Municipality of West Nipissing
COMMUNITY RISK ASSESSMENT

Presented to:

West Nipissing Ouest

Presented by:

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PREFACE

This Community Risk Assessment will serve as a foundational document to inform and direct the development of a municipal Fire Master Plan for the Municipality of West Nipissing to address the strengths, threats and vulnerabilities that are unique to the municipality, to protect lives, the environment and property.

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ACRONYMS

Acronym	Definition
CEMP	Community Emergency Management Program
CI	Critical Infrastructure
CO	Carbon Monoxide
CRA	Community Risk Assessment
FMP	Fire Master Plan
FPPA	Fire Protection and Prevention Act
HIRA	Hazard Identification and Risk Assessment
MPAC	Municipal Property Assessment Corporation
MVC	Motor Vehicle Collision
MW	Megawatt
NBC	National Building Code
NFPA	National Fire Protection Association
OBC	Ontario Building Code
OFC	Ontario Fire Code
OFM	Office of the Fire Marshal
PPE	Personal Protective Equipment
WNFES	West Nipissing Fire and Emergency Services

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EXECUTIVE SUMMARY

Introduction

A Community Risk Assessment (CRA) is a process used to identify, evaluate, and prioritize potential hazards, vulnerabilities, and risks to the public within a specific community or geographic area. Under the Fire Protection and Prevention Act, 1997 (FPPA), Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18), every municipality must complete and review a CRA "to inform decisions about the provisions of fire protection services[1]"in the interest of public safety. It involves gathering information, analyzing data, and engaging with stakeholders to understand the potential threats and vulnerabilities that could lead to various types of emergencies or disasters. The goal of a CRA is to inform emergency management and response agencies to enhance community resiliency and reduce the impact of potential future emergencies.

Community Risk Assessment Process

The Office of the Fire Marshal (OFM) has developed a guideline (OFM-TG-02-2019) to assist municipalities during the process of conducting a CRA. As per O.Reg. 378/18, there are nine mandatory profiles that must be examined:

1. **Geographic Profile:** Physical features of the community
2. **Building Stock Profile:** Types, numbers, uses and ages of buildings in the community
3. **Critical Infrastructure Profile**: Facilities and services that meet vital needs, sustain economy, and protect public security
4. **Demographic Profile:** Composition of the community's population
5. **Public Safety and Response Profile:** Organized agencies and organizations within and external to the community that can respond to certain types of incidents
6. **Community Services Profile:** Community agencies, organizations and associations that can provide supportive services
7. **Hazard Profile:** Natural, human-caused, and technological hazards in the community
8. **Economic Profile:** Economic sectors that are critical to financial stability of the community
9. **Past Loss and Event History Profile:** Past emergency responses in the community

Each profile is considered and where applicable, taken through the core six-step process of a CRA development as outlined in the table below.

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

No.	Step	Description
1	Data Collection	Gather relevant data about the community, including demographics, geography, infrastructure, land use, historical disaster data, socio-economic factors, and stakeholder input.
2	Hazard Identification	Identify the various hazards that could affect the community. Hazards include natural, human-made and technological events.
3	Vulnerability Analysis	Assess the community's vulnerabilities in relation to each identified hazard. Consider factors such as population density, housing quality, socio-economic status, access to community resources and community protection agencies.
4	Risk Assessment	Combine information about hazards and vulnerabilities to assess the overall risk to the community by quantifying the likelihood and potential impact of various hazards occurring and affecting vulnerable areas.
5	Risk Ranking and Risk Treatment	Assign each risk a ranking score and potential treatment options to accept, avoid, mitigate, or transfer the risk.

The results of the five-step process will provide a series of identified risks and key findings. Identified risks are factors which may highlight a need for future consideration during the development of a Fire Master Plan (FMP) when examining emergency service levels, while key findings may be noted as strengths in the community's current response model and/or trends to be monitored.

The identified risks and key findings of the Municipality of West Nipissing's CRA are summarized in the next section and a full analysis of the risk assessment process is outlined in Section 11 of this report.

Summary of Identified Risks and Key Findings

The following identified risks and key findings are drawn from analyses presented throughout the report. They are grouped based on the nine mandatory profiles and in the order in which they appear in the report.

As per the OFM technical guidelines, the risk treatments presented in this report are a generalized basis for further consideration and in-depth analysis during the development of a FMP, which will serve to account for feasibility of risk treatments, cost, and execution.

Table 1: Summary of Identified Risks

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
1	Geographic	The road network is a contributor to emergency call volume due to motor vehicle collisions and vehicle fires.	Almost Certain	Moderate	High	• Approximately 195 emergency calls responded to between 2018 and 2022 pertain to motor-vehicle related incidents, this represents 91% of rescue calls and approximately 21% of all calls responded to by WNFS during that period.
2	Geographic	Major Rail line through the municipality presents a risk related primarily to the movement of goods.	Possible	Catastrophic	High	• The Ottawa Valley Railway track runs along Highway 17 through the Municipality of West Nipissing. • There are tracks running through most major neighborhoods of the municipality.
3	Geographic	Waterways in the municipality, such as the Sturgeon River, Cache Bay, Temagami River, and Lake Nipissing, pose rescue and accident risks from boating and snowmobiles, and natural hazards like flooding, ice jams, and erosion, necessitating swift evacuations and rescue responses.	Unlikely	Moderate	Moderate	• The Minnehaha Bay Marina, with its 50 boat slips, increases the potential for boating accidents and collisions due to the high volume of boats in the area. • Waterfront activities increase the risk of an incident both on the water and onshore. WNFS reported a total of 8 water and/or ice rescues over the period of January 2018 – December 2022.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
4	Building Stock and Past Loss and Event History	Group C- Residential Occupancies represents 84.86% of the existing property stock and, over the period from January 1, 2018 - December 31, 2022, were associated with 77.78% of the structure fire loss.	Almost Certain	Moderate	High	• The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%). • 77.78% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. • 100.00% of the civilian fire related injuries, 100.00% of the civilian fire related fatalities occurred in residential occupancies. • There is a considerably diverse portfolio of non-profit housing in the community. • In accordance with the growth projections an estimated range of 282 to 578 new dwellings units will be required to meet housing stock needs in 2031.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
5	Building Stock	Data provided by the Municipal Property Assessment Corporation (MPAC) indicates that 49.24% of the municipality's residential building stock was built prior to the introduction of the 1981 OFC.	Almost Certain	Moderate	High	• 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC. • Buildings built prior to the adoption of the 1981 OFC or the 1975 OBC may not be in conformance with current smoke alarm and CO alarm requirements and likely will not have interconnected devices.
6	Building Stock	There are several properties within West Nipissing that have a potentially high fuel load and therefore an increased high fire risk.	Possible	Major	Moderate	• There are 181 industrial occupancies (2.48% of property stock) -some with known high fuel load concerns. • Certain industrial operations may have increased fuel loads and conduct higher risk activities. Proactive inspections should target these facilities to ensure compliance with codes, maintenance, and emergency planning requirements. • There have been4 industrial fires over the past 5 years resulting in over $816k fire loss (9.41% of the total fire loss).

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
7	Building Stock	The municipality has identified 12 registered vulnerable occupancies and 7 Community Living spaces.	Possible	Major	High	• The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%). • 81% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. • 100% of the civilian fire related injuries, and civilian fire related fatalities occurred in residential occupancies.
8	Building Stock	In addition to registered vulnerable occupancies the municipality has 10 elementary and secondary schools (9 buildings).	Likely	Moderate	Moderate	• 10 elementary and secondary schools. There are 9 buildings with one building housing both French and English high. • Children, due to age and potential cognitive or physical limitations may prevent or delay self-evacuation in the event of an emergency.
9	Critical Infrastructure	There were 195 emergency calls responded to between 2018 and 2022 pertaining to motor-vehicle related incidents, this represents 91.54% of rescue calls.	Almost Certain	Moderate	High	• 195 emergency calls responded to between 2018 and 2022 pertaining to motor-vehicle related incidents, this represents 91.54% of rescue calls. • 50.00% of the labour force begins their commute between the hours of 7 and 9 AM.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
10	Demographic	The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population, which is 7.87% higher than the province's rate of 18.54%.	Almost Certain	Moderate	High	• Canada's aging population has been recognized as one of the most significant demographic trends. • Trending indicates that seniors are residing in their own independent homes longer. • 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). • The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population. • 18.48% of the municipality's population falls between the age group of 55 and 64, who are aging towards the senior's demographic of 65 years of age and older. • that 57.96% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC which may limit compliance with current smoke alarm requirements.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
11	Demographic	18.48% of the municipality's population falls between the ages of 55 and 64, gradually aging into the senior demographic of 65 years and older. This is 4.37% higher than that of the province.	Almost Certain	Moderate	High	• This group over the next 5 years will fall into the senior's category presenting a greater risk. • Canada's aging population has been recognized as one of the most significant demographic trends. • 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). • The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population. • 18.48% of the municipality's population falls between the age group of 55 and 64, who are aging towards the senior's demographic of 65 years of age and older.
12	Demographic	West Nipissing has a notably higher proportion of Indigenous population at 19.71% compared to the province at of 2.90%.	Almost Certain	Moderate	High	• The municipality has a higher proportion of indigenous population (19.71%) when compared to Ontario (2.90%). • 32.03% (900 individuals) identify as First Nations, 65.30% (1,835 individuals) as Métis, and 0.88% (25 individuals) as Inuit.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
13	Hazard	Small communities such as North Monetville, Lavigne, Kipling, River Valley, Field, and Crystal Falls are at a greater risk of a forest fire. This statement does not exclude the other rural areas and shoreline properties of lakes and rivers in the Municipality that are surrounded by forest.	Possible	Catastrophic	High	• The majority of the Municipality is surrounded by forest. The different fuel load of the forest is approximately: ○ 50% is 30-70% softwood ○ 35% is Mixed wood with less than 30% Softwood ○ 10% is open Forest and Grass (Brush) ○ 4% Mature Jack Pine ○ 1% Wetland
14	Building Stock & Past Loss and Event History	For the period from January 1st, 2018, to December 31st, 2022, the municipality experienced a total of 90 structure fires of which 77.78% occurred in Group C-Residential Occupancies.	Almost Certain	Moderate	High	• Structure Fires were responsible for 88.61% of the total fire loss for this period. • 100.00% of the civilian fire related injuries, 100.00% of the civilian fire related fatalities occurred in residential occupancies. • 70 new dwellings were added to the market in 2021. Based on data for housing starts and in-progress construction for 2021, an additional 91 new units will be completed in the future, composed of 66 Single Detached, 8 Semi-Detached, 17 Apartment.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
15	Past Loss and Event History	100% of the civilian fire related injuries, and civilian fire related fatalities occurred in Group C -residential occupancies.	Almost certain	Major	High	• The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%). • 81% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. • 100% of the civilian fire related injuries, and civilian fire related fatalities occurred in residential occupancies.
16	Past Loss and Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 13.33% of the reported fires had an ignition source related to heating equipment which is 5.98% higher than that of the province at 7.35%.	Likely	Moderate	Moderate	• 13.33% of fires were related to heating equipment. • incidents where a smoke alarm was present but failed to operate accounted for 18.03%, higher than the provincial rate of 12.40%. • 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC.

No.	Profile	Identified Risk	Probability Level	Consequence Level	Risk Level	Rationale
17	Past Loss and Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, in 18.03% of incidents, there was a smoke alarm present on the floor of origin, but it did not operate. This is 5.63% higher than that of the province.	Likely	Moderate	Moderate	• There were 11 incidents (or 18.03%) where a smoke alarm was present but did not operate. • there was no smoke alarm present in 13.11% of occurrences. • 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC.
18	Past Loss and Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 26.67% of the unintentionally set fires in the municipality occurred due to Mechanical/Electrical Failure which is 11.61% higher than that of the province.	Likely	Moderate	Moderate	• There were 11 incidents (or 18.03%) where a smoke alarm was present but did not operate. • there was no smoke alarm present in 13.11% of occurrences. • 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC.

Table 2: Summary of Key Findings

No.	Profile	Key Finding
1	Geographic	Trans Canada Highway 17 presents an elevated risk of a dangerous goods release that could impact the public and environment.
2	Geographic	Bridges, with restrictions or closures, have the potential to reduce the connectivity of the municipality's road network resulting in the potential for delays in emergency response times.
3	Geographic	There are risks associated with the potential for interactions between rail traffic and vehicular traffic or pedestrian traffic within the municipality.
4	Geographic	Grade level rail crossings could create a physical barrier to the connectivity of the municipality's road network that can potentially result in delays in emergency response times.
5	Building Stock	There were no properties Designated Under Part IV, Section 29 of the Ontario Heritage Act and 102 under Section 27 and 102 under Section 27
6	Critical Infrastructure	Between 2018 and 2022 WNFS responded to 9 calls for fallen hydro lines which is 14.75% of all public hazard calls.
7	Demographics	50.86% of individuals are not in the labour force in West Nipissing compared to the province at 37.20% (difference of 13.66%)
8	Demographics	West Nipissing has a lower proportion of individuals with postsecondary education (49.63% compared to Ontario's 57.53%) and has a higher proportion with no formal education (23.00% compared to Ontario's 15.28%).
9	Hazard	The municipality's 2019 Hazard Identification and Risk Assessment (HIRA) identifies hazards that could each impact the ability of WNFS to deliver fire protection services.
10	Economic	The municipality has identified top employers that contribute to the economic vitality of the community. The majority of these are public services and industrial operations. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the municipality. Consideration should be given to proactive industrial fire safety programming.
11	Past Loss & Event History	There was a 61.21% increase in the call volume from 2021 to 2022. This trend should be monitored.
12	Past Loss & Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 23.02% of the total emergency calls that WNFS responded to were rescue calls of which 84.97% were vehicle collisions.
13	Past Loss & Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, there were 143 false fire calls of which 53.84% were related to an alarm system malfunction.

SECTION 1
INTRODUCTION

1.1 Background

This Community Risk Assessment (CRA) has been developed for the Municipality of West Nipissing 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 (FPPA) and came into effect on July 1, 2019.

It requires all municipalities in Ontario to develop a CRA 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"[2].** At this time, this CRA will inform the Fire Master Plan being developed as a companion document for the Municipality of West Nipissing. This CRA is formatted to become a stand-alone document in the future to assist the municipality in sustaining compliance with O. Reg. 378/18 that includes conducting a review of the CRA when necessary, and annually.

In addition to this CRA, the FPPA 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"[3]**. 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 FPPA also assigns duties to the Office of the Fire Marshal (OFM) to **"advise municipalities in the interpretation and enforcement of this Act and the regulations"[4]**. The OFM has developed Technical Guideline-02-2019 (TG-02-2019) to assist municipalities and fire departments in the process to develop a CRA and to utilize the completed CRA to inform the municipality's decisions about complying with the FPPA.

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 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 Municipality of West Nipissing's Community Risk Assessment report maintained as a living document by the West Nipissing Fire and Emergency Services. This would include regular (e.g. annual) review and updates to the CRA's data and information.

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

[3] *Fire Protection and Prevention Act, 1997 Part II Responsibility for Fire Protection Services, Section 2.1 (a) (b)*

[4] *Fire Protection and Prevention Act, 1997, Part III Fire Marshal, Section 9.2 (b)*

The methodology and analysis utilized to develop this CRA has been directly informed by TG-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.

1.2 Purpose

The primary purpose of this CRA is twofold:

1. To develop a Community Risk Assessment for the Municipality of West Nipissing 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 Municipality of West Nipissing through the development of a Fire Master Plan (FMP).

