes a minimum 42 firefighters (43 if the building is equipped with a fire pump) and includes the same establishment of initial medical care as described in the open-air strip shopping center initial full alarm assignment deployment model that would be provided by the R.D.P.S.

The applicable deployment model for the O.F.S. would include an initial minimum deployment of 38 firefighters (39 firefighters if the building is equipped with a fire pump) described as the 'total effective response force' arriving on scene within a 10 minute and 10 second (610 second) travel time to 90% of the fire suppression incidents in this occupancy type.

9.2.2.7 Vertical Response Times

High-rise structure fires are unique in the method of fire suppression, as detailed in a publication by the N.F.P.A. called **Structural Firefighting: Strategy and Tactics**.[39] When a fire is located above the eighth floor, exterior suppression methods are no longer effective. In these cases, fire suppression is mainly undertaken inside the building. Firefighters create a staging floor; usually two floors below the fire floor. Firefighters will travel to and from the staging area and the fire floor or evacuation floors. The staging area is the location of all safety and suppression equipment needed to combat the fire. Firefighters must get this equipment to the staging area. When fire service access elevators cannot be used firefighters climb the stairs with the equipment. Even in the best conditions climbing the stairs takes time. The average vertical response time, average time it takes for a firefighter to climb the stairs, is shown in **Table 27**. To climb to the tenth floor it would take a firefighter on average three minutes and seven seconds.

Table 28: Vertical Response

Floors	Average Time per Floor in Seconds
1-10	20.8
11-20	27.8
21-30	33.6

[39] Source: Klaene, Bernard, Sanders, Russell, "Structural Firefighting: Strategy and Tactics," Jones & Bartlett Learning, 2007.

Floors	Average Time per Floor in Seconds
31-40	45.9
41-48	59.0

Source: Structural Firefighting: Strategy and Tactics

Ascending with equipment can be physically exhausting. When dedicated fire service access elevators cannot be used additional alarms must be ordered to set-up stairway support to ensure firefighters have enough stamina for fire suppression after ascending. Stairway support is a system to carry equipment to the staging area. A firefighter is usually positioned every two floors and ascends two floors with equipment where the next firefighter pick up the equipment. This gives each firefighter a rest period during their two floor descent.

9.2.3 Summary of Fire Suppression Guidelines and Standards

The analysis within the preceding sections of this F.M.P. consider the current P.F.S.G's authored by the O.F.M.E.M. and the N.F.P.A 1710 Standard (2020 Edition) for identifying the applicable performance benchmarks for the delivery of fire suppression services within the City of Oshawa. In our view, the performance benchmarks included within the N.F.P.A. 1710 Standard (2020 Edition) represent current industry best practices for assessing the existing and future fire suppression services within the City of Oshawa.

9.3 Importance of Time with Respect to Fire Growth

Understanding how a fire grows from the time of ignition is a critical element of assessing a municipality's fire protection program including the application of the "three lines of defence". Research conducted by the O.F.M.E.M. and National Research Council of Canada indicates that a fire in a non-sprinklered residential occupancy can spread from the room where the fire originates in ten minutes or less. Tests have shown that the fire can extend from the room of origin in as little as three minutes, under fast fire growth conditions.

Fire growth rates, defined by the Society of Fire Protection Engineers as slow, medium and fast, are listed in **Table 28**. The fire growth rates are measured by the time it takes

for a fire to reach a one megawatt (M.W.) fire. This is roughly equivalent to an upholstered chair burning at its peak. A two M.W. fire is approximately equal to a large upholstered sofa burning at its peak.

Table 29: Time to Reach 1 M.W. and 2 M.W. Fire Growth Rates

Fire Growth Rate	Time in Seconds to Reach 1 M.W.	Time in Seconds to Reach 2 M.W.
Slow	600 seconds	848 seconds
Medium	300 seconds	424 seconds
Fast	150 seconds	212 seconds

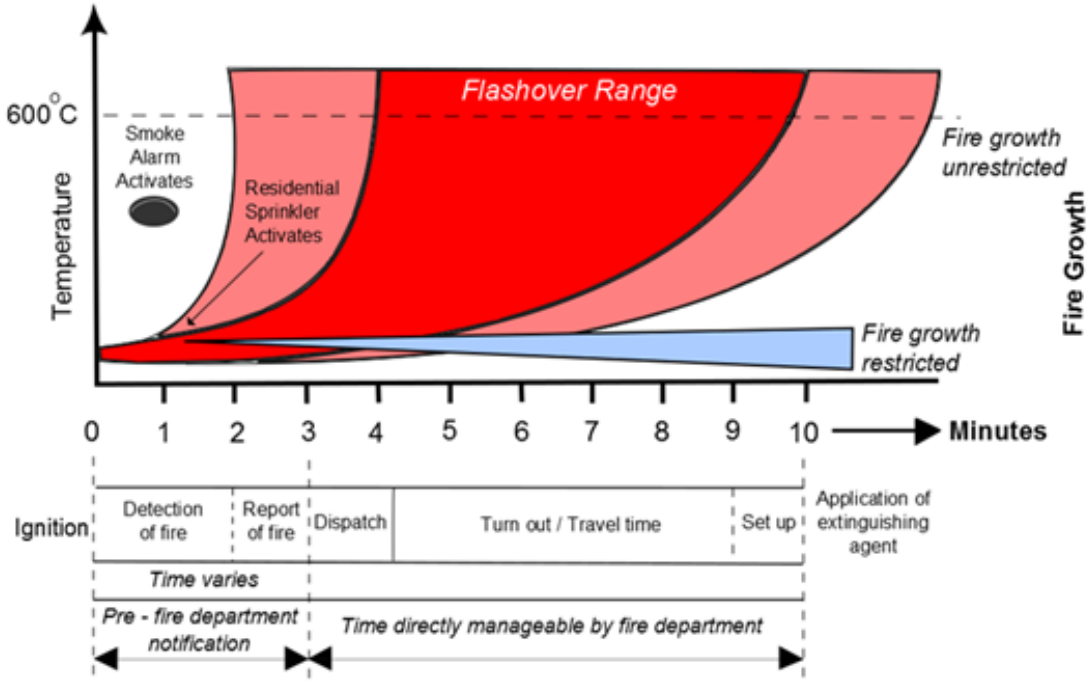
Source: "Operational Planning: An Official Guide to Matching Resource Deployment and Risk", Office of the Fire Marshal and Emergency Management, January 24, 2011, p. 4

In less than ten-minutes from ignition a fire can reach the point of "flashover" representing a point in the fires growth and intensity that all of the combustible items within a given space reach a temperature that is sufficiently high enough for them to auto-ignite. The fire prorogation curve shown in **Figure 6** illustrates the importance of the time period prior to the fire department being notified and alerted to deploy fire suppression resources. Within this pre-fire department notification period the presence of working smoke alarms, carbon monoxide alarms and public education that has guided the residents of the building to develop and practice a home escape plan are critical elements to the life safety of the occupants. It is within this pre-fire department notification period that the first two lines of the **"three lines of defence"** are critical to the life safety of the occupants. These are the factors that support the proposed strategic priorities presented within this F.M.P. including:

1. **The Oshawa Fire Services will prioritize the optimization of the first two lines of defence, including public education and fire prevention, and the utilization of fire safety standards and fire code enforcement as the foundation of providing a comprehensive fire protection program within the City of Oshawa.**

2. **The Oshawa Fire Services will specifically prioritize the delivery of fire and life safety programs in Group C- Residential Occupancies that include an enhanced Home Smoke Alarm/Carbon Monoxide Alarm Program.**

Figure 6: Fire Propagation Curve



Source: Fire Underwriters Survey "Alternative Water Supplies for Public Fire Protection: An Informative Reference Guide for Use in Fire Insurance Grading" (May 2009) and N.F.P.A. "Fire Protection Handbook" (2001)

9.4 Historical Emergency Response Performance

The data used for this analysis is a compilation of all historic calls for service and emergency response incidents that the O.F.S. responded to from January 1, 2014 to December 31, 2019 (complete six-year data set). The data set was analyzed in two different ways. The first method assessed all calls, and included all the incidents and call types. This version of the data set was used to assess call volumes of the department, stations, apparatus, etc. The second method of call analysis divided out the emergency calls (or emergency incidents). This data sub-set was used to assess emergency response performance such as dispatch time, turnout time, travel time and

total response time. To prepare this sub-set of the complete six-year data set, the information was sorted by the O.F.S emergency incident response codes.

Through consultation with O.F.S. senior staff the actual "emergency incidents"[40] were categorized as those emergency incidents that the O.F.S. would have responded to under emergency conditions including the use of emergency lights and sirens. These emergency incidents were then further categorized as either "Fire", "Medical" or "Other" responses. It should be noted that emergency incidents that the O.F.S. responded to that were located outside of the City of Oshawa were excluded from the analysis. Similarly, all emergency incidents that were not identified by an O.F.S emergency incident response code, or had more than one emergency incident response code were excluded from the emergency incident analysis. The O.F.S. six-year emergency incident data set included the following applicable columns:

- **Call Time Column**: The time that the Communications Centre was notified of the emergency incident
- **Dispatch Time Column**: The time that Communications Centre notified fire suppression staff/apparatus to respond
- **Enroute Time Column: T**he time that fire suppression staff/apparatus notified the Communication Centre that they were responding
- **On Location Time Column:** The time that the fire suppression staff/apparatus arrived at the emergency incident

The performance benchmarks included within the **N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments** (2020 Edition) were utilized to inform the O.F.S. historical emergency response performance including:

- **Dispatch Time:** Is calculated as the difference between the "Call Time Column" and the "Dispatch Time Column"
- **Turnout Time:** Is calculated as the difference between the "Dispatch Time Column" and the "Enroute Time Column"

[40] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3 Definitions, Section 3.3.19

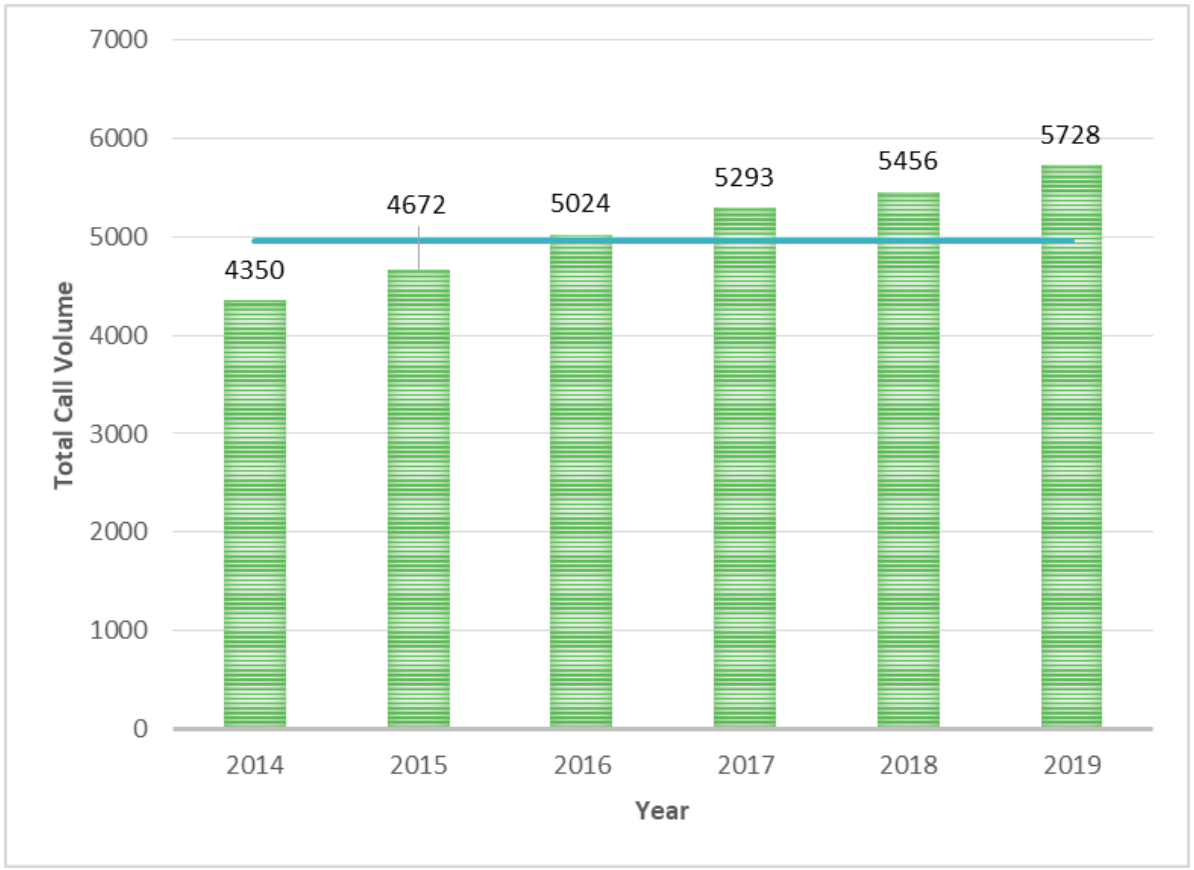
- **Travel Time:** Is calculated as the difference between the “Enroute Time Column” and the “On Location Time Column”

For the majority of the statistics presented, only the initial arriving company is included; this is to ensure a single incident is not counted multiple times, potentially impacting the accuracy of the analysis.

9.4.1 Annual Call Volume – All Calls, All Incident Types

Reviewing the total annual call volume is an important element of understanding the historical, and existing emergency response workload of a fire department. This includes the analysis of all emergency response incident types, as defined by the O.F.M.E.M Standard Incident Reports (S.I.R. Reports). **Figure 7** illustrates that for the period from January 1, 2014 to December 31, 2019 the total number of emergency responses incidents increased from 4,350 in 2014 to 5,728 in 2019. This represents a 31.67% increase over this six-year period.

Figure 7: Annual Call Volume – All Calls, All Incident Types

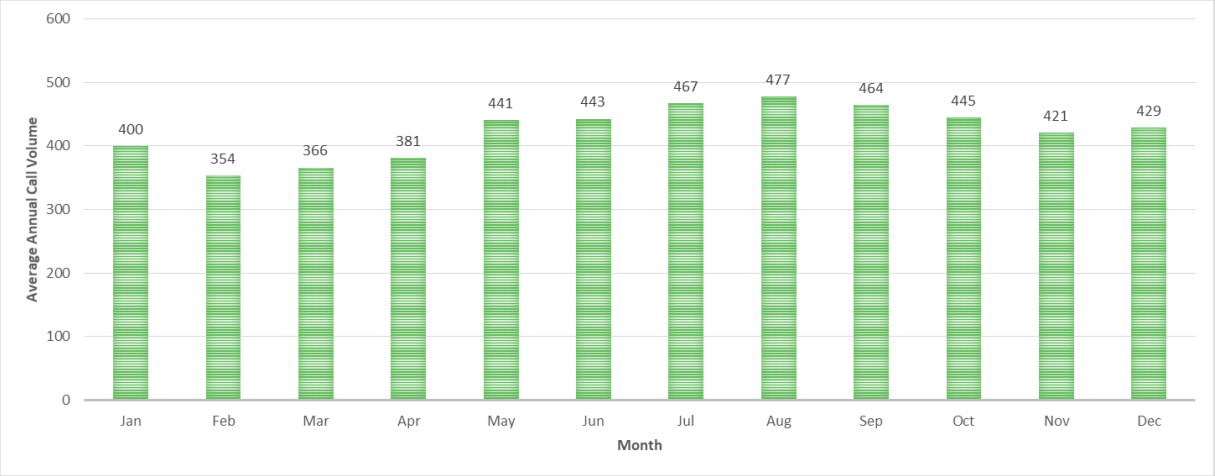


Source: Oshawa Fire Services Emergency Response Call Data

9.4.2 Average Call Volume by Month – All Calls, All Incident Types

Figure 8 illustrates that the average call volume typically peaks from May to October and during the summer months when people are more active either outdoors or potentially driving. This analysis indicates that the highest volume of emergency incidents has historically occurred in July (a month of 31 days in length), and the lowest volume has occurred in February (the shortest month at 28 or 29 days).

Figure 8: Average Call Volume by Month – All Calls, All Incident Types

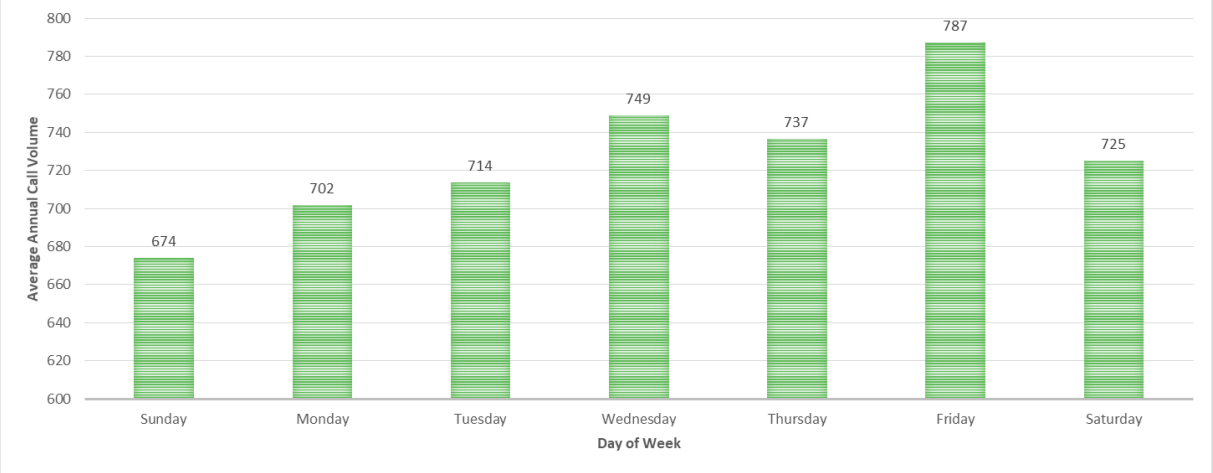


Source: Oshawa Fire Services Emergency Response Call Data

9.4.3 Average Call Volume by Day of Week – All Calls, All Incident Types

Figure 9 illustrates that for the period from January 1, 2014 to December 31, 2019 the highest volume of calls for service occurred on Fridays and the lowest volume of calls have occurred on Sundays.

Figure 9: Average Call Volume by Day of Week – All Calls, All Incident Types

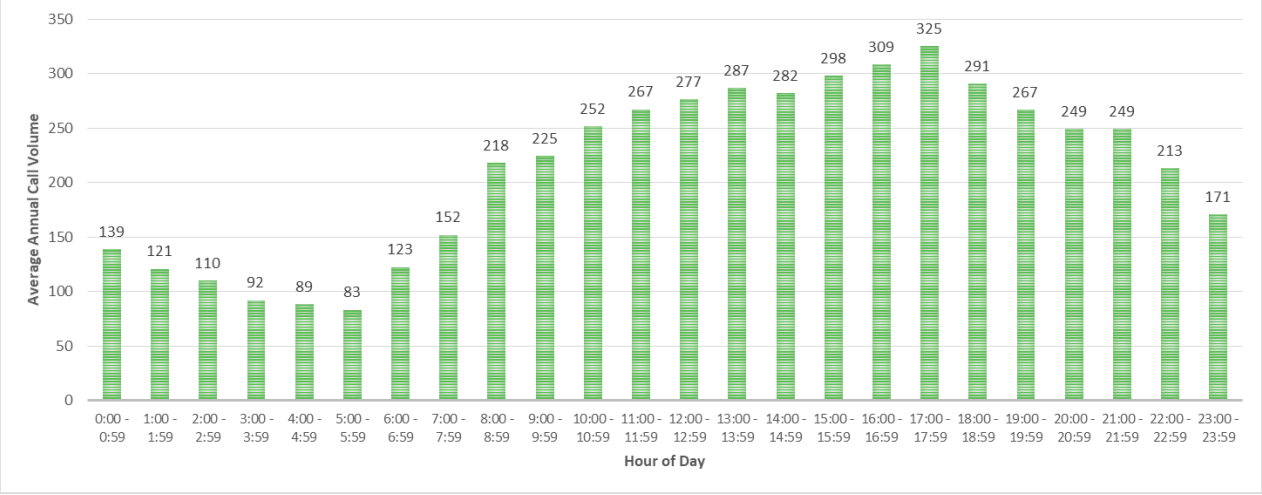


Source: Oshawa Fire Services Emergency Response Call Data

9.4.4 Average Call Volume by Time of Day – All Calls, All Incident Types

Figure 10 indicates that the highest volume of calls for service have historically occurred during the daytime between 8 AM and 10 PM. There is a notable drop in the volume of incidents between the hours of 11 PM and 7 AM when most people are resting or sleeping. It is during this time period when people are sleeping that they are most vulnerable to the effects of a fire including smoke inhalation.

Figure 10: Average Call Volume by Time of Day – All Calls, All Incident Types

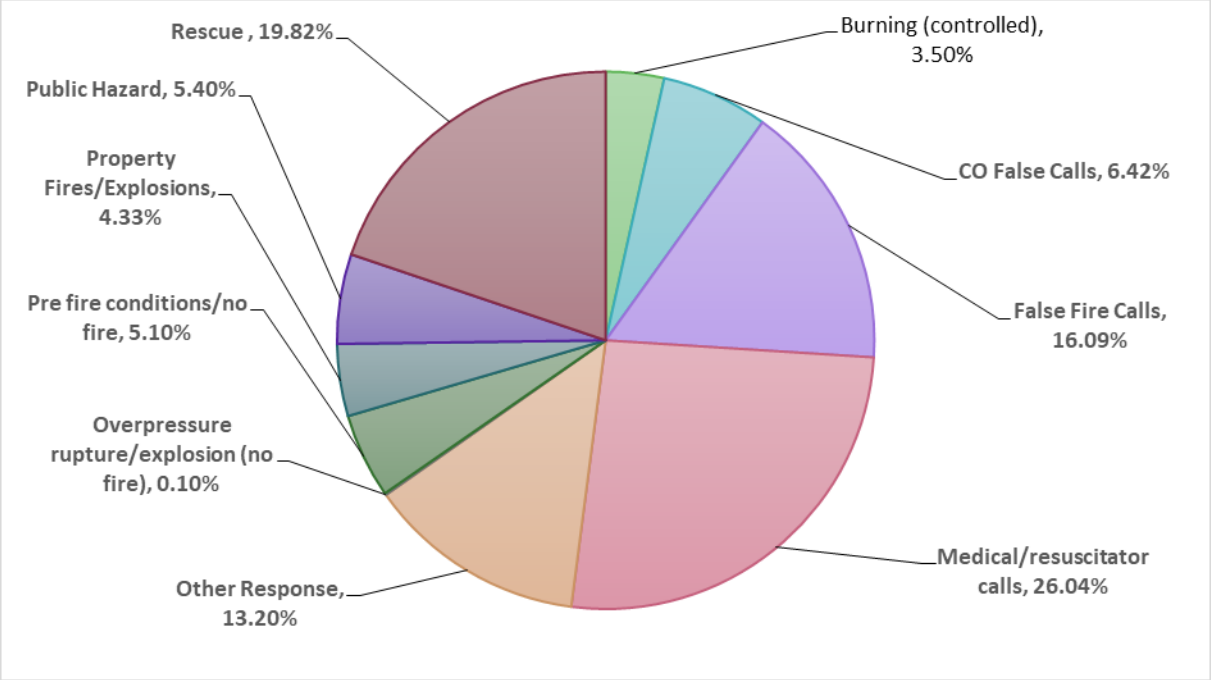


Source: Oshawa Fire Services Emergency Response Call Data

9.4.5 Call Distribution by O.F.M.E.M. Incident Type (All Calls)

Figure 11 illustrates the distribution of all calls by the identified O.F.M.E.M. incident type for the period from January 1, 2014 to December 31, 2019. This analysis indicates that medical/resuscitator calls represent the highest percentage of historic calls representing 26.04% of all calls over this six-year period. Rescue calls represented the second highest percentage calls representing 19.82% of all calls. Property fires/explosions represented 4.33% of all calls within the City of Oshawa for this same six-year period.

Figure 11: Call Volume Distribution by O.F.M.E.M. Incident Type (All Calls)

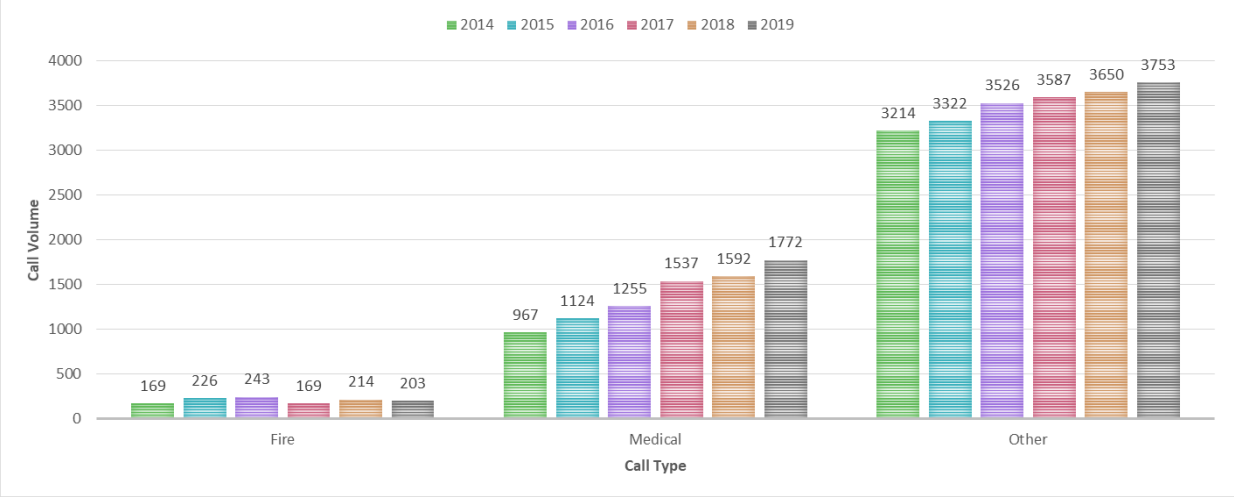


Source: O.F.M.E.M. Emergency Call Statistics

9.4.6 Call Volume – Fire/Medical/Other (All Calls)

Figure 12 illustrates the distribution of historic calls for service by either fire/explosion, medical/resuscitator or other types of emergency responses for the period from January 1, 2014 to December 31, 2019. This analysis highlights a peak in the total number of fire/explosion calls in 2016 at 243 that has not been exceeded since. This analysis also highlights that the number of medical/resuscitator calls have increased by 83.25% since 2014. This analysis also highlights a similar trend that shows the number of other types of calls increasing each year.

Figure 12: Call Volume – Fire/Medical/Other

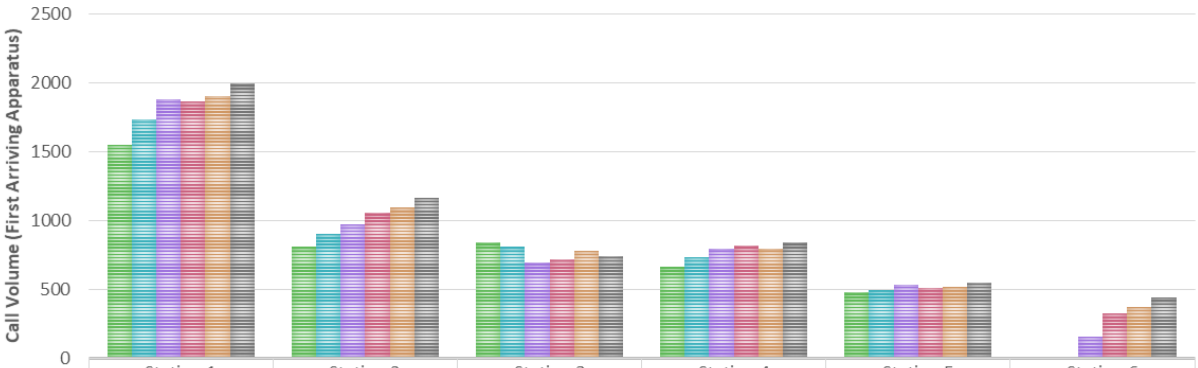


Source: Oshawa Fire Services Emergency Response Call Data

9.4.7 Call Volume, All Calls – By Station (Initial Arriving Apparatus)

Figure 13 illustrates that for the period from January 1, 2014 to December 31, 2019 the call volume for the initial arriving company deployed from Fire Station 6 increased by 187.66%. The second highest increase over this six-year period was from Fire Station 2 that increased 43.54%. The call volume for the initial arriving company deployed from Fire Station 1 increased by 28.29%, very similar to the experience of Fire Station 4 that grew by 26.09%.

Figure 13: Emergency Call Volume – Initial Arriving Company



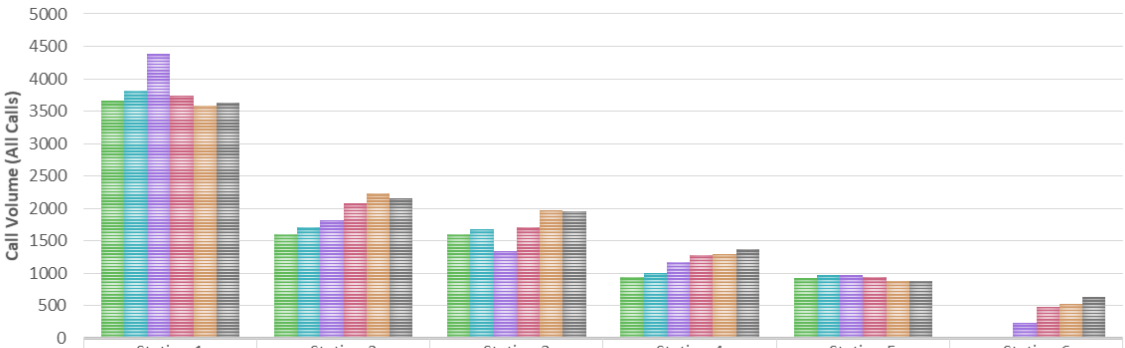
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
2014	1552	813	840	667	478	
2015	1729	902	811	737	493	
2016	1877	973	692	792	536	154
2017	1861	1056	719	816	512	329
2018	1900	1096	776	795	520	369
2019	1991	1167	739	841	547	443

Source: Oshawa Fire Services Emergency Response Call Data

9.4.8 Call Volume, All Calls – By Station (All Responding Apparatus)

Figure 14 illustrates the distribution of the historical call volume by station for all responding apparatus for the period from January 1, 2014 to December 31, 2019. This is the number of calls that all apparatus combined at each station responded to. A decline in calls is visible in 2016 at Station 3. In 2016, aligned with the opening of Station 6, the second staffed apparatus from Station 3 was relocated to Station 6. The analysis also indicates a peak in the total number of calls in 2016 from Fire Station 1. This coincides with a change in deployment that occurred in 2017 when the aerial from Station 1 was relocated to Station 3 to improve the geographical coverage of the aerial across the City. For the period of 2014 to 2016 there were two staffed apparatus located at Station 1, and therefore more calls were responded two with the two staffed apparatus. Since that time there has only been one front line pump responding to calls from Station 1, which translates to a reduction in call volume responded to by the total apparatus at Station 1 from 2016 to 2019. It is possible that some of the call volume increases shown at Station 2 and Station 3 from 2017 to 2019 would coincide with the calls no longer responded to by the second apparatus responding from Station 1 (and instead responded to by the second apparatus at either Station 2 or Station 3).

Figure 14: Call Volume, All Calls – By Station (All Responding Apparatus)

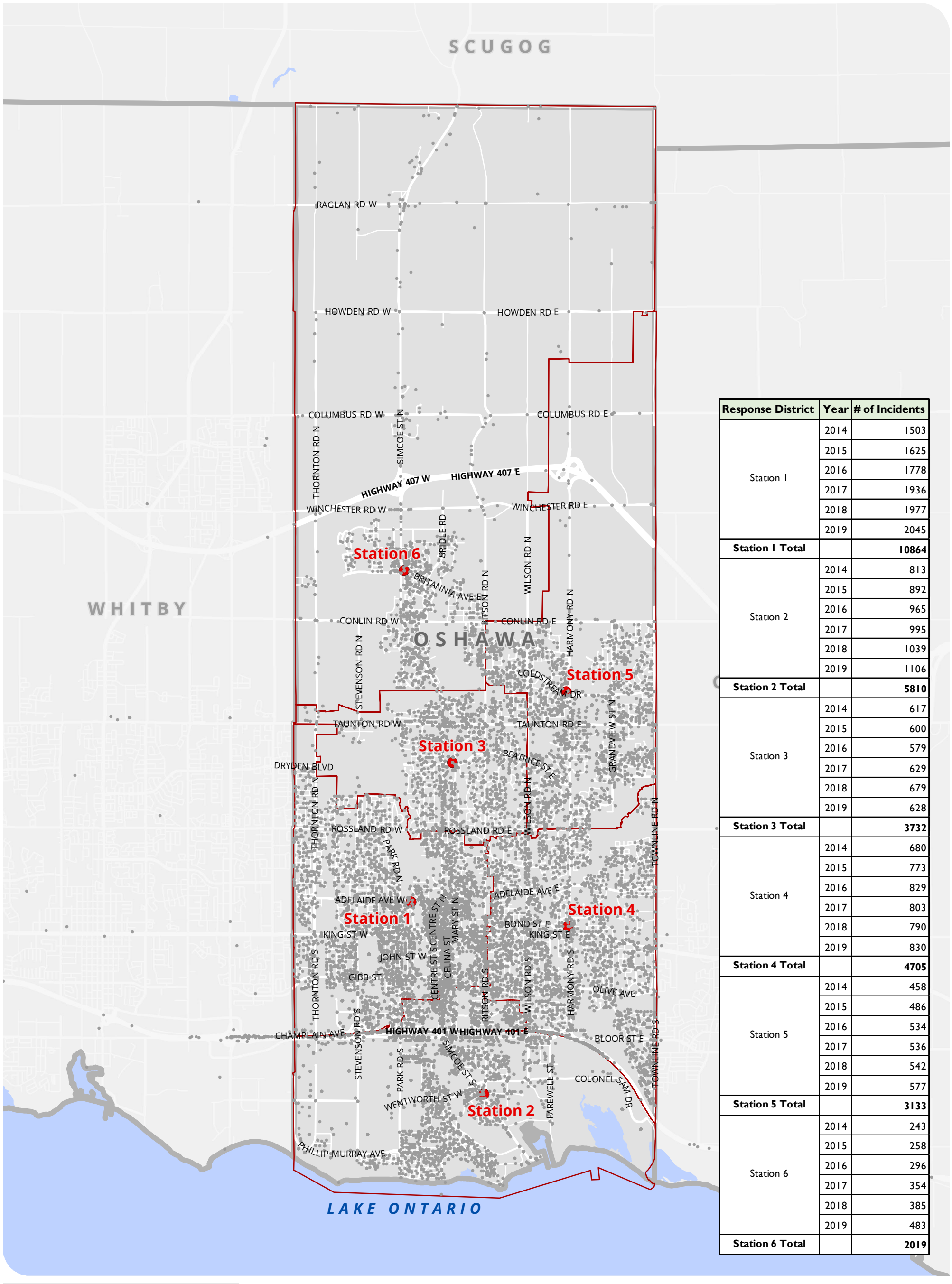


	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
2014	3655	1596	1607	937	928	
2015	3817	1716	1678	1001	965	
2016	4392	1822	1337	1176	970	240
2017	3746	2077	1705	1282	935	480
2018	3578	2235	1972	1296	882	523
2019	3625	2156	1956	1368	875	639

Source: Oshawa Fire Services Emergency Response Call Data

9.4.9 Call Volume, All Calls per Station First Due Response Zone

As opposed to measuring the calls per station based on the responding apparatus (both initial arriving company and all responding apparatus), this analysis uses the geographical locations of the historic calls (all calls from January 1st, 2014 to December 31st, 2019). The call volumes occurring within each Station's First-Due Response Zone geography are summarized by year in **Figure 15,** using a G.I.S. map and summary table. This analysis shows that the total calls within Station 1's First-Due Response Zone have continued to increase from 2014 to 2019 (a 36.06% increase over the six-year period). Station 2's First-Due Response Zone has also experienced call volume growth over the six-years, equalling an increase of 36.04%. Station 3's First-Due Response Zone call volume has remained relatively stable with only a 1.78% increase over the six-year period. Station 4's First-Due Response Zone has experienced a call volume increase of 22.05% from 2014 to 2019. Station 5's First-Due Response Zone experienced a 25.98% call volume increase in the same time period. Station 6, a newly defined First-Due Response Zone as of the station opening in 2016, experienced a 98.76% increase in call volume from 2014 to 2019. It should be noted that prior to Station 6 opening in 2016, the calls in this First-Due Response Zone would have been responded to by either Station 3 or Station 5.



Response District	Year	# of Incidents
Station 1	2014	1503
	2015	1625
	2016	1778
	2017	1936
	2018	1977
	2019	2045
Station 1 Total		**10864**
Station 2	2014	813
	2015	892
	2016	965
	2017	995
	2018	1039
	2019	1106
Station 2 Total		**5810**
Station 3	2014	617
	2015	600
	2016	579
	2017	629
	2018	679
	2019	628
Station 3 Total		**3732**
Station 4	2014	680
	2015	773
	2016	829
	2017	803
	2018	790
	2019	830
Station 4 Total		**4705**
Station 5	2014	458
	2015	486
	2016	534
	2017	536
	2018	542
	2019	577
Station 5 Total		**3133**
Station 6	2014	243
	2015	258
	2016	296
	2017	354
	2018	385
	2019	483
Station 6 Total		**2019**

Historic Emergency Incident 2014-2019
Fire Station
Fire Response Boundary

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 15: CALL VOLUME PER STATION FIRST-DUE RESPONSE ZONE

Final Draft March 2020

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 250 500 1,000 m

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-25

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Incidents per Response Boundary.mxd

9.4.10 Call Volume and Emergency Responses – Fire Station Workload

The analysis within this section has calculated the total amount of time that the apparatus at each of the City's six fire stations has historically been committed to an emergency response. This analysis recognizes that there are two apparatus in two of the stations, and that there has been some redeployment of these apparatus during this six-year period.

This analysis defines the time the apparatus are 'committed' to an emergency response as the time period from 'dispatch time' to 'return time'. This analysis assessed all emergency incidents for the period from January 1, 2014 to December 31, 2019.

It should be noted that this analysis has averaged the amount of time each day that the apparatus assigned to each of the stations are committed to an emergency response. The actual time may vary depending on the number of calls that may be received on any given day.

This analysis further confirms that the call volume, and associated time apparatus and staff are 'committed' to an emergency response is the highest at Fire Station 1, followed by Fire Station 2.

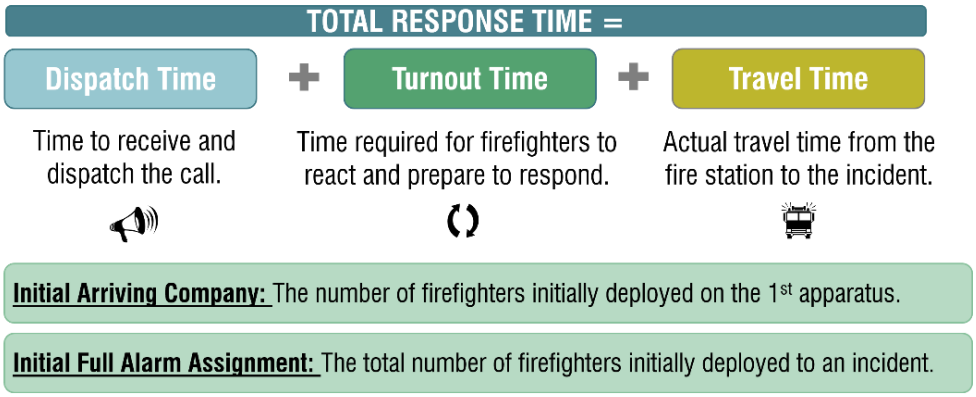
Table 30: Emergency Call Volume – Fire Station Workload

Station	Average Minutes Per Day	Average Hours Per Day
1	164	2.73
2	93	1.55
3	73	1.22
4	58	0.96
5	52	0.86
6	36	0.60

9.5 Historical Fire Suppression Emergency Response Analysis

Within the fire service, fire suppression emergency response capabilities are assessed based on **"Total Response Time"** that represents the total of three primary elements including the **"Dispatch Time"**, **"Turnout Time"** and **"Travel Time"**. **Figure 16** illustrates how these three elements relate to calculating the total response time.

Figure 16: Total Response Time



The analysis within this section applies the emergency incidents call data sub-set, based on those call types that were responded to using emergency lights and sirens to assess emergency response performance.

9.5.1 Emergency Calls - Dispatch Time

In Canada, the Canadian Radio-television and Telecommunications Commission (C.R.T.C.) regulates the carriers who supply the network to direct, and connect 911 calls to regional centres across Ontario. Calls initiated by the public through the use of the 911 system are typically directed to a regional 911 centre first, and then rerouted to the applicable fire department. It is important to recognize this element of Ontario's 911 emergency dispatching process.

This is because the applicable **N.F.P.A. 1221 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition)** applies only when the Authority Having Jurisdiction (A.H.J.)[41] in this instance

[41] N.F.P.A. 1221 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition), Chapter 3 Definitions, Section 3.2.2 Authority Having Jurisdiction.

being the O.F.S. takes control of the "Emergency Event Processing/Dispatching"[42] process.

The **N.F.P.A. 1710 - Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments (2020)** defines alarm processing time (dispatch time) as "The time interval from when the alarm is acknowledged at the communication center until response information begins to be transmitted via voice or electronic means to emergency response facilities (E.R.F.s) and emergency response units (E.R.U.s)."[43]

This standard requires that "The fire department shall establish a performance objective of having an alarm processing time of not more than 64 seconds for at least 90% of the alarms and not more than 106 seconds for at least 95% of the alarms processed, as specified by N.F.P.A. 1221"[44].

Figure 17 illustrates that for the period from January 1st, 2014 to December 31st, 2019 the O.F.S. consistently exceeded the 64 second 90th percentile performance benchmark for fire/explosion calls. In 2019 the department exceeded the 90th percentile performance benchmark by 52 seconds, or 81.25%. In contrast the analysis indicates that for the same period the O.F.S. was able to achieve the 64 second 90th percentile performance objective for medical/resuscitator calls.

This analysis supports the need for the O.F.S. to further investigate its current alarm processing procedures to target compliance with the applicable N.F.P.A. 1710 call processing performance benchmarks for fire/explosions emergency incidents.

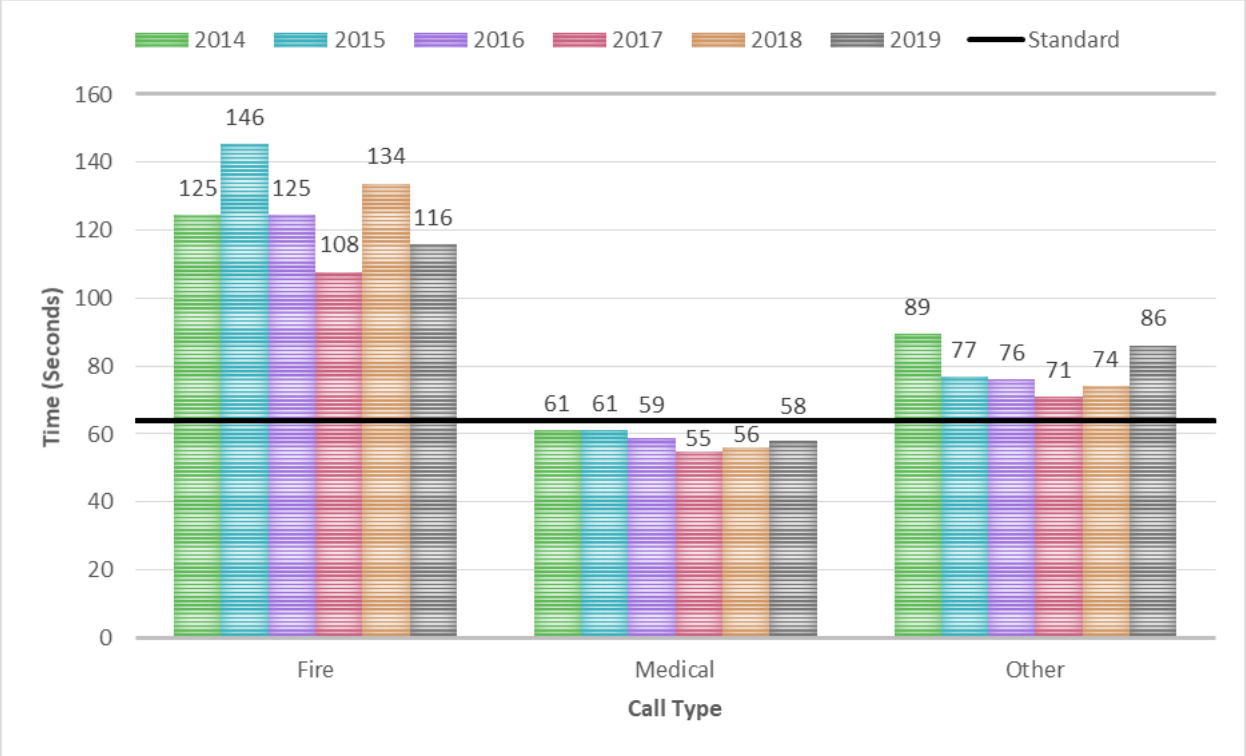
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[42] N.F.P.A. 1221 Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition), Chapter 3 Definitions, Section 3.3.50 Emergency Event Processing/Dispatching.

[43] N.F.P.A. 1710 - Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments (2020 Edition), Chapter 3 Definitions, Section 3.3.64.3 Alarm Processing Time.

[44] N.F.P.A. 1710 - Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments (2020 Edition), Chapter 4 Organization, Section 4.1.2.3.3.

Figure 17: Emergency Calls – Dispatch Time



Source: Oshawa Fire Services Emergency Response Call Data

9.5.2 Emergency Calls - Turnout Time

Turnout time is defined within **N.F.P.A. 1710 - Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments** (2020) as "The time interval that begins when the emergency response facilities (E.R.F.s) and emergency response units (E.R.U.s) notification process begins by either an audible alarm or visual annunciation or both and ends at the beginning point of travel time."[45]

This standard identifies a performance benchmark of 80 seconds or less for all fire-related incidents and 60 seconds or less for medical/resuscitator calls.

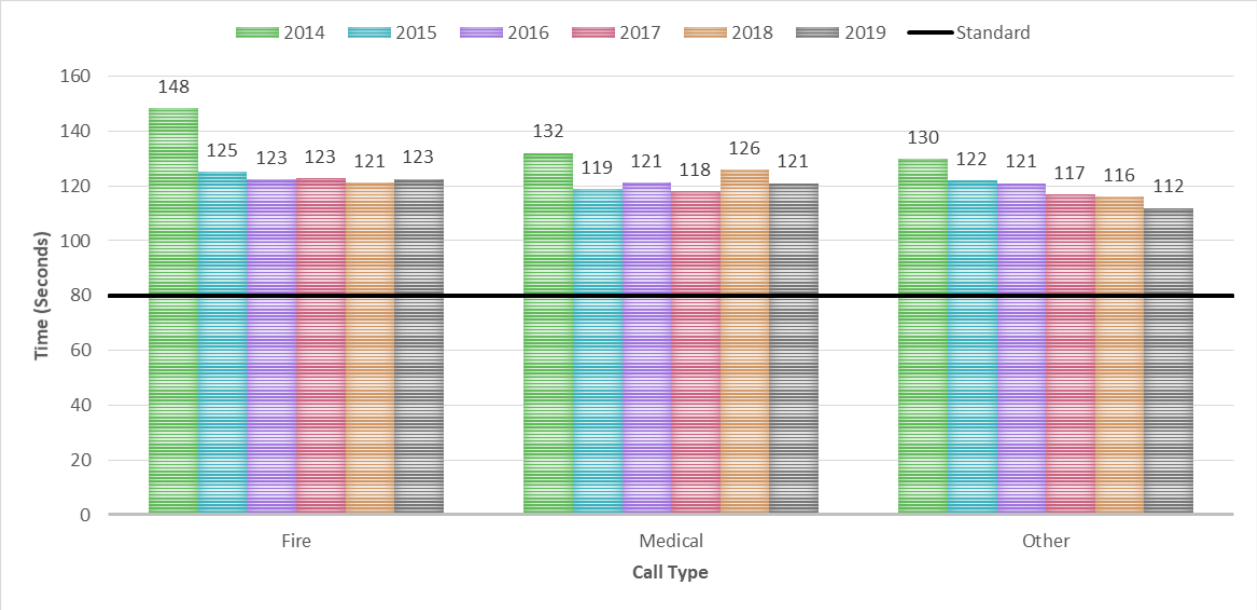
[45] Source: N.F.P.A. 1710 Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments 2020 Edition – Section 3.3.64.8.

The general industry definition of firefighter turnout time is defined as the preparation time required between the emergency call being received at the fire station and the time the truck and firefighters leave the station.

The 2018 F.M.P. Report identifies concerns related to the historical turnout times of firefighters and their impact on the department **Total Response Time** capabilities. This report recommended that the department "Establish a committee to review turnout times and provide efficiencies to achieve N.F.P.A. standards"[46].

This analysis indicates that for the period from January 1, 2014 to December 31, 2019 the O.F.S. consistently exceeded the 80 second performance benchmark for fire/explosion emergency calls. In 2019 the department exceeded the 90th percentile performance benchmark by 43 seconds, or 53.75% for fire/explosions emergency calls.

Figure 18: Emergency Call Volume - Turnout Time (Initial Arriving Company)

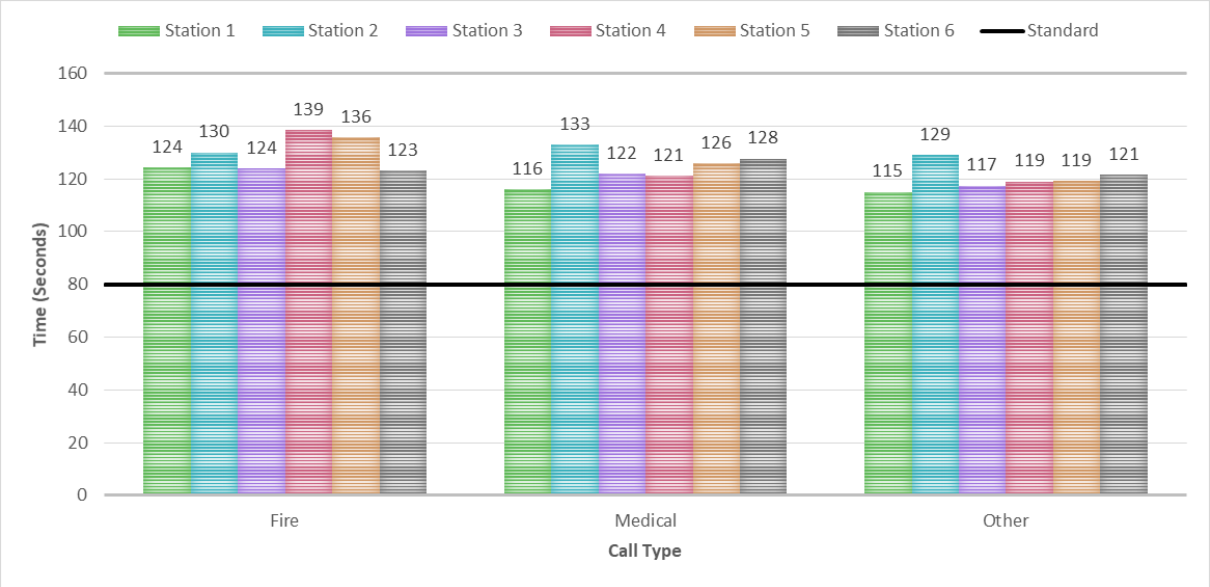


Source: Oshawa Fire Services Emergency Response Call Data

[46] Oshawa Fire Services 2018 Fire Master Plan & Community Risk Assessment, Recommendations page 92 #2.

Figure 19 illustrates a more in-depth analysis of turnout times by station. This analysis confirms that all six of the existing fire stations have historically exceeded the N.F.P.A. performance target of 80 seconds for fire/explosions emergency responses.

Figure 19: Emergency Calls - Turnout Time by Station (Initial Arriving Company)



Source: Oshawa Fire Services Emergency Response Call Data

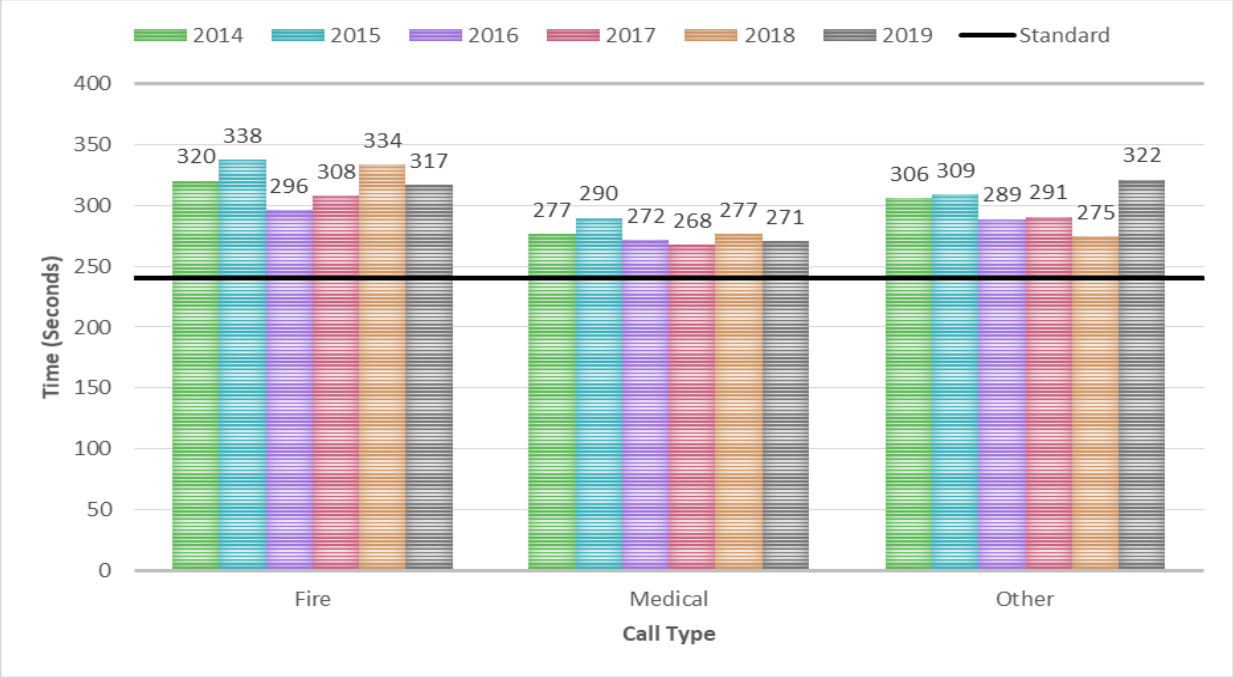
9.5.3 Emergency Calls - Travel Time (Initial Arriving Company)

Travel time is defined by N.F.P.A. 1710 - Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments (2020) as “The time interval that begins when a unit is enroute to the emergency incident and ends when the unit arrives at the scene”[47].

This standard identifies a performance benchmark of 240 seconds or less travel time for the arrival of the Initial Arriving Company at a fire suppression incident 90% of the time. **Figure 20** illustrates that for the period from January 1, 2014 to December 31, 2019 the O.F.S. exceeded the 240 second performance benchmark.

[47] Source: N.F.P.A. 1710 Standard for Organization and Deployment of Fire Suppression Operations by Career Fire Departments 2020 Edition – Section 3.3.64.7.

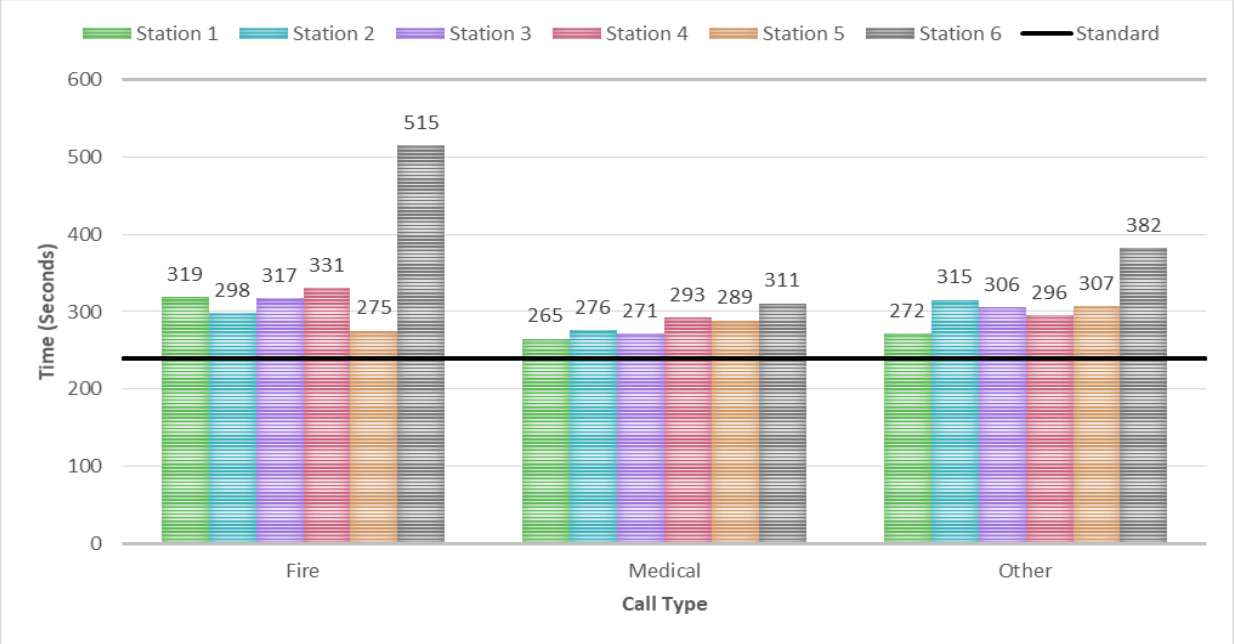
Figure 20: Emergency Calls - Travel Time City-Wide (Initial Arriving Company)



Source: Oshawa Fire Services Emergency Response Call Data

Figure 21 illustrates a more in-depth analysis of travel times by station. This analysis identifies the longer travel times associated with Fire Station 6 that responds into the rural area of the City and has a larger assigned station response area (first-due response zone).

Figure 21: Emergency Calls – Travel Time by Station (Initial Arriving Company)



Source: Oshawa Fire Services Emergency Response Call Data

9.5.4 Emergency Calls - Total Response Time Performance

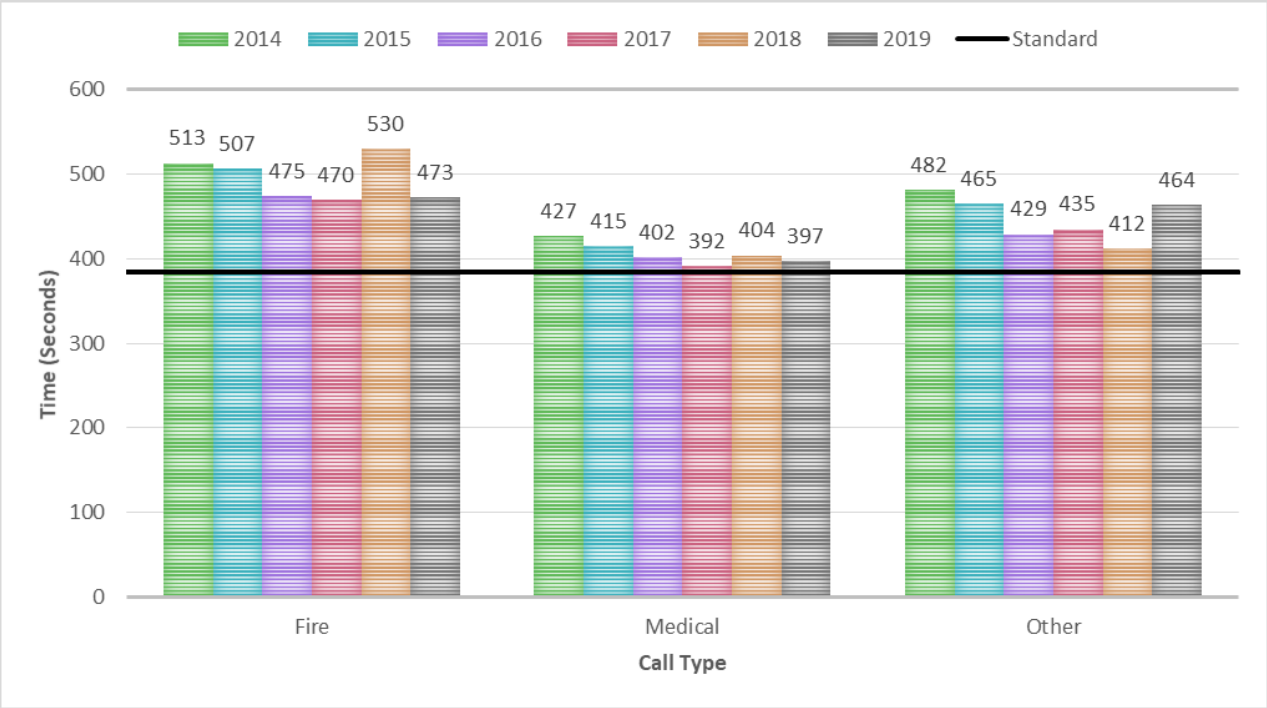
The N.F.P.A. 1710 Standard defines Total Response Time as "The time interval from receipt of the alarm at the P.S.A.P. to when the first emergency response unit is initiating action or intervening to control the incident"[48]. Within this F.M.P. **Total Response Time** is measured by the sum of the following three components:

Dispatch Time + Turnout Time + Travel Time = Total Response Time

The applicable N.F.P.A. 1710 Standard performance benchmarks for these three components totals 384 seconds for 90% of the fire/explosion incidents the fire department responds to. **Figure 22** illustrates that for the period from January 1, 2014 to December 31, 2019 the O.F.S. city wide **Total Response Time** to fire/explosion incidents consistently exceed the 384 second performance benchmark.

[48] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3 Definitions, Section 3.3.64.6

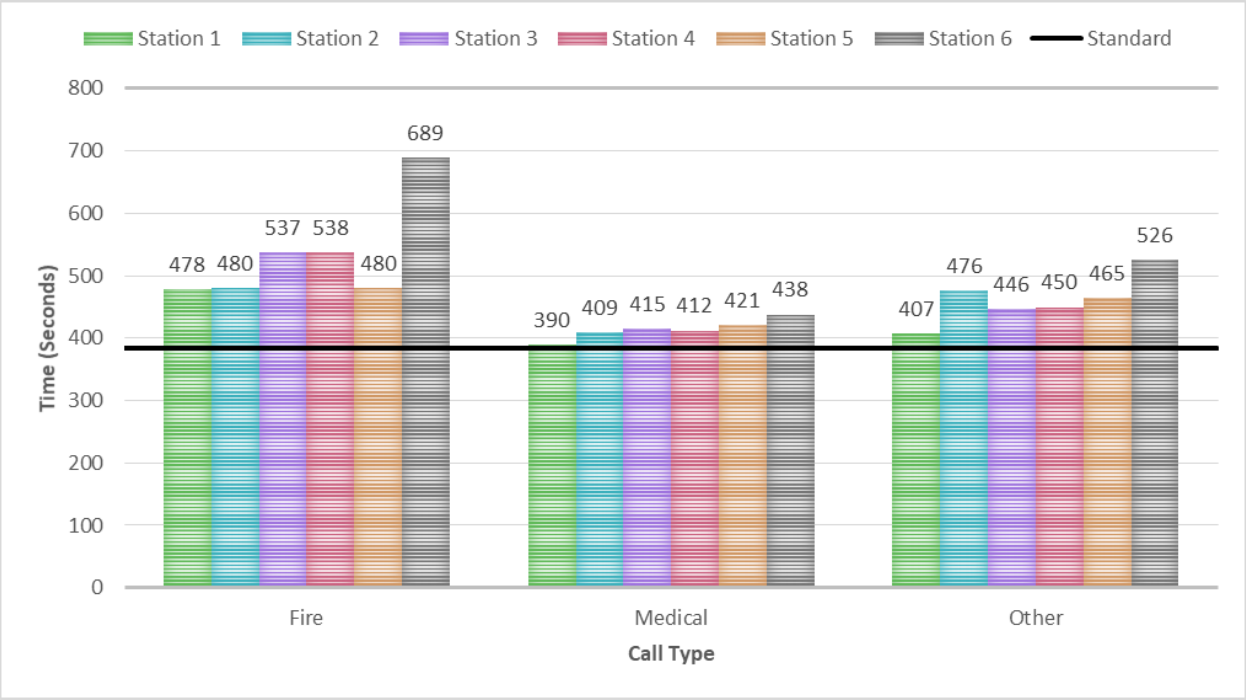
Figure 22: Emergency Calls - Total Response Time, City Wide (Initial Arriving Company)



Source: Oshawa Fire Services Emergency Response Call Data

Figure 23 illustrates the more in-depth analysis of **Total Response Time** by station. This analysis further identifies the longer travel times associated with Fire Station 6 that responds into the rural area of the City.

Figure 23: Emergency Calls - Total Response Time, By Station (Initial Arriving Company)



Source: Oshawa Fire Services Emergency Response Call Data

9.5.5 Historical Fire Suppression Emergency Response Summary

The analysis of the O.F.S. historical fire suppression emergency response capabilities for the period from January 1st, 2014 to December 31st, 2019 indicates that the department is significantly exceeding the N.F.P.A. 1710 performance benchmarks for both the dispatch time and turnout time, and specifically to fire/explosion incidents. As a result the O.F.S. has a longer **Total Response Time** to fire/explosion incidents within the City.

In our view, the identification and implementation of strategies that specifically target improvements in both the department's alarm processing time (dispatch time) and turnout time should be considered the first priority for the City to improving the O.F.S. **Total Response Time**.

Operational Recommendation #32: That the O.F.S. prioritize the identification and implementation of strategies to reduce the dispatch time and turnout time components of the Total Response Time by a minimum of one minute (60

seconds) combined, to further enhance the department's emergency response fire suppression capabilities.

9.6 Community Risk Assessment – Identified Risks/Key Findings

The C.R.A. identifies both **"Identified Risks"** and **"Key Findings"** that should be considered as part of assessing the emergency response (fire suppression) deployment coverage within the City. This type of analysis provides further insight into identifying the City's local needs and circumstances as defined by the F.P.P.A. In our view, the C.R.A. analysis highlights that Group C-Residential Occupancies should be considered as the most vulnerable building stock within the City of Oshawa. This occupancy type has a demonstrated potential for the occurrence of a fire, a fire-related injury or fatality as a result of a fire. This conclusion is supported by the following **"Identified Risks"** and **"Key Findings"** included within the C.R.A:

- Group C - Residential Occupancies represent 93.41% of the City's existing property stock, and over the five year period from January 1st, 2014 to December 31st, 2018 were associated with 82.56% of the structure fires within the City; and
- Most reported fire related civilian injuries (20) and fatalities (6) occurred in Group C – Residential Occupancies, with one (1) fatality occurring in an occupancy not classified within the O.B.C. (i.e. vehicle).

In our view, the O.F.S. fire suppression deployment model must prioritize its emergency response deployment capabilities to identified Group C-Residential Occupancies.

9.7 Existing Fire Suppression Deployment Capabilities

The following sections detail our analysis of the existing emergency response fire suppression deployment capabilities of the O.F.S. The analysis was carried out using Esri's Network Analyst, a Geographical Information System (G.I.S.) tool developed specifically for the purpose of assessing networks, such as roads. Various G.I.S. modelling scenarios were developed to assess the O.F.S. existing emergency response coverage, including the **Initial Arriving Company**, **Second Arriving Company** and **Initial Full Alarm Assignment** in comparison to the applicable N.F.P.A. 1710 Standard performance benchmarks.

9.7.1 G.I.S. Modelling Methodology

G.I.S. layers provided by the City were used to create a G.I.S.-based model of the City's current road network. Relevant base road information, such as road length and road classification, was extracted from the G.I.S. data. Esri's Network Analyst tool was used to simulate the existing emergency response fire suppression deployment capabilities of the O.F.S. navigating the City's road network.

The historic call locations for all "emergency response" incidents such as structure fires, vehicle fires and medical calls as designated by the applicable O.F.M.E.M. response codes for the period from January 1, 2014 to December 31, 2019 were utilized to calibrate the model. Any calls with a five second or less, or thirty minute or more dispatch time, turn out time or travel time were removed from the data set.

The emergency calls within the analysis represent the types of incidents where the department operating guidelines require the use of all emergency lights and warning systems therefore representing the most consistent and expedited type of responses. These emergency calls were then added to the network and coded based on travel time to reach the call. An iterative process was applied to assess the speeds throughout the road network to calibrate the model to reflect historic travel times and emergency response performance of the first responding apparatus for all calls with an emergency response code.

Table 30 identifies that the current posted speeds for the existing current road network reflect the actual historical response capabilities of the O.F.S. The G.I.S. calibrated model was then used to assess the applicable fire suppression performance benchmarks.

Table 31: Model Calibration

Posted Speed Limit (km/hr)	Modelled Speed (km/h)
10	10
15	15
20	20
25	25
30	30
40	32
50	32
60	40
70	60
80	70
100	90

9.7.2 Existing Fire Suppression Deployment Model

The existing O.F.S. fire suppression deployment model includes sustaining a minimum of 33 full-time firefighters on duty at all times. These firefighters are deployed from the City's six existing fire stations that are strategically located across the City. **Table 31** illustrates the current distribution of apparatus and staffing at each of the City's fire stations. The existing deployment model of the O.F.S. represents what was recommended by the 2013 F.M.P. and successfully implemented by the Fire Chief.

Table 32: Existing O.F.S Fire Suppression Deployment Model

Fire Station	Apparatus	Existing Minimum Staffing
1	Car 25	1
	Pump 21	4
2	Pump 22	4
	Aerial 22	4
3	Pump 23	4
	Aerial 23	4
4	Pump 24	4
5	Pump 25	4
6	Pump 26	4
Minimum Number of Firefighters On Duty At All Times		33

It is important to note that the N.F.P.A. 1710 Standard (2020 Edition) now requires the analysis of fire suppression deployment capabilities by each "first-due response zones"[49]. Within this F.M.P. the "first-due response zones" are defined as, and presented as the current primary response districts for each fire station as designated by the O.F.S.

In addition to assessing the current fire suppression deployment capabilities of the O.F.S., our analysis considered the existing staffing model within this division. This analysis was presented to City staff and Council at the preliminary findings stage of the project. The O.F.S. currently utilizes a four platoon system to schedule and delivery fire suppression services. The current Collective Agreement with the O.P.F.F.A. contains a number of articles that relate to the operation of the platoon system including rank structure, and the hours of work that include 24 hour shifts.

[49] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 4 Organization, Section 4.1.2.1

Our analysis indicated that the four platoons are currently staffed inconsistently. Three of the four platoons are staffed with a total complement of 40 firefighters and one platoon is staffed with 41 firefighters. In our view this inconsistency has an impact on the department's ability to sustain the required minimum staffing of 33 firefighters on-duty at all times. The difference between the total complement of firefighters on each platoon (41 or 40), and the minimum number of firefighters on-duty (33) at all times is required to accommodate vacation, sickness, approved absences and long-term leaves such as Workplace Safety and Insurance Board (W.S.I.B.) or Post-Traumatic Stress Disorder (P.T.S.D.) related absences.

Over the past decade significant progress has been made in recognizing the health risks associated with firefighting. Ontario Regulation 253/07 was developed and implemented to recognize seventeen prescribed diseases that can impact the health of a firefighter. This regulation provides recognition that these diseases are job related and can impact the health and wellness of a firefighter whether he, or she is full-time, part-time or a volunteer firefighter. Fire services across the province, including the O.F.S., are recognizing that their staff are not immune to these diseases. Once identified the impacts can have a significant impact on a department's ability to sustain required minimum staffing levels. As such, ensuring that strategies are in place that recognize the potential impacts of long-term absences is a core element of effective and efficient operations.

The current practices of the O.F.S. is to allow for six firefighters on each platoon to be off on vacation at any one time. On the three platoons with a total complement of 40 firefighters this allows for one additional firefighter to be absent as a result of sickness, W.S.I.B. or other approved absences before overtime is required to sustain the minimum required staffing of 33 firefighters on duty. On the platoon with 41 total firefighters two additional firefighters are available to accommodate sickness, W.S.I.B. or other approved absences. As identified within the preliminary findings analysis, in our view the City should consider hiring three additional firefighters to equalize the total complement of firefighters on each platoon at 41.

Council Recommendation #4 (completed): That Council consider allocating sufficient funding within the City's 2020 operating budget to hire three firefighters as identified within the preliminary analysis of the fire master planning process.

9.7.3 Existing Initial Arriving Company Response Capabilities

The calibrated road network, combined with the existing fire station locations, was used to build a graphical (map-based) display of the existing emergency response performance capabilities of the O.F.S. both city-wide (defined urban and rural areas) and by the primary response districts for each fire station. These mapped results represent the emergency response coverage that can be provided in the specified amount of travel time of the Initial Arriving Company only.

The existing emergency response fire suppression deployment capabilities of the O.F.S. Initial Arriving Company were assessed in comparison to the N.F.P.A. 1710 Standard performance benchmark of "Four firefighters arriving on scene within a four minute travel time to 90% of fire suppression incidents".

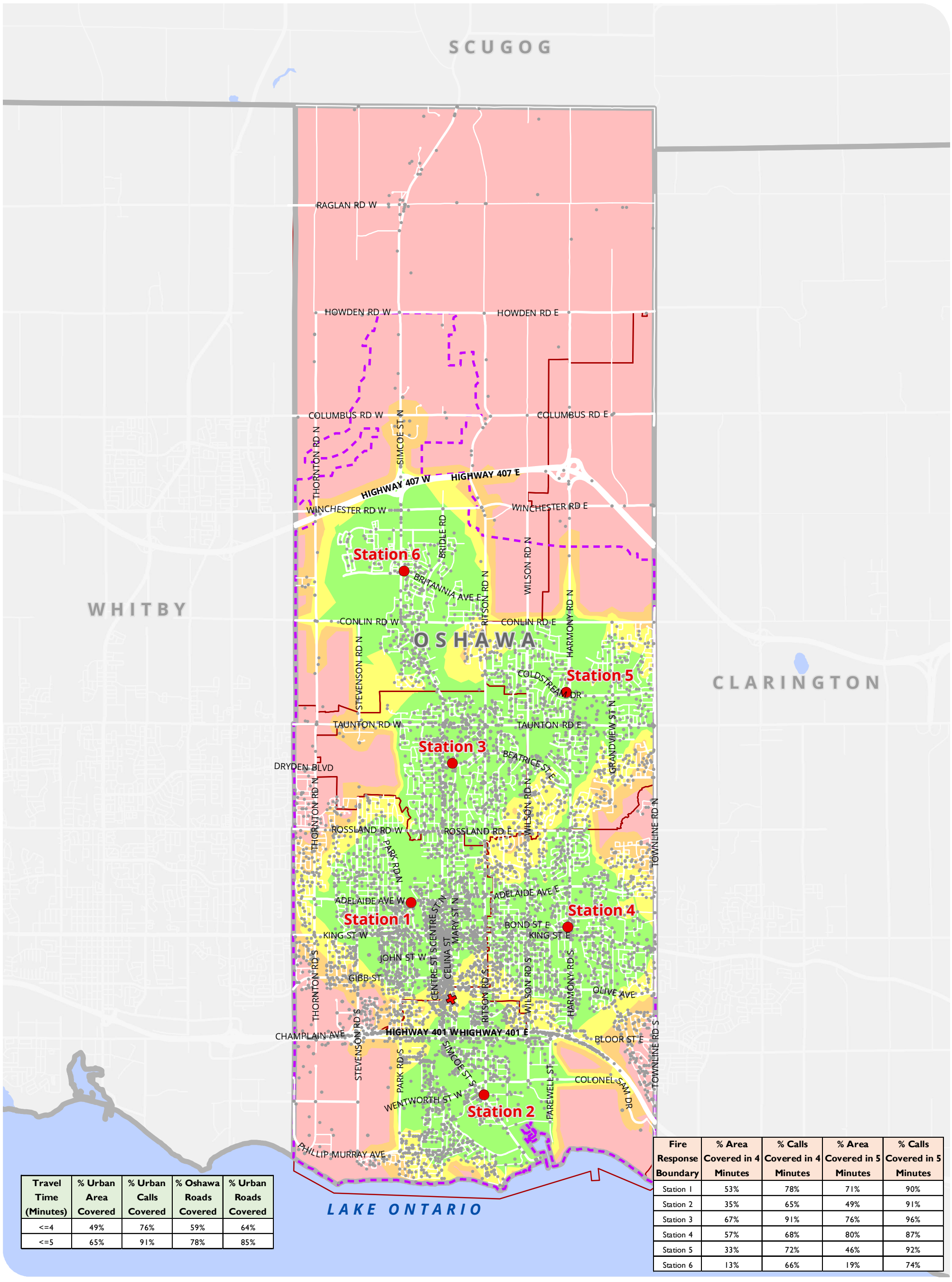
Figure 24 illustrates the locations of the historical emergency calls for the period from January 1, 2014 to December 31, 2019. This model indicates that within a four minute travel time the Initial Arriving Company was able to provide emergency response coverage to 49% of the defined urban area, 76% of the historical emergency calls within the defined urban area, 59% of the road network within the City and 64% of the road network within the defined urban area.

This analysis is quite consistent with the findings of the 2018 I.A.F.F. Report that indicates "Currently, the O.F.S. can assemble at least 4 firefighters on 66.7% roads within Oshawa within 4 minutes"[50]. The analysis on page 93 of the 2018 I.A.F.F. Report also states that "However, such incidents were also distributed widely throughout all first-due districts, accounting for 20.8% of fire suppression incidents during the three-year study period"[51]. The context of presenting the 20.8% reference within the 2018 I.A.F.F. Report is intended to indicate that the O.F.S was unable to achieve the four minute travel time 20.8% of the time. Through consultation with representatives of the I.A.F.F. from Washington D.C. who were the authors of the 2018 I.A.F.F. report it was confirmed that this analysis also represents that the O.F.S was able to achieve a

[50] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Current Emergency Response Capabilities, Page 71.

[51] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Travel Time Analysis, page 91.

deployment of four firefighters within a four minute travel time to 79.2% of the fire suppression incidents during the three-year data period. This is result very comparable to the findings of this F.M.P. that indicates for the longer six-year period of this study's data set, the O.F.S. has achieved a performance of 76% of the historical emergency calls within the defined urban area.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=4	49%	76%	59%	64%
<=5	65%	91%	78%	85%

Fire Response Boundary	% Area Covered in 4 Minutes	% Calls Covered in 4 Minutes	% Area Covered in 5 Minutes	% Calls Covered in 5 Minutes
Station 1	53%	78%	71%	90%
Station 2	35%	65%	49%	91%
Station 3	67%	91%	76%	96%
Station 4	57%	68%	80%	87%
Station 5	33%	72%	46%	92%
Station 6	13%	66%	19%	74%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 24: EXISTING INITIAL ARRIVING COMPANY RESPONSE CAPABILITIES

Final Draft March 2020

- Fire Station
- Albert Street Bridge Restriction
- Historic Emergency Incident (2014-2019)
- Urban Area
- Fire Response Boundary

Travel Time

- ≤ 4 Minutes at Network Speed
- ≤ 5 Minutes at Network Speed
- ≤ 6 Minutes at Network Speed
- > 6 Minutes at Network Speed

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DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
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1:70,000
0 250500 1,000 m

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Arriving Apparatus.mxd

Figure 24 also illustrates the Initial Arriving Company deployment capabilities from each of the City's six fire stations. This analysis indicates that for this six-year period the initial arriving company deployed from Fire Station 3 was able to respond to 91% of the historical emergency incidents within its first-due response zone. Fire Station 1 was able to respond to 78% of the historical emergency incidents within its first-due response zone.

Figure 24 illustrates that there is a notable improvement in the emergency response coverage of historical emergency calls from a four minute travel time to a five minute travel time. With the exception of Fire Station 6, the first-due Initial Arriving Companies deployed from the City's five other fire stations would either achieve, or come very close to achieving the 90th percentile performance benchmark within a five minute travel time.