1.3 Methodology

In addition to TG-02-2019, the methodology applied to develop this CRA has been informed by other current industry standards and best practices. These include:

1. OFM Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model
2. OFM Public Fire Safety Guideline (PFSG) 04-40A-03: Simplified Risk Assessment
3. NFPA 1300, Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition)
4. NFPA 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)
6. Vision 20/20 Community Risk Reduction Planning: A Guide for Developing a Community Risk Reduction Plan

As required by O. Reg. 378/18, this CRA includes a comprehensive analysis of the nine mandatory profiles including:

i. Geographic Profile
ii. Building Stock Profile
iii. Critical Infrastructure Profile
iv. Demographic Profile
v. Public Safety and Response Profile
vi. Community Services Profile
vii. Hazard Profile
viii. Economic Profile
ix. Past Loss and Event History Profile

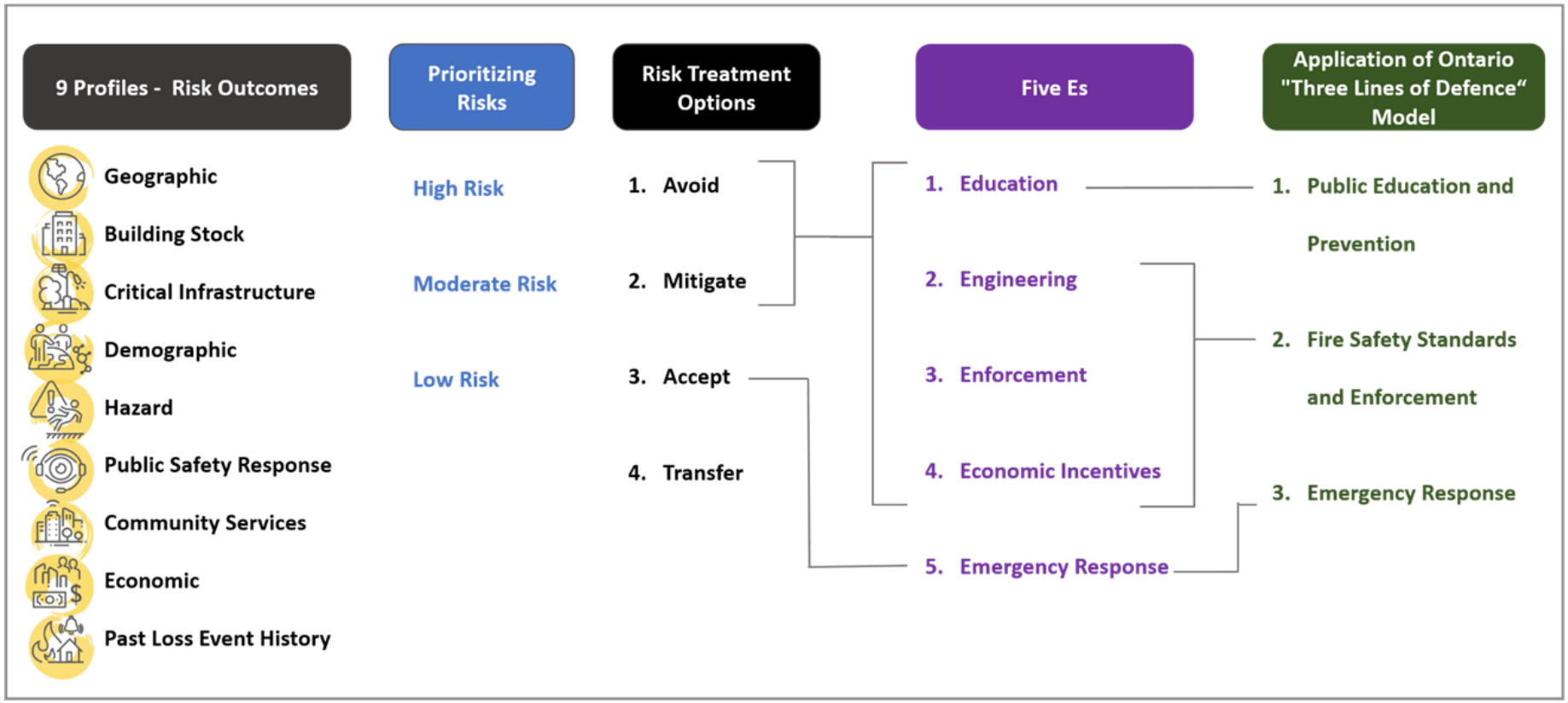
Within each of the nine profiles, there are several sub-topics examined. These sub-topics are illustrated in Figure 1. These profiles are based on an analysis of several sources of information, including data provided by the Municipality of West Nipissing, West Nipissing Fire and Emergency Services (WNFS), Statistics Canada, the OFM, 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 TG-02- 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 decision making. Figure 2 illustrates the risk treatment process.

Figure 1: Community Risk Assessment Profiles and Sub-topics

COMMUNITY RISK ASSESSMENT PROFILES AND SUB-TOPICS								
Geographic	**Building Stock**	**Critical Infrastructure**	**Demographics**	**Hazards**	**Public Safety Response**	**Community Services**	**Economic**	**Past Loss & Event History**
• Road network • Bridges • Railways • Airport • Natural features and landforms • Wildland Urban Interface	• Property stock by occupancy type • Building age, construction • Building density and exposure • Building height and area • Potential high fire risk occupancies • Historically or culturally important features	• Food and water • Oil and natural gas • Electricity • Telecommunications • Public safety and security • Continuity of government • Transportation • Health • Financial institutions	• Population and dispersion • Age • Gender • Socioeconomic circumstances • Ethnic and cultural considerations • Transient populations	• Hazard Identification and Risk Assessment (HIRA)	• Public safety response agencies within the community	• Community service agencies, organizations, and associations	• Major employers and economic sectors	• Overall fire loss • Fire loss by occupancy type • Civilian fire deaths and injuries • Fire cause and ignition • Smoke alarm status • Call volume • Call types

Figure 2: Risk Treatment Process



The analysis presented within this CRA has been informed by a wide range of data sources. Where applicable, all numerical data has been rounded to the nearest 1/100 (hundredth) decimal point to provide consistency in the analysis. As a result, the numerical totals presented within each analysis, although stated as reflecting 100%, may show a minor variance based on the use of only the nearest 1/100 (hundredth) decimal points.

SECTION 2
GEOGRAPHIC PROFILE

2.1 Geographic Overview[5]

The Municipality of West Nipissing, ON, spans nearly 2,000 km^2, largely characterized by green spaces and numerous lakes, including Lake Nipissing and the Sturgeon River. It has a population of 14,583[6] as per the 2021 census, with a population density of around 7.5 individuals /km^2.

Formed through the amalgamation of various townships and communities in 1999, West Nipissing comprises 11 named townships, including Cache Bay, Crystal Falls, Desaulniers, Field, Kipling, Lavigne, North Monetville, River Valley, Sturgeon Falls, and Verner, along with 17 ½ unincorporated townships.

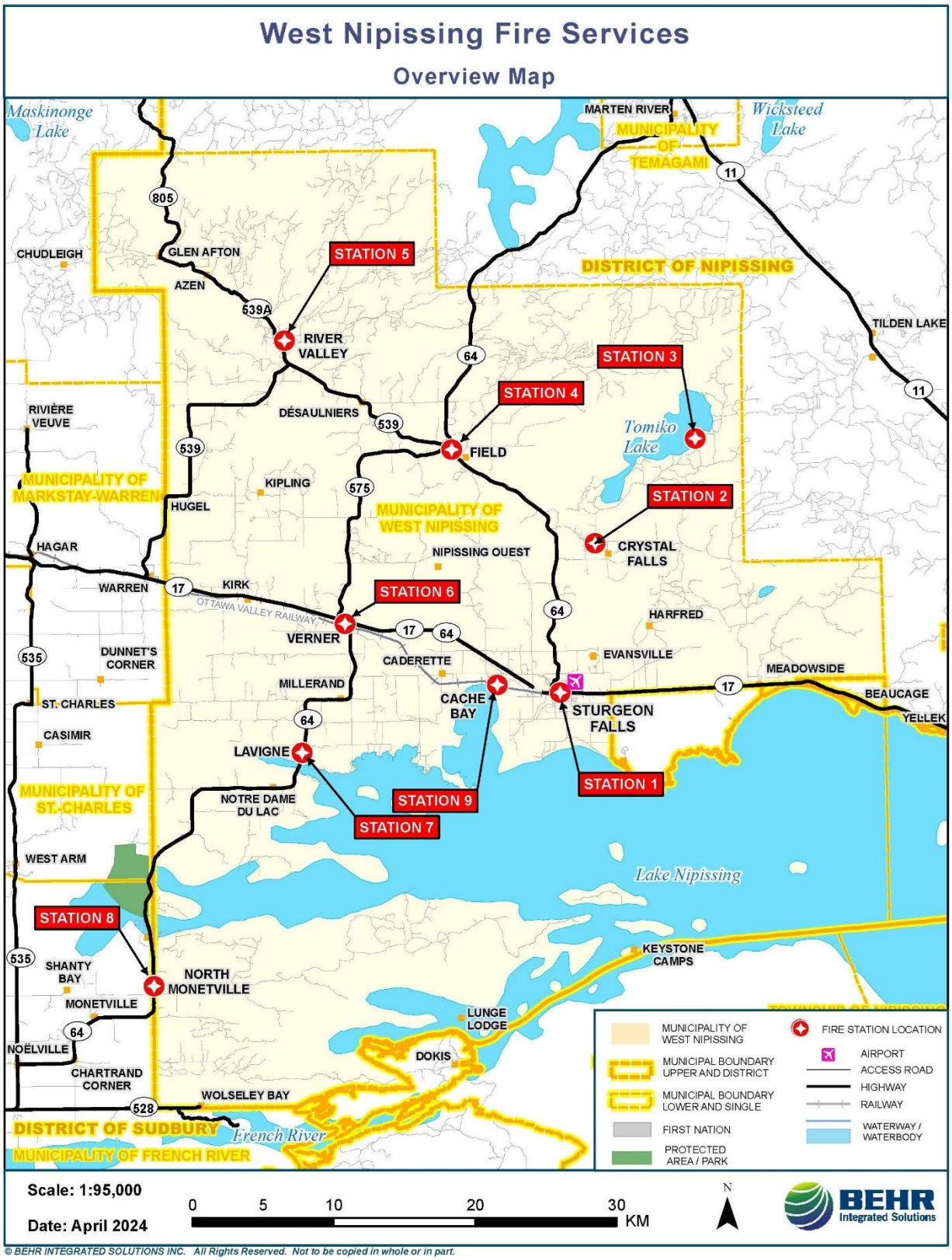
West Nipissing has access to major hubs in Ontario via Highway 17 and the province's 400-series highway system, with North Bay only 40 kilometers away, reachable within a 30-minute drive. Additionally, Sudbury is situated 90 kilometers from West Nipissing, approximately a one-hour drive, while larger urban centers such as Toronto, Ottawa, Timmins, and Sault Ste. Marie are all approximately 400 kilometers away, accessible within a four-hour drive.

The municipality serves as an agricultural hub and offers diverse opportunities across sectors such as mining, healthcare, public service, retail trade, education, construction, forestry, and transportation.

[5] *https://www.westnipissing.ca/town-hall/about-west-nipissing/*

[6] *https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=West%20Nipissing%20%2F%20Nipissing%20Ouest&DGUIDlist=2021A00053548055&GENDERlist=1,2,3&STATISTIClist=1&HEADERlist=0*

Map 1: Municipality of West Nipissing Overview Map



2.2 Transportation Network

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; therefore, it is valuable to consider areas where there may be a lack of connectivity due to road network design, as well as other natural barriers (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 municipality's transportation planning processes should include WNFS as a stakeholder to provide consideration for emergency services' needs and challenges relating to the road network, traffic congestion, and 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 municipality oversees a network of roads totaling 535 kilometers, comprising various types, including arterial, collector, local, and gravel roads. Of this total:

- 430 kilometers (80%) consist of gravel roads.
- 41 kilometers (7.66%) are surface-treated Low-Class Bituminous Surface (LCB) roads.
- 64 kilometers (12%) are paved with asphalt High-Class Bituminous (HCB) surfaces.

According to the municipality's Asset Management Plan (2013), the overall road conditions are rated as average, with an average condition rating of 63.6%.

The Municipality of West Nipissing has a network of essential highways linking it to neighboring regions, including Sudbury and North Bay. Highway 17 serves as a primary route, supported by highways like Highway 64 and Highway 575, as well as smaller segments of Highway 539, Highway 539A, and Highway 805. Since all provincial highways are designated dangerous goods routes, traffic carrying various hazardous materials passes through the municipality regularly, highlighting the importance of safe transportation.

Incidents involving roads and highways, as well as incidents involving dangerous goods was listed as a high threat on the municipality's 2019 Hazard Identification and Risk Assessment.

2.2.2 Bridges and Culverts

Bridges must be considered when conducting a CRA, as they can create physical barriers to emergency responses and negatively impact response times. An apparatus may face restrictions from crossing, such as load limitations, or roadway connectivity may be disrupted if a bridge is out of service for maintenance or repairs. Additionally, incidents occurring on a bridge pose increased risks, including spills, congestion, and difficulty accessing the scene. Such incidents may also necessitate specialized skills and equipment for slope rope rescue operations.

According to the municipality's Asset Management Plan (2013), there are 30 bridges (excluding pedestrian bridges) and 9 structural culverts. Among the bridges, 21 (70%) are considered to be in good or fair condition, while 4 (13.33%) are in poor condition, and 5 (16.67%) have an unknown status. As for the culvert system, most are rated as fair, with 2 (22.22%) considered good, 4 (44.44%) fair, and 3 (33.33%) in poor condition.

2.2.3 Rail

At-grade rail crossings, intersections where a road crosses a rail line at the same level, can cause delays in emergency response by obstructing roadway access and pose a threat of dangerous collisions with motor vehicles. Moreover, the physical barriers created by rail infrastructure, such as rail yards or the placement of tracks, grade separations, and level crossings, can significantly impact emergency services travel times and overall response times throughout a community. Additionally, the frequency of trains passing through a community and the nature of goods they transport pose varying degrees of risk, including the potential for derailments and releases of hazardous materials.

The Ottawa Valley Railway track runs along Highway 17 through the Municipality of West Nipissing, deviating slightly south between Verner and Cache Bay before running parallel with the highway again. The track travels through the urban areas of Sturgeon Falls, Cache Bay, Verner, and the rural areas of Springer Township, Caldwell, and Kirkpatrick Township. Large containers of dangerous goods are transported by these trains.

While the possibility of a derailment and subsequent release of dangerous goods is low, such an event could have significant consequences and would require a specialized emergency response. Dangerous goods are frequently transported along these routes and pass through populated areas, posing risks to public safety. Additionally, the presence of a rail crossing over the Sturgeon River on the western edge of Sturgeon Falls is noteworthy. This crossing, which leads to Lake Nipissing, not only increases the potential for environmental impact in the event of an incident but also raises concerns about the contamination of the waterways and surrounding ecosystem.

2.3 Waterways and Marinas

Waterways in the municipality, such as the Sturgeon River, Cache Bay, Temagami River, and Lake Nipissing, pose natural hazards like flooding, ice jams, and erosion, necessitating swift evacuations and rescue responses. Responders require specialized technical rescue training and equipment to handle emergencies, especially in water bodies used for recreational activities, which see heightened activity during the summer months. The Minnehaha Bay Marina, with its 50 boat slips, increases the potential for boating accidents and collisions due to the high volume of boats in the area.

Waterfront activities increase the risk of an incident both on the water and onshore including rescue and accident risks from boating and snowmobiles. WNFS reported a total of 8 water and/or ice rescues over the period of January 2018 – December 2022.

2.4 Geographic Profile – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Identified Risk	
Identified Risk	The road network is a contributor to emergency call volume due to motor vehicle collisions and vehicle fires.
Identified Risk	Major Rail line through the municipality presents a risk related primarily to the movement of goods.
Identified Risk	Waterways in the municipality, such as the Sturgeon River, Cache Bay, Temagami Rier, and Lake Nipissing, pose rescue and accident risks from boating and snowmobiles, and natural hazards like flooding, ice jams, and erosion, necessitating swift evacuations and rescue responses.
Key Finding	
Key Finding	Trans Canada Highway 17 presents an elevated risk of a dangerous goods release that could impact the public and environment.
Key Finding	Bridges, with restrictions or closures, have the potential to reduce the connectivity of the municipality's road network resulting in the potential for delays in emergency response times.
Key Finding	There are risks associated with the potential for interactions between rail traffic and vehicular traffic or pedestrian traffic within the municipality.
Key Finding	Grade level rail crossings could create a physical barrier to the connectivity of the municipality's road network that can potentially result in delays in emergency response times.

SECTION 3
BUILDING STOCK PROFILE

As referenced in **O. Reg. 378/18**, the building stock profile assessment includes an analysis of the types and uses of the building stock within the municipality. Important considerations include the number, type, and use of buildings, as well as any building-related risks known to the fire service. There are potential fire risks associated with different types or uses of buildings, depending on the presence or absence of fire safety systems and equipment at the time of construction and maintenance thereafter. This section examines these building characteristics within the municipality.

3.1 Ontario Building Code Occupancy Classifications

OFM TG-02-2019 encourages fire services to consider the potential fire-related risks associated with different building occupancy types and uses. This involves assessing the prevalence of each occupancy classification within a community and the presence of fire and life safety systems and equipment. The Ontario Building Code (OBC) categorizes buildings by major occupancy classification, providing a recognized definition and baseline for developing a community risk assessment, as outlined in TG-02-2019.

The OBC consists of six major building occupancy classifications (groups), further defined by division within each group. The OBC major classification groups and divisions are detailed in Table 3.

Table 3: OBC Major Occupancy Classifications

Group	Division	Description of Major Occupancies
A	1	Assembly occupancies intended for the production and viewing of the performing arts
A	2	Assembly occupancies not elsewhere classified in Group A
A	3	Assembly occupancies of the arena type
A	4	Assembly occupancies in which occupants are gathered in the open air
B	1	Detention occupancies
B	2	Care and treatment occupancies
B	3	Care occupancies
C	All divisions	Residential occupancies
D	All divisions	Business and personal services occupancies
E	All divisions	Mercantile occupancies
F	1	High-hazard industrial occupancies
F	2	Medium-hazard industrial occupancies
F	3	Low-hazard industrial occupancies

Table Source: Ontario Building Code[7]

3.2 OFM Fire Risk Model Occupancy Classification

The Fire Risk Sub-model developed by the OFM utilizes major group classifications (i.e., Group A, B, C, D, E, F) without the detailed division classifications found in the OBC. This approach enables comparative assessment of buildings within a community by major occupancy groups, ensuring consistent and recognized definitions for each major occupancy type. Moreover, it allows for further analysis of specific occupancy groups. Occupancies within a group can be individually assessed, subject to any site-specific hazards or concerns, and included within the broader scope of the CRA as needed.

The OFM Fire Risk Sub-Model OBC classifications, definitions, associated fire-related risks, and potential proactive measures to mitigate risk within these occupancy types are presented in Table 4.

[7] *Ontario Regulation 332/12:Building Code, Part III Fire Protection, Occupant Safety and Accessibility, Section 3.1.2.1*

Table 4: OFM Fire Risk Sub-Model Major Building Classifications

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM 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

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM Fire Related Risks	Proactive Measures for Reducing Risk
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 OFC compliance • Pre-planning by fire suppression staff • Fire Drills as required by the OFC

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM 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 OFC compliance • Targeted fire prevention inspections for OFC retrofit 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

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM Fire Related Risks	Proactive Measures for Reducing Risk
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) • high hazard (F1) based on its combustible content and the potential for rapid fire growth.	These occupancies constitute a special fire hazard due to 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 systems • Approved Fire Safety Plans • Preplanning by fire suppression staff • Fire extinguisher training

3.2.1 Municipality of West Nipissing Existing Major Building Stock Classification Summary

Analysis of the municipality's major building occupancy types was conducted using data from the Municipal Property Assessment Corporation (MPAC)[8]. Table 5 provides a summary of the municipality's existing major building occupancy classifications.

The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%), and 91.87% of those are single-detached homes. The second largest occupancy type within the municipality are farm properties at 10.07% of the municipality's property stock (734 farm properties).

Table 5: Existing Major Building Classification Summary

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Percentage of Occupancies
Group A	Assembly Occupancies	50	0.69
Group B	Care or Detention Occupancies	5	0.07
Group C	Residential Occupancies - Total	6187	84.86
Group C	*Single-detached*	*5684*	*91.87*
Group C	*Semi-detached*	*151*	*2.44*
Group C	*Row*	*12*	*0.19*
Group C	*Apartment < 5 Storeys*	*303*	*4.90*
Group C	*Apartment > 5 Storeys*	*0*	*0.00*
Group D	Business/Personal	28	0.38
Group E	Mercantile	106	1.45
Group F (all divisions)	Industrial Occupancies - Total	181	2.48
F1	*High Hazard Industrial*	*1*	*0.55*
F2	*Medium Hazard Industrial*	*170*	*93.92*
F3	*Low Hazard Industrial*	*10*	*5.52*
Other	Not classified in OBC- Farm	734	10.07
Other	Not classified in OBC - Government	0	0.00
	Total	7291	100.00

Table Source: MPAC

[8] *Municipal Property Assessment Corporation (MPAC) Municipal Connect property extract dated May 13, 2024*

Consistent with most other municipalities in Canada, Group C - Residential Occupancies represent the most prominent type of building occupancy type. Standard incident reporting from the OFM[9] indicates that 91.91% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. It is also important to note that 81.56% of the civilian fire related injuries, and 100.00% of the civilian fire related fatalities.

3.3 Building Age and Construction

The OBC was adopted in 1975, and the Ontario Fire Code (OFC) was adopted in 1981. Together, these two codes have provided the foundation for eliminating many inconsistencies in building construction and maintenance that existed before their adoption. They ensure uniform building construction and maintenance standards for all new building projects and provide specific fire and life safety measures based on the building's use.

Examples of fire and life safety issues addressed by the codes include:

- Occupancy
- Exits/means of egress (including signs and lighting)
- Fire alarm and detection equipment
- Fire service access
- Inspection, testing, and maintenance

In many cases, the age and construction of a building can be directly associated with whether it was constructed before or after the introduction of these codes. For instance, during the late 19th and early 20th centuries, balloon frame construction was common, allowing exterior walls to extend continuously from the main floor to the roof, often through multiple stories. This construction method facilitated unobstructed fire and smoke spread from the basement to the roof, resulting in rapid fire propagation without occupants' or firefighters' knowledge. The OBC implemented requirements to change this construction method and introduced additional measures to mitigate fire spread through wall cavities.

Similarly, the new codes recognize modern construction techniques such as lightweight wood frame construction, including the use of wood trusses and laminated veneer lumber. While these techniques and materials enhance construction efficiency and cost-effectiveness, they pose different challenges to firefighters compared to historical methods. For example, lightweight wood frame construction relies on structural components working together, so if one component fails due to exposure to high heat or fire, the entire roof system may fail. Lightweight construction is discussed further, later in this section.

Table 6 lists fire growth rates measured by the time it takes for a fire to reach one-megawatt (MW). Fire growth rate varies depending on the flammability of materials and contents within the building, introducing variances into the presented growth rates.

[9] *West Nipissing SIR- Municipal Fires: Overview Property Class, Injuries, Cause, Ignition Source (2018-2022)*

Table 6: Time to Reach 1 MW Fire Growth Rates in the Absence of Fire Suppression[10]

Fire Growth Rate	Time in Seconds (Minutes) to Reach 1 MW	Time in Seconds (Minutes) to Reach 2 MW
Slow	600 seconds (10 minutes)	848 seconds (14.13 minutes)
Medium	300 seconds (5 minutes)	424 seconds (7.07 minutes)
Fast	150 seconds (2.5 minutes)	212 seconds (3.53 minutes)

The impact of increasing fire growth rates is directly related to the time lapse from ignition to flashover, where combustible items within a given space reach a temperature high enough for them to auto-ignite. Figure 3 (below) illustrates the exponential increase in fire temperature over time and the potential for property loss and loss of life.

Figure 3: Fire Propagation Curve

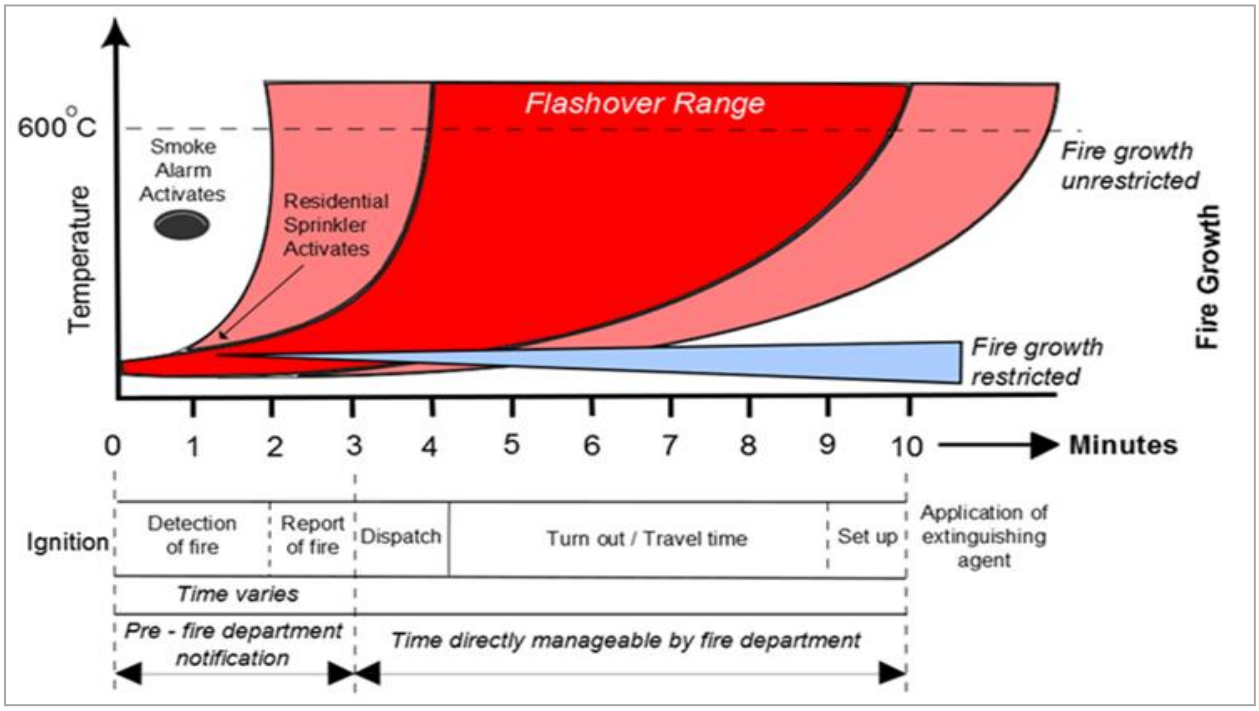


Figure Source: Fire Underwriters Survey "Alternative Water Supplies for Public Fire Protection: An informative Reference Guide for Use in Fire Insurance Grading" (May 2009) and NFPA "Fire Protection Handbook" (2001)

[10] *Office of the Fire Marshal and Emergency Management. (2017, May). Operational Planning: An Official Guide to Matching Resource Deployment and Risk Workbook.*

Understanding building construction and materials is crucial for firefighters to determine the appropriate fire attack strategies and safety measures needed. Therefore, knowledge of a building's age may directly correlate with the construction methods and materials used, making building age and construction a vital component of this CRA. Prior to the amalgamation in 1999, the unincorporated villages were not required to obtain building permits. Although required to meet the OBC, this cannot be confirmed that OBC requirements were met.

Table 7 provides a summary of the age of the building stock within the municipality prior to the adoption of the new codes (OBC and OFC). This analysis reveals that 57.96% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC. While this represents a significant fire risk within the community, it is comparatively lower (4.24%) than the provincial average.[11]

Table 7: Period of Construction of all Dwellings – Municipality of West Nipissing and Ontario

Period of Construction	West Nipissing Dwellings	West Nipissing % of Dwellings	Ontario Total Number of Dwellings	Ontario % of Dwellings
1960 or before	2,217	30.41%	1,247,430	22.72%
1961-1980	1,838	25.21%	1,456,110	26.52%
1981-1990	701	9.61%	711,940	12.97%
Total	7,291	65.23%	5,491,200	62.20%

Table Source: 2021 Census, Statistics Canada[12]

3.3.1 Lightweight Construction

As of February 25, 2022, the OFM has directed that available information documenting the presence and location of truss and lightweight construction systems, referred to as lightweight construction, must inform pre-planning activities by fire departments. Buildings with lightweight construction pose a safety risk to responding firefighters due to their susceptibility to premature failure and rapid collapse under fire conditions. Pre-plans provide responding fire departments with awareness of the presence of lightweight construction, enabling proactive fire response strategies to protect the safety of firefighters.

It is anticipated that the municipality will collect and document information on buildings with lightweight construction to update the CRA during the annual review and updating process. Furthermore, it is expected that the WNFS will integrate this information into their pre-planning program. Details regarding pre-planning will be further discussed within the Fire Master Plan.

[11] *Ibid*

[12] *https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Ontario&DGUIDlist=2021A00053548055,2021A000235&GENDERlist=1,2,3&STATISTIClist=1&HEADERlist=0*

3.4 Building Density and Exposure

NFPA 1730 - Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition) highlights building density as a crucial factor for understanding potential fire risk, particularly in core areas like downtown districts. Closely spaced buildings, typical of historic downtown core areas and newer infill construction, may pose a higher risk of fire spreading to adjacent exposed buildings. In densely built-up areas with minimal building setbacks, a fire originating in one building could extend to neighboring structures due to their proximity. Moreover, the close proximity of buildings can impede firefighting operations by limiting access for firefighters and equipment.

The adoption of the OBC and the OFC has required spatial separations and the use of fire-retardant materials and construction methods to mitigate fire risks. Basic firefighting practices prioritize the protection of exposures as a primary function and consideration during fire and emergency service responses. As mentioned earlier, older developments as well as new infill projects may present increased exposure risks due to higher building density.

Table 8 below illustrates a comparison of the municipality's existing Group C – residential building stock with that of the province, based on the 2021 Statistics Canada Census.

Table 8: Group C Residential Building Stock Comparison

Dwelling Type	West Nipissing	%	Ontario	%
Single Detached	4,755	74.18	2,942,990	53.59
Semi-Detached	210	3.28	303,260	5.52
Row House	100	1.56	505,265	9.20
Apartment or flat in a duplex	355	5.54	181,030	3.30
Apartment < 5 Storeys	900	14.04	548,785	9.99
Apartment > 5 Storeys	0	0.00	984,665	17.93
Other single-attached house	35	0.55	10,220	0.19
Moveable dwelling	55	0.86	14,985	0.27
Total	6,410	100	5,491,200	100

Table Source: 2021 Census, Statistics Canada[13]

This analysis highlights that the municipality has a higher percentage of single detached houses (74.18%) compared to that of the province at 53.59%. West Nipissing currently has a much lower percentage of low-rise occupancies as compared to the province.

[13] *https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Ontario&DGUIDlist=2021A00053548055,2021A000235&GENDERlist=1,2,3&STATISTIClist=1&HEADERlist=0*

3.5 Building Height and Area

3.5.1 Building Height

The municipality currently does not have buildings classified as high-rise. For the purposes of developing this CRA, the OBC/OFC definition has been used to analyze building height within the municipality which defines high-rise as 18 metres above grade, or six storeys However, should the municipality consider approval of these buildings, the following considerations need to be examined by the WNFS during the planning stages.

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 have a dramatic effect on smoke permeation throughout the common areas and individual units within the building. This can be directly related to the high percentage of deaths that occur in high-rise buildings because of smoke inhalation. 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 enter the building and ascend to the upper floors by the stairwells. Options such as "shelter-in-place" whereby occupants are directed by the fire service 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.