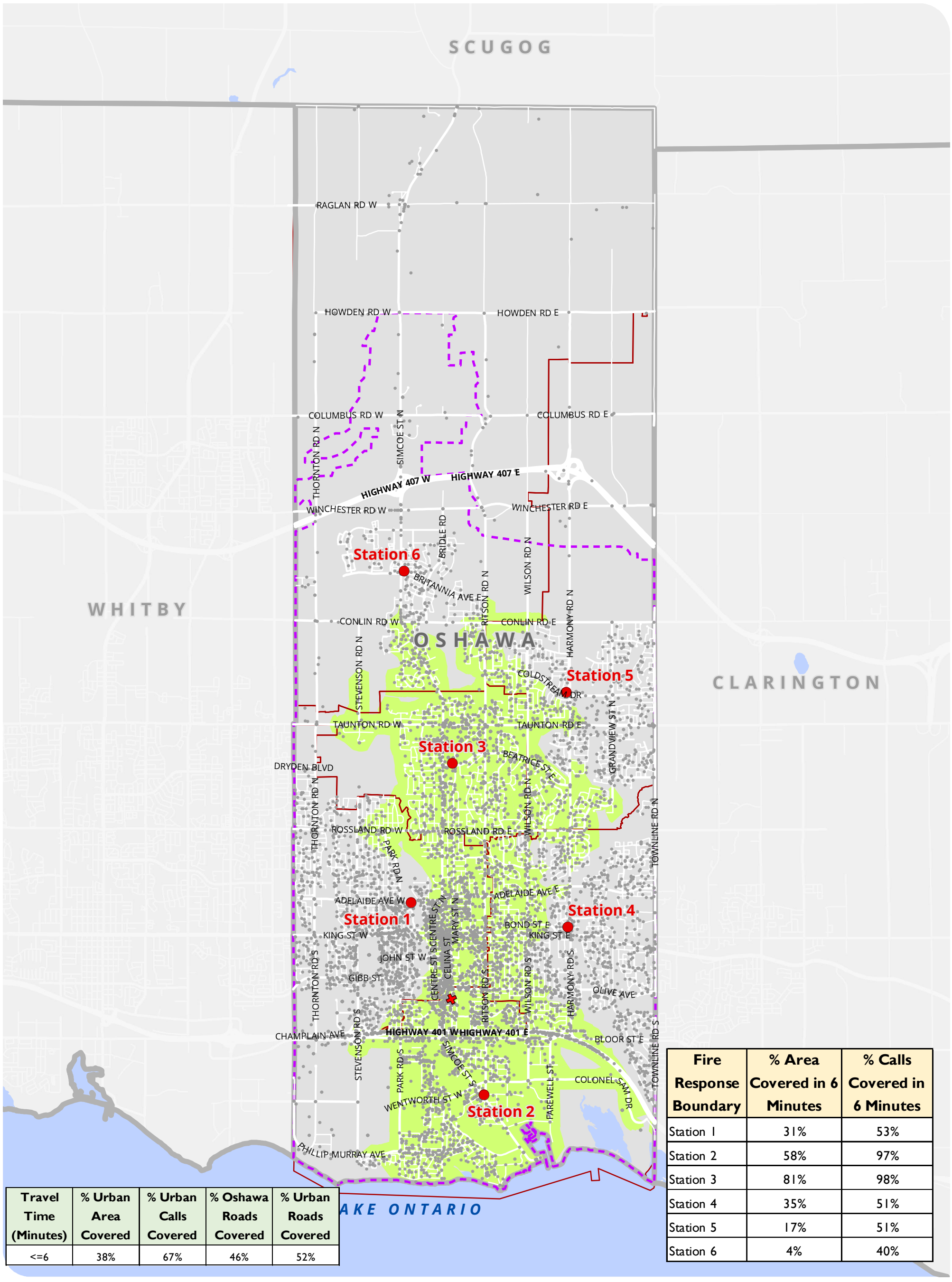
9.7.4 Existing Second Arriving Company Response Capability

The N.F.P.A. 1710 Standard (2020) edition includes a new performance benchmark for assessing the second arriving company. This standard defines a "company" as a group of members who are "usually organized and identified as engine companies, ladder companies, rescue companies, squad companies or mulita-functional companies"[52]. This same standard identifies the minimum staffing for these apparatus is four firefighters.

The existing emergency response fire suppression deployment capabilities of the O.F.S. for the Second Arriving Company were assessed in comparison to the N.F.P.A. 1710 Standard performance benchmark of "**Four firefighters arriving on scene within a six minute travel time to 90% of fire suppression incidents".**

Figure 25 illustrates the locations of the historical emergency calls for the period from January 1, 2014 to December 31, 2019.

[52] N.F.P.A. 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition) Chapter 3, Definitions, 3.3.15



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=6	38%	67%	46%	52%

Fire Response Boundary	% Area Covered in 6 Minutes	% Calls Covered in 6 Minutes
Station 1	31%	53%
Station 2	58%	97%
Station 3	81%	98%
Station 4	35%	51%
Station 5	17%	51%
Station 6	4%	40%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 25: **EXISTING SECOND ARRIVING COMPANY RESPONSE CAPABILITIES**

Final Draft March 2020

- Fire Station
- Albert Street Bridge Restriction
- Historic Emergency Incident (2014-2019)
- Urban Area
- Fire Response Boundary
- Second Arriving Truck in 6 Minutes of Travel Time

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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

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This model indicates that within a six minute travel time the **Second Arriving Company** was able to provide emergency response coverage to 38% of the defined urban area, 67% of the historical emergency calls within the defined urban area, 46% of the road network within the City and 52% of the road network within the defined urban area.

The **2018 I.A.F.F. Report** does not include analysis of the Second Arriving Company because this report was prepared prior to the N.F.P.A. 1710 Standard (2020 Edition) being made available to the industry.

Figure 25 also illustrates the historical deployment capabilities within each of the fire stations first-due response zones. This analysis highlights that the Second Arriving Company performance benchmark of 90% was exceeded in the Fire Station 2 and Fire Station 3 first-due response zones. This is directly related to Aerial 22 and Aerial 23 being deployed from these two stations.

9.7.5 Existing Initial Full Alarm Assignment Response Capabilities

The analysis of the O.F.S. existing **Initial Full Alarm Assignment** response capabilities were assessed in comparison to the applicable N.F.P.A. 1710 Standard for the following:

- Single-Family Dwelling Initial Full Alarm Assignment: The applicable N.F.P.A. 1710 fire suppression deployment model for an initial full alarm assignment to a single-family dwelling includes a minimum deployment of 16 firefighters (17 if an aerial device is used) **arriving on scene within an 8 minute (480 second) travel time to 90% of the fire suppression incidents in this occupancy type**.
- Apartment Initial Full Alarm Assignment: The applicable N.F.P.A. 1710 fire suppression deployment model for an initial full alarm assignment to an apartment includes a minimum deployment of 25 firefighters (26 if an aerial device is used) **arriving on scene within an 8 minute (480 second) travel time to 90% of the fire suppression incidents in this occupancy type**. This deployment model is the same for an Open-Air Strip Shopping Centre.

It is important to note that the current O.F.S fire suppression deployment model includes the staffing of two aerial apparatus. One of these aerials would be automatically deployed to a fire suppression incident involving these types of occupancies.

As such, our analysis of these performance benchmarks focuses on the deployment of 16 firefighters being deployed to single-family dwellings, and 25 firefighters being deployed to apartments.

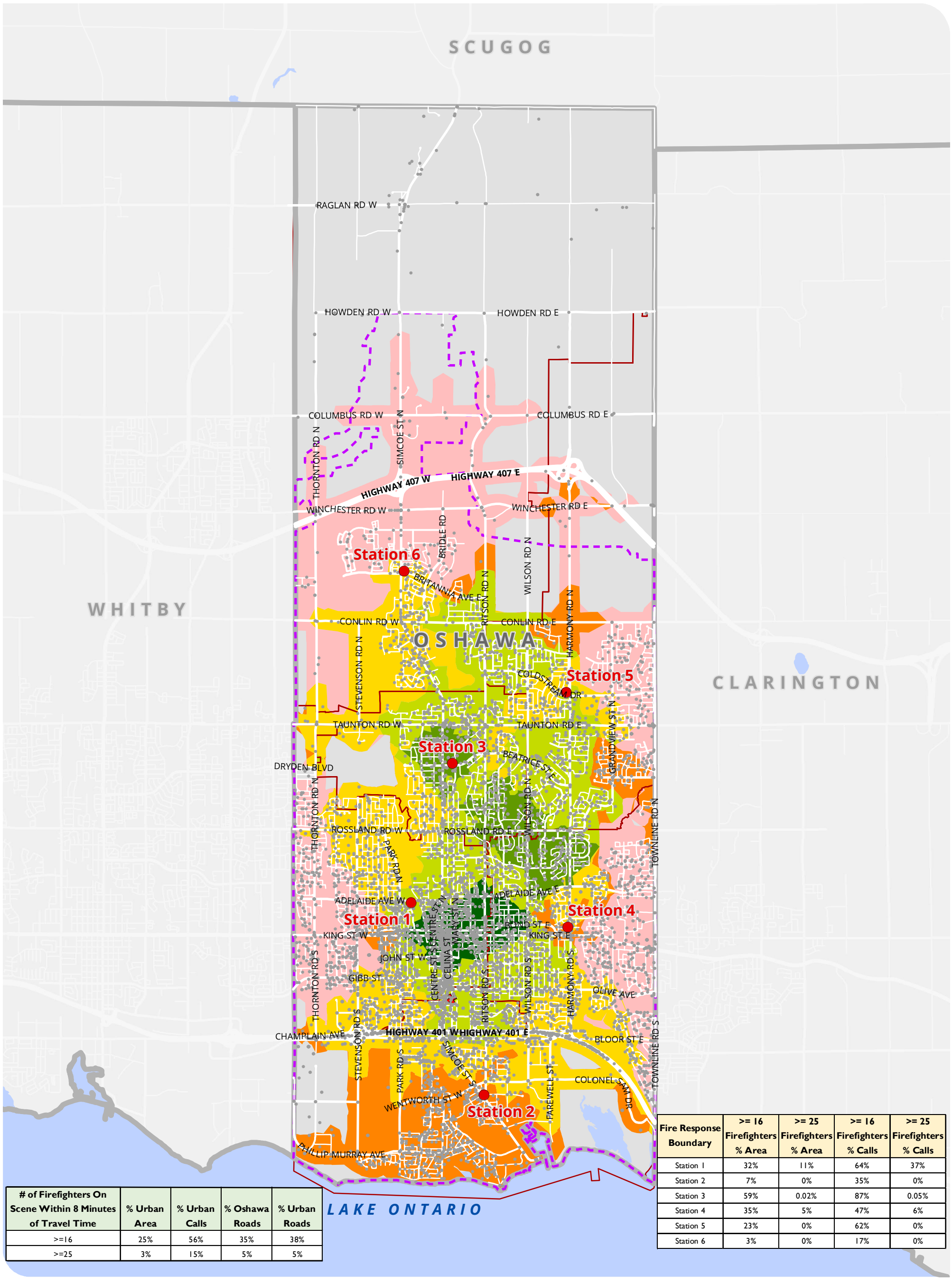
The **2018 I.A.F.F. Report** recommends that the **"O.F.S. should modify the initial full alarm response to a low-hazard structure fire to ensure an initial response of a minimum of 15 firefighters"**[53]. After reviewing the **2018 I.A.F.F. Report** the O.F.S. did revise its fire suppression deployment model to ensure that 15 firefighters were being deployed to incidents requiring an Initial Full Alarm Assignment.

9.7.5.1 Existing Single-Family Dwelling Initial Full Alarm Assignment

Figure 26 illustrates the locations of the historical emergency calls for the period from January 1st, 2014 to December 31st, 2019. This model indicates that within an eight minute travel time the O.F.S. has historically deployed an Initial Full Alarm Assignment to a Single-Family Dwelling to 25% of the defined urban area, 56% of the historical emergency call locations within the defined urban area, 35% of the road network within the City and 38% of the road network within the defined urban area.

Figure 26 also illustrates the Initial Full Alarm Assignment to a Single-Family Dwelling deployment capabilities from each of the City's six fire stations. This analysis indicates that for this six-year period the initial full alarm assignment deployed from Fire Station 3 was able to respond to 87% of the historical emergency incidents within its first-due response zone. Fire Station 5 was able to respond to 62% of the historical emergency incidents within its first-due response zone. This analysis further illustrates the extended travel times in the Fire Station 6 first-due response zone to the rural area of the City as this station was only able to achieve the performance objective to 17% of the emergency call within this area. This model illustrates that the O.F.S. Initial Full Alarm Assignment response capabilities to fire suppression incidents within the defined urban area is 56% the historical emergency call locations within an eight minute travel time.

[53] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Recommendations Page 8 #1



# of Firefighters On Scene Within 8 Minutes of Travel Time	% Urban Area	% Urban Calls	% Oshawa Roads	% Urban Roads
>=16	25%	56%	35%	38%
>=25	3%	15%	5%	5%

Fire Response Boundary	>= 16 Firefighters % Area	>= 25 Firefighters % Area	>= 16 Firefighters % Calls	>= 25 Firefighters % Calls
Station 1	32%	11%	64%	37%
Station 2	7%	0%	35%	0%
Station 3	59%	0.02%	87%	0.05%
Station 4	35%	5%	47%	6%
Station 5	23%	0%	62%	0%
Station 6	3%	0%	17%	0%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 26: EXISTING INITIAL FULL ALARM ASSIGNMENT RESPONSE CAPABILITIES

Final Draft March 2020

Fire Station
Historic Emergency Incident (2014-2019)
Albert Street Bridge Restriction
Urban Area
Fire Response Boundary

Number of Staff On Scene within 8 Minutes of Travel Time

≥ 25 Firefighters
≥ 20 Firefighters
≥ 16 Firefighters
≥ 12 Firefighters
≥ 8 Firefighters
≥ 4 Firefighters

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DATA PR
MAP CREATED BY: GM
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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

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9.7.5.2 Existing Apartment Initial Full Alarm Assignment

Figure 26 also illustrates that the O.F.S. has historically been able to provide an Initial Full Alarm Assignment including a minimum of 25 firefighters within an eight minute travel time to 3% of the defined urban area, 15% of the historical emergency call locations within the defined urban area, 5% of the road network within the City and 5% of the road network within the defined urban area.

Figure 26 also illustrates the current limited abilities of the O.F.S. to deploy an Initial Full Alarm Assignment including a minimum of 25 firefighters within an eight minute travel time within any of the existing first-due response area. However, the Fire Station 1 first-due response area has the highest performance of achieving 37% of the historical call locations.

9.7.6 Existing High-Rise Initial Full Alarm Assignment Capabilities

The N.F.P.A. 1710 Standard includes a performance benchmark for high-rise buildings described as having the highest floor greater than 75 feet (23 metres) above the lowest level of fire department vehicle access. The applicable deployment model for the O.F.S. would include an initial minimum deployment of 38 firefighters (39 firefighters if the building is equipped with a fire pump) arriving on scene within a 10 minute and 10 second (610 second) travel time to 90% of the fire suppression incidents in this occupancy type.

The existing fire suppression deployment model of the O.F.S. includes a minimum of 33 firefighters on duty at all times. Therefore, the O.F.S. is currently not able to deploy the required 38 firefighters. The O.F.S. can assemble more than its current minimum staffing of 33 firefighters on scene through utilization of the emergency call back process of off duty firefighters, or alternatively through the activation of the Regional Mutual Aid Agreement.

In our experience, it is not uncommon for municipalities similar to the City of Oshawa to not have immediate access to a pool of 38 or more firefighters to respond to a fire in a high-rise building as defined by the N.F.P.A. 1710 Standard. As a result, it is important that municipalities like Oshawa prioritize the utilization of the first two lines of defence including proactive fire inspections, fire code enforcement and public education programs that target high-rise buildings.

9.8 Future Growth Considerations

To support the analysis of the current and future fire suppression services provided by the O.F.S. as part of this F.M.P, the City developed future growth scenarios including high, moderate, and low growth scenarios as directed by Council. This section presents the defined Major Urban Area and designated land uses of the City followed by the identified future growth scenarios.

9.8.1 City of Oshawa Defined Major Urban Area

The Durham Region Official Plan (R.O.P.) (Office Consolidation May 2017) establishes a Regional Structure that includes an Urban System and Rural System. In conformity with the Province of Ontario Growth Plan, the identified Regional Structure within the R.O.P. is designed to accommodate population, household, and employment forecasts to the year 2031.[54] Specifically for the City of Oshawa, the R.O.P. identifies that most of this projected growth will occur within the Urban Area as illustrated in **Table 32**.[55]

Table 33: Population, Households, and Employment Forecasts to 2031 (City Official Plan Policy 1.9)

	2011	2016	2021	2026	2031
Urban Population	152,565	164,355	173,650	183,405	195,935
Rural Population	1,020	1,035	1,045	1,055	1,065
Total Population	153,585	165,390	174,695	184,460	197,000
Households	59,100	64,535	70,415	75,655	82,590
Employment	68,270	75,305	84,660	86,835	90,790

[54] The Region of Durham is currently undergoing a Municipal Comprehensive Review to plan for and accommodate projected growth across the Region to the year 2041.

[55] Projections identified are from the Durham Region Official Plan (Policy 7.3.3) and the City's Official Plan (Policy 1.9). The City's O.P. includes a few notes which are listed verbatim here:

1. The population figures identified above exclude post-secondary students who reside temporarily in the City.
2. Totals may not add precisely due to rounding.
3. Population includes undercount.
4. The rural population forecast represents an allocation of development potential in the City's rural area, not a target to be achieved.

The City of Oshawa Official Plan (O.P.) (Office Consolidation September 2019) plans for the accommodation of that growth. In referencing the growth projections (Policy 1.9), the O.P. notes that the "rural population forecast represents an allocation of development potential in the City's rural area" and is not a growth target. In addition, the O.P. identifies that the City is "comprised of urban, rural, and Greenland areas" (O.P. Policy 1.3) with a defined Major Urban Area. The O.P. states that the area north of the Major Urban Area boundary (including Greenbelt lands) are "intended to remain essentially rural in nature" (O.P. Policy 1.3). The Major Urban Area boundary can be seen in **Figure 27.**

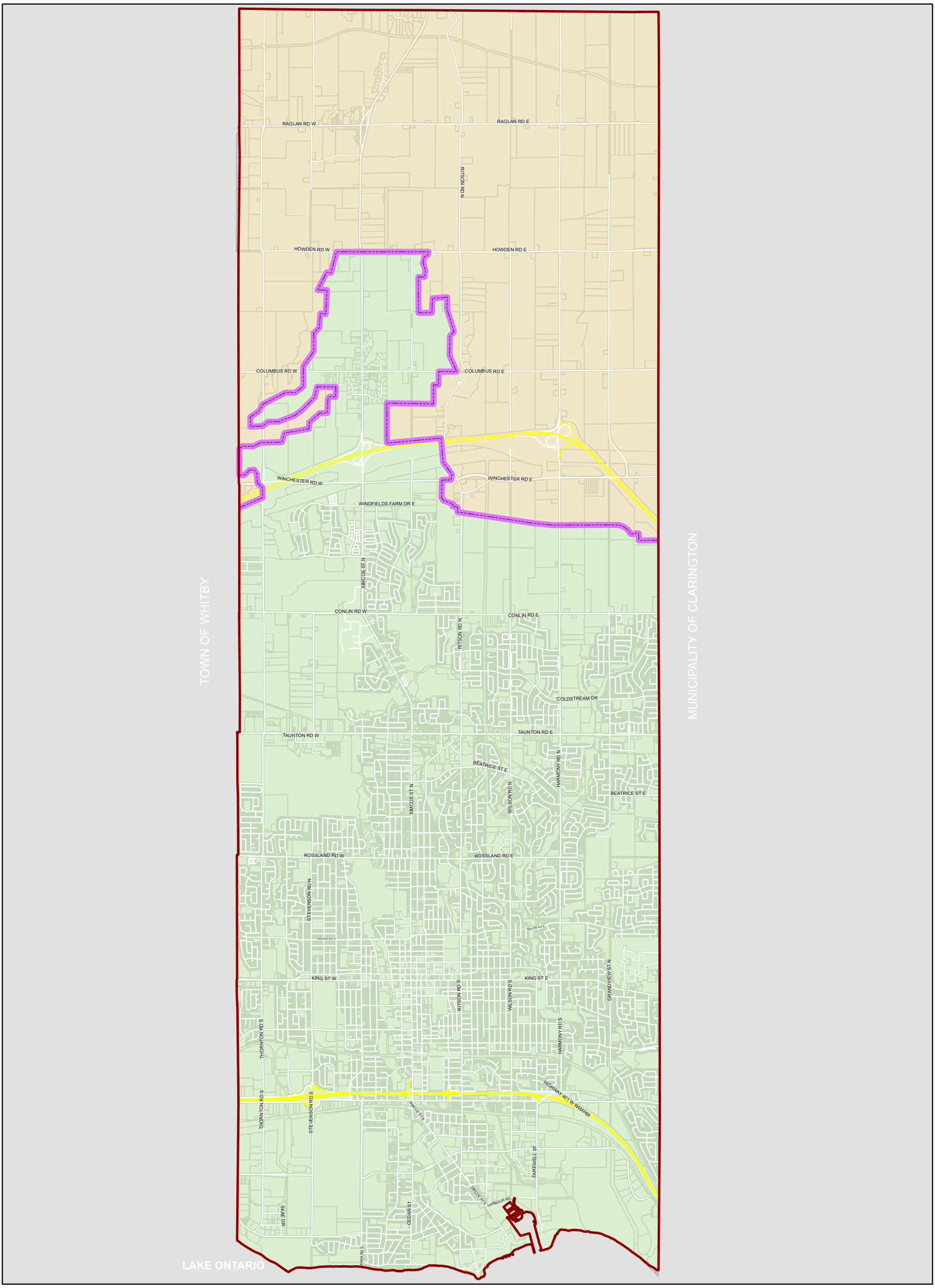


Figure 27: MAJOR URBAN BOUNDARY

Boundary of Major Urban Area
Urban Area
Rural Area (OshawaFMP)

SCALE 1:57,500

0 250 500 1,000 m

MAP DRAWING INFORMATION:
DATA PROVIDED BY THE CITY OF OHSAWA

MAP CREATED BY: JH
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PROJECT: 19-1064
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9.8.1.1 Rural Population Density

N.F.P.A. 1710 (2020) defines a rural area as an area with fewer than 500 people per square mile. For the purposes of this F.M.P., analysis was completed to identify the population density of the defined rural area within the City of Oshawa. G.I.S. data provided by the City identified that the geographic area of the rural area (i.e., the area of the municipality north of the Major Urban Area) is 19.02 square miles.

Statistics Canada 2016 Census data was used to determine population density of the rural area.[56] One limitation of using Statistics Canada data for this analysis is that the geographies used by Statistics Canada (e.g., Dissemination Areas) do not exactly line up with the delineated Major Urban Area boundary. Recognizing this, Esri ArcGIS Online offers a tool called "Enrich Layer" that allows for what is referred to as data apportionment at a Census Block level. The benefit of this tool is that it uses a weighted centroid method as opposed to assuming an even distribution of the population across a Dissemination Area.[57] Using this method of analysis, the population within the rural area is 932 resulting in a population density of 49.00 people per square mile.

Recognizing that a sophisticated G.I.S. tool such as Esri's Enrich Layer comes with its own limitations based on the assumptions and calculations, an additional calculation was completed for comparison. The population density for the rural area was calculated referring to the 2031 rural population forecast of 1,065 people. (This population represents an allocation of development potential in the City's rural area to 2031). The resulting population density is 55.99 people per square mile.

[56] In determining population density of the area north of the Major Urban Area (the rural area), City staff were contacted to confirm whether they had this information available. Staff identified that the reports they had available were limited to household density reports that do not accurately represent population numbers and so the use of Statistics Canada data may be more appropriate.

[57] Further detail on the data apportionment ArcGIS online method can be found at https://developers.arcgis.com/rest/geoenrichment/api-reference/data-apportionment.htm

9.8.2 Designated Land Use

To direct and manage the growth of the community, the O.P. identifies a number of land use designations that are found within the Major Urban Area (see **Figure 28** and **Figure 29**). Land use designations include Residential, Industrial, and Institutional.

As established in Policy 2.3.2, further direction regarding residential densities is provided within the O.P. through Part II Plans which designate residential densities including:

- Low Density Residential (generally represented by single-detached, semi-detached, and duplexes)
- Medium Density I Residential (generally represented by single-detached, semi-detached, duplexes, and townhouses)
- Medium Density II Residential (generally represented by townhouses, low-rise apartments, and medium-rise apartments)
- High Density I Residential (generally represented by low-rise, and medium-rise apartments)
- High Density II Residential (generally represented by medium-rise, and high-rise apartments)

The Official Plan identifies a number of planning areas where a Part II Plan will be completed. For the purposes of this F.M.P., two key Part II Planning areas were identified: Kedron Planning Area, and the Columbus Planning Area. The Part II Plan for Kedron has also been completed and incorporated into the Official Plan. The designated land use for Kedron is shown in **Figure 30**. The Part II Plan for Columbus is currently underway which will include an area specific land use and road plan.

Figure 28: City of Oshawa Land Use (Official Plan Schedule A Land Use – North Half)

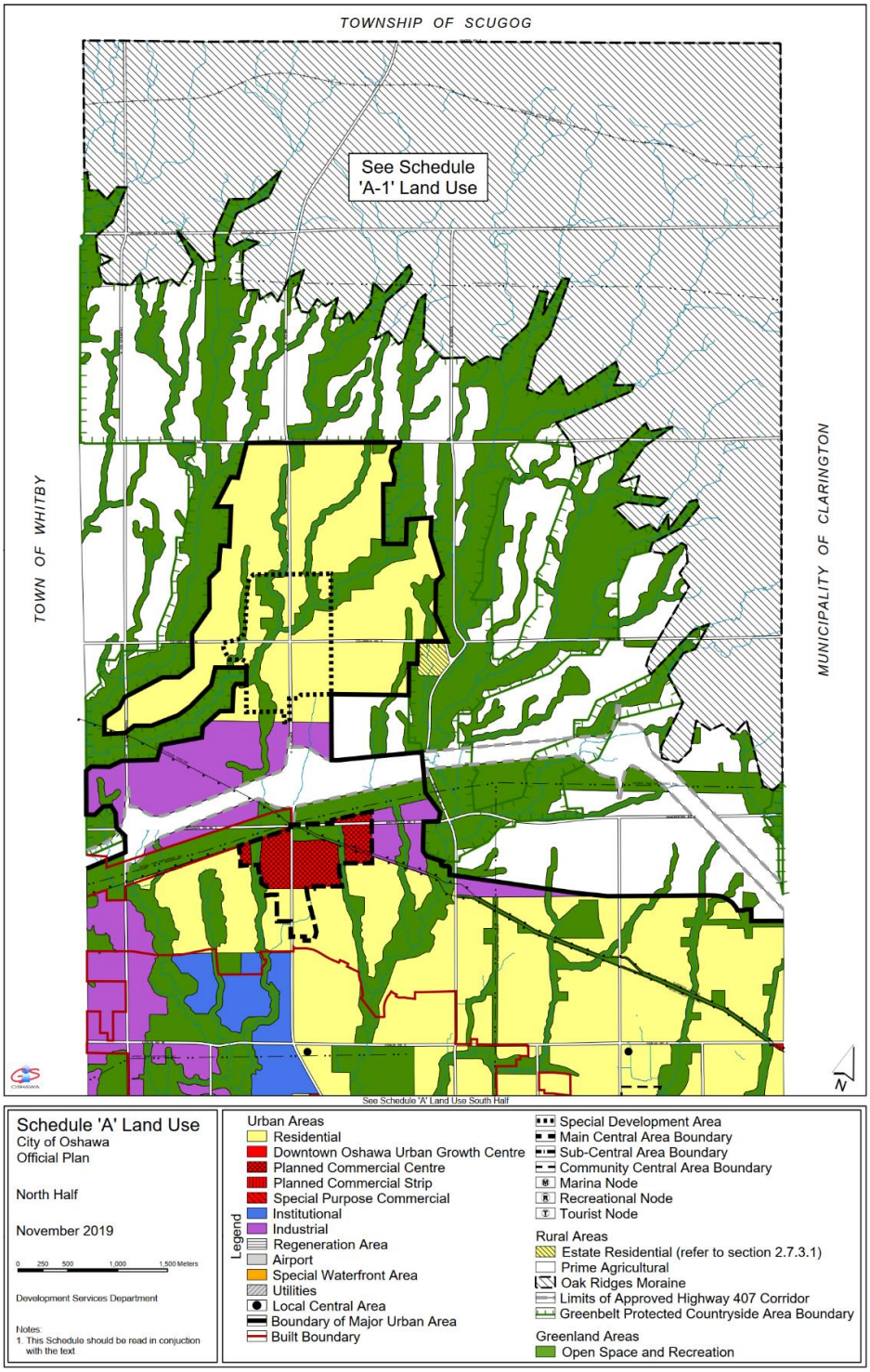


Figure 29: City of Oshawa Land Use (Official Plan Schedule A Land Use – South Half)

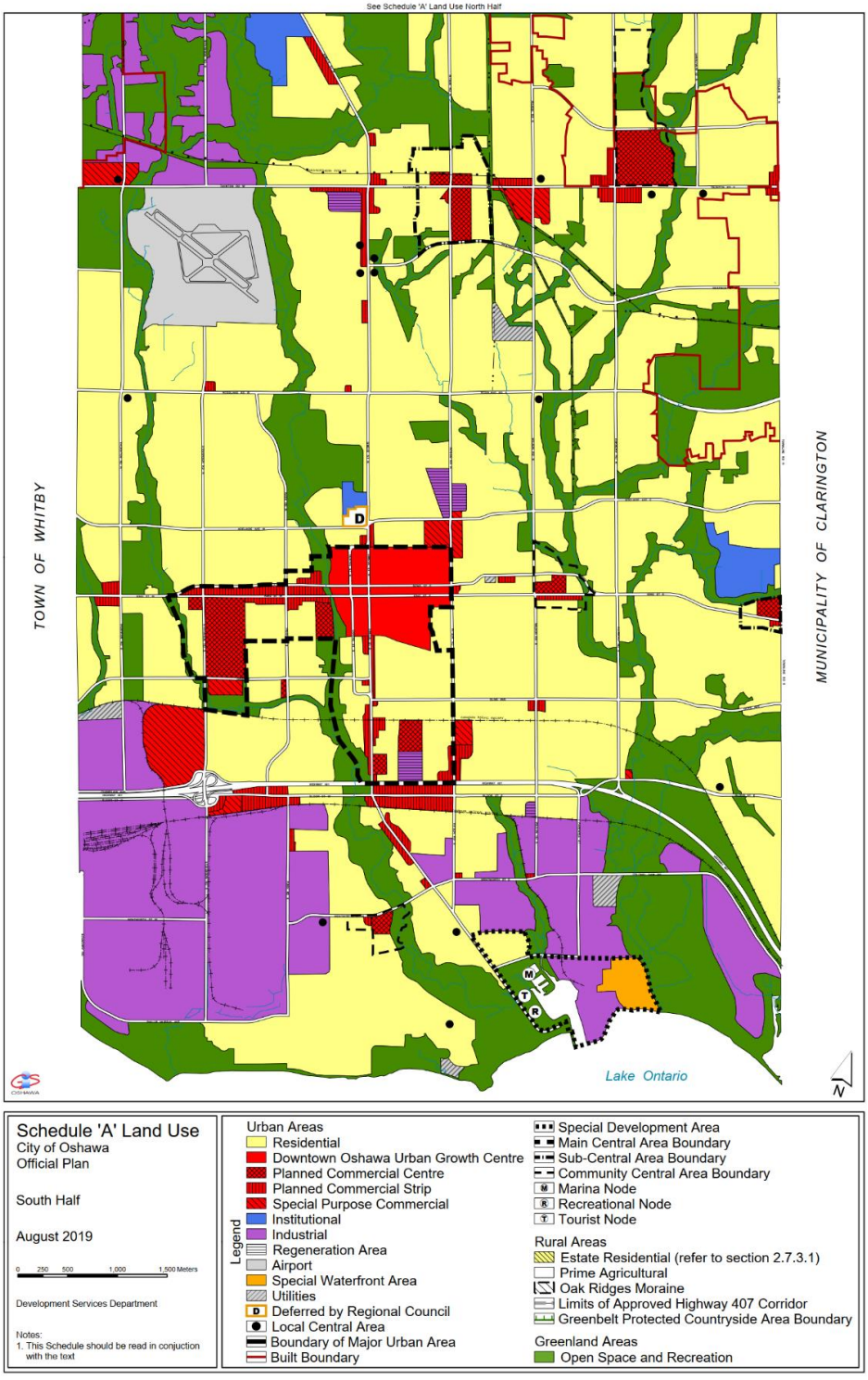
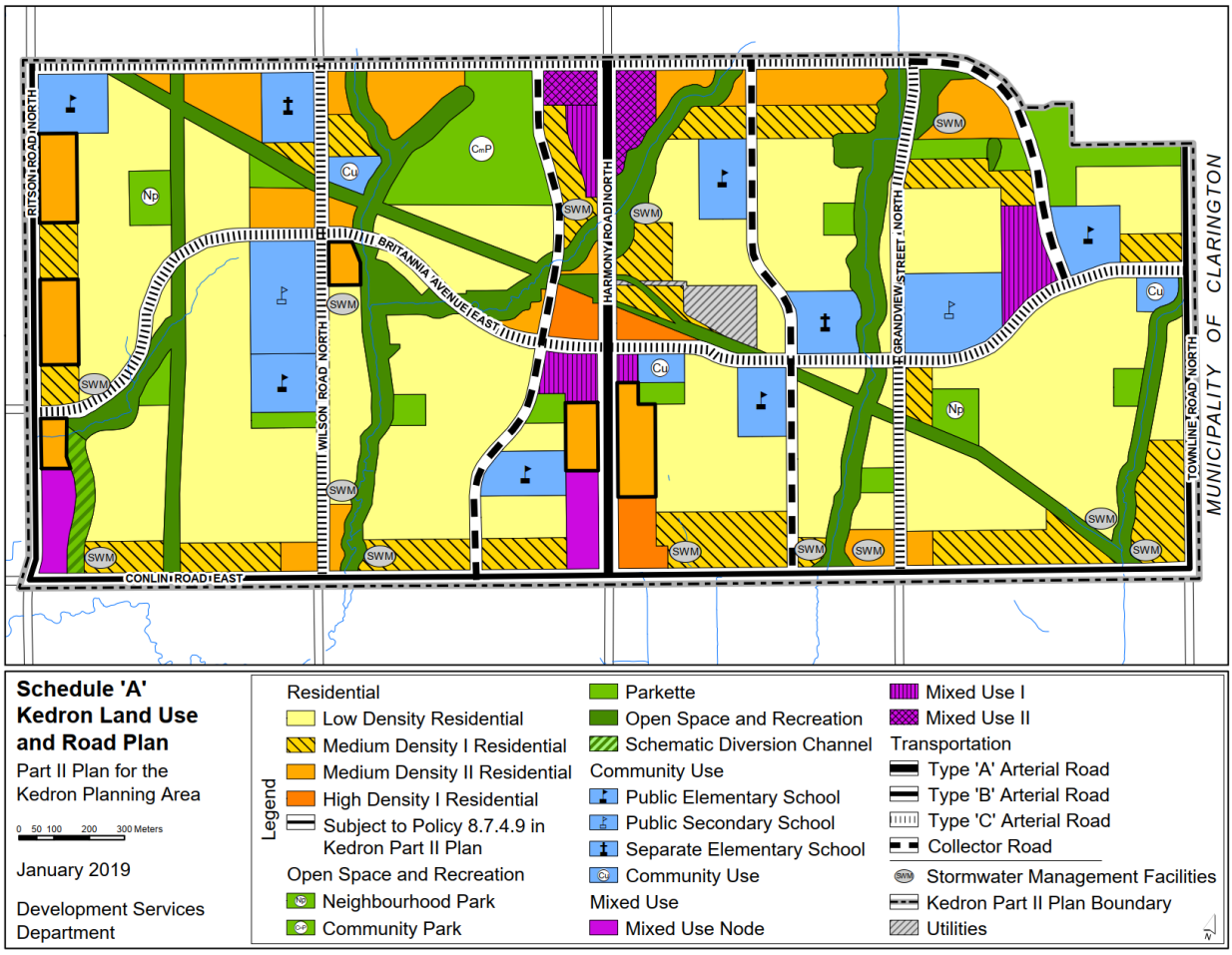


Figure 30: City of Oshawa Kedron Land Use and Road Plan



9.8.3 Future Growth Scenarios

To inform the fire suppression emergency response coverage analysis, the City of Oshawa Planning Services staff developed high, moderate, and low future growth scenarios for consideration within the F.M.P. as directed by Council. These scenarios are presented in **Figure 31, Figure 32,** and **Figure 33.** These figures identify areas for growth within a horizon of 0 to 5 years or 6 to 10 years, with the majority of the growth being residential land uses. The figures also show a future road network as confirmed by the City.

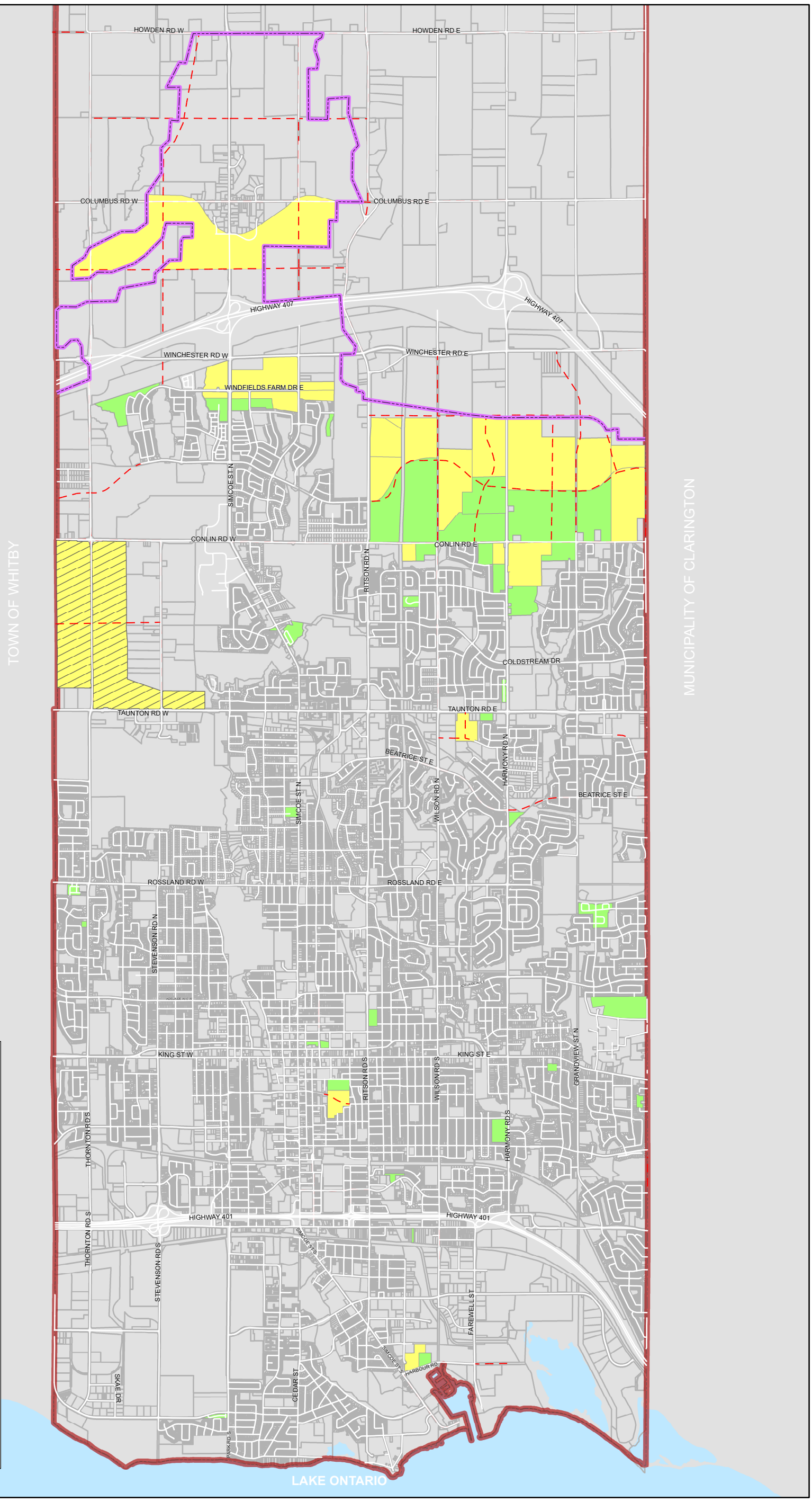
When considering the future growth scenarios, it is important to note that:

- The future scenarios being assessed are based on a ten year development horizon.
- The City developed the scenarios based in part on the following assumptions:
  - 1750 units annually is high growth
  - 1100 units annually is moderate growth
  - 450 units annually is low growth
  - 40% of growth in any given year will occur within the build boundary (i.e., intensification) and 60% will occur outside of the built boundary
- Full build out of the Northwood Park Business Area is not anticipated in the ten year horizon. The City provided estimates as to the proportion of the area that would be developed in each of the growth scenarios as presented in the note on each figure.
- Road network connectivity is critically important for accessing future (and existing) development to provide emergency response coverage. In order to assess future station location options, it was necessary to assume a future road network for the ten year horizon. Some of the roads as shown will be refined including:
  - The road location and alignment to serve the Northwood Business Park will be refined through an Environmental Assessment process.
  - As previously mentioned, the Part II Plan for Columbus is currently underway. For the purposes of the F.M.P. the future road network for Columbus is as identified in the current in effect City of Oshawa Official Plan. The future road network to serve Columbus will be refined through the ongoing Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study.

- The identified development areas are based on the best available information and the current known development potential. The actual timing and location of future development will depend on a range of factors including the provision of servicing, market demand, and landowner interest.

As part of the implementation of this F.M.P., it will be important to monitor how growth occurs and adjust F.M.P. implementation accordingly including consideration to the Community Risk Assessment.

*Map will include built boundary when we recieve layer from the City.



Notes:
Growth areas, growth horizons,and future roads illustrated were provided by the City of Oshawa Planning Services to inform the analysis for this F.M.P.

The future road network to serve Columbus will be refined through the ongoing Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study.

For the purposes of the F.M.P. the future road network for Columbus is as identified in the current in effect City of Oshawa Official Plan. The road location and alignment to serve the Northwood Business Park will be refined through an Environmental Assessment process.

In a high growth scenario, it is assumed that the Northwood Park Business will see 25% of the area identified on this figure as developed within a ten year horizon.

The actual timing and location of growth will depend on a range of factors including the provision of servicing, market demand, and landowner interest. As part of implementation of this F.M.P. it will be important to monitor how growth occurs and adjust F.M.P. implementation accordingly.

OSHAWA FIRE MASTER PLAN

Figure 31: HIGH GROWTH SCENARIO - FUTURE GROWTH

Final Draft March 2020

- Future Road
- Major Urban Area Boundary
- Northwood Business Park

Growth Horizon

- 0-5 Years
- 6-10 Years

SCALE 1:47,500

0 250 500 1,000 m

MAP DRAWING INFORMATION:
DATA PROVIDED BY THE CITY OF OHSAWA

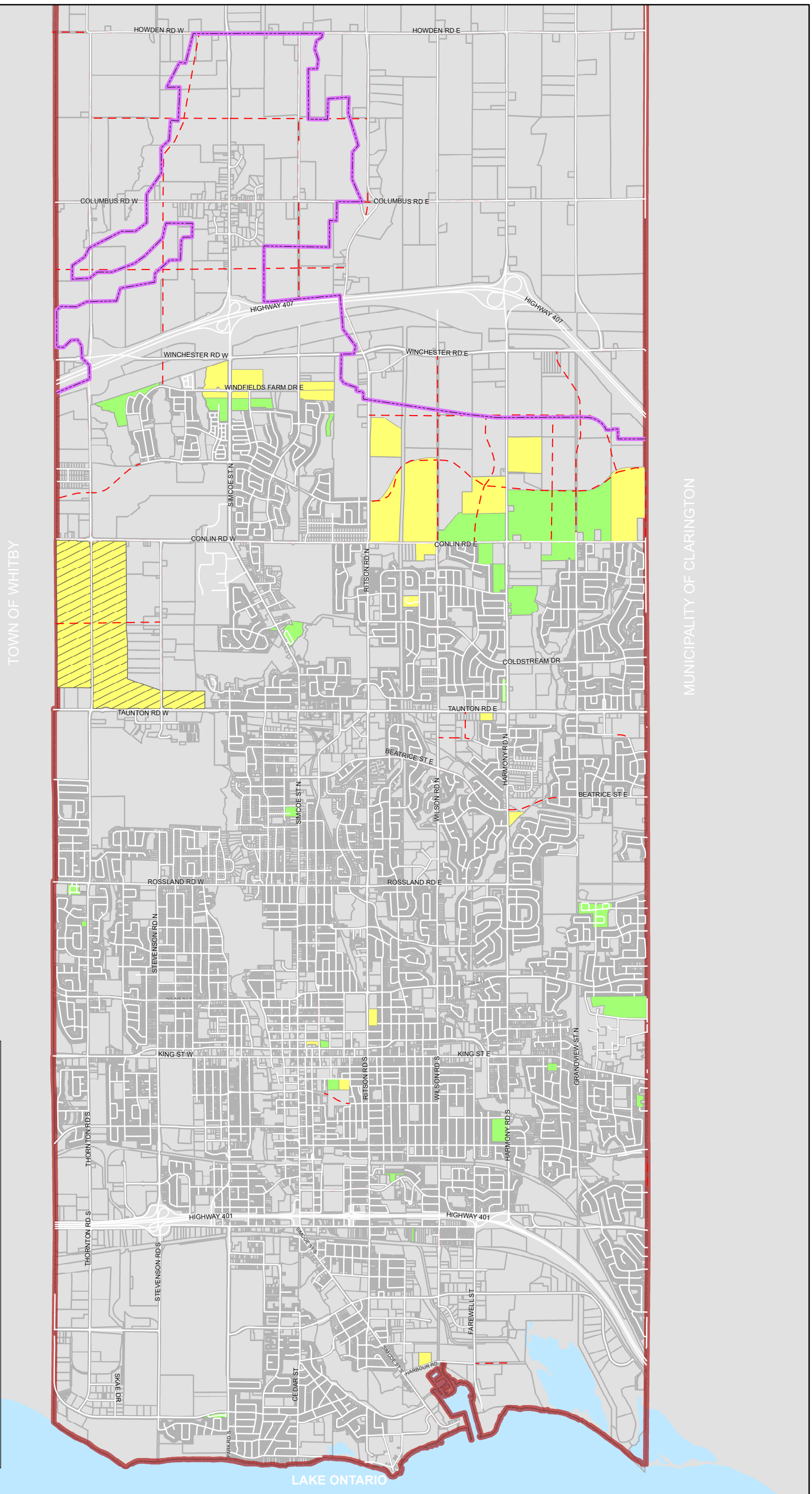
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MAP PROJECTION: NAD 1983 UTM Zone 17N

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*Map will include built boundary when we recieve layer from the City.



Notes:
Growth areas, growth horizons,and future roads illustrated were provided by the City of Oshawa Planning Services to inform the analysis for this F.M.P.

The future road network to serve Columbus will be refined through the ongoing Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study.

For the purposes of the F.M.P. the future road network for Columbus is as identified in the current in effect City of Oshawa Official Plan. The road location and alignment to serve the Northwood Business Park will be refined through an Environmental Assessment process.

In a moderate growth scenario, it is assumed that the Northwood Park Business will see 20% of the area identified on this figure as developed within a ten year horizon.

The actual timing and location of growth will depend on a range of factors including the provision of servicing, market demand, and landowner interest. As part of implementation of this F.M.P. it will be important to monitor how growth occurs and adjust F.M.P. implementation accordingly.

OSHAWA FIRE MASTER PLAN

Figure 32: MODERATE GROWTH SCENARIO - FUTURE GROWTH

Final Draft March 2020

- Future Road
- Major Urban Area Boundary
- Northwood Business Park

Growth Horizon

- 0-5 Years
- 6-10 Years

SCALE 1:47,500

0 250 500 1,000 m

MAP DRAWING INFORMATION:
DATA PROVIDED BY THE CITY OF OHSAWA

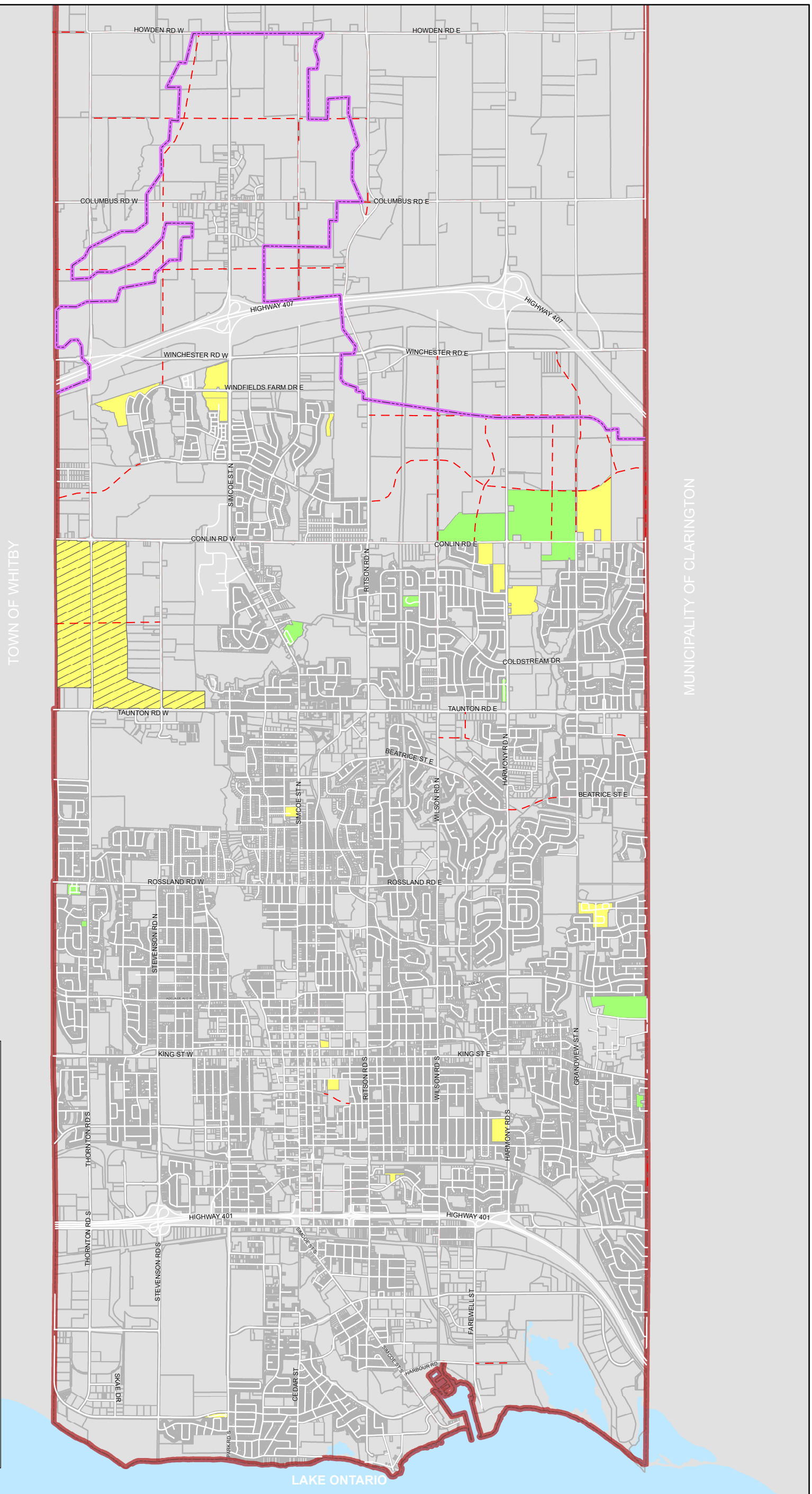
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*Map will include built boundary when we recieve layer from the City.



Notes:
Growth areas, growth horizons,and future roads illustrated were provided by the City of Oshawa Planning Services to inform the analysis for this F.M.P.

The future road network to serve Columbus will be refined through the ongoing Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study.

For the purposes of the F.M.P. the future road network for Columbus is as identified in the current in effect City of Oshawa Official Plan. The road location and alignment to serve the Northwood Business Park will be refined through an Environmental Assessment process.

In a low growth scenario, it is assumed that the Northwood Park Business will see 15% of the area identified on this figure as developed within a ten year horizon.

The actual timing and location of growth will depend on a range of factors including the provision of servicing, market demand, and landowner interest. As part of implementation of this F.M.P. it will be important to monitor how growth occurs and adjust F.M.P. implementation accordingly.

OSHAWA FIRE MASTER PLAN

Figure 33: LOW GROWTH SCENARIO - FUTURE GROWTH

Final Draft March 2020

- Future Road
- Major Urban Area Boundary
- Northwood Business Park

Growth Horizon

- 0-5 Years
- 6-10 Years

SCALE 1:47,500

0 250 500 1,000 m

MAP DRAWING INFORMATION:
DATA PROVIDED BY THE CITY OF OHSAWA

MAP CREATED BY: JH
MAP CHECKED BY: AN
MAP PROJECTION: NAD 1983 UTM Zone 17N

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DATE: 2020-02-13

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9.9 Future Fire Suppression Deployment Capabilities

The analysis within this F.M.P. illustrates the future fire suppression capabilities of the O.F.S. as Future Baseline scenarios. These scenarios illustrate the projected fire suppression deployment capabilities of the O.F.S. considering the projected future community growth and planned road network in comparison to the existing fire suppression deployment model and existing resources (e.g. stations, staff and apparatus) of the O.F.S.

9.9.1 Future Baseline Scenario – Future Conditions

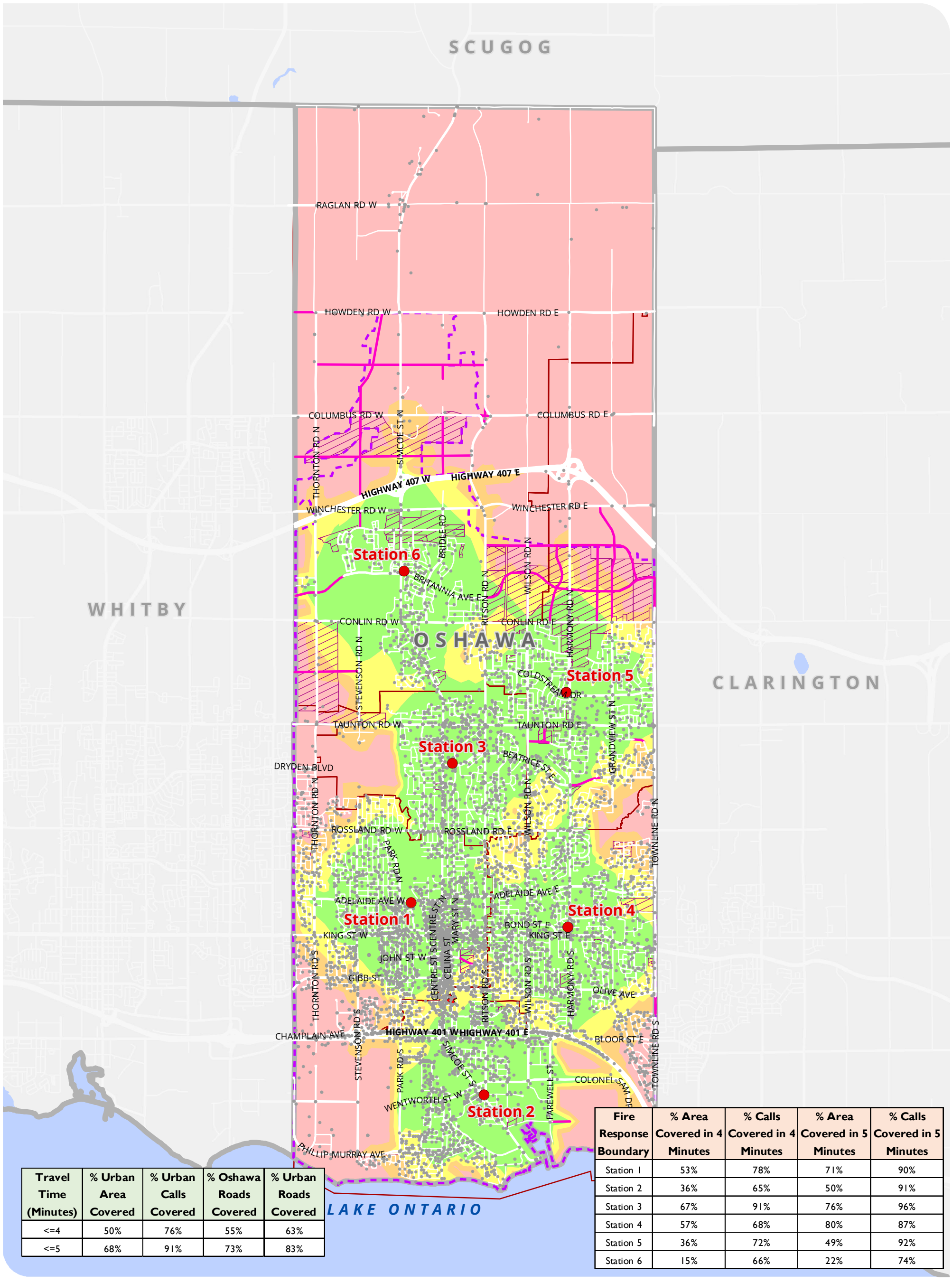
The Future Baseline Scenario assesses the performance of the existing stations and staffing of O.F.S. under the future conditions of new roads and new growth. This scenario provides the future baseline from which to measure other future scenarios against, ensuring an 'apples to apples' comparison.

9.9.2 Future Baseline Initial Arriving Company

Figure 34 illustrates the Future Baseline Initial Arriving Company capabilities of the O.F.S. based on the projected community growth and the associated planned future road network.

The analysis indicates that from January 1, 2014 to December 31, 2019 the O.F.S. was able to was able to deploy an Initial Arriving Company to 50% of the defined urban area, 76% of the historical emergency calls within the defined urban area, 55% of the proposed future road network within the City, and 63% of the road network within the defined urban area of the City.

This figure also illustrates that within a five minute travel time the O.F.S. has historically been able to deploy an Initial Arriving Company to 68% of the defined urban area, 91% of the historical emergency calls within the defined urban area, 73% of the proposed future road network within the City, and 83% of the road network within the defined urban area of the City.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=4	50%	76%	55%	63%
<=5	68%	91%	73%	83%

Fire Response Boundary	% Area Covered in 4 Minutes	% Calls Covered in 4 Minutes	% Area Covered in 5 Minutes	% Calls Covered in 5 Minutes
Station 1	53%	78%	71%	90%
Station 2	36%	65%	50%	91%
Station 3	67%	91%	76%	96%
Station 4	57%	68%	80%	87%
Station 5	36%	72%	49%	92%
Station 6	15%	66%	22%	74%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 34: FUTURE BASELINE INITIAL ARRIVING COMPANY

Final Draft March 2020

Fire Station
Historic Emergency Incident (2014-2019)
Albert Street Bridge Restriction
Proposed Road
Urban Area
Fire Response Boundary
High Growth Area

Travel Time
≤ 4 Minutes at Network Speed
≤ 5 Minutes at Network Speed
≤ 6 Minutes at Network Speed
> 6 Minutes at Network Speed

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MAP D

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DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Arriving Apparatus - Future Do Nothing.mxd

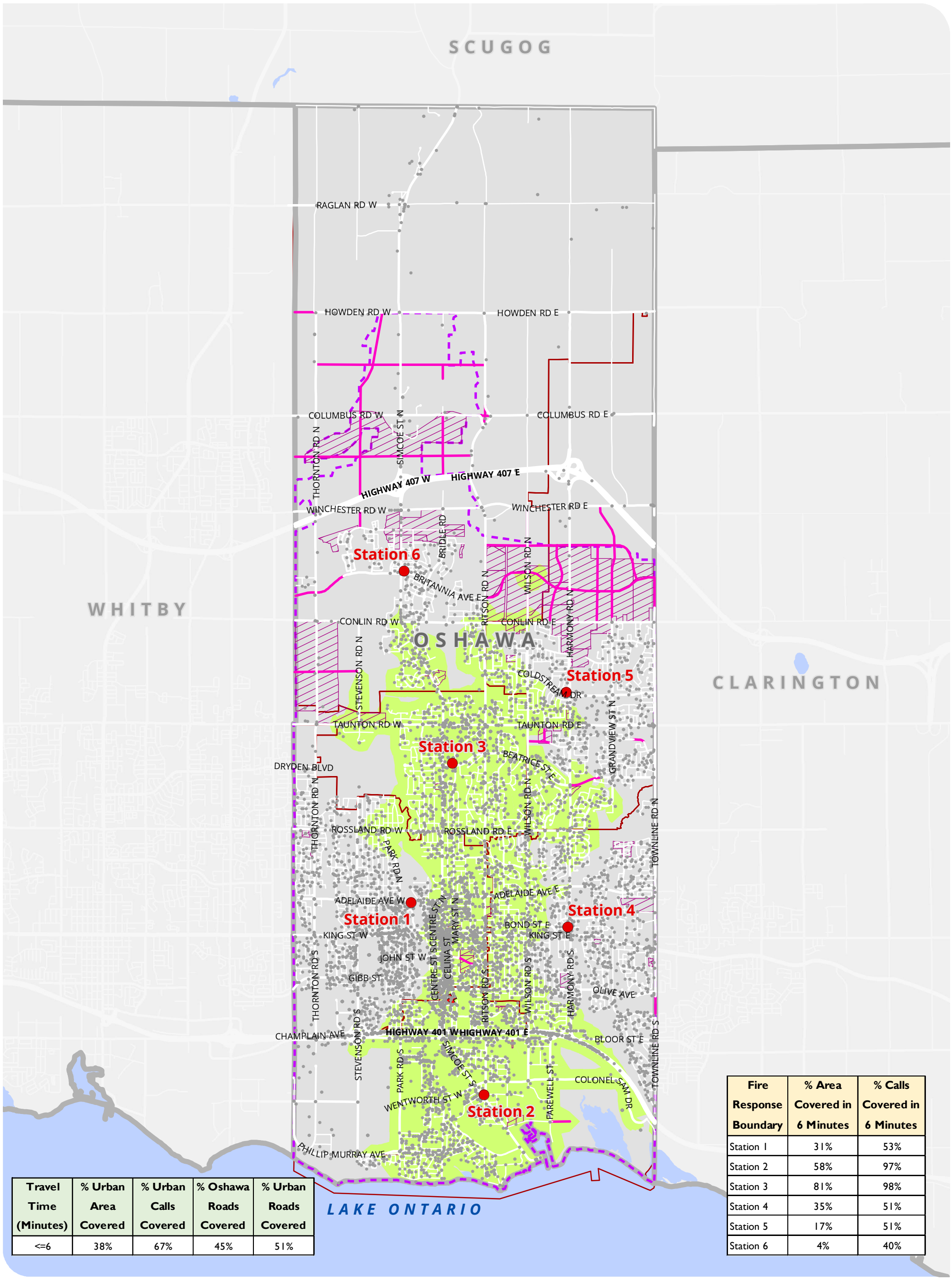
9.9.3 Future Baseline Second Arriving Company

Figure 35 illustrates the Future Baseline Second Arriving Company capabilities of the O.F.S. based the projected community growth and the associated planned future road network. The analysis indicates that from January 1, 2014 to December 31, 2019 the O.F.S. was able to deploy a second company to 38% of the defined urban area, 67% of the historical emergency calls within the defined urban area, 45% of the proposed future road network within the City, and 51% of the road network within the defined urban area of the City.

9.9.4 Future Baseline Initial Full Alarm Assignment

Figure 36 illustrates the Future Baseline initial full alarm assignment capabilities of the O.F.S. based on projected community growth and the associated planned future road network. The analysis indicates that from January 1, 2014 to December 31, 2019 the O.F.S. was able to deploy an Initial Full Alarm Assignment including 16 firefighters within an eight minute travel time to 27% of the defined urban area, 57% of the historical emergency calls within the defined urban area, 33% of the proposed future road network within the City, and 39% of the road network within the defined urban area of the City.

During this period the O.F.S. was able to deploy 25 firefighters within an eight minute travel time to 3% of the defined urban area, 15% of the historical emergency calls within the defined urban area, 4% of the proposed future road network within the City, and 5% of the road network within the defined urban area of the City.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=6	38%	67%	45%	51%

Fire Response Boundary	% Area Covered in 6 Minutes	% Calls Covered in 6 Minutes
Station 1	31%	53%
Station 2	58%	97%
Station 3	81%	98%
Station 4	35%	51%
Station 5	17%	51%
Station 6	4%	40%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 35: **FUTURE BASELINE SECOND ARRIVING COMPANY**

Final Draft March 2020

- Fire Station
- Historic Emergency Incident (2014-2019)
- Albert Street Bridge Restriction
- Proposed Road
- High Growth Area
- Urban Area
- Fire Response Boundary
- Second Arriving Truck in 6 Minutes of Travel Time

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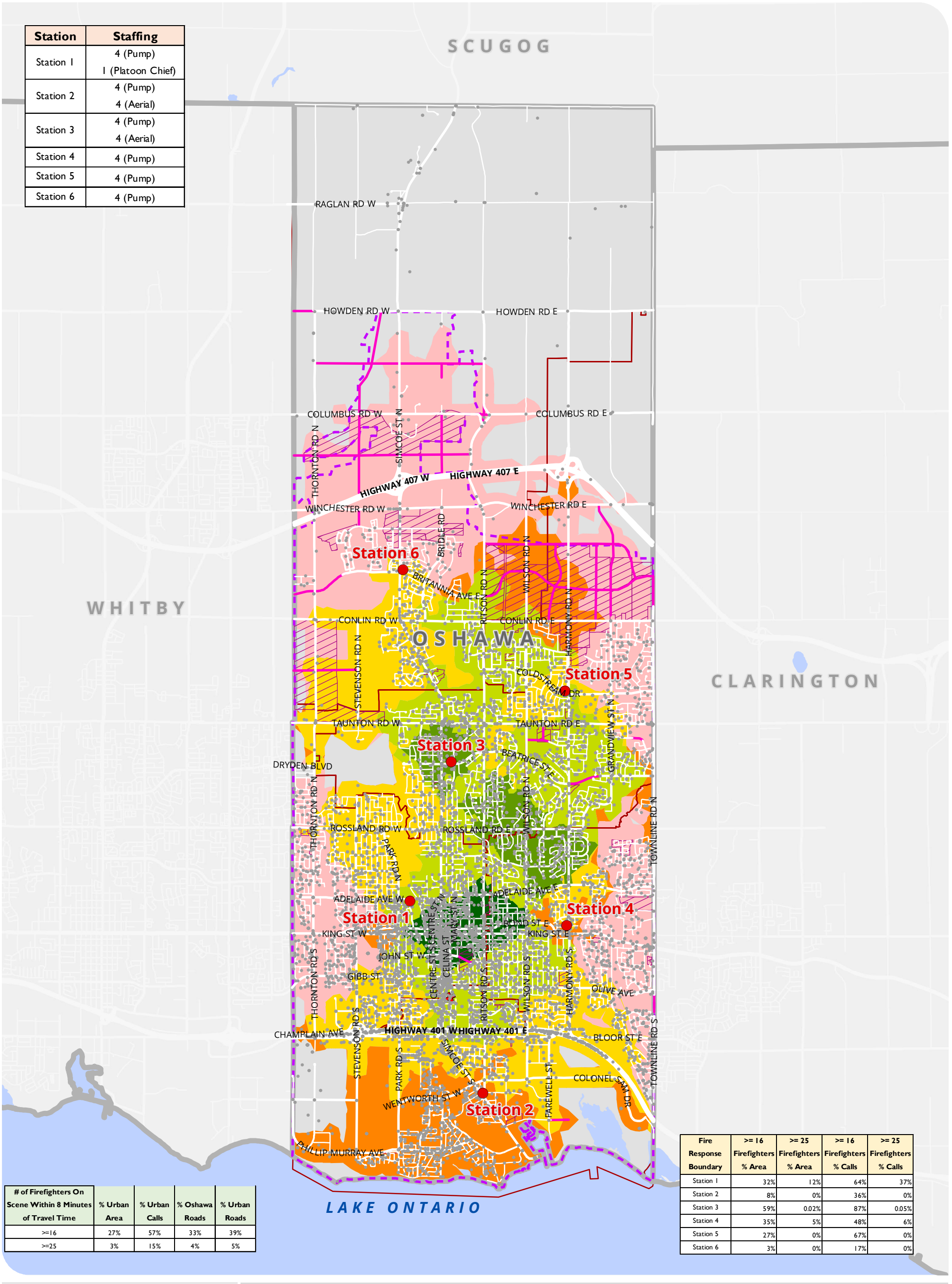
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Second Arriving Apparatus - Future Do Nothing.mxd

Station	Staffing
Station 1	4 (Pump) 1 (Platoon Chief)
Station 2	4 (Pump) 4 (Aerial)
Station 3	4 (Pump) 4 (Aerial)
Station 4	4 (Pump)
Station 5	4 (Pump)
Station 6	4 (Pump)



# of Firefighters On Scene Within 8 Minutes of Travel Time	% Urban Area	% Urban Calls	% Oshawa Roads	% Urban Roads
>=16	27%	57%	33%	39%
>=25	3%	15%	4%	5%

Fire Response Boundary	>= 16 Firefighters % Area	>= 25 Firefighters % Area	>= 16 Firefighters % Calls	>= 25 Firefighters % Calls
Station 1	32%	12%	64%	37%
Station 2	8%	0%	36%	0%
Station 3	59%	0.02%	87%	0.05%
Station 4	35%	5%	48%	6%
Station 5	27%	0%	67%	0%
Station 6	3%	0%	17%	0%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 36: FUTURE BASELINE INITIAL FULL ALARM ASSIGN-MENT

Final Draft March 2020

Fire Station
Historic Emergency Incident (2014-2019)
Albert Street Bridge Restriction
Proposed Road
Urban Area
High Growth Area
Fire Response Boundary

Number of Staff On Scene within 8 Minutes of Travel Time
≥ 25 Firefighters
≥ 20 Firefighters
≥ 16 Firefighters
≥ 12 Firefighters
≥ 8 Firefighters
≥ 4 Firefighters

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MAP PROJECTION: NAD 1983 UTM Zone 17N

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-25

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Full Alarm Assignment - Future Do Nothing.mxd

9.10 Fire Suppression Deployment Options

Current industry best practices indicate that the fire master planning process should consider the projected ten-year community planning, and growth management process, and the concept of seeking "continuous improvement"[58]. In addition, Council has directed that this fire master planning process consider how the rate of community growth may impact the planning and delivery of fire protection services in the future, and that this fire master planning process provide options for Council's consideration in determining the level of fire suppression services to be provided to the community.

The analysis within this section utilizes the Future Baseline G.I.S. model as the baseline against which to compare additional future options. These future models include the projected community growth and future road network considerations.

The estimated financial impacts of the options presented are based on the salary and benefits of a first class firefighter provided by the City, including an annual operating cost increase of $135,785 for each new proposed firefighter position, and capital financing requirements for personal protective clothing for each proposed new firefighter position of $7,500. The capital financing requirements for proposed new apparatus was informed recent apparatus purchases by the O.F.S. The capital financing requirements for the proposed new fire stations was informed by the City's Development Charges Study and our experience in other similar municipalities. The operationalization of some or a combination of the options may result in further cost increases, such as officer positions / salaries, and related equipment, including potential positions such as a District Chief.

9.10.1 Proposed Fire Suppression Service Level Rating

Providing effective fire suppression services has become one of the most significant challenges facing municipalities across Canada. In communities across the country that rely on volunteer firefighting models, the sustainability of volunteer firefighters is becoming an increasingly difficult challenge. This is due in part due to the increasing demands for training and qualifications. Another significant contributing factor is the shift

[58] Commission of Fire Accreditation International (C.F.A.I.)

in society to better balance work life and family life, leaving less available time for part-time employment or volunteer service.

Municipalities utilizing full-time firefighters are facing a more challenging fiscal impact based on the increasing cost of salaries and benefits.

To respond to Council's request to provide options for Council's consideration in determining the level of fire suppression services to be provided to the community, the analysis within this F.M.P. has considered two key factors including:

- **The findings of the municipal comparators analysis presented within this Fire Master Plan (as Appendix C) ; and**
- **The performance benchmarks for fire suppression services presented within the N.F.P.A. 1710 Standard (2020 Edition) and specifically the 90th percentile performance target.**

These two key factors have been combined to provide Council with an alternative approach to assessing the proposed enhanced fire suppression deployment capability scenarios presented within this F.M.P. **Table 33** illustrates how the N.F.P.A. 1710 Standard 90th percentile performance benchmark has been divided into three categories, presented as proposed service ratings 'below average' (e.g. bronze), 'average' (e.g. silver) and 'above average' (e.g. gold). In our view, applying this scale in conjunction with the findings of the community comparator analysis presented within this F.M.P., provides Council with another tool in determining the appropriate level of fire suppression services for the City of Oshawa.

Table 34: Proposed Fire Suppression Service Level Rating

Range/Service Level	N.F.P.A. 1710 Standard 90th Percentile Performance Benchmark		
Range	0% to 40%	41% to 79%	80% to 100%
Proposed Service Level Categories	Below Average	Average	Above Average

Where applicable these proposed service ratings will be referenced within this F.M.P. to further assist Council in its decision-making process in regards to the proposed fire suppression deployment options.

9.10.2 Option 1 – Implement Improvements to Total Response Time

Improving the performance capabilities of the dispatch time and turnout time by the target of a one minute (60 second) improvement does not directly impact the department's ability to achieve the N.F.P.A. 1710 standard travel time performance objective of a four minute travel time. However, it would have a positive impact on improving the department's **Total Response Time** capabilities.

The analysis of the O.F.S. historical fire suppression emergency response capabilities presented within **Section 9.5.5** of this F.M.P. recommends **"That the O.F.S. prioritize the identification and implementation of strategies to reduce the dispatch time and turnout time components of the Total Response Time by a minimum of one minute (60 seconds) combined to further enhance the department's emergency response fire suppression capabilities".**

The analysis of the O.F.S. existing Initial Arriving Company capabilities presented within **Section 9.7.3** of this F.M.P. indicates that if the O.F.S was able to improve its historical dispatch time and turnout time by one minute (60 seconds) as recommended by this F.M.P., the resulting impact would be an improvement in the department's **Total Response Time** capabilities resulting in the O.F.S. being able to respond to 91% of the historical emergency call locations within the same **Total Response Time** provided currently. In our view, there would be no additional financial investment on behalf of the City required to implement this option.

Table 34 illustrates the potential efficiencies in the department's **Total Response Time** as a result of improving the existing dispatch time and turnout time.

Table 35: Option 1- Implement Improvements to Total Response Time

Response	% of Historical Emergency Calls Covered				
	Existing Performance	Existing Service Range	Projected Performance	Proposed Service Range	Projected Improvement
Initial Arriving Company within Defined Urban Area	76%	Average	91%	Above Average	15%

9.10.3 Option 2 – Implement Rapid Response Apparatus at Fire Station 1

The C.R.A. includes an **"Identified Risk"** that indicates that "For the period from January 1, 2014 to December 31, 2018 there is a higher concentration of medical/resuscitator, false fire and fire/explosion incidents in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City"[59]. The **2018 I.A.F.F. Report** identifies similar conclusions to the concentration of "Structure Fire Incidents January 2015 – December 2017"[60], and the concentration of "Medical Emergencies January 2015-December 2017"[61]. In addition to these findings the analysis within this F.M.P. identifies that for the period from January 1, 2014 to December 31, 2019 the percentage of medical/resuscitator calls that the O.F.S. responds to has increased by 83.25%, and that medical/resuscitator emergency calls now represent the highest percentage of emergency calls the department responds to representing 26.04% of all emergency calls.

The 2018 M.N.P. Budget Review Report identifies that **"Currently the City of Oshawa does not utilize lighter duty vehicles that would have a two-man crew. The use of smaller vehicles with a lower minimum crew requirement have been utilized by other City's Fire Services to increase the Service's flexibility. The smaller vehicles can be utilized for medical and other calls and be deployed in addition to pumper crews. The use of these vehicles could reduce long term capital costs and operating costs as they would extend the use and life of the pumper trucks"**[62].

[59] City of Oshawa Community Risk Assessment and Fire Master Plan, Dillon Consulting, February 2020

[60] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Historical Response Page 22 Map:8

[61] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Historical Response Page 23 Map:9

[62] City of Oshawa M.N.P. Budget Review Report, Section 12.0 Fire Services

The 2018 M.N.P. Budget Review Report further states that **"If the City is required to increase the size of the Fire service, the incremental addition of a smaller vehicle with lower manning requirements into the existing station network could provide the City with a lower investment level for expansion"**[63].

Based on our analysis, the City should consider implementing a 'Rapid Response' apparatus at Fire Station 1 with a minimum staffing of two firefighters at all times. The primary focus of this apparatus should be to respond to medical/resuscitator emergency calls in the Fire Station 1's first-due response zone. The result would be less demand on Pump 21 located at Fire Station 1 to respond to medical/resuscitator calls in this area, increasing its availability to respond to other emergency calls, and an increase in the total number of firefighters assigned to Fire Station 1 to respond to other emergencies including fire/explosion incidents. The result would also be an increase to the total minimum number of firefighters on duty at all times from the current 33 to 35.

The **2018 I.A.F.F. Report** identifies that "from April 10th, 2017 until December 31st, 2017, when only a single suppression apparatus deployed from Station 1, substantial increases were seen in responses by units from other stations into Station 1's first-due area"[64]. This option implements a second apparatus at Station 1 that in our view would minimize the need for an apparatus from another station to respond into Station 1's area as referenced by this analysis within the **2018 I.A.F.F. Report.**

The proposed 'Rapid Response' apparatus would be designed as a smaller commercially available cab and chassis, and include a custom designed rear box unit with multi-function cabinets capable of holding medical/resuscitator equipment, self-contained breathing apparatus and other specialized rescue equipment. Staffing this apparatus with a minimum of two firefighters on-duty at all times would require the City to hire twelve additional full-time firefighters.

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[63] City of Oshawa M.N.P. Budget Review Report, Section 12.0 Fire Services

[64] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Page 7, Bullet 1

The implementation of this option specifically targets improvements to the O.F.S. existing fire suppression deployment capabilities in response to the following:

- An identified high concentration of medical/resuscitator calls in the area south east and west of Fire Station 1 representing a portion of the downtown core
- Increasing the minimum staffing at Fire Station 1 from the current four firefighters to six firefighters at all times
- Increasing the minimum number of firefighters on duty at all times from the current 33 to 35 firefighters
- Implementing a smaller 'Rapid Response' apparatus as recommended by the 2018 M.N.P. Budget Review Report

The benefit of this option is to provide a second apparatus at Fire Station 1 staffed with a minimum of two firefighters at all times to be deployed on an apparatus specifically designed to respond to medical/resuscitator emergency incidents, other specialized rescue incidents and provide additional staff available to respond quickly to a fire/explosion incident in the Fire Station 1 first-due response area.

In our view, the implementation of this option would require a further annual operating cost investment of $1,629,420 (12 x $135,785) to hire twelve additional firefighters, and a capital financing investment of $90,000 (12 x $7,500) for firefighter protective clothing, and $550,000 for the purchase of the proposed Rapid Response apparatus and equipment. This option would also require four officer positions, with associated costs.

9.10.4 Option 3 – Implement a Second Apparatus at Fire Station 1

The **2018 I.A.F.F. Report** recommends "adding an additional suppression apparatus staffed with a minimum of four multi-role firefighters at all times to Fire Station 1"[65]. The **2018 I.A.F.F. Report** does not recommend a specific type of apparatus, only the additional staffing of four multi-role firefighters at all times. Should Council consider the implementation of this option our recommendation would be to redeploy the existing Rescue 25 to Fire Station 1 and staff it with a minimum of four firefighters at all times to respond to this recommendation. In our view, the O.F.S. does not require any additional fire suppression capability such as pumping capacity, or aerial operations in this first-due response area. In our view, the primary purpose of this recommendation is to

[65] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Recommendations, Page 8, #3

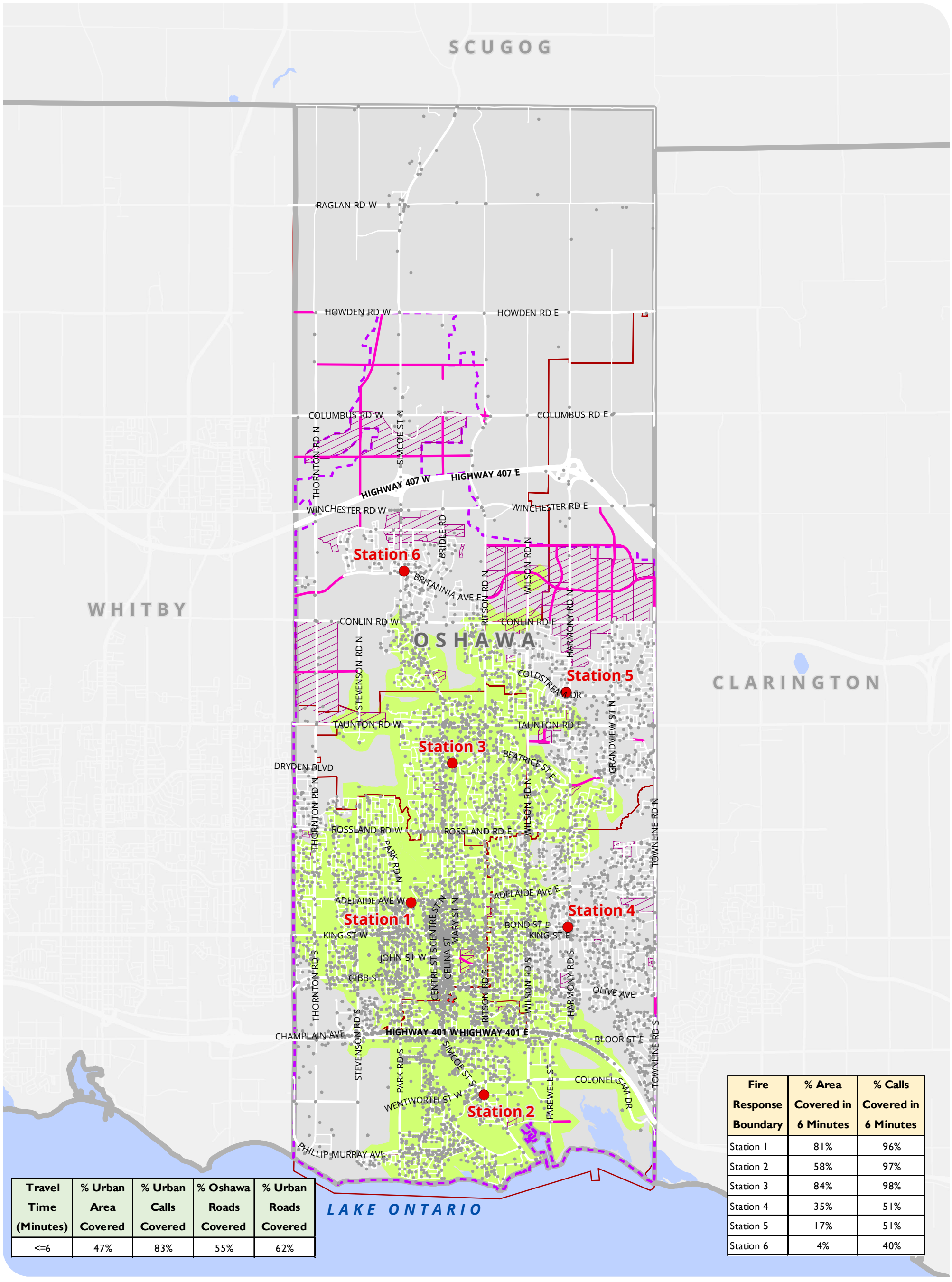
increase the minimum staffing deployed from this station. It is our understanding that the Rescue 25 may not function well as a front-line apparatus due to weight and loading concerns. This requires further internal review and consideration. The alternative to using Rescue 25 would be for the City to purchase a new apparatus for this role, recommended as a heavy rescue type apparatus (cost estimate of $750 K).