The following fire safety features of high buildings are required by the OBC for new buildings, and the OFC once they are occupied:

- Building services (ventilation, firefighter elevators, water supply, etc.)
- Non-combustible construction (concrete and steel)
- Interior finishes (drywall, block, concrete slab)
- Fire detection and notification of occupants (pull stations, heat detectors, fire detectors, alarm system)
- Compartmentation (containment of fire and smoke spread, fire doors, fire shutters, self-closing mechanisms on doors, etc.)

- Means of egress (stairwells constructed with non-combustibles)
- Fire protection system (automatic sprinklers, standpipes and hose cabinets, fire pumps, fire extinguishers, etc.)

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, municipal staff were able to provide building footprint data for the Municipality of West Nipissing. The information presented in Table 9 indicates that the majority of building stock (88.99%) has a total building area (footprint) of 2,500 square feet or less. The data collected also indicates there is only one building greater than 50,000 square feet or approximately 4,655 square metres.

Table 9: Building Area

Building Size	# of Buildings	% of all Buildings
0-2,499	6488	88.99%
2,500-4,999	464	6.36%
5,000-9,999	93	1.28%
10,000-19,999	26	0.36%
20,000-49,999	10	0.14%
>50,000	1	0.01%
N/A*	209	2.87%
Total	7291	100.00%

**no floor area provided by MPAC*

3.6 Potential High-Fire Risk Occupancies

Potential high-fire risk occupancy is another factor to consider within a municipality's building stock. High fire risk can be associated with a combination of factors, including building density (exposure), building age, and construction. Fuel load refers to the quantity and type of combustible content and materials within a building, encompassing combustible contents, interior finishes, and structural materials. Combustible content typically poses the greatest potential fire loss risk, as higher fuel loads increase the likelihood of ignition and severity of fires.

In many communities, large amounts of fuel load can be concentrated within a single occupancy, such as a building supply business, a large multi-unit residential building, or a historic downtown core. This section of the CRA will primarily focus on fuel load for industrial occupancies.

3.6.1 Fuel Load Concerns

Buildings with potential fuel load concerns are identified in Table 10. These include buildings housing materials such as oxidizers and flammable and combustible liquids and chemicals.

Table 10: Potential High Fire Risk Occupancies

Address	Facility Name/ Organization	Risk Description
325 Quesnel Rd	A-1 Blasting Mats	Rubber tire recycling/ Rubber blasting mats
10402 ON-17 Verner	RL Equipment Sales and Services	Tractor and recreational vehicle sales
694 Olivier Rd., Verner	West Nipissing Sanitation	General contracting, sanitation services and rentals
717 Gingras Ave, Verner	Co-op Regional Verner Petroleum Bulk plant	Bulk fuel storage and sales
175 Goulard Rd	Goulard Lumber	Lumber manufacturing and sales
656 Coursol Rd	Savignac General Woodworkings Ltd	Woodworking
14 Toulouse Cr.	Simcoe North Supply	Building materials
317 Quesnel Rd. Sturgeon Falls	TCM Total Cabinet Modules	Cabinet Manufacturing
500 Salter St	Best Blasting Mats	Rubber recycling/ rubber blasting mats
118 Front St	Sturgeon Falls Home Hardware	Building materials
826 Drive In Rd	Groulx Equipment	Farm equipment sales
114 Front St	ASM Sales	Tractor and ATV sales parts and service
90 Bay St	ASM Parts and Service	Tractor and ATV parts and service
11995 Hwy 17	TG Powersports	ATV/ Snowmobiles/ watercraft sales and services
27 Golf Course Rd	Sturgeon Motorsports & Trans Canada RV	ATV and RV sales and service
15 Toulouse Cr	DSI Underground Canada Ltd.	Underground mining and tunneling machinery
580 Quesnel Rd	Just In Septic	Sewer and septic service, porta-potties. plastics and sewage
219 O'Hara St	Sturgeon Falls Arena	Municipal arena with ammonia on site

Address	Facility Name/ Organization	Risk Description
80 Principal St E	Verner Arena	Municipal arena with ammonia on site
717 Gingras Av	Verner Bulk Propane	Propane storage and distribution tanks
12011 Hwy 17	Canadian Tire (propane fill station)	Propane distribution tanks
114 Front St	ASM (propane fill station)	Propane distribution tanks
119 Hwy 539A	Kwik Way River Valley (propane fill station)	Propane distribution tanks
15 Landfill Site Rd	Sturgeon Brush & Contracting Ltd	Piles of raw wood (kiln being built)

In addition to ensuring compliance with the requirements of the OBC and the OFC, fire services can implement operational strategies to address fuel load concerns. These strategies include regular fire inspection cycles and pre-planning of buildings of this nature, which provide an operational advantage in the event of a fire.

3.7 Occupancies with Potential High-Fire Safety Risk

Fire risk affects individuals differently, and some people are more vulnerable to fire injury or fatality than others. These vulnerable individuals may be unable to self-evacuate during a fire or require assistance in their evacuation efforts. Identifying the location and number of vulnerable individuals or occupancies within the community offers insight into the magnitude of this demographic within a community.

3.7.1 Registered Vulnerable Occupancies

From an occupancy perspective, vulnerable occupancies house individuals who may require assistance to evacuate during an emergency due to cognitive or physical limitations, presenting a potential high-life safety risk. The OFM defines vulnerable occupancy as any care occupancy, care and treatment occupancy, or retirement home regulated under the Retirement Homes Act. These occupancies accommodate individuals such as seniors or people requiring specialized care.

It is essential to note that not all vulnerable individuals reside in vulnerable occupancies. For example, some seniors who are vulnerable due to physical limitations may live independently or in subsidized housing, making them a key demographic to reach.

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 comprises hospitals, certain group homes, seniors' residences, and long-term care facilities. The regulation mandates the fire service to conduct annual inspections, approve and witness fire drill scenarios, and submit specific information regarding the occupancy to the OFM. A list of vulnerable occupancies provided by the municipality is presented in Table 11.

Table 11: Vulnerable Occupancies

Property Name	Occupancy Type	Location
Au Château Home for the Aged	Long Term Care Home	100 rue Michaud Street
West Nipissing General Hospital	Hospital	725 COURSOL RD
Villa Du Loisir	Senior Apartments	106 Michaud St.
Villa Des Pignons	Seniors Apartments	709 Coursol Rd
Domaine Leclair	Seniors Apartments	711 Coursol Rd
Joie de Vivre	Seniors Apartments	715 Coursol Rd
Villa Aubin	Seniors Apartments	145 Holditch St
Bellevue Apartments	Seniors Apartment	19 William St.
Residence Mutuelle #1	Seniors Apartments	163 King St
Residence Mutuelle #2	Seniors Apartments	140 Parker St
Villa du Bonheur	Social Housing	70 Principal St. East
Foyer Prieur	Social Housing	25 Grand Allee
Community Living	Assisted Adult Living	170 William St
Community Living	Assisted Adult Living	114 William St
Community Living	Assisted Adult Living	120 Nipissing St
Community Living	Assisted Adult Living	145 Main St
Community Living	Assisted Adult Living	113 Nipissing St
Community Living	Assisted Adult Living	15 John St
Community Living	Assisted Adult Living	90 Cholette St

3.7.2 Other High-Fire Life Safety Risk Occupancies

From a risk perspective, it's valuable for a fire service to identify additional potential high fire life-safety risk considerations. This includes day care facilities and schools, where children, due to their age and potential cognitive or physical limitations, may face challenges in self-evacuation during emergencies. For the purposes of this CRA, potential high life-safety risk occupancy considerations encompass schools and licensed day care facilities. It's worth noting that many schools also offer before and after-school childcare services for children aged 4-12, as well as childcare centers for infants to pre-school-aged children.

Conducting pre-planning activities for all occupancies with vulnerable occupants would be beneficial for the WNFS. Pre-planning activities increase fire service personnel's familiarity with buildings of special interest and help reduce the risk faced by vulnerable individuals or vulnerable occupancies. These activities may include:

- Regularly scheduled fire safety inspections
- Approving and witnessing fire drill scenarios
- Providing public education on fire safety issues
- Conducting pre-planning exercises to increase fire service personnel's familiarity with the facility
- Reviewing fire safety plans for accuracy and encouraging facility owners to update facilities as needed
- Providing staff training
- Encouraging fire drills

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 of the community, providing a sense of heritage, place, and pride, and contributing to the overall importance of the community. Regular fire inspections of these buildings are essential, especially if they serve as tourism destinations, as fire incidents could have significant economic impacts.

Historic areas can present a high fire risk due to their age and the materials used to construct the buildings, as well as exposure cycles. Strategies to enforce continued compliance with the OFC are considered best practices for achieving the legislative responsibilities of the municipality and providing an effective fire protection program to address fuel load risks.

The municipality identified that there were no heritage properties identified under the Ontario Heritage Act.

3.9 Building Stock Profile – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Identified Risk	
Identified Risk	Group C- Residential Occupancies represents 84.86% of the existing property stock and, over the period from January 1, 2018 - December 31, 2022, were associated with 77.78% of the structure fire loss.
Identified Risk	Data provided by the Municipal Property Assessment Corporation (MPAC) indicates that 49.24% of the municipality's residential building stock was built prior to the introduction of the 1981 OFC.
Identified Risk	There are several properties within West Nipissing that have a potentially high fuel load and therefore an increased high fire risk.
Identified Risk	The municipality has identified 12 registered vulnerable occupancies and 7 Community Living spaces.
Identified Risk	In addition to registered vulnerable occupancies the municipality has 10 elementary & secondary schools (9 buildings).
Key Finding	
Key Finding	There were no properties Designated Under Part IV, Section 29 of the Ontario Heritage Act and 102 under Section 27 and 102 under Section 27.

SECTION 4
CRITICAL INFRASTRUCTURE PROFILE

Critical infrastructure refers to the systems, facilities, and assets crucial for the functioning of society and the economy. As referenced in O. Reg. 378/18, the critical infrastructure profile assessment includes analyses of the capabilities and limitations of critical infrastructure, such as electrical distribution, water distribution, telecommunications, hospitals, and airports. The following section considers these critical infrastructure characteristics within the Municipality of West Nipissing.

4.1 Critical Infrastructure in the Municipality of West Nipissing

Ontario's Critical Infrastructure Assurance Program defines critical infrastructure (CI) 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." The program identifies nine critical infrastructure sectors: 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 where the failure of one could lead to the failure of others. The vulnerability of infrastructure is often linked 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.

For the purposes of this CRA, Municipality of West Nipissing-specific CI concerns are described in greater detail below.

4.1.1 Water Servicing & Infrastructure

The municipality provides drinking water treatment and distribution services to the communities of Sturgeon Falls and Verner. The system comprises two treatment facilities, two water storage towers, and a water main network spanning approximately 73.5 kilometers in length. Municipal staff are responsible for managing and maintaining the water treatment and distribution network. 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). Hydrants are available in the communities of Sturgeon Falls and Verner, however the rest of the municipality relies on tanker shuttle and static water sources to supply water for firefighting operations.

4.1.2 Stormwater & Sanitary Servicing & Infrastructure

Stormwater facilities are engineered to gather and regulate runoff from precipitation, including rain and snowmelt, thereby reducing the risk of flooding, erosion, and damage to property and infrastructure. Storm sewers, which are underground pipelines, are designed to collect and transport stormwater runoff to nearby water bodies such as rivers and lakes. By preventing stormwater from flooding streets and buildings, storm sewers help manage water quality and quantity in natural water bodies.

Stormwater services play a critical role in managing and controlling the flow of stormwater runoff during precipitation events and in mitigating challenges and impacts associated with flooding. This becomes especially relevant when considering the effects of climate change.

The municipality maintains approximately 125 municipal drains located primarily in agricultural and rural areas. These drains are either ditches or closed systems such as pipes or tiles buried in the ground and are utilized to improve drainage on farmland or remove excess water collected by roadside ditches or properties in rural areas.

Any disruption to the operation of stormwater facilities and storm sewers can have significant impacts on public safety, property, and the environment. For instance, malfunctioning storm sewers can lead to flooding, property damage, and health hazards such as waterborne diseases. Therefore, they are classified as critical infrastructure and require protection and maintenance to ensure their proper functioning during extreme weather events.

Sanitary sewers, on the other hand, are underground pipelines that transport wastewater from residences, commercial establishments, and industries to treatment plants for purification before discharge into rivers or lakes. The proper operation of sanitary sewers is essential for preventing the spread of diseases, safeguarding public health, and preserving the environment. Any disruption to sanitary sewer operations can result in significant impacts on public health and the environment, underscoring the need to recognize them as part of critical infrastructure.

4.1.3 Transportation Infrastructure

Transportation infrastructure encompasses highways, railways, airports, seaports, and public transit systems. It plays a crucial role in enabling economic activity, ensuring public safety, facilitating social mobility, and promoting environmental sustainability. Disruptions to transportation infrastructure can have significant impacts on the functioning of municipalities and the economy, underscoring the importance of protecting and maintaining it.

The following section offers an overview of the municipality's transportation infrastructure. Additional details on the transportation systems in the Municipality of West Nipissing are provided in the Geographic Profile.

4.1.3.1 Roads & Highways

As described in the Geographic Profile, the Municipality of West Nipissing has a network of essential highways linking it to neighboring regions, including Sudbury and North Bay. Highway 17 serves as a primary route, supported by highways like Highway 64 and Highway 575, as well as smaller segments of Highway 539, Highway 539A, and Highway 805.

Major highways are of concern from the perspective of fire protection services due to the following factors:

- 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.

Approximately 195 emergency calls were responded to between 2018 and 2022 pertaining to motor-vehicle related incidents, this represents 91.55% of rescue calls.

4.1.3.2 Rail

The Ottawa Valley Railway track runs along Highway 17 through the Municipality of West Nipissing. The track travels through the urban areas of Sturgeon Falls, Cache Bay, Verner, and the rural areas of Springer Township, Caldwell, and Kirkpatrick Township. Rail lines and operations are of concern from the perspective of fire protection services due to the following factors:

- 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
- Difficulty accessing scene
- Major incidents resulting in long term recovery could delay daily shipment of goods and services, with potential negative affects to local economy.

4.1.4 Energy and Communications Infrastructure

Energy infrastructure comprises the systems, facilities, and assets involved in generating, transmitting, and distributing electricity, oil, and gas within the municipality. In the Municipality of West Nipissing, Sudbury Hydro and Hydro One serves as the local utility for electricity, while Union Gas provides natural gas services.

Energy and utility infrastructure are significant considerations for fire protection services due to several reasons:

- The oil and natural gas subsector pose operational hazards to first responders, including spills, personal injury, and exposure to toxic or hazardous materials
- There is potential for explosion and/or fire within these facilities
- Emergency incidents could result in limited gas and oil supply across the municipality
- Firefighter safety is a concern when responding to fires at electrical substations, which may involve high-voltage electrical hazards and the presence of chemicals used to cool electrical conductors
- Disruptions to the electrical distribution system could affect emergency communication systems and municipal power supply, leading to various public health and safety concerns requiring fire department assistance

Communications infrastructure is also considered critical infrastructure because it provides essential connectivity and communication services for daily life and the economy. This includes systems, facilities, and assets enabling the transmission and reception of voice, data, and video communications.

In the Municipality of West Nipissing, the combined energy and communications infrastructure includes hydro lines, pipelines, transmission lines, and communications fiber lines. These components play vital roles in maintaining connectivity, facilitating communication, and supporting emergency response efforts within the municipality.

The most pertinent risk arising from these utilities relates to fallen hydro lines. Between 2018 and 2022 WNFS responded to 9 calls for fallen hydro lines which is 14.75% of all public hazard calls.