This option would not enhance the existing Initial Arriving Company capabilities of the O.F.S. because it does not include any additional fire stations, or new deployment locations for additional apparatus.

Figure 37 presents the results of the second arriving apparatus analysis for this option. This option would result in an improvement to the Future Baseline coverage of 67% to 83% of emergency calls within the urban area. This is an improvement of 16% call coverage for the second arriving apparatus within six minute of travel time. The result would also be an improvement in the Fire Station 1 first-due response area from the 'future do-nothing' historical emergency call coverage of 53% to 96% an improvement of 43%.

Figure 38 illustrates that this option would result in the improvement to the Future Baseline Initial Full Alarm Assignment capabilities of the O.F.S. from the 'future do-nothing' city-wide coverage of historical emergency calls of 57% to 69% an improvement of 12%. The result would also be an improvement in the Fire Station 1 first-due response area from the 'future do-nothing' historical emergency call coverage of 64% to 81% an improvement of 17%.

In our view, the implementation of this option would require a further annual operating cost investment of $2,715,700 (20 x $135,785) and a capital financing investment of $150,000 (20 x $7,500) for firefighter protective clothing. These costs assume the redeployment of Rescue 25 to Fire Station 1 and no purchase of a new apparatus. If a new apparatus, such as heavy rescue apparatus, is required to be purchased the cost estimate is approximately $750K.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=6	47%	83%	55%	62%

Fire Response Boundary	% Area Covered in 6 Minutes	% Calls Covered in 6 Minutes
Station 1	81%	96%
Station 2	58%	97%
Station 3	84%	98%
Station 4	35%	51%
Station 5	17%	51%
Station 6	4%	40%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 37: OPTION 3 IMPLEMENT SECOND APPARATUS AT FIRE STATION 1, SECOND ARRIVING COMPANY

Final Draft March 2020

- Fire Station
- Historic Emergency Incident (2014-2019)
- Albert Street Bridge Restriction
- Proposed Road
- High Growth Area
- Urban Area
- Fire Response Boundary
- Second Arriving Truck in 6 Minutes of Travel Time

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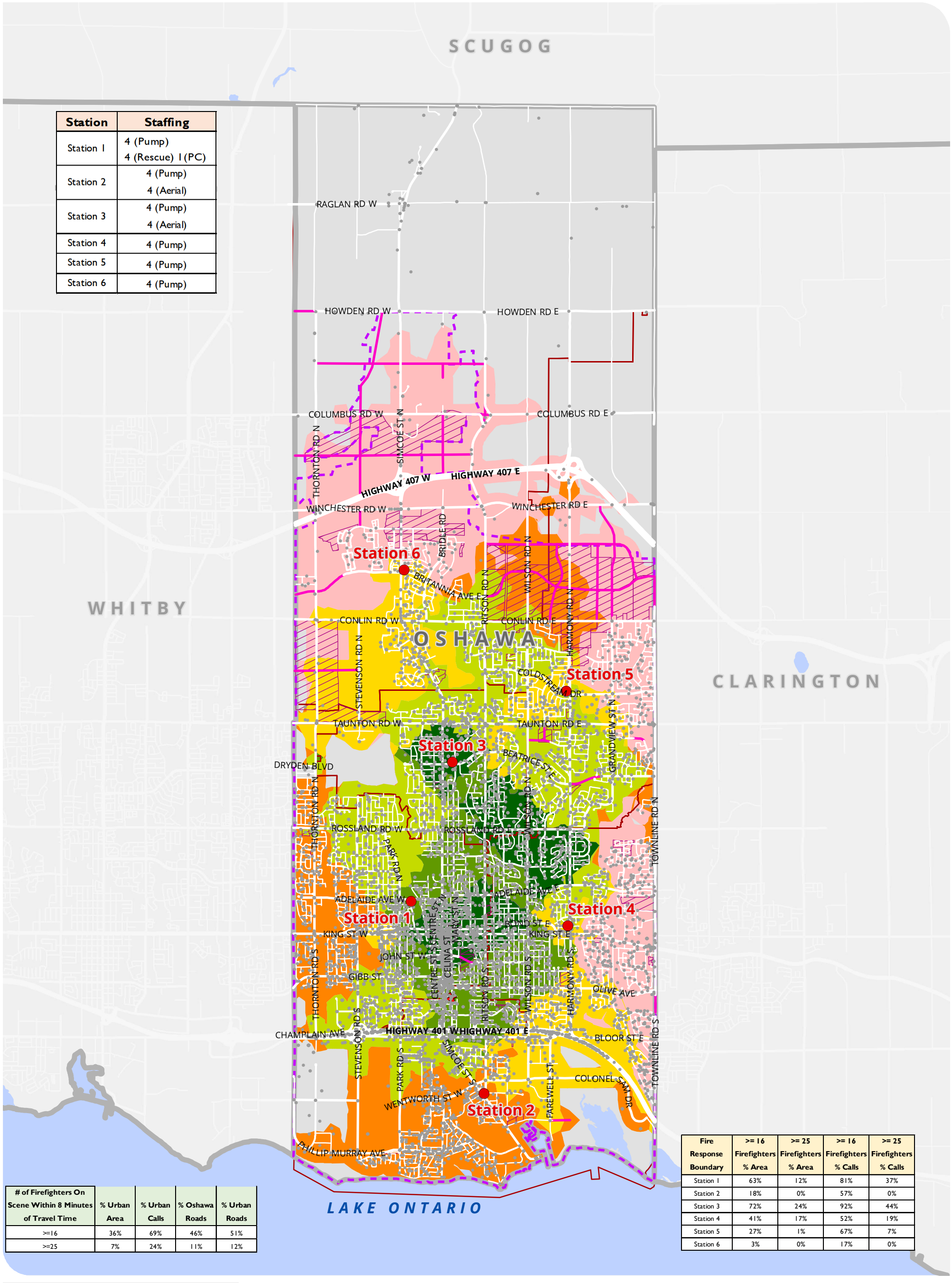
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Second Arriving Apparatus - Future Scenario 2.mxd

Station	Staffing
Station 1	4 (Pump) 4 (Rescue) 1 (PC)
Station 2	4 (Pump) 4 (Aerial)
Station 3	4 (Pump) 4 (Aerial)
Station 4	4 (Pump)
Station 5	4 (Pump)
Station 6	4 (Pump)



# of Firefighters On Scene Within 8 Minutes of Travel Time	% Urban Area	% Urban Calls	% Oshawa Roads	% Urban Roads
>=16	36%	69%	46%	51%
>=25	7%	24%	11%	12%

Fire Response Boundary	>= 16 Firefighters % Area	>= 25 Firefighters % Area	>= 16 Firefighters % Calls	>= 25 Firefighters % Calls
Station 1	63%	12%	81%	37%
Station 2	18%	0%	57%	0%
Station 3	72%	24%	92%	44%
Station 4	41%	17%	52%	19%
Station 5	27%	1%	67%	7%
Station 6	3%	0%	17%	0%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 38: OPTION 3 IMPLEMENT SECOND APPARATUS AT FIRE STATION 1 INITIAL FULL ALARM ASSIGNMENT

Final Draft March 2020

Fire Station
Historic Emergency Incident (2014-2019)
Albert Street Bridge Restriction
Proposed Road
Urban Area
High Growth Area
Fire Response Boundary

Number of Staff On Scene within 8 Minutes of Travel Time
≥ 25 Firefighters
≥ 20 Firefighters
≥ 16 Firefighters
≥ 12 Firefighters
≥ 8 Firefighters
≥ 4 Firefighters

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MAP DRAWING INFORMATION:
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MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-21

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Full Alarm Assignment - Future Scenario 2.mxd

Table 35 illustrates the potential improvements in the department's emergency response capabilities as a result of adding a second pump/rescue apparatus, staffed with four firefighters, at Fire Station 1.

Table 36: Option 3 - Implement a Second Apparatus (e.g. Pump/Rescue) at Fire Station 1

Response	% of Historical Emergency Calls Covered				
	Future Baseline Performance	Future Baseline Service Range	Projected Performance	Proposed Service Range	Projected Improvement
Second Arriving Apparatus	67%	Average	83%	Above Average	16%
Initial Full Alarm Assignment City-Wide	57%	Average	69%	Average	12%
Initial Full Alarm Assignment Fire Station 1 First-due Response Area	64%	Average	81%	Above Average	17%

9.10.5 Option 4 – Proposed Future Fire Station 7

The 2013 F.M.P. Report recommended "That prior to the midpoint (five year) horizon of this F.M.P. further analysis of the future growth projections and consideration of a 7th Fire Station to serve the north east area of the municipality be completed and that suitable land for this station be acquired thereafter"[66]. The 2018 F.M.P. Update Report, authored by the Fire Chief, recommended that the City "Acquire land for Fire Station #7"[67]. The low, moderate and high growth planning scenarios presented in **Section 9.8.3** above, indicate new developments planned for the area north of Conlin Road, up

[66] 2013 Fire Master Plan Report, Dillon Consulting, Fire Suppression Division Recommendation #4

[67] 2018 Fire Master Plan and Community Risk Assessment Report, Recommendation 39

to the Major Urban Boundary, east of Ritson Road North. As can be seen in the Future Baseline Initial Arriving Company model (**Figure 34**), this planned future growth area is located beyond Station 5's four minute travel time response polygon and to the east of Station 6's four minute travel time response polygon boundary. As a result, proposed Station 7 was modelled to provide response coverage to this area.

9.10.5.1 Proposed Fire Station 7 - Initial Arriving Company Capabilities

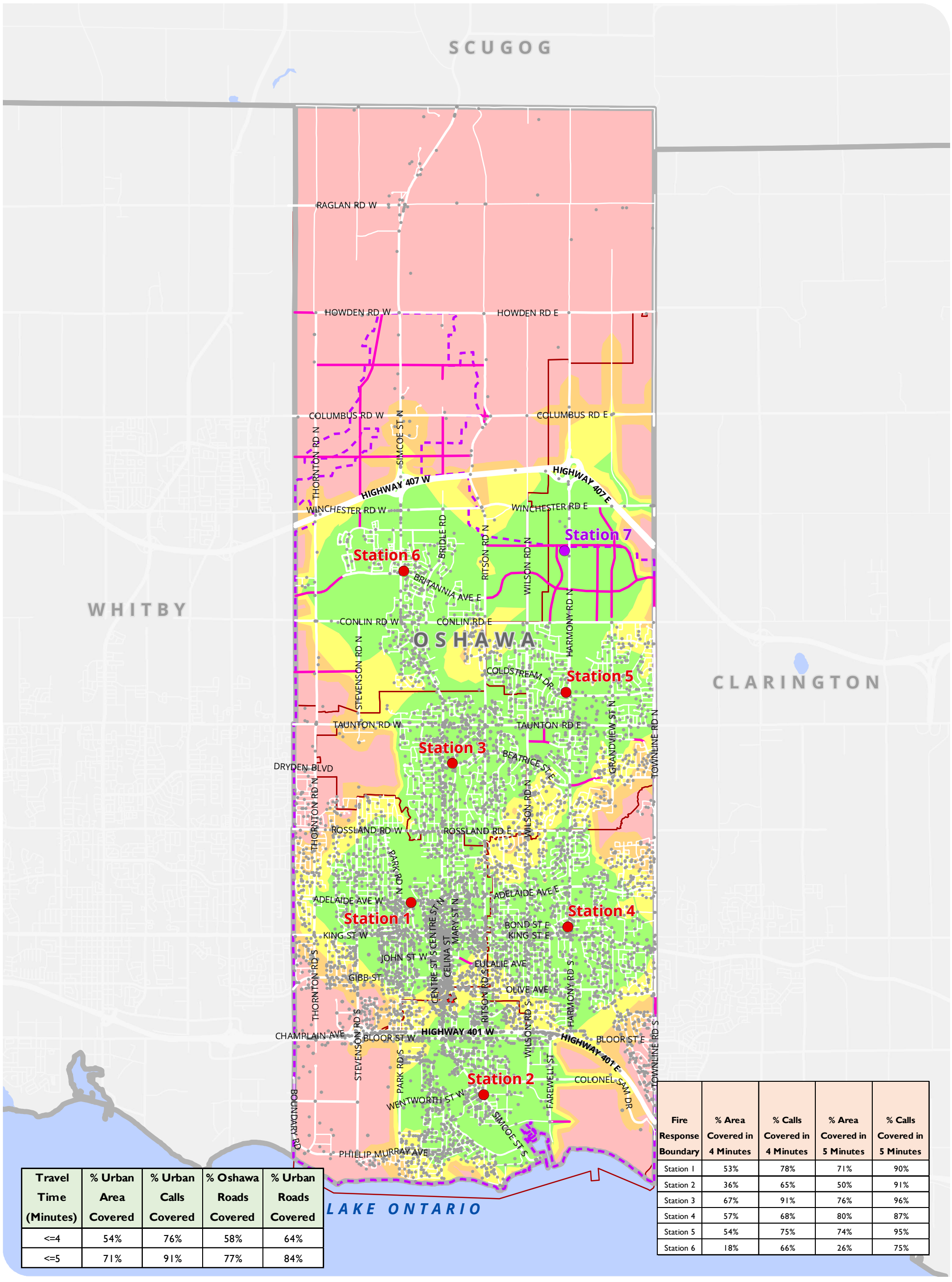
Figure 39 illustrates the proposed location of a seventh Fire Station in the vicinity of Harmony Road near the proposed east-west collector road in the northeast area of the City. The projected performance of the Initial Arriving Company includes staffing this station with a new pump/rescue apparatus and a minimum of four firefighters on duty at all times. This analysis includes the projected community growth areas and planned future road network, and addresses planned growth identified in the low, moderate and high growth planning scenarios.

This analysis indicates that with the implementation of the proposed seventh fire station the O.F.S. would be able to deploy an Initial Arriving Company within a four minute travel time to 54% of the defined urban area, 76% of the historical emergency calls within the defined urban area, 58% of the proposed future road network within the City, and 64% of the road network within the defined urban area of the City. It is important to note that in areas of proposed growth and development there are few, if any, historic calls, therefore, it is common to see no improvement in the coverage of historic emergency calls when planning fire services in new development areas. Instead, the improvement in area and roads covered, as well as the visual polygon coverage shown in the mapped results, provide the descriptions of improvements to future fire services.

Figure 39 also illustrates that within a five minute travel time the O.F.S. would be able to deploy an Initial Arriving Company to 71% of the defined urban area, 91% of the historical emergency calls within the defined urban area, 77% of the proposed future road network within the City, and 84% of the road network within the defined urban area of the City.

In our view, the implementation of this option would require a further annual operating cost investment of $2,715,700 (20 x $135,785) and a capital financing investment of $150,000 (20 x $7,500) for firefighter protective clothing. The cost of land, design and

construction of a new Fire Station 7 estimated at $1.5 million for land purchase, $5.0 million for design and construction and $800,000 to purchase a new Pumper/Rescue.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=4	54%	76%	58%	64%
<=5	71%	91%	77%	84%

Fire Response Boundary	% Area Covered in 4 Minutes	% Calls Covered in 4 Minutes	% Area Covered in 5 Minutes	% Calls Covered in 5 Minutes
Station 1	53%	78%	71%	90%
Station 2	36%	65%	50%	91%
Station 3	67%	91%	76%	96%
Station 4	57%	68%	80%	87%
Station 5	54%	75%	74%	95%
Station 6	18%	66%	26%	75%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 39: OPTION 4 - PROPOSED FIRE STATION 7 INITIAL ARRIVING COMPANY

Final Draft March 2020

- Existing Fire Station
- Proposed Fire Station
- Historic Emergency Incident (2014-2019)
- Albert Street Bridge Restriction
- Proposed Road
- Urban Area
- Fire Response Boundary

Travel Time
- ≤ 4 Minutes at Network Speed
- ≤ 5 Minutes at Network Speed
- ≤ 6 Minutes at Network Speed
- > 6 Minutes at Network Speed

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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-22

FILE LOCATION: \\dillon.ca\DILLON_DFS\Toronto\Toronto GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Arriving Apparatus - Future Do Nothing - Add Station 7.mxd

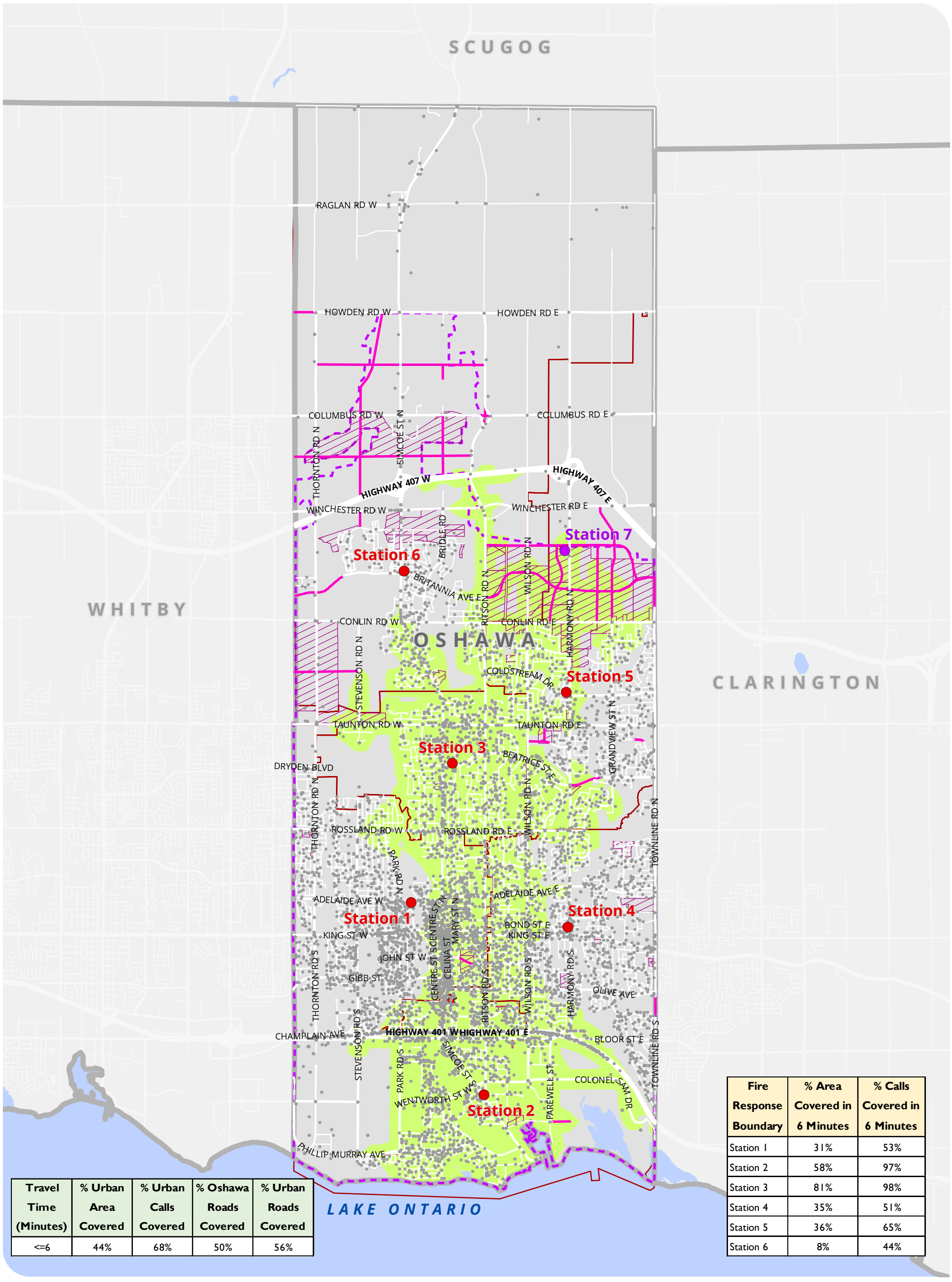
9.10.5.2 Proposed Fire Station 7 - Second Arriving Company

Figure 40 illustrates that the addition of the proposed Fire Station 7 would result in the O.F.S. being able to deploy a Second Arriving Company within a six minute travel time to 44% of the defined urban area, 68% of the historical emergency calls within the defined urban area, 50% of the proposed future road network within the City, and 56% of the road network within the defined urban area of the City.

9.10.5.3 Proposed Fire Station 7 - Initial Full Alarm Assignment

Figure 41 illustrates that the addition of the proposed Fire Station 7 would result in the O.F.S. being able to deploy an Initial Full Alarm Assignment including 16 firefighters within an eight minute travel time to 28% of the defined urban area, 58% of the historical emergency calls within the defined urban area, 35% of the proposed future road network within the City, and 41% of the road network within the defined urban area of the City.

The implementation of this option would also result in the O.F.S. being able to deploy 25 firefighters within an eight minute travel time to 3% of the defined urban area, 15% of the historical emergency calls within the defined urban area, 4% of the proposed future road network within the City, and 5% of the road network within the defined urban area of the City.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=6	44%	68%	50%	56%

Fire Response Boundary	% Area Covered in 6 Minutes	% Calls Covered in 6 Minutes
Station 1	31%	53%
Station 2	58%	97%
Station 3	81%	98%
Station 4	35%	51%
Station 5	36%	65%
Station 6	8%	44%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 40: OPTION 4 - PROPOSED FIRE STATION 7 SECOND ARRIVING COMPANY

Final Draft March 2020

- Existing Fire Station
- Proposed Fire Station
- Historic Emergency Incident (2014-2019)
- Albert Street Bridge Restriction
- Proposed Road
- High Growth Area
- Urban Area
- Fire Response Boundary
- Second Arriving Truck in 6 Minutes of Travel Time

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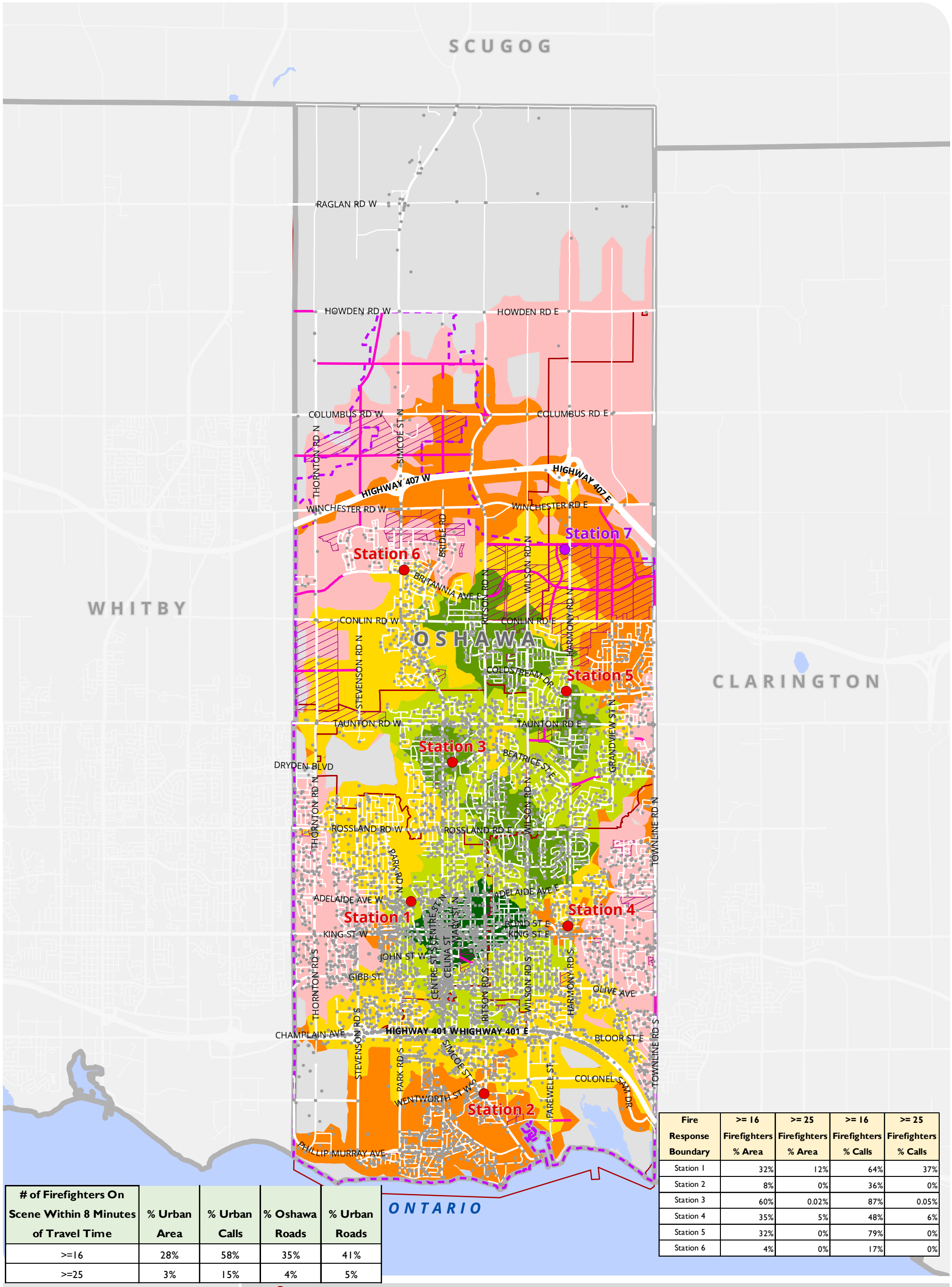
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MAP DRAWING INFORMATION:
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MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-25

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# of Firefighters On Scene Within 8 Minutes of Travel Time	% Urban Area	% Urban Calls	% Oshawa Roads	% Urban Roads
>=16	28%	58%	35%	41%
>=25	3%	15%	4%	5%

Fire Response Boundary	>= 16 Firefighters % Area	>= 25 Firefighters % Area	>= 16 Firefighters % Calls	>= 25 Firefighters % Calls
Station 1	32%	12%	64%	37%
Station 2	8%	0%	36%	0%
Station 3	60%	0.02%	87%	0.05%
Station 4	35%	5%	48%	6%
Station 5	32%	0%	79%	0%
Station 6	4%	0%	17%	0%

Existing Fire Station
Proposed Fire Station
Historic Emergency Incident (2014-2019)
Albert Street Bridge Restriction
Proposed Road
Urban Area
High Growth Area
Fire Response Boundary

Number of Staff On Scene within 8 Minutes of Travel Time

≥ 25 Firefighters
≥ 20 Firefighters; 24
≥ 16 Firefighters
≥ 12 Firefighters
≥ 8 Firefighters
≥ 4 Firefighters

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 41: OPTION 4 - PROPOSED FIRE STATION 7 INITIAL FULL ALARM ASSIGMENT

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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-25

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Full Alarm Assignment - Future Add Station 7.mxd

Table 36 illustrates the projected improvement to the O.F.S. fire suppression deployment capabilities by adding the proposed Fire Station 7. It is important to note that this illustrates a comparison of the percentage of historical emergency call coverage as presented within the N.F.P.A. 1710 standard. As Fire Station 7 is proposed for the northeast portion of the City, in a future growth area there is a limited number of historical emergency calls to compare with.

Table 37: Option 4 – Proposed Fire Station 7

Response	% of Historical Emergency Calls Covered				
	Future Baseline Performance	Future Baseline Service Range	Projected Performance	Proposed Service Range	Projected Improvement
Initial Arriving Company	76%	Average	76%	Average	0%
Second Arriving Company	67%	Average	68%	Average	1%
Initial Full Alarm Assignment – Single Family Dwelling	57%	Average	58%	Average	1%
Initial Full Alarm Assignment - Apartment	15%	Average	15%	Average	0%

As noted above, the improvement in areas of new development can be measured using area coverage and road coverage. With the addition of proposed Fire Station 7 there is an improvement in the initial arriving company performance of 4% of urban area covered, 3% of City roads covered and 1% of urban roads covered compared to the baseline scenario. The second arriving company coverage improves by 6% urban area coverage, and 5% of both City roads and urban roads covered. The initial full alarm assignment of 16 firefighters responding improves by 1% urban area, 2% of City roads and 2% of urban roads.

9.10.6 Option 5 – Proposed Future Fire Station 8

Based on the High Growth Scenario (**Figure 31**), there is a potential for future growth and development to initiate in the northwestern limit of the defined urban area within the horizon of this Fire Master Plan. In order to respond to this identified future growth, a potential eighth fire station scenario was analyzed. This scenario builds upon Option 4 that added a future Fire Station 7.

9.10.6.1 Proposed Fire Station 8 - Initial Arriving Company Capabilities

Figure 42 illustrates the proposed location of Fire Station 8 in the vicinity of Simcoe Street North and Columbus Road West. The projected performance of the Initial Arriving Company includes staffing this station with a new pump/rescue apparatus and a minimum of four firefighters on duty at all times. This analysis responds to the projected community growth areas identified within the high growth scenario, and the associated proposed future road network.

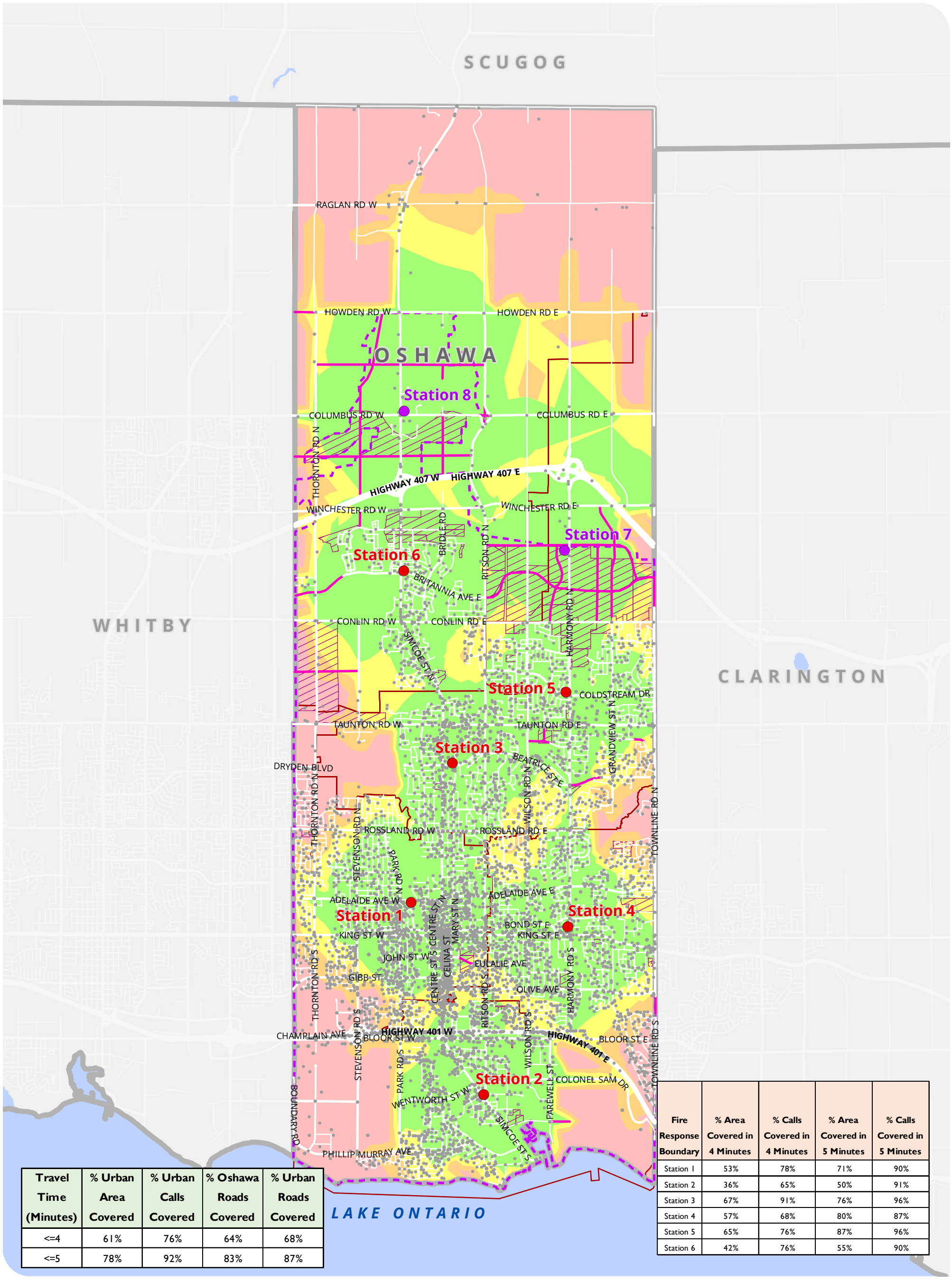
The analysis indicates that with the implementation of both proposed Fire Station 7 and proposed Fire Station 8 the O.F.S. would be able to deploy an Initial Arriving Company within a four minute travel time to 61% of the defined urban area, 76% of the historical emergency calls within the defined urban area, 64% of the proposed future road network within the City, and 68% of the road network within the defined urban area of the City. Again, the increase of area coverage and roads coverage indicate the improvement of emergency response capabilities in areas of proposed future development (where no historic calls currently exist).

Similarly to the addition of proposed Station 7, the implementation of this option is predicted to require a further annual operating cost investment of $2,715,700 (20 x $135,785) and a capital financing investment of $150,000 (20 x $7,500) for firefighter protective clothing. The cost of land, design and construction of a new Fire Station 8 estimated at $1.5 million for land purchase, $5.0 million for design and construction and $800,000 to purchase a new Pumper/Rescue.

Table 38: Option 5 – Proposed Fire Station 8

Response	% of Historical Emergency Calls Covered				
	Future Baseline Performance	Future Baseline Service Range	Projected Performance	Proposed Service Range	Projected Improvement
Initial Arriving Company	76%	Average	76%	Average	0%

As noted above, the improvement in areas of new development can be measured using area coverage and road coverage. With the addition of proposed Fire Station 7 and 8 in place there is an improvement in the initial arriving company performance of 11% of urban area covered, 9% of City roads covered and 5% of urban roads covered compared to the baseline scenario.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered	% Oshawa Roads Covered	% Urban Roads Covered
<=4	61%	76%	64%	68%
<=5	78%	92%	83%	87%

Fire Response Boundary	% Area Covered in 4 Minutes	% Calls Covered in 4 Minutes	% Area Covered in 5 Minutes	% Calls Covered in 5 Minutes
Station 1	53%	78%	71%	90%
Station 2	36%	65%	50%	91%
Station 3	67%	91%	76%	96%
Station 4	57%	68%	80%	87%
Station 5	65%	76%	87%	96%
Station 6	42%	76%	55%	90%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 42: **OPTION 5 - PROPOSED FIRE STATION 8 INITIAL ARRIVING COMPANY**

Final Draft March 2020

- Existing Fire Station
- Proposed Fire Station
- Historic Emergency Incident (2014-2019)
- Albert Street Bridge Restriction
- Proposed Road
- Urban Area
- Fire Response Boundary
- High Growth Area

Travel Time
- ≤ 4 Minutes at Network Speed
- ≤ 5 Minutes at Network Speed
- ≤ 6 Minutes at Network Speed
- > 6 Minutes at Network Speed

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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-22

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Arriving Apparatus - Future Do Nothing - Add Station 7,8.mxd

9.10.7 Option 6 – Compliance with N.F.P.A. 1710 Standard (2020 Edition)

Within the Province of Ontario there is no legislated standard or regulation that defines the level of fire suppression services a municipality must provide. The F.P.P.A. states that every municipality shall **"provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances"**[68]. The new Ontario Regulation 378/18: Community Risk Assessments now requires every municipality, and fire department to **"use its community risk assessment to inform decisions about the provision of fire protection services"**[69]. The information presented within this F.M.P. and companion C.R.A. is intended to assist Council in defining the "needs and circumstances" for the City of Oshawa.

Although the municipality is not mandated, or legislatively required to comply with the standards authored by the National Fire Protection Association these standards are recognized as industry best practices. The N.F.P.A. 1710 standard (2016 Edition) is utilized within the **2018 I.A.F.F. Report** and this F.M.P. to assess the current fire suppression services provided by the O.F.S. The **2018 I.A.F.F. Report** states that **"Additionally, O.F.S. should examine where emergencies have typically occurred in the past and make efforts to ensure these areas continue to enjoy the level of coverage, while adjusting resources and deployment in an effort to achieve complete compliance with N.F.P.A. Standard 1710"**[70].

This option considers what adjustments to the O.F.S. current fire suppression deployment model would be required for the City to comply with the performance benchmarks of the N.F.P.A. 1710 standard (2020 Edition) for the following:

- **Initial Arriving Company: Deploying a minimum of four firefighters within a four minute (240 second) travel time to 90% percent of the fire suppression incidents; and**

[68] Fire Protection and Prevention Act, 1997 Part II Responsibility for Fire Protection Services, Municipal Responsibilities, 2. (1)(b)

[69] Ontario Regulation 378/18 – Community Risk Assessments, Mandatory Use 1.(b)

[70] Geographic Information System Emergency Services Response Capabilities Analysis report (I.A.F.F. Report) prepared by the International Association of Firefighters (I.A.F.F.) Conclusions, Page 103

- **Initial Full Alarm Assignment: Deploying a minimum of 16 firefighters within an eight minute (480 second) travel time to 90% percent of the fire suppression incidents involving a single-family dealing.**

This analysis focused on achieving an emergency response coverage of 90% of the historic emergency call incidents within the City of Oshawa. These calls reflect the demands for service from the existing City of Oshawa population and developed area. Future growth and development will add demands for services in new growth areas. These future, unknown calls, were not accounted for in the analysis of achieving the N.F.P.A. 1710 benchmarks to the 90th percentile level. For the City of Oshawa to achieve compliance with these N.F.P.A. 1710 standard performance benchmarks there will be a need to relocate two of the existing fire stations and add three new fire stations in the southern portion of the City. The result will be a significant change in the first-due response zones for the fire stations located south of Taunton Road. As a result the analysis of these two performance benchmarks focuses on achieving the 90th percentile of the historical emergency calls for the period from January 1st, 2014 to December 31st, 2019 within the defined urban area of the City only.

To achieve the 90th percentile response capability for the Initial Arriving Company and the Initial Full Alarm Assignment for a Single-Family Dwelling within the defined urban area the City would be required the City to adjust the number and locations of Fire Stations, apparatus and minimum staffing. **Table 38** identifies that the City would need to relocate the existing Fire Stations 1 and 4, and add three new Fire Stations labelled as Stations ‘A’ ‘B’ and ‘C’.

Table 39: Option 6 - Fire Station and Locations – N.F.P.A. 1710 Compliance

Station	Location
Relocated Station 1	Relocate to the vicinity of Rossland Road West and Finucane Street
Relocated Station 4	Relocate to the vicinity of Rossland Road East and Harmony Road
Proposed Station A	New Station in the vicinity of King Street West and Ritson Road North
Proposed Station B	New Station in the vicinity of Stevenson Road and Laval Drive

Station	Location
Proposed Station C	New Station in the vicinity of Harmony Road South and Bloor Street East

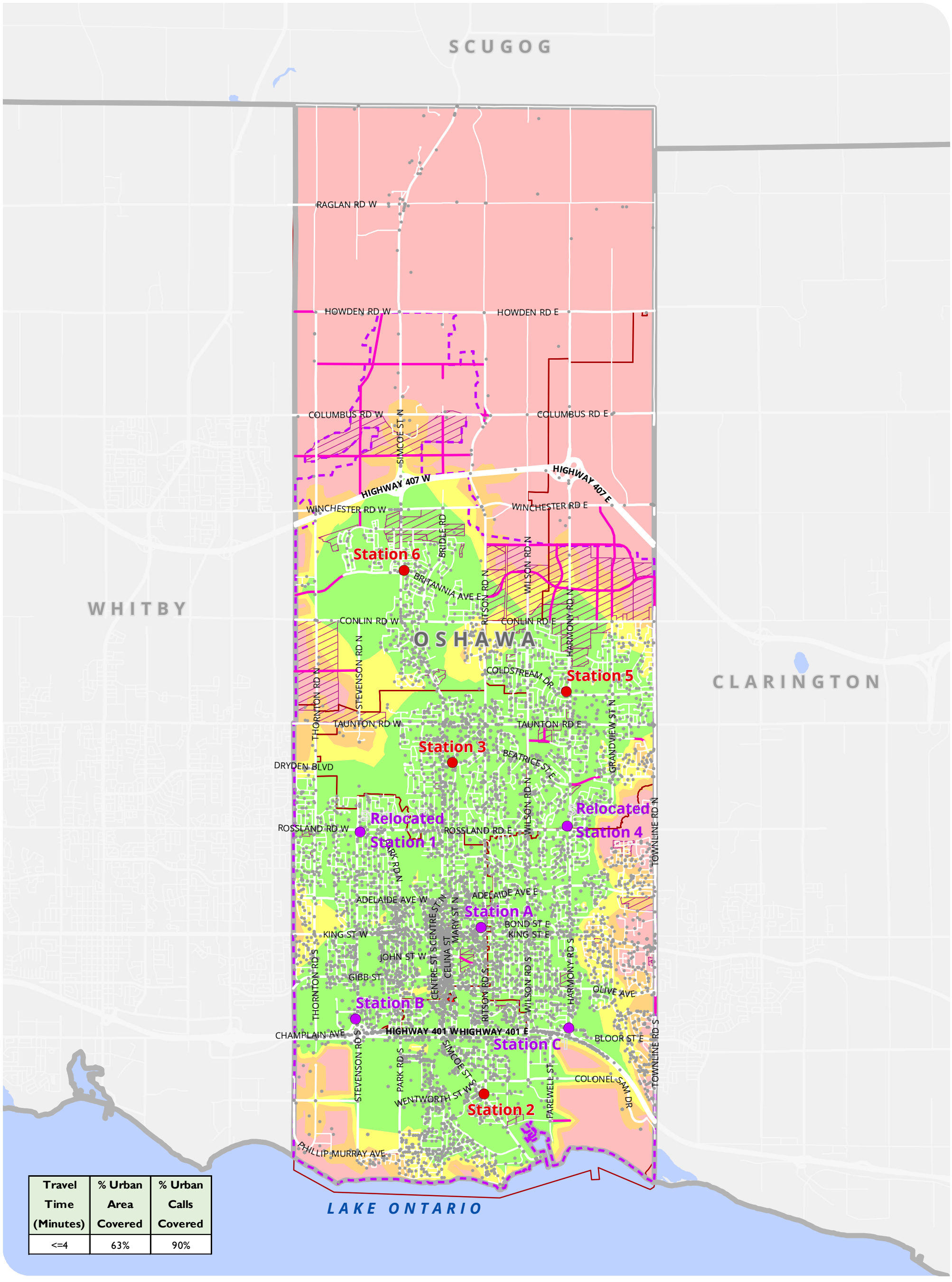
Table 39 identifies that in addition to relocating and building new fire Stations the City would need to relocate and purchase new apparatus and hire additional firefighters to achieve the applicable 90th percentile N.F.P.A. 1710 performance benchmarks.

Table 40: Option 6 – Apparatus and Staffing – N.F.P.A. 1710 Compliance

Station	Apparatus	Staffing
Relocated 1	Relocate Pump 21	Relocate Existing
2	Pump 22	Existing
3	Pump 23 Rescue 25	Existing Hire 20 Firefighters
Relocated 4	Relocate Pump 24	Relocate Existing
5	Pump25	Existing
6	Pump 26 Aerial 23	Existing Existing
Proposed A	New Pump/Rescue Relocate Aerial 22	Hire 20 Firefighters Existing
Proposed B	New Pump/Rescue	Hire 20 Firefighters
Proposed C	New Pump/Rescue New Rescue	Hire 20 Firefighters Hire 20 Firefighters

9.10.7.1 N.F.P.A. 1710 Compliance - Initial Arriving Company

Figure 43 illustrates the proposed fire station location and fire suppression deployment model to achieve compliance with the N.F.P.A. 1710 standard for an Initial Arriving Company. This model illustrates that with this fire station location and deployment model the O.F.S. would be able to achieve the 90th percentile performance benchmark for the Initial Arriving Company including four firefighters arriving on scene within four minutes of travel time to 90% of the historical emergency call locations within the defined urban area.



Travel Time (Minutes)	% Urban Area Covered	% Urban Calls Covered
<=4	63%	90%

CITY OF OSHAWA
FIRE MASTER PLAN

Figure 43: OPTION 6 INITIAL ARRIVING COMPANY SINGLE-FAMILY DWELLING

Final Draft March 2020

- Existing Fire Station
- Proposed Fire Station
- Historic Emergency Incident (2014-2019)
- Albert Street Bridge Restriction
- Proposed Road
- Urban Area
- Fire Response Boundary
- High Growth Area

Travel Time

- ≤ 4 Minutes at Network Speed
- ≤ 5 Minutes at Network Speed
- ≤ 6 Minutes at Network Speed
- > 6 Minutes at Network Speed

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9.10.7.2 N.F.P.A. 1710 Compliance – Initial Full Alarm Assignment - Single Family Dwelling

Figure 44 illustrates the proposed fire station location and fire suppression deployment model to achieve compliance with the N.F.P.A. 1710 standard for an Initial Full Alarm Assignment - Single-Family Dwelling. This model illustrates that with this fire station location and deployment model the O.F.S. would be able to achieve the 90th percentile performance benchmark for the Initial Full Alarm Assignment - Single-Family Dwelling including 16 firefighters arriving on scene within eight minutes of travel time to 90% of the historical emergency call locations within the defined urban area.

Station	Staffing
Station 2 (Existing)	4 (Pump)
Station 3 (Existing)	4 (Pump) 4 (Rescue)
Station 5 (Existing)	4 (Pump)
Station 6 (Existing)	4 (Pump) 4 (Aerial))
Station I (Relocated)	4 (Pump)
Station4 (Relocated)	4 (Pump)
Station A (Proposed)	4 (Pump) 4 (Aerial)
Station B (Proposed)	4 (Pump)
Station C (Proposed)	4 (Pump) 4 (Rescue)

SCUGOG
WHITBY
OSHAWA
CLARINGTON
LAKE ONTARIO
RAGLAN RD W
HOWDEN RD W
HOWDEN RD E
COLUMBUS RD W
COLUMBUS RD E
SIMCOE ST N
HIGHWAY 407 W
HIGHWAY 407 E
WINCHESTER RD W
WINCHESTER RD E
BRIDLE RD
WILSON RD N
Station 6
BRITANNIA AVE E
CONLIN RD W
CONLIN RD E
HARMONY RD N
THORNTON RD N
STEVENSON RD N
COLDSTREAM DR
Station 5
TAUNTON RD W
TAUNTON RD E
GRANDVIEW ST N
Station 3
DRYDEN BLVD
BEATRICE ST E
Relocated Station I
Relocated Station 4
ROSSLAND RD W
ROSSLAND RD E
TOWNLINE RD N
ADELAIDE AVE W
ADELAIDE AVE E
Station A
KING ST W
KING ST E
BOND ST E
JOHN ST W
GIBB ST
CENTRE ST S
CELINA ST
DIVINE AVE
Station B
CHAMPLAIN AVE
HIGHWAY 401 W
HIGHWAY 401 E
Station C
BLOOR ST E
PARK RD S
WENTWORTH ST W
COLONEL SAM DR
FAREWELL ST
Station 2
PHILLIP MURRAY AVE

# of Firefighters On Scene Within 8 Minutes of Travel Time	% Urban Area	% Urban Calls
>=16	58%	90%

Existing Fire Station
Proposed Fire Station
Albert Street Bridge Restriction
Historic Emergency Incident (2014-2019)
Proposed Road
Urban Area
High Growth Area
Fire Response Boundary

Number of Staff On Scene within 8 Minutes of Travel Time

≥ 25 Firefighters
≥ 20 Firefighters
≥ 16 Firefighters
≥ 12 Firefighters
≥ 8 Firefighters
≥ 4 Firefighters

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Figure 44: **OPTION** 6 - **INITIAL FULL ALARM ASSIGNMENT**
SINGLE FAMILY DWELLING

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DATA PR

MAP CREATED BY: GM
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PROJECT: 191064 STATUS: DRAFT DATE: 2020-02-25

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Report 2020_02_19\Initial Full Alarm Assignment - Future Scenario 1c.mxd

9.10.7.3 N.F.P.A. 1710 Compliance Summary

Implementing a fire station location / fire suppression deployment model that would achieve the 90th percentile performance benchmarks for the Initial Arriving Company and Initial Full Alarm Assignment as defined by the N.F.P.A. 1710 standard (2020 Edition), and as proposed by the **2018 I.A.F.F. Report**, would require a significant financial investment on behalf of the City of Oshawa. And as noted in the introduction to this section, these resources would address the 90th percentile coverage of the existing City population and developed area, without consideration for future growth needs. Based on the estimated capital costs identified within this F.M.P. for the purchase of land and the design and construction of Fire Station 7 we estimate that the addition of a new Fire Station within the defined urban area of the City would cost approximately $7.5 million dollars. For those fire stations that are identified as being relocated there would be some cost recovery for the sale of the existing land and building. These fire stations may also be identified for some re-purposing for other City uses.

The implementation of this option would result in the City needing to purchase land and build five new Fire Stations within the defined urban area. The estimated capital costs for this are $37.5 million dollars (5 x $7.5 million). Subject to growth considerations some of this amount may be development charge applicable. There would be a further capital cost associated with purchasing three new pump/rescue apparatus and one new rescue apparatus. The estimated capital costs of these purchases is $3.0 million dollars (4 x $800,000). The required additional staffing includes 100 new firefighter positions estimated an additional annual operating cost of approximately $13.58 million dollars per year (100 x $135,785). There would also be a capital cost for firefighter protective clothing of $750,000 (100 x $7,500). Additional cost considerations include officer salaries and the need for additional positions such as a District Chief (operating costs for salary and benefits and capital costs for protective equipment and vehicle).

9.11 Suppression Division Summary and Recommendations

The analysis within this section highlights that in comparison to a representative group of six municipalities located within the G.T.A. and surrounding area the City of Oshawa is currently providing fire suppression services that are similar to, or above the average of, the comparator group. For example, for 2019 the City of Oshawa had a total emergency call volume of 5,875 incidents in comparison to the municipal group average of 7,428 incidents; the City currently has 161 fire suppression personnel in comparison

to the municipal group average of 157 suppression staff; and within a four minute travel time the City is able to deploy the Initial arriving Company to 74% of the historical emergency calls in comparison to the municipal group average of 64.2%. In our view, in comparison to the representative group of municipalities, the O.F.S. has developed a very effective fire suppression deployment model to respond to the fire-related risks within the community.

The analysis within this section identifies that for the period from January 1st, 2014 to December 31st, 2019 medical/resuscitator have accounted for 26.04% of the total emergency call volume. The percentage of medical/resuscitator calls has also increased by 83.25% since 2014. Of the department's total historical emergency call volume, 22.51% of it can be attributed to either C.O. false calls, or fire false calls, representing the second highest type of incidents the O.F.S. responds to. Actual property fire/explosion incidents represented only 4.33% of the total historical emergency call volume over the six-year period analyzed.

From January 1st, 2014 to December 31st 2019, the area now identified as the Station 6 First-Due Response Zone has had an increase of 98.76% in emergency calls. In the southern portion of the City Station 1 has experienced a 36.06% increase and Station 2 has experienced a 36.04% increase. The findings of the C.R.A. identify an increasing concentration of emergency calls in the area between Stations 1 and 2 within the older downtown core of the City. This includes higher concentrations of false fire calls, medical calls and property fires/explosion incidents.

The statistical analysis of all emergency calls for the period from January 1st, 2014 to December 31st, 2019 indicates that the O.F.S. consistently extends beyond the applicable N.F.P.A. 1710 standard performance benchmarks for call processing time (dispatch time) and turnout time for firefighters to assemble in the station and prepare to respond to property fire/explosion incidents. As a result this F.M.P. recommends that the O.F.S. prioritizes the implementation of strategies to improve performance in these two areas. In our view, a combined improvement of one minute (60 seconds) in the two performance benchmarks would result in an improvement in Initial Arriving Company Total Response Time capabilities of 15%, and a further improvement in the overall Total Response Time fire suppression capabilities of the O.F.S.

The analysis within this section provides a range of options for Council's consideration in determining the appropriate level of fire suppression services for the City of Oshawa.

The options presented have been informed by the findings of the companion Community Risk Assessment, and the recommendations of the 2018 I.A.F.F. Report.

Council Recommendations

- **Council Recommendation #4 (completed)**: That Council consider allocating sufficient funding within the City's 2020 operating budget to hire three firefighters as identified within the preliminary analysis of the fire master planning process.

Operational Recommendations

- **Operational Recommendation #30**: That consideration be given to providing sufficient capital funding to complete alterations to Fire Station 1 to accommodate additional office space as presented within the proposed Fire Master Plan.
- **Operational Recommendation #31**: That consideration be given to upgrading all existing Fire Stations to provide separation and ventilation for firefighter protective clothing as described within the proposed Fire Master Plan.
- **Operational Recommendation #32**: That the O.F.S. prioritize the identification and implementation of strategies to reduce the dispatch time and turnout time components of the Total Response Time by a minimum of one minute (60 seconds) combined, to further enhance the department's emergency response fire suppression capabilities.

Table 41: Suppression Options Summary

Description of Scenario / Option Modelled	Initial Arriving Company (4 FFs/4 min)	Second Arriving Company (6 FFs/6 min)	Initial Full Alarm Assignment (16 FFs/8 min)	Initial Full Alarm Assignment (25 FFs/8 min)	Other measures / Improvements	Costs
Existing Conditions	49% urban area **76% urban calls** 59% City roads 64% urban roads	38% urban area **67% urban calls** 46% City roads 52% urban roads	25% urban area **56% urban calls** 35% City roads 38% urban roads	3% urban area **15% urban calls** 5% City roads 5% urban roads		Existing Operating and Capital Expenses
Future Baseline	50% urban area **76% urban calls** 55% City roads 63% urban roads	38% urban area **67% urban calls** 45% City roads 51% urban roads	27% urban area **57% urban calls** 33% City roads 39% urban roads	3% urban area **15% urban calls** 4% City roads 5% urban roads		Existing Operating and Capital Expenses + Inflation to Future Horizon
Option 1 – Improve Total Response Time	50% urban area **76% urban calls** 55% City roads 63% urban roads	38% urban area **67% urban calls** 45% City roads 51% urban roads	27% urban area **57% urban calls** 33% City roads 39% urban roads	3% urban area **15% urban calls** 4% City roads 5% urban roads	Within existing total response time could reach 91% urban calls, a 15% improvement in call coverage	No significant additional costs
Option 2 – Rapid Response Unit (2FFs) at Fire Station 1	50% urban area **76% urban calls** 55% City roads 63% urban roads	38% urban area **67% urban calls** 45% City roads 51% urban roads	27% urban area **57% urban calls** 33% City roads 39% urban roads	3% urban area **15% urban calls** 4% City roads 5% urban roads	Responds to identified risk from C.R.A. that notes high concentration of medical and fire-related calls in Fire Station 1 area. Workload analysis indicates Fire Station 1 is busiest station. Light duty vehicle with 2 FF crew improves O.F.S. flexibility.	Add Rapid Response Apparatus = $550 K Capital Add 12 FFs (12 x $135,785) = $1.63 M Operating Firefighter P.P.E. (12 x $7.5 K) = $90 K Capital **Total Operating = $1.63 M** **Total Capital = $640 K**
Option 3 – Second Apparatus (4 FFs) at Fire Station 1	50% urban area **76% urban calls** 55% City roads 63% urban roads	47% urban area **83% urban calls** 55% City roads 62% urban roads	36% urban area **69% urban calls** 46% City roads 51% urban roads	7% urban area **24% urban calls** 11% City roads 12% urban roads	Initial Full Alarm Assignment Station 1 Response District 16 FFs / 8 min improvement – 31% area & 17% calls	Assume use of existing apparatus at no cost. (If heavy rescue apparatus required to be purchased instead of using Rescue 25, would require additional $750K capital.) Add 20 FFs (20 x $135,785) = $2.72 M Operating Firefighter P.P.E. (20 x $7.5 K) = $150 K Capital **Total Operating = $2.72 M** **Total Capital = $150 K**

Description of Scenario / Option Modelled	Initial Arriving Company (4 FFs/4 min)	Second Arriving Company (6 FFs/6 min)	Initial Full Alarm Assignment (16 FFs/8 min)	Initial Full Alarm Assignment (25 FFs/8 min)	Other measures / Improvements	Costs
Option 4 – Proposed Fire Station 7	54% urban area **76% urban calls** 58% City roads 64% urban roads	44% urban area **68% urban calls** 50% City roads 56% urban roads	28% urban area **58% urban calls** 35% City roads 41% urban roads	3% urban area **15% urban calls** 4% City roads 5% urban roads	Provides coverage of proposed future growth in the low, moderate and high growth scenario. No historic calls exist within new development area. Future calls would occur in new development areas.	Station Land Purchase = $1.5 M Capital Station Design & Construction = $5.0 M Capital Add Apparatus = $800 K Capital Add 20 FFs (20 x $135,785) = $2.72 M Operating Firefighter P.P.E. (20 x $7.5 K) = $150 K Capital **Total Operating = $2.72 M** **Total Capital = $7.45 M**
Option 5 – Add Proposed Fire Stations 7 & 8	61% urban area **76% urban calls** 64% City roads 68% urban roads				Station 8 provides coverage of proposed future growth in high growth scenario (Proposed future Columbus development). No historic calls exist within new development area. Future calls would occur in new development areas.	Station Land Purchase = $1.5 M Capital Station Design & Construction = $5.0 M Capital Add Apparatus = $800 K Capital Add 20 FFs (20 x $135,785) = $2.72 M Operating Firefighter P.P.E. (20 x $7.5 K) = $150 K Capital **Total Operating = $2.72 M** **Total Capital = $7.45 M** (potential additional financial consideration of officer positions / District Chief position and vehicle)
Option 6 – Compliance with N.F.P.A. 1710 (2020 Edition)	63% urban area **90% urban calls**		58% urban area **90% urban calls**		Provides improvement to areas with historic calls. Does not respond to future growth and development areas (where no historic calls currently exist)	Add 5 Fire Stations (5 x $7.5 M) = $37.5 M Capital Add 4 Apparatus (4 x $800 K) = $3.2 M Capital Add 100 Firefighters (100 x $135,785) = $13.58 M Operating Firefighter P.P.E. (100 x $7.5 K) = $750 K Capital **Total Operating = $13.58 M** **Total Capital = $41.45 M** (potential additional financial consideration of officer positions / District Chief position and vehicle)

NOTES:

FF = Firefighter

P.P.E. = Personal Protective Equipment (e.g. breathing apparatus, bunker gear, helmet, boots, gloves, etc.)

10.0 Mechanical Division

The Mechanical Division is responsible for the maintenance and repair of all Oshawa Fire Services' vehicles and equipment. This section provides a review of the division, the department's fleet, and equipment.

10.1 Division Key Functions

The O.F.S.'s Mechanical Division operates in the apparatus bays at Station 5 at 1550 Harmony Road North. Our review indicates that the current workspace at Station 5 is serving the division well.

Operating guidelines have been established by the O.F.S. which outline the Mechanical Division responsibilities (found in **O.G. #M-01 Mechanical Division Responsibilities**). The division is responsible for the maintenance and repairs of all apparatus and equipment, including all self-contained breathing apparatus (S.C.B.A.), generators, portable pumps, power saws, fans, and ladders. Some equipment testing and maintenance, such as hoses, ropes, and certain specialized equipment (e.g. HAZMAT suits) are completed by the Training Division.

Key functions of the division include:

- Annual certification of vehicles
- Self-Contained Breathing Apparatus (S.C.B.A.) testing / maintenance / repairs
- Equipment repair- both small equipment and large equipment
- Maintenance and repair of all fire services vehicles, including small vehicles
- Co-ordination of ladder testing / pump testing / rust proofing
- Ordering / returning mechanical parts and supplies
- Inventory and parts control

These functions are completed following the N.F.P.A. 1901 Standard for Automotive Fire Apparatus, and the N.F.P.A. 1911 Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles. This practice is consistent with current industry best practices and provincial requirements, including conducting Periodic Mandatory Commercial Vehicle Inspections (P.M.C.V.I.s) of apparatus.

In general, the Mechanical Division is transitioning to the use of more sophisticated technology and software to manage its functions and roles more efficiently and

effectively. This includes new inventory management, work order management and records management systems.

10.2 Mechanical Division Staff Resources

The Oshawa Fire Services Mechanical Division reports directly to one of the Deputy Fire Chiefs, and consists of two mechanic positions: lead mechanic and mechanic. The lead mechanic is primarily responsible for overseeing all preventative maintenance and repairs of O.F.S. apparatus and equipment. The mechanic supports the lead mechanic in the daily operations of the division, including the maintenance and repair of apparatus and equipment.

In addition to overseeing and delivering the key functions of the Mechanical Division, the Lead Mechanic assists the Deputy Fire Chief with the following:

- Prioritization of emergent and non-emergent repairs
- Records management system relating to fleet and equipment
- Budget recommendations
- Vehicle and equipment specifications and recommendations

The mechanic responsibilities include:

- Inspect, diagnose and perform repair and maintenance functions to Fire Services apparatus, equipment and sub components
- Transport fire apparatus as required for repair, maintenance and testing
- Prepare and submit proper documentation for all repairs, maintenance actions, labour and parts/material relating to apparatus and equipment
- Identify out-of-service issues and keep Lead Mechanic informed as to the current condition and predicted future repairs and needs of apparatus and equipment and make recommendations on substantial changes to apparatus and/or equipment configuration
- Assist with purchasing parts and materials as directed
- Maintain a safe working environment using all available safety equipment and following all applicable standard operating guidelines and procedures
- Repair and test breathing apparatus
- Promote and support the City of Oshawa core values of Authenticity, Courage and Trust (A.C.T.)
- Respond off duty when directed for emergency repairs

- Other duties as assigned

Our review indicates that the staff within this division are working well together, however, the workload of repairs and maintenance is often challenging to manage within the capacity of the two mechanic positions. This will be magnified as vehicles are added to the fleet with growth of the department. The workload and the impact on timing of repairs and maintenance should continue to be monitored on an on-going basis. In our view, the O.F.S. would benefit from considering hiring an apprentice to assist in the current workload management with this division, and support future succession planning within this division.

Council Recommendation #5: That consideration be given to hiring an apprentice mechanic as presented within the proposed Fire Master Plan.

10.2.1 Division Training and Certification

The department's current mechanics are licensed by Ontario Ministry of Colleges & Trades and have automotive truck licenses. Both mechanics also hold Emergency Vehicle Technician (E.V.T.) certifications. The mechanic holds a Masters level E.V.T., contributing informally to the succession planning of the division.

This F.M.P. highlights the importance of qualifications and certifications for all fire service personnel and has highlighted recent information from the province referencing mandatory qualifications and certifications for the fire department. For mechanics, this includes Emergency Vehicle Technician Certification (E.V.T.), a requirement in which the O.F.S. is achieving.

10.3 Major Fire Apparatus

Overall the apparatus and equipment within the Oshawa Fire Services are well maintained and in good condition. This is reflective of the department's proactive maintenance procedures, such as semi-annual undercoating of the entire fleet. The O.F.S. currently operates with eleven frontline apparatus, and three reserve apparatus.

P.F.S.G. 04-07-12 refers to the **N.F.P.A. 1901 Standard for Automotive Fire Apparatus** (2009 Edition) as a reference for the standards that should be considered in determining the appropriate apparatus for a community. N.F.P.A. 1901 provides the following definitions of major fire apparatus:

- **Pumper:** Fire apparatus with a permanently mounted fire pump of at least 750 gallons per minute (3000 litres per minute) capacity, water tank and hose body whose primary purpose is to combat structural and associated fires.
- **Initial Attack Apparatus:** Fire apparatus with a fire pump of at least 250 gpm (1000 L/min) capacity, water tank, and hose body whose primary purpose is to initiate a fire suppression attack on structural, vehicular, or vegetation fires and to support associated fire department operations.
- **Mobile Water Supply Apparatus (Tanker)**: A vehicle designed primarily for transporting (pick-up, transporting, and delivering) water to fire emergency scenes to be applied by other vehicles or pumping equipment.
- **Quint:** Fire apparatus with a permanently mounted fire pump, a water tank, a hose storage area, an aerial ladder or elevating platform with a permanently mounted waterway, and a complement of ground ladders.
- **Special Services Fire Apparatus:** A multipurpose vehicle that primarily provides support services at emergency scenes.

In addition to N.F.P.A. 1901 the industry commonly refers to the following types of major fire apparatus:

- **Rescue:** A vehicle specifically designed for the purposes of transporting specialized rescue equipment such as vehicle extrication equipment, water/ice rescue equipment, hazardous materials equipment, and additional fire suppression support equipment such as additional self-contained breathing apparatus.

- **Pump/Rescue:** A vehicle that combines the traditional functions of a pumper and a rescue apparatus into one multi-functional apparatus.
- **Aerial Device:** A vehicle equipped with an aerial device, elevating platform, or water tower that is designed and equipped to support firefighting and rescue operations by positioning personnel, handling materials, providing continuous egress, or discharging water at positions elevated from the ground.

The O.F.S. operates a major fire apparatus fleet that reflects the needs of a modern fire service and is aligned with the size of the department and the services it provides. The fleet reflects what would be expected based on the fire risks present within the community. The current major apparatus fleet assigned to the fire stations as "front-line" apparatus (meaning they are available for emergency response at all times) is listed in **Table 41**. This table also presents the planned replacement years forecast within the current O.F.S. fleet replacement plan.

Table 42: Major Fire Apparatus

Fleet Number	Station	Vehicle Description	Year Purchased	Forecasted Replacement Date
55190	Station 1	Spartan Metrostar Pumper (P21)	2019	2034
55100	Station 2	Pierce Pumper/Rescue (P22)	2010	2025
55191	Station 2	E-One Cyclone Aerial (A22)	2019	2034
55040	Station 3	Freightliner FL80 Tanker (T23)	2004	2019
55070	Station 3	American LaFrance Eagle Pumper/Rescue (P23)	2007	2022
55071	Station 3	Smeal 105' Aerial (A23)	2007	2022
55050	Station 4	Freightliner American LaFrance Pumper/Rescue (P24)	2005	2020
55120	Station 5	Spartan Gladiator Rescue (R25)	2012	2027
55131	Station 5	Spartan Gladiator Pumper (P25)	2013	2028
55130	Station 6	Spartan Gladiator Pumper (P26)	2013	2028

10.4 Reserve Fleet Considerations

Maintaining a fleet of reserve major fire apparatus reflects current industry best practices and is supported by the Fire Insurance Underwriters as due diligence on behalf of the municipality. The term “reserve” can be interpreted to mean this apparatus may not necessarily be required. In our experience the term “service ready” is more applicable to this category of major fire apparatus. It should be recognized that this apparatus may be needed under emergency conditions to sustain the level of Council approved fire suppression services in the event of an apparatus breakdown. This apparatus also provides greater flexibility in the event of a major incident.

The O.F.S. currently has a fleet replacement plan on a ten-year capital budget. There are three reserve apparatus which are used when front line vehicles are out for annual certification, maintenance, or repair. One of the reserve apparatus is stocked with equipment at all times. If it is determined that an apparatus will be out of service for a short period of time (e.g. two to three days) the fully equipped reserve apparatus is used as a replacement. The reserve apparatus are housed at Station 5, where the Mechanical Division operates from. The existing reserve apparatus within the O.F.S. fleet are described below in **Table 42**.

Table 43: Service Ready Major Fire Apparatus

Fleet Number	Station	Vehicle Description	Year Purchased
55990	Station 5	E-One Superior Quint 75’	1999
55041	Station 5	Freightliner FL80 Pumper Rescue	2004
55060	Station 5	American LaFrance Eagle Pumper/Rescue	2006

10.5 Small and Specialized Vehicles

In addition to the major fire apparatus the O.F.S. operates a number of small and specialized vehicles. This includes vehicles for administration staff (Fire Chief and Deputy Fire Chief), mechanical staff, and fire prevention staff. A list of the small and specialized vehicles found within the O.F.S. are listed in **Table 43**. This table also provides the forecast replacement dates based on the current O.F.S. fleet replacement plan and capital budget forecasts.

Table 44: Current Small and Specialized Apparatus

Fleet Number	Station	Vehicle Description	Division Assigned To	Year Purchased	Forecasted Replacement Date
54092	Station 1	Chevrolet HHR	Fire Prevention	2009	2019
54140	Station 1	Chevrolet Impala	Administration (Deputy Chief)	2014	2021
54150	Station 1	Suburban	Suppression (Platoon Chief)	2015	2020
54190	Station 1	Chevrolet Equinox	Administration (Fire Chief)	2019	2026
54191	Station 1	Chevrolet Equinox	Fire Prevention	2019	2026
54192	Station 1	Chevrolet Equinox	Administration (Deputy Chief)	2019	2026
54193	Station 1	Chevrolet Equinox	Fire Prevention	2019	2026
54961	Station 4	Hazmat Command Trailer	Suppression (Hazmat)	1996	2021
54200	Station 5	GMC Sierra 2500 HD Double Cab	Mechanical	2020	2027
54131	Station 5	Chevrolet Equinox	Fire Prevention	2013	2020
54141	Station 5	Chevrolet Silverado	Fire Prevention	2014	2021
54153	Station 5	Chevrolet Equinox	Fire Prevention	2015	2022
54160	Station 5	Chevrolet Equinox	Fire Prevention	2016	2023
54180	Station 5	GMC Sierra	Fire Prevention	2018	2025
54181	Station 5	GMC Sierra	Training	2018	2025
54151	Station 6	Chevrolet Equinox	Fire Prevention	2015	2022
54152	Station 6	Chevrolet Equinox	Fire Prevention	2015	2022

10.6 Fleet Replacement Plan

Lifecycle planning is a core component of the capital planning process, and fleet standardization strategy across Canada.

The Fire Underwriters Survey (F.U.S.) requires that all major fire apparatus meet either the Underwriters Laboratory of Canada standard U.L.C. - S515 - 04 or the N.F.P.A. 1901 - Standard for Automotive Fire Apparatus. F.U.S. identifies the following major fire apparatus replacement guidelines:

- Major cities 12 – 15 years, with an additional five years in reserve
- Medium size cities 15 years, with additional five years as back up, and five years in reserve
- Small municipalities 20 years, with an additional five years second line or reserve

The F.U.S. defines a major city 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.” Oshawa meets the criteria of ‘major city’ and as such, the applicable replacement strategy for the City of Oshawa reflects a 15 year front-line life cycle with an additional five year (reserve use) overall life cycle plan. This aligns with the current fleet replacement practices of the O.F.S.

The O.F.S. currently tracks the lifecycle of its fire apparatus and has a fleet replacement plan in place. All apparatus lifecycle is monitored and replacements are scheduled in the capital budget ten-years in advance. This fleet replacement plan accurately reflects a replacement plan of a major city and is in accordance with current municipal best practices. O.F.S. is working towards standardization of the fleet of major fire apparatus, which is a municipal best practice. This is considered within the replacement plan for major fire apparatus.

10.7 Equipment

The Oshawa Fire Services is a large modern fire service that requires an extensive inventory of equipment such as firefighter protective clothing (bunker gear), self-contained breathing apparatus (S.C.B.A.) firefighting hose and nozzles, ladders, automobile extrication tools and many specialized pieces of equipment required for the specialized rescue services provided. The Mechanical Division is responsible for the

acquisition and maintenance of mechanical equipment. The Training Division is responsible for the acquisition and maintenance of fire services operational equipment. The O.F.S. has established a number of standard operating guidelines related to the maintenance of equipment.

The Mechanical Division is responsible for maintenance of small equipment and self-contained breathing apparatus (S.C.B.A.), though the Training Division completes S.C.B.A. fit testing for the department and assists with maintenance of fire hose. The current S.C.B.A. equipment was put into service in May 2018, and work covered by warranty is outsourced accordingly. All additional work and annual maintenance is conducted by a certified MSA S.C.B.A. technician. The O.F.S. currently has one certified technician on staff in the Mechanical Division, and is in the process of having additional staff certified.

Bunker gear maintenance is currently conducted annually by an outside company. **N.F.P.A. 1851 Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting (2019)** has recently been released. The recommended practice identified within the standard requires maintenance and cleaning of bunker gear to occur twice per year. Furthermore, the standard specifies the use of an extractor for gear cleaning (technical requirements set forth in N.F.P.A. 1851). Currently O.F.S. bunker gear is replaced on a five year schedule and is taken out of service after 10 years.

Additional maintenance, inspections, and repair services provided by outside companies include the following equipment and apparatus: pump testing, aerial ladder inspection, hoist and crane inspections, tire repairs, spring replacement, and large engine repairs.

10.8 Operating Guidelines and Procedures

There are a number of standard operating guidelines established to ensure the proper functioning and maintenance of all O.F.S. apparatus. These guidelines appear to be serving the department well with respect to fleet and equipment.

An important operating guideline for the Mechanical Division is **O.G. # M-02 Reporting Mechanical Deficiencies** which outlines the process of performing vehicle inspections and reporting deficiencies. Crews are to notify their Platoon Chief who communicates

the repair needs with the Mechanical Division. All vehicles are to be inspected multiple times per day, and as soon as possible following a major incident. The department will be implementing new work management software to assist with reporting and managing work orders. The current estimated implementation horizon is 2021.

Fire apparatus are placed out of service for a variety of reasons including for mechanical repair, annual inspections, or work performed by outside agencies. The O.F.S. has established standard operating guidelines regarding placing fire apparatus out of service. O.F.S. standard operating guideline **PO-94 Placing Fire Apparatus out of Service** outlines the policy to be followed by any personnel required to place fire apparatus out of service.

10.9 Mechanical Division Summary and Recommendations

With the support of Council the O.F.S. has developed a modern fleet of firefighting apparatus that reflects the fire risks present within the community. This F.M.P. includes options for Council's consideration that may further increase the size of the existing apparatus fleet and equipment utilized by the O.F.S. In our view, the existing preventive maintenance and repair requirements are exceeding the current workload capacity of the two mechanics.

There is an existing need to consider additional resources in this area. In our view, creating a new position staffed by an apprentice mechanic would assist in managing the current workload while building capacity for future expansion of the apparatus fleet and equipment. As a result of the review of the Mechanical Division, the following recommendations are presented for Council's consideration and approval.

Council Recommendations

- **Council Recommendation #5**: That consideration be given to hiring an apprentice mechanic as presented within the proposed Fire Master Plan.

11.0 Communications Division

The Communications Division is responsible for receiving and recording all fire alarms, switchboard activities and other emergency calls and dispatching the proper apparatus and equipment in accordance with standard operating procedures.

The Oshawa Fire Services' Communications Division operates out of Fire Station 1 – Headquarters located at 199 Adelaide Avenue West, and providing emergency call taking and fire dispatching for the City of Oshawa. This division facilitates a vital role in connecting the citizens of Oshawa and first responders during emergencies. In addition to providing emergency call taking and fire dispatching for the City of Oshawa and its fire service, this division also provides communication services for the Town of Whitby, Municipality of Clarington, Township of Scugog, Township of Uxbridge and the Township of Brock as referenced in **Section 6.6.3** of this F.M.P.

This section assesses various components of the division including the existing staffing model, training of all personnel assigned to the division, dispatching systems and technology used by the department and the dispatch agreements in place with surrounding municipalities.

11.1 Communications Workspace

The resources provided to dispatchers (telecommunicators) are essential to the function of the communications centre. Communications staff operate from four Bramic console work stations; each equipped with a phone system, a backup phone system, a personal computer, Crisys consoles and the Harris Symphony Interface. The Communications centre is located in a secure space on the second floor of Fire Station 1 – Headquarters. This area does not have elevator access and is not accessible. The dispatchers have access to meal time preparation areas and a break room outside and away from the centre. Staff must also exit the room to access washroom facilities.

11.2 Current Communications Systems/Technologies

The role of technology within a Communications Division is fundamental to its function. The O.F.S. communications centre dispatches all emergency calls using the CriSys Rel. 33.3 B Computer Aided Dispatch software with integrated Automatic Vehicle Location (A.V.L.). CriSys software allows communications personnel to store all emergency call

data and access pertinent information related to the location of the incident. The system also has the capability of running reports based on specific criteria if requested. The Harris Symphony Interface is used by the communicators to page volunteer/part-time firefighters in the Township of Brock, Township of Scugog and the Township of Uxbridge.

Our research and consultation into preparing this F.M.P. identified that there are further opportunities for the O.F.S. to access historical emergency call data from the CriSys software program to further inform the operational efficiencies within the department. This was also identified by the 2018 F.M.P. report that recommended the department **"Develop Standard Operating Procedures (S.O.P.) for auditing and analysing CriSys reports within suppression and communications divisions to increase accountability and accuracy"**[71]. Under the leadership of the Fire Chief the O.F.S. has implemented the 'Statistical Dashboard' program to enhance the internal auditing and analysis capabilities of senior staff. Our observations in preparing this F.M.P. further support broadening the use of the 'Statistical Dashboard' to further enhance the department's ability to track, access and utilize data analysis to inform decision-making.

Operational Recommendation #33: That consideration be given to developing a department Standard Operating Guideline for enhancing the utilization of the CriSys software to inform decision-making within the O.F.S.

Front line apparatus are equipped with Panasonic Toughbook Mobile Data terminals[72] with A.V.L. and utilize Harris XG75 portable radios. Cellular phones are assigned to the on duty Captains in the event that the radio system goes down.

The command vehicle is in the testing phase of Tablet Command software which is operated on a ruggedized Ipad. Senior staff, mechanics and training division staff also utilize the Harris XG75 portable radios. Fire Prevention staff use Harris XL185 portable radios. The 2018 F.M.P. Report recommends that the O.F.S. further investigate the use of G.P.S. tracking. The report recommends that the O.F.S. **"Explore the opportunity for global positioning system (G.P.S.) tracking and navigation for response,**

[71] Oshawa Fire Services 2018 Fire Master Plan & Community Risk Assessment Report, Recommendation #4

[72] At the time of preparing this Fire Master Plan Final Draft O.F.S. was experiencing connectivity issues of approximately four of the eight mobile data terminals, but were working to resolve the issues.

prevention and training vehicles. Undertake further review of all truck movements with the investigation of automatic station response coverage. Review emergency responses, public relation events, training and non-fire related stops"[73]. The use of G.P.S. technology within the fire service has grown significantly over the past decade. In our view, the use of G.P.S. tracking of emergency response apparatus provides the opportunity to ensure that the closest available apparatus is deployed at all times. As referenced within the recommendation, the implementation of G.P.S. tracking would also provide further opportunities to monitor and evaluate several different functions of the department.

Operational Recommendation #34: That consideration be given to implementing global positioning tracking (G.P.S.) as presented within the proposed Fire Master Plan.

Initial interviews with O.F.S. staff indicated that there are radio "dead zones" in the specific areas of the City including the basements of Durham College and the Lakeridge Health Hospital. In our experience, dead zones are not uncommon, although they do pose significant safety concerns for first responders. O.F.S. has installed a repeater in the Platoon Chiefs vehicle, however the issue has not been fully resolved within the City.

Our research indicates some jurisdictions have adopted local by-laws requiring building owners to ensure radio signals can be received from within a building. Under these by-laws, building owners may be required to install booster systems or antennas in those instances where radio signal continues to be an issue, however the costs associated with a booster system or antennas can be substantial.

Working together with property owners to a find mutually satisfactory solution to this challenge will ensure the health and safety of first responders. Using this example, a risk reduction strategy could include both engineering and economic incentive. Ensuring the proper infrastructure and equipment are in place reduces the risk to emergency responders and improves the life safety of building occupants. Providing an

[73] Oshawa Fire Services 2018 Fire Master Plan & Community Risk Assessment Report, Recommendation #3

economic incentive such as a tax credit to the property owner may be sufficient to resolve this safety issue.

Our analysis indicates that the current technology and software used for communications is meeting the needs of the O.F.S. However, upgrades may be necessary to facilitate Next Generation 9-1-1 (N.G. 911) requirements or to provide further capacity if communications services were to be further extended to other municipalities. We learned through our preliminary analysis that the City does not currently include capital costs when calculating cost recovery charges for those municipalities it currently provides emergency call taking and fire dispatching services to. It was identified within the 2019 M.N.P. Report that this was an opportunity for cost recovery. In our view incorporating these costs into existing agreements on a move forward basis, and into similar agreements with other parties in the future would be reasonable.

Operational Recommendation #35: That consideration be given to conducting further analysis of potential radio system "dead zones" and options for minimizing any impact on firefighter communication.

Operational Recommendation #36: That consideration be given to including capital costs when calculating cost recovery charges for the municipalities to which it provides emergency call taking and fire dispatch services.

11.3 Existing Communication Division Staff Resources

In addition to providing emergency all taking and fire dispatching for the O.F.S. this division is responsible for providing communications services to other municipalities that places an added degree of due diligence on the skills and competencies of staff within this division. Ensuring that the operations, and provision of services are consistent with the service agreements in-place with each municipality, and reflect current industry best practices, should be considered a high priority. This should also ensure that all staff assigned to this division are fully qualified and competent in providing these services. The communications division of the O.F.S. currently has a total staffing complement of 16 personnel with a staffing model that reflects a four platoon system. Each platoon has a staffing complement of one communication supervisor and three communicators.

Our research indicates that the position with primary responsibility for overseeing this division is current vacant. The Communications Officer position, which is identified within the Collective Agreement, has been vacant since 2010.

At the time of preparing this F.M.P. two of the communicators (dispatchers) were on leave and were being replaced by two temporary employees to fill their absences. The current practice of the department is to utilize fire suppression personnel (i.e., firefighters) to backfill any absences of a regularly scheduled communicator (dispatcher) due to an absence, when another off-duty communicator is not available. This staffing strategy supports the continuity of delivering emergency call taking and fire dispatching, however, it requires firefighters being placed in the role of a communicator to have the same skills and competencies of a communicator. As the City has introduced the use of "temporary employees" consideration should be given to formalizing this position, and dis-continuing the use of utilizing firefighters to back fill in the communications division. On November 28th, 2019 the Community Risk Assessment and Fire Master Plan Update Report prepared by Dillon Consulting was presented to Council. The analysis within this F.M.P. continues to support the preliminary findings recommendation that was presented to Council at that time including:

Council Recommendation #6 (completed): That Council consider allocating sufficient funding within the City's 2020 operating budget to fill the vacant position of Communications Officer as referenced within the preliminary analysis of the fire master planning process.

It is also recommended that the O.F.S. further investigate the option of utilizing "temporary employees" that may include developing list of part-time dispatchers who have attained the skills and competencies of a dispatcher. This new position could be utilized to reduce any reliance on firefighters to provide back fill within the communications division.

The M.N.P. Report, discussed in **Section 3.5** of this F.M.P, references claims relating to P.T.S.D. within the O.F.S. communications division. Our experience indicates P.T.S.D. claims amongst communications staff are not uncommon, with frequent media coverage often citing hectic and understaffed communications centres as contributing factors. The health and safety of communication staff necessitate ensuring sufficient levels of qualified staff are available within the City's Communications Centre at all times.

We recognize the challenges the City faces in managing P.T.S.D. claims within the O.F.S. from the perspective of ensuring affected personnel receive the help and treatment they need, while also balancing the cost pressures associated with same. A more detailed discussion relating to the City's P.T.S.D. prevention policy is found in **Section 6.9** of this F.M.P.

Operational Recommendation #37: That consideration be given to implementing the use of qualified part-time dispatchers as presented within the proposed F.M.P.

11.4 Training of Communications Staff

Our research and consultation into preparing this F.M.P. identified a gap in the amount of formal training being conducted within the communications division. To address this gap, communications staff have recently started training towards Association of Public Safety Communications Officials (A.P.C.O.) certification. The training and qualifications of staff assigned to the role of a communicator within a fire department has been the focus of several investigations over the past decade. In our view, this supports a heightened awareness of the municipalities due diligence to ensure all staff within this division are trained and qualified to recognized industry standards. In our view, at a minimum this means that all staff assigned to the role of communicator be qualified to the **N.F.P.A. 1061 - Standard for Professional Qualifications for Public Safety Telecommunications Personnel - Level I,** with the goal of achieving the level II qualification. This includes the proposed part-time dispatchers.

Operational Recommendation #38: That consideration be given to ensuring that all staff assigned responsibility for dispatching fire department personnel and resources are trained and certified to N.F.P.A. 1061 Standard for Professional Qualifications for Public Safety Telecommunications Personnel – Levels I and II.

11.5 Communications Performance Benchmarks

The applicable performance benchmarks for emergency alarm processing for the O.F.S. are contained within the **N.F.P.A. 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems** (2019 Edition). This standard includes a performance benchmark for the processing of the highest prioritization of emergency incidents to be completed within 64 seconds, 90% of the time. The O.F.S. currently targets this performance benchmark, and reports its performance through reporting completed by the dispatch supervisors on a quarterly basis.

Our research indicates that at this time the department does not have an operating guideline that directs staff to monitor, and report on the performance benchmarks included within the N.F.P.A. 1221 Standard. In our view, this should be a priority of the recommended Communications Officer.

11.6 Communication Division Summary and Recommendations

The O.F.S. has positioned itself as a leader in the industry in providing effective and efficient emergency call taking and fire dispatching. This F.M.P. includes recommendations that support the O.F.S. developing further business cases in providing these services to other communities within the Region. The analysis within this section presents recommendations to further enhance the effectiveness and efficiency of this division. In our view, priority should be given to those recommendations related to further enhancing the operational effectiveness of this division in complying with the municipalities due diligence including hiring the proposed Communications Officer and considering the use of part-time dispatchers. As a result of the review of the Communications Division, the following recommendations are presented for Council's consideration and approval:

Council Recommendations

- **Council Recommendation #6 (completed)**: That Council consider allocating sufficient funding within the City's 2020 operating budget to fill the vacant position of Communications Officer as referenced within the preliminary analysis of the fire master planning process.

Operational Recommendations

- **Operational Recommendation #33**: That consideration be given to developing a department Standard Operating Guideline for enhancing the utilization of the CriSys software to inform decision-making within the O.F.S.
- **Operational Recommendation #34**: That consideration be given to implementing global positioning tracking (G.P.S.) as presented within the proposed Fire Master Plan.
- **Operational Recommendation #35**: That consideration be given to conducting further analysis of potential radio system "dead zones" and options for minimizing any impact on firefighter communication.
- **Operational Recommendation #36:** That consideration be given to including capital costs when calculating cost recovery charges for the municipalities to which it provides emergency call taking and fire dispatch services.
- **Operational Recommendation #37**: That consideration be given to implementing the use of qualified part-time dispatchers as presented within the proposed F.M.P.
- **Operational Recommendation #38**: That consideration be given to ensuring that all staff assigned responsibility for dispatching fire department personnel and resources are trained and certified to N.F.P.A. 1061 Standard for Professional Qualifications for Public Safety Telecommunications Personnel – Levels I and II.

12.0 Emergency Management

As per the scope of requirements for this fire master planning process, all aspects of the fire department, including its role and responsibilities in the City's emergency management program were assessed. The legal framework for managing emergencies in Ontario is established in the **Emergency Management and Civil Protection Act** (E.M.C.P.A.). It is complemented by **Ontario Regulation 380/04 (Standards)**, which lays out the minimum standards required by municipalities and provincial ministries for emergency management programs. This section of the F.M.P. is guided by the appropriate legislation and industry standards and provides an overview of the emergency preparedness, planning and management activities taking place within the City of Oshawa.

12.1 Compliance with Provincial Legislated Requirements

Under the E.M.C.P.A., the Solicitor General has the authority to make regulations setting standards for the development, implementation and maintenance of emergency management programs required by every municipality. It further requires that every municipality, minister of the Crown and designated agency, board, commission and other branch of government ensure their emergency management programs and emergency plans conform to the standards set within the Act. To verify compliance with the E.M.C.P.A., municipalities are required to annually review and submit supporting documentation which may include:

- Emergency Response Plan (E.R.P.)
- Proof of training
- Proof of exercises
- Evidence of public education program
- Municipal Hazard Identification Risk Assessment (H.I.R.A.)
- Critical Infrastructure (C.I.) List
- Emergency Management Program By-law

Internal consultation with O.F.S. has confirmed that the City was compliant with the Emergency Management and Civil Protection Act for 2018 and has completed, or reviewed the items as per the list above which are discussed in greater detail throughout the sections that follow.

12.2 Emergency Master Plan and Emergency Management Program By-law No. 77-2008

Oshawa's emergency management program was developed under the authority **By-law No. 77-2008.** The Emergency Master Plan was reviewed and revised as recently as 2019 and provides a comprehensive tool that assists emergency personal and users of the plan in their collective response efforts. Appended to the plan are several sub-plans complete with highly detailed information and protocols to be followed during hazard-specific emergencies.

As mentioned in the **Community Risk Assessment**, Oshawa is located between the Pickering Nuclear Generating Station located in Pickering and the Darlington Nuclear Generating Station located in Clarington, which presents the surrounding municipalities (including Oshawa) with a potential risk for radiation release. Although the probability of a nuclear emergency is low, the consequences of a nuclear incident involving the release of radioactive materials would be severe and even catastrophic. Nuclear emergencies are not addressed in the City's the Emergency Master Plan.

To address the potential for a nuclear emergency, the City of Oshawa has developed a Nuclear Emergency Response Plan (N.E.R.P.) as an appendix to its Emergency Master Plan, outlining authority, roles and responsibilities as well as measures to be taken in response to a nuclear emergency. If a nuclear incident occurred at either of these facilities, the Provincial Emergency Operations Centre and the Regional Emergency Operations Centre would be automatically activated and the Province would lead the emergency response effort and assume authority over the incident.

During internal consultation with the O.F.S., it was learned that the Province has recently expanded the emergency planning zones around the Darlington and Pickering Nuclear Generating Stations. Both the primary and alternate emergency operation centres are currently located within these designated zones creating a challenge for operation of an E.O.C. during the event of a nuclear emergency.

In reviewing the Emergency Master Plan it is noted that the titles Fire Chief and Community Emergency Management Coordinator (C.E.M.C.) are used interchangeably. Through the interview process of this F.M.P. we confirmed that the Fire Chief is also the designated Community Emergency Management Coordinator.

It would be preferable to use either the title “Fire Chief/Community Emergency Management Coordinator” or “Community Emergency Management Coordinator,” rather than using both terms throughout the document. It was also noted that the Ministry of Community Safety and Corrections is used throughout the Emergency Master Plan. The ministry with responsibility for the Emergency Management and Civil Protection Act was recently changed to the Ministry of the Solicitor General. This change is insignificant, and can be incorporated into the next annual review of the City’s Emergency Master Plan.

12.3 Training and Annual Exercise

The Emergency Management and Civil Protection Act requires municipalities in Ontario to train staff involved in the jurisdiction’s emergency management program. Courses are available through Emergency Management Ontario (E.M.O.) based on best practices and principles across Ontario. E.M.O. administers courses in the areas of Incident Management Systems, Exercise Program Management, Note Taking, Basic Emergency Management (B.E.M.) and Community Emergency Management Coordinator training.

The most current guidance provided to municipalities with respect to emergency management training is dated February 6, 2018 which specifies the following four courses as mandatory for C.E.M.C.s:

1. Basic Emergency Management (E.M. 200)
2. Community Emergency Management Coordinator (E.M. 300)
3. Introduction to Incident Management System (I.M.S. 100) available on-line
4. Basic Incident Management System (I.M.S. 200)

Under O. Reg. 380/04 Community Emergency Management Coordinators are required to complete the required training within one year of being appointed at C.E.M.C.

Municipal Emergency Control Group members are required on an annual basis to demonstrate:

- Knowledge of all components of the Emergency Management program, including the H.I.R.A. and Critical Infrastructure list
- Knowledge of the Municipal Emergency Plan, including their respective roles and responsibilities as well as the roles and responsibilities for local agencies and organizations included in the Plan

- Knowledge relating to the procedures required to activate and operate under the Municipal Emergency Plan
- Knowledge of notification procedures for the M.E.C.G. when the Plan is activated
- Knowledge of the location, and equipment utilized in the E.O.C.

The 2018 guidance also suggests those with responsibilities during a municipal emergency to maintain records complete E.M. 240- Note Taking to ensure proper documentation is prepared in the event of an emergency which requires the activation of the E.O.C. While this training is not mandatory, in our experience, municipal staff have found value in participating in this course offering.

In 2018, emergency management training was provided for City of Oshawa staff assigned to a role in the Emergency Operations Centre. This included topics such as emergency planning, incident command and use of the E.O.C. portal for live emergencies. In 2019, all E.O.C. members were trained in Basic Emergency Management and an in-person classroom session was held for Incident Management Systems, Level 100. It is crucial that an effective planning process and standardized approach to emergency management be in place prior to an emergency situation and Incident Management Systems defines the roles and responsibilities of all personnel involved in incident management and provides standardized organizational structures, functions, processes and terminology for use at all levels of emergency response. Ensuring that all personnel responsible for operating in an E.O.C. are properly trained is paramount to the effective and efficient collective response to a municipal emergency.

As part of the interview process for this F.M.P. it was noted that in the past some staff with responsibilities under the Emergency Master Plan were not completing on-line training provided by the City. A classroom offering of Incident Management Systems, Level I was therefore presented, making the course more easily accessible. A further challenge to the training requirement appears to be staff turnover, leaving the number of trained staff in a constant state of flux. In our experience, staff turnover is an issue facing many municipalities in Ontario. One option to addressing this concern is to ensure redundancy in staff training. This can be achieved by cross training staff and providing multiple training opportunities to more City staff to take into account, turnover, retirements, vacation time, etc. In our view, the City has provided training in excess of the mandatory requirements of O. Reg. 380/04, evidence of its strong commitment to emergency preparedness.

Operational Recommendation #39: That consideration be given to sustaining ongoing emergency management training to ensure sufficient staff within the City are trained at all times to manage a major emergency within the City.

In addition to training, the E.M.C.P.A. requires that every municipality complete an emergency exercise on an annual basis. Exposing E.O.C. members to simulated emergencies is an effective tool in preparing teams to respond to an emergency efficiently. Emergency exercises can be used to test a municipality's emergency response plan and procedures as well as to validate the capabilities of those responsible for preparing for and responding to an emergency situation. A further example of the City's commitment to emergency management was the introduction of "Rapid Notify" a mass notification system that has the capability to send emergency alerts utilizing a variety of communications modes.

12.4 Public Education Program

The E.M.C.P.A. requires municipalities to provide emergency preparedness education to the community. The City's website provides emergency preparedness information including:

- Emergency communication information including social media platforms such as Facebook and Twitter
- Subscription information for the Service Oshawa and the City's Emergency and Severe Weather Updates and News
- Information regarding the Public Alerting Sirens in place for those within 3 kilometres of the Nuclear Automatic Action Zone and Automated Telephone Notification System for those in the 10 km Detailed Planning Zones
- Information relating to home evacuation planning, types of emergencies to prepare for, emergency shelter locations, and more

Currently, the O.F.S. is collaborating with Corporate Communications to invite members of the community to sign up for emergency updates through the newly adopted Rapid Notify mass communication systems. The existing partnership between these two municipal departments demonstrates the recognition of the benefits of collaboration in distributing key messages about emergency preparedness throughout the community.

Where possible, it is recommended that the fire services continue to utilize the expertise and resources to increase the emergency preparedness messaging throughout the community.

The fire services could also consider using its Alarmed for Life door to door program as a means to distribute emergency preparedness information in addition to smoke alarm and fire safety materials.

12.5 Potassium Iodine Tablets

The Durham Region Health Department has prepared an information sheet about potassium iodine tablet distribution within the Region in an effort to educate the public. The tablets are an effective method of reducing the risk of thyroid cancer in the event of a radioactive release. These tablets were distributed to properties within 10 kilometers as well as to first responders within the same distance of both Pickering and Darlington nuclear generation stations in October 2015.

12.6 Hazard Identification and Risk Assessment

In 2019 the O.F.M.E.M. released the **"Hazed Identification Report"** and **"Methodology Guidelines"** outlining a process for the development of a Hazard Identification and Risk Assessment Program, to assist municipalities in assessing their local hazards and potential risks. This methodology includes consideration of the following steps:

1. Plan
2. Identify Hazards
3. Build Community Knowledge
4. Assess Risk
5. Report and Follow-up

Municipalities are required to review the H.I.R.A. on an annual basis and update as needed. The City updated its H.I.R.A. in 2019 utilizing the O.F.M.E.M. H.I.R.A. methodology guideline.

12.7 Critical Infrastructure (C.I.)

The Province of Ontario defines critical infrastructure as "interdependent, interactive, interconnected networks of institutions, services, systems and processes that meet vital human need, sustain the economy, protect public safety and security, and maintain continuity of a confidence in government." [74] The E.M.C.P.A. requires municipalities to identify critical infrastructure. Further, Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure, requires municipalities to have plans in place addressing vulnerabilities affecting certain municipal infrastructure assets; levels of service; maintenance schedules; adaptation opportunities and amongst other things, disaster planning and contingency funding. Ensuring the City's C.I. protected from vulnerabilities, whenever possible is vital to the resilience of the community. This requires proactive and strategic measures which may include:

- Building C.I. in areas which are outside of flood plains and flood prone areas
- Constructing C.I. to disaster resilient standards
- Maintaining C.I. with a high standard of care
- Maintaining a database of all City owned generators and capacities
- Ensuring facilities included in the City's C.I. inventory have back up power capacity and/or generator
- Maintaining sufficient fuel storage to maintain continuity of City operations for a 72 hour period

The City has created a prioritized list of its assets and infrastructure that are critical to the health, safety, security, and economic well-being of its citizens. This document is restricted from the public domain and is appended to the municipal Emergency Master Plan.

In 2010, the City's I.T. and G.I.S. departments developed a web-based app known as E.O.C. Dashboard. The app became the primary information source and operations log during E.O.C. activations. In 2016, the City expanded on the existing dashboard, launching an E.O.C. web map, which enables individuals in the E.O.C. to visualize the emergency scene or scenes in real time, including evacuation zones, staging areas, road closures, power outages, shelter locations and command posts.

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[74] Source: "Critical Infrastructure", Ministry of the Solicitor General, last modified April 19, 2017.

This tool has improved situational awareness for the M.E.C.G. and it is anticipated next steps will involve making this same information available to on scene incident commanders. We commend the City's proactive efforts in developing these innovative tools.

12.8 Emergency Operations Centre (E.O.C.)

According to the Incident Management Systems for Ontario Resource Manual, "the ability to coordinate incident support is dependent on having a facility with the capabilities to monitor the incident responses, and to communicate with Incident Command."[75] This support is typically coordinated through an Emergency Operations Centre.

The City of Oshawa has both a primary and alternate E.O.C. The facilities have appropriate computer and communications technology, alternative power sources, as well as resources and redundancies to operate effectively during extended emergency operations.

12.9 Emergency Management Staffing

In addition to his roles and responsibilities under the F.P.P.A., the Fire Chief is also the City's designated Community Emergency Management Coordinator (C.E.M.C.). The C.E.M.C. is responsible for ensuring sustained compliance with the Emergency Management and Civil Protection Act (E.M.C.P.A.) and Ontario Regulation 380/04, which sets out the minimum standards for emergency management programs.

Currently both of the Deputy Fire Chiefs are appointed as Alternate C.E.M.C. In our experience, in the event of an emergency requiring the activation of the E.O.C. a Fire Chief who is also the C.E.M.C. is overtaxed. It is incredibly challenging for one person to act in both an operational role as Fire Chief while also acting in an operational role in the E.O.C.

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[75] Source: "Incident Management Systems for Ontario," Ministry of the Solicitor General, last modified May 25, 2016, https://www.emergencymanagementontario.ca/english/emcommunity/ProvincialPrograms/I.M.S./Resources/ims_doctrine.html

This arrangement requires one person to split his or her focus, attending meetings of the M.E.C.G. while also making complex decisions about operational deployments as the Fire Chief. Through the interview process of this F.M.P. we learned that both of the Deputy Fire Chiefs are appointed as an alternate C.E.M.C., should the Fire Chief be unavailable. While this model does provide for some contingency, in our view, there would be value in appointing one of the Deputy Fire Chiefs as the C.E.M.C. and the other Deputy Fire Chief and the proposed Assistant Deputy Fire Chief as the alternates C.E.M.C.s for the purpose of redundancy and succession planning purposes.

Operational Recommendation #40: That consideration be given to revising the appointment of the Community Emergency Management Coordinator (C.E.M.C.) as presented within the proposed Fire Master Plan.

12.10 Emergency Management Summary and Recommendations

The City of Oshawa has developed a comprehensive emergency management program that complies with the requirements of the **Emergency Management and Civil Protection Act** and **Ontario Regulation 380/04.** The City provides proactive training to staff designated to overseeing the City's Emergency Planning process and operational needs. As a result of the review of the City's Emergency Management Program, the following recommendations are presented for Council's consideration and approval:

Operational Recommendations

- **Operational Recommendation #39**: That consideration be given to sustaining ongoing emergency management training to ensure sufficient staff within the City are trained at all times to manage a major emergency within the City.
- **Operational Recommendation #40:** That consideration be given to revising the appointment of the Community Emergency Management Coordinator (C.E.M.C.) as presented within the proposed Fire Master Plan.

13.0 Proposed Implementation Plan

This implementation plan is intended to provide Council with an initial outline of the potential schedule and cost estimates for implementing the recommendations and options contained within this Fire Master Plan. Subject to Council's consideration of the proposed Fire Master Plan it is recommended that the Fire Chief be directed to develop a comprehensive implementation plan for consideration by Council. Where applicable those recommendations with a financial impact would be presented to Council as part of regular corporate process to prepare the annual operating and capital budget of the City.

The proposed implementation schedule includes a range of timelines including **immediate term** (0 to 1 year), **short-term** (2 to 4 years), **medium-term** (5 to 7 years) and **long-term** (8 to 10 years). These timelines will be impacted by the realization of predicted growth and development. The low, moderate and high growth scenarios identified within this F.M.P. are noted within the implementation schedules for recommendations / options that are predicted to be influenced by growth and development.

Industry best practices indicates that a Fire Master Plan should be based on a ten-year community planning horizon, and that at the mid-point (fifth year) the plan should be reviewed to consider any revisions that may be required to address new, or revised legislation, revised community planning projections, and the implementation of the recommendations presented within this Fire Master Plan.

13.1 Council Recommendations

These include recommendations that require the consideration and approval of Council related to a potential operating or capital financing impact or to inform a municipal policy decision including the setting of a municipal service level or where further direction to corporate staff may be needed. *Error! Not a valid bookmark self-reference.* summarizes the Council recommendations included within this proposed Fire Master Plan.

Table 45: F. M.P. Council Recommendations

No.	Recommendation	Estimated Operating Costs	Estimated Capital Costs	Schedule by Growth Scenario
1	That the strategic priorities, as presented within the proposed Fire Master Plan, be adopted by Council in principle to guide all decision making related to the delivery of fire protection services within the City of Oshawa.	n/a	n/a	Immediate-term (0-1 year)
2	That Council consider allocating sufficient funding within the City's 2020 operating budget to hire an Assistant Deputy Fire Chief as referenced within the preliminary analysis of the fire master planning process.	$173,796	Vehicle & Equipment $45,000	Completed and incorporated in 2020 Budget
3	That subject to the results and findings of a comprehensive work load analysis for the Fire Prevention and Public Education Division staff, consideration be given to hiring one more fire prevention inspector in the short-term (i.e. 2 to 4 years) and an additional fire prevention inspector coordinated with the opening of the proposed future Fire Station 7.	Short-term $135,000 2nd Inspector $135,000	Short-term Vehicle & Equipment $45,000 2nd Inspector Vehicle & Equipment $45,000	1st Inspector in short-term (2-4 years) 2nd Inspector aligned with Station 7 opening (see Station 7 implementation for schedules)

No.	Recommendation	Estimated Operating Costs	Estimated Capital Costs	Schedule by Growth Scenario
4	That Council consider allocating sufficient funding within the City's 2020 operating budget to hire three firefighters as identified within the preliminary analysis of the fire master planning process.	$407,355	$22,500	Completed and incorporated in 2020 Budget
5	That consideration be given to hiring an apprentice mechanic as presented within the proposed Fire Master Plan.	$98,000 (Subject to negotiation)	n/a	Short-term (2-4 years)
6	That Council consider allocating sufficient funding within the City's 2020 operating budget to fill the vacant position of Communications Officer as referenced within the preliminary analysis of the fire master planning process.	$156,152	$5,000	Completed and incorporated in 2020 Budget

13.2 Fire Suppression Options for Council's Consideration

The analysis within this F.M.P. provides a range of options for Council's consideration in determining the appropriate level of fire suppression services for the City of Oshawa. The options presented have been informed by the findings of the companion Community Risk Assessment, and the recommendations of the 2018 I.A.F.F. Report. The options, related cost estimates and potential schedules for implementation are summarized below in **Table 45**. The detailed analysis that informs these options is presented in **Section 9.0 – Fire Suppression Division**.

Table 46: Suppression Options for Council's Consideration

Description of Scenario / Option Modelled	Estimated Operating Costs	Estimated Capital Costs	Schedule by Growth Scenario
Option 1 – Improve Total Response Time	No identified additional costs	No identified additional costs	Immediate term (0-1 year)
Option 2 – Rapid Response Unit (2FFs) at Fire Station 1	Add 12 FFs (12 x $135,785) = $1.63 M **Total Operating = $1.63 M**	Add Rapid Response Apparatus = $550 K Firefighter P.P.E. (12 x $7.5 K) = $90 K **Total Capital = $640 K**	Subject to Council's decision to improve existing service level in Fire Station 1 First-due response area.
Option 3 – Second Apparatus (4 FFs) at Fire Station 1	Add 20 FFs (20 x $135,785) = $2.72 M **Total Operating = $2.72 M**	Assume use of existing apparatus (no cost) Firefighter P.P.E. (20 x $7.5 K) = $150 K **Total Capital = $150 K**	Subject to Council's decision to improve existing service level in Fire Station 1 First-due response area.
Option 4 – Proposed Fire Station 7	Add 20 FFs (20 x $135,785) = $2.72 M **Total Operating = $2.72 M**	Station Land Purchase = $1.5 M Station Design & Construction = $5.0 M Add Apparatus = $800 K Firefighter P.P.E. (20 x $7.5 K) = $150 K **Total Capital = $7.45 M**	High growth: short-term (2-4 years) Moderate growth: medium-term (5-7 years) Low growth: long-term (8-10 years)
Option 5 – Add Proposed Fire Stations 7 & 8	Add 20 FFs (20 x $135,785) = $2.72 M Operating **Total Operating = $2.72 M** (potential additional financial consideration of	Station Land Purchase = $1.5 M Station Design & Construction = $5.0 M Add Apparatus = $800 K Firefighter P.P.E. (20 x $7.5 K) = $150 K	High-growth scenario: long-term 8-10 years Low-growth / Moderate-growth: beyond the 10 year F.M.P. planning horizon.

Description of Scenario / Option Modelled	Estimated Operating Costs	Estimated Capital Costs	Schedule by Growth Scenario
	officer positions / District Chief position)	**Total Capital = $7.45 M** (potential additional financial consideration of equipment and District Chief vehicle)	
Option 6 – Compliance with N.F.P.A. 1710 (2020 Edition)	Add 100 Firefighters (100 x $135,785) = $13.58 M Operating **Total Operating = $13.58 M** (potential additional financial consideration of officer positions / District Chief position)	Add 5 Fire Stations (5 x $7.5 M) = $37.5 M Add 4 Apparatus (4 x $800 K) = $3.2 M Firefighter P.P.E. (100 x $7.5 K) = $750 K **Total Capital = $41.45 M** (potential additional financial consideration of equipment and District Chief vehicle)	Subject to Council's decision to consider the implementation of this option a comprehensive implementation plan would be required.

NOTES:

FF = Firefighter

P.P.E. = Personal Protective Equipment (e.g. breathing apparatus, bunker gear, helmet, boots, gloves, etc.)

13.3 Operational Recommendations

These include recommendations that can be administered and implemented by the Fire Chief through the authority delegated to this position though By-Law 29-2009. In some cases, this may require the Fire Chief to prepare further documentation and internal reporting to Council for approval. An example of this is updating the current Establishing and Regulating By-law. This is a process that can be led by the Fire Chief, and senior corporate staff, and through normal reporting, be brought to Council for consideration and approval. The Operational Recommendations are summarized below in **Table 45**.

Table 47: F. M.P. Operational Recommendations

No.	Recommendation	Estimated Operating Costs	Estimated Capital Costs	Schedule
1	That the job descriptions for all members of the O.F.S. including the senior management team, and all other members of the O.F.S. be reviewed and revised to clearly define the roles and responsibilities of all positions.	n/a	n/a	0-1 Year
2	That an appointment by-law or a formal process to delegate authority to the Deputy Fire Chiefs in the event of the Fire Chief's absence, be developed and presented to Council for consideration and approval.	n/a	n/a	0-1 Year
3	That consideration be given to a review of the current administrative support provided to the O.F.S. by the Strategic and Business Services Branch as discussed within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
4	That consideration be given to the creation of a new Administrative Support position within the O.F.S. as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
5	That subject to Council's consideration and approval of the proposed Fire Master Plan that the Establishing and Regulating By-law 30-2001 be reviewed and updated as required.	n/a	n/a	0-1 Year
6	That consideration be given to revising the current General Fees and Charges By-law 13-2003 to include additional fees for service as presented within the proposed Fire Master Plan.	n/a	n/a	2-4 Years
7	That the O.F.S. develop a business plan and standardized agreement for the provision of emergency call taking and emergency dispatching (fire dispatching) as referenced within the proposed Fire Master Plan.	n/a	n/a	2-4 Years
8	That the contents of all O.F.S. operating guidelines be reviewed to ensure there is no overlap of reference to a "policy" and "guideline" in the same document to provide clarity of the intent.	n/a	n/a	0-1 Year
9	That consideration be given to developing a business case for a full-time dedicated information technology position dedicated to support the O.F.S., as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
10	That priority be given to the confirmation and implementation of new software applications as presented within the proposed Fire Master Plan.	$25,000	n/a	0-1 Year

No.	Recommendation	Estimated Operating Costs	Estimated Capital Costs	Schedule
11	That the O.F.S. develop a department policy consistent with the City's Retention By-law 45-2002 that describes the required records management practices for each division within the O.F.S.	n/a	n/a	0-1 Year
12	That the O.F.S. prioritize the training of all staff designated as Chief Fire Officials through the Public Services Health & Safety Association.	$2,500	n/a	2-4 Years
13	That subject to consideration and approval of the proposed Fire Master Plan, the updated fire prevention policy be included within the establishing and regulating by-law as an appendix.	n/a	n/a	0-1 Year
14	That consideration be given to further promotion of the Upgrade to Building and Fire Codes Grant Program as part of its continued commitment to fire-related risk reduction and risk mitigation strategies.	n/a	n/a	2-4 Years
15	That consideration be given to increasing the number of Fire Inspectors (one more at a minimum) who are trained to complete building plans review, including O.B.C. General Legal and Fire Protection exams.	$5,000	n/a	2-4 Years
16	That consideration be given to implementing the proposed enhanced fire safety audit program as outlined in the Fire Master Plan.	n/a	n/a	0-1 Year
17	That consideration be given to developing an enhanced Investigation Protocol and Report strategy whereby data gathered through the fire cause and origin process be used for the purposes of developing and implementing public education and fire prevention initiatives as presented in the proposed Fire Master Plan.	n/a	n/a	0-1 Year
18	That consideration be given to implementing the proposed enhanced Alarmed for Life Program as outlined in the Fire Master Plan.	n/a	n/a	0-1 Year
19	That consideration be given to further development and implementation of the current targeted fire inspection program as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
20	That consideration be given to enhancing the tracking of all workload associated with the O.F.S. fire inspection/enforcement programs as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year

No.	Recommendation	Estimated Operating Costs	Estimated Capital Costs	Schedule
21	That consideration be given to enhancing the fire safety program for seniors (65+) within the community as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
22	That consideration be given to implementing a targeted public education program as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
23	That consideration be given to enhancing the tracking of all workload associated with the O.F.S. public education programs as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
24	That consideration be given to developing a Community Risk Reduction Plan as a holistic approach to reducing risk within the City, as presented within the proposed Fire Master Plan.	n/a	n/a	2-4 Years
25	That O.F.S. require all staff who deliver training to be qualified to a minimum of the N.F.P.A. 1041 Instructor Level I, and that all dedicated training division staff be qualified to the N.F.P.A. 1041 Instructor Level II standards.	$3,500	n/a	2-4 Years
26	That the O.F.S. consider developing a comprehensive training plan based on the N.F.P.A. Professional Qualifications Standards as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year
27	That consideration be given to referencing the O.F.S. specialized rescue service levels in the proposed updated Establishing and Regulating By-law 30-2001.	n/a	n/a	0-1 Year
28	That the current agreements pertaining to the provision of specialized fire rescue services to other municipalities be reviewed and updated to reflect the service levels provided by the O.F.S.	n/a	n/a	0-1 Year
29	That the O.F.S. develop a business case that includes research into partnership opportunities for the development of a permanent training facility within the City of Oshawa that is capable of live fire training.	n/a	n/a	2-4 Years
30	That consideration be given to providing sufficient capital funding to complete alterations to Fire Station 1 to accommodate additional office space as presented within the proposed Fire Master Plan.	n/a	n/a	2-4 Years
31	That consideration be given to upgrading all existing Fire Stations to provide separation and ventilation for firefighter protective clothing as described within the proposed Fire Master Plan.	n/a	Further detailed design and construction estimates will	2-4 Years

No.	Recommendation	Estimated Operating Costs	Estimated Capital Costs	Schedule
			be required to quantify the additional capital costs.	
32	That the O.F.S. prioritize the identification and implementation of strategies to reduce the dispatch time and turnout time components of the Total Response Time by a minimum of one minute (60 seconds) combined, to further enhance the department's emergency response fire suppression capabilities.	n/a	n/a	0-1 Year
33	That consideration be given to developing a department Standard Operating Guideline for enhancing the utilization of the CriSys software to inform decision-making within the O.F.S.	n/a	n/a	0-1 Year
34	That consideration be given to implementing global positioning tracking (G.P.S.) as presented within the proposed Fire Master Plan.	$6,000	n/a	2-4 Years
35	That consideration be given to conducting further analysis of potential radio system "dead zones" and options for minimizing any impact on firefighter communication.	n/a	n/a	2-4 Years
36	That consideration be given to including capital costs when calculating cost recovery charges for the municipalities to which it provides emergency call taking and fire dispatch services.	n/a	Potential cost recovery subject to revised agreement implementation.	2-4 Years
37	That consideration be given to implementing the use of qualified part-time dispatchers as presented within the proposed F.M.P.	c/a	n/a	2-4 Years
38	That consideration be given to ensuring that all staff assigned responsibility for dispatching fire department personnel and resources are trained and certified to N.F.P.A. 1061 Standard for Professional Qualifications for Public Safety Telecommunications Personnel – Levels I and II.	$2,500	n/a	0-1 Year
39	That consideration be given to sustaining ongoing emergency management training to ensure sufficient staff within the City are trained at all times to manage a major emergency within the City.	n/a	n/a	2-4 Years
40	That consideration be given to revising the appointment of the Community Emergency Management Coordinator (C.E.M.C.) as presented within the proposed Fire Master Plan.	n/a	n/a	0-1 Year

Appendix A

Stakeholder Consultation Process

1.0 Stakeholder Consultation

Internal and external stakeholder consultation is a core component of a comprehensive fire master planning process. Various consultation activities were held as part of the process to develop the draft Community Risk Assessment (C.R.A.) and draft Fire Master Plan (F.M.P.) for the City of Oshawa. Effective communication and consultation with all stakeholders is essential to the success of the fire master planning process for three reasons. First, the consultation process provides the opportunity to collect information towards further defining the local fire protection services needs and circumstances which feed directly into the fire master planning process. The second reason is to ensure those responsible for implementing and affected by the F.M.P. understand the basis on which certain decisions are made and why particular recommendations are made. Third, it is an opportunity to obtain feedback from the public, including key stakeholders, as well as to educate the public stakeholders on the fire master planning process and services provided by O.F.S.

This appendix provides an overview and summary of the internal and external stakeholder consultation process conducted to prepare the draft C.R.A. and F.M.P. reports.

1.1 Internal Stakeholder Consultation

The internal stakeholder consultation sessions provided valuable insight into the current strengths, weaknesses, opportunities and challenges within the Oshawa Fire Services. These elements of the consultation process resulted in a wide range of views and opinions that were considered within the analysis. The following subsections summarize the internal stakeholder consultation process with:

- Members of Council
- Senior Corporate and Fire Services staff
- Executive Board of the Oshawa Professional Firefighters Association (O.P.F.A.) Local 465

1.1.1 Members of Council

The community risk assessment/fire master planning process included two consultation sessions with members of Council. These included an initial educational workshop and the presentation of a project update.

1.1.1.1 Council Educational Workshop

On June 25, 2019 members of Council participated in an educational workshop that included an overview of the project scope, a review of Council's legislative responsibilities with respect to the delivery of fire protection services including the Fire Protection and Prevention Act 1997, and the Occupational Health and Safety Act. This educational workshop provided all members of Council with the opportunity to provide their feedback into the current strengths, weaknesses, opportunities and challenges (S.W.O.C.) within the O.F.S.

During this educational workshop members of Council asked a wide range of questions regarding the process, core elements and schedule of the project. Two of the focus areas for members of Council were a request to receive an interim report prior to the 2020 operating budget process (fall 2019), and to highlight the importance of consultation with the Executive Board of the O.P.F.A., including consideration of the analysis within the 2018 I.A.F.F. Geographical Information System Emergency Service Response Capabilities (I.A.F.F. Report) as part of the fire master planning process.

1.1.1.2 Community Risk Assessment/Fire Master Plan Project Update

On November 28, 2019 report CNCL-19-69 was presented to members of Council. This report presented the preliminary findings analysis and three recommendations to inform the City's 2020 budget deliberations. This report provided members of Council with an update on the project schedule, internal consultation process, consultation with the Executive Board of the O.P.F.A. an over of the project preliminary findings and a revised project schedule.

This session also provided members of Council the opportunity to provide feedback on the preliminary analysis, and ask questions of clarification in regards to the analysis presented.

The three recommendations presented were as follows:

- It is recommended that Council consider allocating sufficient funding within the City's 2020 operating budget to hire an Assistant Deputy Fire Chief as referenced within the preliminary analysis of the fire master planning process, and that the implementation of this position be subject to Council's consideration and approval of the proposed Fire Master Plan.
- It is recommended that Council consider allocating sufficient funding within the City's 2020 operating budget to hire three firefighters as referenced within the preliminary analysis of the fire master planning process, and that the implementation of these position be subject to Council's consideration and approval of the proposed Fire Master Plan.
- It is recommended that Council consider allocating sufficient funding within the City's 2020 operating budget to fill the vacant position of Communications Officer as referenced within the preliminary analysis of the fire master planning process, and that the implementation of these position be subject to Councils consideration and approval of the proposed Fire Master Plan.

1.1.2 Senior Corporate and Fire Department Staff

Consultation with senior corporate and department staff provided valuable input at each step of the fire master planning process, providing information about context and background from different perspectives. This form of consultation is extremely beneficial to identifying issues and needs associated with the fire service. It also provides information that is used for study analysis and recommendation phases. Engaging stakeholders helps ensure that multiple perspectives can be brought to the fire master planning process.

Interviews were held with several internal stakeholders to understand the challenges and opportunities from a number of different viewpoints within the department. Individual interviews were held with staff from the City/O.F.S. including:

- Chief Administrative Officer
- Commissioner of Community Services
- Fire Chief
- Deputy Fire Chiefs
- Chief Fire Prevention Officer

- Lead Mechanic
- Chief Training Officer

These initial interviews also created a positive working environment for ongoing communication and collaboration throughout the project.

1.1.3 Executive Board of the Oshawa Professional Firefighters Association (O.P.F.A)

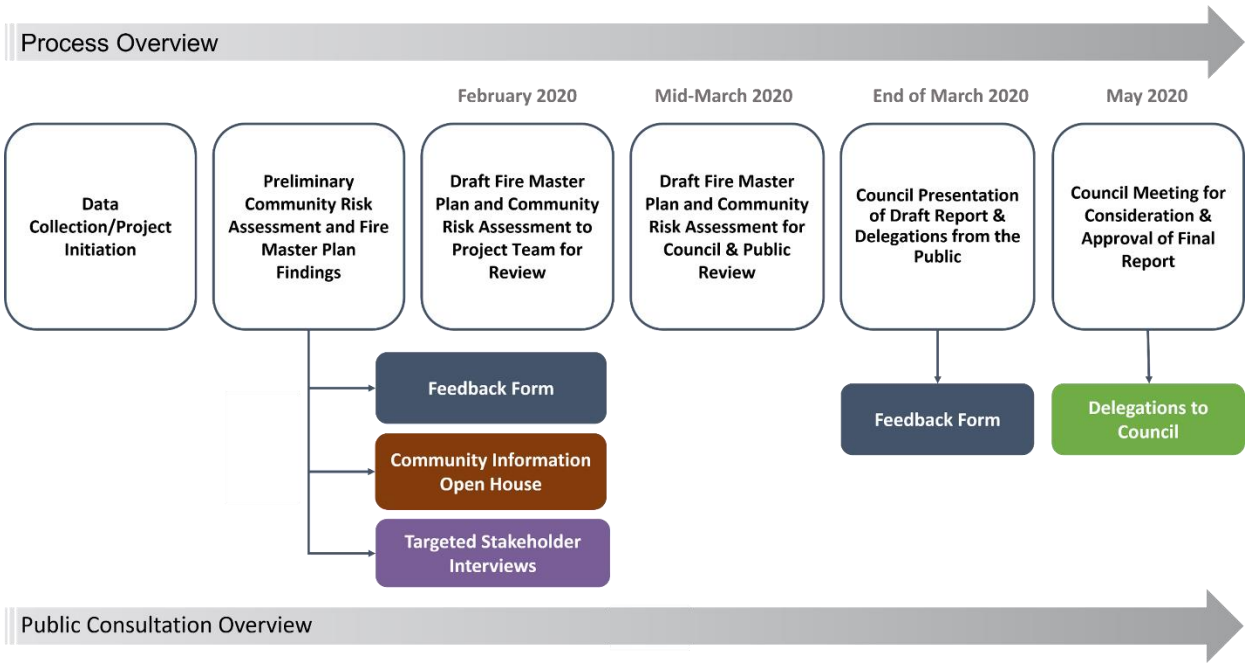
Staff report C.N.C.L.-19-69 presented to Council on November 28th, 2019 includes a comprehensive overview of the initial consultation with the Executive Board of the O.P.F.A. With the support of Council the consultation process with the Executive Board was extended to include two face-to-face sessions with Dillon's Project Team. These consultation sessions were held on September 27th, 2019 and October 11th, 2019. In our view these two initial consultation sessions with members of the Executive Board of the O.P.F.A. were informative, collaborative and productive in understanding the concerns of the Association.

Members of the Executive Board also attended the preliminary findings presentation to the City's Project Team on November 6th, 2019. During this session an overview of the preliminary analysis and findings were presented by Dillon's Project Team. During this session the Executive Board was provided the opportunity to provide feedback and make comment on all preliminary findings presented. The Executive Board will also be included in the draft C.R.A. and F.M.P. report review process and the related Project Team Meeting.

1.2 External Stakeholder Consultation

An overview of the external stakeholder process can be seen in **Figure 1** and includes a Community Information Open House, the Feedback Form, and the Targeted Stakeholder Consultation which are summarized in the following subsections.

Figure 1: External Stakeholder Consultation Overview



1.2.1 Community Information Open House

A Community Information Open House was held on January 21st, 2020 at the Oshawa Civic Auditorium between 6:30 PM and 8:30 PM. This open house was intended to provide members of the public with an opportunity meet members of Dillon's Project Team, and O.F.S. staff, and provide any comments or feedback related to the current fire protection service provided by the O.F.S. Multiple display boards were available to present the preliminary findings analysis of the draft C.R.A. and draft F.M.P. in a visual format to further encourage discussions, and input by members of the public. A total of 41 people registered on entry to this open house. Those attending were provided access to hard copy "Feedback Forms" and directed to the City's' on-line "Connect Oshawa" program to provide further input into the fire master planning process. No hard copy forms were completed by those attending the Public Information Open House.

1.2.2 Connect Oshawa

Connect Oshawa is an online engagement platform designed to give the public an opportunity to provide input into City initiates without the need to attend meetings, or events such as the Public Information Open House. This engagement tool was used in this fire master planning process to provide access for the public to provide input into a range of questions regarding the current fire protection services provided by the O.F.S., including emergency response services, fire prevention and public education services, and the community's role in fire safety and risk mitigation.

For this fire master planning process the public was notified of this opportunity to provide input through the Connect Oshawa program through a range of channels including emails, social media, newspapers, the City website, and registered Connect Oshawa users. Access to the online feedback form was open from January 6th, 2020 to February 6th, 2020. During this time a total of 85 participants representing a demographic between the ages of 18 to 75+ years old provided input. The majority of participants (79 or 92.9%) identified themselves as Oshawa residents or business owners with representation from wards all across the City. The following is a summary of the response results:

- Participants were most familiar with the O.F.S. providing emergency response to fire incidents. The least familiar service was review of building plans for new developments.
- Within the past five years, 21 participants (24.7%) have requested or been involved in an emergency response provided by the O.F.S.
- Participants had accessed a range of O.F.S. emergency services including for fire emergencies, medical emergencies, or motor vehicle incidents. Of the 18 participants who provided written commentary on the emergency services interaction and any feedback to improve the service:
    - Most chose to provide detail on the service accessed and did not provide feedback on how to improve the service.
    - Six commented positively on the responsiveness and professionalism of O.F.S. staff.
    - Two raised concerns in regards to firefighter staffing, in particular, that there 'should be more firefighters and an additional truck at Station 1'.

- Within the past five years, 35 participants (41.2%) have been provided services related to fire prevention or public education by O.F.S.
- The services accessed by participants included inspections, dissemination of public education materials and messaging, and smoke alarm/C.O. alarm checks. Of the 32 participants who provided written commentary on the fire prevention or public education interaction and any feedback to improve the service:
  - Most chose to expand on the service accessed and did not provide feedback on how to improve the service
  - Four specifically commented on the positive and helpful nature of the interaction.
- The top six chosen methods (out of fifteen options) to receive public safety information were: City of Oshawa website, fire services visits to neighbourhoods, fire services presence at community events, school programs, email notices, and Facebook.
- 78 participants (91.8%) indicated that they currently have working smoke alarms in their home.
- 60 participants (70.6%) indicated that they have a working carbon monoxide alarms in their home near all sleeping areas, and an additional 16 participants (18.8%) have at least one carbon monoxide alarm.
- 55 participants (64.7%) indicated that they have prepared a home escape plan, with 27 of those participants having also practiced it.
- 40 participants (44.7%) indicated that they have an emergency action plan, 23 of which also have a 72-hour emergency kit

1.2.3 Targeted Stakeholder Interviews

Targeted stakeholders were identified as those representatives from community groups, businesses, institutions, or other groups that would have direct and regular contact with O.F.S. A total of nine stakeholder representatives participated through a telephone survey. The targeted stakeholder list was provided by senior City staff overseeing the Fire Master Plan project and included:

- Greater Oshawa Chamber of Commerce
- Downtown Business Improvement Area
- Durham College
- Ontario Tech University

- Durham Region Home Builders Association
- Direct Intervention Reaching Everyone
- GAP Committee
- Durham Region Public School Board
- Durham Catholic District School Board

The telephone survey consisted of five questions that invited participants to comment on the services provided by O.F.S. that had been accessed and their experiences related to receiving those services. The five questions were:

1. Has your business/organization/community group used any services provided by the Oshawa Fire Services? If yes, which services did you or your group access?
2. If you have received services provided by the Oshawa Fire Services, were you satisfied with the reliability, processes and/or the operations of those services? (For example, if your organization been inspected by the Oshawa Fire Services, were you satisfied with the inspection process?) Please comment on concerns or issues related to any of the services provided by the Oshawa Fire Services.
3. In your view, do any current policies or procedures of Oshawa Fire Services impede or impact how you do business? Please comment on what can be done differently than what is being done today?
4. Do you believe that the services provided by Oshawa Fire Services align with the needs of your business/organization/community group? If not, how could this be improved?
5. .Do you have any other comments or concerns regarding Oshawa Fire Services that you wish to provide through this consultation process?

The following summarizes responses:

- Participant organizations have accessed a range of O.F.S. services including emergency response for fire, medical, and technical rescue emergencies. They have also accessed fire prevention and public education services including inspections, site plan review, and the smoke alarm program.
- Almost all of the participants identified a number of strengths of the department including the responsiveness, communication, and cooperation to address most issues. Four stakeholder contributors specifically referenced the communication and cooperation of Fire Prevention staff.

- One stakeholder participant identified concerns regarding how the Alarmed for Life program is undertaken in terms of prioritizing certain geographies in addition to the possibility for extended emergency response times, particularly during a weather event.
- Three stakeholder participants raised concerns regarding the risks that exist in the Downtown, such as those related to building stock (e.g., old buildings, rooming houses, exposure risk) and demographics (e.g., income). Two of these stakeholder contributors emphasized the vulnerable population that lives Downtown Oshawa. One raised concern that the high number of false alarms in the downtown could lead to complacency for responses to calls in the downtown area.
- Two stakeholder participants specifically referred to concerns regarding firefighter staffing, in particular, that there is only one truck currently at Station 1 downtown
- One stakeholder participant identified the need to do more fire inspections in the downtown due to the identified risks of the area.

1.3 Summary

The stakeholder consultation process to inform the development of the draft Community Risk Assessment and draft Fire Master Plan included representation from a wide range of internal and external stakeholders including the opportunity for the public to provide input on multiple occasions. Members of the Executive Board of the O.P.F.A. have also been provided multiple opportunities to provide input and feedback into the development of these reports. Where applicable, the input from the stakeholder consultation process has been utilized to further inform the analysis and proposed recommendations contained within the draft Fire Master Plan Report.

Appendix B

Establishing and Regulating By-Law 30-2001

Regional Doc. 90-101 / 2365

Oshawa
The City In Motion

By-Law 30-2001
of The Corporation of the City of Oshawa

being a by-law to establish and regulate a Fire Department.

Whereas the Municipal Act, R.S.O. 1990, c. M.45, and the Fire Protection and Prevention Act, 1997, S.O. 1997, c. 4, as amended, permit the Council to enact a by-law to establish and regulate a Fire Department.

BE IT THEREFORE ENACTED by the Council of The Corporation of the City of Oshawa, as follows:

1. In this by-law, unless the context otherwise requires:

   (a) "Approved" means approved by Council.

   (b) "City" means The Corporation of the City of Oshawa.

   (c) "Collective Agreement" means the agreement in writing from time to time between the City and the Fire Fighters' Association containing provisions respecting terms or conditions of employment or the rights, privileges or duties of the City, the Fire Fighters' Association or the Members.

   (d) "Council" means the Council of the Corporation of the City of Oshawa.

   (e) "Department" means the City's Fire Services.

   (f) "Deputy Fire Chief" means the person appointed by Council to act in the place of the Fire Chief in the Fire Chief's absence, or in the case of a vacancy in the position of Fire Chief.

   (g) "Fire Chief" means the person appointed by a by-law of the Council to act as fire chief for the City and who is ultimately responsible to Council for the delivery of Fire Protection Services.

   (h) "Fire Fighters' Association" means the International Association of Firefighters Local 465.

   (i) "Fire Protection Services" includes fire suppression, fire prevention, fire safety education, communication, training of persons involved in the provision of Fire Protection Services, rescue and emergency services and the delivery of all those services.

(j) "FPPA" means the Fire Protection and Prevention Act, 1997, S.O. 1997, c. 4, as amended.

(k) "Member" means any person employed in, or appointed to, the Department.

2. The Department is hereby established.

3. The head of the Department shall be known as the Fire Chief.

4. In addition to the Fire Chief, Council shall appoint a Deputy Chief and may also appoint such other number of officers and Members as from time to time may be deemed necessary by the Council.

5. The Fire Chief may recommend to Council the appointment or employment of any qualified person as a Member, subject to the approved hiring policies of the City.

6. A Member shall be on probation for the person's first twelve months as a Member during which period the Member shall take such special training and examinations as may be required by the Fire Chief.

7. The Fire Chief may, subject to the terms of the Collective Agreement and the provisions of the FPPA, reprimand, suspend or recommend dismissal of any Member for the Member's failure to comply with any of the provisions of this By-law, with general orders or with Department rules that, in the sole opinion of the Fire Chief, is or would be detrimental to the discipline or efficiency of the Department or the Department's ability to provide Fire Protection Services.

8. The Fire Chief is responsible to Council for the administration and operation of the Department.

9. The Fire Chief shall implement all Approved policies and shall develop such operating procedures and guidelines, orders and rules as are necessary to implement the Approved policies.

10. The Fire Chief shall periodically review all policies, operating procedures and guidelines, orders and rules. For this purpose, the Fire Chief may establish an advisory committee consisting of such Members as the Fire Chief may from time to time determine.

11. The Fire Chief shall take all proper measures for the prevention, control and extinguishment of fires and for the protection of life and property and shall exercise all powers mandated by the FPPA. Without limitation, the Fire Chief shall be empowered to authorize:

(a) pulling down or demolishing any building or structure to prevent the spread of fire;

(b) all necessary actions which may include boarding up or barricading of buildings or property to guard against fire or other danger, risk or accident, when unable to contact the property owner;

(c) recovery of expenses incurred by such necessary actions for the City in the manner provided pursuant to the Municipal Act, R.S.O. 1990, c. M.45, and the FPPA.

12. The Deputy Fire Chief shall act on behalf of the Fire Chief in the case of the Fire Chief's absence from time to time and during the period of any vacancy in the office of Fire Chief.

13. The Department shall include the following divisions:

(a) Administration

(b) Apparatus

(c) Communications

(d) Fire Prevention

(e) Fire Suppression

(f) Mechanical

(g) Training

14. Each division of the Department is the responsibility of the Fire Chief and is under the direction of the Fire Chief or a Member designated by the Fire Chief. Designated Members shall report to the Fire Chief on matters under their supervision and shall carry out all orders of the Fire Chief.

15. The Department shall not respond to a call with respect to a fire or other emergency outside the territorial limits of the City except with respect to a fire or emergency:

(a) that, in the opinion of the Fire Chief, threatens property within the territorial limits of the City or property outside the territorial limits of the City that is owned or occupied by the City,

(b) in a municipality with which an Approved agreement has been struck to provide Fire Protection Services,

(c) on property with respect to which an Approved agreement has been struck with any person or corporation to provide Fire Protection Services,

(d) at the discretion of the Fire Chief, in a municipality authorized to participate in the Regional Emergency Fire Service Plan or any other Approved reciprocal plan or program,

(e) on property beyond the territorial limits of the City where the Fire Chief or designate determines that immediate action is necessary to preserve and protect life or property provided the appropriate fire department is notified or assumes command.

16. In the event that the Department responds in the circumstances contemplated by paragraph 15 of this By-law, the Fire Chief shall advise the Head of Council as soon as practical thereafter.

17. On the date that this By-law comes into effect, paragraphs 90 to 101, inclusive, of Consolidated By-law No. 2365 shall be repealed.

18. This by-law comes into effect the day it is passed by Council.

By-law read a first, second and third time and finally passed this twenty-second day of May, 2001.

Mayor

City Clerk

Appendix C

Municipal Comparison Analysis

DILLON CONSULTING

1.0 Municipal Comparison Analysis

This section provides a comparison of the City of Oshawa and Oshawa Fire Services to a group of municipal comparators. The Municipal Comparator Analysis includes the introduction of a selection of peer municipalities and the presentation of results relating to fire suppression performance. The purpose of this analysis is to provide municipal best practices context to support the Suppression Division analysis included within this Fire Master Plan.

The intent of this additional analysis is to provide Council with an informed understanding of current service levels related to two key N.F.P.A. 1710 standard performance benchmarks through the analysis of a representative group of municipalities. The data collected from the peer communities is based on historic information collected from 2014 to 2019. The 2020 Edition of the N.F.P.A. 1710 standard only recently became publicly available. As such, many municipalities have not yet applied the new standard and revised performance benchmarks to analyze their emergency response capabilities. Therefore this municipal comparator analysis presents the results of the following two N.F.P.A. 1710 (2016 Edition) benchmarks:

- The Initial Arriving Company including four firefighters arriving on scene within four minutes of travel time to 90% of fire suppression incidents.
- The Initial Full Alarm Assignment for a Single-Family Dwelling including 14 firefighters (or 15 firefighters including an aerial) arriving on scene within an eight minute travel time to 90% of fire suppression incidents.

The only significant change in these two benchmarks between the N.F.P.A. 1710 2016 Edition and the 2020 Edition is the Initial Full Alarm staffing target. In the 2020 Edition, the staffing target has been revised from 14 firefighters (or 15 firefighters including an aerial) to 16 firefighters (or 17 firefighters including an aerial) arriving on scene within an eight minute travel time to 90% of fire suppression incidents.

The selection of the peer comparators was based on considerations of geographical characteristics, community risk characteristics, and the availability of data regarding suppression services (including the availability of G.I.S.-based emergency response analysis completed by Dillon Consulting), and the N.F.P.A. performance benchmarks listed above.

As part of the project stakeholder collaboration, the selection of municipal comparators involved a consultative process with the City's Project Team and the Oshawa Professional Firefighters Association (O.P.F.A.) Executive Board, to provide input to the development of the municipal comparator group. This input supported the use of geographical characteristics and risk considerations for peer section, expanded the potential municipal comparators to those beyond strictly the Greater Toronto Area (G.T.A.), and ensured that comparators selected were served by full-time fire services only.

The municipal comparison is intended to provide an informed understanding of current service levels of a representative group from both G.T.A. municipalities and other surrounding urban areas. In addition to the City of Oshawa (and Oshawa Fire Services), the municipal comparator group selected includes the City of Brantford (Brantford Fire Services), the Towns of Aurora and Newmarket (Central York Fire Services), the City of Kitchener (Kitchener Fire Department), the Town of Oakville (Oakville Fire Department), and the Town of Richmond Hill (Richmond Hill Fire and Emergency Services). For comparison purposes, the group average is carried through the municipal comparator analysis presented in the following sections.

1.1 Municipal Group Characteristics

This section presents an overview of the geographical characteristics of the municipal comparator group. A summary of the population, land area, and dwelling is presented below in **Table 1** below.

Table 1: Geographical Characteristics of Municipal Comparator Group

Municipality	Population (2016 Census)	Ranking by Population	Land Area (km², 2016 Census)	Ranking by Land Area	Dwelling Units (2016 Census)
Group Average	169,783	-	115.37	-	64,148
Oshawa	**159,458**	**4th**	**154.57**	**1st**	**64,883**
Brantford	97,496	6th	72.44	6th	40,732

Municipality	Population (2016 Census)	Ranking by Population	Land Area (km², 2016 Census)	Ranking by Land Area	Dwelling Units (2016 Census)
Central York Fire Services (Aurora and Newmarket)	139,669	5th	88.30	5th	48,696
Kitchener	233,222	1st	136.90	3rd	95,495
Oakville	193,832	3rd	138.89	2nd	68,617
Richmond Hill	195,022	2nd	101.11	4th	66,465

Many of the municipalities in the comparison share similar characteristics to the City of Oshawa. The City of Oshawa had a 2016 population of 159,458 people, the fourth highest population within the comparator group. The comparator group average population is 169,786, slightly larger than the population of Oshawa. The comparator group populations range from approximately 97,496 to 233,222. In general terms, the group represents mid-sized Ontario cities, by population. Oshawa's geographic land area is 154 square kilometres, which is the largest of the municipal comparator group. The group average land area is 115 square kilometres, slightly smaller than the City of Oshawa. The comparator group municipalities have a land area of near or over 100 square kilometers. They also have between 40,000 and 100,000 dwelling units with a group average of 64,148 units. This group average is very close to the number of dwelling units in Oshawa, as of 2016, at 64,883. All municipalities are located within, or in close proximity to the G.T.A., all have urban centres and full-time fire departments.

1.2 Municipal Group Community Risk Comparison

1.2.1 Demographic Comparison

Characteristics such as the demographics of a community are important when determining local fire risks and the level of service provided by emergency services. Assessing a municipality's demographic profile is required within the legislated Community Risk Assessment process in Ontario. **Table 2** provides a summary of two of the key demographic ranges related to an increased fire risk: residents 65 years of age and older and residents aged 14 years and younger.

Table 2: Demographic Profile

Municipality	Percentage of Residents 65 Years of Age and Above	Percentage of Residents 14 Years of Age and Under
Group Average	13.26%	18.33%
Oshawa	**16.50%**	**16.70%**
Brantford	18.00%	18.00%
Aurora	10.67%	19.57%
Newmarket	11.12%	18.63%
Kitchener	12.30%	17.70%
Oakville	12.90%	19.60%
Richmond Hill	11.30%	18.10%

Compared to the group average of 13.26%, Oshawa at 16.50% has a slightly higher proportion of residents 65 years of age and above. Conversely, compared to the group average of 18.33%, Oshawa at 16.70% has a slightly lower proportion of residents 14 years of age and under. Generally, the comparator group demographics for these age categories are similar and comparable, representing community risk that is also similar and comparable.

1.2.2 Building Stock Comparison

Another important consideration of community fire risk relating to fire services is the building stock profile within a community. Assessing a municipality's building stock profile is required within the legislated Community Risk Assessment process in Ontario. **Table 3** presents a summary of the major occupancy classes of the Ontario Building Code for the building stock of each municipal comparator.

Table 3: Building Stock Profile

Group	Occupancy Classification	Oshawa	Brantford	Central York Fire Services (Aurora and Newmarket)	Kitchener	Oakville	Richmond Hill
Group A	Assembly	**0.49%**	0.80%	0.4%	0.8%	1.1%	0.3%
Group B	Care or Detention	**0.04%**	0.1%	0.0%	0.1%	0.05%	0.1%
Group C	Residential	**93.42%**	95.4%	95.6%	94.8%	78.6%	98.1%
Group D/ Group E	Business and Personal Services / Mercantile	**1.23%**	1.8%	1.3%	2.4%	18.3%	0.8%
Group F	Industrial	**1.05%**	1.6%	2.7%	1.9%	1.9%	0.6%
Other	Other				0.04%		

The comparator group municipalities all have one building classification that dominates the building stock profile: Group C Residential Occupancies. For all but one of the comparators, Group C Residential comprises over 90% of the building stock. The Town of Oakville is the lowest of the group at 78.6% Group C Residential, which still represents the large majority of the total building stock. As discussed within the C.R.A. and F.M.P., Group C Residential Occupancies have the greatest associated risk of fire injuries and fire fatalities and are therefore a significant consideration in community risk. This is also presented below in the discussion of fire loss.

1.2.3 Fire Loss Comparison

Another indicator of community fire risk within a municipality is historic fire loss information. Assessing a municipality's past fire loss and event history profile is required within the legislated Community Risk Assessment process in Ontario. **Table 4** presents a summary of the percentage of total fire loss associated with each major building code occupancy classification.

Table 4: Fire Loss Profile

Group	Occupancy Classification	Oshawa	Brantford	Aurora	Newmarket	Kitchener	Oakville	Richmond Hill
Group A	Assembly	**0%**	0%	6%	6%	4%	6%	8%
Group B	Care or Detention	**2%**	1%	1%	4%	2%	3%	4%
Group C	Residential	**69%**	77%	75%	68%	75%	66%	72%
Group D	Business and Personal Services	**9%**	0%	4%	2%	2%	4%	2%
Group E	Mercantile	**13%**	0%	5%	7%	6%	4%	5%
Group F	Industrial	**5%**	20%	8%	8%	7%	11%	3%
Other	Other	**1%**	2%	1%	6%	5%	4%	6%

The municipal comparator fire loss data shows the consistency of the trend that the greatest fire loss occurs in Group C residential occupancies. The comparator group's range of Group C fire loss, as a percentage of total fire loss, is from 66% to 77%. This further supports that the community risk within this group of municipalities is comparable.

1.3 Municipal Group Fire Statistics Comparison

As presented above, the geographical characteristics and community risk profiles of the municipal comparator group are similar and comparable. The following sections identify the characteristics, statistics, trends and service levels of the fire services for each of the comparator group municipalities.

Table 5 identifies the suppression staffing resources, minimum staffing levels and fire stations for the municipalities within the comparator group.

Table 5: Fire Staffing and Stations Comparison

Municipality	Ranking by Population	Total # of Fire Suppression Personnel	Minimum On Duty Suppression Staff	Ratio of Total Suppression Staff to Minimum Staff	# of Fire Stations
Group Average	-	157	29.7	5.28:1	6
Oshawa	**4th**	**161**	**33**	**4.88:1**	**6**
Brantford	6th	108	19	5.68:1	4
Central York Fire Services	5th	136	21	6.48:1	4
Kitchener	1st	183	37	4.95:1	7
Oakville	3rd	204	40	5.10:1	8
Richmond Hill	2nd	152	28	5.43:1	6

The group average for total fire suppression personnel within the fire service is 161. Oshawa is just slightly above the group average at 161. The highest population within the group does not directly translate to the highest number of fire suppression personnel, though the two lowest population sizes in the group have the two lowest numbers of total suppression staff.

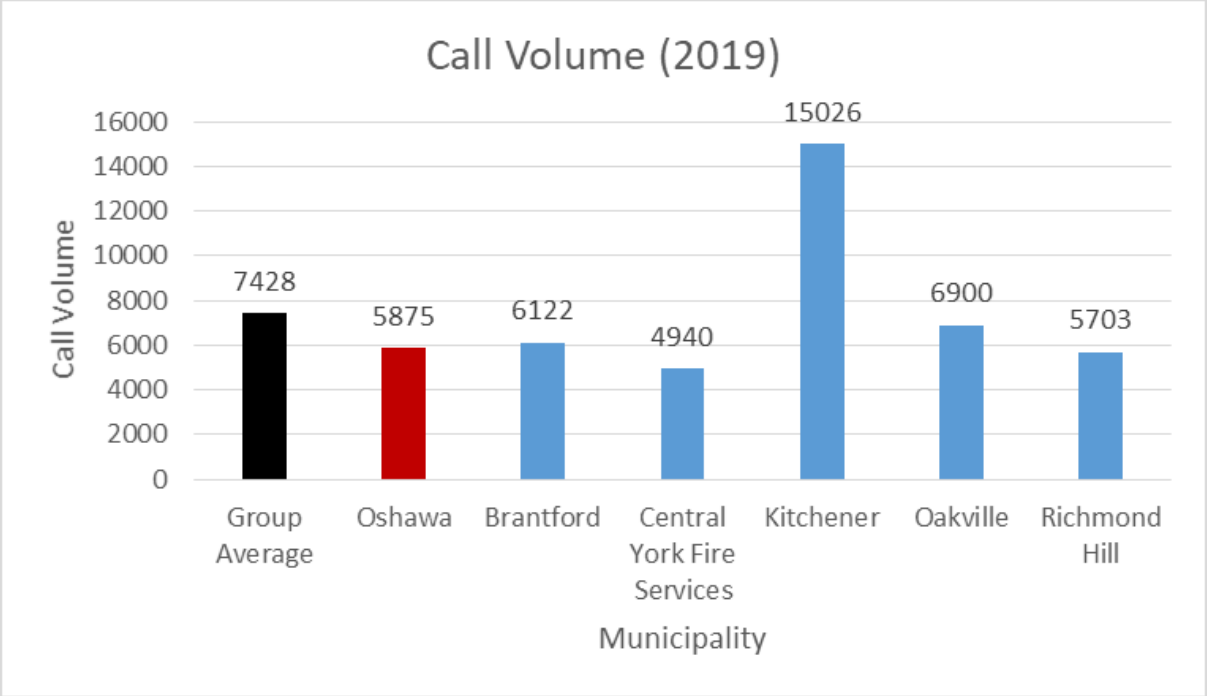
The group average on-duty minimum staffing level is 29.7, which is just slightly less than Oshawa's current minimum staffing level of 33. The group range for minimum staffing level is 19 to 40.

The ratio of total suppression staff to the minimum staffing level indicates the number of full-time firefighters on staff compared to the minimum on-duty staff level. This number can reflect the management of issues such as long-term leaves, sick time, vacation schedules, lieu time, and balancing overtime costs. The ratio within the peer group is fairly consistent, with an average of 5.28 suppression staff to one on-duty firefighter, with a range of approximately one above and one below this ratio level.

The group average for fire stations is six, the same as what Oshawa Fire Services currently operates from. The range of fire stations for the group is from four to eight.

As discussed within the Fire Master Plan, total call volume is an indicator of workload for the fire services. **Figure 1** provides a graphical summary of the 2019 call volumes for the municipal comparator group fire services.

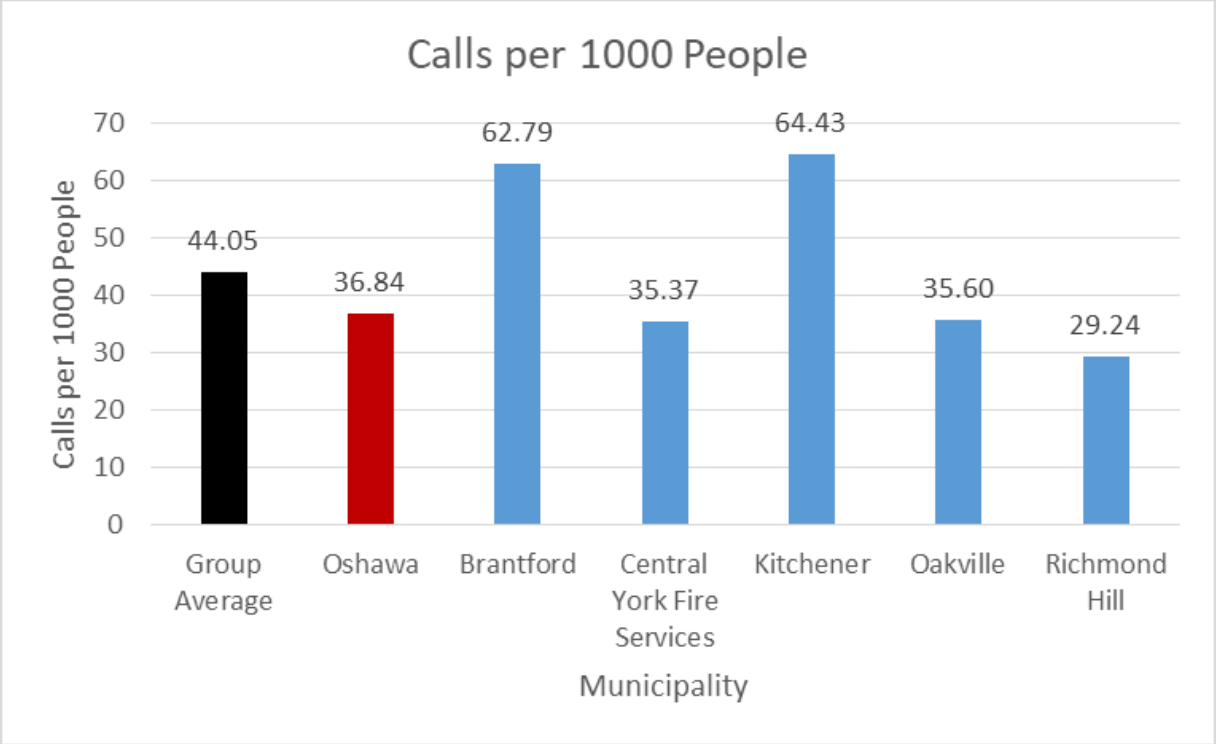
Figure 1: Total Call Volume (2019)



At 15,026 calls, the Kitchener Fire Department call volume is twice as high as the group average. The City of Kitchener also has the highest population within the group, which is an important factor in call volume. This is considered in the calls per population analysis to follow. The remaining fire services within the group have call volumes around the 5,000 to 7,000 level, which are comparable.

Figure 2 presents a graph of the total number of calls per 1000 people in the comparator group municipalities.

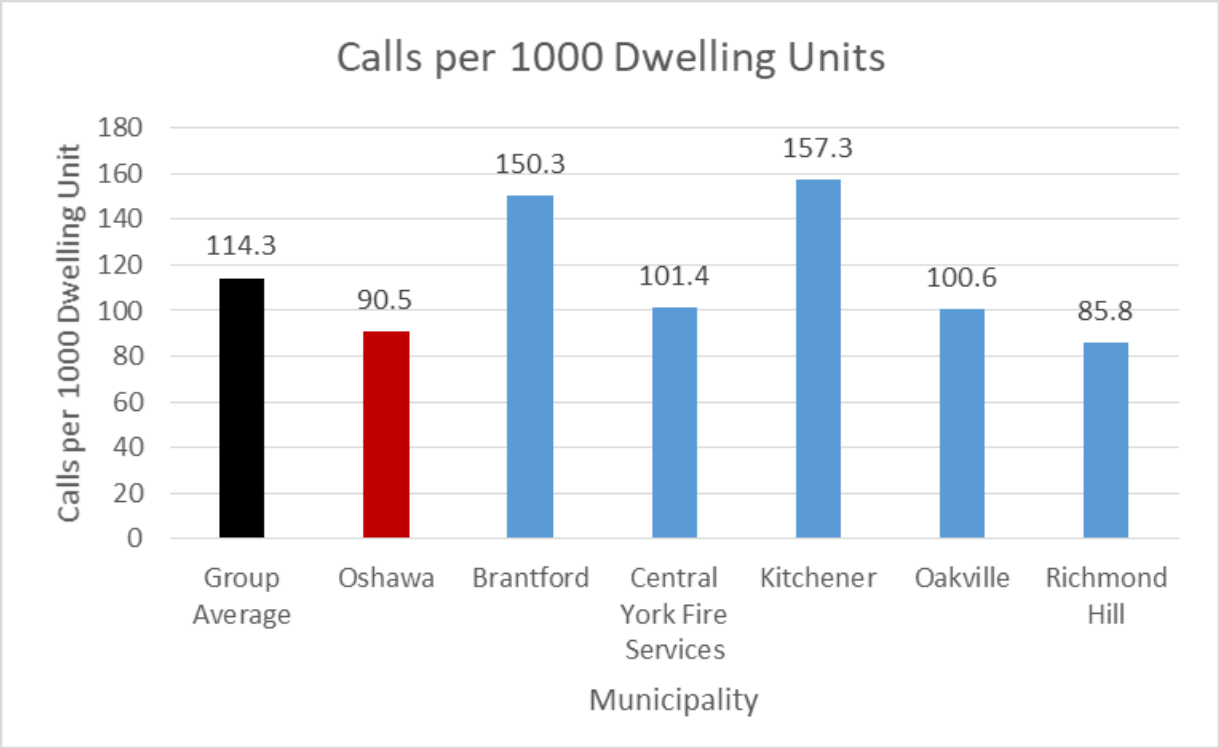
Figure 2: Total Calls per 1000 People



Comparing calls to population, the Kitchener Fire Department and Brantford Fire Services have the highest number of calls per 1000 people. Oshawa Fire Services' calls per 1000 population are slightly below the group average.

Figure 3 shows the results of the analysis of total calls per 1000 dwelling units within the municipal comparator group.

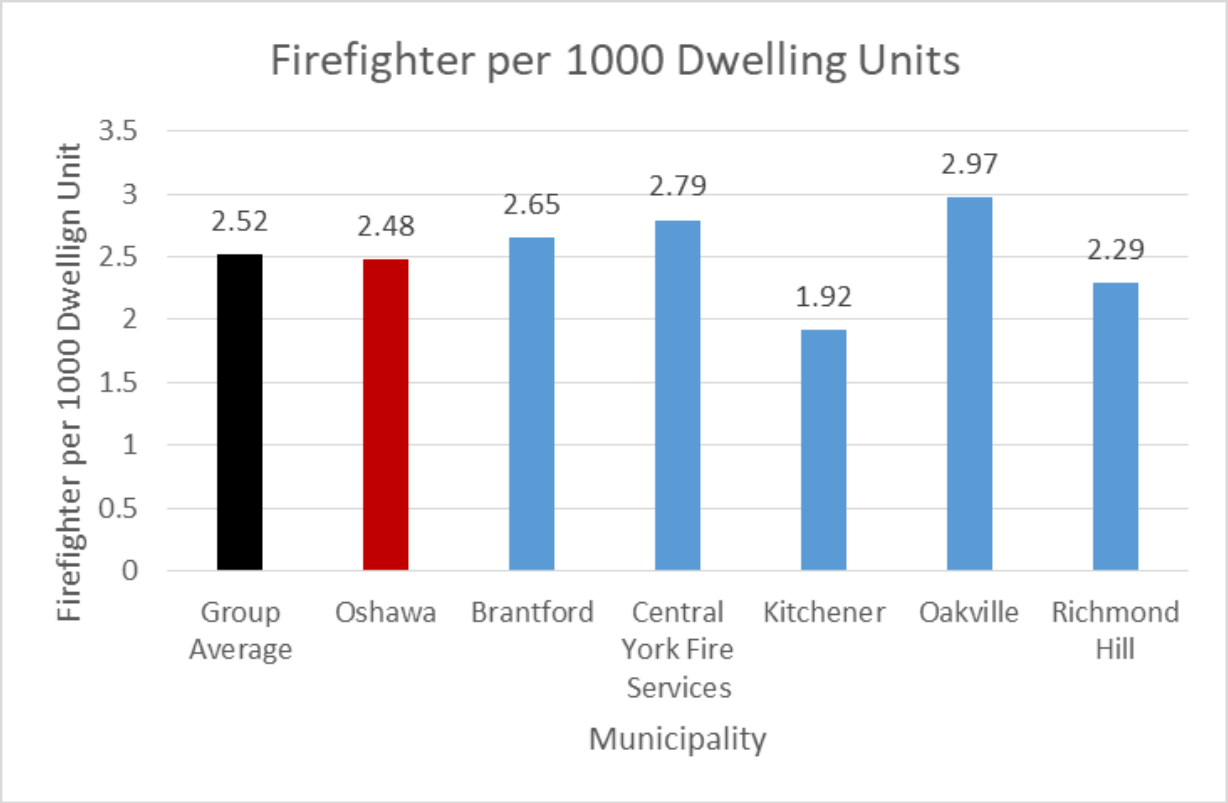
Figure 3: Total Calls per 1000 Dwelling Units



The calls per 1000 dwelling units follows a similar trend to the calls per population. Again, Kitchener and Brantford are the highest in the group. Oshawa is lower than the group average and is actually the second lowest in the group.

Figure 4 presents a graph indicating the number of firefighters (total suppression staff) per 1000 dwelling units.

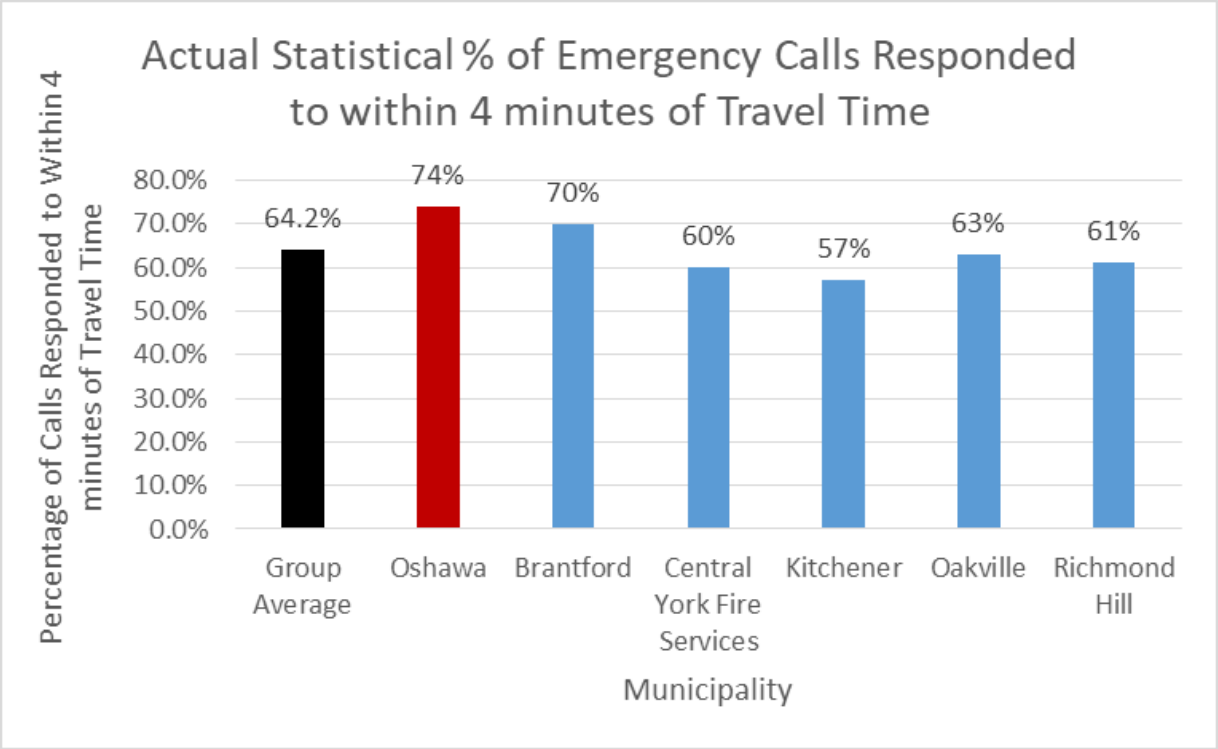
Figure 4: Firefighters per 1000 Dwelling Units



The group average is 2.52 firefighters per 1000 dwelling units, which is very close to the 2.48 firefighters per 1000 dwelling units present in the City of Oshawa.

Figure 5 is based on a statistical analysis of historic 2019 emergency response call data from the municipal comparators fire and emergency services. The data relates to the initial arriving apparatus and provides a measurement of the percent of emergency calls that were responded to within four minutes or less of travel time.

Figure 5: Percentage of 2019 Emergency Calls Responded to Within Four Minutes of Travel Time or Less



The results above show relatively consistent results within the comparator group for the percent of emergency calls responded to within four minutes of travel time. The group average is 64.2% of emergency calls. The range within the comparator group is from 57% to 74%. Oshawa Fire Services, at 74%, has the highest achievement within the comparator group of responding to emergency calls within four minutes or less.

1.4 Municipal Group Response Modelling Comparison

As noted above, this analysis is provided to give Council further understanding of current service levels related to two key N.F.P.A. 1710 standard performance benchmarks through the analysis of a representative group of municipalities.

The data collected from the peer communities is based on historic information collected from 2014 to 2019. Again, it is noted that the 2020 Edition of N.F.P.A. 1710 only recently became publicly available, and as such, many municipalities have not yet applied the new standard and revised benchmarks to analyze their emergency response capabilities. Therefore this municipal comparator analysis presents the results of the following two N.F.P.A. 1710 (2016 Edition) benchmarks:

- **The Initial Arriving Company including four firefighters arriving on scene within four minutes of travel time to 90% of fire suppression incidents.**
- **The Initial Full Alarm Assignment for a Single-Family Dwelling including 14 firefighters (or 15 firefighters including an aerial) arriving on scene within an eight minute travel time to 90% of fire suppression incidents.**

An important consideration is that the only significant change in these two benchmarks between N.F.P.A. 1710 standard 2016 Edition and 2020 Edition is the Initial Full Alarm staffing target. In the 2020 Edition the staffing target is revised to reflect 16 firefighters (or 17 firefighters including an aerial) arriving on scene within an eight minute travel time to 90% of fire suppression incidents.