4.1.5 Other Critical Infrastructure Considerations

General considerations and concerns related to each CI sector as it pertains to the provision of fire protection services for other critical infrastructure sectors are included in Table 12**.**

Table 12: Critical Infrastructure Overview

Sector	Identified Critical Infrastructure	Issues / Concerns
Finance	Banking Institutions	• A disruption to this sector may result in the inability to make transactions for things such as fuel and supplies, maintenance, utilities etc. • May create inability to pay workers • May result in compromised data and funds in reserves and allocated for payroll, purchasing, utility payment etc. • The municipality has 6 bank branches.
Health	Long-Term Care	• Disrupting large numbers of people with mobility issues • Potential communication issues • Need for specialized medical equipment • There are 4 long-term care facilities in the municipality
	Outbreak/Illness	• A major outbreak or illness can create unexpected shortages in the workforce • Reduced staffing can result in an inability to run an apparatus in a certain part of the municipality, as well as affect ambulance and police services for widespread illnesses • Illnesses and outbreaks can also increase medical calls in the region and have an increased cost in replenishing medical PPE
	Health Centres	• The major hospital is West Nipissing General Hospital located In Sturgeon Falls • There are numerous privately owned and operated walk-in clinics and doctors' offices
Food	Food Supply and Demand	• Food related infrastructure can include agriculture, major distribution centres or grocery stores, for example • Grocery stores and food distribution centres typically contain large amounts of ammonia used as a component of refrigeration systems • Fire responders should be aware of dangers related to an ammonia release and response protocols.

Sector	Identified Critical Infrastructure	Issues / Concerns
Safety	Fire and Emergency Services	• There are 9 fire stations located in the municipality • Frequent or extreme emergency events could increase demand for emergency response services affecting the response capacity of the fire department
Government	Municipal Government	• Municipal government closed due to extreme weather, cyber-attack, health emergency, location, civil disruption causes disruption to decision making, financial support, declaration of emergencies etc. • Municipal services are often interconnected, therefore the failure of one may lead to the failure or damage to other services or loss of continuity of operations
Manufacturing	Supply Chain Disruption	• Prolonged disruptions to supply chains can impact apparatus replacement due to manufacturing delays (resulting in them going over lifetime) • Supply disruptions also have an unforeseeable but potentially impactful financially impact on running apparatus, as well as the ability to obtain/replenish PPE
	Industrial Sites	• According to the 2021 Statistics Canada Census, manufacturing in West Nipissing accounts for 4.79% of local industry (see Economic Profile) Processing and other activities that involve various ignition sources often occur in these occupancies. Manufacturing facilities constitute a special fire hazard due to high levels of combustible, flammable or explosive content and the possible presence of oxidizing chemicals and gases

4.2 Critical Infrastructure – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Identified Risk	
Identified Risk	Approximately 195 emergency calls responded to between 2018 and 2022 pertaining to motor-vehicle related incidents, this represents 91.54% of rescue calls
Key Finding	
Key Finding	Between 2018 and 2022 WNFS responded to 9 calls for fallen hydro lines which is 14.75% of all public hazard calls.

SECTION 5
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 Municipality of West Nipissing.

5.1 Population and Dispersion

Over a twenty-year period (2001-2021), the Municipality of West Nipissing's population has steadily increased. Simultaneously, the number of total private dwellings has increased from 2001 to 2021. Table 13 illustrates that the rate of increase for both the population and total private dwellings has increased most significantly over the past 10 years with an 8.54% increase in total population and an 1.52% increase between 2016 and 2021.

Table 13: Historic Growth in Population and Households – Municipality of West Nipissing

Year	Population	% Change	Total Private Dwellings	% Change
2001	No Data	No Data	No Data	No Data
2006	13,410	No Data	5,575	No Data
2011	14,149	5.51	6,021	8.00
2016	14,364	1.51	6,281	4.32
2021	14,583	1.52	6,413	2.10

Table Source: 2021 Census, Statistics Canada[14]

5.1.1 Population Age

Identifying a community's population by age category is a core component of developing the CRA and identifying specific measures to mitigate risks associated with a specific age group, such as seniors. The 2021 Census identifies a total population of 14,583 for the Municipality of West Nipissing. The age distributions of the municipality's population and Ontario's population are compared in Table 14.

[14] *Statistics Canada, 2021 Census of Population, Statistics Canada. 2023. Census Profile. 2021 Census. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023*

Table 14: Population by Age Group – Municipality of West Nipissing and Ontario

Age	West Nipissing Population	West Nipissing %	Ontario Population	Ontario %
0 to 4 years	595	4.08	683,515	4.81
5 to 9 years	760	5.21	764,430	5.37
10 to 14 years	730	5.01	803,850	5.65
15 to 19 years	680	4.66	801,455	5.63
20 to 24 years	650	4.46	895,600	6.30
25 to 29 years	595	4.08	975,400	6.86
30 to 34 years	690	4.73	981,210	6.90
35 to 39 years	720	4.94	948,030	6.67
40 to 44 years	760	5.21	890,160	6.26
45 to 49 years	885	6.07	894,580	6.29
50 to 54 years	970	6.65	941,270	6.62
55 to 59 years	1,310	8.98	1,040,160	7.31
60 to 64 years	1,385	9.50	966,575	6.80
65 to 69 years	1,180	8.09	813,215	5.72
70 to 74 years	1,020	7.00	691,280	4.86
75 to 79 years	750	5.14	469,485	3.30
80 to 84 years	475	3.26	325,110	2.29
85 to 89 years	265	1.82	205,480	1.44
90 to 94 years	125	0.86	101,430	0.71
95 to 99 years	30	0.21	28,000	0.20
100 +	5	0.03	3,705	0.03
Total	14,580	100.00	14,223,945	100.00
Median Age of the Population	51.20		41.60	-
Population aged 14 and under	2,090	14.33	2,251,795	15.83%
Population aged 65 and over	3,850	26.41%	2,637,710	18.54%
Population aged 55 to 64	2,695	18.48%	2,006,735	14.11%
** Note: Due to rounding totals may not reflect individual counts*				

Table Source: 2021 Census, Statistics Canada[15]

[15] *ibid*

The youngest demographic, comprising individuals aged 14 years and under, accounts for 14.33% of the municipality's total population, slightly lower than the province's figure of 15.8%. Although they face a lower risk of fatality in residential occupancies compared to seniors or adults, youth in this age group remain an essential demographic for public education efforts. Therefore, directing public education and prevention programs toward this demographic holds significant value. Implementing structured education programs consistently for children and youth can effectively embed fire and life safety awareness and knowledge into future generations.

The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population, which is 7.87% higher than the province's rate of 18.54%. Furthermore, an additional 18.48% of the municipality's population falls between the ages of 55 and 64, gradually aging into the senior demographic of 65 years and older. Based on historic residential fire fatality data, this population will transition into seniors who will face greater risks. Trending indicates that seniors are residing in their own independent homes longer.

These demographic trends are crucial considerations for developing informed, **targeted public education programs** and risk reduction strategies within the community.

A community's population by age is an important factor in identifying specific measures to mitigate risks associated with particular age groups, such as seniors. Canada's aging population has emerged as one of the most significant demographic trends. According to Statistics Canada, from 2016 to 2021, Canada experienced a notable increase in the proportion of seniors since Confederation, primarily due to the baby boomer generation reaching the age of 65. Presently, there are more Canadians over the age of 65, accounting for 18.98% of the population, than there are children aged 14 years and younger, who make up 16.25%.

Seniors, defined as individuals aged 65 years and over, are regarded as one of the highest fire risk groups across the province, based on the residential fire death rate (fire deaths per million of population). Figure 4 illustrates the number of fire deaths in Ontario up to 2020, highlighting seniors' increased vulnerability to fatality in residential occupancies compared to other age groups.

Figure 4: 2011-2020 Residential Fire Death Rate by Age of Victim

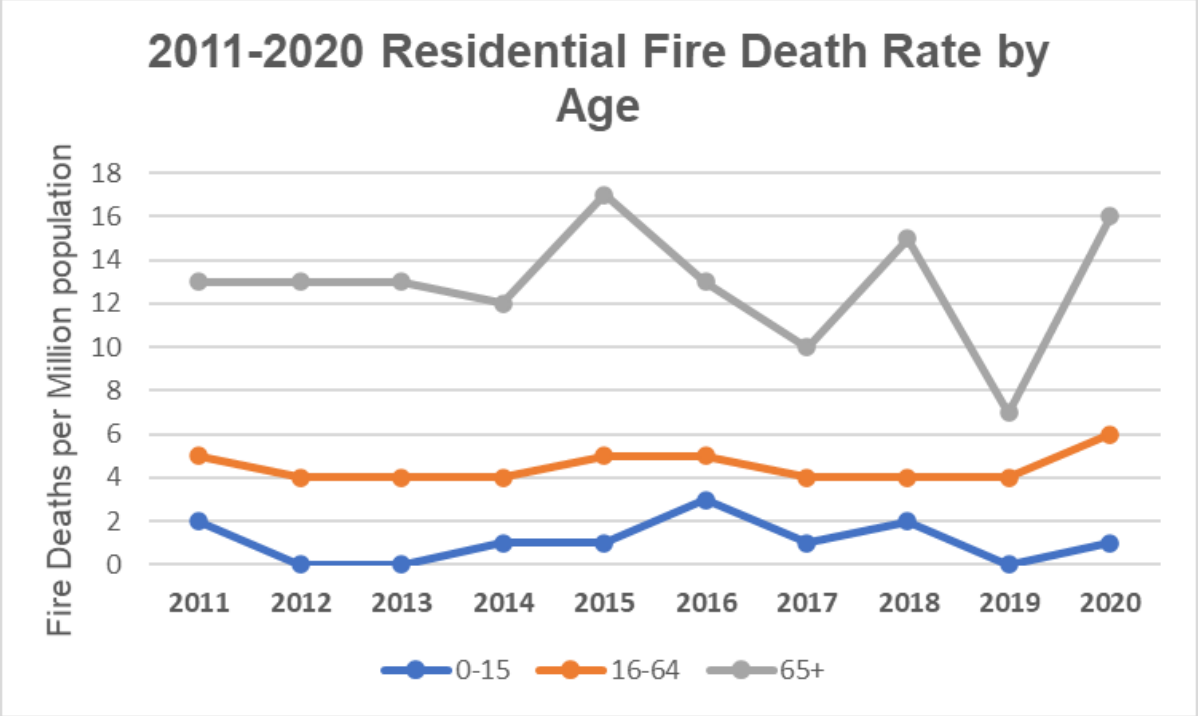


Figure Source: Adapted based on OFM reported residential fatal fires[16]

5.2 Gender

NFPA 1730: Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition) integrates gender considerations into Community Risk Assessments, recognizing that males historically have higher incidences of fire-related injuries or fatalities. In the Municipality of West Nipissing, Table 15 outlines the gender distribution by age, showing that males represent 48.94% and females 50.96%, closely aligning with the provincial ratio of 49% men and 51% women. This parity persists across age groups, with minor differences among those aged 65 and over (25.30% men versus 27.50% women) and 85 years and over group (2.00% men versus 3.8% women), mirroring provincial trends. Thus, no gender-based adjustments are required for public education programs in West Nipissing.

[16] *Office of the Fire Marshal (revised 2018, November), Ontario Residential Fatal Fires, Retrieved from the Ministry of the solicitor General Website*

Table 15: Gender Distribution by Age Group – Municipality of West Nipissing

Age Group	Total Population	Male	%	Female	%
0 to 4 years	595	300	2.06	295	2.02
5 to 9 years	760	380	2.61	380	2.61
10 to 14 years	730	355	2.43	375	2.57
15 to 19 years	680	370	2.54	310	2.13
20 to 24 years	650	330	2.26	315	2.16
25 to 29 years	595	300	2.06	295	2.02
30 to 34 years	690	345	2.37	345	2.37
35 to 39 years	720	330	2.26	390	2.67
40 to 44 years	760	380	2.61	380	2.61
45 to 49 years	885	435	2.98	455	3.12
50 to 54 years	970	480	3.29	485	3.33
55 to 59 years	1,310	625	4.29	685	4.70
60 to 64 years	1,385	710	4.87	675	4.63
65 to 69 years	1,180	575	3.94	605	4.15
70 to 74 years	1,020	495	3.40	520	3.57
75 to 79 years	750	385	2.64	365	2.50
80 to 84 years	475	200	1.37	275	1.89
85 to 89 years	265	100	0.69	170	1.17
90 to 94 years	125	35	0.24	85	0.58
95 to 99 years	30	5	0.03	25	0.17
100 +	5	0	0.00	0	0.00
Total	14,580	7,140	48.94	7,435	50.96

Table Source: 2021 Census, Statistics Canada[17]

5.3 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.

[17] *Statistics Canada, 2021 Census of Population, Statistics Canada. 2023. Census Profile. 2021 Census. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023*

Socioeconomic factors intersect in several ways and have direct and indirect impacts on fire risk. One such example is outlined in the OFM's Fire Risk Sub-Model. The Sub-Model refers 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 CRA 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.

Factors that are highlighted in this section include:

- Labour force status
- Immigrant status
- Educational attainment
- Household tenure, occupancy, suitability, and cost

5.3.1 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 OFM's Fire Risk Sub-Model references several 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 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 neighborhoods 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 since 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).
- 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.

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 labor 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).

Table 16 details the labour force status, revealing significant disparities between the Municipality of West Nipissing and the province. West Nipissing exhibits a notably lower participation rate (49.10%) compared to the provincial average (62.80%). Employment rates in West Nipissing are also lower (44.20%) in contrast to Ontario (55.10%), with the unemployment rate standing at 9.9% in West Nipissing, higher than Ontario's 7.69%. These differences imply that although a smaller portion of West Nipissing's population is employed, those seeking work encounter elevated unemployment rates compared to the provincial norm.

Furthermore, the higher proportion of individuals not in the labour force in West Nipissing (50.86%) compared to Ontario (37.20%) suggests additional socioeconomic challenges within the municipality, such as potential factors like an aging population or diminished workforce participation rates among specific demographics.

Table 16: Labour Force Status – Municipality of West Nipissing and Ontario

Status	West Nipissing Population	Ontario Population
In the Labour Force*	5,975	7,399,200
Employed	*5,385*	*6,492,895*
Unemployed	*590*	*906,310*
Not in the Labour Force	6,190	4,383,620
Total	12,170	11,782,820
Participation Rate	49.10	62.80
Employment Rate	44.20	55.10
Unemployment Rate	9.90	12.2

Table Source: 2021 Census, Statistics Canada[18]

5.3.2 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. Approximately two thirds (67.10%) of the top 1% had attained a university degree compared to 20.90% of all Canadians aged 15 and over.

Based on this national trend and for the purposes of this Community Risk Assessment, it is assumed that higher education leads to more disposable income and a lower fire risk. It is also assumed that households with higher disposable income are more likely to invest in fire life safety products such as fire extinguishers and smoke alarms, reducing the fire risk.

Table 17 illustrates the educational attainment for both the Municipality of West Nipissing and the Province of Ontario. Comparing West Nipissing to Ontario using data from the 2021 Census, it is evident that West Nipissing has a lower proportion of individuals with postsecondary education (49.63% compared to Ontario's 57.53%). Additionally, West Nipissing has a higher proportion of individuals with no formal education (23.00% compared to Ontario's 15.28%).

Table 17: Educational Attainment – Municipality of West Nipissing and Ontario

Educational Attainment	West Nipissing Population	West Nipissing %	Ontario Population	Ontario %
No Certificate / Diploma / Degree	2,800	23.00	1,799,890	15.28
High School Diploma or Equivalent	3,330	27.36	3,204,170	27.19
Postsecondary Certificate; Diploma or Degree	6,040	49.63	6,778,765	57.53
Total	12,170	100.00	11,782,825	100.00

Table Source: 2021 Census, Statistics Canada[19]

[18] *Ibid*

[19] *Ibid*

5.3.3 Median Income

Based on the 2021 Census, the median total income of households for the municipality in 2020 stood at $69,500, reflecting a $21,500 difference compared to the provincial median total income per household. Additionally, the median income per individual in the municipality falls $4,000 lower than the provincial median individual income. Table 18 provides a comparison of both individual and household median incomes between West Nipissing and the province.