1.4.1 Modelled Response Data for the Peer Comparator Group

A consideration in the selection of the municipalities within the comparator group was the availability of the data to support the comparison of the fire suppression benchmarks (initial arriving company and initial full alarm assignment). It was important that the methodology used to assess the results of these benchmarks be comparable as well. Therefore, municipalities and their fire services for which Dillon Consulting had completed a G.I.S.-based analysis of emergency response performance, applying the N.F.P.A. benchmarks, were included within the comparator group. **Table 6** provides details on the year that the emergency response analysis was completed within, between the years of 2014 to 2020 (subject study for Oshawa).

Table 6: Year of Emergency Response Analysis Completed

Municipality	Year of Study Completion
Oshawa	**Subject Study (2020)**
Brantford	2019
Central York Fire Services (Aurora and Newmarket)	2014
Kitchener	2016
Oakville	2015
Richmond Hill	2016

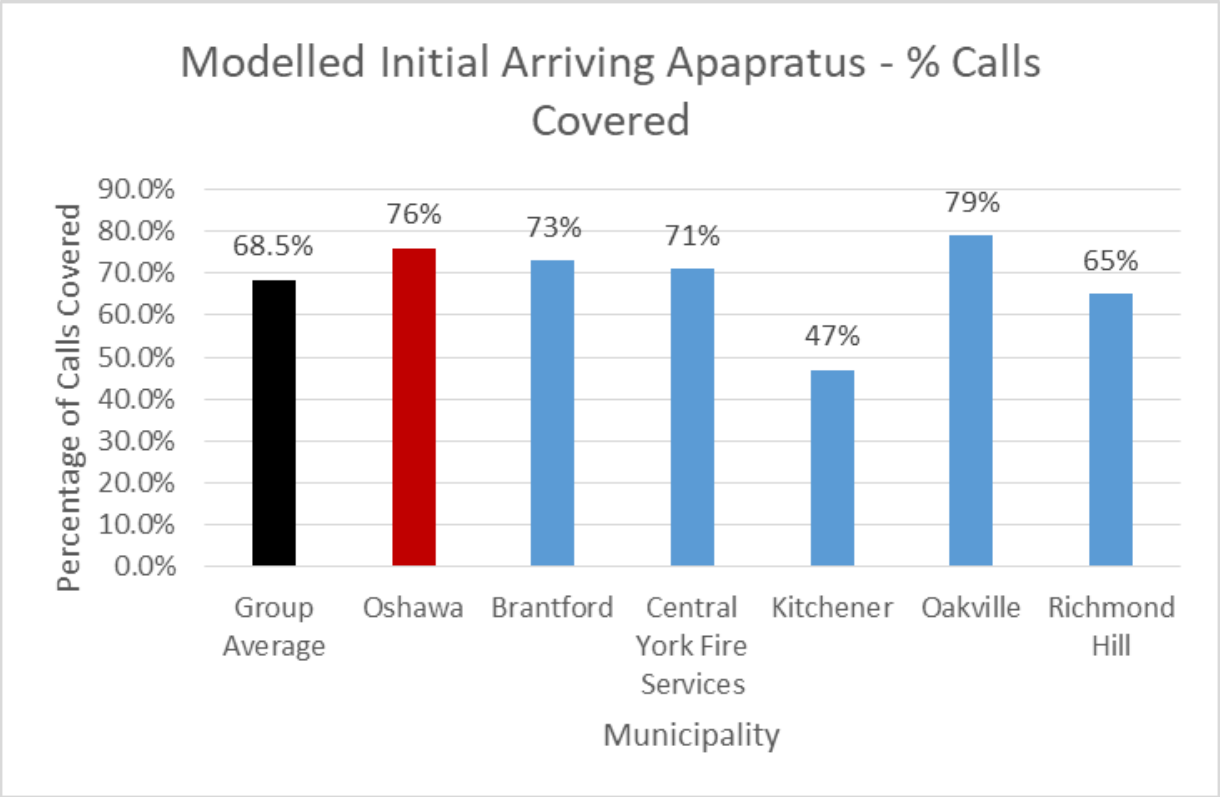
The results of the modelled emergency response analysis of the initial arriving company and initial full alarm assignment for the comparator municipalities are provided below. The results are provided as the measurement of percentage of historic emergency calls covered. The coverage of calls relates most closely to the intent of the N.F.P.A. 1710 standard, which aims to measure the fire suppression incidents (such as structure fires) which are responded to according to the requirements of the benchmarks.

1.4.2 Initial Arriving Company Benchmark

Benchmark: The Initial Arriving Company including four firefighters arriving on scene within four minutes of travel time to 90% of fire suppression incidents.

Figure 6 provides a graphical summary of the comparator group analysis of the initial arriving apparatus benchmark, measuring the percentage of emergency call coverage. The group average is 68.5% of emergency calls covered with four firefighters responding within four minutes of travel time. The highest result in the group is 79%, achieved by Oakville Fire Department. Oshawa Fire Services has the second highest modelled initial arriving apparatus capability with 76% of emergency calls covered with four firefighters responding in four minutes of travel time. The lowest initial arriving apparatus coverage of emergency calls is 47% (Kitchener Fire Department).

Figure 6: Initial Arriving Apparatus - % of Emergency Calls Covered

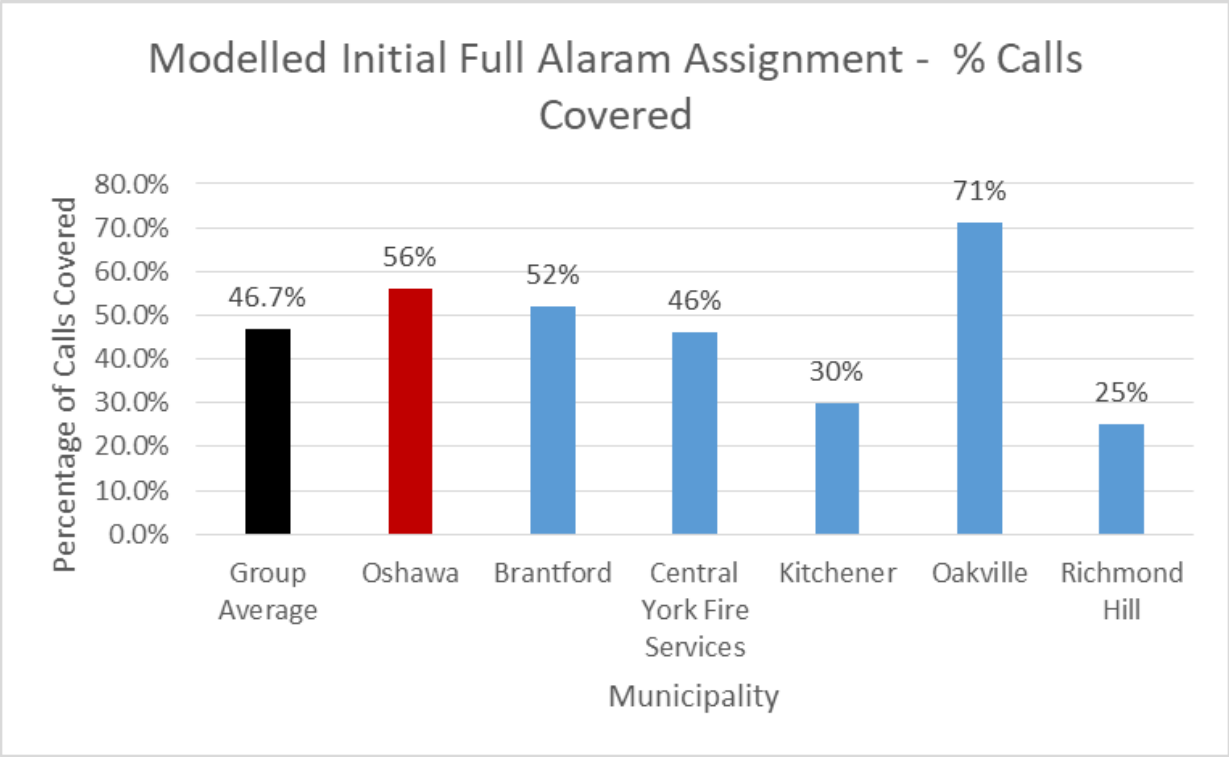


1.4.3 Initial Full Alarm Benchmark

Benchmark: The Initial Full Alarm Assignment for a Single-Family Dwelling including 14 firefighters (or 15 firefighters including an aerial) arriving on scene within an eight minute travel time to 90% of fire suppression incidents.

Figure 7 provides a graphical summary of the comparator group analysis of the initial full alarm assignment benchmark, measuring the percentage of historical emergency call coverage. The group average is 46.7% of emergency calls covered with 14 (15) firefighters responding within eight minutes of travel time. The highest initial full alarm benchmark result in the group is 71%, achieved by Oakville Fire Department. Oshawa Fire Services again achieves the second highest modelled capability with 56% of historic emergency calls covered with 15 firefighters responding in four minutes of travel time. The lowest initial full alarm assignment coverage of emergency calls is 25%, by Richmond Hill Fire and Emergency Services.

Figure 7: Initial Full Alarm Assignment - % of Emergency Calls Covered



1.4.4 Summary of Performance Benchmarks

Table 7 provides the summary of results of the municipal comparator analysis regarding the two N.F.P.A. 1710 standard benchmarks of initial arriving company and initial full alarm assignment.

Table 7: Summary of Municipal Comparator Results – N.F.P.A. 1710 Benchmarks

Municipality	Statistical Initial Arriving Company[1]	Modelled Initial Arriving Company[2]	Modelled Initial Full Alarm Assignment[3]
Group Average	64.2%	68.5%	46.7%
Oshawa	**74%**	**76%**	**56%**
Brantford	70%	73%	52%
Central York Fire Services (Aurora and Newmarket)	60%	71%	46%
Kitchener	57%	47%	30%
Oakville	63%	79%	71%
Richmond Hill	61%	65%	25%

The results of the municipal comparator analysis were used to inform an approach to assessing fire suppression deployment capabilities against municipal best practices. This approach divides the N.F.P.A. 1710 Standard's '90th percentile' performance benchmark into three categories: 'below average', 'average' and 'above average'. The ranges of the categories were informed by the comparator group averages, highs and lows. The majority of the results presented represent performance within the 'average' categories, between the ranges of 41% to 79% achievement of the benchmarks. No results represented within the municipal comparator group exceeded the 80% threshold, therefore this is considered to be the level at which 'above average' initiatives.

[1] Percentage of calls responded to within four minutes or less of travel time.
[2] Percentage of calls covered with four firefighters arriving on scene within four minutes of travel time.
[3] Percentage of calls covered with 14 (15) Firefighters arriving on scene within eight minutes of travel time.

In our view, applying this scale in conjunction with the findings of the comparator analysis provides Oshawa's Council with a tool to assist in determining the appropriate level of fire suppression services for the City of Oshawa.

These service levels and categories can be applied to assess both the initial arriving apparatus and the initial full alarm assignment capabilities.

Table 8: Proposed Fire Suppression Service Level Rating Categories

Range/Service Level	N.F.P.A. 1710 Standard 90th Percentile Performance Benchmark		
Range	0 to 40%	41% to 79%	80% to 100%
Proposed Service Rating Categories	Below Average	Average	Above Average

Where applicable, these proposed service rating categories are referenced within the Oshawa F.M.P. to assist Council in its decision-making process in regards to the proposed fire suppression deployment options presented.

Appendix D

Critical Task Matrix

Fireground Critical Task		Low Risk		Moderate Risk		High Risk		Extreme Risk	
		LERL	UERL	LERL	UERL	LERL	UERL	LERL	UERL
Incident Response (Note: Where zero or no number has been assigned, the task may be performed at the direction of the incident commander.)	Incident Command*	1	1	1	1	1	1	1	1
	Pump Operator	1	1	1	1	1	1	1	1
	Attack Line (Confine & Extinguish)	2	2	2	2	2	2	2	2
	Additional Pump Operator(s)	0	0	0	2	2	4	4	6
	Additional Attack Line Backup	0	0	0	4	4	8	8	12
	Search & Rescue	0	0	2	4	2	6	2	8
	Initial Rapid Intervention Team (IRIT)	0	0	4	6	8	16	12	22
	Ventilation	0	2	2	2	2	4	2	8
	Water Supply – Pressurized	0	1	1	1	1	1	1	2
	Water Supply – Non Pressurized	0	3	1	4	2	6	4	8
	Forcible Entry Team	0	0	0	0	0	1	0	1
	Utilities	0	1	1	1	1	1	1	1
	Laddering (Ground Ladders)	0	2	0	2	0	4	0	6
	Laddering (Aerial or Elevating Device Operator)	0	0	0	2	0	2	0	2
	Exposure Protection			0	4	2	6	2	6
	Incident Safety Officer			0	1	1	1	1	1
	Accountability			1	1	1	1	1	1
	Entry Control			0	2	1	4	1	4
	Rehabilitation			0	1	1	1	1	1
	Salvage			0	2	2	2	2	2
	Lighting					0	2	0	2
	Directing Occupants					0	4	0	4
	Scribe					1	1	1	1
	Sector Officers					1	4	1	4
	Air Management (Air Refilling Station, etc.)							1	2
Other Or Additional Response Considerations	Logistics Officer								
	Administrative and/or Finance Officer								
	Planning Officer								
	Evacuations (Large Scale)								
	Communications (Dispatch)								
	Public Information Officer								
	Overhaul								
	Additional Firefighters								
Summary	Incident Response Range	4	13	16	43	36	83	49	108
	Total Fire Department Including External								
	Fire Call Incident Response Range								

Notes:

- LERL = Lower Effective Response Level
- UERL = Upper Effective Response Level (together form the critical staffing range)
- This tool provides a range of staffing requirements only. Actual numbers may vary depending on the fire risk that exists in the municipality. Tasks performed on fireground based on decisions made by Incident Commander.
- Planning moderate, high and extreme risk occupancies/locations will further validate staffing requirements to ensure the optimum level of protection for the municipality.
- Simultaneous events will require further consideration due to additional personnel requirements beyond the scope of the matrix.
- Incident Command will assume responsibilities for the accountability and entry control tasks when no person has been assigned, or until a person has been assigned the task.

(Source: Ontario Fire Marshal (2011), Operational Planning: An official Guide to Matching Resource Deployment and Risk)

DILLON CONSULTING

Corporation of the City of Oshawa

Community Risk Assessment

Final Draft Report

March 2020 – 19-1064

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1.0 Introduction

This Community Risk Assessment (C.R.A.) has been developed for the City of Oshawa to comply with **Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18)**. O. Reg. 378/18 was made under the authority of the Fire Protection and Prevention Act, 1997 (F.P.P.A.) and came into effect on July 1st 2019. It requires all municipalities in Ontario to develop a C.R.A. prior to July 1st, 2024. This regulation also requires municipalities to **"use its community risk assessment to inform decisions about the provisions of fire protection services"[1].** At this time, this C.R.A. is included as an appendix to the City's proposed Fire Master Plan being developed as a companion document for the City of Oshawa. However, this C.R.A. is formatted to become a stand-alone document in the future to assist the City in sustaining compliance with O. Reg. 378/18 that includes conducting a review of the C.R.A. when necessary, and annually.

In addition to this C.R.A., the F.P.P.A. requires that municipalities must provide fire protection programs that "**must include public education with respect to fire safety and certain components of fire prevention, and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances"[2]**. The recent introduction of O. Reg. 378/18 is now a core component of developing an in-depth analysis of a community's fire related risks through a comprehensive analysis of nine mandatory profiles.

The F.P.P.A. also assigns duties to the Office of the Fire Marshal and Emergency Management (O.F.M.E.M.) to **"advise municipalities in the interpretation and enforcement of this Act and the regulations"[3]**. The O.F.M.E.M. has developed Technical Guideline-02-2019 (T.G.-02-2019) to assist municipalities and fire departments in the process to develop a C.R.A. and to utilize the completed C.R.A. to inform the municipality's decisions with regard to complying with the F.P.P.A.

At a minimum, the regulation outlines a standard set of information profiles that must be considered when conducting a community risk assessment. The Guideline provides

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[1] Ontario Regulation 378/18: Community Risk Assessments, Mandatory Use, Section 1 (b).
[2] Fire Protection and Prevention Act, 1997 Part II Responsibility for Fire Protection Services, Section 2.1 (a) (b).
[3] Fire Protection and Prevention Act, 1997, Part III Fire Marshal, Section 9.2(b).

suggestions as to how to record and analyze the data/information and provides sample worksheets to assist municipalities. A leading practice in Ontario would see the City of Oshawa's Community Risk Assessment report maintained as a living document by the Oshawa Fire Services. This would include regular (e.g. annual) review and updates to the C.R.A.'s data and information.

The methodology and analysis utilized to develop this C.R.A. has been directly informed by T.G.-02-2019 that recognizes the value of understanding the fire risk within a community, and the importance of developing fire risk reduction and mitigation strategies in addition to providing fire suppression services.

The primary purpose of this C.R.A. is twofold:

1. To develop a Community Risk Assessment for the City of Oshawa to identify the fire related risks within the community and comply with O. Reg. 378/18; and
2. To utilize the risk conclusions of the Community Risk Assessment to inform comprehensive analyses of the existing, and future fire protection needs of the City of Oshawa through the development of a Fire Master Plan (F.M.P.).

1.1 Methodology

In addition to T.G.-02-2019, the methodology applied to develop this C.R.A. has been informed by other current industry standards and best practices. These include:

1. O.F.M.E.M. Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model;
2. O.F.M.E.M. Public Fire Safety Guideline (P.F.S.G.) 04-40A-03: Simplified Risk Assessment;
3. N.F.P.A 1300, Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition);
4. N.F.P.A. 1730, Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition);
5. Vision 20/20 Community Risk Assessment: A Guide for Conducting a Community Risk Assessment (Version 1.5, 2016); and
6. Vision 20/20 Community Risk Reduction Planning: A Guide for Developing a Community Risk Reduction Plan.

In our view, these documents collectively represent the most current industry best practices related to the applicable methodology and process to develop a C.R.A. for the City of Oshawa as required by O. Reg. 378/18. The information presented within these documents is, in many cases, complementary. For example, the N.F.P.A. 1730 Standard Community Risk Assessment Guide, Annex B is based on the O.F.M.E.M. Public Fire Safety Guideline on Simplified Risk Assessments (04-40A-03).

The methodology presented within this C.R.A. has also been reviewed by the O.F.M.E.M. and the N.F.P.A. Risk Analysis Sub-Committee as part of other projects completed by Dillon Consulting Limited. This includes the Corporation of the City of Mississauga Comprehensive Community Risk Assessment.[4]

As required by O. Reg. 378/18, this C.R.A. includes a comprehensive analysis of the nine mandatory profiles including:

- Geographic Profile
- Building Stock Profile
- Critical Infrastructure Profile
- Demographic Profile
- Public Safety and Response Profile
- Community Services Profile
- Hazard Profile
- Economic Profile
- Past Loss and Event History Profile

Within each of the nine profiles, there are a number of sub-topics examined. These sub-topics are illustrated in **Figure 1**. These profiles are based on an analysis of several sources of information, including data provided by the City of Oshawa, Oshawa Fire Services (O.F.S.), Statistics Canada, the O.F.M.E.M., and desktop research.

The mandatory profile analyses result in a series of risk related conclusions that will be used to inform service levels or other strategies in alignment with the three lines of defense through a risk treatment process. These are referred to as a '**key finding**' or an '**identified risk**'. Those findings referred to as an 'Identified Risk' are taken through a risk assignment process to assist with risk prioritization as referred to within T.G.-02-

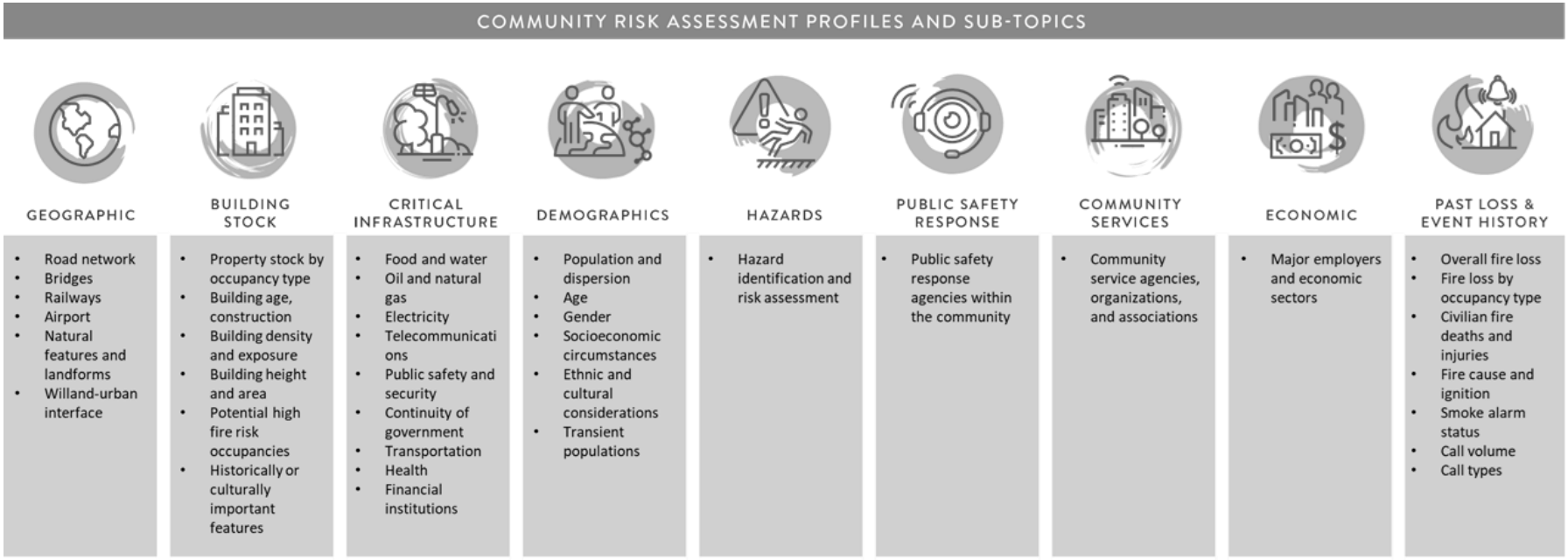
[4] O.F.M.E.M. T.G.-02-2019 End Notes (2)

2019. In specific circumstances, being those that involve additional jurisdictional or legislative considerations, a risk-related conclusion is referred to as a Special Consideration. All risk-related conclusions will be taken through a risk treatment process and aligned with the three lines of defense in order to inform the analysis and recommendations within the Fire Master Plan.

More information on how the findings and identified risks will be used to inform the F.M.P. can be found in **Section 11.0 – Applying Key Findings and Identified Risks**.

The analysis presented within this C.R.A. has been informed by a wide range of data sources. Where applicable all numerical data has been rounded to the nearest 1/100 (hundredths) decimal point to provide consistency in the analysis. As a result, the numerical totals presented within each analysis although presented as reflecting 100% may actually reflect a minor variance based on the use of only the nearest 1/100 (hundredths) decimal points.

Figure 1: Community Risk Assessment Profiles and Sub-Topics



2.0 Geographic Profile

As referenced in **O. Reg. 378/18**, the geographic profile assessment includes analysis of the physical features of the community, including the nature and placement of features such as highways, waterways, railways, canyons, bridges, landforms and wildland-urban interfaces. These physical features may present inherent risks or potentially have an impact on fire department access or emergency response time. The following sections consider these geographic characteristics within the City of Oshawa.

2.1 Geographical Snapshot of Oshawa

The City of Oshawa is one of eight municipalities comprising Durham Region, located east of the Greater Toronto Area, at the northwestern shoreline of Lake Ontario. It is bordered by the Municipality of Clarington to the east, the Town of Whitby to the west and the Township of Scugog to the north. The City is located in close proximity to major transportation corridors that facilitate the movement of commuting populations as well as a large volume of goods and products throughout the region. The land area of Oshawa represents a fire suppression response area of 145.64 square kilometres (2016 Census, Statistics Canada) and includes key natural heritage and water features including the Oak Ridges Moraine, Oshawa watershed, Lake Ontario, as well as several wetlands, forests and woodlots. The City contains a Major Urban Area as shown in the Schedule 'A' – Land Use of the City's Official Plan. The south half of the City is shown **Figure 2** and the north half in **Figure 3**.

Figure 2: City of Oshawa – Schedule 'A' – Land Use – South Half

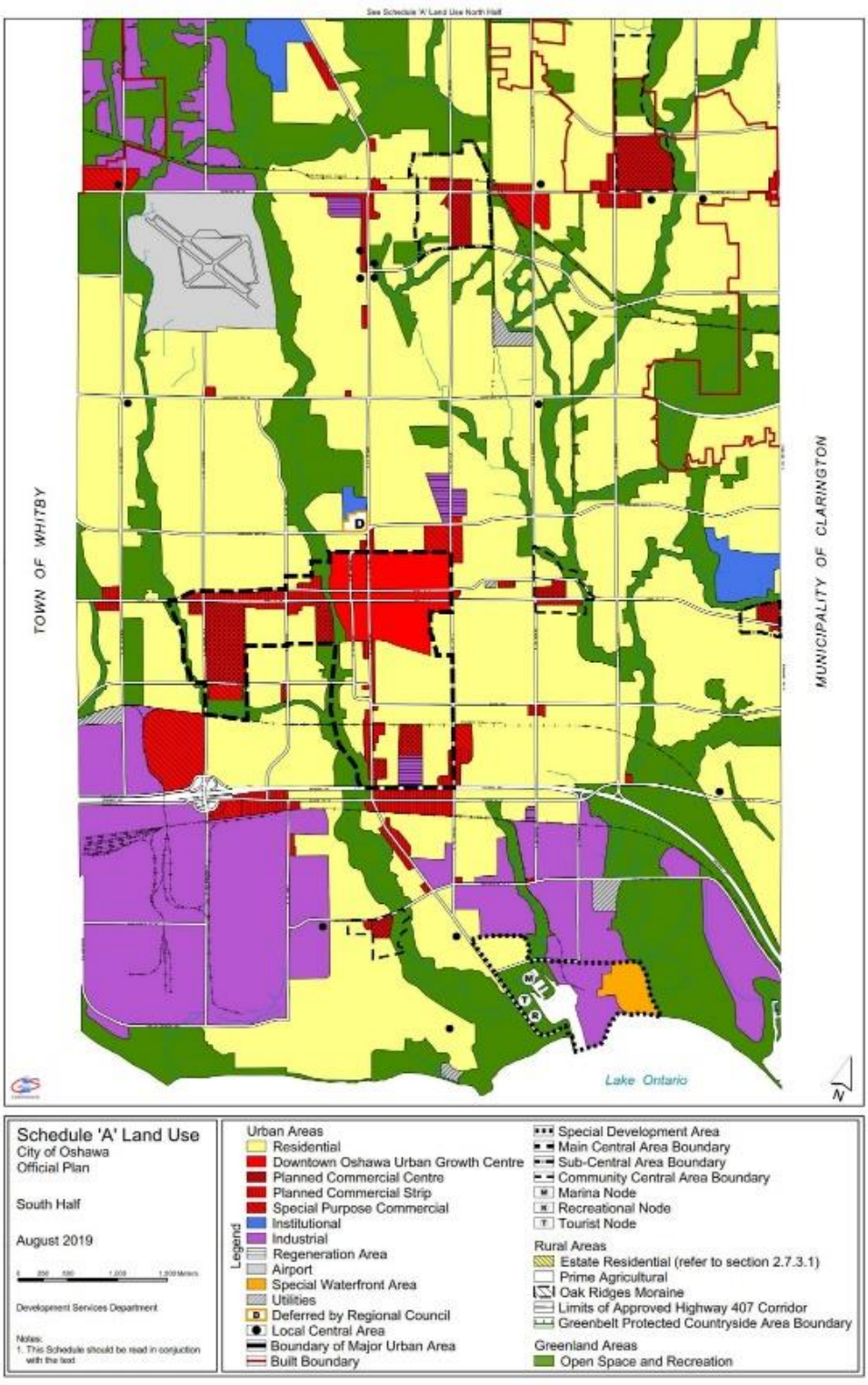
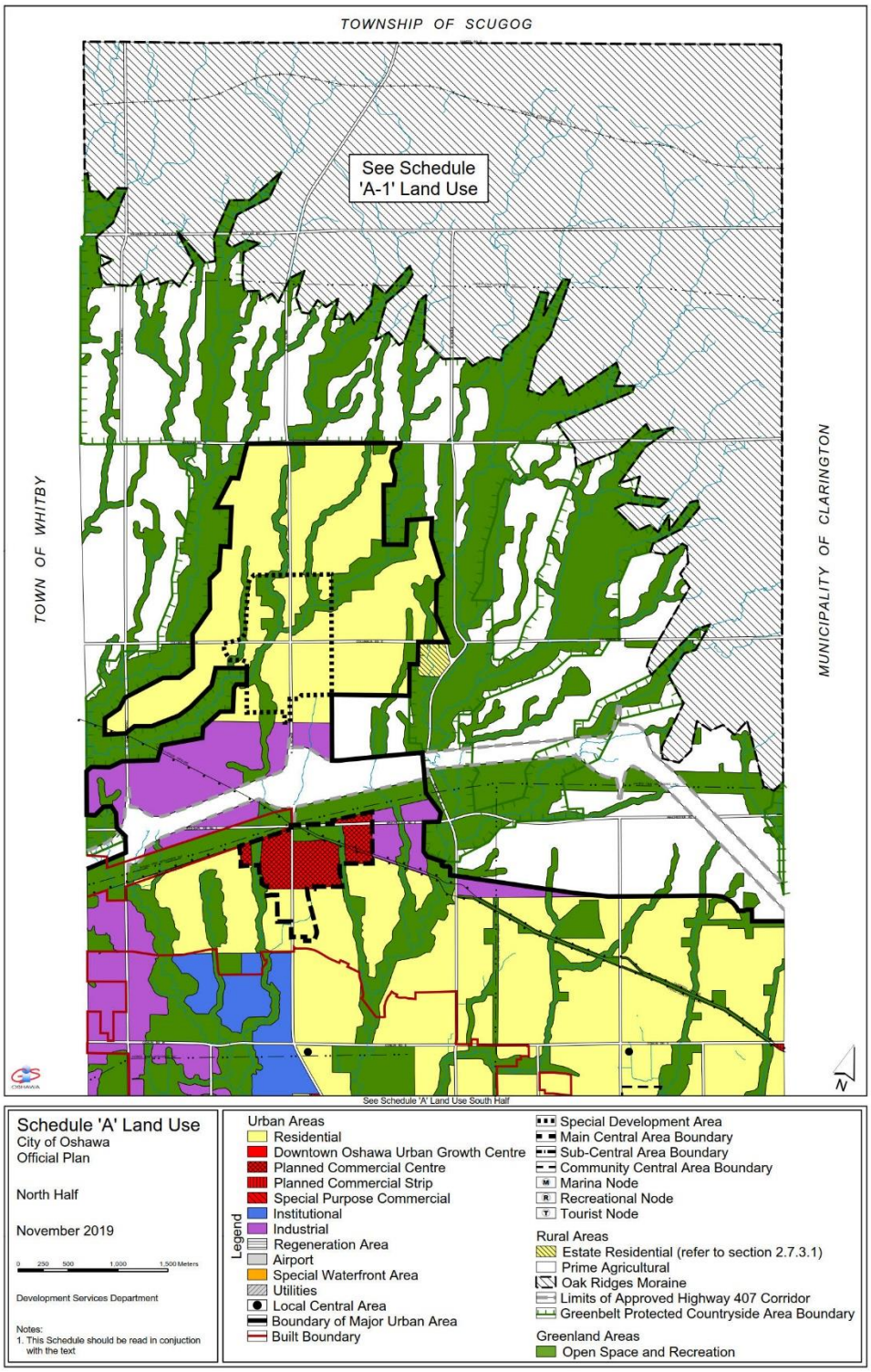


Figure 3: City of Oshawa – Schedule 'A' – Land Use – North Half



2.2 Roads, Transit, Bridges and Rail

2.2.1 Road Network

Road networks and transportation systems provide fire services with access throughout a community when responding to emergency calls. The road network is how fire apparatus travel through a municipality; and therefore, it is valuable to consider where there may be a lack of connectivity due to road network design as well as other natural (e.g. rivers, lakes, etc.) or human-made barriers (e.g. rail lines, traffic calming measures, etc.). Road networks can also contribute to vehicle congestion causing delays in emergency response travel times. Where possible, the City's transportation planning processes should include the O.F.S. as a stakeholder to provide consideration to emergency services needs and challenges relating to the road network, traffic congestion, traffic calming and related topics.

Roads are also important from a risk and emergency response perspective because motor vehicle-related incidents are often a common source of emergency call volume within a municipality.

The road hierarchy of the south half of Oshawa is presented within **Figure 4** and the north half is illustrated in **Figure 5** as found within the City's Official Plan. Oshawa is well connected by a number of provincial highways, major and minor arterial roads, collector roads, and local roads. There are two provincial highways located within the City namely: Provincial Highway 401 and Provincial Highway 407 running East/West through the City.

Public transit in Oshawa is provided by Durham Region Transit (D.R.T.) and GO Transit. D.R.T. also provides transportation to the residents of Oshawa and area that have special needs or mobility issues through a specialized transit service. The GO Transit network in Oshawa consists of two 'mobility hubs', or major transit stations, with one located in Downtown Oshawa and the other at the Oshawa Train Station. Mobility hubs, according to Metrolinx, are points of connectivity where different modes of transportation converge, promoting mobility around concentrations of housing, employment and recreational activities.[5]

[5] Metrolinx. (n.d.). About Mobility Hubs. Retrieved from http://www.metrolinx.com/en/regionalplanning/mobilityhubs/default.aspx

The Oshawa Integrated Transportation Master Plan (I.T.M.P.) (2015) indicates that the City's residents will see increased amounts of congestion related to projected growth. This presents a challenge to the City that will not be eliminated through roadway expansion alone.[6] The I.T.M.P. supports the alternative that as congestion increases, the City should encourage a shift in modal split by considering supporting strategies that improve mobility options and enable residents to choose modes of travel, such as public transit, that reduce the number of vehicles on the road at any given time. This approach is also echoed in the City of Oshawa Active Transportation Plan which promotes active lifestyles opportunity while also reducing the number of vehicles on the road by making active transportation more accessible to the public. A disruption to a major roadway could cause further congestion within the City and therefore result in delayed emergency response times both within the urban and rural areas.

The road network can also contribute to emergency response call volume due to incidents involving motor-vehicle collisions and accidents. As described in **Section 10.2.2.2 – Spatial Modelling - Rescue Incidents** of this C.R.A., 4,670 calls pertain to motor-vehicle related incidents (vehicle collisions and vehicle extrication combined), therefore accounting for approximately 18.33% of all calls responded to by O.F.S. during a five year period (2014-2018).

The presence of major highways and transportation routes have the potential for a transport incident involving dangerous goods, given the municipality's complex transportation network connecting rail, road, air and marine transportation modes. The Port of Oshawa (discussed further in **Section 2.3.1.1**) is a major gateway for the shipment of a wide range of goods including those classified by Transport Canada as dangerous goods. Due to the Port's close proximity to the provincial highway network, many of these goods are then transported by truck through Oshawa to their destination. This warrants special consideration as an accident involving the goods being transported could occur, requiring hazardous materials response from O.F.S.

There are also several private or restricted (e.g. gated / locked) emergency access routes used by fire apparatus and personnel throughout the City. However, as part of the data collection process for this C.R.A., it was identified that these routes are not

[6] M.M.M. Group. (2015, September). Oshawa Integrated Transportation Master Plan (PDF File). Retrieved from https://www.oshawa.ca/city-hall/transportation-master-plan.asp

always well-maintained, especially during the winter season when they will often accumulate snow. At present, the City does not possess an inventory of these emergency access routes or the maintenance schedules/capacity of site owners or developers. The development of such an inventory would benefit the O.F.S. when attempting to access sites that are not accessible via the regular road network.

Identified Risk: Increasing traffic congestion on the existing road network presents the potential for a delay in emergency response times.

Identified Risk: Motor vehicle-related incidents on the existing road network represent 18.33% (4,670) of the historical emergency responses of the Oshawa Fire Services.

Key Finding: There are several private or restricted (e.g. gated / locked) emergency access routes located throughout the City used by fire apparatus. It was identified that these routes are not always well-maintained and currently, the City does not possess an inventory of these emergency access routes.

Figure 4: City of Oshawa Road Network – South Half

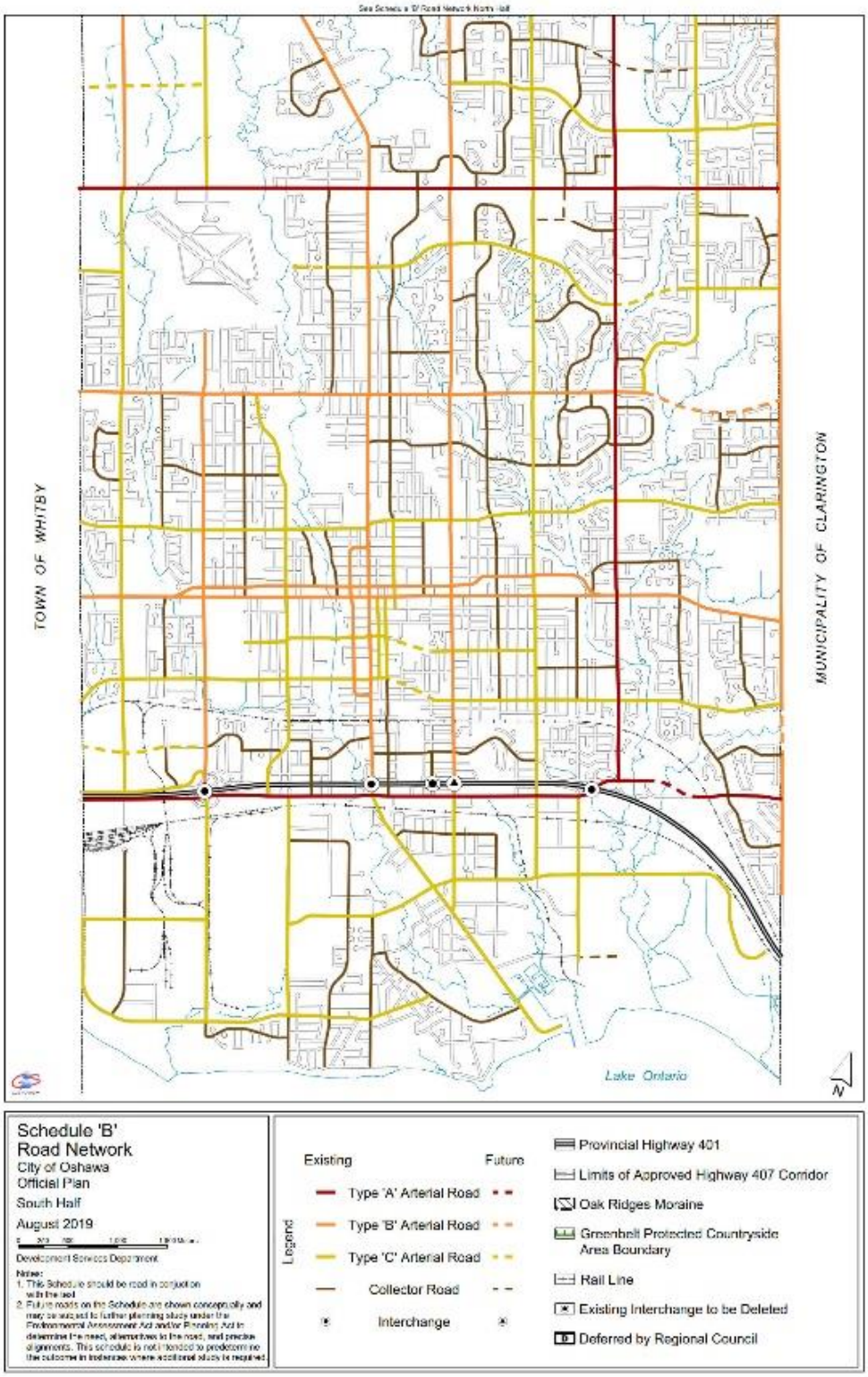
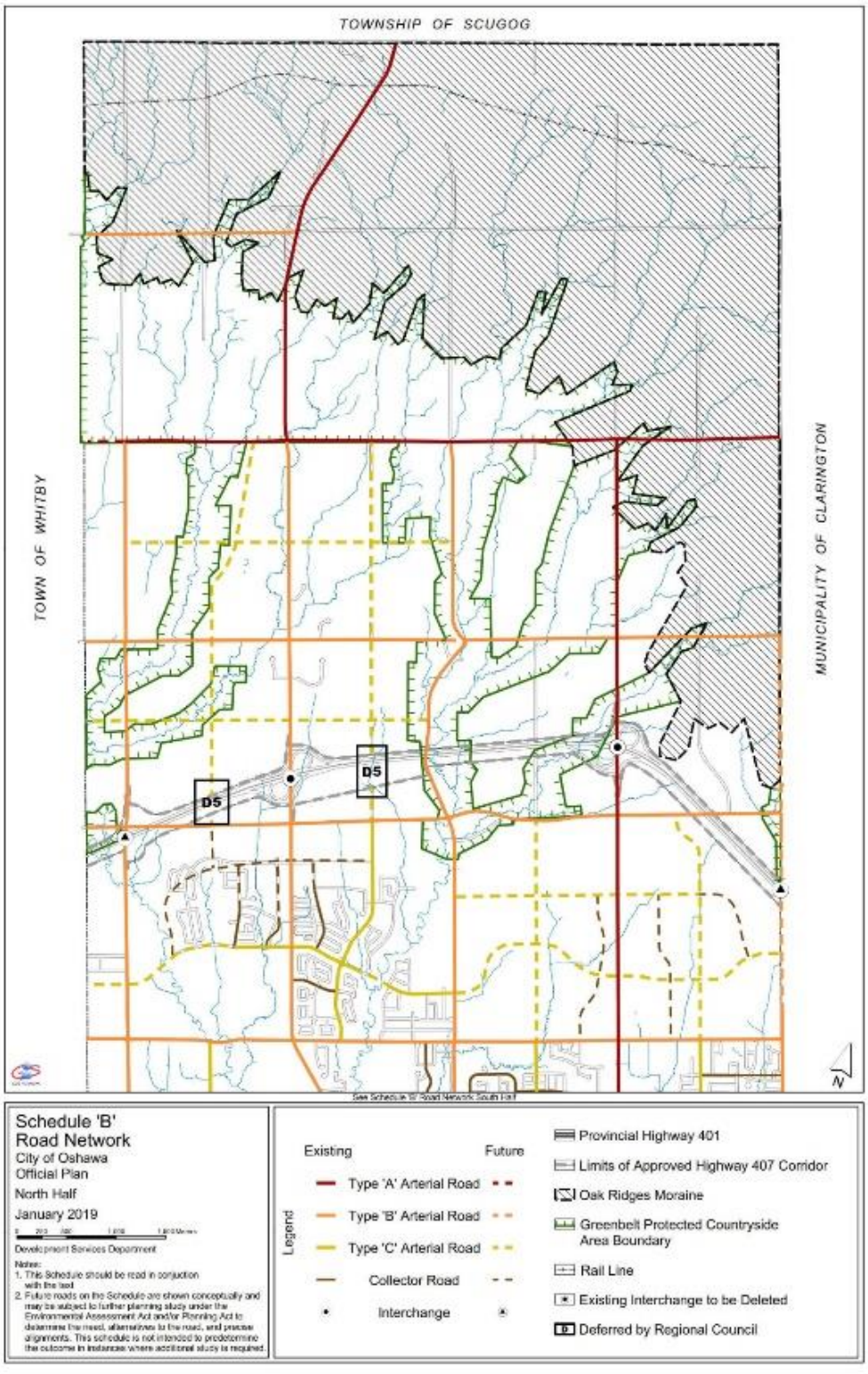


Figure 5: City of Oshawa Road Network – North Half



2.2.2 Bridges

Bridges are considered within a C.R.A. for two main considerations: the potential for crossing restrictions for fire apparatus due to weight (i.e. load restrictions); and potential for impact on road network connectivity in the event that a bridge is out of service.

There are several bridges across the City which overpass rail lines, roads, or water features. Based on a desktop review, it appears that there is a potential for the road connectivity to be impacted should one or more of these bridges be rendered out of service. This could result in the potential for delays in emergency response times.

As part of the review for this C.R.A., it was identified that there is an existing load restriction on the Albert Street Bridge, located on Albert Street north of Provincial Highway 401, and west of Ritson Road South. The bridge is constructed of wood panels preventing fire apparatus from crossing this bridge, which may affect O.F.S. emergency response travel times to surrounding neighbourhoods.

Key Finding: Bridges, with restrictions or closures, have the potential to reduce the connectivity of the City's road network resulting in the potential for delays in emergency response times.

2.2.3 Rail

Within Oshawa, there are three rail lines running east/west through the City, one in the northern half and two in south Oshawa. The Canadian Pacific Railway (C.P.) operates the rail line in north Oshawa, connecting Toronto to Peterborough, while both C.P. and the Canadian National Railway Company (C.N.) offer freight services and operate switching facilities on the rail line north of Highway 401 in the City's southern half.[7] Passenger rail service is provided by VIA Rail Canada and GO Transit south of the 401.

Rail lines are considered in this C.R.A. for a few key reasons related to emergency services. The potential for a rail-based transportation incident is a relevant consideration, as a derailment or accident involving dangerous goods transport has the potential to occur. An event such as this would require specialized emergency response. At this time, O.F.S. is provided detailed confidential information (via the Fire Chief) by both CN and CP as to the contents of their rail containers which pass through

[7] City of Oshawa. (n.d.). Transportation Logistics. Retrieved from https://www.oshawa.ca/business-and-investment/transportation-logistics.asp

City boundaries. Information sharing practices such as this ensures that O.F.S. can provide informed and appropriate response to incidents involving the release of dangerous goods. Also, the physical barrier created by the rail infrastructure itself, such as a rail yards or the placement of rail infrastructure (e.g. tracks, grade separations, grade level crossings, etc.) within and throughout a municipality can impact emergency services travel and overall emergency response times.

At-grade rail crossings (an intersection at which a road crosses a rail line at the same level) can create delays in emergency response by inhibiting emergency response vehicles and apparatus from accessing a road. Desktop research indicates there are eight at-grade rail crossings throughout the City. At-grade rail crossings can be found in both the urban and rural areas in the following locations:

- Wilson Road South, south of Bloor Street East
- Thornton Road South, south of Gibb Street
- Bloor Street East, west of Grandview Street South
- Wentworth Street East, west of Wilson Road South
- Thornton Road North, south of Coates Road West
- Stevenson Road North, south of Coates Road West
- Ritson Road North, south of Coates Road East; and
- Harmony Road North, south of Coates Road East

The locations of these grade level crossings are further illustrated in **Figure 6**.

Figure 6: At-grade Rail Crossings

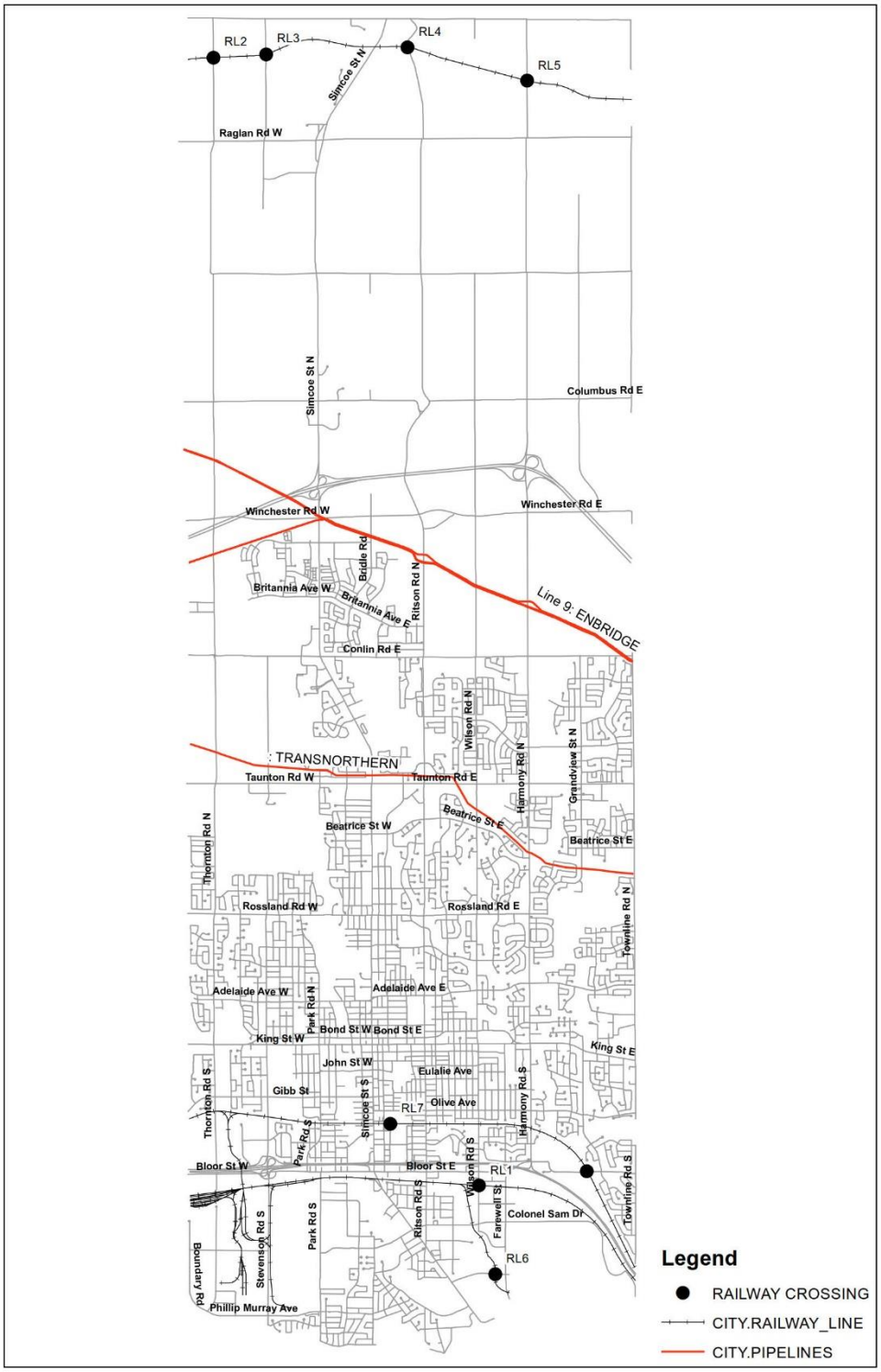


Figure Source: City of Oshawa

Key Finding: Grade level rail crossings could create a physical barrier to the connectivity of the City's road network that can potentially result in a delays in emergency response times.

2.3 Waterways and Conservation Areas

2.3.1 Waterways

Waterways are important from a risk perspective, in part, due to the recreational activities that take place in these settings and the natural hazards that they present, which could require specialized technical rescue emergency responses. There may also be natural hazards, such as flooding, associated with waterways.

The City of Oshawa is situated on the northwestern side of the Lake Ontario shoreline with a waterfront that supports the Oshawa Port, recreational boating and other marine activities. The Oshawa Creek Watershed, which encompasses the Montgomery Creek and Goodman Creek subwatersheds, extending from the Oak Ridges Moraine to Lake Ontario at the Oshawa Harbour. It traverses the City of Oshawa but also flows throughout parts of the Municipality of Clarington, Town of Whitby, and the Township of Scugog.[8]

The City of Oshawa lists creek flooding as one of its most common forms of flooding[9] which can present a potential risk to local residents. Creeks and rivers are also a risk consideration during the winter months, as the frozen streams and rivers can be associated with emergency incidents requiring ice rescue services.

All watershed resources in Oshawa are closely monitored by the Central Lake Ontario Conservation Authority (C.L.O.C.A.). C.L.O.C.A. is responsible for monitoring stream flow, lake and river water levels, ice conditions, ground saturation levels. C.L.O.C.A. also distributes flood and water quality warnings to local municipalities and agencies as needed.

Identified Risk: The presence of waterways within the City of Oshawa creates a potential need for specialized technical ice and water rescue services.

[8] Central Lake Ontario Conservation. (2013, February). Oshawa Creek Watershed Plan (PDF File). Retrieved from https://www.cloca.com/watershed-plans.
[9] City of Oshawa. (n.d.). Flooding. Retrieved from https://www.oshawa.ca/residents/flooding.asp

2.3.1.1 The Port of Oshawa

The Port of Oshawa is a deep-sea port connecting Durham Region to major economic markets worldwide via the Great Lakes St. Lawrence Seaway System. It is a major driver of the local economy in Oshawa generating 6 million dollars annually in federal and provincial taxes and securing close to 300 jobs.[10] The port's loading dock is conveniently located two kilometres from Highway 401 and in close proximity to other modes of circulation and distribution, including the Oshawa Executive Airport and C.N. and C.P. operated rail lines. Over the past decade, the port has handled more than three million metric tonnes of cargo and averages 23 million dollars' worth of cargo on an annual basis.[11] Types of cargo shipped annually include, but are not limited to, a wide range of agricultural products such as liquid asphalt, calcium chloride, potash, road salt and cement.

Like any major port centre, goods delivered by vessel can contain dangerous goods in addition to ordinary goods. In Canada, regulations made under the Canada Shipping Act or under the Transportation of Dangerous Goods Act apply to the movement of dangerous goods. With respect to the movement of dangerous goods, the Oshawa Port, in conjunction with Transport Canada, are responsible for the inspection of any and all sea containers registered as holding these types of materials. Close monitoring of dangerous goods by these agencies is a significant factor in the prevention of dangerous goods incidents that could be harmful to human health, safety, property and the environment. Unlike the transport of goods by rail, the fire department is not typically provided with key information as to the types and quantities of dangerous goods passing through the port. Access to this type of pertinent information would assist the department in delivering the appropriate response to incidents involving dangerous goods at the Port of Oshawa.

In addition to the presence of dangerous goods, there are other safety considerations at the port that O.F.S. would need to be aware of prior to accessing the site (e.g. steel beams, overhanging wires, etc.). Pre-incident planning at this site by Oshawa Fire Services would facilitate building familiarization with the port and its complexities in the instance of a fire or dangerous goods related incident prompting specialized emergency

[10] Hamilton Oshawa Port Authority. (n.d.). Oshawa Facts and Stats. Retrieved from https://www.hopaports.ca/port-facts/cargo-statistics/13137-2/
[11] Ibid.

response. Pre-incident planning is discussed in greater depth within the Fire Master Plan to which this C.R.A. is appended.

The City of Oshawa currently holds an agreement with the Oshawa Harbour Commission (O.H.C.) for the purpose of facilitating and promoting cooperation between the two parties and to establish an ongoing interface between them with the intention to resolve issues and achieve the greatest degree of compatibility. It is important that the City of Oshawa and the O.H.C. continue to strive towards cultivating a cooperative relationship to promote the ongoing safety of residents of the City of Oshawa and its first responders.

Special Consideration: Activities at the Port of Oshawa have been identified as including the potential for dangerous goods transportation that may present a risk to the community.

2.3.2 Conservation Areas

There are four conservation areas in the City of Oshawa: Purple Woods Conservation Area, Cedar Valley Conservation Area, Harmony Valley Conservation Area, and Oshawa Valleylands Conservation Area. Conservation areas are typically included in the assessment of community risk due to the activities that take place within them which may require specialized rescue services. For example, the presence of an escarpment might facilitate activities such as rock climbing that could, at some point, require high angle rescue from fire service personnel. Conservation areas and landforms covering a large area, with few internal roadways, also have the potential to impact emergency response times, as they may require emergency vehicles to travel longer distances around them.

The McLaughlin Bay Wildlife Reserve located adjacent to Lake Ontario is open to the public, offering outdoor recreational activities such as hiking and canoeing in the warmer months and cross-country skiing and skating during winter. The presence of water activities necessitates consideration of water-related hazards. Waterways are discussed further in **Section 2.3.1.**

2.4 Wildland-Urban Interface

N.F.P.A. 1730 identifies wildland-urban interface as geography-based risk for consideration. This interface refers to the area of transition between unoccupied land

and human development. This transition area can be comprised of a mix of woodlots, bush or grass.

Many residential neighbourhoods in Oshawa are located adjacent to wildland areas, specifically in the northern half of the City.

However, based on review of fire loss data for the City for the period of 2014 to 2018, there were only 15 outdoor fires. There does not appear to be a risk of wildfire in the City of Oshawa.

3.0 Building Stock Profile

As referenced in **O. Reg. 378/18**, the building stock profile assessment includes analysis of the types and uses of the building stock within the municipality. Important considerations include the number of buildings of each type, the number of buildings of each use and any building-related risks known to the fire service. There are potential fire risks associated with different types or uses of buildings given the presence or absence of fire safety systems and equipment at the time of construction and maintenance thereafter. This section considers these building characteristics within the City of Oshawa.

3.1 Ontario Building Code Occupancy Classifications

O.F.M.E.M. T.G.-02-2019 encourages fire departments to consider the potential fire related risks associated with different building occupancy types and building uses. This includes consideration of their prevalence within a community and the presence of fire and life safety systems and equipment. The Ontario Building Code (O.B.C.) categorizes buildings by major occupancy classification to distinguish it from other occupancy classifications. Utilizing the O.B.C. major building occupancy classifications is consistent with the intent of T.G.-02-2019 to provide a recognized definition and baseline for developing a community risk assessment.

The O.B.C. is divided into six major building occupancy classifications (groups). Within each group the occupancies are further defined by division. The O.B.C. major classification groups and divisions are presented in **Table 1**.

Table 1: O.B.C. Major Occupancy Classifications

Group	Division	Description of Major Occupancies
Group A	1	Assembly occupancies intended for the production and viewing of the performing arts
Group A	2	Assembly occupancies not elsewhere classified in Group A
Group A	3	Assembly occupancies of the arena type
Group A	4	Assembly occupancies in which occupants are gathered in the open air
Group B	1	Detention occupancies
Group B	2	Care and treatment occupancies
Group B	3	Care occupancies
Group C	---	Residential occupancies
Group D	---	Business and personal services occupancies
Group E	---	Mercantile occupancies
Group F	1	High-hazard industrial occupancies
Group F	2	Medium-hazard industrial occupancies
Group F	3	Low-hazard industrial occupancies

Source: Ontario Building Code[12]

3.2 O.F.M.E.M. Fire Risk Sub-Model Occupancy Classifications

The Fire Risk Sub-model developed by the O.F.M.E.M. utilizes the major group classifications (i.e. Group A, B, C, D, E, F), but does not use the detailed division classifications as included in the O.B.C. This strategy provides the ability to assess buildings within a community comparatively by major occupancy groups, thus providing a consistent and recognized definition for each major occupancy type. This strategy provides the opportunity for further analysis of a specific occupancy group. Subject to any site specific hazards or concerns, occupancies within this group can be assessed individually and then included where required within the scope of the broader Community Risk Assessment. The O.F.M.E.M. Fire Risk Sub-Model O.B.C. classifications, definitions and associated fire related risks are presented in **Table 2** along with potential proactive measures to reduce risk within these occupancy types.

[12] Ontario Regulation 332/12: Building Code, Part III Fire Protection, Occupant Safety and Accessibility, Section 3.1.2.1.

Table 2: O.F.M.E.M. Fire Risk Sub-Model Major Building Classifications

O.B.C. Occupancy Classification	O.F.M.E.M. Fire Risk Sub-Model Major Building Classifications	O.F.M.E.M. Definitions	O.F.M.E.M. Fire Related Risks	Proactive Measures for Reducing Risk
Group A	Assembly Occupancies	An assembly occupancy is defined as one that is used by a gathering of persons for civic, political, travel, religious, social, educational, recreational or like purposes or for the consumption of food or drink.	Assembly buildings are often occupied by a large number of people and may contain high quantities of combustible furnishings and decorations. Occupants are generally unfamiliar with the building's exit locations and may not know how to react in the event of an emergency. Low light conditions are inherent to some of these occupancies and can contribute to occupant confusion during an evacuation. Numerous examples exist of disastrous events that have occurred throughout the world, resulting in multiple fire fatalities in these occupancies. Therefore, these facilities warrant special attention. Accordingly, it is paramount to ensure that maximum occupant load limits are not exceeded, detection is available, an approved fire safety plan is in place and adequate unobstructed exits/means of egress are readily available.	• Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved fire safety plan and staff training • Pre-planning by fire suppression staff
Group B	Care or Detention Occupancies	A care or detention occupancy means the occupancy or use of a building or part thereof by persons who: Are dependent on others to release security devices to permit egress; Receive special care and treatment; or Receive supervisory care.	In addition to the presence of vulnerable occupants, these occupancies may contain quantities of various flammable/combustible liquids and gases, oxidizers and combustible furnishings that will impact the intensity of the fire if one should occur. The evacuation or relocation of patients, residents or inmates to an area of refuge during an emergency poses additional challenges in these facilities. It is essential to ensure that properly trained staff is available and prepared to quickly respond according to the facility's approved fire safety plan.	• Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved Fire Safety Plan and staff training • Pre-planning by fire suppression staff
Group C	Residential Occupancies	A residential occupancy is defined as one that is used by persons for whom sleeping accommodation is provided but who are not harboured or detained to receive medical care or treatment or are not involuntarily detained.	In Ontario, residential occupancies account for 70% of all structural fires and 90% of all fire deaths. Residential units that are located in multi-unit buildings, including secondary units in a house, pose additional risks due to egress and firefighting accessibility challenges.	• Home smoke alarm programs • Public education programming including home escape planning • Retro-fit and compliance inspection cycles for O.F.C. compliance • Pre-planning by fire suppression staff • Fire Drills as required by the O.F.C.

O.B.C. Occupancy Classification	O.F.M.E.M. Fire Risk Sub-Model Major Building Classifications	O.F.M.E.M. Definitions	O.F.M.E.M. Fire Related Risks	Proactive Measures for Reducing Risk
Group D	Business & Personal Services	A business and personal services occupancy is defined as one that is used for the transaction of business or the rendering or receiving of professional or personal services.	Many office buildings are occupied by a large number of people during business hours and contain high combustible content in the form of furnishings, paper, books, computers and other office equipment/supplies. Those that are located in a high-rise building pose additional risks due to egress and firefighting challenges.	• Regular fire prevention inspection cycles to maintain O.F.C. compliance • Targeted fire prevention inspections for O.F.C. retro-fit compliance • Staff training in fire prevention and evacuation procedures • Public education programs • Pre-planning by fire suppression staff
Group E	Mercantile	A mercantile occupancy is defined as one that is used for the displaying or selling of retail goods, wares or merchandise.	Larger mercantile occupancies such as department stores are generally occupied by a large number of people and contain high quantities of combustibles in the form of merchandise, furnishings and decorations. Customers may be unfamiliar with the building's exit locations and not know how to react in the event of an emergency. Additional hazards will be present in "big box" type stores that sell and store large volumes of combustible materials in bulk. These stores generally have similar properties to industrial warehouses with the additional hazard of higher number of occupants.	• Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved Fire Safety Plan and staff training • Pre-planning by fire suppression staff
Group F	High/Medium/Low Hazard Industrial	An industrial occupancy is defined as one for the assembling, fabricating, manufacturing, processing, repairing or storing of goods and materials. This category is divided into low hazard (F3), medium hazard (F2) and high hazard (F1) based on its combustible content and the potential for rapid fire growth.	These occupancies constitute a special fire hazard due to their high levels of combustible, flammable or explosive content and the possible presence of oxidizing chemicals and gases. Processing and other activities that involve various ignition sources often occur in these occupancies. The lack of security during non-operational hours also makes them susceptible to incendiary type fires. Industrial fires generally involve large quantities of combustible materials and potentially result in large financial losses (e.g. building, contents) and significant damage to the community's environment and economic well-being (e.g. loss of jobs).	• Regular fire prevention inspection cycles • Staff training in fire prevention and evacuation • Public education • Pre-planning by fire suppression staff • Installation of early detection systems (e.g., fire alarm systems, heat detectors) • Installation of automatic sprinkler

O.B.C. Occupancy Classification	O.F.M.E.M. Fire Risk Sub-Model Major Building Classifications	O.F.M.E.M. Definitions	O.F.M.E.M. Fire Related Risks	Proactive Measures for Reducing Risk
				systems • Approved Fire Safety Plans • Preplanning by fire suppression staff • Fire extinguisher training
Other	Other Properties	In addition to gathering information on building related risks, attention should also be given to other property types, particularly those that contain large quantities of combustible materials. Propane storage facilities, outdoor tire storage yards, grasslands/forests, plastic recycling depots are examples of properties that could severely impact a community and its environment if involved in a fire. Major highways and railway lines used to transport high volumes of traffic and perhaps large quantities of hazardous chemicals also warrant serious consideration.		

Source: O.F.M.E.M. Fire Risk Sub-Model[13]

[13] Office of the Fire Marshall and Emergency Management. (2016, February). Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model. Retrieved from https://www.mcscs.jus.gov.on.ca/english/FireMarshal/FireServiceResources/ComprehensiveFireSafetyEffectivenessModel/FireRiskSub-Model/Fire_risk_submodel.html

3.2.1 City of Oshawa Existing Major Building Classification Summary

Analysis of the City of Oshawa's existing major building occupancy types was conducted through a review of the Municipal Property Assessment Corporation (M.P.A.C.) property data as provided by the City of Oshawa. In comparison to Statistics Canada 2016 Census data, a discrepancy was identified related to residential dwellings which can be attributed to individual condominium units versus apartment buildings being assessed for property tax purposes. **Table 3** illustrates a summary of the City's existing major building occupancy classifications

As shown, the majority of the City's existing property stock is comprised of Group C - Residential Occupancies (93.41%) represented by 50,393 residential property parcels. The second largest occupancy type within the City is Group F –Industrial Occupancies (combined Low [0.03%], Medium [1.00%] and High Hazard [0.02%]) accounting for 1.05% of the City's property stock. There is also a comparatively small number of Group A – Assembly Occupancies (267), Group E – Mercantile (431) and Group D – Business (234) and a small number of mixed use Group E/D property parcels (33).

In addition, there are a number of parcels that are classified as farms under the National Farm Building code and some that are vacant or open space (e.g., park land, right-of-way, etc.).

There are 24 Group B – Care or Detention Occupancies in the City of Oshawa based on property parcel data. Through the analysis conducted for this C.R.A., it was identified that some Vulnerable Occupancies (V.O.) are considered Group C - Residential Occupancies according to M.P.A.C. data. In addition, not all registered City of Oshawa V.O.s are Group B - Care or Detention Occupancies. The property stock analysis presented in the table reflects a confirmation of occupancy types of these properties in consultation with the O.F.S.

Table 3: City of Oshawa Existing Property Stock

O.B.C. Occupancy Classification	O.F.M.E.M. Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Percentage of Occupancies
Group A	Assembly Occupancies	267	0.49%
Group B	Care or Detention Occupancies	24	0.04%
Group C	Residential Occupancies	50,393	93.41%
Group D	Business	234	0.43%
Group E	Mercantile	431	0.80%
Group F Division 3	Low-Hazard Industrial	16	0.03%
Group F Division 2	Medium-Hazard Industrial	538	1.00%
Group F Division 1	High-Hazard Industrial	9	0.02%
Group F (all Divisions combined)	Industrial Occupancies	563	1.05%
Group C/D/E/F	Mixed Use C/D/E/F	2	0.00%
Group E/D	Mixed Use E/D	33	0.06%
Farm	Classed under National Farm Building Code	6	0.01%
Vacant	Vacant	1,996	3.70%
Total		**53,949**	**100.00%**
Source: City of Oshawa, Municipal Property Assessment Corporation Data			

Group C - Residential Occupancies represent the most prominent type of building occupancy type within the City of Oshawa which is consistent with most municipalities across Canada. Within Ontario, information provided by the O.F.M.E.M. (as described in **Table 31** of **Section 10.0** – **Past Loss and Event History Profile**) indicates that the majority of structure fires over the five year period from January 1st, 2014 to December 31st, 2018, occurred within Group C - Residential Occupancies. This trend is also reflected in the fire loss data for the City of Oshawa, where 82.56% of structure fires occurring over the five year period from January 1st, 2014 to December 31st, 2018 have taken place in residential dwellings.

Products related to farming are processed on these properties which also contain residential buildings and a business or mercantile occupancy for the sale of items processed nearby. These are separate buildings and facilities within the same property parcel.

Identified Risk: Group C - Residential Occupancies represent 93.41% (50,393) of the City's existing property stock, and over the five year period from January 1st, 2014 to December 31st, 2018 were associated with 82.56% (322) of the structure fires within the City.

Table 4 illustrates a comparison of the City's existing Group C- Residential building stock with that of the Province based on the 2016 Statistics Canada Census. This analysis highlights that the existing residential building stock within the City is very similar to that of the Province. The City has a slightly higher percentage of single detached – houses of 55.58% compared to the Province of 54.31%.

In contrast, the City has a lower number of apartments in buildings of five storeys or more of 11.41% compared to the Province of 17.15%. The City also has a higher percentage of other attached dwellings of 33.00% compared to that of the Province of 28.25%.

Table 4: Group C- Residential Building Stock Comparison

	Oshawa		Ontario	
Structural Dwelling Type	**Total Dwellings**	**Total % Dwellings**	**Total Dwellings**	**Total % Dwellings**
Single-detached house	34,790	55.58%	2,807,380	54.31%
Apartment in a building that has five or more storeys	7,145	11.41%	886,705	17.15%
Movable dwelling	5	0.01%	14,890	0.29%
Other attached dwellings[14]	20,655	33.00%	1,460,200	28.25%
Semi-detached house	5,285	8.44%	289,975	5.61%
Row house	5,650	9.03%	460,425	8.91%
Apartment or flat in a duplex	3,430	5.48%	176,080	3.41%
Apartment in a building that has fewer than five storeys	6,145	9.82%	522,810	10.11%
Other single-attached house[15]	140	0.22%	10,910	0.21%
Total	**62,595**	**100.00%**	**5,169,175**	**100.00%**

Source: 2016 Census, Statistics Canada[16]

[14] The category 'Other attached-dwelling' is a subtotal of the following categories: semi-detached house, row house, apartment or flat in a duplex, apartment in a building that has fewer than five storeys and other single-attached house.
[15] The category 'other single-attached house' addresses houses attached to non-residential buildings and to account for single houses attached to multi-unit or multi-purpose buildings.
[16] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

3.3 Building Density and Exposure

N.F.P.A. 1730 lists building density as a key factor for understanding potential fire risk with particular consideration given to core areas (downtown). Closely spaced buildings, typical of historic downtown core areas and newer infill construction, may have a higher risk of a fire spreading to an adjacent exposed building. In a built up area with minimal building setbacks, a fire originating in one building could extend to a neighbouring structure due to the close proximity. The close proximity of buildings can also impede firefighting operations due to the limited access for firefighters and equipment.

As shown in **Table 4**, the City also has a higher percentage of other attached dwellings of 33.00% compared to that of the Province of 28.25%. The City has a number of existing areas where the presence of building density and potential exposure as a result of minimal setbacks should be highlighted. These include the downtown core that contains mixed use occupancies including some Group C- Residential and commercial uses. These areas may be further impacted by infill construction and intensification. Existing residential areas that include other attached dwellings such as townhouses, row houses and apartments with less than five storeys should be highlighted for potential exposure risks. O.F.S. has indicated that there are many townhouses located in the north Oshawa area that present potential exposure related risks.

Key Finding: The City includes areas of building stock that have higher density and, as such, greater potential for exposure in the event of a fire.

3.4 Building Age and Construction

The O.B.C. was adopted in 1975, and the Ontario Fire Code (O.F.C.) was adopted in 1981. Together, these two codes have provided the foundation for eliminating many of the inconsistencies in building construction and maintenance that were present before their adoption.

The O.B.C. and the O.F.C. were developed to ensure that uniform building construction and maintenance standards are applied for all new building construction. The codes also provide for specific fire and life safety measures depending on the use of the building.

Examples of the fire and life safety issues that are addressed include:

- Occupancy;
- exits/means of egress including signs and lighting;
- fire alarm and detection equipment;
- fire department access; and
- inspection, testing, and maintenance.

In many situations the age and construction of a building can be directly associated with whether the building was constructed prior to, or after the introduction of these codes. For example, during the late 19th century and early 20th century, balloon frame construction was a common wood framing technique that was used in both residential and small commercial construction. This technique allowed for exterior walls to be continuous from the main floor to the roof in some cases extending multiple stories through a building. The result was the potential for fire and smoke to spread unobstructed from the basement to the roof of a building. In many cases, the result was a fire that started in the basement spreading to the roof very quickly and without the knowledge of building occupants or fire service personnel. The O.B.C. implemented requirements to change this construction method and introduce additional requirements to mitigate the potential of fire spread through wall cavities.

Similarly, the new codes have recognized new construction techniques such as light weight wood frame construction. This includes the use of wood trusses to replace conventional wood frame roofing techniques and new construction materials including Laminated Veneer Lumber (L.V.L.) that is a high strength engineered wood product now used commonly in residential and commercial buildings. Although these techniques and materials have enhanced the efficiency and cost of construction, this construction presents very different challenges to firefighters from those of historical construction methods. For example, the light weight wood frame construction used in an engineered wood truss roof system relies on all of the structural components to work together. In the event one of the components fails due to exposure to high heat or fire, the result is the potential for the entire roof system to fail.

In addition to building construction, fire growth rate depends on the flammability of the materials and contents within the building which introduces variances into the growth rates presented above.

The impact of increasing fire growth rates is directly related to the time lapse from ignition to flashover when the combustible items within a given space reach a temperature that is sufficiently high for them to auto-ignite.

Listed in **Table 5**, are fire growth rates measured by the time it takes for a fire to reach a one megawatt (M.W.) fire. Fire growth rate depends on the flammability of the materials and contents within the building which introduces variances into the growth rates presented below.

Table 5: Time to Reach 1 M.W. Fire Growth Rates in the Absence of Fire Suppression

Fire Growth Rate	Time in Seconds to Reach 1 M.W.	Time in Seconds to Reach 2 M.W.
Slow	600 seconds	848 seconds
Medium	300 seconds	424 seconds
Fast	150 seconds	212 seconds

Source: O.F.M.E.M, Operational Planning: An Official Guide to Matching Resource Deployment and Risk Workbook.[17]

In addition to building construction, fire growth rate depends on the flammability of the materials and contents within the building which introduces variances into the growth rates presented above. The impact of increasing fire growth rates is directly related to the time lapse from ignition to flashover when the combustible items within a given space reach a temperature that is sufficient high for them to auto-ignite. The graph in **Figure 7** (below) highlights the exponential increase in fire temperature and the potential for loss of property/loss of life with the progression of time.

[17] Office of the Fire Marshal and Emergency Management. (2017, May). Operational Planning: An Official Guide to Matching Resource Deployment and Risk Workbook. Retrieved from http://www.mcscs.jus.gov.on.ca/english/FireMarshal/FireServiceResources/PublicFireSafetyGuidelines/04-08-10at1.html

Figure 7: Fire Propagation Curve

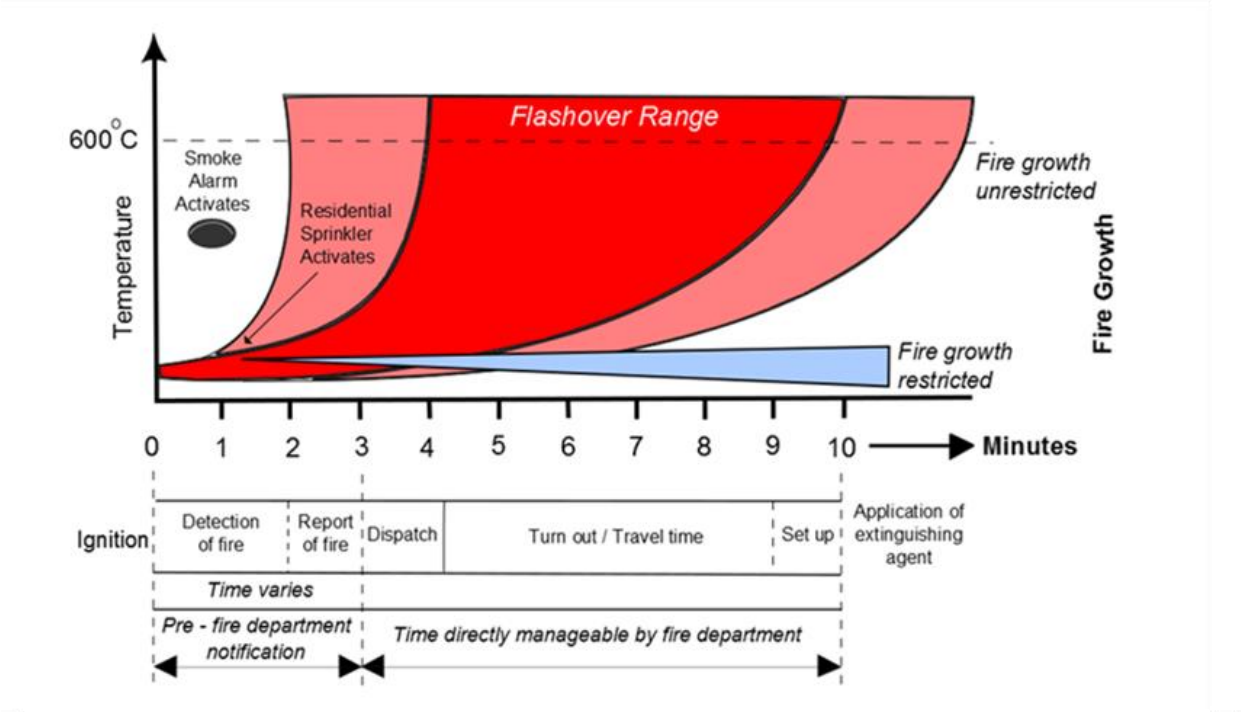


Figure Source: Fire Underwriters Survey "Alternative Water Supplies for Public Fire Protection: An informative Reference Guide for Use in Fire Insurance Grading" (May 2009) and N.F.P.A. "Fire Protection Handbook" (2001)

Understanding building construction and building materials is a critical component for firefighters in determining the appropriate type of fire attack and safety measures that need to be in place. As such, having knowledge of the age of a building may be directly related to the type of construction methods and materials used to build it, making building age and construction an essential component of this Community Risk Assessment.

Table 6 and **Figure 8** illustrate the age of residential buildings (2016 Census Data) within the City prior to the new codes, and in comparison to the Province of Ontario. This analysis indicates that 62.60% of the City's residential building stock was built prior to 1981, preceding the adoption of the 1981 Ontario Fire Code. This represents a fire risk within the community. By comparison, 53.06% of the residential building stock in the Province was built prior to this date suggesting that the City of Oshawa has an older building stock when compared to the Province.

Table 6: Period of Construction of Residential Dwellings – Oshawa and Ontario

	Oshawa		Ontario	
Period of Construction	**Total Dwellings**	**% Dwellings**	**Total Dwellings**	**% Dwellings**
Prior to 1960	16,350	26.12%	1,293,135	25.02%
1961 to 1980	22,835	36.48%	1,449,585	28.04%
1981 to 1990	7,810	12.48%	709,135	13.72%
1991 to 2000	5,045	8.06%	622,565	12.04%
2001 to 2005	3,220	5.14%	396,130	7.66%
2006 to 2010	3,925	6.27%	368,235	7.12%
2011 to 2016	3,400	5.43%	330,390	6.39%
Total	**62,595**	**100.00%**	**5,169,175**	**100.00%**

Source: 2016 Census, Statistics Canada[18]

[18] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

Figure 8: Period of Construction of Residential Dwellings – Oshawa and Ontario

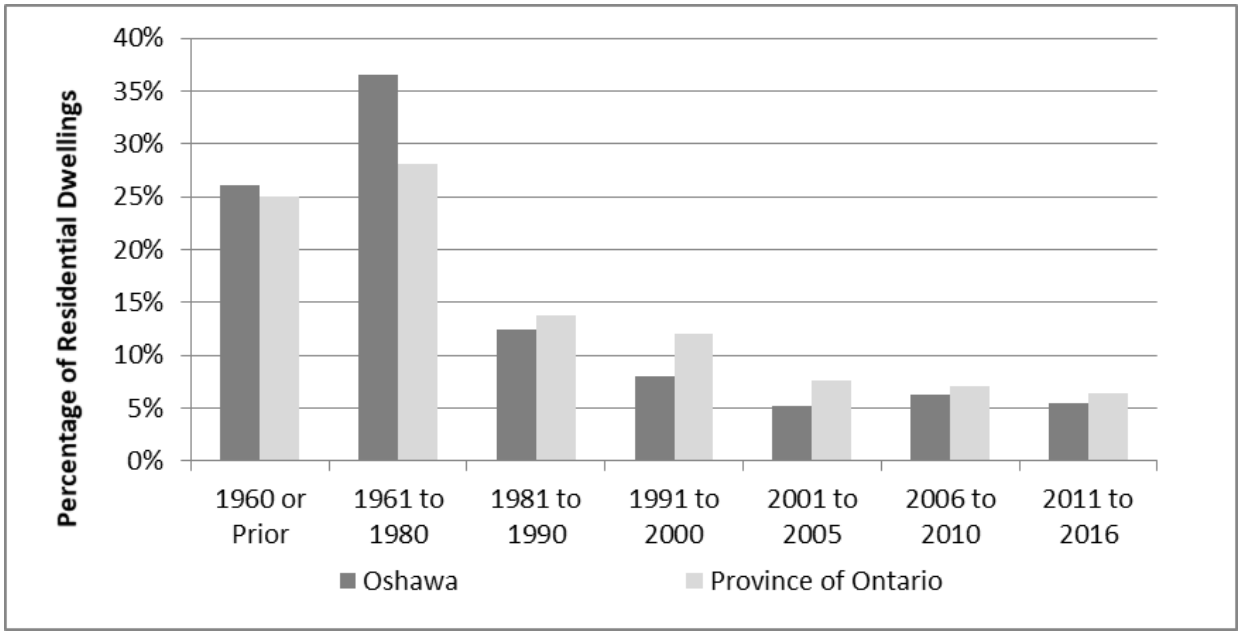


Figure Source: 2016, Census, Statistics Canada[19]

Identified Risk: The 2016 Census data indicates that 62.60% (39,185) of the City's Group C-Residential building stock was built prior to the introduction of the 1981 Ontario Fire Code and Ontario Building Code compared to 53.06% (2,742,720) of residential building stock in the remainder of the Province.

3.5 Building Height and Area

Buildings that are taller in height, or contain a large amount of square footage (building footprint) can have a greater fire loss risk and life safety concern. One of the unique characteristics and risks of tall / multi-storey buildings is known as the "stack effect". This is characterized as vertical air movement occurring throughout the building, caused by air flowing into and out of the building, typically through open doors and windows. The resulting buoyancy caused by the differences between the indoor/outdoor temperature and elevation differences causes smoke and heat to rise within the building. This can be directly related to the high percentage of deaths that occur in high-rise buildings as a result of smoke inhalation.

[19] Ibid.

The nature of taller buildings also brings the presence of higher occupant loads and higher fuel loads due to the quantity of furnishings and building materials.

Efficient evacuation can also be a challenging process due to a lack of direction, signage, knowledge, or familiarity of the occupants which may result in overcrowding of stairways and exit routes.

Ensuring all required fire and life safety systems are in place and functioning is a priority for these occupancies. Taller buildings can experience extended rescue / fire suppression response times for firefighters to ascend to the upper levels. This is commonly referred to as “vertical response” representing the time it takes for firefighters to gain entry into the building and ascent to the upper floors by the stairwells. Options such as “shelter-in-place” whereby occupants are directed by the fire department to stay within their units can be an effective life safety strategy. However, ensuring internal building communications systems are in place and functioning is critical to the success of this strategy. Targeted public education campaigns addressing strategies like shelter-in-place are also critical to educating building occupants.

Building area can cause comparable challenges as those present in taller buildings. Horizontal travel distances rather than vertical can mean extended response times by firefighters attempting rescue or fire suppression activities in buildings with a very large footprint.

3.5.1 Building Height

3.5.1.1 Defining High-Rise Buildings

It is important to note that there are a variety of metrics associated with the terms “high rise”, “tall buildings” and “high buildings.” Some key definitions are outlined in **Table 7**.

Table 7: Summary of High-Rise Building Height Metrics

Source	Simplified Definition
Ontario Building Code/Ontario Fire Code	A building with its floor level 18 metres (59 feet) above grade, or 6 storeys
N.F.P.A. 1710: Standard for the Organization and Deployment of Fire Suppression Operations	Building height greater than 75 feet (23 metres), or 7 storeys
Statistics Canada*	Buildings with 5 or more storeys
*Statistic Canada's references to building height are not focused on a strict definition of building height consideration but to provide insight as to the overall built form of housing within a community.	

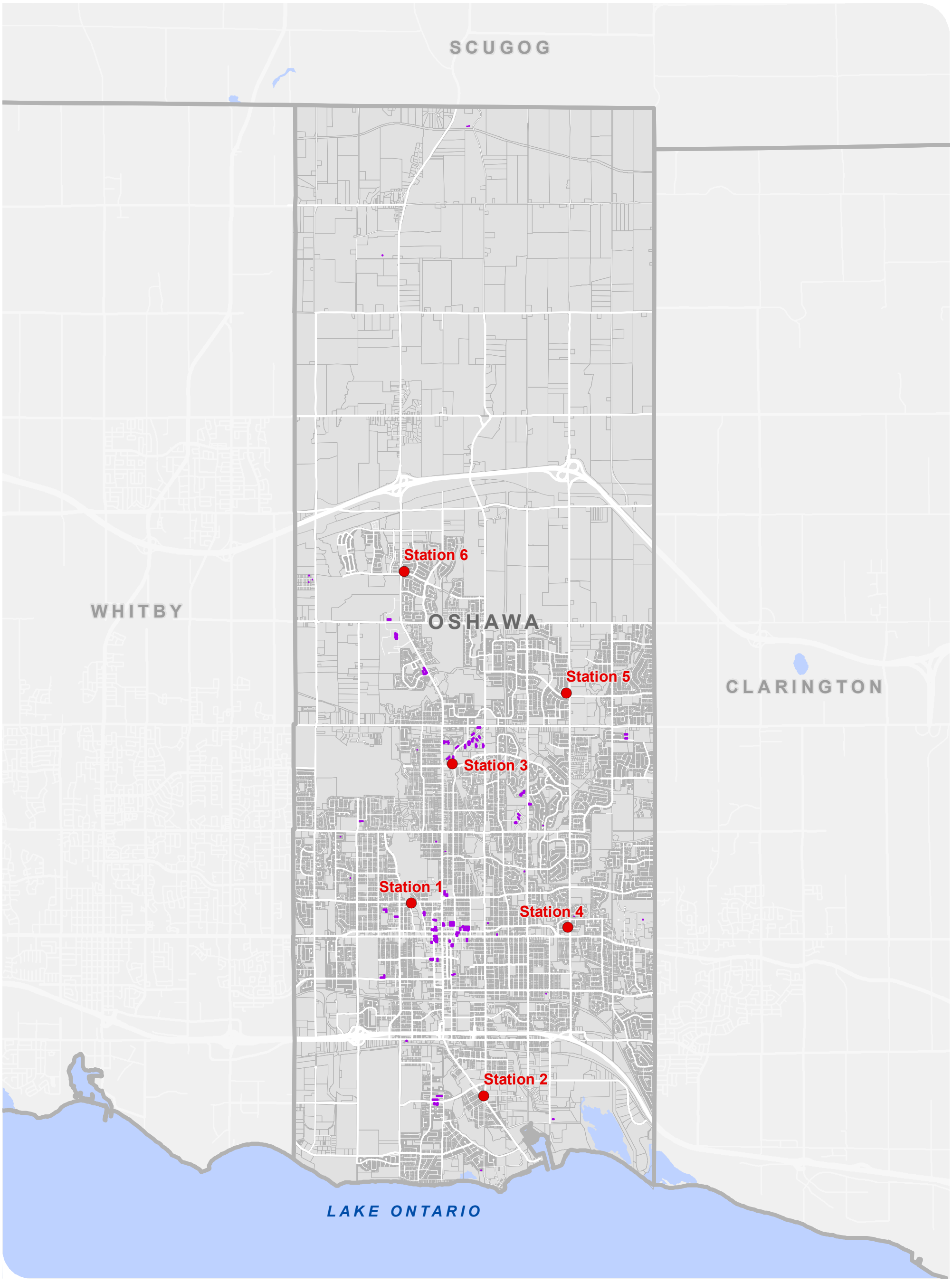
The variance in these definitions is directly related to the different applications required by these organizations. For example, the O.B.C. has detailed considerations to define a high-rise building based on the occupancy classification, floor area and occupant load. Within all occupancy classifications, additional O.B.C. requirements apply when a building is or exceeds 18 meters in height.

Within the data collection process to prepare this C.R.A. the application of these different definitions was confirmed by the City. The O.B.C. definition is applied by departments that work within the building, planning and development areas of the City, whereas O.F.S. utilizes the definition of the N.F.P.A. 1710 standard to define high-rise buildings. In our experience, in other municipalities this is not uncommon and relates directly to the regulatory and operational responsibilities of the City.

For the purposes of developing this C.R.A., the O.B.C. definition has been used to analyse building height within the City. For the purposes of developing the accompanying Fire Master Plan the N.F.P.A. 1710 standard will be applied.

3.5.1.2 Mapping Building Height

As part of the data provided for this C.R.A., the City provided building height data from which buildings with a height greater than 18 metres were identified, reflecting a high-rise occupancy per Section 3.2.6 of the O.B.C. For the purposes of this analysis, it has been assumed that buildings 18 metres or less (roughly 5 storeys or less) are not considered high-rise. Buildings identified with a height at or in excess of 18 metres are illustrated in **Figure 9**.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

BUILDING HEIGHTS
FIGURE 9

Final Draft March 2020

Existing Fire Station
Identified High-Rise Occupancy
Parcel Boundary
Water Body

Note: Identified high-rise occupancies were classified as buildings with a height equal to or greater than 18 m.

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

N W E S

PROJECT: 191064 STATUS: DRAFT DATE: 2019-11-01

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Building Height.mxd

In total, 76 buildings as defined by the O.B.C. were identified as high-rise buildings. As shown, the buildings identified as high-rise are distributed within the urban area of the City, with several located in the downtown area.

Identified Risk: The City currently has 76 building defined by the O.B.C. as high-rise buildings with a floor level 18 metres (59 feet) above grade, or 6 storeys. These buildings are distributed within the urban area with several located in the downtown area.

3.5.2 Building Area

Building area can cause comparable challenges as those present in taller buildings. Horizontal travel distances rather than vertical can mean extended response times by firefighters attempting rescue or fire suppression activities. Large buildings, such as industrial plants and warehouses, department stores, and big box stores, can also contain large volumes of combustible materials. In many of these occupancies the use of high rack storage is also present. Fires within this type of storage system can be difficult to access and may cause additional risk to firefighter safety, due to collapse-related risks.

As part of the data collection process, City staff were able to provide building footprint data for the City of Oshawa. The information presented in **Table 8** indicates that the majority of building stock (93.2%) have a total building area (footprint) of 2,500 square feet or less. This summary also indicates that 0.2% (91) buildings have an area greater than 50,000 square feet (approximately 4,645 square meters).

Table 8: Building Area

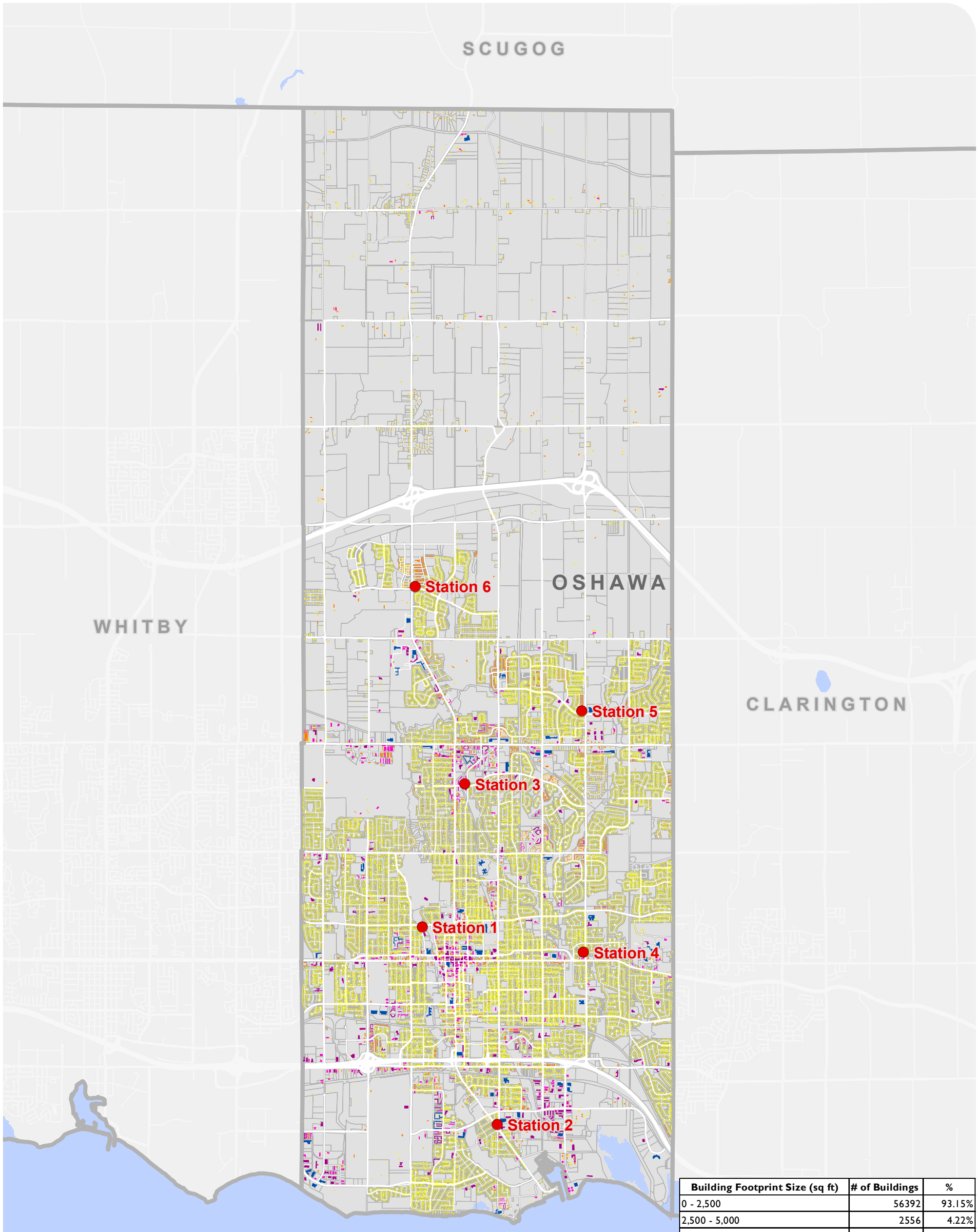
Building Size (Square Feet)	# of Buildings	% of all Buildings
0-2,500	56,392	93.15%
2,500-5,000	2,556	4.22%
5,000-10,000	892	1.47%
10,000-20,000	391	0.65%
20,000-50,000	215	0.36%
>50,000	91	0.15%
Total	**60,537**	**100.00%**

Source: City of Oshawa, Building Elevations Spreadsheet (includes building area in square feet).

3.5.2.1 Mapping Building Area

As part of the data provided for this C.R.A., the City provided building area in square feet. **Table 8** provided a breakdown of the number of buildings based on building footprint area. Based on this analysis, the vast majority of building footprints (93.2%) are 2,500 square feet or less. **Figure 10** illustrates these findings further, showing that the buildings with a larger footprint are dispersed mainly throughout the urban area of the City and are consistent with the commercial and industrial land use areas such as the area south of Highway 401 and along Taunton Road.

Identified Risk: The City has 91 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). These buildings are predominantly located in the commercial and industrial land use areas such as the area south of Highway 401 and along Taunton Road.



Building Footprint Size (sq ft)	# of Buildings	%
0 - 2,500	56392	93.15%
2,500 - 5,000	2556	4.22%
5,000 - 10,000	892	1.47%
10,000 - 20,000	391	0.65%
20,000 - 50,000	215	0.36%
> 50,000	91	0.15%
Total	60537	100%

CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

BUILDING AREA
FIGURE 10

Final Draft March 2020

Existing Fire Station
Parcel Boundary
Water Body

Building Footprint Area (sq ft)

0 - 2,500
2,500 - 5,000
5,000 - 10,000
10,000 - 20,000
20,000 - 50,000
> 50,000

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-29

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Building Footprint.mxd

3.6 Potential High-Fire Risk Occupancies

Potential high-fire risk occupancy is another factor for consideration within a City's building stock. High fire risk can be linked to a combination of factors such as building density (exposures), building age, and construction. Fuel load typically refers to the amount and nature of combustible content and materials within a building. This can include combustible contents, interior finishes as well as structural materials. Combustible content tends to create the greatest potential fire loss risk. Higher fuel loads results in increased fire loss risk due to increased opportunity for ignition and increased fire severity. In many communities large amounts of fuel load can be contained within a single occupancy, such as a building supply business, within a large multi-unit residential building, or within a historic downtown core. This section of the Community Risk Assessment will focus primarily on fuel load for industrial occupancies.

In terms of industrial occupancies, the O.F.S. has identified several occupancies with a fuel load concern, primarily those providing distribution and storage services for propane. In total, there are seven propane facilities registered through the Technical Standards and Safety Authority (T.S.S.A), the governing body that regulates these facilities. In terms of local fire department involvement, different levels of facilities require different levels of involvement from a local fire department for servicing purposes. The O.F.S. is aware of these facilities which are located in the following areas:

- 1818 Simcoe Street North
- 1279 Simcoe Street North
- 540 Taunton Road East
- 1333 Wilson Road North
- 1277 Wilson Road North
- 130 Ritson road North
- 325 Bloor Street West

Buildings with potential fuel load concerns as identified by O.F.S. are presented in **Table 9.** O.F.S. identified several occupancies with fuel load concerns as being lumber retail facilities or storage yards in addition to several fuel depots. As mentioned in **Section 3.4 – Building Age and Construction**, fire growth rate is dependent upon the

flammability of materials and contents within a building. Various material forms including fuels are carried in stock inside these facilities (e.g. lumber).

Table 9: Potential High-Fire Risk Occupancies

Address	Facility Name/Organization	Risk Description
328 Ritson Road South	Peacock Lumber	Lumber Yard
1481 Harmony Road North	Home Depot	Retail / Lumber Internal
685 Laval Drive	Lowes	Retail / Lumber Internal
999 Boundary Road	Kruger Products	Paper Distribution Center
1240 Skae Drive	Velcan Forest Products	Saw Mill / Wood Products
1181 Thornton Road South	Direct Timber	Wood Products
190 Wentworth Street East	Petro-Pass Truck	Fuel Depot
700 Raleigh Avenue	Kal Tire	Manufacturer / Retreading
1515 Thornton Road North	Recycling Facility	Recycling Facility
Farewell Street	Oshawa Harbour West	Shipping/Receiving/Storage
Multiple Locations	Canadian Tire Propane Fill Stations	Fuel

Source: O.F.S.

In addition to ensuring compliance to the requirements of the O.B.C. and the O.F.C., there are operational strategies that a fire service can implement to address fuel load concerns. These include regular fire inspection cycles and pre-planning of buildings of this nature to provide an operational advantage in the event of fire.

Key Finding: O.F.S. identified several properties within Oshawa as having an increased potential for high fire risk in regards to fuel load.

3.7 Occupancies with Potential High Fire Life-Safety Risk

Fire risk does not affect all people equally. Those who are at an increased risk of fire injury or fatality are known as vulnerable individuals. In the event of a fire, these individuals may be unable to self-evacuate and/or require assistance in their evacuation efforts. Identifying the location and number of vulnerable individuals or occupancies within the community provides insight into the magnitude of this particular demographic within a community.

From an occupancy perspective, vulnerable occupancies contain vulnerable individuals who may require assistance to evacuate in the event of an emergency due to cognitive or physical limitations, representing a potential high-life safety risk. As part of its registry of vulnerable occupancies, the O.F.M.E.M. defines vulnerable occupancy as any care occupancy, care and treatment occupancy, or retirement home regulated under the Retirement Homes Act.

These occupancies house individuals such as seniors or people requiring specialized care. It is important to note, however, that **not all vulnerable individuals live in vulnerable occupancies**; for example, some seniors who are vulnerable due to physical limitation can live on their own or in subsidized housing making them a key demographic to reach.

3.7.1 Registered Vulnerable Occupancies

Ontario Regulation 150/13: Fire Code, which amends **Ontario Regulation 213/07: Fire Code**, identifies vulnerable occupancies as care, care and treatment and retirement homes. This includes hospitals, certain group homes and seniors' residences and long term care facilities. The regulation requires fire departments to perform annual inspection, approve and witness fire drill scenarios and file certain information regarding the occupancy with the Fire Marshal's office. **Table 10** provides a list of registered vulnerable occupancies within the City of Oshawa. As referenced in **Section 3.2.1 – City of Oshawa Existing Major Building Classification Summary,** a registered Vulnerable Occupancy could fall into different occupancy types such as Group B – Care or Detention or Group C – Residential.

Table 10: Registered Vulnerable Occupancies

Property Name	Occupancy Type	Location
Carriage House	Retirement Home	60 Bond Street East
Cedarcroft Retirement Home	Retirement Home	649 King Street East
Centennial Retirement Home	Retirement Home	259 Hillcroft Street
Chartwell Wynflied Retirement Residence	Retirement Home	431 Woodmount Drive
Christian Horizons	Care occupancy – group home for adults	75 Southwood Street
Christian Horizons	Care occupancy – group home for adults	1285 Harmony Road North
Christian Horizons	Care occupancy – group home for adults	837 Somerville Street
Christian Horizons	Care occupancy – group home for adults	11 Ridgetop Court
Christian Horizons	Care occupancy – group home for adults	1143 Wakefield Drive
Community Living Oshawa/Clarington	Care occupancy – group home for adults	488 Rossland Road West
Community Living Oshawa/Clarington	Care occupancy – group home for adults	844 Bessborough Drive
Community Living Oshawa/Clarington	Care occupancy – group home for adults	425 Adelaide Avenue East
Community Living Oshawa/Clarington	Care occupancy – group home for adults	209 Killdeer Street

Property Name	Occupancy Type	Location
Community Living Oshawa/Clarington	Care occupancy – group home for adults	821 Central Park Boulevard North
Community Living Oshawa/Clarington	Care occupancy – group home for adults	1035 Olive Avenue
Community Living Oshawa/Clarington	Care occupancy – group home for adults	881 Pinecrest Road
Community Living Oshawa/Clarington	Care occupancy – group home for adults	380 Holcan Avenue
Deafblind Ontario	Care occupancy	1133 King Street East
Durham Association for Family Respite Services	Care occupancy	743 Ashley Court
Extendicare	Care and treatment occupancy – Long-term care home	82 Park Road North
Hillsdale Estates	Care and treatment occupancy – Long-term care home	590 Oshawa Boulevard North
Hillsdale Terraces	Care and treatment occupancy – Long-term care home	600 Oshawa Boulevard North
Lakeridge Health Oshawa	Hospital	1 Hospital Court
Participation House	Care occupancy	380 Holcan Avenue
The Wynfield LTC Centre	Care and treatment occupancy – Long-term care home	451 Woodmount Drive
Thorntonview	Care and treatment occupancy – Long-term care home	186 Thornton Road South
Traditions of Durham	Retirement Home	1255 Bloor Street East

Source: City of Oshawa, Registry of Vulnerable Occupancies in Ontario

Identified Risk: The City of Oshawa currently has twenty-seven (27) registered vulnerable occupancies.

3.7.2 Other High Fire Life Safety Risk Occupancies

From the perspective of risk, and for the purposes of the services provided by the fire services, including enhanced and targeted fire inspections and public education programming, it can be valuable for a fire department to identify additional potential high fire life-safety risk considerations, including day care facilities and schools, where due to their age, children may have cognitive or physical limitations to preventing or delaying self-evacuation in the event of an emergency. For the purposes of this C.R.A., potential high life-safety risk occupancy considerations include schools and licenced day care facilities. Analysis of Municipal Property Assessment Corporation Data identified that there are 58 schools within the City of Oshawa. In addition, the City identified 56 daycare facilities; 28 in public schools, 2 in private schools, and 10 in catholic schools. There are also several post-secondary educational institutions in the City of Oshawa including Ontario Tech University, Trillium College, Durham College, Trent University - Oshawa Campus and Queen's University School of Medicine - Oshawa Campus.

It would be beneficial for O.F.S. to conduct pre-planning activities for all occupancies with vulnerable occupants. Pre-planning activities increase fire department personnel familiarity with buildings of special interest. A fire department can help reduce the risk faced by vulnerable individuals or vulnerable occupancies by performing regularly scheduled fire safety inspections; approving and witnessing fire drill scenarios; enforcing the O.F.C.; providing public education on fire safety issues; conducting pre-planning exercises to increase fire department personnel's familiarity with the facility; reviewing fire safety plans for accuracy and encouraging facility owners to update facilities as needed; providing staff training; and encouraging fire drills.

(Some of these activities are now legislated responsibilities under O. Reg. 150/13: Fire Code for those facilities classified as vulnerable occupancies.)

Key Finding: In addition to registered vulnerable occupancies the City has 58 schools, and 56 daycares that represent higher fire life-safety risks.

3.8 Historic or Culturally Significant Buildings

An understanding of the location of historic or culturally significant buildings or facilities is an important consideration within the building stock profile of a Community Risk Assessment. Such buildings or facilities may be keystone features to the community that provide a sense of heritage, place, and pride and act as tourism destinations which

could result in an economic impact in the case of their loss. Historic areas can present a high fire risk due to their age, the materials used to construct the buildings, their exposure to other buildings, and their importance to the community. Regular fire inspection cycles and strategies to enforce continued compliance with the O.F.C. are considered as best practices to achieving the legislative responsibilities of the municipality and providing an effective fire protection program to address fuel load risks.

The City of Oshawa maintains an inventory of properties of cultural heritage value or interest. To date, the City of Oshawa has a total of 24 designated properties and 11 registered, non-designated property under Part IV of the Ontario Heritage Act. There are also a combined 513 Class A or Class B properties having potential for heritage designation, many of which were constructed in the early to mid-1800s.[20]

Key Finding: There are a number of identified heritage buildings within Oshawa, many of which were constructed prior to the introduction of the Ontario Fire Code and Ontario Building Code.

[20] Data provided by the City of Oshawa as part of the data collection process for this Community Risk Assessment.

4.0 Critical Infrastructure Profile

As referenced in **O. Reg. 378/18**, the critical infrastructure profile assessment includes analysis of the capabilities and limitations of critical infrastructure, including electrical distribution, water distribution, telecommunications, hospitals and airports. The following section considers these critical infrastructure characteristics within the City of Oshawa.

4.1 Critical Infrastructure in Oshawa

Ontario's Critical Infrastructure Assurance Program defines critical infrastructure (C.I.) as "interdependent, interactive, interconnected networks of institutions, services, systems and processes that meet vital human needs, sustain the economy, protect public health, safety and security, and maintain continuity of and confidence in government."[21] The program also sets out nine critical infrastructure sectors, namely: continuity of government, electricity, financial institutions, food and water, health, oil and natural gas, public safety and security, telecommunications and transportation networks. Infrastructure is a complex system of interconnected elements whereby failure of one could lead to the failure of others. The vulnerability of infrastructure is often connected to the degree to which one infrastructure component depends upon another. Therefore, it is critical that these elements be viewed in relation to one another and not in isolation.

An extensive list of the City's C.I. for each sector was provided by the City of Oshawa as found within Appendix G of the City of Oshawa's Emergency Master Plan. For the purposes of this C.R.A., critical infrastructure of similar type were grouped into the categories listed below (for example, the multiple electrical substations identified by the City were grouped into one 'electrical substation' category). General considerations and concerns related to each C.I. as it pertains to the provision of fire protection services for each C.I. listed within the City of Oshawa are included in **Table 11**. Oshawa specific C.I. concerns are described in greater detail within the text.

[21] Ministry of the Solicitor General. (2017). Critical Infrastructure. Retrieved from https://www.emergencymanagementontario.ca/english/emcommunity/ProvincialPrograms/ci/ci.html

Table 11: Critical Infrastructure Considerations

Identified Critical Infrastructure	C.I. Sector	Fire Related Issues/Concerns
Water Storage, Distribution and Treatment Stations	Food and Water	• Oshawa water systems are owned and provided by the Region of Durham. Water supply is an essential component of firefighting and is accessible to the fire department through hydrant systems. A water supply shortage or damage to the distribution system could impede the fire department's ability or use of these systems. • There are fire department considerations to areas without adequate water flow and supply (hydrants)
Sewage Pumping Station	Food and Water	• Potential for contaminated water or spread of disease with untreated sewage on a local or regional level.
Electrical Substations	Electricity	• Electricity in Oshawa is provided by the Oshawa Power and Utilities Corporation and operates multiple substations within the City. Firefighter safety considerations when responding to a fire at an electrical substation (e.g. high voltage electrical hazards and the presence of chemical hazards that are used to cool electrical conductors) • Disruption to the electrical distribution system can disrupt communications, cause food spoilage, close local business, prevent the use of medical devices and have other potential impacts on public health
911 Dispatch Centre/Radio Tower/Switching	Telecommunications	• There are several radio towers owned and operated by different entities within Oshawa including, the Durham Regional Police Service and the City of Oshawa. If wires or towers are

Identified Critical Infrastructure	C.I. Sector	Fire Related Issues/Concerns
Stations		compromised, the ability to communicate with emergency personnel could be delayed, possibly leading to delay in the delivery of emergency services • The City of Oshawa also provides dispatching services for Oshawa, Whitby, Scugog, Clarington, Brock and Uxbridge • Other telecommunications infrastructure would include telecommunication providers (such as Bell, Telus or Rogers, for example). In the event of an emergency, these companies are expected to have emergency response plans or business continuity plans in place to ensure the continuation of the services they provide.
Main Gas and Oil Distribution Lines	Gas and Oil	• There are three main gas and oil pipelines extending across the City. These lines have the potential for explosion and/or fire • Hazardous materials response could expose firefighters to toxic or hazardous materials via inhalation, skin contact, and/or ingestion • Gas and oil supply could be limited across the City
Rail Line	Transportation	• Accidents involving transportation of hazardous cargo could result in release hazardous material requiring hazardous materials response • Potential for explosions, fires and destabilization of surrounding structures • For passenger train derailments or collisions, passenger and rail employee extrication and technical rescue may be required • Difficulty accessing scene • Major incidents resulting in long term recovery could delay daily

Identified Critical Infrastructure	C.I. Sector	Fire Related Issues/Concerns
		shipment of goods and services, with potential negative affects to local economy
Major Highways	Transportation	• Incidents involving hazardous materials transport • Motor vehicle collisions driving fire department and ambulance call volume • Multi lane and vehicle collisions can obstruct lane access for responding apparatus • Traffic hazards (distracted drivers, high speed movement) present safety considerations for responding crews
Federal Harbour	Transportation	• Vessel collisions, fires and explosions • Electrical malfunctions and high voltage electrical incidents • Fuel load concerns • Dangerous goods and hazardous substance spills • Storage of hazardous cargo • Major incidents could affect local economy • Some harbours allow owners and passengers overnight stay in boat sleeping quarters presenting additional high fire life safety concerns.
Regional Transit	Transportation	• Some residents of the City rely on public transit and may not have access during emergencies impacting the road network.
Municipal Airport	Transportation	• Aircraft crash incidents • Dangerous goods shipment and storage
Reception/ Evacuation Centres	Continuity of Government	• There are several community buildings designated as evacuation or reception centres within the City of Oshawa for use during

Identified Critical Infrastructure	C.I. Sector	Fire Related Issues/Concerns
		emergency situations. A fire department should inspect the facilities designated for emergency shelter use to ensure compliance • Facilities housing evacuees overnight present additional life safety risks to occupants • Large number of people in these facilities during an emergency a consideration for fire department if there is a fire at one of these facilities – may include vulnerable occupants with mobility limitations requiring additional support during evacuation of a shelter.
Provincial and Municipal Buildings	Continuity of Government	• Municipal services are often interconnected, therefore the failure of one may lead to the failure or damage to other services.
Fire Station	Public Safety and Security	• There are six fire stations in Oshawa. Frequent or extreme emergency events could increase demand for emergency response services affecting the response capacity of the fire department.
Provincial Court	Public Safety and Security	• Municipal services are often interconnected, therefore the failure of one may lead to the failure or damage to other municipal services.
Ambulance Base	Health	• There are two ambulance bases in Oshawa in addition to a hospital ambulance staging area from which ambulances respond. Health related emergencies can increase demand for health care services, specifically ambulance services and medical response.
Hospital	Health	• A fire at Lakeridge Hospital in Oshawa would require complex evacuation procedures for a large amount of immobile and medical device dependant individuals
		• Infectious disease outbreaks can present significant challenges to

Identified Critical Infrastructure	C.I. Sector	Fire Related Issues/Concerns
		first responders and the community causing hospital workplace absenteeism, and an increased demand for medical supplies

Source: City of Oshawa, Appendix G of the Emergency Master Plan.

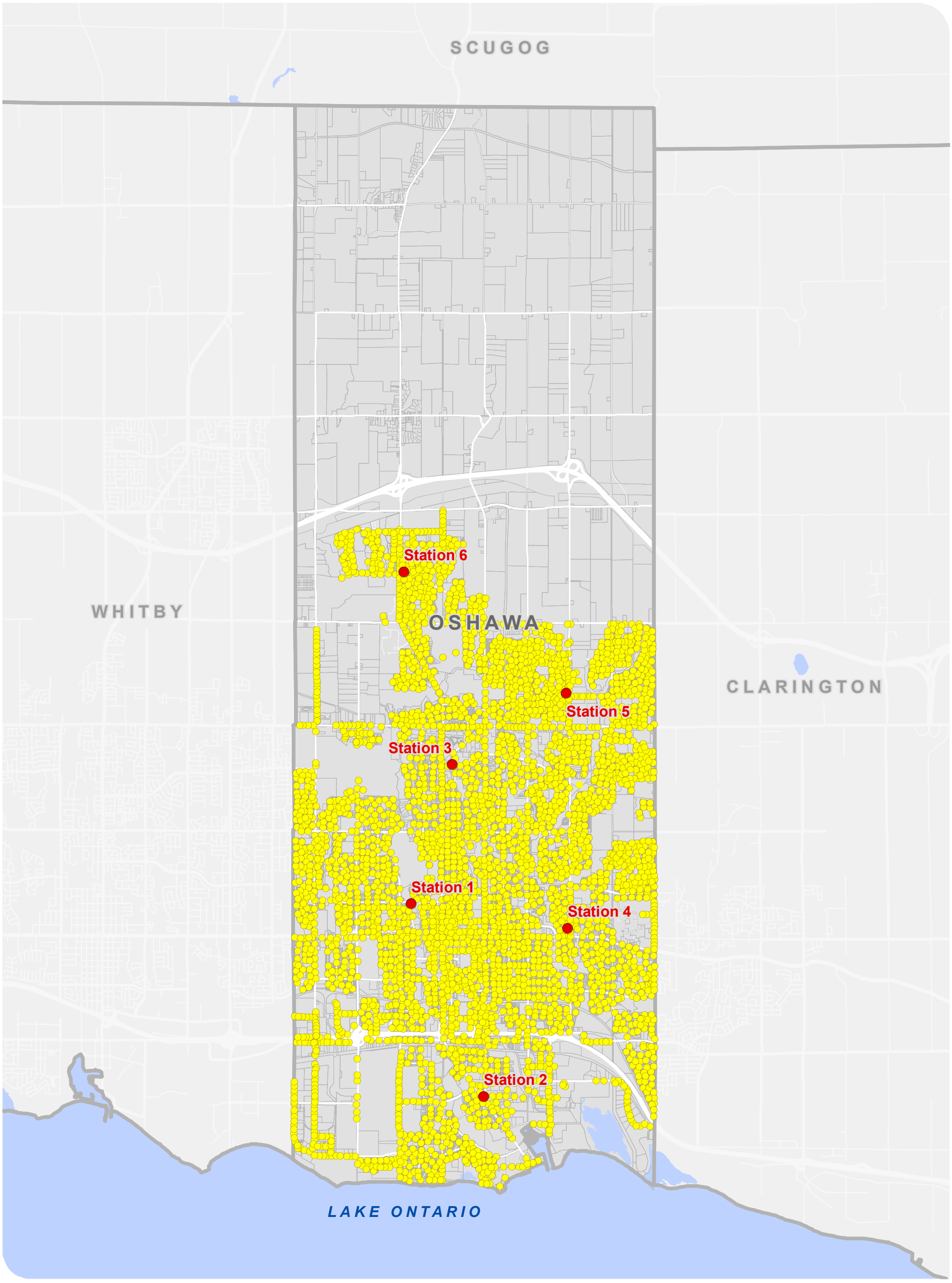
4.1.1 Water Infrastructure

Oshawa has a water supply system consisting of water treatment, water storage, and distribution stations, as well as numerous fire hydrants mostly in the urban area. Water supply as a critical infrastructure is essential for firefighting and is accessible to the fire department through municipal water delivery systems, or the fire department itself (tanker shuttles). Equally important to the presence of water supply is the quantity of water available for fire protection purposes, referred to as fire flow. As described in the N.F.P.A. Glossary of Terms (2019 Edition), fire flow is “the flow rate of water supply measured at 20psi (137.9 kPa) residual pressure, that is available for firefighting.” The control of structure fires in urban areas are typically delivered by hose lines supplied by a local water delivery system via hydrants. A water supply shortage or water system disruption could impede the flow rate of water delivered to hydranted areas resulting in inadequate water supply and distribution needed for the delivery of fire protection services.

Where no municipal water systems exist, supplementary water supply sources are considered. It is a common occurrence for rural and undeveloped areas, not to have pressurized hydranted water supply systems. For example, **Figure 11** displays fire hydrants located throughout Oshawa and as shown, they are found primarily in the southern half of the City. Alternate water supply sources can include the use of pumper apparatus that have portable tanks, such as a tanker shuttle and the use of reliable and accessible local water supplies. According to the Fire Underwriter’s Survey, an Accredited Superior Tanker Shuttle Service is a recognized equivalency to hydrant protection if it meets all the requirements for accreditation. In areas without municipal water supply, a fire department should consider a water servicing strategy or formal plan for those areas requiring water flow for firefighting.

Although hydrants are mapped in **Figure 11** below, O.F.S. has identified that there are several privately owned hydrants throughout the City, which are currently unknown to O.F.S.

Key Finding: It was identified that there are several privately owned hydrants located throughout the City. However, the City does not currently have an inventory of these hydrants.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

FIRE HYDRANTS
FIGURE 11

Final Draft March 2020

Existing Fire Station
Fire Hydrant
Parcel Boundary
Water Body

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-30

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Hydrants.mxd

4.1.2 Transportation Infrastructure

Transportation infrastructure within Oshawa is characterized by rail, major highways, a federal harbour and a municipal airport all of which are well connected and form a multimodal distribution network. As mentioned in **Section 2.3.1.1 – The Port of Oshawa**, the Port of Oshawa is a driver of the local economy and a critical component to the distribution of goods and services throughout the area. If a major incident were to occur at this port involving a fire or explosion of great magnitude, it could have significant consequential life safety, financial and/or environmental implications. Ensuring the resilience of this critical transportation infrastructure is essential in securing safe conditions at the port as well as Oshawa's status as a gateway to world markets.

4.1.3 Gas and Oil Infrastructure

There are three main gas and oil pipelines within the City of Oshawa; a natural gas pipeline, an oil pipeline both owned and operated by TransCanada Pipelines as well as a crude oil pipeline owned by Enbridge Pipelines Inc. (shown in **Figure 6**, **Section 2.2.3**). There are a number of risks associated with these types of materials due to their inherent properties and characteristics and the ways in which they are often transported. Natural gas, for example, is highly combustible and is explosive when placed under pressure. A pipeline rupture or leak could result in prolonged or uncontrolled product release requiring specialized emergency response and/or evacuation of the exposed surrounding area. Crude oil is a flammable liquid that can have a high or low flash point depending on the type. For this reason, it is important for local response agencies to understand the type of crude oil that is transported throughout the community and its physical and chemical properties. This is due to the fact that different variations in crude oil may require different response types or personal protective equipment. Pre-incident planning, training and exercise activities with the pipeline operator and other response partners is paramount to ensuring that the emergency response personnel are equipped with the right knowledge, skills and equipment needed to respond to a pipeline-related incident.[22] Establishing partnerships and procedures before an incident occurs is conducive to building awareness, and a

[22] Source: "Liquid Petroleum Pipeline Emergencies On-Scene Incident Commander Field Guide, "N.F.P.A. Research Foundation, July 2016.

safe and effective response. Public Safety Response Partners are discussed further in **Section 7.0 – Public Safety Response Profile**.

4.1.4 Airport

Airports and airlines facilitate the movement of material goods and people, serving as gateways of connectivity to other municipalities and regions that can contribute to the economic growth and development of the City. They play an essential role in trade, commerce and product distribution and provide a major mechanism through which people travel. Airports also present unique hazards related to aircraft and supporting infrastructure. In addition to those using this type of transportation these hazards can include the use of aircraft fuel and the transportation of dangerous goods.

The Oshawa Executive Airport, located on Taunton Road West and Thorton Road North is the closest aviation service provider within the geographical boundaries of the City, which offers corporate business travel and general aviation services to the surrounding area. In the event of an emergency incident occurring at the airport, Fire Station 3 is the closest fire station that can provide fire protection services.

The Oshawa Executive Airport has their own Emergency Response Plan (as required by Canadian Aviation Regulations, S.O.R./96-433[23]) which considers all aviation related emergency scenarios that might occur both on and off airport grounds. The Oshawa Fire Services is the primary fire protection service provider for the Oshawa Executive Airport performing simulated training exercises for aircraft fire incidents while following Canadian aviation regulations.

Airport staff and tenants are also participants in the City of Oshawa's annual emergency exercise training program that also includes Durham Regional Police Services, the Oshawa Fire Services and the Whitby Fire Services, among others.

Special Consideration: The Oshawa Executive Airport presents a number of unique fire related risks associated with aircraft, supporting infrastructure and the potential transportation of dangerous goods requiring specialized fire protection services.

[23] Source: Canadian Aviation Regulations, SOR/96-433, Section 302.202 – Airport Emergency Plan, last amended August 8, 2019, https://laws-lois.justice.gc.ca/eng/regulations/sor-96-433/page-27.html

5.0 Demographic Profile

As referenced in **O. Reg. 378/18**, the demographic profile assessment includes analysis of the composition of the community's population, respecting matters relevant to the community such as population size and dispersion, age, gender, cultural background, level of education, socioeconomic make-up and transient population. The following sections consider these demographic characteristics within the City of Oshawa.

5.1 Population and Dispersion

Between 2001 and 2016, the City of Oshawa's population increased steadily. **Table 12** shows that over this fifteen year timeframe, the number of total private dwellings has also increased with the highest increase occurring between 2011 and 2016 by 9.37%.

Table 12: Historic Growth in Population and Households - Oshawa

Year	Population	% Change	Total Private Dwellings	% Change
2001	139,051	-	53,298	-
2006	141,590	1.79%	57,469	7.25%
2011	149,607	5.35%	58,797	2.25%
2016	159,458	6.17%	64,883	9.37%

Source: 2016[24], 2011[25], 2006[26], 2001[27] Census, Statistics Canada

[24] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017.
[25] Statistics Canada. 2012. Oshawa, Ontario (Code 3518013) and Ontario (Code 35) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012.
[26] Statistics Canada. 2007. Oshawa, Ontario (Code3518013) (table). 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. https://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E (accessed November 26, 2019)
[27] Statistics Canada. (updated 2012). Population and Dwelling Counts, for Canada and Census Subdivisions (Municipalities), 2001 and 1996 Censuses. Retrieved from https://www12.statcan.gc.ca/english/census01/products/standard/popdwell/Table-CSD-N.cfm?T=1&SR=3379&S=1&O=A

5.1.1 Mapping Population Dispersion

The dispersion of the population is presented in **Figure 12**. Areas of the City most densely populated are found in areas south of Provincial Highway 401 and in the City's downtown core.

SCUGOG

WHITBY

OSHAWA

CLARINGTON

LAKE ONTARIO

Station 6

Station 5

Station 3

Station 1

Station 4

Station 2

Existing Fire Station

Parcel Boundary

Water Body

People per Square Kilometre

0 - 1623	4440 - 6754
1624 - 3052	6755 - 11350
3053 - 4439	11360 - 17260

CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

POPULATION DENSITY
FIGURE 12

Final Draft March 2020

Note: 2016 census population data obtained through ESRI and displayed by dissemination area.

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000

0 0.5 1 2 km

N W E S

PROJECT: 191064 STATUS: DRAFT DATE: 2019-11-01

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Population Density.mxd

5.2 Population Age

A community's population by age is an important factor in identifying specific measures to mitigate risks associated with a specific age group, such as seniors. Canada's aging population has been recognized as one of the most significant demographic trends. According to Statistics Canada, from 2011 to 2016 Canada experienced "the largest increase in the proportion of seniors since Confederation" due to the baby boomer generation reaching the age of 65. There are now more Canadians over the age of 65 (16.9% of the population) than there were children aged 14 years and younger (16.6%).[28]

Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the province based on residential fire death rate (fire deaths per million of population). **Figure 13** illustrates the results of an analysis revised by the O.F.M.E.M.'s Fire Statistics in November 2018. The figure illustrates fire death rate which is characterized by the number of fire fatalities per million of population. Through this analysis, it is identified that seniors at an increased risk of fatality in residential occupancies compared to other age groups. However, the fire death rate for seniors has been decreasing since 1997 according to Ontario residential fatal fires reporting.

Figure 13: 2008-2017 Residential Fire Death Rate by Age of Victim

[28] Statistics Canada. (2017, May). The Daily: Age and sex, and type of dwelling data: key results from the 2016 Census. Retrieved from http://www.statcan.gc.ca/daily-quotidien/170503/dq170503a-eng.htm?HPA=1

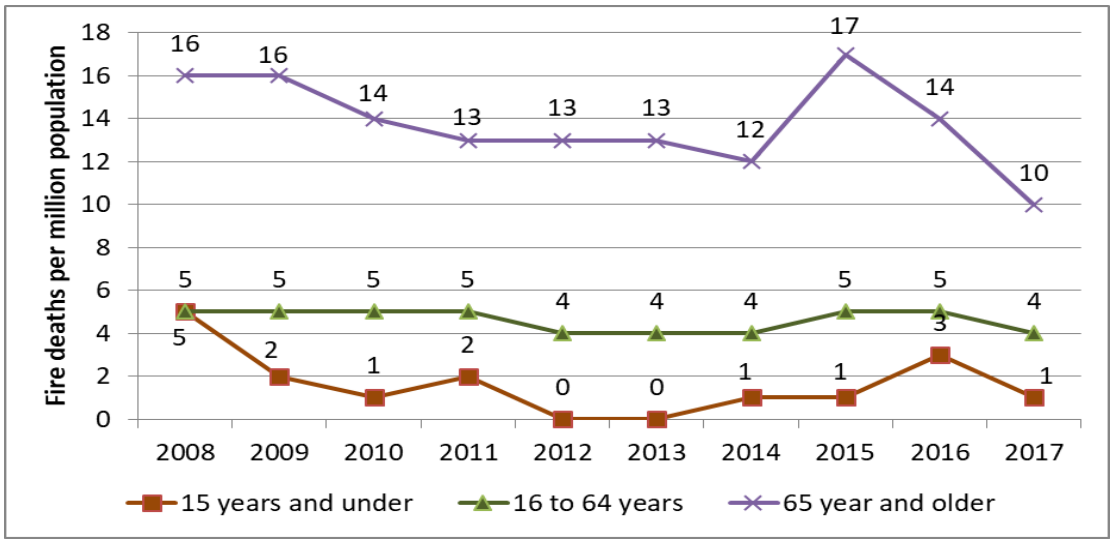


Figure Source: Adapted based on O.F.M.E.M. reported residential fatal fires.[29]

Identifying a community's population by age category is a core component of developing the C.R.A. and identifying specific measures to mitigate risks associated with a specific age group, such as seniors. The 2016 Census identifies a total population of 159,460 for the City of Oshawa. The age distributions of the City's population and the Province of Ontario's population are summarized and compared in **Table 13** and further illustrated in **Figure 14** below.

Table 13: Population by Age Group – Oshawa and Ontario

	Oshawa		Ontario	
Age	**Population**	**%**	**Population**	**%**
0 to 4 years	8,770	5.50%	697,360	5.19%
5 to 9 years	9,130	5.73%	756,085	5.62%
10 to 14 years	8,670	5.44%	754,530	5.61%
15 to 19 years	9,220	5.78%	811,670	6.04%
20 to 24 years	10,660	6.69%	894,390	6.65%
25 to 44 years	40,925	25.66%	3,453,475	25.68%

[29] Office of the Fire Marshal and Emergency Management. (Revised 2018, November). Ontario Residential Fatal Fires. Retrieved from https://www.mcscs.jus.gov.on.ca/english/FireMarshal/MediaRelationsandResources/FireStatistics/OntarioFatalities/HomeFireFatalitiesChildrenAdultsSeniors/stats_fatal_res.html

	Oshawa		Ontario	
45 to 54 years	23,915	15.00%	1,993,730	14.82%
55 to 64 years	21,815	13.68%	1,835,605	13.65%
65 to 74 years	14,560	9.13%	1,266,390	9.42%
75 to 84 years	8,155	5.11%	684,195	5.09%
85 + years	3,640	2.28%	301,075	2.24%
Total	**159,460**[30]	**100.00%**	**13,448,505**	**100.00%**
Median Age of the Population	41	-	41	-
Population aged 14 and under	**26,570**	**16.66%**	**2,207,975**	**16.42%**
Population aged 65 and over	**26,355**	**16.53%**	**2,251,660**	**16.74%**

Source: 2016 Census, Statistics Canada[31]

Overall, the City and the Province show similar age distributions. The youngest demographic (those 14 years of age and under) represents 16.66% of the City's total population, similar in comparison to the Province. While at a lower risk of fatality in residential occupancies overall when compared to seniors or adults, youth (aged 14 years and under) represent an important demographic for the purposes of public education. As a result, there should be public education and prevention programs targeted to this demographic. Structured education programs consistently provided to children and youth can help to engrain fire and life safety awareness and knowledge into future generations.

The percentage of the population aged 65 years and older in Oshawa is also similar to that of the Province. An additional 28.68% of the City's population falls between the age

[30] For the purposes of this C.R.A., the total population counts provided are a sum of the values provided by Statistics Canada. Of note, these totals may be different from the totals provided by Statistics Canada because of the following "Statistics Canada is committed to protect the privacy of all Canadians and the confidentiality of the data they provide to us. As part of this commitment, some population counts of geographic areas are adjusted in order to ensure confidentiality. The adjustment to counts of the total population for any dissemination block is controlled to ensure that the population counts for dissemination areas will always be within 5 of the actual values. The adjustment has no impact on the population counts of census divisions and large census subdivisions."

[31] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

group of 45 and 64 who are aging towards the senior's demographic of 65 years of age and older. Based on historic residential fire fatality data, this population will soon become seniors who will be at greater risk.

These demographic trends are important considerations for the development of informed targeted public education programs and risk reduction strategies within the community.

Figure 14: Population Distribution – Oshawa and Ontario

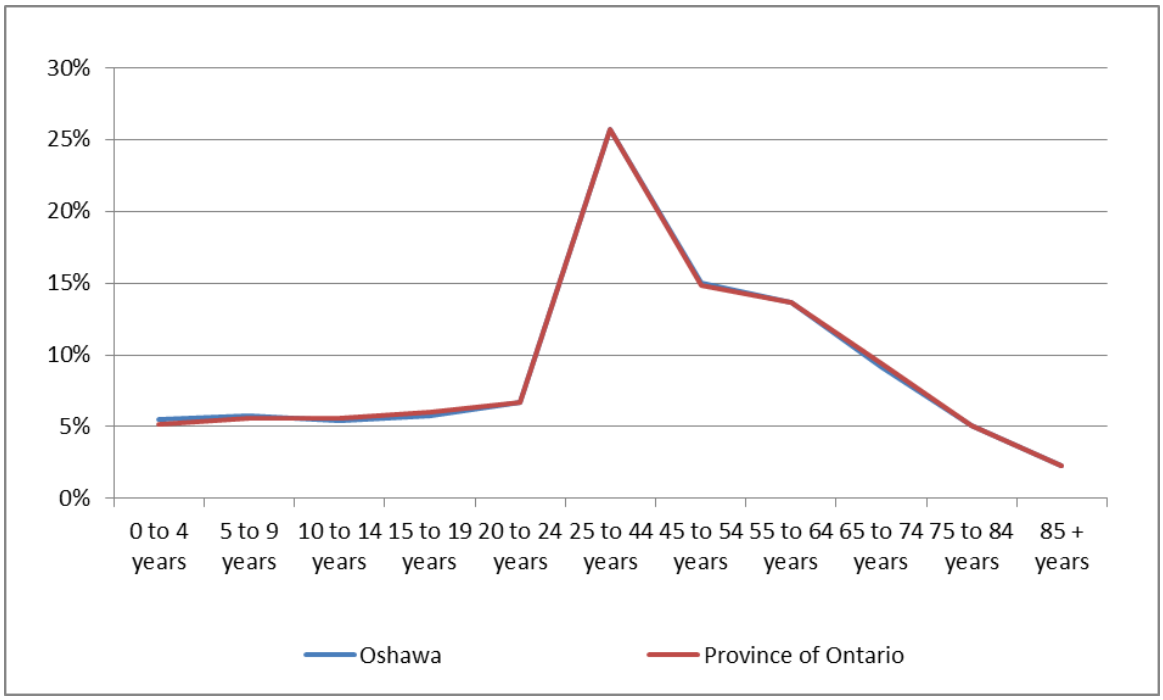


Figure Source: 2016 Census, Statistics Canada[32]

Key Finding: The 2016 Census data indicates that children aged 14 and under represent 16.66% (26,570) of the City's total population.

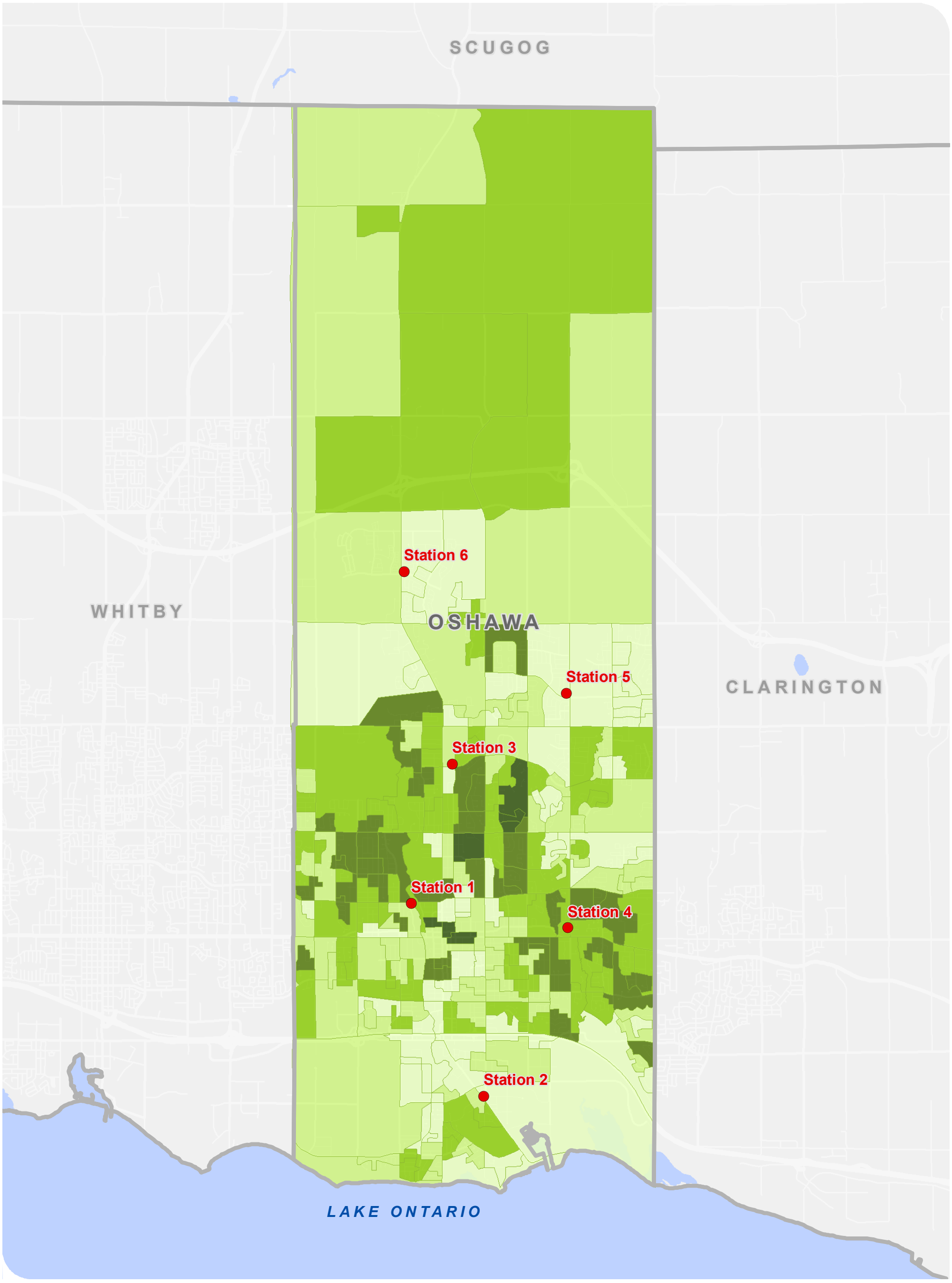
Identified Risk: Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% (26,355) of the City's total population.

[32] Ibid.

Key Finding: Of the City's total population, 28.68% (45,730) fall into the age range of 45 to 64, representing a cohort aging towards the seniors demographic of 65 years or older.

5.2.1 Mapping Population Age

To understand the spatial distribution of population by age across the City, 2016 Census data was mapped by dissemination area. **Figure 15** presents the distribution of the senior population (65 and older) and **Figure 16** shows the distribution of youth (0 to 14 years). **Figure 15** shows that a higher proportion of seniors reside in the downtown area with notable clusters west of Harmony Road North, on and slightly north of King Street East. There is also a higher concentration of seniors living in the Centennial neighbourhood south of Fire Station 3 and in the area west of Harmony Road North near Rossland Road East. **Figure 16** shows a higher proportion of youth (0-14 years) concentrated along Lake Ontario in the Lakeview Park neighbourhood, in the Taunton neighbourhood between Townline Road North and Wilson Road North as well as in the Kedron neighbourhood between Ritson Road North and Simcoe Street North. The identified areas observed and presented in both figures could be targeted for relevant public education and fire life safety programming.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

PERCENTAGE OF POPULATION AGED 65 PLUS (SENIORS) BY DISSEMINATION AREA
FIGURE 15

Final Draft March 2020

Existing Fire Station
Water Body

Percentage of Population 65 Plus (Seniors)

0 - 10.9%	23.8% - 39.5%
10.9 - 16.7%	39.5% - 71.2%
16.7 - 23.8%	

Note: 2016 census population data displayed

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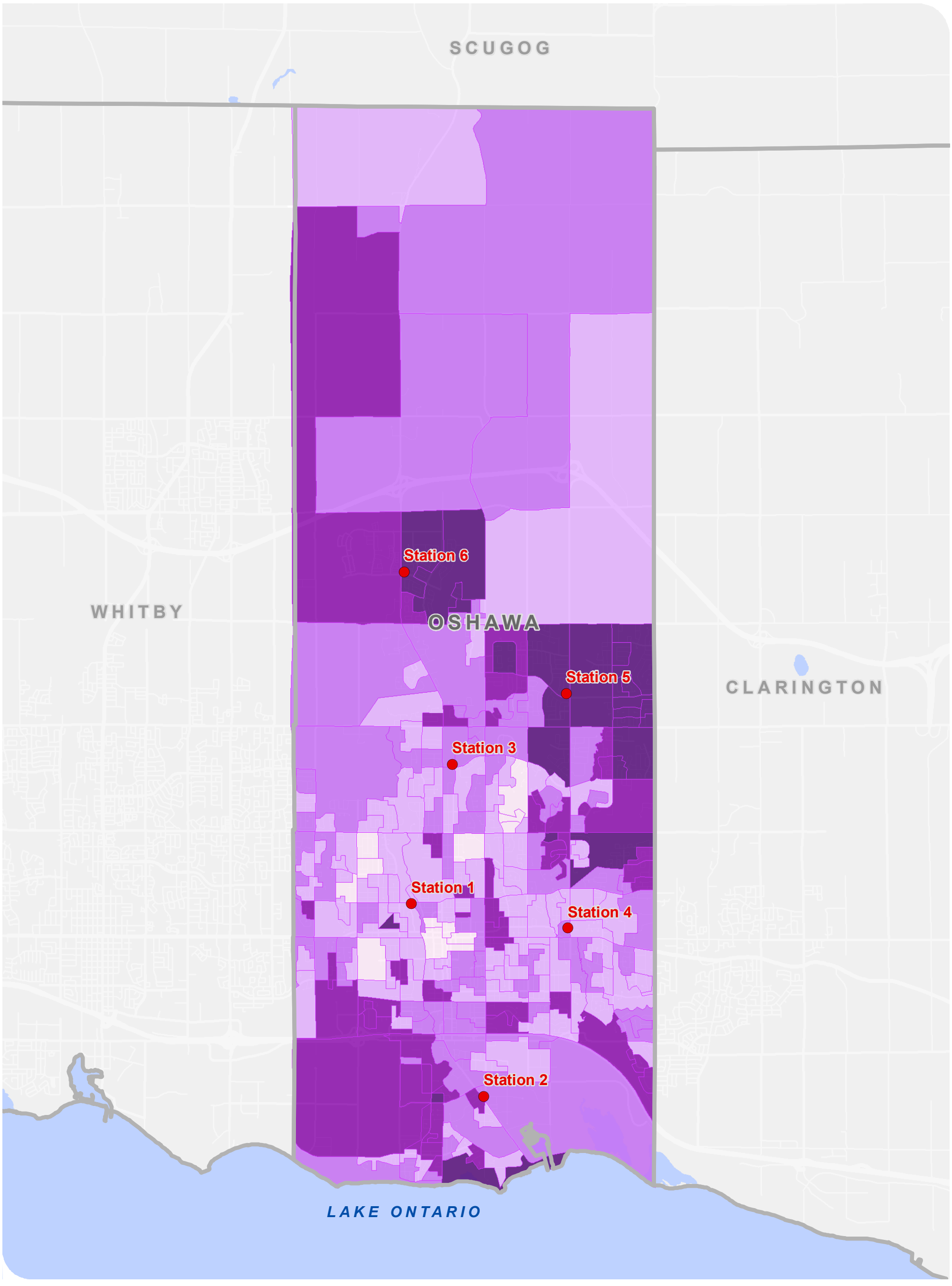
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2019-11-05

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Age 65 plus.mxd



Existing Fire Station

Water Body

Percentage of Population 0 - 14 Years Old (Youth)

- 0 - 8.1%
- 8.1 - 13.2%
- 13.2 - 17.1%
- 17.1 - 23.3%
- 23.3 - 38%

CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

PERCENTAGE OF POPULATION AGED 0 - 14 YEARS OLD (YOUTH) BY DISSEMINATION AREA
FIGURE 16

Note: 2016 census population data displayed

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MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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0 0.5 1 2 km

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PROJECT: 191064 STATUS: DRAFT DATE: 2019-11-05

Final Draft March 2020

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Age 0 - 14.mxd

5.3 Gender

N.F.P.A. 1730 considers gender as part of a Community Risk Assessment due to the finding that, based on historic data, males are more likely to be injured or lose their life in a fire. **Table 14** displays the gender distribution by age for the City of Oshawa. The proportion of males versus females is fairly even at 48.78% male and 51.22% female, as would be expected. When specific age groups are reviewed, there are minor variations. One of the greater differences is the proportion of males (33.38%) compared to females (66.62%) for the 85 years and over age group. Based on these statistics, it is not anticipated that public education programming would be refined based on gender. The impact of gender distribution on public education programming would be more notable in a community with unique demographics such as those that have transient populations due to employment, for example.

Table 14: Gender Distribution by Age Group – Oshawa

Age Group	Total Population	Male	%	Female	%
0 to 4 years	8,775[33]	4,515	51.45%	4,260	48.55%
5 to 9 years	9,135	4,650	50.90%	4,485	49.10%
10 to 14 years	8,670	4,495	51.85%	4,175	48.15%
15 to 19 years	9,220	4,625	50.16%	4,595	49.84%
20 to 24 years	10,665	5,450	51.10%	5,215	48.90%
25 to 44 years	40,930	20,240	49.45%	20,690	50.55%
45 to 54 years	23,910	11,645	48.70%	12,265	51.30%
55 to 64 years	21,810	10,615	48.67%	11,195	51.33%
65 to 74 years	14,560	6,760	46.43%	7,800	53.57%
75 to 84 years	8,155	3,585	43.96%	4,570	56.04%
85 + years	3,640	1215	33.38%	2425	66.62%

[33] The total population for persons aged 0 to 4 years of age is 8,775, whereas the total provided in Table 13 of this C.R.A. is 8,770. This is due to the following statement according to Statistics Canada "Statistics Canada is committed to protect the privacy of all Canadians and the confidentiality of the data they provide to us. As part of this commitment, some population counts of geographic areas are adjusted in order to ensure confidentiality. The adjustment to counts of the total population for any dissemination block is controlled to ensure that the population counts for dissemination areas will always be within 5 of the actual values. The adjustment has no impact on the population counts of census divisions and large census subdivisions." This is reflected in the total population provided in the table.

Age Group	Total Population	Male	%	Female	%
Total	**159,470**	**77,795**	**48.78%**	**81,675**	**51.22%**

Source: 2016 Census, Statistics Canada[34]

5.4 Socioeconomic Circumstances

Socioeconomic circumstances of a community are known to have a significant impact on fire risk. Socioeconomic status is reflected in an individual's economic and social standing and is measured in a variety of ways. These factors can be reflected in the analysis of socioeconomic indicators such as labour force status, educational attainment and income as well as household tenure, occupancy, suitability, and cost.

Socioeconomic factors intersect in a number of ways and have direct and indirect impacts on fire risk. One such example is outlined in the O.F.M.E.M.'s Fire Risk Sub-Model.[35] The Sub-Model makes reference to the relationship between income and fire risk. As one consideration, households with less disposable income may be less likely to purchase fire safety products (e.g., smoke alarms, fire extinguishers, etc.), which puts them at higher risk of experiencing consequences from a fire. Another consideration is that households living below the poverty line may have a higher number of persons per bedroom in a household and/or children who are more likely to be at home alone. These circumstances would impact both the probability and consequence of a fire. While these complex relationships between socioeconomic circumstances and the probability / consequence of a fire are not well understood, this C.R.A. seeks to explore these factors.

The factors reviewed at a high level have been selected based on the data available from Statistics Canada. Socioeconomic factors such as income decile group and median household income have been displayed spatially throughout this section.

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[34] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019).

[35] Minister of the Solicitor General. (Modified 2016, February). Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model. Retrieved from https://www.mcscs.jus.gov.on.ca/english/FireMarshal/FireServiceResources/ComprehensiveFireSafetyEffectivenessModel/FireRiskSub-Model/Fire_risk_submodel.html

Factors that are highlighted in this section include:

- Labour force status
- Immigrant status
- Educational attainment
- Household tenure, occupancy, suitability, and cost

5.4.1 Labour Force Status

Those who are economically disadvantaged, including low-income families, the homeless and perhaps those living alone, may experience a higher fire risk. The O.F.M.E.M.'s Fire Risk Sub-Model references a number of reports that suggest there is a correlation between income levels and fire risk. The reports identify the following factors:

- The higher number of vacant buildings found in low-income neighborhoods attract the homeless. This introduces risks such as careless smoking, drinking and unsafe heating practices.
- Building owners are less likely to repair building systems (electrical, mechanical, suppression) due to affordability, increasing fire risk from improper maintenance.
- Households with lower disposable income are less likely to purchase fire safety products (i.e. smoke alarms, extinguishers, cigarette ignition resistant furniture, etc.) due to affordability.
- Households with lower disposable income are more likely to have their utilities shut off due to non-payment, leading to increased risks related to unsafe heating, lighting and cooking practices.
- The 1981 report, "Fire-Cause Patterns for Different Socioeconomic Neighborhoods in Toledo, Ohio" determined that the incendiary fire rate in low-income neighbourhoods is 14.4 times higher compared to areas with the highest median income. Further, fires caused by smoking and children playing occurred at rates 8.5 and 14.2 times higher, respectively.
- Single parent families are more economically challenged due to the fact that there is only one income. These households also have fewer resources to arrange childcare, increasing the likelihood of fires caused by unsupervised children.
- Studies have shown that cigarette smoking is inversely related to income. In Canada, findings by the Centre for Chronic Disease Prevention and Control through

the National Population Health Survey established that there were nearly twice as many smokers in the lowest income group when compared against the highest (38% vs. 21% respectively), and

- Those with low education and literacy levels are inhibited in their ability to read instruction manuals and warning labels and less likely to grasp fire safety messages.[36]

Labour force status is a possible indicator of income levels which directly influence fire risk (e.g. lower income, increased fire risk). The participation rate (i.e. the proportion of residents in the labour force) can also be an indicator of income and can be considered alongside unemployment rates (e.g. lower participation rate and higher unemployment could mean lower income, higher fire risk).

Labour force status, shown in **Table 15** below, shows that the City of Oshawa has a lower participation rate than the Province of Ontario (62.10% versus 64.70%). This would suggest that the City faces a slightly higher fire risk in comparison to the Province from the perspective of labour force.

Table 15: Labour Force Status – Oshawa and Ontario

	Oshawa		Ontario	
Status	**Population**	**%**	**Population**	**%**
In the Labour Force[37]	81,425	62.10%	7,141,675	64.70%
Employed	73,470	56.04%	6,612,150	59.90%
Unemployed	7,955	6.07%	529,525	4.80%
Not in the Labour Force	49,685	37.90%	3,896,765	35.30%
Total	**131,110[38]**	**100.00%**	**11,038,440**	**100.00%**
Source: 2016 Census, Statistics Canada[39]				

[36] Ibid.
[37] The category 'In the Labour Force' is a subtotal of the following categories: employed and unemployed.
[38] Total population reflects those aged 15 years and over by Labour force status – 25% sample data. According to statistics Canada this refers to whether a person aged 15 years and over was employed, unemployed or not in the labour force during the week of Sunday, May 1 to Saturday, May 7, 2016.
[39] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017.

5.4.2 Educational Attainment

The relationship between educational attainment and income is complex. An analysis conducted by Statistics Canada has found that high-income Canadians are generally more likely to be highly educated. Over two thirds (67.1%) of the top 1% had attained a university degree compared to 20.9% of all Canadians aged 15 and over.[40] Based on this national trend and for the purposes of this Community Risk Assessment it is assumed that a higher education leads to more disposable income and a lower fire risk. It is also assumed that households with more disposable income are more likely to invest in fire life safety products such as fire extinguishers and smoke alarms reducing the fire risk.

Table 16 displays educational attainment for the City of Oshawa and the Province of Ontario.

Table 16: Educational Attainment – Oshawa and Ontario

	Oshawa		Ontario	
Educational Attainment	**Population**	**%**	**Population**	**%**
No Certificate/Diploma/Degree	26,395	20.13%	1,935,355	17.53%
High School Diploma or Equivalent	42,195	32.18%	3,026,100	27.41%
Postsecondary Certificate; Diploma Or Degree	62,525	47.69%	6,076,985	55.05%
Total	**131,115[41]**	**100.00%**	**11,038,440**	**100.00%**

Source: 2016 Census, Statistics Canada[42]

https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

[40] Statistics Canada. (Modified 2018, July). Education and occupation of high-income Canadians. Retrieved from https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-014-x/99-014-x2011003_2-eng.cfm

[41] According to Statistics Canada, the total population reflects the highest certificate, diploma or degree for the population aged 15 years and over in private households - 25% sample data.

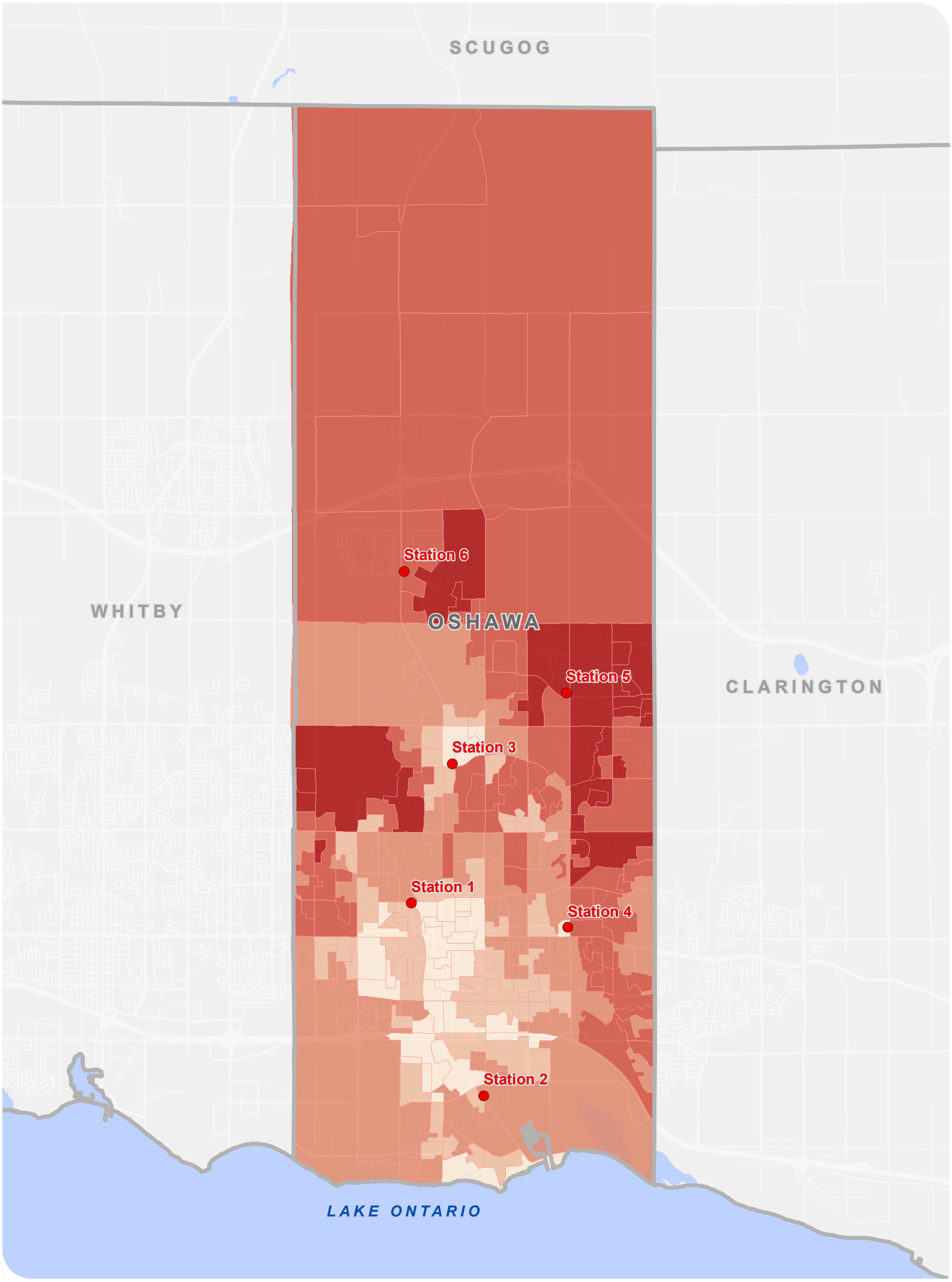
[42] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

According to the 2016 Census, 47.69% of residents in Oshawa have a postsecondary Certificate, Diploma or Degree, which is 7.36% lower than the Province. This level of educational attainment could be linked to the median household incomes found in the City.

According to the 2016 Census, the median total income of households for Oshawa in 2015 was $70,211, slightly below the Provincial median total income per household of $74,287.

5.4.2.1 Mapping Income

Median household income across the City is displayed in **Figure 17**, indicating that households with a lower median income are clustered primarily in the areas south of Adelaide Avenue West (and Fire Station 1) and south of Provincial Highway 401, west of Fire Station 2.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

MEDIAN INCOME BY DISSEMINATION AREA
FIGURE 17

Final Draft March 2020

Existing Fire Station
Water Body

Median total income of households in 2015 ($)

18,912 - 45,952	84,396 - 108,672
45,953 - 65,408	108,673 - 155,648
65,409 - 84,395	

Note: 2016 census population data displayed

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MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2019-11-05

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Median Income.mxd

5.4.3 Income Decile Groups

Income can also be viewed through the lens of income decile groups. As stated by Statistics Canada, a "decile group provides a rough ranking of the economic situation of a person based on his or her relative position in the Canadian distribution of the adjusted after-tax income of economic families".[43] Economic family income decile group for the population in private households in Oshawa is presented in **Table 17** illustrating that a higher portion of the population within the City falls within the bottom distribution of income decile groups when compared to the overall population of the Province. These statistics may be suggestive of a slightly higher fire risk within the City from the perspective of income.

Table 17: Economic Family Income Decile Group for the Population in Private Households – Oshawa and Ontario

	Oshawa		Ontario	
Decile Group	**Population**	**%**	**Population**	**%**
In the bottom half of the distribution	81,010	51.39%	6,335,170	47.84%
In the top half of the distribution	76,620	48.61%	6,906,990	52.16%
Total	**157,630[44]**	**100.00%**	**13,242,160**	**100.00%**

Source: 2016 Census, Statistics Canada[45]

[43] Statistics Canada. (Updated 2016). Income Decile Group. Retrieved from https://www12.statcan.gc.ca/nhs-enm/2011/ref/dict/pop166-eng.cfm

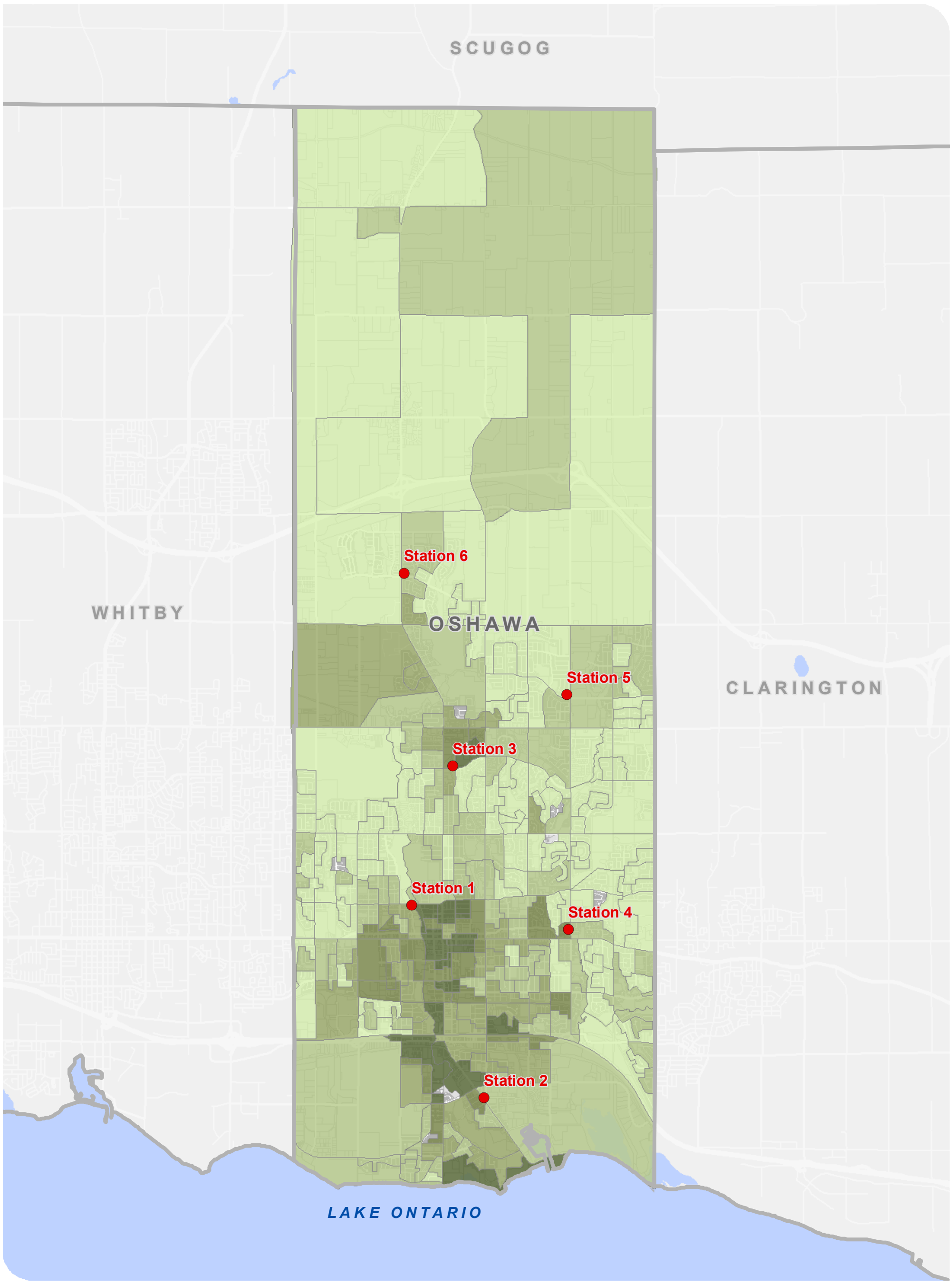
[44] According to Statistics Canada, this total reflects economic family after-tax income decile group. The economic family income decile group provides a rough ranking of the economic situation of a person based on his or her relative position in the Canadian distribution of the adjusted after-tax income of economic families for all persons in private households. Using data from the 2016 Census of Population, the population in private households is sorted according to its adjusted after-tax family income and then divided into 10 equal groups each containing 10% of the population. The decile cut-points are the levels of adjusted after-tax family income that define the 10 groups. For the 2016 Census, the reference period is the calendar year 2015 for all income variables.

[45] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

5.4.3.1 Mapping Income Decile Group

To understand the spatial distribution of income decile group, **Figures 18** and **19** display the percentages of the population in the bottom and top decile groups by dissemination area.[46] **Figure 18** shows that there are dissemination areas with a high percentage of the population in the bottom half of the income decile in the downtown area, southeast of Fire Station 1 and south of Provincial Highway 401 as well as the area along the Lake Ontario shoreline. **Figure 19** shows there are dissemination areas with a high percentage of the population in the top income decile in the neighbourhoods south of Taunton Road East and north of Adelaide Avenue West.