Table 18: Median Income of the Municipality of West Nipissing and Ontario - 2020

Geography	Median Income Individual	Median Income Household
West Nipissing	$37,200	$69,500
Ontario	$41,000	$91,000
% Difference	9.71%	26.79%

Table Source: 2021 Census, Statistics Canada[20]

5.3.3.1 Income Decile Groups

Income can also be examined through the lens of income decile groups, which offer a rough ranking of an individual's economic status based on their relative position in the Canadian distribution of adjusted after-tax income of economic families, as defined by Statistics Canada[21]. Table 19 presents the economic family income decile group distribution for the population in private households in the municipality.

Notably, the municipality displays a higher proportion of the population falling within the bottom distribution of income decile groups, accounting for 56.65%, compared to the province's 46.44%. These statistics may suggest that a significant portion of the municipality's residents have lower economic status, which could correlate with increased vulnerability to fire risks due to potential socioeconomic factors such as housing quality, access to fire safety resources, and emergency preparedness.

Table 19: Economic Family Income Decile Group for the Population in Private Households – Municipality of West Nipissing and Ontario

Decile Group	West Nipissing Population	West Nipissing %	Ontario Population	Ontario %
In the bottom half of the distribution	8,075	56.65	6,516,085	46.44
In the top half of the distribution	6,180	43.35	7,515,670	53.56
Total	14,255	100.00	14,031,755	100.00

Table Source: 2021 Census, Statistics Canada[22]

[20] *Ibid*
[21] *Ibid*
[22] *Ibid*

5.3.4 Housing Tenure

Housing tenure, particularly the rate of homeownership, is often used as an indicator of socioeconomic status within a community. A higher rate of homeownership may suggest greater wealth, stability, and higher incomes in the community, while a higher rate of rental properties may indicate lower incomes and socioeconomic challenges.

Generally, lower homeownership rates are linked to higher fire risk due to various factors. Homeowners typically invest in property maintenance and are more likely to have access to fire prevention resources and insurance. Conversely, rented properties may have a higher turnover rate, potentially leading to neglect of fire safety measures by tenants or landlords.

Table 20 indicates that the Municipality of West Nipissing has a housing tenure profile like that of Ontario as a whole, with a comparable proportion of dwellings that are owned versus rented. West Nipissing has a homeownership rate of 68.28%, which closely matches the province's rate of 68.40%. Additionally, the percentage of rented dwellings in West Nipissing (31.72%) is comparable to Ontario's (31.41%).

Table 20: Household Tenure – Municipality of West Nipissing and Ontario

Household Tenure	West Nipissing	%	Ontario	%
Owner	4,380	68.28	3,755,720	68.40
Renter	2,035	31.72	1,724,970	31.41
Total	6,415	100.00	5,491,200	100.00

Table Source: 2021 Census, Statistics Canada[23]

5.3.4.1 Occupancy

A higher proportion of multiple persons per household can lead to increased fire loss (consequence), thereby elevating the risk. As illustrated in Table 21, compared to the province (97.04%), the municipality exhibits a higher proportion of households with one or fewer occupants per room (99.38%). Specifically, only 0.62% of total households in the municipality accommodate more than one person per room, totaling just 40 households. This percentage is notably lower than the province's 2.96%, suggesting a potential reduction in fire risk compared to the province.

Table 21: Household Occupancy

Household Occupancy	West Nipissing	%	Ontario	%
One person or fewer per room	6,375	99.38	5,328,575	97.04
More than one person per room	40	0.62	162,625	2.96
Total	6,415	100.00	5,491,200	100.00

Table Source: 2021 Census, Statistics Canada[24]

[23] *Ibid*

[24] *Ibid*

5.3.4.2 Suitability

The 2021 Census data, as presented in Table 22, indicates that the Municipality of West Nipissing has a notably lower percentage of housing deemed unsuitable compared to Ontario as a whole. Specifically, only 2.26% of the municipality's housing is classified as not suitable, contrasting with 6.72% in the province. Housing suitability is determined based on whether the dwelling has adequate bedrooms relative to the ages and relationships among household members, according to the National Occupancy Standard. This discrepancy suggests that West Nipissing has a lower fire risk from the perspective of housing suitability compared to the province.

Table 22: Household Suitability – Municipality of West Nipissing and Ontario

Housing Suitability	West Nipissing	%	Ontario	%
Suitable	6,275	97.82	5,122,185	93.28
Not suitable	145	2.26	369,015	6.72
Total	6,415	100.00	5,491,200	100.00

Table Source: 2021 Census, Statistics Canada[25]

5.3.4.3 Housing Costs

The cost of housing can reflect a household's disposable income. Households with less disposable income have less funds to purchase household fire safety items resulting in a higher risk. In West Nipissing, fewer households (19.86%) spend 30% or more of their income on housing compared to Ontario (24.23%), as illustrated in Table 23. This suggests residents there may have more money for fire safety items, potentially reducing fire risk. Additionally, housing in West Nipissing is more affordable, with lower median home values ($280,000 vs. $700,000) and lower monthly housing costs for both owned and rented homes, as shown in Table 24. This affordability could mean residents have more resources to devote to fire safety, contributing to a lower fire risk compared to Ontario.

Table 23: Shelter Costs – Municipality of West Nipissing and Ontario

Shelter Costs	West Nipissing	%	Ontario	%
Spending less than 30% of household total income on shelter costs	5,045	80.14	4,103,320	75.77
Spending 30% or more of household total income on shelter costs	1,250	19.86	1,312,095	24.23
Total	6,295	100.00	5,415,415	100.00

Table Source: 2021 Census, Statistics Canada[26]

[25] *Ibid*

[26] *Ibid*

Table 24: Median Costs – Municipality of West Nipissing and Ontario

Median Costs	West Nipissing	Ontario
Median value of dwellings	$280,000	$700,000
Median monthly shelter costs for owned dwellings	$980	$1,440
Median monthly shelter costs for rented dwellings	$900	$1,300

Table Source: 2021 Census, Statistics Canada[27]

5.4 Cultural Background, Language Considerations

In the Municipality of West Nipissing, where the proportion of newcomers is significantly lower (2.18%) compared to Ontario (29.98%), cultural background and language should still be considerations and remain crucial factors for fire service providers when developing and delivering fire prevention and public education programs. While the immigrant population is smaller, communication barriers, including language proficiency and literacy levels, continue to be important to address. Even with a lower proportion of newcomers, there may still be familiarity challenges related to fire safety standards within immigrant populations. Therefore, targeted education initiatives are necessary to ensure that all residents, regardless of cultural background or language proficiency, have access to essential fire safety information and resources. Table 25 summarizes the immigration status of West Nipissing's population.

Table 25: Immigration Status – Municipality of West Nipissing and Ontario

Immigration Status	West Nipissing	%	Ontario Population	%
Non-immigrants	13,930	97.82	9,437,320	67.26
Immigrants	310	2.18	4,206,585	29.98
Before 1980	*110*	*35.48*	*860,305*	*20.45*
1980 to 1990	*60*	*19.35*	*506,195*	*12.03*
1991 to 2000	*35*	*11.29*	*852,765*	*20.27*
2001 to 2010	*55*	*17.74*	*941,630*	*22.38*
2011 to 2015	*15*	*4.84*	*461,010*	*10.96*
2016 to 2021	*35*	*11.29*	*584,680*	*13.90*
Non-permanent residents	0	0.00	387,850	2.76
Total	14,240	100.00	14,031,755	100.00

Table Source: 2021 Census, Statistics Canada[28]

[27] *Ibid*

[28] *Ibid*

Table 26 provides insights into language demographics in the Municipality of West Nipissing and Ontario based on the 2021 Census. In West Nipissing, 31.44% of the population speaks only English, while 64.91% are proficient in both English and French. Additionally, 3.52% speak French exclusively, and only a small percentage (0.10%) have no knowledge of English or French. However, further research into "mother tongue" languages reveals a diverse linguistic landscape, including Algonquian languages such as Ojibway-Potawatomi and Anishinaabemowin (Chippewa), as well as languages like Arabic, Vietnamese, and Tagalog. As West Nipissing grows, it's important to address potential communication barriers arising from this diversity.

Table 26: Knowledge of Official Language – Municipality of West Nipissing and Ontario

Language	West Nipissing Total	%	Ontario Total	%
English Only	4,515	31.44	12,196,575	86.50
French Only	505	3.52	39,310	0.28
English and French	9,325	64.91	1,519,365	10.78
Neither English nor French	15	0.10	344,545	2.44
Total (non-institutional)	14,365	100.00	14,099,795	100.00

Table Source: 2021 Census, Statistics Canada[29]

5.5 Transient Populations and Commuting

Ontario Regulation 378/18 mandates the consideration of “transient populations”, referring to population shifts occurring within a community at various times during the day, week, or year. Population shifts can stem from factors like employment, tourism, and education. In some municipalities, residents routinely leave for work, contributing to increased traffic and possibly more motor vehicle collisions. Other communities may serve as major tourist destinations, leading to significant population fluctuations based on seasonal tourism activities. This can heighten the demand for fire protection services, especially concerning overnight tourism accommodations. Additionally, educational institutions can draw transient student populations who commute daily or reside in dormitories or student housing seasonally.

Student accommodations and short-term rental units present distinct fire safety challenges, often arising from the conversion of houses into boarding houses or rooming house accommodations that do not adhere to the Ontario Fire Code (OFC) or Ontario Building Code (OBC). Identifying these properties poses a challenge for fire prevention division staff tasked with enforcing fire codes.

[29] *Ibid*

5.5.1 Commuters Populations

Commuter populations represent a significant portion of West Nipissing's labour force. Table 27 shows the commuting destination trends for the residents of the municipality based on 2021 Census data. The majority of the labour force (65.79) in the census subdivision of residence commute within the same area. Additionally, 19.61% commute to a different census subdivision within the same census division of residence, while 14.19% commute to a different census subdivision and census division within the same province or territory of residence. A small percentage (0.42%) commute to a different province or territory.

Table 27: Commuting Destinations – Municipality of West Nipissing and Ontario

Commuting Destination	West Nipissing Labour Force	%	Ontario Labour Force	%
Commute within census subdivision (CSD) of residence	2,365	65.79	2,212,620	58.72
Commute to a different CSD within CSD of residence	705	19.61	653,055	17.33
Commute to a different CSD and Census Division (CD) within province or territory of residence	510	14.19	885,485	23.50
Commute to a different province or territory	15	0.42	17,050	0.45
Total	3,595	100.00	3,768,210	100.00
*Commuting destination for the employed labour force aged 15 years and over in private households with a usual place of work - 25% sample data				

Table Source: 2021 Census, Statistics Canada[30]

When attempting to understand peak commuter times in and out of the municipality, Table 28 suggests that a large proportion (50.00%) of the labour force begins their commute between the hours of 7 and 9 AM, and therefore the risk of Motor Vehicle Collision (MVC) calls is likely to be greatest during this time.

[30] *Ibid*

Table 28: Time of Commute to Work

Time Leaving for Work	Population	%
Between 5 AM and 5:59 AM	395	8.84
Between 6 AM and 6:59 AM	860	19.24
Between 7 AM and 7:59 AM	1,320	29.53
Between 8 AM and 8:59 AM	915	20.47
Between 9 AM and 9:59 AM	290	6.49
Between 12 PM and 4:59 AM	690	15.44
Total	4,470	100.00
Total time leaving for work for the employed labour force aged 15 years and over with a usual place of work or no fixed workplace address - 25% sample data		

Table Source: 2021 Census, Statistics Canada[31]

5.5.2 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. The majority of tourism related sources is summer cottaging, fishing, snowmobiling and other outdoor activities.

5.5.3 Indigenous Population

The Municipality of West Nipissing has a notably higher proportion of Indigenous population (19.71%) compared to Ontario's average of 2.90%. Within the Indigenous population of West Nipissing, the majority (98.22%) identify with a single Indigenous identity, including First Nations, Métis, or Inuit. Specifically, 32.03% (900 individuals) identify as First Nations, 65.30% (1,835 individuals) as Métis, and 0.88% (25 individuals) as Inuit. Given these demographics, it's crucial to monitor these populations closely, especially with new Census data, to inform the planning of public education programs and materials that cater to the unique needs and perspectives of Indigenous communities in West Nipissing.

[31] *Ibid*

5.6 Demographic Profile – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Identified Risk	
Identified Risk	The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population, which is 7.87% higher than the province's rate of 18.54%.
Identified Risk	18.48% of the municipality's population falls between the ages of 55 and 64, gradually aging into the senior demographic of 65 years and older. This is 4.37% higher than that of the province.
Identified Risk	West Nipissing has a notably higher proportion of Indigenous population at 19.71% compared to the province at of 2.90%.
Key Finding	
Key Finding	50.86% of individuals are not in the labour force in West Nipissing compared to the province at 37.20% (difference of 13.66%)
Key Finding	West Nipissing has a lower proportion of individuals with postsecondary education (49.63% compared to Ontario's 57.53%) and has a higher proportion with no formal education (23.00% compared to Ontario's 15.28%).

SECTION 6
HAZARD PROFILE

6.1 Hazard Identification and Risk Assessment (HIRA)

The hazard profile assessment includes analysis of the hazards within the community, including natural hazards, hazards caused by humans, and technological hazards to which a fire service may be expected to respond, and that may have a significant impact on the community. This section considers these hazards within the Municipality of West Nipissing.

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. A Hazard Identification and Risk Assessment (HIRA) is a comprehensive process to assess risks based on potential consequences and frequencies. The outcome of the HIRA assists municipalities in prioritizing risks based on their likelihood and potential to cause an emergency. Appropriate measures can then be taken to mitigate, prepare for, and respond to the risks that pose the greatest threat to reduce future losses.

Under the Local Authority Emergency Management Regulation 203/2018, municipalities are required to have an emergency plan that must include a 'hazard and risk assessment'. The regulation does not specify which standard must be used; however, the use of a formal HIRA process is encouraged.

6.1.1 Municipality of West Nipissing Community Emergency Management Program Risk Assessment

A CRA provides an opportunity to examine the results of a community emergency management program (CEMP) risk assessment and the impact that these identified hazards would have on a fire service. For the purposes of this CRA, a "fire protection services" lens will be applied to the top hazards as identified. As a component of the risk assessment and risk analysis process, the top hazards in the community were identified as a part of the risk assessment reported by the municipality in 2019. Hazards were assigned a risk score and risk level ranking from extreme to very low, depending on their probability and consequence. As a result of this analysis, the following top hazards were identified: (note some hazards were grouped together based on similar risks).

- Flood River & lake
- Windstorm
- Hazard Material Transportation Incident
- Transportation Accident
- Forest Fire
- Snowstorm - Blizzard

To better understand the risks of hazards as they pertain to fire protection services, the top 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 are presented in Table 29.

Table 29: Impacts of Hazards on Fire Protection Services

Hazard	Possible Impact
Flood River & Lake	**Overall Impact** All lakes and rivers discharge their water into Lake Nipissing. Any flooding of Lake Nipissing could have a disastrous effect on the municipality. There is a large population that resides along these rivers and lakes. Flooding, in the area, already occurred in 1959 and 1979. **Fire Services** Flooding can result in access issues areas or individual occupancies, require evacuation, or water rescue.
Transportation Accident	**Overall Impact** Threat to life safety. Impact to road network, downed power lines and vehicular fires. **Fire Services** Pose secondary threat to responders of fire or explosion. Delayed response in accessing scene. May require support for high number of injuries/fatalities and/or rescues.
Snowstorm - Blizzards	**Overall Impact** Above ground power lines could be impacted along with road treatments, debris clearing, salt gravel or other road treatment supplies. Increase in call volume due to vehicular incidents, rescues. **Fire Services** Depending on the severity of the debris on roads and downed power lines, access to various sections of the road network could be limited to fire service response delaying emergency response times. Interruptions to communication towers could impact fire service communications.
Windstorms	**Overall Impact** Above ground power lines could impact buildings or roads and winds could take down communication towers. Life safety risk, in particular to vulnerable population. **Fire Services** Depending on the severity of the debris on roads and downed power lines, access to various sections of the road network could be limited to fire service response delaying emergency response times. Interruptions to communication towers could impact fire service communications.