[46] Data obtained from Statistics Canada was used in the creation of both income decile maps. Some areas of the City are not included within the income decile group maps. According to the dataset obtained through Statistics Canada and viewed in the Beyond 20/20 data viewer, these areas were suppressed to meet the confidentiality requirements of the Statistics Act.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

PERCENTAGE OF POPULATION IN BOTTOM INCOME DECILE
FIGURE 18

Final Draft March 2020

Existing Fire Station
Parcel Boundary
Water Body

Percentage of Population in Bottom Income Decile by Dissemination Area

- 0% - 6.25%
- 6.251% - 11.24%
- 11.241% - 18.87%
- 18.871% - 28.44%
- 28.441% - 44.58%

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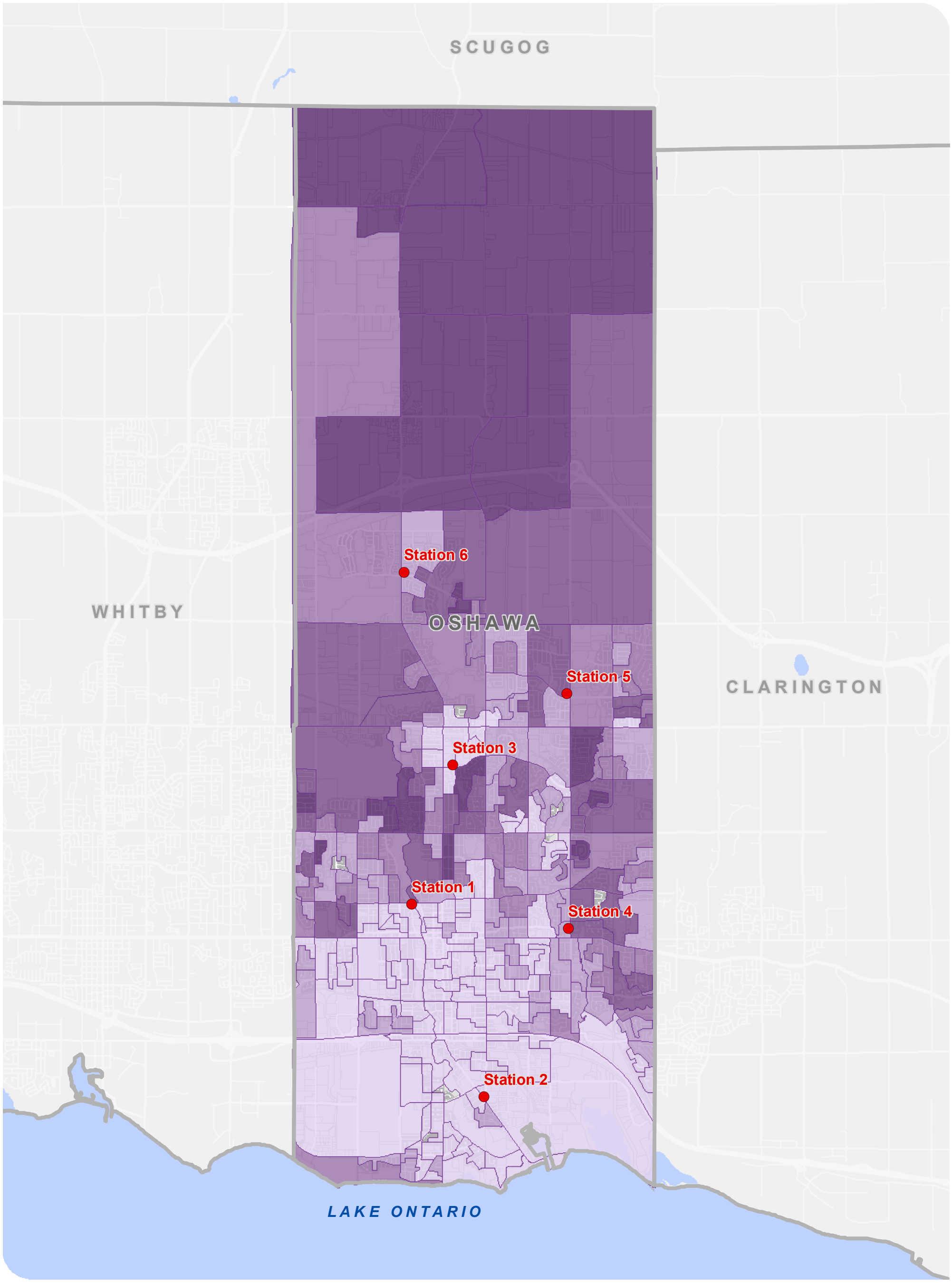
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-09

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Income Bottom Decile.mxd



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

PERCENTAGE OF POPULATION IN TOP INCOME DECILE
FIGURE 19

Existing Fire Station
Parcel Boundary
Water Body

Percentage of Population in Top Income Decile by Dissemination Area
0% - 3.31%
3.311% - 7.01%
7.011% - 11.59%
11.591% - 17.39%
17.391% - 27.94%

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MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-09

Final Draft March 2020

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Income Top Decile.mxd

5.4.4 Household Tenure, Occupancy, Suitability and Costs

Table 18 summarizes household statistics for the City of Oshawa and the Province of Ontario including tenure, occupancy, suitability and costs.

5.4.4.1 Housing Tenure

Housing tenure reflects socioeconomic status whereby a low home ownership rate may reflect lower incomes in the community and a higher overall fire risk. The City has a lower proportion of dwellings that are owned versus rented when compared to the Province (68.50% owned in Oshawa versus 69.78% in the Province).

5.4.4.2 Occupancy

A higher proportion of multiple persons per household can result in increased fire loss (consequence) resulting in a higher risk. There are 595 households (0.95% of total households) that have more than one person per room in Oshawa. This reflects a lower percentage compared to the Province where 2.37% of households have more than one person per room.

5.4.4.3 Suitability

The 2016 Census reports on housing suitability which, according to Statistics Canada, refers whether a private household is a suitable accommodation according to the National Occupancy Standard. Suitable accommodations are defined by whether the dwelling has enough bedrooms based on the ages and relationships among household members. Based on this measure, 4.40% (or 2,755 households) are classified as “not suitable” within the City compared to 6.02% for the Province as a whole (resulting in nearly 311,005 “not suitable” households across Ontario). From the perspective of housing suitability, the City has a potential lower fire risk than that of the Provincial statistics.

5.4.4.4 Housing Costs

The cost of shelter may also be indicative of the amount of disposable income within a household. Households with less disposable income have fewer funds to purchase household fire life safety items resulting in a higher risk. In Oshawa, 29.70% of households spend 30% or more of the household total income on shelter costs. This is

2.05% higher than the Province, where 27.65% of households spend 30% or more of income on shelter costs.

Looking closer at shelter costs, the median value of dwellings in Oshawa is $370,343 ($30,153 less than the Province). The City also has a lower median monthly shelter costs for owned and rented dwellings than the Province.

Table 18: Household Tenure, Occupancy, Suitability and Costs – Oshawa and Ontario

	Oshawa	%	Ontario	%
Household Tenure				
Owner	42,875	68.50%	3,601,825	69.78%
Renter	19,720	31.50%	1,559,720	30.22%
Total Households	62,595[47]	100.00%	5,161,545	100.00%
Household Occupancy				
One person or fewer per room	62,000	99.05%	5,046,810	97.63%
More than one person per room	595	0.95%	122,360	2.37%
Total Households	62,595[48]	100.00%	5,169,170	100.00%
Housing Suitability				
Suitable	59,840	95.60%	4,858,170	93.98%
Not suitable	2,755	4.40%	311,005	6.02%
Total Households	62,595[49]	100.00%	5,169,175	100.00%
Shelter Costs				
Spending less than 30% of household total income on shelter costs	43,970	70.30%	3,694,385	72.35%
Spending 30% or more of household total income on shelter costs	18,575	29.70%	1,411,900	27.65%
Total Households	62,545[50]	100.00%	5,106,285	100.00%
Median value of dwellings	$370,343		$400,496	
Median monthly shelter costs for owned dwellings	$1,396		$1,299	
Median monthly shelter costs for	$1,015		$1,045	

[47] According to Statistics Canada, the total households refers to owner and tenant households with household total income greater than zero, in non-farm, non-reserve private dwellings by shelter-cost-to-income ratio - 25% sample data.
[48] According to Statistics Canada, the total households here refers to private households by number of persons per room - 25% sample data.
[49] According to Statistics Canada, the total households refers to private households by housing suitability - 25% sample data.
[50] According to Statistics Canada, the total household count refers to owner and tenant households with household total income greater than zero, in non-farm, non-reserve private dwellings by shelter-cost-to-income ratio - 25% sample data.

	Oshawa	%	Ontario	%
rented dwellings				

Source: 2016 Census, Statistics Canada[51]

5.4.5 Durham Region Healthy Neighbourhoods

The Durham Region Healthy Neighbourhoods project provides an overview of the 50 healthy neighbourhoods identified by the Region of Durham, presenting various indicators that provide information about the demographics and health of each community. The goal of this project is to use this information to improve the health and well-being of all residents across the Region. The results of the healthy neighbourhood review can help inform the City of Oshawa regarding the health and well-being of the residents of the City in relation to the Region as a whole.

In summary, the healthy neighbourhood profile for the City of Oshawa identified the following areas in which the rate or percentage for each demographic indicator was higher in the City of Oshawa when compared to the region:

- Higher percentage of senior demographic
- Higher percentage of female-lone parent families
- Higher percentage of seniors living alone
- Higher percentage of low income
- Higher percentage of children less than six years of age in low income households
- Higher percentage of high school education not completed
- Higher unemployment rate
- Higher aboriginal population[52]

[51] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

5.5 Cultural Background and Language Considerations

Cultural background and language considerations can be factors for fire service providers to consider in developing and delivering programs related to fire prevention and public education. Communication barriers, in terms of language and the ability to read written material, may have an impact on the success of these programs. There may also be familiarity challenges related to fire safety standards within recent immigrant populations. A high proportion of immigrants could demonstrate a large population that has a potential for unfamiliarity with local fire life safety practices and/or may experience possible language barriers. **Table 19** summarizes the immigration status of Oshawa's population. The City has a lower proportion of newcomers (17.11%) when compared to Ontario (29.09%). This population should be monitored as new Census data becomes available for consideration when planning public education programs and materials.

Table 19: Immigration Status – Oshawa and Ontario

	Oshawa		Ontario	
Immigration Status	**Population**	**%**	**Population**	**%**
Non-immigrants	129,685	82.27%	9,188,815	69.39%
Immigrants	26,970	17.11%	3,852,150	29.09%
Before 1981	11,925	7.57%	1,077,745	8.14%
1981 to 1990	3,765	2.39%	513,995	3.88%
1991 to 2000	4,290	2.72%	834,510	6.30%
2001 to 2005	2,620	1.66%	490,560	3.70%
2006 to 2010	2,420	1.54%	463,170	3.50%
2011 to 2016	1,950	1.24%	472,170	3.57%
Non-permanent residents	970	0.62%	201,200	1.52%
Total	**157,625**[53]	**100.00%**	**13,242,165**	**100.00%**

Source: 2016 Census, Statistics Canada[54]

[52] Durham Region (n.d.). Healthy Neighbourhoods. Retrieved March 9 2020 from https://www.durham.ca/en/health-and-wellness/health-neighbourhoods.aspx#Oshawa
[53] According to Statistics Canada, the total population count refers to Immigrant status and period of immigration for the population in private households - 25% sample data.
[54] Statistics Canada. 2017. Oshawa [Census metropolitan area], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017.

Knowledge of official languages based on the 2016 Census is included in **Table 20** for the City of Oshawa and Province of Ontario. As shown, 92.81% of the population in the City speak English only, 6.47% possess knowledge of both English and French, 0.63% have no knowledge of English or French, and 140 people speak French only. The potential for communication barriers should be considered and monitored, especially as the City continues to grow in the future.

Table 20: Knowledge of Official Language – Oshawa and Ontario

	Oshawa		Ontario	
Language	**Total**	**%**	**Total**	**%**
English Only	146,650	92.81%	11,455,500	86.05%
French Only	140	0.09%	40,040	0.30%
English and French	10,225	6.47%	1,490,390	11.20%
Neither English nor French	990	0.63%	326,935	2.46%
Total population (non-institutional)	**158,005**	**100.00%**	**13,312,865**	**100.00%**

Source: 2016 Census, Statistics Canada[55]

5.6 Transient Populations

Ontario Regulation 378/18 requires the consideration of “transient population”. This refers to the concept of population shift where the population within a community can shift at various times during the day or week or throughout the year. Population shift can be a result of a number of factors including employment, tourism, and education. In some municipalities, residents regularly leave the community for employment. This can contribute to increased traffic resulting in an increase in the number of motor vehicle calls. Other communities may be major tourist and vacation destinations resulting in large population shifts related to seasonal availability of tourism activities. This can result in an increased risk due to overnight tourism accommodation (sleeping) which can impact the demand for fire protection services. Educational institutions can attract a transient student population who commute to school daily or reside in dormitories or student housing on a seasonal basis. Student accommodations and short term rental

https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019).

[55] Ibid.

units present unique fire safety issues that may be attributed to the conversion of houses into boarding houses or rooming house type accommodations that do not conform to the O.F.C. or O.B.C. These properties are not always known to the fire department, posing a challenge for fire prevention division staff responsible for fire code enforcement.

5.6.1 Tourism

An increase in tourism can result in an increased risk due to overnight tourism accommodation which can impact the demand for fire protection services. There are several events each year and attractions that draw residents and non-residents to the City of Oshawa. Annual festivals and events include AutoFest, Bikes on Bond, Purple Wood's Maple Syrup Festival, and Canada Day. These events do not appear to cause a significant shift in population in terms of tourism accommodation; however, they may provide opportunities for O.F.S. to distribute fire and life safety information to large numbers of people.

5.6.2 Education

Educational institutions are a key source for population shift in larger communities as they attract people from outside of the typical community. They are important to consider since they may have school-based residences, or contribute to a population that is not captured through the census. There are several educational institutions in the City of Oshawa including Ontario Tech University, Trillium College, Durham College, Trent University -Oshawa Campus and Queen's University School of Medicine - Oshawa Campus suggesting that there is a need for targeted education programs geared towards fire safety and prevention in student housing.

5.6.3 Employment

Commuter populations represent a significant portion of Oshawa's labour force. **Table 21** shows the commuting destination trends for the residents of Oshawa based on 2016 Census data. It appears that a large portion of the City's labour force (20,075) commutes to a different census subdivision. An additional 16,700 commute to a different census division within the province.

A shift in commuter population may impact the demand for fire protection services. These figures are important from a fire suppression standpoint as large numbers of

person commuting to and from work could increase the number of vehicle collision calls to which the fire service responds.

Table 21: Commuting Destinations – City of Oshawa

Another way to measure this population shift is based on traffic counts. The Transportation Tomorrow Survey (T.T.S.) is a comprehensive travel survey conducted every five years, providing insight into the travel habits of residents in the Greater Toronto, Hamilton and surrounding areas, including the City of Oshawa.

The most recent T.T.S. reporting year (2016) indicates that, in a 24 hour period, 306,500 trips are made by the residents of Oshawa. Of the 306,500 trips made in a 24 hour period, the majority were made by drivers as the main mode of travel. Similarly, 309,900 trips are made to Oshawa by residents of the surrounding T.T.S. Area in a 24 hour period.[56]

High commuter volumes (due to an individual's journey to work or school) can have a significant impact on transit and traffic, increasing the likelihood of vehicle collisions with the possibility of higher call volumes during peak commuting times in the morning and late afternoon. This could potentially impact emergency response times within the City.

Identified Risk: The City's commuter population presents a factor that may impact traffic congestion, and the potential occurrence of motor vehicle accidents within the City.

[56] Data Management Group, University of Toronto. (2018, March). Transportation Tomorrow Survey 2016 (PDF File). Retrieved from http://dmg.utoronto.ca/pdf/tts/2016/2016TTS_Summaries_Durham_Wards.pdf

6.0 Hazard Profile

As referenced in the **O. Reg. 378/18**, the hazard profile assessment includes analysis of the hazards within the community, including natural hazards, hazards caused by humans, and technological hazards to which fire departments may be expected to respond, that may have a significant impact on the community. This section considers these hazards within the City of Oshawa.

6.1 Hazard Identification and Risk Assessment in Ontario (H.I.R.A.)

A hazard is defined as a phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Hazards can be natural, human-caused or technological. It is important to identify and consider these hazards from a fire risk, emergency response and overall public safety perspective in order to assist local governments and emergency management personnel plan for the risks within their communities and take the appropriate action to reduce future losses.

Under the Emergency Management and Civil Protection Act (E.M.C.P.A.), municipalities are required to 'identify and assess the various hazards and risks to public safety that could give rise to emergencies and identify the facilities and other elements of the infrastructure that are at risk of being affected by emergencies'. 2002, c. 14, s. 4. The O.F.M.E.M. has recently released methodology guidelines outlining a process for the development of an H.I.R.A. program, to assist municipalities in assessing their local hazards and potential risks.

Current legislation requires an annual review and update of the municipally developed H.I.R.A.

6.1.1 H.I.R.A. and the C.R.A.

The O.F.M.E.M. T.G.-02-2019 and O.F.M.E.M. "Question and Answers" provide guidance on the role of a completed H.I.R.A. in the context of a Community Risk Assessment. The guidelines acknowledge that these processes are separate but complementary. The O.F.M.E.M. "Question and Answers" states that the C.R.A. process "may result in decisions about fire department responses to various types of emergencies identified in a completed H.I.R.A.".

A H.I.R.A. is a comprehensive process to identify the hazards to a community as a whole. A C.R.A. provides an opportunity to examine the impact that these hazards would have on the services provided by a fire department. For the purposes of this C.R.A., a "fire protection services" lens will be applied to the top hazards as identified through the municipal led H.I.R.A.

6.2 City of Oshawa Hazard Identification and Risk Assessment

The City's Hazard Identification and Risk Assessment was reviewed and updated as recently as 2018 indicating that Oshawa has complied with its legislative requirements. As a component of the risk assessment and risk analysis process, the top risks in Oshawa were identified. The H.I.R.A. assigns likelihood and consequence levels to a list of hazards based on the potential for impacts to people, property and the environment. As a result of this analysis, the top hazards in the City include the following:

- hazardous material incident;
- transportation emergency;
- energy emergency/power outage;
- snowstorm/blizzard;
- health epidemic/pandemic;
- flood; and
- freezing rain.

6.3 Impacts of Hazards on Fire Protection Services

To better understand the risks of hazards as they pertain to fire protection services, the top five hazards have been assessed to identify possible impacts on fire protection services. Many of the potential impacts are not unique to a jurisdiction. The results of this review as they pertain to the top five hazards in the City are presented in **Table 22**.

Table 22: Impacts of Hazards on Fire Protection Services

Hazard (City H.I.R.A.)	Possible Impact on Fire Protection Services
Hazardous Material Incident	Incidents involving hazardous materials can have harmful effects on human life, property and the environment. Depending on the level of service offered and training acquired, a fire department can perform hazardous materials response or partner with a neighbouring jurisdiction to provide the same service. It is important for a fire department to possess the proper training and certification required to perform hazardous materials response safety and securely in order to prevent firefighter injury. The City's H.I.R.A. indicates that hazardous materials incidents have happened on roads and railways within Durham Region as dangerous goods are transported on a daily basis. However, no marine or airway incidents have occurred in the Region. Within Oshawa specifically, hazardous materials are transported daily on the major highways and rail lines. Technical rescue capabilities of O.F.S. are expanded on in the Fire Master Plan.
Transportation Emergency	The transportation system within Oshawa encompasses rail lines, roadways and major highways, an airport, and marine transportation. A transportation emergency could mean damage to or closure of a specific transportation type or to the system as a whole with impacts that include injury or loss of life, environmental damage, hazardous materials leak, and/or economic loss. Oshawa's transportation system is multimodal and supports the City as a distribution hub and day to day connectivity. A transportation emergency in Oshawa could require hazardous materials response from O.F.S. or other specialized rescue service. The City's H.I.R.A. has indicated that there have been major pileups along the 401 Highway. This is supported by the impacts that vehicle collisions have already had on the fire service's call volume. For example, rescue calls responded to by O.F.S. accounted for 19.82% of total call volume over a five year period from January 1st, 2014 to December 31st, 2018. Of those rescue calls, 95.07% are motor vehicle related incidents (**Section 10.2.2.3 – Spatial Modelling – Rescue Incidents**).
Energy	Energy emergencies that include power outages can affect critical infrastructure, essential services

Hazard (City H.I.R.A.)	Possible Impact on Fire Protection Services
Emergency/ Power Outage	or a large portion of local residents and businesses, lasting long periods of time. Common causes of power outages include extreme weather events and storms, increased demand on the system, or energy infrastructure failure. An event such as this could mean the loss of energy for heat, cooling, cooking, refrigeration, life assistance equipment and more. Emergency Services such as O.F.S. have backup generators but refuelling them could be an issue during a long-term power outage. The System Average Interruption Duration Index (SAIDI) is commonly used as a reliability indicator by electric power utilities. The City's H.I.R.A. indicates that a S.A.I.D.I. report for O.P.U.C. (the City's electricity provider) has a high reliability with only minor power outages.
Snowstorm/ Blizzard	According to the City's H.I.R.A., Durham Region receives snowstorms and blizzards on an annual basis which is often increased due to its presence on the Lake. Snowstorm/blizzard events can cause disruptions to the road network, preventing emergency vehicles from reaching their destinations, delaying emergency response times. Additionally, this type of event promotes dangerous driving conditions leading to motor vehicle collisions or crashes, contributing to an increase in call volume. As mentioned above, it is not uncommon for O.F.S. to experience high call volumes related to vehicle collisions throughout the year.
Health Epidemic/ Pandemic	Epidemic or pandemic breakout can present significant challenges to first responders and the community causing potential fire department workplace absenteeism, and an increased demand for medical response and supplies. For example, during the severe acute respiratory syndrome (S.A.R.S.) outbreak in Toronto, declared a medical state of emergency in March of 2003, of Toronto EMS's 850 paramedics, 436 were placed in a 10-day home quarantine, 62 developed SARS-like illnesses, and 4 developed suspected or probable SARS requiring hospitalization.[57]

[57] Alexis Silverman, Andrew Simor, Mona R. Loutfy. (2004). Toronto Emergency Medical Services and SARS. Emerging Infectious Diseases., Volume 10(9): 1688–1689, doi: 10.3201/eid1009.040170

Hazard (City H.I.R.A.)	Possible Impact on Fire Protection Services
Flood	The City's H.I.R.A. indicates that in the springtime, water levels rise in local waterways due to snow thaw creating creek flooding. During heavy rain events in the summer, the City's stormwater systems cannot handle the surge resulting in flash flooding in many of the City's older neighbourhoods. Depending on the severity of the flooding, access to various sections of the road network could be limited to fire department response delaying emergency response times.
Freezing Rain	Freezing rain can weigh down electrical wires or branches causing them to break, blocking roadways and fire department or other first responder access leading to delayed emergency response and extended travel times. Downed electrical wiring presents electrical current exposure hazards which can cause injuries requiring medical assistance and overall damages to the electrical grid could lead to energy system disruption. Freezing rain also promotes dangerous driving conditions leading to motor vehicle collisions or crashes, driving emergency response call volume. The City's H.I.R.A. indicates that on average the Region as a whole experiences approximately 10 days of freezing rain per year.
Source: City of Oshawa Hazard Identification and Risk Assessment, Appendix F of the Emergency Master Plan	

The City of Oshawa is situated between two nuclear generating stations; the Pickering Nuclear Generating Station located in Pickering, Ontario and the Darlington Nuclear Generating Station located in Clarington, Ontario. Facilities of this type pose the potential risk of radiation release. Although the probability of a nuclear emergency is low, the consequences of a nuclear incident involving the release of radioactive materials would be severe and even catastrophic. This hazard is not a top risk for the City of Oshawa, but is noteworthy and warrants consideration for hazard specific planning and high prioritization due to the severity of potential consequences. To address this hazard, the City of Oshawa has a Nuclear Emergency Response Plan (N.E.R.P.) in place outlining authority, roles and responsibilities as well as measures to be taken in response to a nuclear emergency. In the event of a nuclear incident at either of these two facilities, the Provincial Emergency Operations Centre and the Regional Emergency Operations Centre are automatically activated. Both Durham Region and City of Oshawa N.E.R.P.s support the Provincial Nuclear Emergency Response Plan and conform to the directives issued by the Province who lead the overall effort in a nuclear event.

The Fire Master Plan, which is informed by the findings of this C.R.A., includes a high-level review of the City's emergency management and planning efforts and operational approaches to the hazards identified in this assessment.

Key Finding: The City's 2018 Hazard Identification and Risk Assessment identifies hazards that could each impact the ability of the City to deliver fire protection services.

7.0 Public Safety Response Profile

As required by **O. Reg. 378/18**, the Public Safety Response Profile includes analysis of the types of incidents responded to by other entities in the community, and those entities' responsibilities. These entities could include police, ambulance, fire and other entities that may be tasked with or able to assist in some capacity the collective response to an emergency situation. The following sections consider these public safety response characteristics within the City of Oshawa.

7.1 Public Safety Response Agencies in the City of Oshawa

Public safety and response agencies refer to agencies and organizations that respond to specific types of incidents within a community that provide trained personnel and resources critical to upholding public safety. Each of these entities offer specialized skillsets in support of front-line operations. The types of response services offered might include fire protection, medical attention, rescue operations, policing activities or hazardous materials response. In addition to responding individually to certain types of incidents, these entities work closely with one another in the event of major emergencies through a structured standardized response approach to ensure effective coordination among all response agencies.

Table 23 lists the public safety response agencies within Oshawa who will be able to assist in a collective emergency response effort and may contribute to the minimization of risk within the community. Identifying the public safety response agencies within the community can help the fire service understand the agencies that may be able to assist in the response to emergencies and therefore determine the level of response they offer.

Table 23: Public Safety Response Agencies

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident
Durham Regional Police Services	• Motor vehicle collisions • Medical incidents • Fire incidents • False fire incidents • Public assistance	• Traffic control, scene stabilization, investigation • Patient contact, initial first aid, scene stabilization, investigation • Scene stabilization, evacuation, investigation • Scene stabilization, investigation • Assist in coordinating public information
Region of Durham Paramedic Services	• Motor vehicle collisions • Medical incidents • Fire incidents • False fire incidents • Public assistance	• Patient stabilization, extrication, reporting • Patient stabilization, transport, reporting • Standby for firefighter safety, patient stabilization, transport, reporting • Standby for firefighter safety, patient stabilization, transport, reporting • Assist in coordinating public information
Oshawa Power and Utilities Corporation	• Power supply incident • Distribution emergency	• Customer and emergency personnel notification • Service restoration
Enbridge Gas	• Distribution emergency • Gas supply emergency	• Affected customer notification • Incident support teams for emergencies • Pipeline shutdown • Service restoration
C.O.M.R.A. Marine Rescue Association	• Persons requiring water or ice water rescue	• Cooperate with emergency services • Patrol waters of Oshawa, Whitby and Clarington

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident
	• Missing persons requiring search	• Search and rescue • Water and ice rescue
Ontario Volunteer Emergency Response Team (O.V.E.R.T.) (located in Oshawa)	• Large scale disasters that may require evacuation including floods, power outages, public health emergencies and more.	• Provides emergency assistance to first responders and emergency management agencies • Incident command • Ground and marine search and rescue • canine unit support • Technical rescue • Communications.

7.1.1 Mutual Aid Agreements

Mutual aid agreements can provide additional depth of resources and response that may not have been dispatched as part of a municipality's initial response. These agreements establish a mutual relationship between multiple public safety and response agencies whereby emergency services and resources are shared to promote a more effective response and strengthen the depth of emergency response provided by a fire department. Currently, the Oshawa Fire Services is a participant in the Regional Municipality of Durham Mutual Aid Plan.

7.1.2 Automatic Aid Agreements

Agreements between public safety and response agencies such as fire departments can also provide for initial or supplemental emergency response services. Automatic aid agreements are programs designed to provide and/or receive assistance from the closest available resource, regardless of municipal boundaries, on a day-to-day basis. **Table 24** lists the automatic aid agreements established between the City of Oshawa and its surrounding municipalities for the provision of fire protection services.

Table 24: Public Safety Response Agencies through Automatic Aid Agreements

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident
Town of Whitby	• Fire scenes • Motor Vehicle Collisions • Rescue scenes	• Firefighting • Fire scene control • Rescue services • Provides services listed above for East-bound and West-bound coverage for each other on the 407 and the 401 on either side of the Oshawa/Whitby border
Municipality of Clarington	• Fire scenes • Motor Vehicle Collisions • Rescue scenes	• Firefighting • Fire scene control • Provides services listed above for all of Highway 401 between Harmony Road in Oshawa and Holt Road in Clarington, and Highway 418 north between Highway 401 and Highway 2 in Clarington.

Source: Automatic Aid Agreement between the City of Oshawa and Municipality of Clarington, dated 2018 and the Automatic Aid Agreement between the City of Oshawa and the Town of Whitby, dated 2016.

8.0 Community Services Profile

As referenced in **O. Reg. 378/18**, the community service profile assessment includes analysis of the types of services provided by other entities in the community, and those entities' service capabilities. This includes the presence or absence and potential abilities of other agencies, organizations or associations to provide services that may assist in mitigating the impacts of emergencies to which the fire department responds. The following sections consider these community service characteristics within the City of Oshawa.

8.1 Community Services in the City of Oshawa

Fires and other emergency events can have devastating effects on a community and at times can overwhelm public safety and security agencies' capacity to respond. In an emergency event, community-based agencies, organizations and associations can provide surge capacity to the response and recovery efforts of first responders and a useful resource to call upon if integrated into the emergency management framework of a municipality early on. These types of affiliations can contribute a variety of capabilities essential to response and recovery efforts including support in the areas of communications, health care, logistics, shelter, food and water supply, emergency clothing, and more specialized skillsets.

Investigating new community partnerships and strengthening existing ones may be an effective strategy for consideration towards enhancing the current public fire and life safety education program, fire inspection efforts and emergency response and recovery capabilities of O.F.S. **Table 25** lists community agencies, organizations and associations within Oshawa.

Table 25: Community Service Agencies, Organizations and Associations

Community Service Agency	Types of Assistance Provided
Canadian Red Cross – Durham Region Branch (located in Oshawa)	In the event of a fire incident or emergency, The Canadian Red Cross - Durham Region Branch can provide temporary lodging, clothing and food to persons who cannot return to their homes or, who cannot find alternate accommodations. In larger emergencies requiring evacuation, the organization has the capability to set up reception and information services to greet evacuees, provide information, provide family reunification and control facility access.
Salvation Army Oshawa (located in Oshawa)	The Salvation Army is capable of providing both immediate and long-term recovery assistance in cooperation with Fire and Police Services. The Salvation Army's Emergency Disaster Services program can provide food and hydration resources, emotional and spiritual care, donations management, social services, long-term recovery and training and volunteers.
St. John's Ambulance (located in Oshawa)	As a member of the Disaster Response Service Agencies, St. John's Ambulance Emergency Preparedness and Disaster Response Teams are integrated into the collective community disaster and emergency response and preparedness effort. The organization has the capacity to provide health care and first aid in reception centres, casualty care at the scene of an event, patient transportation, and evacuation assistance.
Local Radio Broadcasters (e.g. C.K.D.O. Radio)	Public media outlets can provide the fire department with means to disseminate important fire and life safety education messaging to a broad audience. This could include a partnership with local radio such as Durham Region's C.K.D.O. Radio to provide a fire safety messaging or advertising campaign to inform the public about residential fires and the actions residents can take to prevent incidents from

Community Service Agency	Types of Assistance Provided
	happening. There may also be an opportunity to establish a partnership with local radio for a designated fire department member to appear regularly offering fire safety tips that capture a variety of brief messages around topics such as careless smoking, space heaters, faulty wiring, electrical outlet overloading, etc.).
Alcohol and Gaming Commission of Ontario	O.F.S. can partner with local organizations that may be able to provide additional support in the area of fire inspection and enforcement. For example, the Alcohol and Gaming Commission of Ontario may be able to assist in the enforcement of occupancy loads in nightclubs through after hour inspections. Establishing lines of communications and collaborative partnerships early on with agencies who share a common concern for people's welfare and safety can inform and strengthen the fire department's inspection and enforcement program.
Durham Region Hoarding Coalition	Hoarding presents unique fire risks due to the large amount of flammable materials in the home which may contribute to a fire burning faster and hotter and due to the falling objects or sharp objects concealed within clutter that may injure or trap residents and responding firefighters. The Durham Region Hoarding Coalition can assist O.F.S. in identifying occupancies that may present code violations and unsafe hoarding practices requiring follow up and inspection.
School boards (e.g. Durham Catholic district School Board, Durham district School Board, French-First Language School Board)	As reported in **Section 5.2 – Population Age**, the 2016 Census data indicates that children aged 14 and under represent 16.66% of the City's total population. The proportion of children in the City is significant, especially when considering the opportunity for public education. This percentage supports the development of enhanced public education programming that targets children/youth of all ages. Partnering with school boards and other agencies that work with children can provide opportunity for fire and life safety education.

Community Service Agency	Types of Assistance Provided
Durham Children's Aid Society (C.A.S.)	The Durham Children's Aid Society is responsible for providing child protection services to children who live in Durham Region. It is common practice for this agency to investigate and inspect living conditions where there is a concern for a child's welfare. C.A.S. workers may encounter property conditions that they feel warrant follow up by O.F.S. due to unsafe conditions or fire hazard related concerns.
Victim Services of Durham Region	The Victim Services of Durham Region can provide aid in grief counselling and relocation of displaced civilians on a small scale.
Living Assistance Agencies (e.g. Home Instead Senior Care, Meals on Wheels), Victorian Order of Nurses, Retirement Homes Regulatory Authority	As reported in **Section 5.2 – Population Age** of this C.R.A., seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% of the City's total population. It also identified that of the City's total population, 28.68% fall into the age range of 45 to 64 years, representing a cohort aging towards the seniors demographic of 65 years or older. Agencies that provide at-home care and assisted living services to seniors can assist O.F.S. in identifying occupants who are at increased fire risk due to unsafe living conditions (e.g. absence of a working smoke alarm) which may require follow up or inspection.
Public Health – Durham Region	As reported in **Section 6.3 – Impacts of Hazards on Fire Protection Services** of this C.R.A., it was identified that there are hazards within the City of Oshawa that could impact the ability of the City to deliver fire protection services. Specifically, a health-related incident such as an epidemic or pandemic could present significant challenges to first responders and the community causing potential fire department workplace absenteeism due to illness, and an increase in medical call volume. Public Health – Durham Region can provide guidance and technical expertise to O.F.S.

Community Service Agency	Types of Assistance Provided
	during a health related emergency and educate emergency personnel about how to protect themselves and others during events of widespread illness.
Durham Transit Buses	In the event of a fire or other emergency, the O.F.S. has used Durham Transit buses for residents in need of temporary shelter after a fire. This initiative is coordinated with Durham Regional Police Services.

9.0 Economic Profile

As referenced in **O. Reg. 378/18**, the economic profile assessment includes analysis of the economic sectors affecting the community that are critical to its financial sustainability. This involves economic drivers in the community that have significant influence on the ability of the community to provide or maintain service levels. The following sections consider these economic characteristics within the City of Oshawa.

9.1 Economic Sectors and Employers in Oshawa

Certain industries, employers and events contribute to the financial sustainability and economic vitality of a community. A fire or other emergency at key sectors and employment facilities within a community could have significant impacts on local economy and employment.

As mentioned in **Section 2.2.1.,** the GO Transit network in Oshawa consists of two 'mobility hubs', or major transit stations, with one located in Downtown Oshawa and the other at the Oshawa Train Station. These areas currently promote easy accessibility to the City's employment areas.

The top industries that contribute to the economic base of the City are summarized in **Figure 20** below. According to the Statistics Canada 2016 Census, retail trade, health care and manufacturing were significant industries within Oshawa. Since 2016, Oshawa's economy has been trending away from manufacturing and the City has positioned itself for growth in areas of advanced manufacturing (new manufacturing processes that use computer controlled and electronic based equipment), energy, health and biosciences, information technologies and logistics.[58] As the City diversifies its economic base and positions itself for growth specifically in the logistics sector moving forward, Oshawa's position as a transportation hub will become increasingly significant. The various available modes of transportation and the Oshawa Port which have established Oshawa as a distribution hub already, often see the transport of dangerous goods and hazardous materials. A major hazardous materials or transportation emergency incident at a key logistics facility such as the Port of Oshawa

[58] City of Oshawa. (2019). Community Profile (PDF File). Retrieved from https://www.oshawa.ca/business-and-investment/resources/Community_Profile_2018_FINAL.pdf

could potentially impact the movement of cargo and the revenue it generates towards the local economy.

Figure 20: Industry in Oshawa

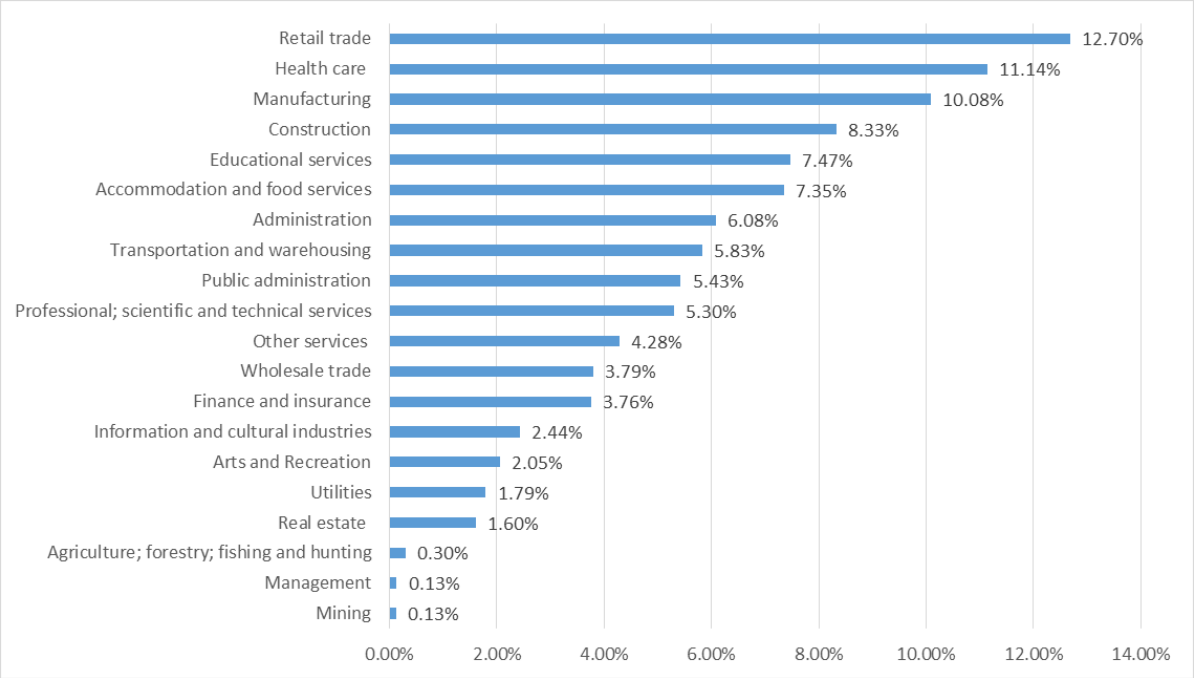


Figure Source: 2016 Census, Statistics Canada[59]

According to the Conference Board of Canada, education and health care are two significant industries within Oshawa that account for approximately one-sixth of the areas total economic activity today.[60] As part of the data collection process for this C.R.A., top employers were provided by the City of Oshawa. As shown in **Table 26**, there are two post-secondary institutions (University of Ontario Institute of Technology and Durham College) that are at the top of Oshawa's top employers list by number of employees after Lakeridge Health which employs an estimated 2,008 employees. Not only are these employers significant in that they offer employment opportunities and contribute jobs to the local economy of Oshawa, but they also contain a number of

[59] Statistics Canada. 2017. Oshawa, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed November 26, 2019)

[60] Alan Arcand, Robin Wiebe, and Constantinos Bougas. (2019). Metropolitan Outlook 2: Oshawa. Conference Board of Canada, Winter 2019, p.9.

assets that contribute economic development initiatives within one of the City's key sectors that has the potential for growth.

Therefore, a significant fire or other emergency at one of these institutions may have an impact on this economic sector and the sectors that are supported by the innovation and research taking place within them.

To reduce potential losses, the fire services can consider increasing public fire and life safety activities that focus on fire safety concerns within student housing and facilities or focus on Fire Code inspections (in particular Part 4.12 – Laboratories) to reduce the probability of an incident occurring at one of these sites.

Table 26: Top Employers in Oshawa

Employer	Description	Number of Employees
Lakeridge Health - Oshawa Hospital	Hospital	2,008
Concentrix	Runs commercial and emergency call centre.	1,200
Ministry of Finance	The Ministry of Finance performs a variety of roles, all focused on supporting a strong economic, fiscal investment climate for Ontario, while ensuring accountability with respect to public funds.	1,000
City of Oshawa	Municipal administration	750
Durham College - Oshawa Campus	College- Oshawa campus	713
Ontario Tech University	University- Oshawa campus.	657
Durham Children's Aid Society	Children's aid services.	400
Durham Regional Police (Central East Division)	Regional police services.	292

Employer	Description	Number of Employees
Ontario Power Generation	OPG head office	247
Oshawa Clinic	Doctor's office.	240
Metroland Media Oshawa Region	Distribution and manufacturing warehouse and office for The Whitby, Oshawa and Clarington This Week and for The Pickering and Ajax News Advertiser.	220
Hillsdale Estates	Long term care facilities.	216
Mackie Moving Systems	Moving services for anything from a local move to a large scale move system for a corporation - Trucking.	200
Costco Wholesale	Membership-only warehouse club that provides a wide selection of merchandise.	180
Extendicare Oshawa	Elderly care apartments	175
Durham Regional Transit - East	Bus maintenance and operations.	173
Del Monte Distribution Centre	Distribution centre for Del Monte.	150
A.G. Simpson Co Ltd	Auto parts supplier	150
Hillsdale Terrace	Long term care facility.	149

Source: Major Employers Spreadsheet, City of Oshawa

Key Finding: The City has identified top employers that contribute to the economic vitality of the community. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the City.

10.0 Past Loss and Event History Profile

As referenced in **O. Reg. 378/18**, the past loss and event history profile assessment includes analysis of the community's past emergency response experience, including an analysis of the number and types of emergency responses, injuries, deaths and dollar losses, and a comparison of the community's fire loss statistics with provincial fire loss statistics. Evaluation of previous response data will inform decisions on fire protection services delivery including public fire safety education and inspection programs. The following sections consider these past loss and event history characteristics within the City of Oshawa.

10.1 Past Loss

Analysis of historical data provides valuable insight into understanding the specific trends within a community. Assessing the key factors of life safety risk and fire risk in relation to provincial statistics provides a foundation for evaluating where specific programs or services may be necessary. The analysis within this section is based on the O.F.M.E.M.'s Standard Incident Reporting for the period of January 1st, 2014 to December 31st, 2018.

10.1.1 Total Fire Loss

Analysis of the total fire loss within the City over the five year period from January 1st, 2014 to December 31st, 2018 as displayed in **Table 27** includes three categories representing the primary types of fires and the total amount of dollar loss associated with these fires. This includes 390 structure fires, 15 outdoor fires, and 95 vehicle fires representing $33,274,653 in total dollar loss.

Over this five year period, the City averaged 100 fires per year and $6,654,931 in property loss per year. On average, 78 structure fires occur per year with an average structural fire property loss of $5,881,034 per year.

The fire loss in 2016 was driven by one major fire in a Group D- Business Occupancy that resulted in a fire loss of $3.0 million dollars, and six other significant fires with a fire loss in excess of $250,000 each. In 2018 the City also experience two large fires in Group D- Business Occupancy reflecting a total loss of $5.0 million dollars and twelve other significant fires with a fire loss in excess of $250,000 each.

Table 27: Total Fire Loss – City of Oshawa

	Structure		Outdoor		Vehicle		Total	
Year	# of Fires	Loss ($)	# of Fires	Loss ($)	# of Fires	Loss ($)	# of Fires	Loss ($)
2014	75	3,552,850	2	1,500	16	215,000	93	3,769,350
2015	76	2,384,580	5	3,500	19	252,215	100	2,640,295
2016	97	8,203,861	5	5,600	13	85,630	115	8,295,091
2017	71	4,300,406	1	3,000	20	185,719	92	4,489,125
2018	71	10,963,471	2	300	27	3,117,021	100	14,080,792
Total	**390**	**29,405,168**	**15**	**13,900**	**95**	**3,855,585**	**500**	**33,274,653**
% of All Fires	**78.00%**	**88.37%**	**3.00%**	**0.04%**	**19.00%**	**11.59%**	**100.00%**	**100.00%**
Average	**78**	**$5,881,034**	**3**	**2,780**	**19**	**$771,117**	**100**	**6,654,931**

Source: O.F.M.E.M. Standard Incident Reporting

Table 28 compares the number of structure fires and the associated total property loss within the City of Oshawa for the period from January 1st, 2014 to December 31st, 2018 to the number of structure fires and total property loss that occurred across Ontario for the same period.

The City of Oshawa experienced an average of 78 structure fires per year over the five year period from January 1st, 2014 to December 31st 2018, representing an average of 15.6% of all fires that occurred in the City.

Over this same period, the Province experienced an average of 7,030.6 structure fires per year representing an average of 13.07% of all fires that occurred in the Province.

This analysis highlights that Oshawa experienced an average of 78 structure fires per year representing an average of 15.60% of all fires that occurred in the Province.
Structure fires in Oshawa and the Province accounted for the highest percentage of total dollar loss for fires. However, the average of all fire loss in Oshawa of 17.67% was lower than that of the Province of 17.88%.

Table 28: Structure Fires and Property Loss – City of Oshawa and Province of Ontario

	City of Oshawa				Province of Ontario			
Year	Structure Fires	Loss ($)	% All Fires	% All Loss ($)	Structure Fires	Loss ($)	% All Fires	% All Loss ($)
2014	75	3,552,850	15.00%	10.68%	7,065	784,681,080	13.14%	20.12%
2015	76	2,384,580	15.20%	7.17%	7,240	658,957,595	13.46%	16.89%
2016	97	8,203,861	19.40%	24.65%	7,169	654,514,771	13.33%	16.78%
2017	71	4,300,406	14.20%	12.92%	6,679	657,580,390	12.42%	16.86%
2018	71	10,963,471	14.20%	32.95%	7,000	732,673,155	13.02%	18.78%
Average	**78**	**$5,881,034**	**15.60%**	**17.67%**	**7,030.60**	**$697,681,398**	**13.07%**	**17.88%**
Total for Structure Fires	**390**	**29,405,168**	**78.00%**	**88.37%**	**35,153**	**3,488,406,991**	**65.37%**	**89.42%**
Total for All Fires with a Loss (Structure, Vehicle, Outdoor)	**500**	**33, 274, 653**	**100%**	**100%**	**53,774**	**3,900,958,780**	**100%**	**100%**

Source: O.F.M.E.M. Standard Incident Reporting

Key Finding: Over the five year period from January 1st, 2014 to December 31st, 2018, the City averaged 78 structure fires per year.

10.1.2 Fires by Occupancy Type

This section assesses the structure fires that occurred over the period from January 1st, 2014 to December 31st, 2018 based on the type of occupancy. Information retrieved from the O.F.M.E.M.'s Standard Incident Reporting was utilized to inform this analysis.

The analysis in **Table 29** indicates that during this period, Oshawa experienced a total of 390 structure fires, 322 of these fires, or 82.56% occurred in Group C-Residential Occupancies. These fires were responsible for 68.94% of the City's total fire loss for this period. In comparison, structure fires in Group C-Residential Occupancies accounted for 73.49% of structure fires across the Province and 61.97% of all fire loss. Over this period, Oshawa experience a 9.07% higher rate of fires in Group C-Residential Occupancies than that of the Province and a 6.97% higher dollar loss in Group C-Residential Occupancies.

The second most significant source of property loss in the City accounting for 13.00% of structure fire loss and 3.85% of the total structure fires over the same period are Group E – Mercantile occupancies (higher than the Provincial structure fire loss within this occupancy type by 8.14%).

Some of the trends within this historical fire loss reporting for the City could be explained by the distribution of Property Stock by Major Occupancy classification within the City. For example, as found within **Section 3.2.1 – City of Oshawa Existing Major Building Classification Summary** of this C.R.A., 93.41% of the property stock classified by the Ontario Building Code is Group C – Residential. It is reasonable to expect that Group C would account for the highest proportion of structure fires. For example, Group F – Industrial occupancies account for 1.05% off the property stock but 4.10% of the structure fires.

Table 29: Fires by O.B.C. Major Occupancy Classification – City of Oshawa and Province of Ontario

		City of Oshawa				Province of Ontario	
Group	**Occupancy Classification**	**Fires**	**% of Structure Fires**	**Fire Loss**	**% of Fire Loss**	**% of Structure Fires**	**% of Fire Loss**
Group A	Assembly	8	2.05%	17,185	0.06%	3.92%	3.34%
Group B	Care or Detention	1	0.26%	500,000	1.70%	1.45%	1.61%
Group C	Residential	322	82.56%	20,270,914	68.94%	73.49%	61.97%
Group D	Business and Personal services	7	1.79%	2,712,500	9.22%	2.47%	2.28%
Group E	Mercantile	15	3.85%	3,824,000	13.00%	3.35%	4.86%
Group F	Industrial	16	4.10%	1,398,169	4.75%	7.50%	18.43%
Other	Not Classified within the O.B.C.	20	5.13%	332,400	1.13%	5.15%	1.17%
Farm	Classified within the N.F.B.C.	1	0.26%	350,000	1.19%	2.67%	6.35%
Total		**390**	**100.00%**	**29,405,168**	**100.00%**	**100.00%**	**100.00%**

Source: O.F.M.E.M. Standard Incident Reporting

Key Finding: Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group F – Industrial occupancies account for 4.10% (16) of total structure fires within the City.

Key Finding: Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group E – Mercantile occupancies account for 13.00% ($3,824,000) of total structure fire loss within the City, higher than the Province by 8.14%.

10.1.3 Civilian Fire Fatalities and Injuries

As shown in **Table 30**, according to O.F.M.E.M. Standard Incident Reporting, over the five year period from January 1st, 2014 to December 31st, 2018, there were 20 reported injuries and seven reported fire fatalities within the City of Oshawa. The majority of injuries and fatalities within the City occurred in Group C – Residential Occupancies. There was also a fire fatality categorized as 'other' and occurred in a vehicle. This finding is consistent with the fire loss statistics by occupancy type, whereby the majority of fire losses within the Province and within the City occurred in Group C – Residential occupancies.

Table 30: Civilian Fire Fatalities and Injuries by O.B.C. Major Occupancy Classification - City of Oshawa

Group	Occupancy Classification	Injuries	Fatalities
Group A	Assembly	0	0
Group B	Care or Detention	0	0
Group C	Residential	20	6
Group D	Business and Personal services	0	0
Group E	Mercantile	0	0
Group F	Industrial	0	0
Other	Not Classified within the O.B.C.	0	1
Total		**20**	**7**

Source: O.F.M.E.M. Standard Incident Reporting

Key Finding: Most reported fire related civilian injuries (20) and fatalities (6) occurred in Group C – Residential Occupancies, with one (1) fatality occurring in an occupancy not classified within the O.B.C.

10.1.4 Reported Fire Cause

The N.F.P.A. defines fire cause as “the circumstances, conditions, or agencies that bring together a fuel, ignition source, and oxidizer (such as air or oxygen) resulting in a fire or a combustion explosion.”[61] Assessing the possible cause of the fires reported is an important factor in identifying potential trends or areas that may be considered for introducing additional public education or fire prevention initiatives. Within O.F.M.E.M. fire loss reporting, there are four categories of cause used to classify the cause of a fire. These include intentional, unintentional, other, and undetermined.

Table 31 presents the reported fire causes for the City compared to the Province over the five year period from January 1st, 2014 to December 31st, 2018. Overall the leading reported fire causes are fairly consistent with the Province.

The “intentional” category recognizes the cause of a fire to be started for a specific reason. These are typically classified as arson fires, acts of vandalism, or to achieve personal gain through insurance payment for example. As indicated in **Table 32**, 8.21% of the fires reported (arson and vandalism combined) over the five year period from January 1st, 2014 to December 31st, 2018 were intentional in the City, similar to the Provincial total of intentional fires (7.77%).

The “unintentional” category recognizes a number of the common causes of a fire that represent both human behavioural causes (e.g., playing with matches) and equipment failures (e.g., mechanical failure). In total, unintentional fire causes represented 67.18% of the cause for the 262 fires during this period (compared to 68.09% within the Province). This suggests a need for targeted education programs about fire causes and prevention. The leading cause of unintentionally set fires in Oshawa occurred due to misuse of ignition source at 31.03% (121 fires), compared to 29.96% in the Province, followed by mechanical/electrical failure at 13.33% (52 fires), compared to 15.45% in the Province.

[61] Source: N.F.P.A., Glossary of Terms, 2019 Edition.

Table 31: Reported Fire Cause – City of Oshawa and Province of Ontario

		City of Oshawa		Ontario	
Nature	**Fire Cause**	**# of Fires**	**% of Fires**	**# of Fires**	**% of Fires**
Intentional	Arson	28	7.18%	2,107	5.99%
Intentional	Vandalism	4	1.03%	616	1.75%
Intentional	Other Intentional	0	0.00%	12	0.03%
Unintentional	Children Playing	3	0.77%	138	0.39%
Unintentional	Design/Construction/Maintenance Deficiency	15	3.85%	2,590	7.37%
Unintentional	Mechanical/Electrical Failure	52	13.33%	5,432	15.45%
Unintentional	Misuse of Ignition Source	121	31.03%	10,532	29.96%
Unintentional	Other Unintentional	27	6.92%	2,483	7.06%
Unintentional	Undetermined	43	11.03%	2,735	7.78%
Unintentional	Vehicle Collision	1	0.26%	25	0.07%
Other	Other	39	10.00%	1,904	5.42%
Undetermined	Undetermined	57	14.62%	6,532	18.58%
Unknown, not reported	Unknown, not reported	0	0.00%	47	0.13%
Total		**390**	**100.00%**	**35,153**	**100.00%**

Source: O.F.M.E.M. Standard Incident Reporting

Key Finding: Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the leading cause of unintentionally set fires was due to misuse of ignition source at 31.03% (121 fires), compared to 29.96% (10,532) in the Province.

Key Finding: Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the second most common cause of unintentionally set fires was due to mechanical/electrical failure at 13.33% (52 fires), compared to 15.45% (5,432) in the Province.

10.1.5 Ignition Source

According to the 2019 N.F.P.A. Glossary of Terms, ignition source is defined as "any item or substance capable of an energy release of type and magnitude sufficient to ignite any flammable mixture of gases or vapors that could occur at the site or onboard the vehicle."[62] **Table 32** provides fire loss by source of ignition for the City of Oshawa and the Province.

The most common reported ignition sources within the City are "open flame tools/smokers' articles" at 20.26% (higher than the Province by 6.54%), "cooking equipment" at 19.23% (higher than the Province by 1.51%), miscellaneous at 13.33% (higher than the Province by 3.42%) and "exposure" at 10.26% (higher than the Province by 5.61%). This presents the opportunity to incorporate key messages relating to cooking and smoking in public education materials.

Table 32: Source of Ignition - City of Oshawa and Province of Ontario

Reported Ignition Source	City of Oshawa		Ontario	
	# of Fires	% of Fires	# of Fires	% of Fires
Appliances	16	4.10%	1,635	4.65%
Cooking Equipment	75	19.23%	6,228	17.72%
Electrical Distribution	34	8.72%	3,125	8.89%
Heating Equipment, chimney etc.	14	3.59%	2,750	7.82%
Lighting Equipment	6	1.54%	1,101	3.13%
Open flame tools/smokers articles	79	20.26%	4,822	13.72%
Other electrical/mechanical	10	2.56%	1,667	4.74%

[62] Source: N.F.P.A. Glossary of Terms, 2019 Edition.

Reported Ignition Source	City of Oshawa		Ontario	
Processing Equipment	1	0.26%	441	1.25%
Miscellaneous	52	13.33%	3,485	9.91%
Exposure	40	10.26%	1,634	4.65%
Undetermined	63	16.15%	8,210	23.36%
Unknown, not reported	0	0.0%	55	0.16%
Total	**390**	**100.00%**	**35,153**	**100.00%**

Source: O.F.M.E.M. Standard Incident Reporting

Key Finding: Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 19.23% (19) of fires had a reported ignition source of cooking equipment, which is 1.51% higher than the Province (17.72%).

Key Finding: Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 20.26% (79) of fires had a reported ignition source of open flame tools/smokers articles, which is 6.54% higher than the Province (13.72%).

Key Finding: Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 10.26% (40) of fires had a reported ignition source of exposure, which is 5.61% higher than the Province (4.65%).

10.1.6 Smoke Alarm Status Processing Equipment

Smoke alarms are required on every level of a dwelling in the Province of Ontario and are the first line of defence against the negative consequence of a fire. As a result, smoke alarm programs and compliance are a key component of public education and fire prevention activities provided by the municipal fire departments across the Province.

Data is publically available at the provincial level for the smoke alarm status in the event of a fire and municipalities collect smoke alarm status information and report it to the Province. This data was provided by the O.F.M.E.M. as part of the C.R.A. for the City of Oshawa and the Province of Ontario over a five year period from January 1st, 2014 to December 31st, 2018 for Group C - Residential occupancies. **Table 33** highlights

whether a smoke alarm was present and operating on the floor or in the suite of fire origin.

Table 33: Smoke Alarm Presence and Operation on the Floor of Fire Origin - City of Oshawa and Province of Ontario

City of Oshawa								Ontario	
Smoke Alarm Status on Floor of Origin	2014	2015	2016	2017	2018	Total	%	Total	%
No Smoke Alarm Present	16	16	20	8	7	67	21.82%	4,289	17.31%
Smoke Alarm Present And Operated	24	24	30	29	26	133	43.32%	11,044	44.57%
Smoke Alarm Present, Did Not Operate	7	8	9	5	5	34	11.07%	3,467	13.99%
Smoke Alarm Present, Operation Undetermined	4	4	5	5	4	22	7.17%	1,907	7.70%
Smoke Alarm Presence Undetermined	8	6	15	12	8	49	15.64%	4,014	16.20%
Unknown, not reported	1	1	0	1	0	3	0.98%	59	0.24%

Source: O.F.M.E.M. Standard Incident Reporting

Over the five year period from January 1st, 2014 to December 31st, 2018, there was no smoke alarm present for 21.82% of occurrences in the City compared to 17.31% in the Province. A further 34 incidents (or 11.07%) had a smoke alarm present but it did not operate (compared to 13.99% in the Province). In Oshawa, 43.32% of occurrences a smoke alarm was present and operated. Smoke alarm presence or operation combined was undetermined in 22.81% of instances in the City. Provincial and local statistics

support having a targeted and proactive smoke alarm program in place and suggest the need for increased enforcement strategies for those properties that are non-compliant.

Key Finding: Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 21.82% (67) of incidents did not have a smoke alarm present (compared to 17.31% or 4,289 in the Province).

Key Finding: Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 43.32% (133) of incidents had a smoke alarm present and operating compared to 44.57% (11,044) in the Province.

10.2 Event History

Event history seeks to apply O.F.S.' historic emergency call data to develop an understanding of community risks. O.F.S. provided the data used in this analysis for all historical calls for the five year period from January 1st, 2014 to December 31st, 2018. This section provides a statistical assessment of historic emergency call volumes for the City as a whole by different time segments (e.g. annual calls, monthly calls, weekly calls, daily calls, etc.).

The analysis included within this section also provides a detailed breakdown of calls by O.F.M.E.M. response type. Data used in the analysis of call volume by type was sourced from the O.F.M.E.M.'s Standard Incident Reporting because call volume by type is compared to the Province as a whole.

The volume and frequency of historic calls informs the understanding of response probability. The types of calls inform the potential consequences of O.F.S. responses and calls for service. The combined consideration of these elements provides an understanding of community risk, based on past calls for service.

10.2.1 Emergency Call Volume – All Incident Types

This section illustrates the historical emergency call volume by year, month, day of week, and time of day for all types of incidents responded to by O.F.S. for the time period from January 1st, 2014 to December 31st, 2018.[63]

10.2.1.1 Annual Emergency Call Volume – All Incident Types

The analysis of annual emergency call volume can be beneficial in garnering an understanding of where trends may be evolving, or changes in community emergency response demand may be occurring. A summary of the total number of emergency calls for the period from January 1st, 2014 to December 31st, 2018 is shown in **Figure 21**. This analysis indicates an increase in the total emergency call volume within the City over this period from 4,499 calls in 2014 to 5,555 calls in 2018. This represents a total increase of 23% over this five year period with an average of 5,094 calls per year. A further observation of the year to year rate of emergency call volume growth illustrates an incremental annual growth average of 5.4%, however, there is also a noted downward trend in the amount of actual percentage of growth year over year. From 2014 to 2015 the annual growth increased by 8.2% whereas from 2017 to 2018 the actual percentage of growth year over year was 2.8%. The year by year percentage growth appears to be decreasing over time. This indicates that although annual emergency call volume continues to grow there is a downward trend in the percentage of actual growth year over year.

[63] The data used for the analysis is a compilation of each of the 5 years (2014-2018) of unit response times reports. For the majority of statistics, only the first truck is considered; this is to ensure a single incident is not counted multiple times as this would not provide an accurate representation of the data. To determine which entries were the first truck entries, the dataset was sorted by Call Time and On Location [time]. The first entry for each incident number was included in the First Truck dataset. The second entry for each incident number was assumed to be the second truck. It should also be noted that calls from stations outside of Oshawa were excluded from the analysis. Similarly, all calls with either zero or more than one response type code were excluded from response type analyses.

Figure 21: Annual Call Volume – All Incidents January 1st, 2014 to December 31st, 2018

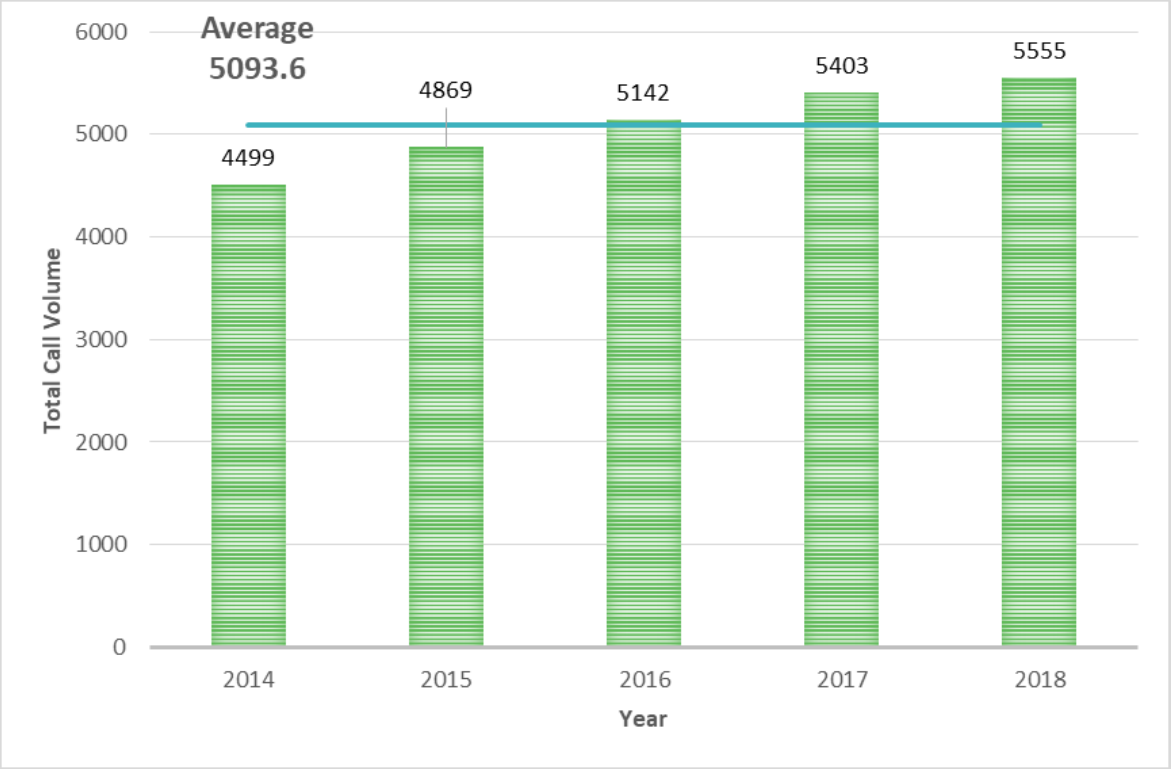


Figure Source: Oshawa Fire Services Emergency Response Call Data

Key Finding: Over the period from January 1st, 2014 to December 31st, 2018 the volume of emergency calls responded to by the Oshawa Fire Services increased by 23%.

Key Finding: Over the period from January 1st, 2014 to December 31st, 2018 there is a notable downward trend in the percentage of actual emergency call volume growth year over year.

10.2.1.2 Monthly Average Emergency Call Volume – All Incident Types

The analysis of average emergency call volume for the period from January 1st, 2014 to December 31st, 2018 by month can be beneficial to identifying any potential variances that may be associated with seasonal trends related to activities such as more motor vehicle travel during summer months, or use of heating devices during winter months. **Figure 22** illustrates an average monthly emergency call volume of 424 calls with the highest percentage of emergency calls occurring in July and August.

Figure 22: Average Call Volume by Month – All Incident January 1st, 2014 to December 31st, 2018

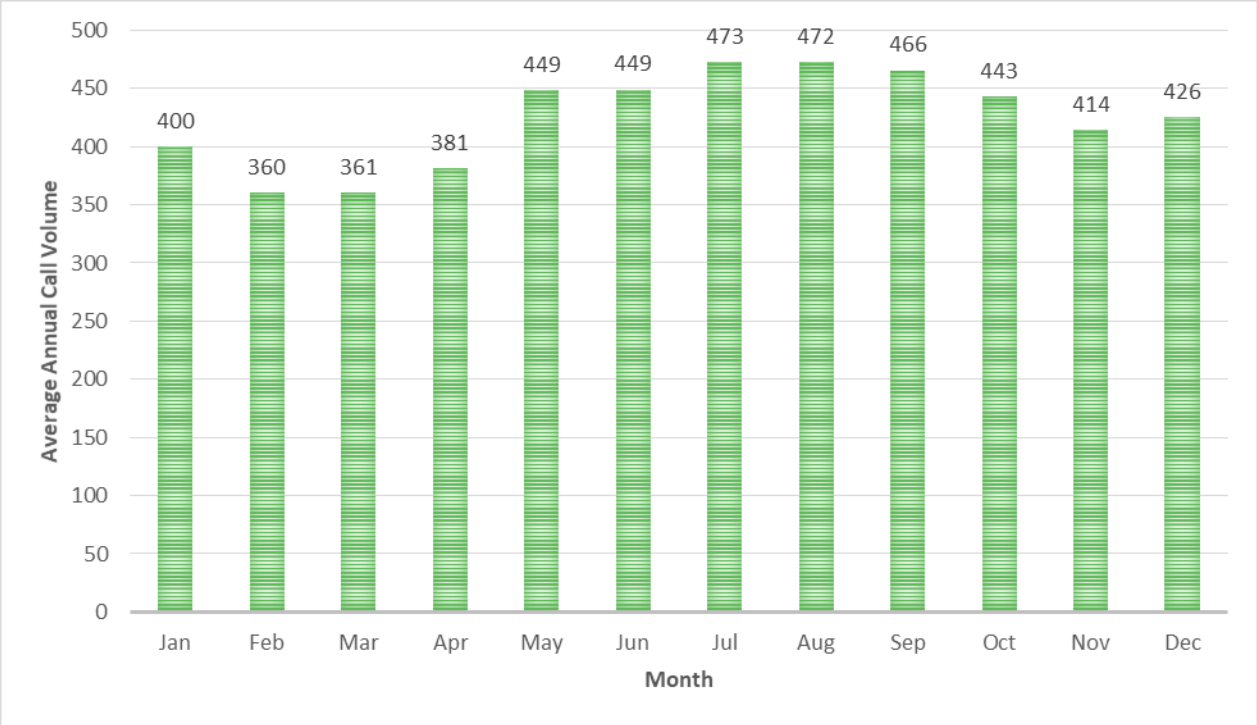


Figure Source: Oshawa Fire Services Emergency Response Call Data

10.2.1.3 Weekly Average Emergency Call Volume – All Incident Types

The analysis of average call volume for the period from January 1st, 2014 to December 31st, 2018 by day of the week as shown in **Figure 23** illustrates that on average the highest number of emergency call volume occurs on Fridays, while the lowest emergency call volume occurs on Sundays.

Figure 23: Average Call Volume by Day of Week – All Incidents January 1st, 2014 to December 31st, 2018

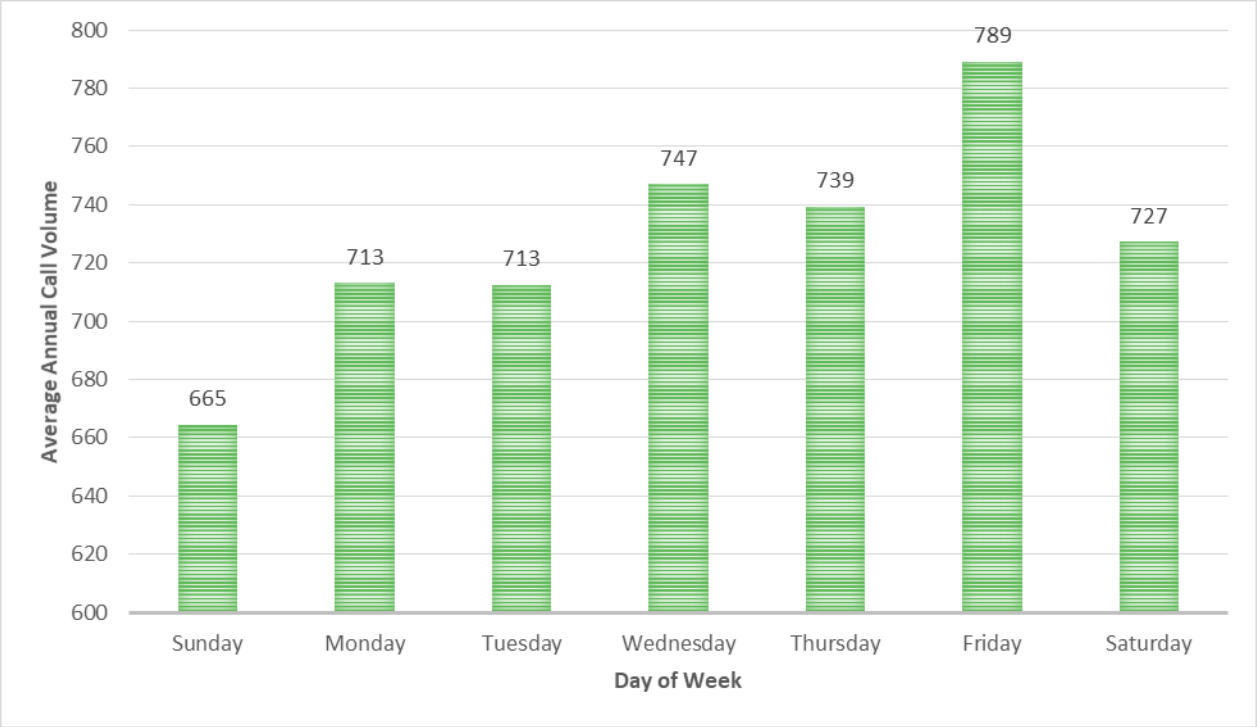


Figure Source: Oshawa Fire Services Emergency Response Call Data

10.2.1.4 Daily Emergency Call Volume – All Incident Types

Figure 24 indicates that for the period from January 1st, 2014 to December 31st, 2018 a higher emergency call volume is typically experienced between 8 A.M. and 10 P.M. The lowest percentage of emergency call volume typically takes place between the hours of 11 P.M. and 8 A.M. This trend can be directly associated to when the majority of the population is typically sleeping.

Figure 24: Average Call Volume by Time of Day – All Incidents January 1st, 2014 to December 31st, 2018

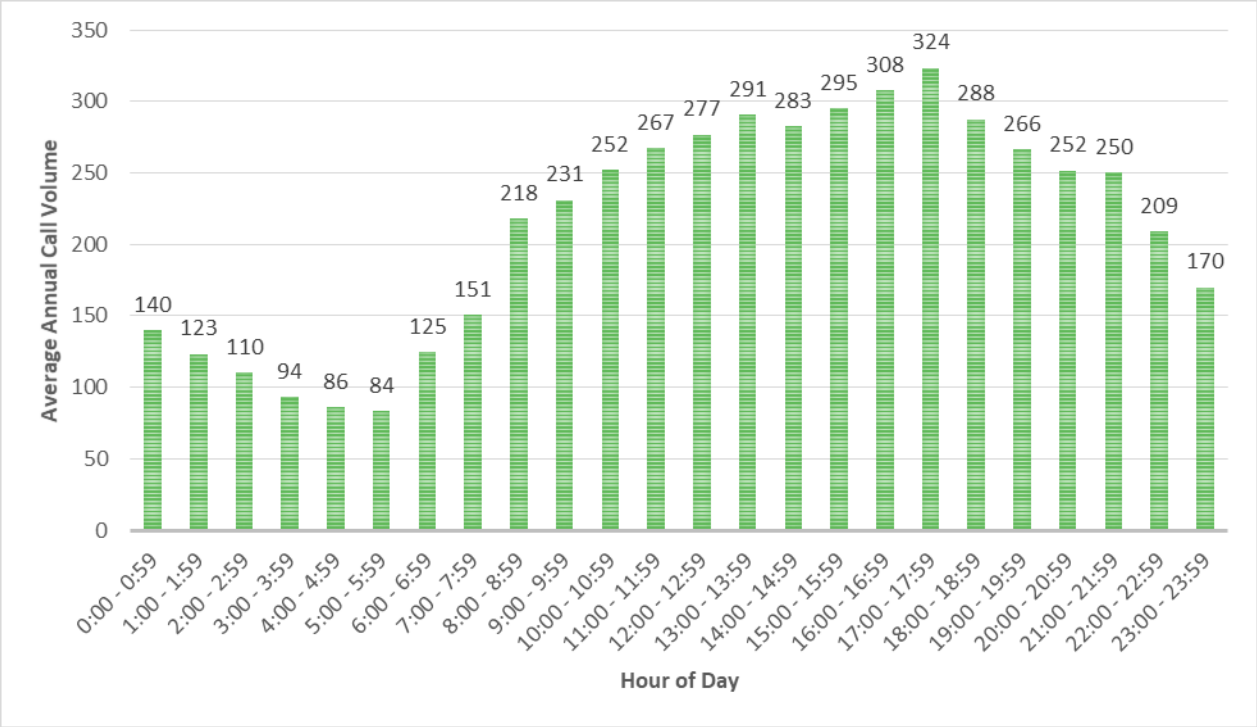


Figure Source: Oshawa Fire Services Emergency Response Call Data

10.2.1.5 Total Emergency Call Volume – All Incident Types

This section illustrates the analysis of all emergency call volume for the period from January 1st, 2014 to December 31st, 2018 by the designated O.F.M.E.M. emergency response type. **Figure 25** illustrates that during this period 26.04% of the total emergency calls that Oshawa Fire Services responded to were medical/resuscitator incidents. Responding to rescue calls was the second highest percentage of total emergency calls representing 19.82% of the department's total emergency call volume. False fire calls represent the third highest percentage of emergency call volume at 16.09%. During this five year period, only 0.10% of emergency calls were categorized as overpressure/rupture/explosion. This analysis confirms that responding to incidents involving a property fire/explosion (4.33%), or an incident involving burning (controlled) (3.50%) each represent the lowest percentage of the total emergency call volume that O.F.S. responded to.

Figure 25: Percentage of O.F.S. Calls by O.F.M.E.M. Response Type January 1st, 2014 to December 31st, 2018

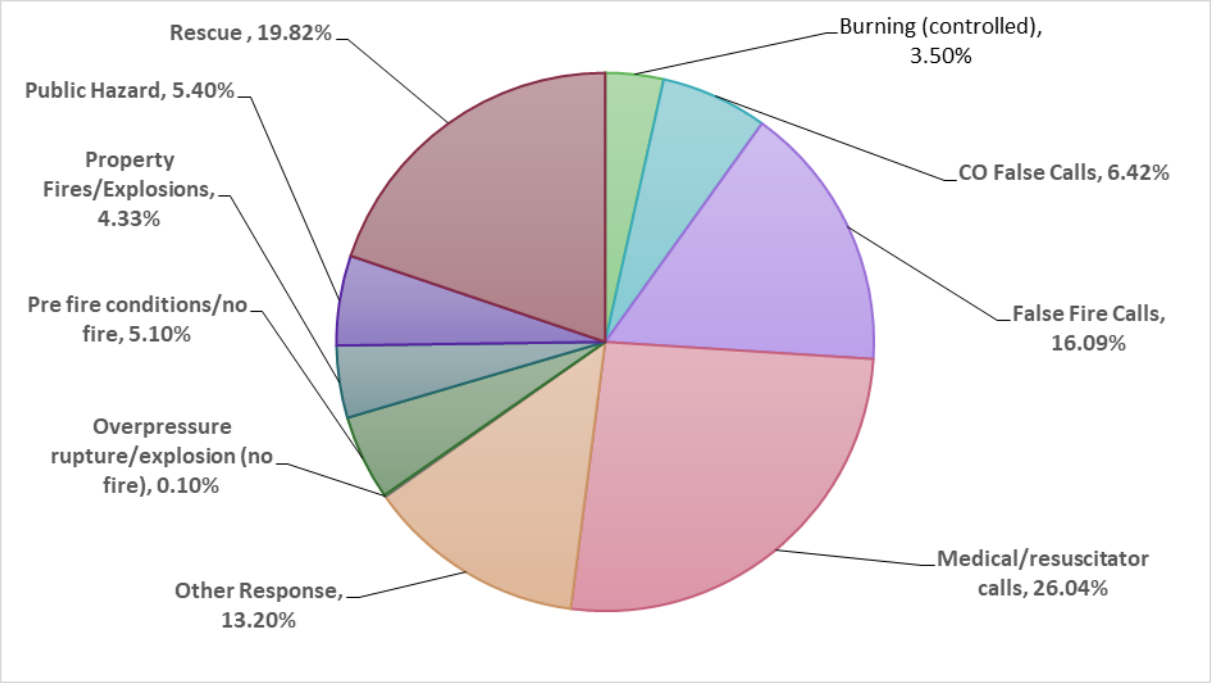


Figure Source: Office of the Fire Marshal and Emergency Management, Municipal Emergency Calls by Response Type Class

Figure 26 illustrates a comparison of the experience of other fire services in the Province based on the same O.F.M.E.M. response type categorization. This comparison shows that for the same period, responses to medical/resuscitator calls represented the highest percentage of calls that other fire departments responded to representing 42.41% of incident types. This is 16.37% higher than the experience of Oshawa Fire Services of 26.04%. Comparison of the percentage of responses to false fire calls indicates that the experience of the Province of 16.34% is slightly higher than Oshawa representing 16.09% of the total emergency calls. This analysis also confirms that for this five year period, Oshawa has experienced a very similar percentage of property fires/explosions as that of other fire departments across the Province representing 4.00% of all emergency calls compared to Oshawa of 4.33%.

Figure 26: Percentage of Ontario Calls by O.F.M.E.M. Response Type January 1st, 2014 to December 31st, 2018

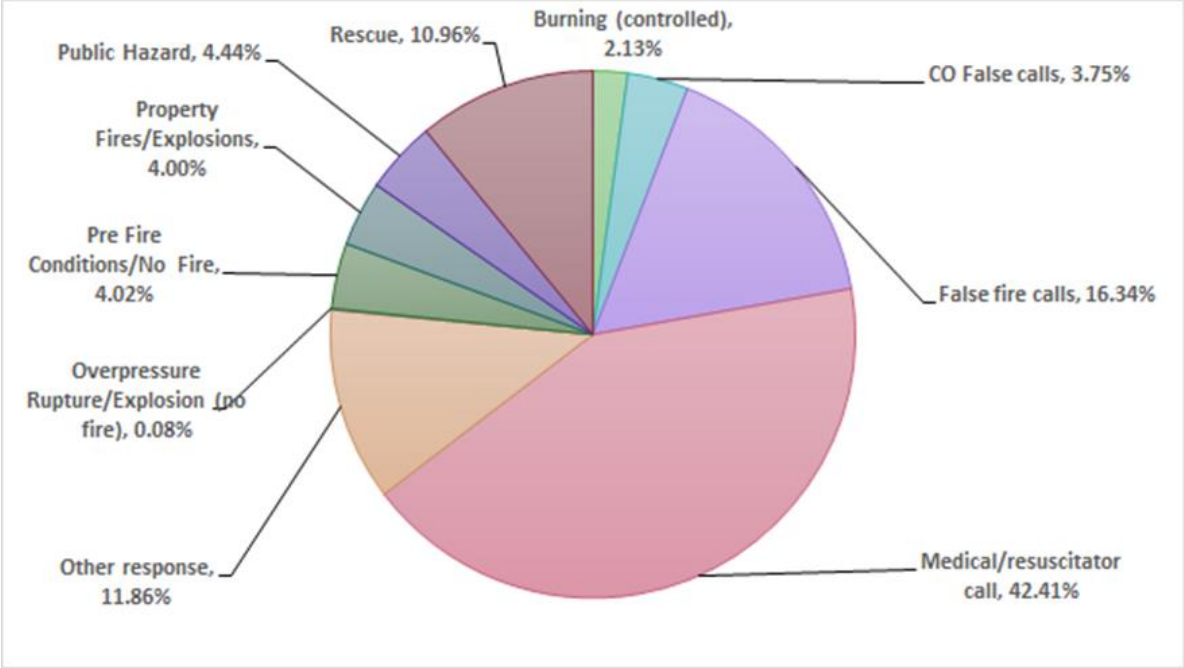


Figure Source: Office of the Fire Marshal and Emergency Management, Municipal Emergency Calls by Response Type Class

Key Finding: For the period from January 1st, 2014 to December 31st, 2018 the highest percentage of emergency call volume responded to by Oshawa Fire Services as defined by the O.F.M.E.M. response types was medical/resuscitator calls representing 26.04% of total emergency call volume.

Key Finding: For the period from January 1st, 2014 to December 31st, 2018 the second highest percentage of emergency call volume responded to by Oshawa Fire Services as defined by the O.F.M.E.M. response types was false fire calls representing 16.09% of total emergency call volume.

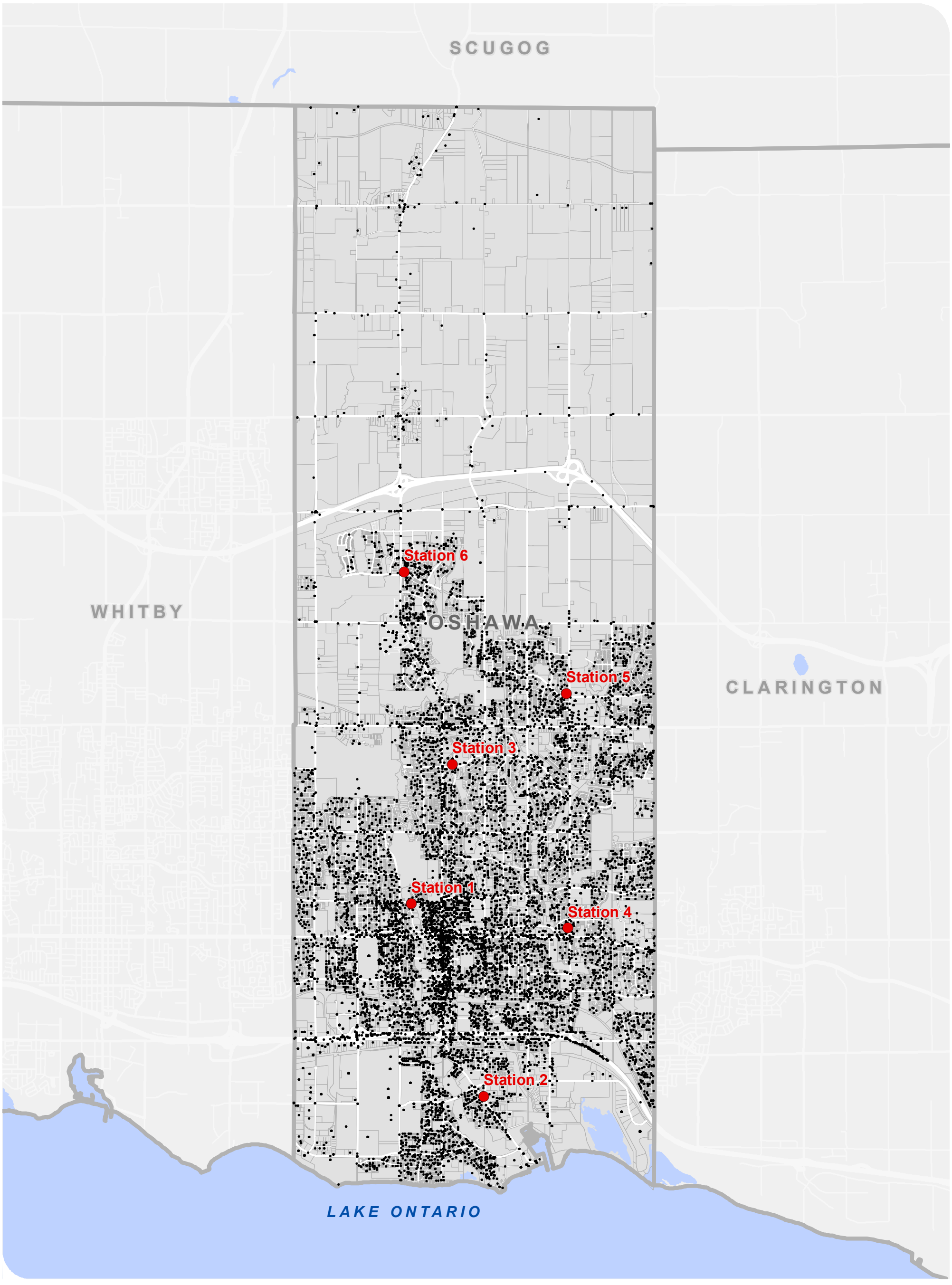
Key Finding: For the period from January 1st, 2014 to December 31st, 2018 the lowest percentage of emergency call volume responded to by Oshawa Fire Services as defined by the O.F.M.E.M. response types were overpressure/rupture/explosion, incidents involving burning (controlled), and property fire/explosion.

10.2.2 Emergency Call Volume – Spatial Modelling

The analysis within this section illustrates the distribution of the emergency call volume within the City for the period from January 1st, 2014 to December 31st, 2018. The analysis includes the spatial distribution of all emergency incidents that occurred during this period based on the O.F.M.E.M. response types including medical/resuscitator, rescue, false fire and fire /explosions incidents over this five year period.

10.2.2.1 Spatial Modelling – All Emergency Incidents

Figure 27 illustrates the distribution of all emergency incidents that occurred within the City over this five year period. This model shows the wide distribution of all emergency incidents throughout the City. There is a notable concentration of incidents in the area located predominantly south east of Fire Station 1 representing a portion of the downtown core of the City. There are other smaller pockets of incidents shown across the City where multiple incidents have occurred over this five year period. **Figure 28** illustrates an overview of where higher concentrations of incidents have occurred over this five year period. This figure further illustrates the higher concentration of all emergency incidents in the area south east of Fire Station 1 and a portion of the downtown area. There is a smaller concentration of emergency incidents in the area just north of Fire Station 3.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

ALL EMERGENCY INCIDENTS
FIGURE 27

Final Draft March 2020

- Existing Fire Station
- All Emergency Calls within Oshawa
- Parcel Boundary
- Water Body

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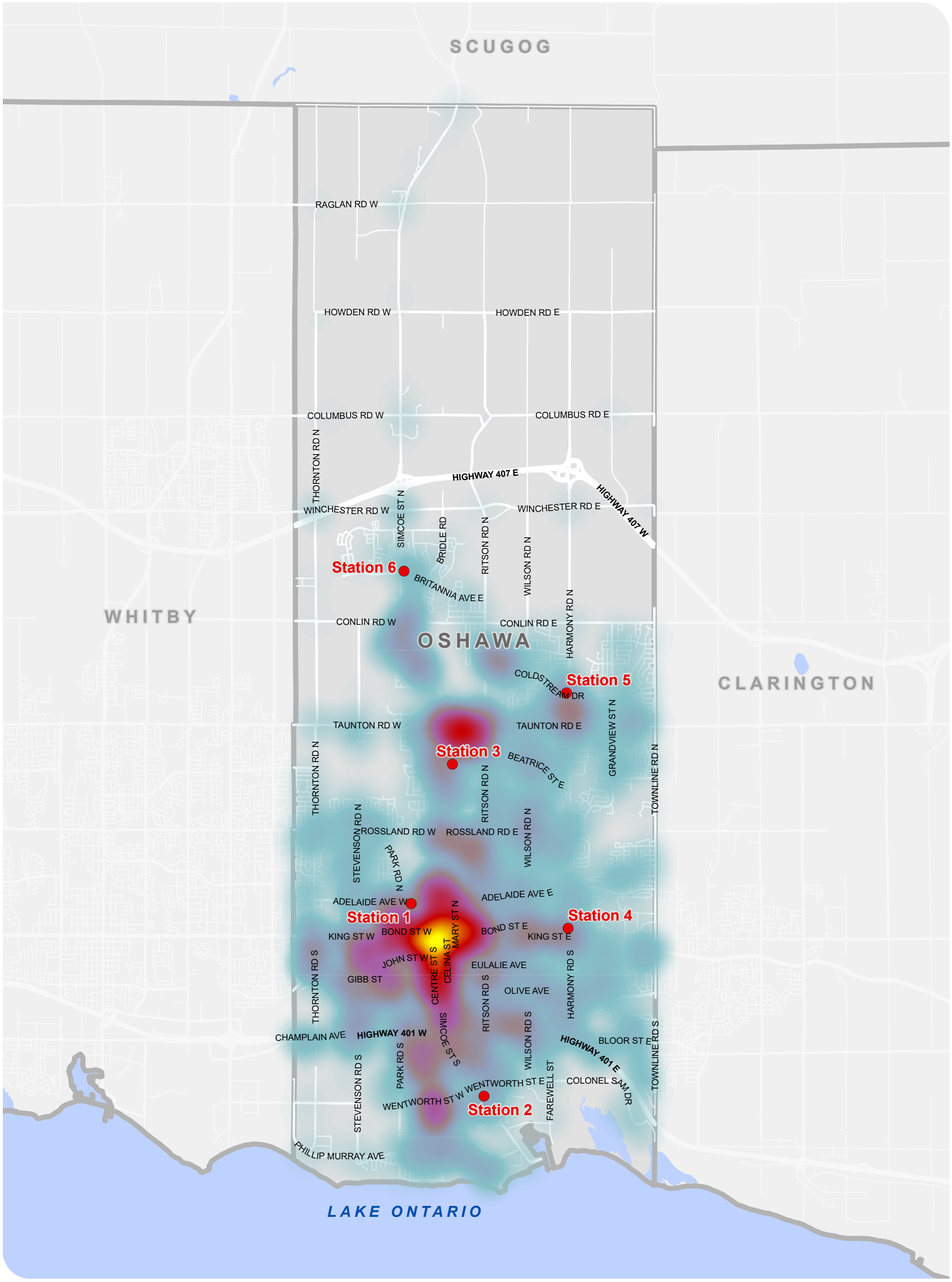
MAP DRAWING IFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2019-11-05

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Emergency Calls.mxd



CITY OF OSHAWA
FIRE MASTER PLAN

SPATIAL CONCENTRATION - ALL EMERGENCY INCIDENTS
FIGURE 28

Final Draft March 2020

Fire Station

Concentration of Incidents

Sparse

Dense

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

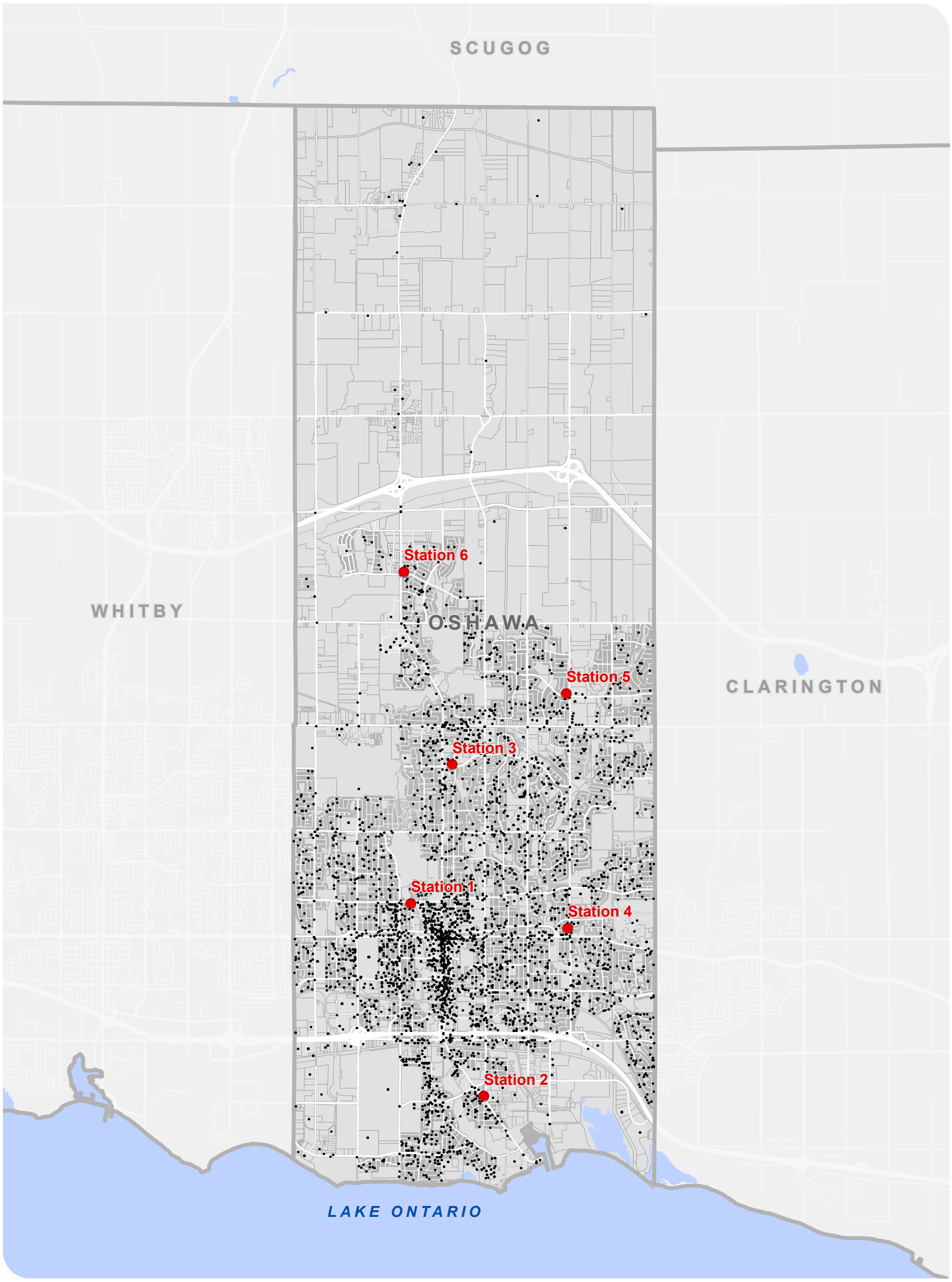
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0 250500 1,000 m

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\GIS\Oshawa_Fire.aprx

10.2.2.2 Spatial Modelling – Medical/Resuscitator Incidents

Figure 29 illustrates the locations where the medical/resuscitator incidents occurred during the period from January 1st, 2014 to December 31st, 2018. This model illustrates a similar higher concentration of medical/resuscitator calls south east of Fire Station 1 representing a portion of the downtown core of the City and a smaller area of higher concentration north of Fire Station 3. **Figure 30** further illustrates the spatial concentration of medical/resuscitator over this period.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

SPATIAL MODELLING - MEDICAL/RESUSCITATOR INCIDENTS
FIGURE 29

Final Draft March 2020

- Existing Fire Station
- Medical Emergency Calls within Oshawa
- Parcel Boundary
- Water Body

DILLON CONSULTING

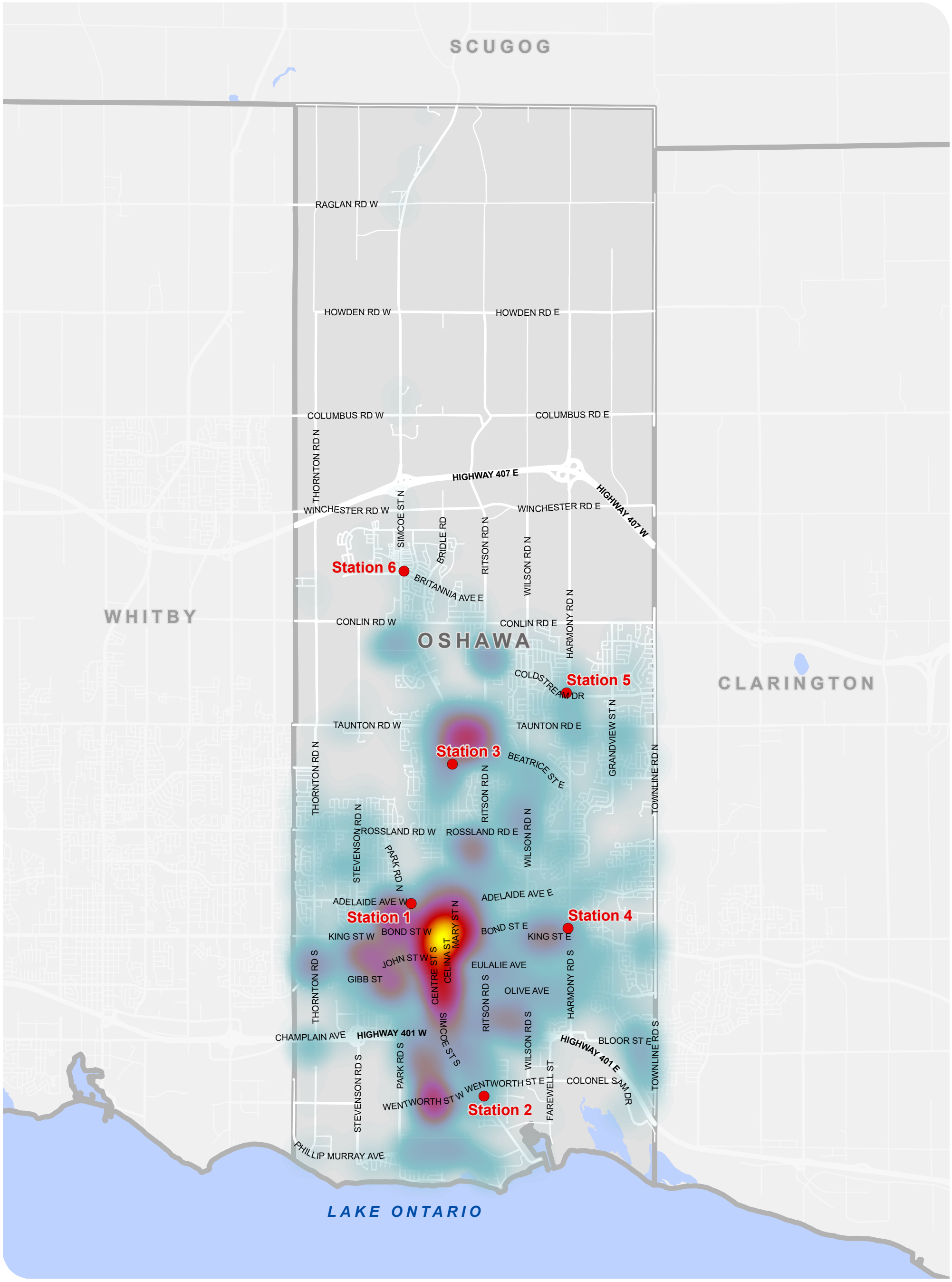
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Emergency Calls - Medical.mxd



CITY OF OSHAWA
FIRE MASTER PLAN

SPATIAL CONCENTRATION - MEDICAL / RESUSCITATOR INCIDENTS
FIGURE 30

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Fire Station

Concentration of Incidents

Sparse

Dense

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 250500 1,000 m

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\GIS\Oshawa_Fire.aprx

10.2.2.3 Spatial Modelling – Rescue Incidents

Figure 31 illustrates the locations where the rescue incidents occurred during the period from January 1st, 2014 to December 31st, 2018. **Table 34** presents a comprehensive analysis of rescue incidents that O.F.S. responded to during this five year period. This analysis indicates that 93.24% of the rescue incidents were related to responding to vehicle collisions. As described in **Section 10.2.1.1 – Annual emergency Call Volume, All Incident Types**, O.F.S. experienced a total of 25,468 emergency calls during this five year period, of which 4,670 calls pertain to motor-vehicle related incidents including vehicle collisions (4,580) and vehicle extrications (90) therefore accounting for approximately 18.33% of total emergency call volume responded to by O.F.S. during this period.

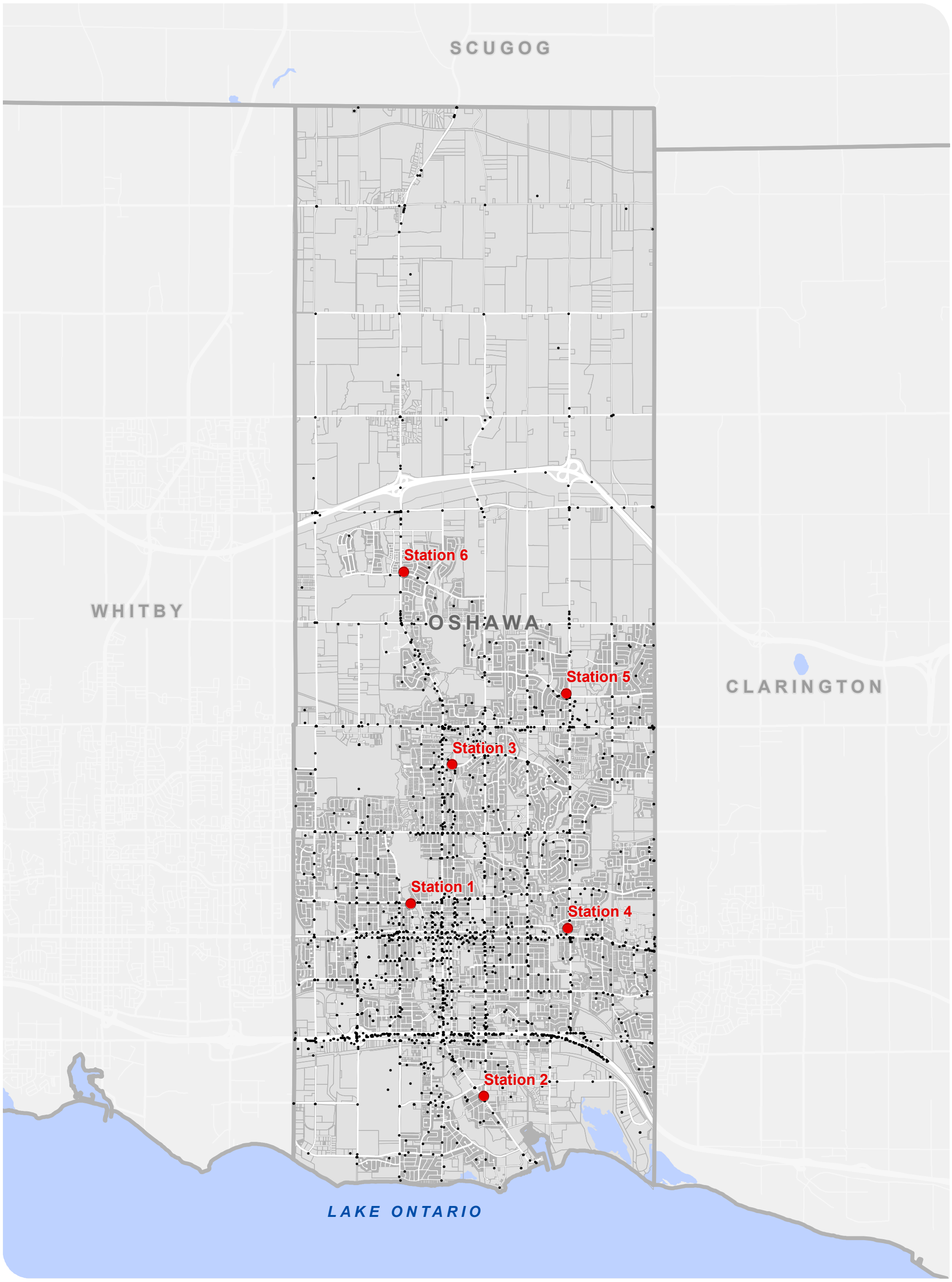
Table 34: Rescue Incidents - Analysis

Response Type	Number of Calls	% of Calls
Animal rescue	9	0.18%
Building Collapse	1	0.02%
Commercial/Industrial Accident	3	0.14%
High angle rescue (non-fire)	7	0.14%
Home/Residential Accident	26	0.53%
Low angle rescue (non-fire)	5	0.10%
Other Rescue	58	1.18%
Persons Trapped in Elevator	46	0.94%
Rescue false alarm	22	0.45%
Rescue no action required	53	1.08%
Trench rescue (non-fire)	2	0.04%
Vehicle Collision	4,580	93.24%
Vehicle Extrication	90	1.83%
Water Ice Rescue	4	0.08%
Water Rescue	6	0.12%
Source: O.F.S.		

As a result the majority of the rescue incidents O.F.S. responds to are distributed along major arterial roads within the City and the Highway 401 corridor. There is a noticeable

concentration of rescue calls along the King Street East/West (Highway 2) corridor and the Simcoe Street North corridor from Highway 401 to Highway 407. There is also a very high concentration of rescue calls along the Highway 401 corridor. These transportation corridors are associated with a large percentage of O.F.S. response to motor vehicle accidents.

Figure 31 further illustrates the distribution of the historical rescue incidents that in addition to identifying the transportation corridors identified in the proceeding section also identify several major intersection where there has been a historical larger concentration of motor vehicle accidents.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

SPATIAL MODELLING - RESCUE INCIDENTS
FIGURE 31

Final Draft March 2020

- Existing Fire Station
- Rescue Calls within Oshawa
- Parcel Boundary
- Water Body

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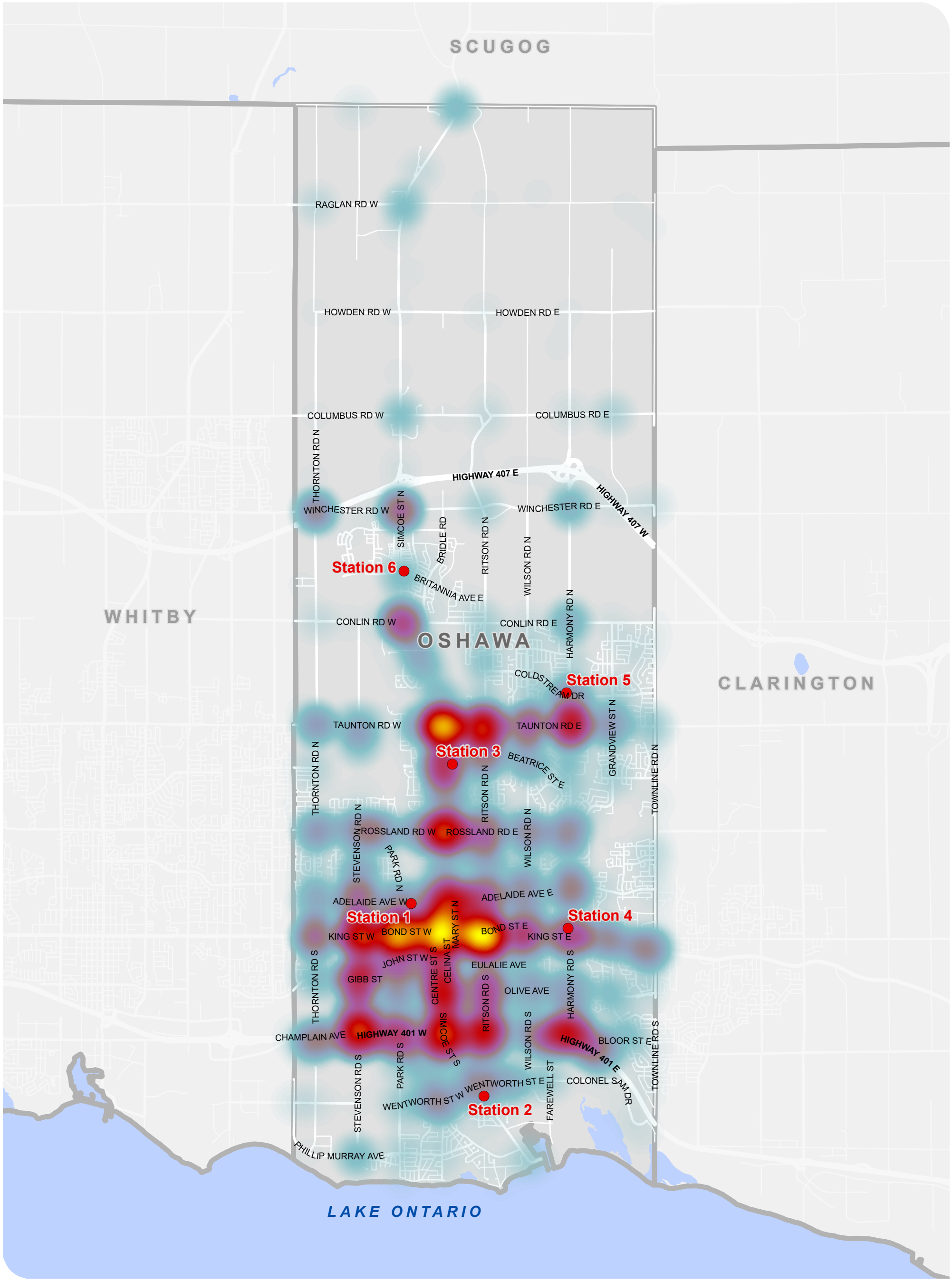
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Emergency Calls - Rescue.mxd



CITY OF OSHAWA
FIRE MASTER PLAN

SPATIAL CONCENTRATION - RESCUE INCIDENTS
FIGURE 32

Final Draft March 2020

Fire Station
Concentration of Incidents
Sparse
Dense

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

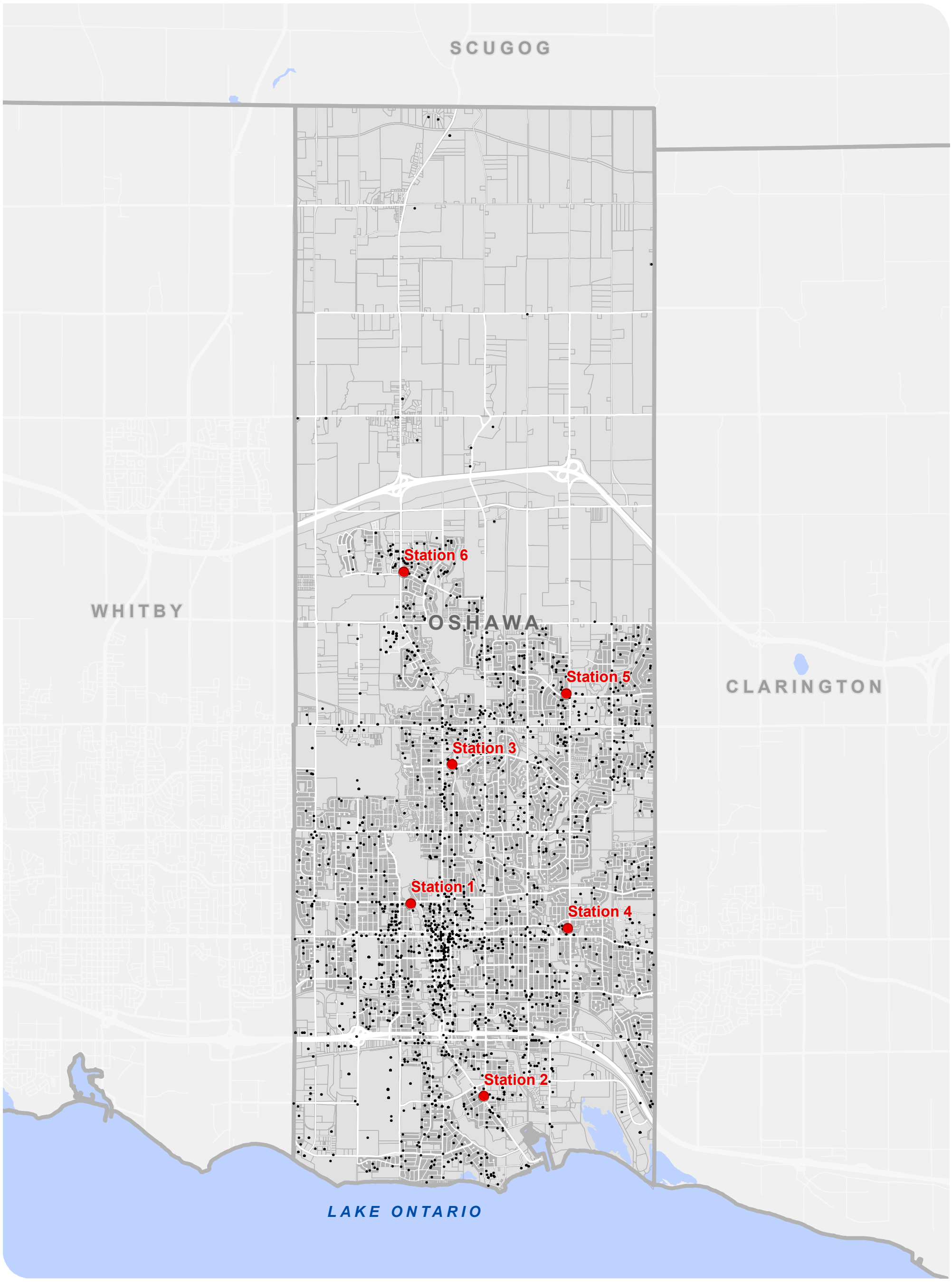
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PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\GIS\Oshawa_Fire.aprx

10.2.2.4 Spatial Modelling – False Fire Incidents

Figure 33 illustrates the locations where the false fire incidents occurred during the period from January 1st, 2014 to December 31st, 2018. During this five year period false fire incidents accounted for 19.82% of O.F.S. total emergency call volume. This figure illustrates a wide and relatively consistent distribution of false fire calls across the entire urban area south of Highway 407. This model indicates that there were only 15 false fire incidents north of the Highway 407 corridor. There is a higher concentration of false fire incidents along the Simcoe Street North corridor from Highway 401 north to Adelaide Avenue in the downtown core. **Figure 34** confirms the historical concentration of false fire calls along the Simcoe Street North corridor and a smaller concentration north of Fire Station 3.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

SPATIAL MODELLING - FALSE FIRE INCIDENTS
FIGURE 33

Final Draft March 2020

- Existing Fire Station
- False Fire Calls within Oshawa
- Parcel Boundary
- Water Body

DILLON CONSULTING

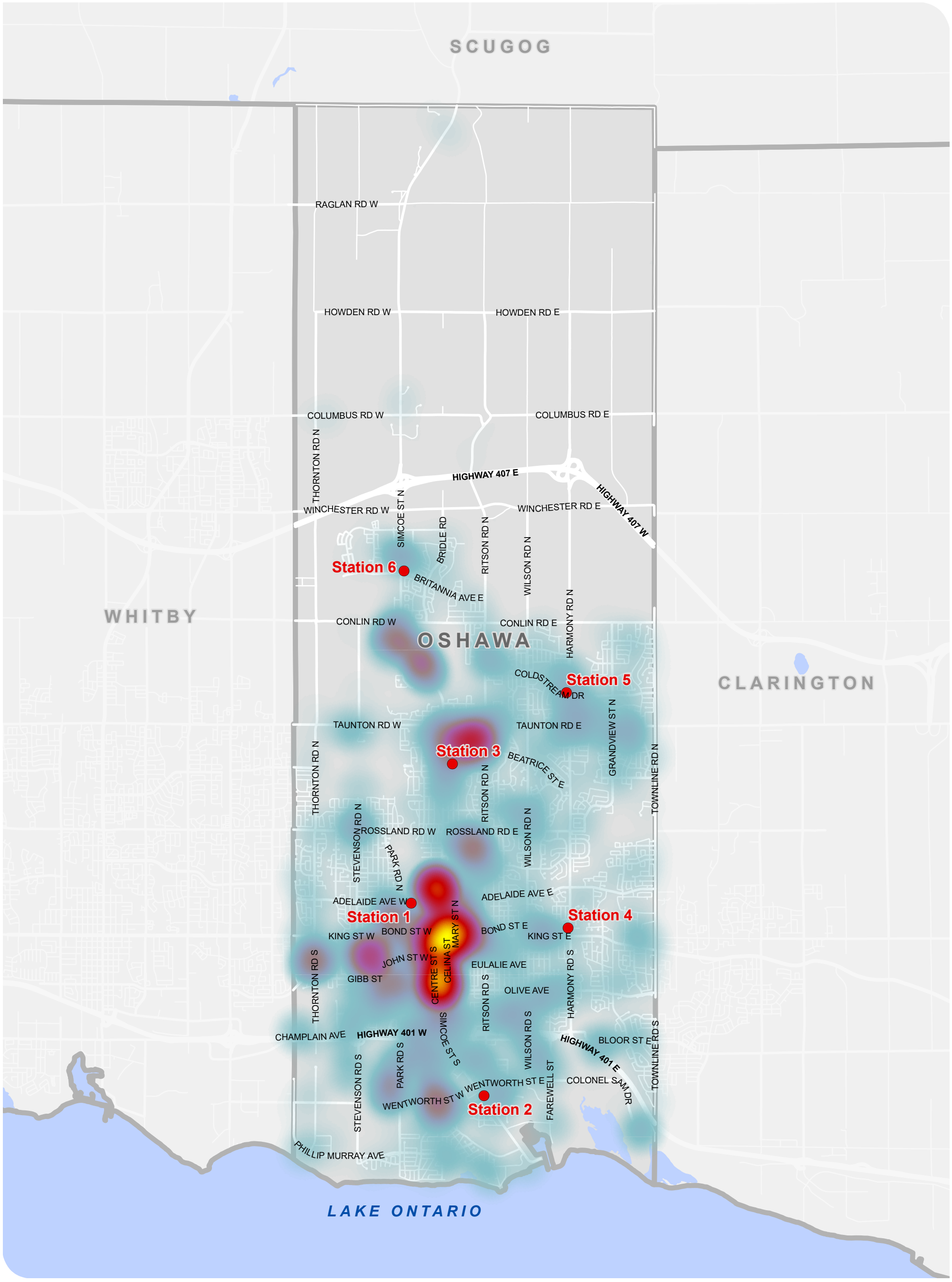
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Emergency Calls - False Fire.mxd



CITY OF OSHAWA
FIRE MASTER PLAN

SPATIAL CONCENTRATION - FALSE FIRE INCIDENTS
FIGURE 34

Final Draft March 2020

Fire Station
Concentration of Incidents
Sparse
Dense

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

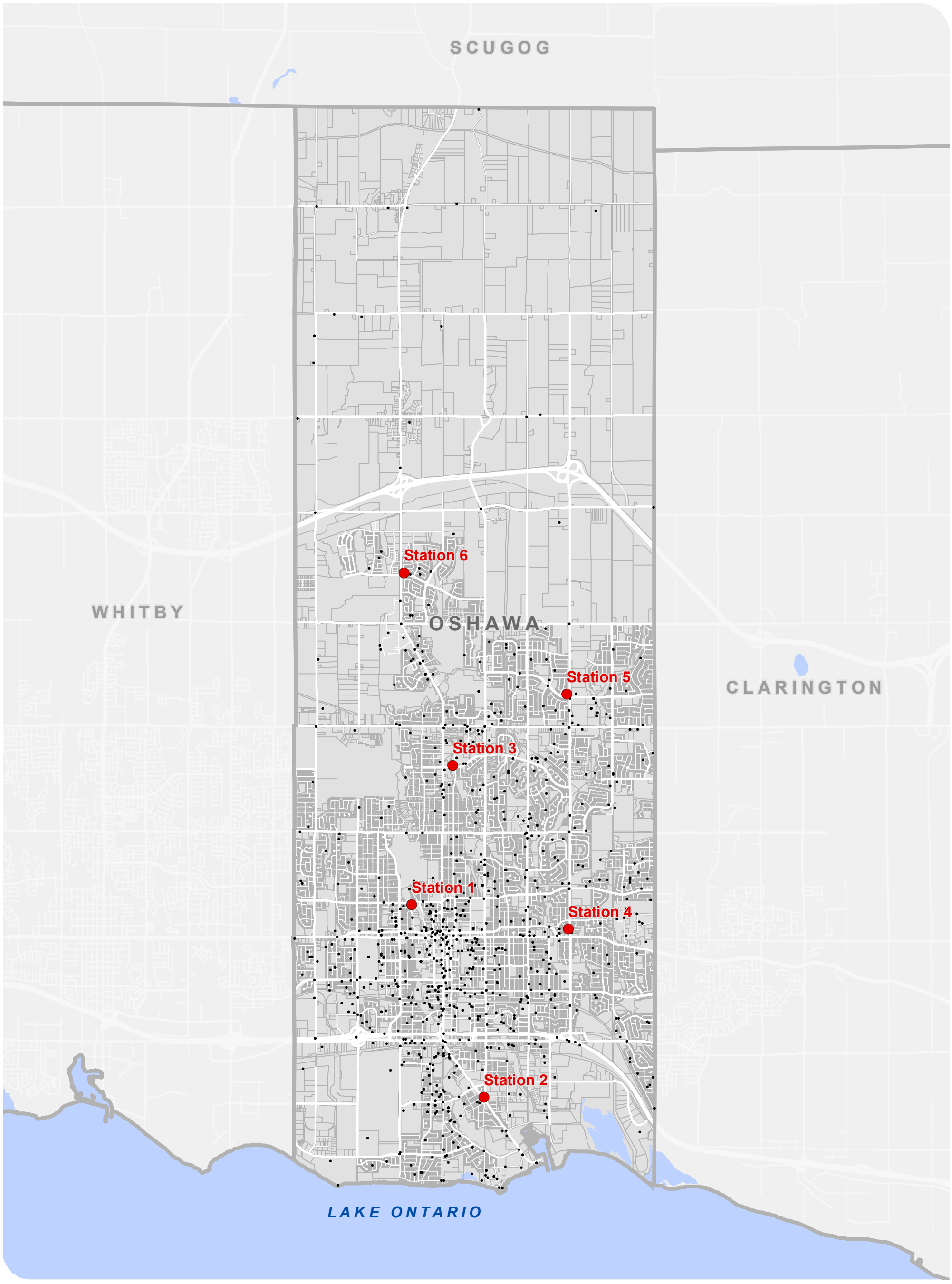
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PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\GIS\Oshawa_Fire.aprx

10.2.2.5 Spatial Modelling – Fire/Explosion Incidents

Figure 35 illustrates the locations where the fire/explosion incidents occurred during the period from January 1st, 2014 to December 31st, 2018. During this five year period fire/explosion incidents accounted for 4.33% of O.F.S. total emergency call volume. This analysis illustrates that the fire/explosions incidents were very widely distributed across the entire geographical area of the City. There is some evidence of a higher concentration of fire/explosion incidents south east of Fire Station 1 representing a portion of the downtown core of the City, west of Fire Station 2, and adjacent to Fire Stations 3 and 5. **Figure 36** further illustrates the higher concentration of fire/explosion incidents south east of Fire Station 1 representing a portion of the downtown core of the City, west of Fire Station 2, and adjacent to Fire Stations 3 and 5. It must be noted that although this figure visually illustrates a high concentration of incidents it does not represent a high volume of incidents. Fire/explosion incidents were only 4.33% of the department's total emergency call volume for this five year period.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

SPATIAL MODELLING - FIRE/EXPLOSION INCIDENTS
FIGURE 35

Final Draft March 2020

- Existing Fire Station
- Fire and/or Explosion Emergency Calls within Oshawa
- Parcel Boundary
- Water Body

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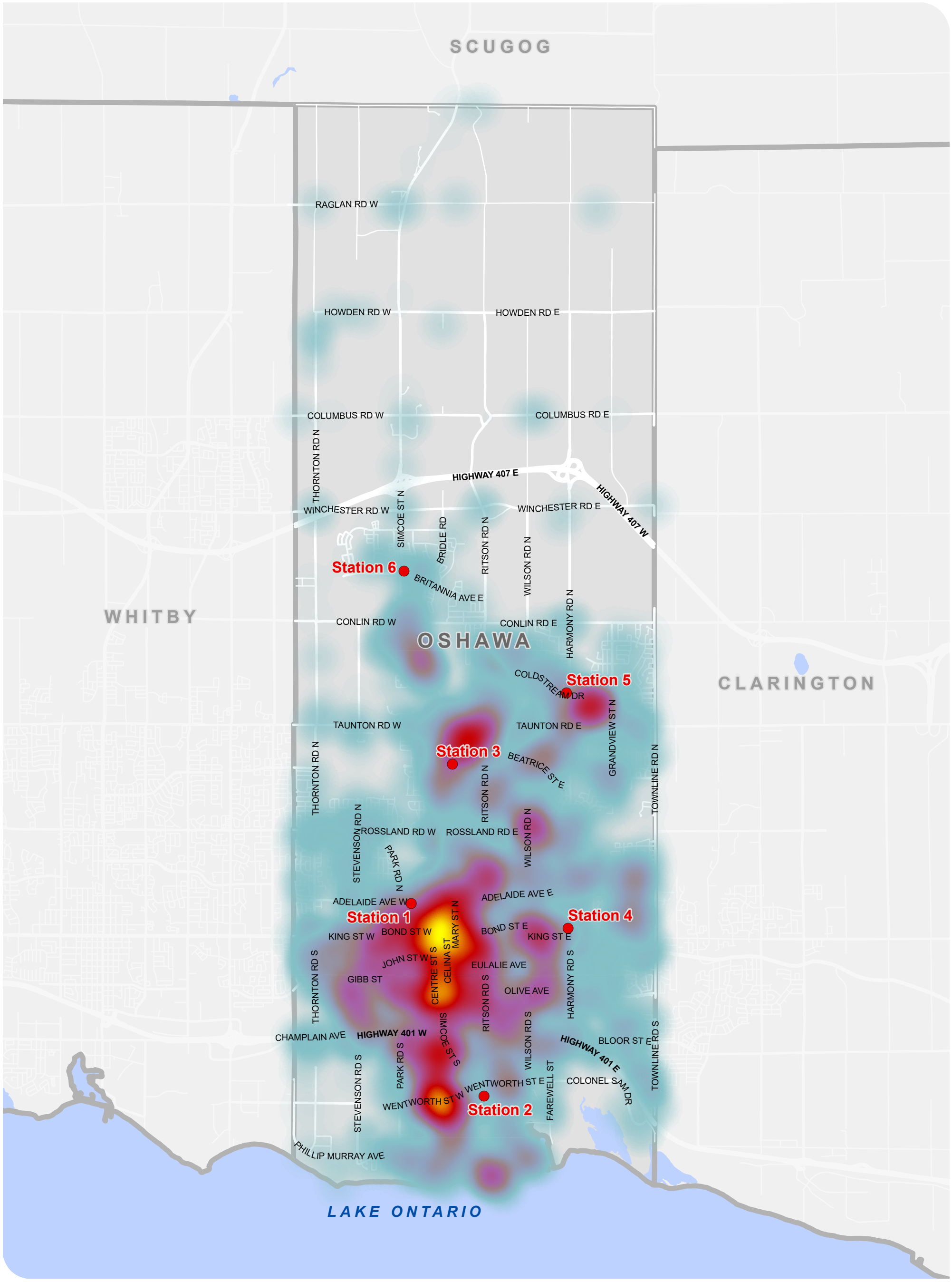
MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

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0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-09

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Emergency Calls - Fire and Explosion.mxd



CITY OF OSHAWA
FIRE MASTER PLAN

SPATIAL CONCENTRATION - FIRE / EXPLOSION INCIDENTS
FIGURE 36

Final Draft March 2020

Fire Station
Concentration of Incidents
Sparse
Dense

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF

MAP CREATED BY: GM
MAP CHECKED BY: SC
MAP PROJECTION: NAD 1983 UTM Zone 17N

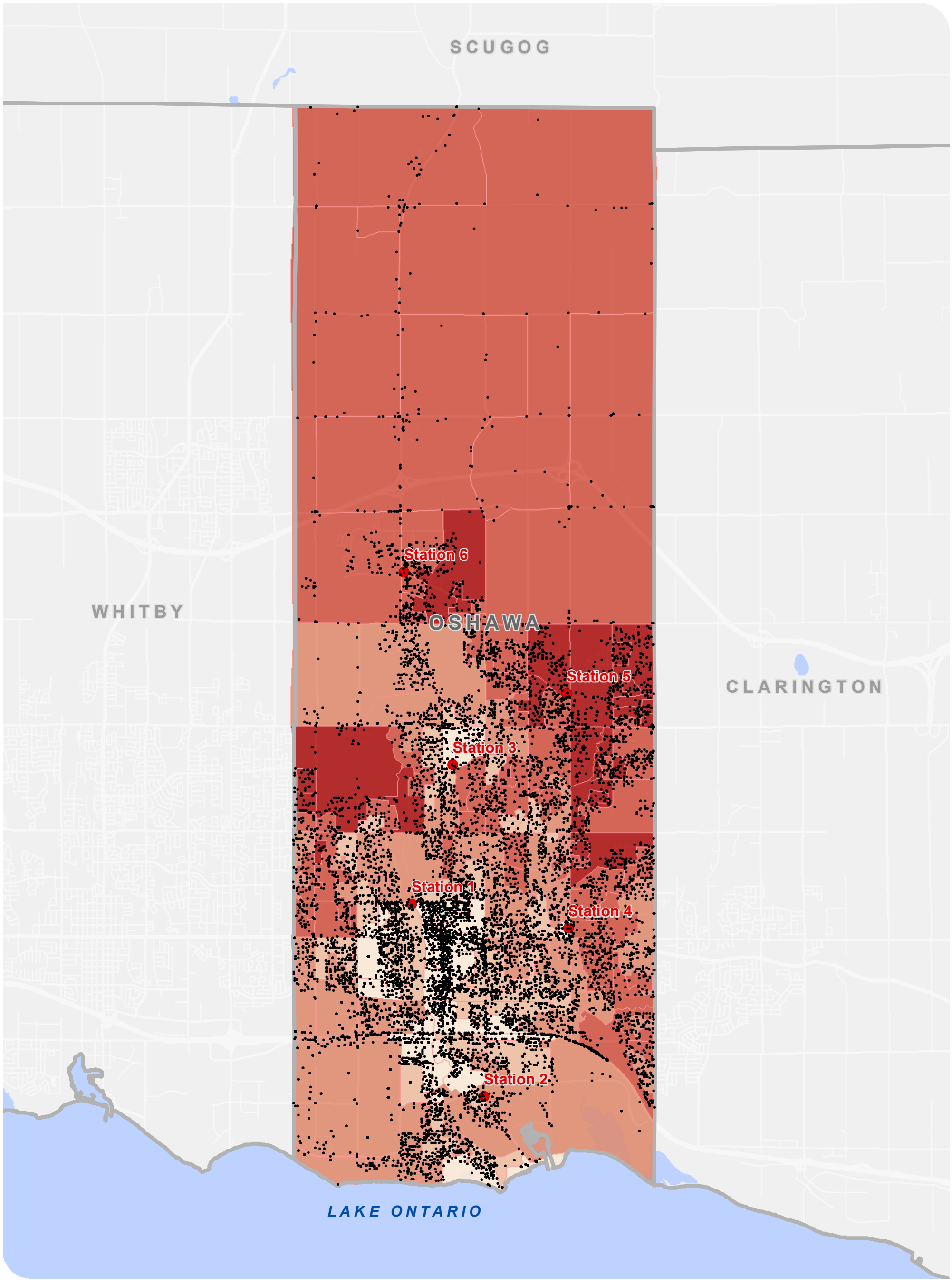
1:70,000
0 250500 1,000 m

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-31

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\GIS\Oshawa_Fire.aprx

10.2.2.6 Spatial Modelling – Median Income Dissemination Area

Research within the fire service has identified a potential correlation between median income and the available financial capability to support fire and life safety measures within a home. This could include the purchase of smoke alarms and carbon monoxide detectors, or alterations to ensure two exists from every room. **Figure 37** illustrates results of analysing the median income by dissemination areas within the City of Oshawa based on 2016 census data. This analysis identifies a higher concentration of median income between $18,912 and $45,952 in the areas south east and south west of Fire Station 1 representing a portion of the downtown core of the City. This area of high concentration is consistent with the higher concentration of fires/explosion, medical/resuscitator and false fire incidents. Collectively these factors highlight the need to consider more proactive public education and fire inspection services and programs in these areas in support of prioritizing the first two lines of defence in responding to the fire risks in these areas.



CITY OF OSHAWA
COMMUNITY RISK ASSESSMENT

SPATIAL MODELLING - MEDIAN INCOME AND EMERGENCY RESPONSE CALLS
FIGURE 37

Final Draft March 2020

Existing Fire Station
All Emergency Calls within Oshawa
Water Body

Median total income of households in 2015 ($)

18,912 - 45,952	84,396 - 108,672
45,953 - 65,408	108,673 - 155,648
65,409 - 84,395	

Note: 2016 census population data displayed

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY OSHAWA, MNRF, STATISTICS CANADA (2016)

MAP CREATED BY: LK
MAP CHECKED BY: CB
MAP PROJECTION: NAD 1983 UTM Zone 17N

1:70,000
0 0.5 1 2 km

PROJECT: 191064 STATUS: DRAFT DATE: 2020-01-09

FILE LOCATION: I:\GIS\191064 - Fire Master Plan Oshawa\mxd\Community_Risk_Assessment\Figure Median Income with Calls.mxd

10.2.3 Emergency Call Volume – Summary

The spatial analysis of the City's historical emergency call volume for the period from January 1st, 2104 to December 31st, 2018 indicates a consistent distribution of emergency call types within the defined urban area of the City and south of the Highway 407 corridor. There has been limited emergency call volume in the identified rural area currently north of the Highway 407 corridor. There are some minor exceptions where there is evidence of higher concentration of specific incident types such as motor vehicle collisions that tend to occur major arterial corridors and intersections including the Highway 401 corridor. The exception is the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City. In these areas there is a higher concentration medical/resuscitator, false fire and fire/explosions. The analysis also illustrates the presence of a lower median income in these same geographical areas.

Identified Risk: For the period from January 1st, 2014 to December 31st, 2018 there is a higher concentration of medical/resuscitator, false fire and fire/explosion incidents in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.

Key Finding: There is a higher concentration of lower median income in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.

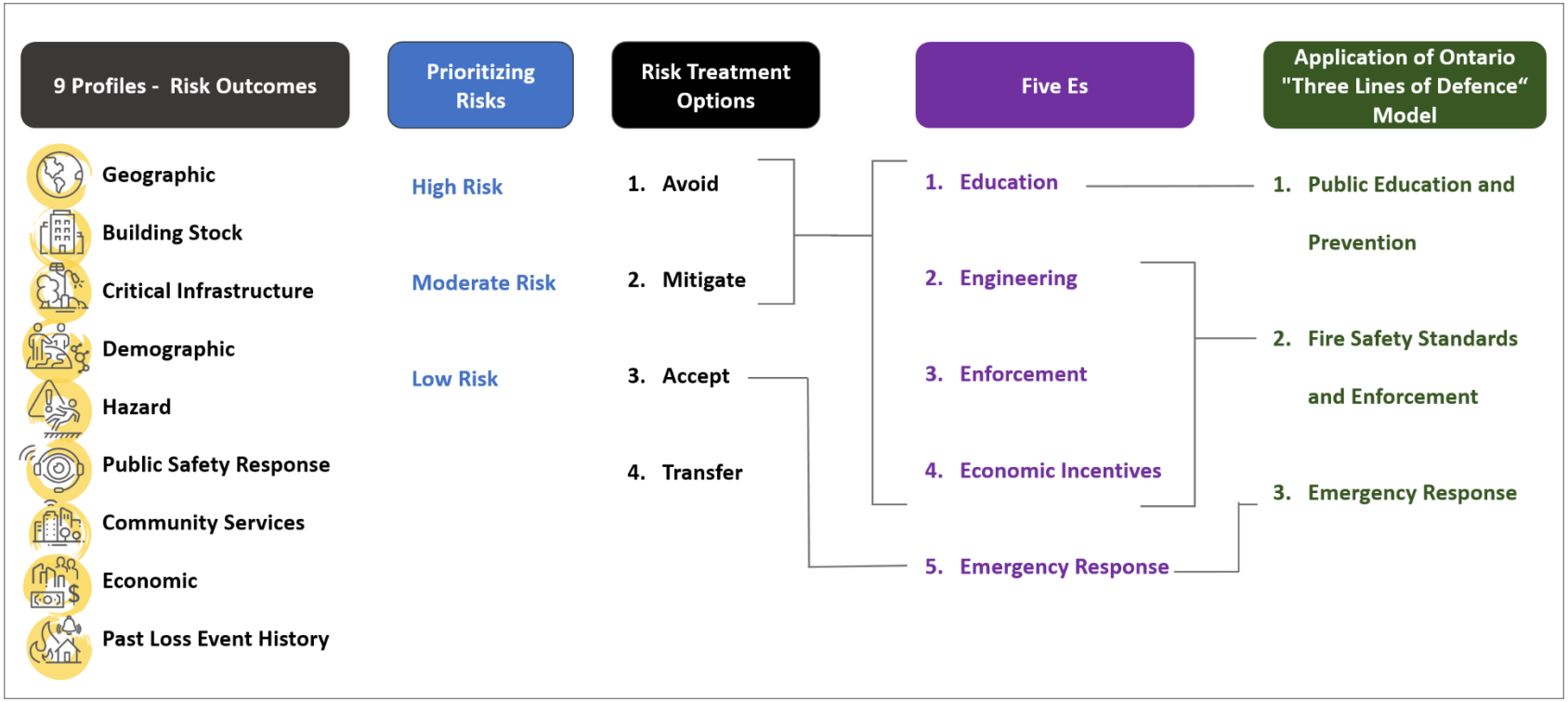
Key Finding: For the period from January 1st, 2014 to December 31st, 2018 there are higher concentrations of rescue incidents involving motor vehicle collisions and vehicle extrication along the King Street East/West (Highway 2) corridor and the Simcoe Street North corridor from Highway 401 to Highway 407. There is also a very high concentration of rescue calls along the Highway 401 corridor.

11.0 Applying Key Findings and Identified Risks

The purpose of a C.R.A. is to identify risks that are then used to inform decision-making regarding the provision of fire protection services. The analysis throughout this C.R.A. identifies '**Key Findings**' and '**Identified Risks'** to be considered within the F.M.P. In alignment with T.G.-02-2019, this section takes the identified risk conclusions (both the key findings and the identified risks) through a risk assignment process to assist in the prioritization of risks, as well as a risk treatment process.

This section of the C.R.A. brings together all of the key findings and identified risks and frames how they will be used to inform the F.M.P. They are taken through a risk treatment process and aligned with the "Five E's" of Community Risk Reduction and three lines of defence in order to inform the analysis and recommendations within the Fire Master Plan as shown in **Figure 38**.

Figure 38: Risk Conclusions Application Process



11.1 Prioritizing Risks

N.F.P.A 1300 and O.F.M.E.M. T.G.-02-2019 identify that risks can be prioritized based on their probability and consequence. The O.F.M.E.M. T.G.-02-2019 further emphasizes that all the risk findings and profiles should be considered together.

Following the probability and consequence levels identified by the O.F.M.E.M. as described in the subsections below, the risk assignment process considers probability and consequence of each identified risk. This will result in each risk having a risk level (e.g., low, moderate, or high) assigned. These risk levels will then be used to assist in the prioritization of risks as part of the Fire Master Plan.

11.1.1 Risk Assignment Process Overview

The risk assignment methodology used as part of this C.R.A is informed by the O.F.M.E.M. Technical Guideline (T.G.)-02-2019 Community Risk Assessment Guideline.

There are three steps included in the risk assignment exercise used for this C.R.A.:

1. Determine a probability level
2. Determine a consequence level
3. Establish the risk level (i.e., low, moderate or high) for each based on the identified probability and consequence for each event

The following sections provide additional insight into the assignment process.

11.1.1.1 Step 1 - Probability Levels

The probability of a fire or emergency event occurring can be estimated in part based on historical experience of the community and that of the province as a whole. The likelihood categories, and the values presented, follow the O.F.M.E.M. T.G.-02-2019 Community Risk Assessment Guideline. **Table 35** presents the probability levels and the adjusted descriptions.

Table 35: Probability Levels

Likelihood Category*	Numerical Value	Description (Adjusted)
Rare	1	• may occur in exceptional circumstances • no incidents in the past 15 years
Unlikely	10	• could occur at some time, especially if circumstances change • 5 to 15 years since the last incident
Possible	100	• might occur under current circumstances • 1 incident in the past 5 years
Likely	1,000	• will probably occur at some time under current circumstances • multiple or recurring incidents in the past 5 years
Almost Certain	10,000	• expected to occur in most circumstances unless circumstances change • multiple or recurring incidents in the past year

11.1.1.2 Step 2 - Consequence Levels

The consequences of an emergency event relate to the potential losses or negative outcomes associated with the incident. There are four components that should be evaluated in terms of assessing consequence. These include:

1. **Life Safety:** Injuries or loss of life due to occupant and firefighter exposure to life threatening fire or other situations.
2. **Property Loss:** Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks and critical infrastructure due to fire.
3. **Economic Impact:** Monetary losses associated with property income, business closures, downturn in tourism, tax assessment value and employment layoffs due to fire.
4. **Environmental Impact:** Harm to human and non-human (e.g., wildlife, fish and vegetation) species of life and general decline in quality of life within the community due to air/water/soil contamination as a result of fire or fire suppression activities. **Table 36** presents the consequence levels.

Table 36: Consequence Levels

Consequence Category	Numerical Value	Description
Insignificant	1	• No life safety issue • Limited valued or no property loss • No impact to local economy and/or • No effect on general living conditions
Minor	10	• Potential risk to life safety of occupants • Minor property loss • Minimal disruption to business activity and/or • Minimal impact on general living conditions
Moderate	100	• Threat to life safety of occupants • Moderate property loss • Poses threat to small local businesses and/or • Could pose threat to quality of the environment
Major	1,000	• Potential for large loss of life • Would result in significant property damage • Significant threat to businesses, local economy, and tourism and/or • Impact to environment would result in a short term, partial evacuation of local residents and businesses
Catastrophic	10,000	• Significant loss of life • Multiple property damage to significant portion of the municipality • Long term disruption of businesses, local employment, and tourism and/or • Environmental damage that would result in long-term evacuation of local residents and businesses

11.1.1.3 Step 3 - Risk Level

Once probability and consequence are determined the level of risk is calculated by multiplying the numerical values for probability and consequence. The relationship between probability and consequence as it pertains to risk levels can be illustrated in a risk matrix. In a risk matrix, probability and consequence are defined on separate scales with varying descriptors providing direction on how to assign the probability and consequence of an event. **Table 37** shows the risk matrix for this C.R.A.

Table 37: Risk Matrix

Probability \ Consequence		Insignificant	Minor	Moderate	Major	Catastrophic
		1	10	100	1,000	10,000
Almost Certain	10,000	Moderate	Moderate	High	High	High
Likely	1,000	Moderate	Moderate	Moderate	High	High
Possible	100	Low	Moderate	Moderate	Moderate	High
Unlikely	10	Low	Low	Moderate	Moderate	Moderate
Rare	1	Low	Low	Low	Moderate	Moderate

11.1.2 Assigned Risk Levels

The purpose of assigning a risk level is to assist in the prioritization of the range of risks that were identified as part of this C.R.A.

The results of the risk assignment process are presented in **Table 38**. Where possible, quantitative data was used to inform the risk assignment as described in the rationale in the table. It is important to recognize that with the availability of new or updated data, the probability levels could change or be refined. It should also be recognized that, as identified in O.F.M.E.M. T.G.-02-2019, “professional judgment based on experience should also be exercised in combination with historical information to estimate probability levels” (pg. 12). Similarly, T.G.-02-2019 acknowledges the role of professional judgment and reviews of past occurrences in determining consequence levels. The rationale provided for both probability and consequence takes into account information from the nine profiles, as T.G.-02-2019 supports consideration of the profiles together in order to inform decision making about the provision of fire protection services in the specific municipality/community.

Table 38: Risk Assignment

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Increasing traffic congestion on the existing road network presents the potential for a delay in emergency response times.	Almost Certain	• Integrated Transportation Master Plan 2015 projects increased traffic congestion due to growth (Geographic) • Congestion during peak travel times such as between 5 PM and 6 PM, can influence emergency response times, in part through commuter populations (Demographic, Event History) • Motor vehicle-related incidents on the existing road network contribute to congestion (Critical Infrastructure, Event History) • Some identified hazards including transportation emergency, energy emergency/power outage, snowstorm/blizzard, flood, and freezing rain could contribute to increased congestion due to loss of power impacting traffic lights or increased motor vehicle incidents, for example (Hazard)	Minor	• Potential delay in emergency response travel time • Potential for risk to life safety of occupants • Potential risk for property loss • Consequence level could be impacted by the magnitude of a hazard event.	**Moderate**
Motor vehicle-related incidents on the existing road network represent 18.33% (4,670) of the historical emergency responses of the Oshawa Fire Services.	Almost Certain	• O.F.S. responded to a total of 4,670 calls pertaining to motor-vehicle related incidents over a five year period (Event History) • Integrated Transportation Master Plan 2015 projects increased traffic congestion due to growth (Geographic) • Congestion during peak travel times such as between 5 PM and 6 PM, in part through commuter populations (Demographic, Event History) • Some identified hazards including transportation emergency, energy emergency/power outage, snowstorm/blizzard, flood, and freezing rain could contribute to increased congestion due to loss of power impacting traffic lights or increased motor vehicle incidents, for example (Hazard)	Moderate	• Potential for risk to life safety of occupants of motor vehicles • Potential risk for property loss • Could pose a threat to small local business • Could pose a threat to the quality of the environment • Consequence level could be impacted by the magnitude of a hazard event.	**High**
The presence of waterways within the City of Oshawa creates a potential need for specialized technical ice and water	Likely	• Presence of Lake Ontario and other water features including those that may be used for recreation (Geographic) • The identified hazard of flooding could contribute to	Minor	• Potential risk to life safety of individuals needing rescue.	**Moderate**

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
rescues.		the need for specialized ice or water rescue (Hazard) • Ten calls pertained to water or ice water rescue (an average of two water/ice water calls per year) (Event History)			
Group C - Residential Occupancies represent 93.41% (50,393) of the City's existing property stock, and over the five year period from January 1st, 2014 to December 31st, 2018 were associated with 82.56% (322) of the structure fires within the City.	Almost Certain	• The majority of property stock is Group C – Residential (Building Stock) • 322 fires (82.56%) over the five year period occurred in Group C – Residential (Past Loss)	Moderate	• Could pose a threat to the life safety of occupants, • Could result in moderate property loss, • Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment. • Potential for vulnerable individuals including seniors and youth within Group C – Residential (Demographic) • Most reported fire-related civilian injuries (20) and fatalities (6) occurred in Group C – Residential (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 21.82% of incidents did not have a smoke alarm present (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 43.32% of incidents had a smoke alarm present and operating (Past Loss) • Potential for exposure risk depending on dwelling type and building age (Building Stock) • Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock) • Potential of need for vertical response (Building Stock)	**High**
The 2016 Census data indicates that 62.60% (39,185) of the City's Group C-Residential building stock was built prior	Almost Certain	• The majority of property stock is Group C – Residential (Building Stock) • 322 fires (82.56%) over the five year period	Moderate	• Could pose a threat to the life safety of occupants, • Could result in moderate property	**High**

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
to the introduction of the 1981 Ontario Fire Code and Ontario Building Code compared to 53.06% (2,742,720) of residential building stock in the remainder of the Province.		occurred in Group C – Residential (Past Loss)		loss, • Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment. • Potential for vulnerable individuals including seniors and youth within Group C – Residential (Demographic) • Most reported fire-related civilian injuries (20) and fatalities (6) occurred in Group C – Residential (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 21.82% of incidents did not have a smoke alarm present (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 43.32% of incidents had a smoke alarm present and operating (Past Loss) • Potential for exposure risk depending on dwelling type and building age (Building Stock) • Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock)	
The City currently has 76 buildings defined by the O.B.C. as high-rise buildings with a floor level of 18 metres (59 feet) above grade, or 6 storeys. These buildings are distributed within the urban area with several located in the downtown area.	Likely	• Recognizing the high number of Group C – Residential occupancies, it is assumed that some of the high-rise buildings are Group C – Residential • The majority of property stock is Group C – Residential (Building Stock) • 322 fires (82.56%) over the five year period occurred in Group C – Residential (Past Loss) • Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock)	Major	• Potential of need for vertical response (Building Stock) • Due to the number of occupants in high-rise buildings, an incident occurring could result in a large loss of life, • Could result in significant property damage, • Could result in significant threat to large businesses, local economy and tourism, and/or impact to the environment or result in a short term, partial evacuation of local residents and businesses.	**High**

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
				• Potential for vulnerable individuals including seniors and youth within Group C – Residential (Demographic) • Most reported fire-related civilian injuries (20) and fatalities (6) occurred in Group C – Residential (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 21.82% of incidents did not have a smoke alarm present (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 43.32% of incidents had a smoke alarm present and operating (Past Loss) • Potential for exposure risk depending on dwelling type and building age (Building Stock) • Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock)	
The City has 91 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). These buildings are predominantly located in the commercial and industrial land use areas such as the area south of Highway 401 and along Taunton Road.	Almost Certain	• Buildings with large area footprints appear to be predominantly located in the commercial and industrial areas (Building Stock) • Group D – Business, Group E - Mercantile, Group F - Industrial or a mix of uses represent 2.34% of the City's existing property stock (Building Stock) • Over the five year period, Group D, E and F were associated with 38 (9.74%) of the structure fires within the City (Past Loss) • Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock)	Major	• Due to the potential for these buildings to contain large volumes of combustible materials, as well as horizontal travel distances for fire suppression activities, an incident occurring could result in a large loss of life • Could result in significant property damage, • Could result in significant threat to large businesses, local economy and tourism, and/or impact to the environment.	**High**

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
				• Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock) • Over the five year period, Group D, E and F were associated with 26.97% of the structure fire loss within the City (Past Loss) • Some of the identified occupancies may play a role in the economic well-being of the City (Economic)	
The City of Oshawa currently has twenty-seven (27) registered vulnerable occupancies.	Likely	• These vulnerable occupancies may fall into different occupancy types such as Group B – Care or Detention or Group C – Residential (Building Stock) • Group B – Care or Detention occupancies represent 0.04% and Group C – Residential occupancies represent 93.41% of the City's existing property stock (Building Stock) • 322 fires (82.56%) over the five year period occurred in Group C – Residential and one (0.26%) fire occurred in Group B – Care or Detention (Past Loss) • Ontario Regulation 150/13 requires fire departments to perform annual inspections and approve and witness fire drill scenarios (Building Stock)	Major	• Ontario Regulation 150/13 requires fire departments to perform annual inspections and approve and witness fire drill scenarios (Building Stock) • Presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock) • Most reported fire-related civilian injuries (20) and fatalities (6) occurred in Group C – Residential (Past Loss) • Potential for vulnerable individuals including those who receive special care or treatment within a Group B occupancy (Building Stock) • Potential to contain quantities of various flammable/combustible liquids and gases, oxidizers and combustible furnishings (Building Stock)	**High**
Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% (26,355) of the City's total population.	Almost Certain	• Seniors represent one of the most vulnerable demographics and are 16.35% of the City's population (Demographic) • The majority of property stock is Group C – Residential (Building Stock) • 322 fires (82.56%) over the five year period occurred in Group C – Residential (Past Loss)	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Most reported fire-related civilian injuries (20) and fatalities (6) occurred in Group C – Residential (Past Loss)	**High**

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
				• Of the fire loss incidents in Group C – Residential occupancies 21.82% of incidents did not have a smoke alarm present (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies 43.32% of incidents had a smoke alarm present and operating (Past Loss) • Potential for exposure risk depending on dwelling type and building age (Building Stock) • Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinkler's, etc. (Building Stock)	
For the period from January 1st, 2014 to December 31st, 2018 there is a higher concentration of medical/resuscitator, false fire and fire/explosion incidents in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.	Almost Certain	• Over the five year period, false fires represent 16.09% of total emergency call volume, medical/resuscitator calls represent 26.04% and fire/explosion calls represent 4.33% (Event History). A higher concentration of medical, fire and false fire calls are expected to occur in portions of the downtown core area. • Areas of the City most densely populated are found in areas south of Provincial Highway 401 and in the City's downtown core (Demographics)	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment	**High**

11.2 Risk Treatment Options

N.F.P.A. 1300 and the O.F.M.E.M. T.G.-02-2019 apply the process of identifying a risk treatment option for an identified risk. The risk treatment options include avoidance, mitigation, acceptance, and transfer. Further detail on these options can be found in **Table 39**. There are four risk treatment options:

1. Avoid;
2. Mitigate;
3. Accept; and
4. Transfer.

Table 39: Risk Treatment Options

Treatment Option	N.F.P.A. 1300 Description	O.F.M.E.M. T.G.-02-2019 Description
Avoid	Eliminate the hazard.	Implementing programs and initiatives to prevent a fire or emergency from happening.
Mitigate	Reduce probability or impact (consequence) of the risk.	Implementing programs and initiatives to reduce the probability and/or consequence of a fire or emergency.
Accept	Take no actions.	No specific programs or initiatives will be implement. Accept the risk and respond if it occurs.
Transfer	Transfer the risk to another party.	Transfer the impact and/or management of the risk to another organization or body.

Most of these options, if chosen by a fire department, will require some action or consideration as they pertain to fire protection services. As part of the application of the risk conclusions, a risk treatment option will be identified for each outcome followed by the application of the Five Es as described in the next section.

11.2.1 The 'Five Es' of Community Risk Reduction

N.F.P.A. 1300 defines a Community Risk Reduction plan as a "document that outlines the goals, objectives, programs, and resources used to reduce the risks identified by the community risk assessment". Establishing service levels in regards to programs and resources in alignment with a C.R.A. is required of Ontario municipalities as part of **O.Reg. 378/18**. As such, the recommendations of the F.M.P. if implemented can be considered a part of community risk reduction plan since it includes a review of Fire Prevention and Public Education.

To apply the risk conclusions to the F.M.P., each risk conclusion ('key finding' or 'identified risk') will be reviewed through the lens of the "Five Es". The Five Es is a framework outlined in N.F.P.A. 1300, and the Institution of Fire Engineers' Vision 20/20 National Strategy for Fire Loss Prevention. The Five Es are summarized in **Table 40**. They include:

1. increasing awareness (Education);
2. changes to the physical environment (Engineering);
3. influencing change through economic incentives (Economic Incentives)'
4. enforcing legislation through inspection programs (Enforcement); and
5. mitigating injury, illness and saving lives (Emergency Response).

Table 40: Overview of the N.F.P.A. 1300 Five "E's"

Five E's	Description
Education	Education influences audiences to refrain from risky or unhealthy behavior or take positive action to reduce risk.
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.
Emergency Response	Effective emergency response can mitigate the effects of unintentional injuries and save lives.

Source: Community Risk Reduction: Doing More With More, The N.F.P.A. Urban Fire and Life Safety Task Force, June 2016.

It is important to note that N.F.P.A. 1300 discusses the application of the Five Es to develop specific goals and objectives to reduce risk. It also acknowledges that some strategies may require policy advocacy or legislative work. These are important considerations for a department but are beyond the purview of the recommendations found within a Fire Master Plan. As a result, the recommendations of the F.M.P. will focus on ways to reduce risk from the perspective of the typical suppression and public education/prevention operations of the department. This includes a focus on a proactive reduction of risk through education, prevention, and enforcement with fire suppression as the fail-safe.

11.2.2 Risk Conclusions, Treatment Options, and the Five Es

When it comes to aligning service levels with risks that define local needs and circumstances, it is important to recognize that not all risk conclusions align with the services provided by a fire department in the same way. For this reason, the risk conclusions are categorized based on the identified treatment options and how they can be used to inform the activities, strategies, and services provided by the department through the lens of the Five Es. This categorization will then be used to inform the Fire Master Plan. The purpose of the Five Es as they pertain to this study is shown in **Table 42**.

Table 41: Risk Analysis Conclusions – 5 E's Categorization

Five E's	Description	Purpose
Education	Education influences audiences to refrain from risky or unhealthy behavior or take positive action to reduce risk.	For consideration within the proposed Public Education Program
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.	For consideration within the proposed Inspection/Enforcement Program
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.	For consideration within the proposed Fire Inspection and Enforcement Program
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.	For consideration within the proposed Inspection/Enforcement Program
Emergency Response	Effective emergency response can mitigate the effects of unintentional injuries and save lives.	For consideration within the proposed Emergency Response Deployment Options

Table 42 presents the identified risks in a matrix format to indicate the ways in which the risks can be addressed by O.F.S. and ultimately considered within the Fire Master Plan analysis and recommendations. The same process is applied to the key findings in **Table 43**.

For those risk conclusions that will not be considered within the F.M.P., the department should use the findings of the risk assessment to review other fire protection services provided by the department to help ensure compliance with **O.Reg.378/18** (e.g., training, by-laws, fleet, equipment, all department policies and guidelines, etc.).

Table 42: Treatment Options and Five E's Categorization – Identified Risks

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	Increasing traffic congestion on the existing road network presents the potential for a delay in emergency response times.	Moderate	Accept					Yes
Geographic	Motor vehicle-related incidents on the existing road network represent 18.33% (4,670) of the historical emergency responses of the Oshawa Fire Services.	High	Accept					Yes
Geographic	The presence of waterways within the City of Oshawa creates a potential need for specialized technical ice and water rescues.	Moderate	Mitigate Accept	Yes				Yes
Geographic	Activities at the Port of Oshawa have been identified as including the potential for dangerous goods transportation that may present a risk to the community.	**Special Consideration**	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	Group C - Residential Occupancies represent 93.41% (50,393) of the City's existing property stock, and over the five year period from January 1st, 2014 to December 31st, 2018 were associated with 82.56% (322) of the structure fires within the City.	High	Mitigate Accept	Yes	Yes	Yes		Yes
Building Stock	The 2016 Census data indicates that 62.60% (39,185) of the City's Group C-Residential building stock was built prior to the introduction of the 1981 Ontario Fire Code and Ontario Building Code compared to 53.06% (2,742,720) of residential building stock in the remainder of the Province.	High	Mitigate Accept	Yes	Yes			Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Building Stock	The City currently has 76 buildings defined by the O.B.C. as high-rise buildings with a floor level of 18 metres (59 feet) above grade, or 6 storeys. These buildings are distributed within the urban area with several located in the downtown area.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City has 91 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). These buildings are predominantly located in the commercial and industrial land use areas such as the area south of Highway 401 and along Taunton Road.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City of Oshawa currently has twenty-seven (27) registered vulnerable occupancies.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Critical Infrastructure	The Oshawa Executive Airport presents a number of unique fire related risks associated with aircraft, supporting infrastructure and the potential transportation of dangerous goods requiring specialized fire protection services.	**Special Consideration**	Mitigate Accept		Yes	Yes		Yes
Demographic	Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on residential fire death rate. According to the 2016 Census, seniors represent 16.53% (26,355) of the City's total population.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	For the period from January 1st, 2014 to December 31s, 2018 there is a higher concentration of medical/resuscitator, false fire and fire/explosion	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
	incidents in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.							

Table 43: Treatment Options and Five E's Categorization – Key Findings

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	There are several private or restricted (e.g. gated / locked) emergency access routes located throughout the City used by fire apparatus. It was identified that these routes are not always well-maintained and currently, the City does not possess an inventory of these emergency access routes.	Mitigate	Yes				
Geographic	Bridges, with restrictions or closures, have the potential to reduce the connectivity of the City's road network resulting in the potential for delays in emergency response times.	Accept					Yes
Geographic	Grade level rail crossings could create a physical barrier to the connectivity of the City's road network that can potentially result in a delays in emergency response times.	Accept					Yes
Building Stock	The City includes areas of building stock that have higher density and, as such, greater potential for exposure in the event of a fire.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	O.F.S. identified several properties within Oshawa as having an increased potential for high fire risk in regards to fuel load.	Mitigate	Yes	Yes	Yes	Yes	Yes
Building Stock	Key Finding: In addition to registered vulnerable occupancies the City has 58 schools, and 56 daycares that represent higher fire life-safety risks.	Mitigate Accept	Yes	Yes	Yes		Yes
Building Stock	There are a number of identified heritage buildings within Oshawa, many of which were constructed prior to the introduction of the Ontario Fire Code and Ontario Building Code.	Accept					Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Critical Infrastructure	It was identified that there are several privately owned hydrants located throughout the City. However, the City does not currently have an inventory of these hydrants.	Mitigate Accept	Yes				Yes
Demographic	The 2016 Census data indicates that children aged 14 and under represent 16.66% (26,570) of the City's total population.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Demographic	Of the City's total population, 28.68% (45,730) fall into the age range of 45 to 64, representing a cohort aging towards the seniors demographic of 65 years or older.	Mitigate Accept	Yes				Yes
Demographic	The City's commuter population presents a factor that may impact traffic congestion, and the potential occurrence of motor vehicle accidents within the City.	Accept					Yes
Hazard	The City's 2018 Hazard Identification and Risk Assessment identifies hazards that could each impact the ability of the City to deliver fire protection services.	Mitigate Accept	Yes				Yes
Economic	The City has identified top employers that contribute to the economic vitality of the community. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the City.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018, the City averaged 78 structure fires per year.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group F – Industrial occupancies account for 4.10% (16) of total structure fires within the City.	Mitigate	Yes	Yes	Yes	Yes	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018 structure fires occurring in Group E – Mercantile occupancies account for 13.00% ($3,824,000) of total structure fire loss within the City, higher than the Province by 8.14%.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Most reported fire related civilian injuries (20) and fatalities (6) occurred in Group C – Residential Occupancies, with one (1) fatality occurring in an occupancy not classified within the O.B.C.	Avoid Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the leading cause of unintentionally set fires was due to misuse of ignition source at 31.03% (121 fires), compared to 29.96% (10,532) in the Province.	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring in the City over the five year period from January 1st, 2014 to December 31st, 2018, the second most common cause of unintentionally set fires was due to mechanical/electrical failure at 13.33% (52 fires), compared to 15.45% (5,432) in the Province.	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 19.23% (19) of fires had a reported ignition source of cooking equipment, which is 1.51% higher than the Province (17.72%).	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 20.26% (79) of fires had a reported ignition source of open flame tools/smokers articles, which is 6.54% higher than the Province	Mitigate Accept	Yes	Yes	Yes		Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
	(13.72%).						
Past Loss and Event History	Of the fires occurring within the City over the five year period from January 1st, 2014 to December 31st, 2018, 10.26% (40) of fires had a reported ignition source of exposure, which is 5.61% higher than the Province (4.65%).	Mitigate Accept	Yes	Yes	Yes		Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 21.82% (67) of incidents did not have a smoke alarm present (compared to 17.31% or 4,289 in the Province).	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the five year period from January 1st, 2014 to December 31st, 2018, of the fire loss incidents in Group C – Residential occupancies, 43.32% (133) of incidents had a smoke alarm present and operating compared to 44.57% (11,044) in the Province.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	There is a higher concentration of lower median income in the areas south east and west of Fire Station 1 representing a portion of the downtown core of the City.	Mitigate Accept	Yes				Yes
Past Loss and Event History	For the period from January 1st, 2014 to December 31st, 2018 there are higher concentrations of rescue incidents involving motor vehicle collisions and vehicle extrication along the King Street east/west (Highway 2) corridor and the Simcoe Street North corridor from Highway 401 to Highway 407. There is also a very high concentration of rescue calls along the Highway 401 corridor.	Accept					Yes