Hazard	Possible Impact
Hazardous Material Transportation Incident	**Overall Impact** Serious injury or fatality. Possible secondary emergencies such as fire or explosion when chemicals mixed with air, water, or other agents. Could require small- or large-scale evacuation of homes, businesses, school etc. **Fire Services** Depending on the severity and type of release, could pose secondary risk to firefighters on-scene. Must have proper knowledge of chemical release. May not be able to access the scene until proper back-up arrives or have proper information.
Forest Fire	**Overall Impact (from HIRA)** The whole Municipality is surrounded by forest. The different fuel load of the forest is approximately: • 50% 30 – 70% Softwood • 35% Mixed wood with less than 30% Softwood • 10% Open Forest and Grass (Brush) • 4% Mature Jack Pine • 1% Wetland Small communities such as North Monetville, Lavigne, Kipling, River Valley, Field and Crystal Falls are at a greater risk of a forest fire. This statement does not exclude the other rural areas and shoreline properties of lakes and rivers in the Municipality that are surrounded by forest. **Fire Services** Requires coordination with Ministry of Natural Resources. Require coordination of fire support to Ministry of Natural Resources, creation of fire breaks, exposure protection, coordination of evacuations and rescues.

6.2 Hazard Profile – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Identified Risk	
Identified Risk	Small communities such as North Monetville, Lavigne, Kipling, River Valley, Field and Crystal Falls are at a greater risk of a forest fire. This statement does not exclude the other rural areas and shoreline properties of lakes and rivers in the Municipality that are surrounded by forest.
Key Finding	
Key Finding	The municipality's 2019 Hazard Identification and Risk Assessment (HIRA) identifies hazards that could each impact the ability of WNFS to deliver fire protection services.

SECTION 7
PUBLIC SAFETY RESPONSE PROFILE

7.1 Public Safety Response Agencies in the Municipality of West Nipissing

As required by **O. Reg. 378/18**, the Public Safety Response Profile considers 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 Municipality of West Nipissing.

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 offers specialized skill sets in support of front-line operations. The types of response services offered might include fire protection, medical attention, rescue operations, policing activities, or dangerous goods 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 30 lists the public safety response agencies who could be able to assist the municipality 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 an emergency.

Table 30: Public Safety Response Agencies

Public Safety Response Agency	Types of Incidents they Respond to	Agency Role in Incident
Ontario Provincial Police	• Federal provincial and municipal law infractions • Traffic calls, emergency calls, crowd control, public assistance • Major crimes i.e., homicide, kidnapping, organized crime • Investigations • Complaints	• Enforce Criminal Code • Enforce Municipal bylaws • Investigate cross-jurisdictional and major crimes • Offender transport

Public Safety Response Agency	Types of Incidents they Respond to	Agency Role in Incident
Municipal Law Enforcement Officers	• Violations of municipal bylaws	• Enforcing traffic infractions on municipal roads • Providing information on legislation and municipal bylaws to industry, as well as the general public • Enforce municipal bylaws • Liaise with regional law enforcement
Office of the Fire Marshal	• Fire	• Assistance with managing fire and obtaining resources beyond capability of the municipality
District of Nipissing Social Services Board- Paramedic Services	• Advanced EMT pre-hospital care • Mass casualty incidents • Evacuation of health facilities (hospital, nursing homes etc.) • Disease related emergencies	• Ensuring provision of paramedic services at the site of the emergency • Ensuring continuity of paramedic services coverage is maintained throughout the remainder of the community/municipality • Liaise with the Medical Officer of Health to help facilitate medical services at the hospital
Medical Officer of Health	• Communicable Diseases • Health Inspection Services • Advice on Medical Services • Public Health Advisory • Liaise with long term care facilities, hospitals, retirement homes, and other vulnerable populations as required	• Provide information and instructions to the population on matters concerning public health • Protect the health of the community from inherent health threats by enforcement of the applicable legislation. • Continue delivery of established programs to ensure continuity of care and general health protection

Public Safety Response Agency	Types of Incidents they Respond to	Agency Role in Incident
Victim Services of Nipissing District	• Serious assault • Domestic violence • Sexual assault • Stalking	• Immediate crisis response • Vitim assistance • Victim support and needs assessment
CANUTEC	• Hazardous spills/emissions	• Product information • Safe handling information • emergency actions
Ministry of Natural Resources	• Spills • Environmental disasters	• Provide personnel and equipment for cleanup and remediation
Ministry of Environment	• Spills • Environmental disasters	• Provide personnel and equipment for cleanup and remediation
Ministry of Labour, Immigration, Training and Skill Development	• Industrial accidents • Workplace critical injuries and deaths	• Investigate worker injury or death
Ministry of Natural Resources and Forestry	• Large wildland fires	• Assis in mitigating and combating wildland fires
Ministry of Transportation	• Major/large vehicle incidents on King's Highways	• Traffic control • Assist with repair and cleanup
Emergency Management Ontario	• Large-scale emergencies requiring declaration of state of local emergency	• Provincial level support • Communication
CP Police Service	• Rail emergencies (on and off board) • Rail security incidents on and-off board • Promote rail safety • Protect infrastructure • Enforce Criminal Code	• Oversee response to all rail emergencies. • Liaise with and support municipal or provincial fire and emergency services as needed for large incidents
CN Police Constables	• Rail emergencies (on and off board) • Rail security incidents on and-off board • Enforce Criminal Code • Safety awareness	• Oversee response to all rail emergencies. • Liaise with and support municipal or provincial fire and emergency services as needed for large incidents.

7.1.1 Fire Service Protection Agreements

Large emergency events can quickly overwhelm the response capacity of most community fire departments in Ontario. As a result, mutual aid and automatic aid agreements are a necessary component in adding response capacity for these low frequencies but potentially high or extreme consequence events. West Nipissing Fire Services participates in the Nipissing Parry Sound mutual aid plan which includes North Bay Fire Services.

The Municipality of West Nipissing has agreements with:

- Municipality of Markstay-Warren "Automatic Aid Agreement 2005/36" 2006-07-05
- Municipality of French River "Automatic Aid Agreement 2009/74" 2010-09-09
- Municipality of St. Charles "Automatic Aid Agreement 2005/54" 2008-09-05
- Ministry of Natural Resources and Forestry agreement

The principal purpose for entering into these fire service protection agreements and plans is to promote and ensure that adequate and coordinated resources are made available when requested from, or by a neighbouring municipality to minimize the loss of human life and property and damage to the environment in the event of an emergency that requires such additional resources.

All inter-municipal agreements should be reviewed regularly and adjusted as required. This provides for the updating and clarification of agreements and consideration of adjustments. It may also lead to discussions regarding localized fire service response agreements and considerations about whether automatic aid in defined circumstances might be of additional value.

SECTION 8
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 Municipality of West Nipissing.

8.1 Community Services

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 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 skill sets. Table 31 lists the community agencies and non-government organizations (NGOs) available to the Municipality of West Nipissing.

Table 31: Community Service Agencies

Community Service Agency	Type of Assistance Provided
Local School Boards - Near North District School Board Nipissing Parry Sound Catholic District School Board Conseil scolaire public du Nord-Est de l'Ontario Conseil scolaire catholique Franco-Nord	The 2021 Census data indicates that children aged 14 and under, represent 14.33% of the municipality's total population. The proportion of children in West Nipissing should be considered as an opportunity for public education. These numbers support 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.
Horizon Women's Shelter	The Centre offers shelter for women over the age of 16 and their children who require short-term emergency housing (4-6 weeks) as a result of being affected by violence or crisis. In addition to emergency shelter, the Centre also offers crisis counseling/intervention, education and information on the dynamics of women abuse, as well as advocacy and support groups.

Community Service Agency	Type of Assistance Provided
District of Nipissing Social Services Administration Board (DNSSAB)	Provides basic and advance medical care for first aid emergencies at public events. They are also able to provide volunteer support in the event of emergency situations such natural or human disasters. One of the primary roles for DNSSAB is the provision of funding to the Nipissing District Housing Corporation (NDHC) to maintain and manage their non-profit housing stock in Nipissing District
Victim Services Sturgeon Falls	Provides immediate on-site crisis, trauma, safety & support services to victims of crime and sudden tragedies.
Big Brothers & Sisters of North Bay & District	Provides youth 6 to 16 years old with a role model to talk to and share the experiences of growing up with.
Community Living West Nipissing	Employment, access to assisted living/housing.
West Nipissing Food Bank	Provides food and supplies
Local community faith-based organizations	Public fire safety messaging does not always reach community's most vulnerable populations. Partnering with local faith-based organizations can provide WNFS with the opportunity to improve its public education program as a method of information sharing to a wider audience within the municipality. This type of opportunity could involve distributing printed materials with fire safety messaging and smoke alarm installation information among the congregation, or faith-based leaders may allow representatives from WNFS to address congregations at faith-based events with fire safety messaging in person. These organizations may also be able to identify residents within the community who are at great risk of fire danger due to substandard housing or hoarding.

SECTION 9
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 a significant influence on the ability of the community to provide or maintain service levels. The following sections consider these economic characteristics within the Municipality of West Nipissing.

9.1 Economic Sectors and Employers in the Municipality of West Nipissing

The top industries that contribute to the economic base of the municipality are summarized in Figure 5. According to the Statistics Canada 2021 Census, Health Care, Retail, Educational Services, Public Administration, and Construction are the top contributing industries to West Nipissing's economic base.

Figure 5: Municipality of West Nipissing Top Industries

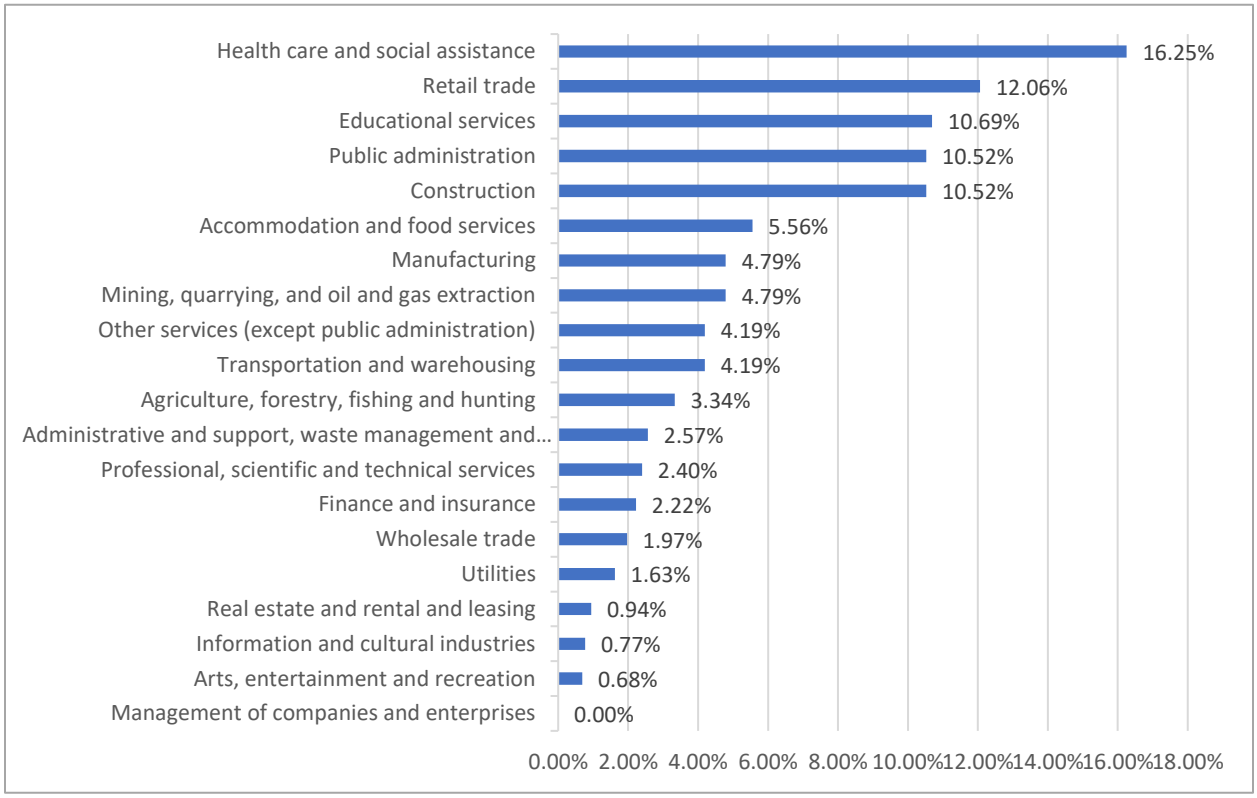


Figure Source: 2021 Census, Statistics Canada[32]

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 the local economy and employment.

[32] *Ibid*

The municipality's top employers are summarized in Table 32.

Table 32: Major Employers in the municipality

Company	Service/Product	Address	Number of Employees
Public Sector			
West Nipissing General Hospital	Health Care	725 Coursol Road	270
Municipality of West Nipissing	Municipal services	225 Holditch Street	244 – Full-time, Part-time, Seasonal, Firefighters
College Boreal Nipissing	Post Secondary Education	96 Main Street	unavailable
Stats Canada	Federal government statistics	225 Holditch Street	Over 330
Private Sector			
Goulard Lumber	Softwood lumber sawmill	175 Goulard Road	50
DSI Underground Canada Ltd	Mining ground support systems	15 Toulouse Cresent	75-90
Verner Ag Centre and Grain Elevators	Agriculture and propane supplies and services	723 Gingras Avenue	unavailable
Sturgeon Falls Brush & Contracting	Land clearing and road building	145 Main Street	14
Au-Chateau Home for the Aged	Long-term Care Home	100 rue Michaud Street	Over 200

West Nipissing has substantially larger employers in public sectors, specifically the West Nipissing General Hospital, Stats Canada, College Boreal Nipissing, and the Municipality of West Nipissing. There are a number of private employers that are predominately industrial operations. Certain industrial operations may have increased fuel loads and conduct higher risk activities. Proactive inspections should target these facilities to ensure compliance with codes, maintenance, and emergency planning requirements.

9.2 Economic Profile – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Key Finding	
Key Finding	The municipality has identified top employers that contribute to the economic vitality of the community. The majority of these are public services and industrial operations. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the municipality. Consideration should be given to proactive industrial fire safety programming.

SECTION 10
PAST LOSS & 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 Municipality of West Nipissing.

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 OFM's Standard Incident Reporting for the period of January 1st, 2018, to December 31st, 2022, Total Fire Loss

The analysis of total fire loss in the Municipality of West Nipissing over the five-year period from 2018 to 2022, as presented in Table 33, highlights three primary types of fires: structure fires, outdoor fires, and vehicle fires, totaling $9,786,500 in property loss. On average, the Municipality of West Nipissing experienced 29.40 fires per year and incurred approximately $1,957,300 in property loss annually.

Table 34 compares the number of structure fires and associated property loss in the Municipality of West Nipissing to those in Ontario during the same period. The Municipality of West Nipissing experienced an average of 18 structure fires per year, accounting for about 12.24% of all fires. In contrast, Ontario averaged 7,026 structure fires per year, representing approximately 12.86% of all fires in the province. Despite a lower proportion of structure fires compared to the province by approximately 0.62%, the reported percentage of loss was comparable between the Municipality of West Nipissing and Ontario.

Table 33: Total Fire Loss – Municipality of West Nipissing

Year	Structure Fires	Loss ($)	Outdoor Fires	Outdoor Loss	Vehicle Fires	Vehicle Loss	Total Fires	Total Loss
2018	19	$866,200	1	$1,000	8	$60,000	28	$927,200
2019	26	$2,391,700	0	$0	11	$187,000	37	$2,578,700
2020	13	$684,000	0	$0	9	$541,000	22	$1,225,000
2021	16	$1,899,100	0	$0	9	$179,000	25	$2,078,100
2022	16	$2,830,500	1	$10,000	18	$137,000	35	$2,977,500
Total	90	$8,671,500	2	$11,000	55	$1,104,000	147	$9,786,500
% of All Fires	61.22	88.61	1.36	0.11	37.41	11.28	100.00	100.00
Average	18	$1,734,300	0.4	$2,200	11	$220,800	29.4	$1,957,300

Table Source: OFM SIR Data for West Nipissing[33]

Table 34: Structure Fires and Property Loss – Municipality of West Nipissing and Ontario

Year	West Nipissing Structure Fires	West Nipissing Structure Loss	% of All Fires	% of All Loss	Ontario Structure Fires	Ontario Structure Loss	% of All Fires	% of All Loss
2018	19	$866,200	12.93	8.85	7,012	$734,340,655	12.83	14.75
2019	26	$2,391,700	17.69	24.44	6,715	$860,432,756	12.29	17.28
2020	13	$684,000	8.84	6.99	6,842	$790,698,587	12.52	15.88
2021	16	$1,899,100	10.88	19.41	7,081	$858,108,388	12.96	17.23
2022	16	$2,830,500	10.88	28.92	7,482	$1,161,882,704	13.69	23.34
Total	90	$8,671,500	61.22	88.61	35,132	$4,405,463,090	64.29	88.48
Total, fires with Loss	147	$9,786,500	100.00%	100.00%	54,645	$4,978,933,145	100.00	100.00
Average	18	$1,734,300	12.24	17.72	7,026	$881,092,618	12.86	17.70

Table Source: OFM SIR data for Municipality of West Nipissing[34]

[33] *OFM SIR Data for the Municipality of West Nipissing, 2018-2022*

[34] *Ibid*

10.1.1 Fires by Occupancy Type

This section examines structure fires occurring from January 1st, 2018, to December 31st, 2022, categorized by occupancy type, utilizing data from the OFM's Standard Incident Reporting. Over this period, the Municipality of West Nipissing experienced a total of 90 structure fires. Notably, 77.78% of these fires occurred in Group C-Residential Occupancies, contributing to 81.16% of the total fire loss. Compared to the province, West Nipissing exhibited a 3.92% higher incidence of fires in Group C-Residential Occupancies and a 13.72% greater share of structure fire loss. The second most substantial source of property loss was Group F – Industrial occupancies, representing 4.44% of structure fires and 9.41% of total structure fire loss during this period, with a 4.73% lower incidence than the province for this occupancy type (Table 35).

Table 35: Fires by Major Occupancy Type – 2018-2022

Group	Occupancy Classification	# of Fires	West Nipissing % of Structure Fires	West Nipissing Structure Fire Loss	West Nipissing % of Structure Fire Loss	Ontario % of Structure Fires	Ontario % of Structure Fire Loss
A	Assembly	1	1.11	$3,000	0.03	3.33	3.76
B	Care & Detention	0	0.00	$0	0.00	1.45	0.75
C	Residential	70	77.78	$7,037,600	81.16	73.86	67.44
D	Business & Personal Services	1	1.11	$200,000	2.31	2.63	2.63
E	Mercantile	1	1.11	$425,000	4.90	3.28	4.44
F	Industrial	4	4.44	$816,000	9.41	7.26	11.99
Other	Not Classified in OBC	12	13.33	$99,900	1.15	5.52	1.18
Farm	Classified in the OBC	1	1.11	$90,000	1.04	2.67	7.81
	Total	90	100.00	$8,671,500	100.00	100.00	100.00

Table Source: OFM SIR data for Municipality of West Nipissing[35]

[35] *Ibid*

10.1.2 Civilian Fatalities and Injuries

As shown in Table 36, according to data from the OFM Standard Incident Reporting, spanning from January 1st, 2018, to December 31st, 2022, there were 3 reported injuries and 1 fatality within the Municipality of West Nipissing. Notably, the majority of injuries, accounting for 3 or 100%, were associated with Class C – Residential Occupancy fires. This finding aligns with fire loss statistics by occupancy type, indicating that most fire losses within both the province and the municipality occurred in Group C – Residential occupancies. Additionally, the analysis reveals that 1 fatality, also accounting for 100%, occurred in the Residential Occupancy group. Comparatively, Ontario reported 2,569 injuries, with Residential Occupancy fires contributing to 89.68% of injuries, and 472 fatalities, with Residential Occupancy fires accounting for 94.07% of fatalities.

Table 36: Civilian Fire Fatalities and Injuries by OBC Major Occupancy Classification – Municipality of West Nipissing and Ontario

Group	Occupancy Classification	West Nipissing Injuries	West Nipissing Injuries (%)	West Nipissing Fatalities	West Nipissing Fatalities (%)	Ontario Injuries	Ontario Injuries (%)	Ontario Fatalities	Ontario Fatalities (%)
A	Assembly	0	0	0	0	23	0.90	3	0.64
B	Care & Detention	0	0	0	0	51	1.99	6	1.27
C	Residential	3	100.00	1	100	2304	89.68	444	94.07
D	Business & Personal Services	0	0	0	0	35	1.36	0	0.00
E	Mercantile	0	0	0	0	34	1.32	1	0.21
F	Industrial	0	0	0	0	74	2.88	12	2.54
Other	Not Classified in OBC	0	0	0	0	34	1.32	6	1.27
Farm	Classified in the NBC	0	0	0	0	14	0.54	0	0.00
	Total	3	100	1	100	2,569	100.00	472	100.00

Table Source: OFM SIR data for Municipality of West Nipissing[36]

[36] *Ibid*

10.1.3 Reported Fire Cause

The NFPA 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." 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 OFM 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 37 presents the reported fire causes for the municipality compared to the province over the five-year period from January 1st, 2018, to December 31st, 2022.

The analysis of fire causes in the Municipality of West Nipissing, as detailed in Table 37, reveals various factors contributing to fires over the period examined. The "intentional" category recognizes fires started for a specific reason, typically classified as arson fires, acts of vandalism, or for personal gain through insurance payment. According to the data, intentional fires, including arson and acts of vandalism, accounted for 2.22% of the reported fires in the municipality during this five-year period, whereas the provincial total of intentional fires was 7.85%. This indicates that the municipality has a lower rate of intentional fires compared to the province. The 'unintentional' category represents common causes of fires, including human behavioral causes (e.g., misuse of ignition source) and equipment failures (e.g., mechanical failure). Unintentional fire causes represented 75.56% of all reported fires in the municipality during this period, compared to 66.01% for the province. The leading cause of unintentionally set fires in the municipality occurred due to misuse of ignition source (26.67%) and mechanical/electrical failure (26.67%), compared to 28.14% and 15.06%, respectively, in the province.

Table 37: Reported Fire Cause – Municipality of West Nipissing and Ontario – 2018-2022

Nature	Fire Cause	West Nipissing # of Fires	West Nipissing % of Fires	Ontario # of Fires	Ontario % of Fires
Intentional	Arson	1	1.11	2,219	6.32
	Vandalism	1	1.11	536	1.53
	Other	0	0.00	11	0.03
Unintentional	Design/Construction/ Maintenance Deficiency	10	11.11	2,232	6.35
	Mechanical/Electrical Failure	24	26.67	5,292	15.06
	Misuse of Ignition Source	24	26.67	9,885	28.14
	Other Unintentional	7	7.78	2,554	7.27
	Vehicle Collision	0	0.00	29	0.08
	Children Playing	0	0.00	138	0.39
	Undetermined	3	3.33	3,062	8.72
Other	Other	4	4.44	1,952	5.56
Undetermined	Undetermined	16	17.78	7,100	20.21
Unknown	Unknown, Not reported	0	0.00	122	0.35
	Total	90	100.00	35,132	100.00

Table Source: OFM SIR data for Municipality of West Nipissing[37]

10.1.4 Ignition Source

According to the 2019 NFPA 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."[38] Table 38 provides fire loss by source of ignition for the municipality and the province. The most reported ignition sources within the municipality were related to electrical distribution equipment (20.00%), which is higher than the provincial rate of 8.47%. The municipality also had a very high rate of heating equipment fires (13.33%) when compared to the province (7.35%). The elevated occurrence of both heating equipment fires and electrical distribution fires could potentially be linked to heating equipment overloading the electrical distribution circuits. This could be attributed to various factors such as older heating systems, insufficient maintenance due to financial constraints or lack of awareness, limited access to professional HVAC services, energy poverty among lower-income households, and increased strain on systems due to environmental factors. Increased public education efforts in the Municipality of West Nipissing could help reduce heating equipment fires by raising awareness about maintenance, safe usage, and the risks of outdated equipment.

[37] *OFM SIR Data for the Municipality of West Nipissing, 2018-2022*

[38] *NFPA, Glossary of Terms. 2019 Edition*

Table 38: Source of Ignition – Municipality of West Nipissing and Ontario – 2018-2022

Reported Ignition Source	West Nipissing # of Fires	West Nipissing % of Fires	Ontario # of Fires	Ontario % of Fires
Appliances	7	7.78	1,528	4.35
Cooking Equipment	6	6.67	5,450	15.51
Electrical Distribution Equipment	18	20.00	2,977	8.47
Heating Equipment	12	13.33	2,582	7.35
Lighting Equipment	3	3.33	964	2.74
Open Flame tools/ Smokers Articles	14	15.56	4,974	14.16
Other Electrical/Mechanical	4	4.44	1,791	5.10
Processing Equipment	0	0.00	421	1.20
Miscellaneous	8	8.89	3,469	9.87
Exposure	1	1.11	1,736	4.94
Undetermined	17	18.89	9,101	25.91
Unknown/Not Reported	0	0.00	139	0.40
Total	90	100.00	35,132	100.00

Table Source: OFM SIR data for Municipality of West Nipissing[39]

10.1.5 Smoke Alarm Status

In the Province of Ontario, smoke alarms serve as crucial safety measures, mandated on every level of residential dwellings to act as the first line of defense against fires. Therefore, smoke alarm programs and compliance initiatives are integral components of public education and fire prevention efforts led by municipal fire services. Data regarding smoke alarm status during fire incidents is collected and reported by municipalities to the province, with information publicly available for analysis. Table 39 shows that over a five-year period from January 1st, 2018, to December 31st, 2022, in Group C - Residential occupancies, the Municipality of West Nipissing reported that 13.11% of incidents occurred without a smoke alarm, notably lower than the provincial average of 17.35%. Conversely, incidents where a smoke alarm was present but failed to operate accounted for 18.03%, higher than the provincial rate of 12.40%. In 36.07% of occurrences, smoke alarms were present and successfully operated, which is considerably less than the provincial rate of 44.68%.

[39] *OFM SIR Data for the Municipality of West Nipissing, 2018-2022*

Table 39: Smoke Alarm Presence and Operation on the Floor of Fire Origin – Municipality of West Nipissing and Ontario– 2018-2022[40]

	West Nipissing							Ontario	
Smoke Alarm Status (on floor of origin)	2018	2019	2020	2021	2022	Total	%	Ontario Total	Ontario %
No Smoke Alarm Present	2	3	2	1	0	8	13.11	4,307	17.35
Smoke Alarm Present & Operated	4	6	3	4	5	22	36.07	11,091	44.68
Smoke Alarm Present & did not operate	4	3	2	1	1	11	18.03	3,079	12.40
Smoke Alarm Present, Operation undetermined	0	2	2	1	0	5	8.20	2,007	8.09
Smoke Alarm Presence Undetermined	2	4	2	4	3	15	24.59	4,269	17.20
Unknown, not reported	0	0	0	0	0	0	0.00	69	0.28
Total	12	18	11	11	9	61	100.00	24,822	100.00

Table Source: OFM SIR data for Municipality of West Nipissing[41]

Among the incidents analyzed over the five-year period, there were occurrences where the status of smoke alarms could not be conclusively determined. In the Municipality of West Nipissing, these undetermined instances totaled 20, representing 32.79% of all cases. Similarly, in Ontario, 6,276 incidents, or 25.29% of the total, fell under this category. The reasons for the undetermined status could vary, including factors such as the extent of fire damage obscuring the evidence of smoke alarm presence or functionality, lack of proper documentation, or limitations in investigative procedures. Efforts to enhance data collection and investigation methods could help reduce the number of undetermined cases, providing valuable insights for fire prevention and safety initiatives.

[40] *Ibid*

[41] *Ibid*

10.2 Event History

Event history seeks to apply WNFS historic emergency call data to develop an understanding of community risks. The OFM provided the data used in this analysis for all historical calls for the five-year period from January 1st, 2018, to December 31st, 2022. This section provides a statistical assessment of historic emergency call volumes for the municipality. The analysis included within this section also provides a detailed breakdown of calls by OFM response type. Data used in the analysis of call volume by type was sourced from the OFM's Standard Incident Reporting because call volume by type is compared to the province. The volume and frequency of historic calls informs the understanding of response probability. The types of calls inform the potential consequences of WNFS 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

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 WNFS for the time from January 1st, 2018, to December 31st, 2022.

10.2.1.1 Annual Call Volume – All Incident Types

The analysis of annual emergency call volume can be beneficial in understanding evolving trends or changes in emergency response demand. A summary of the total number of emergency calls for the period from January 1st, 2018, to December 31st, 2022, is shown in Figure 6. This analysis identifies an increase in the total emergency call volume within the municipality over this period from 153 calls in 2018 to 266 calls in 2022. This represents a total increase of 73.80% over this five-year period with an average of 181 calls per year. There was a 61.20% increase in the call volume from 2021 to 2022. This trend should be monitored.

Figure 6: Annual Call Volume – All Incidents January 1st, 2018, to December 31st, 2022

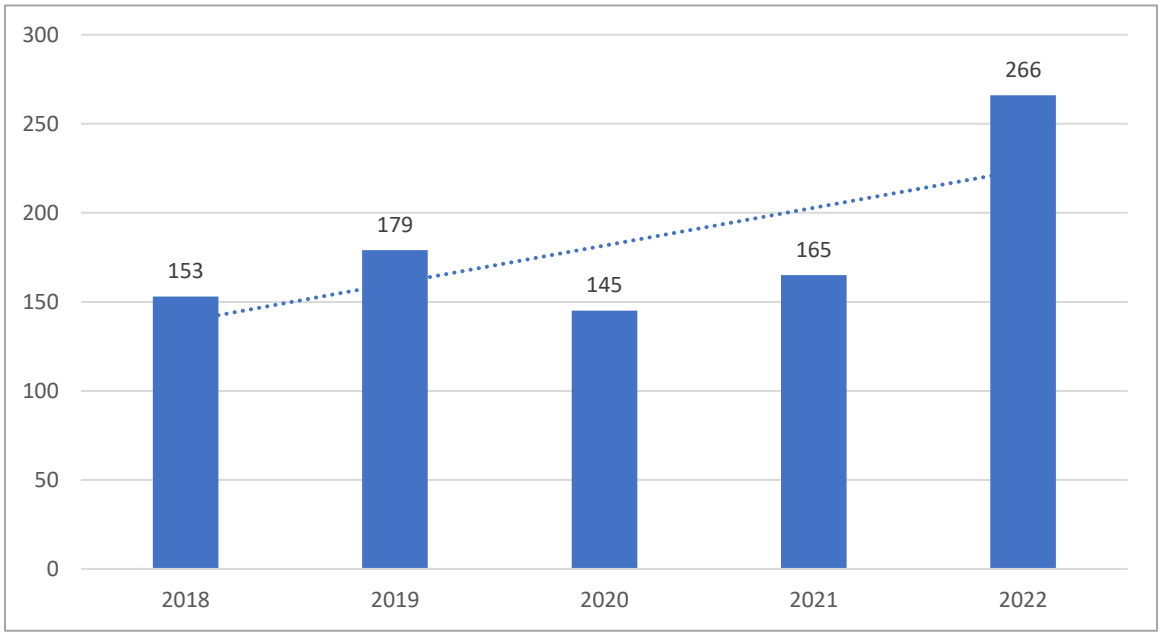


Figure Source: OFM SIR data for Municipality of West Nipissing[42]

10.2.1.2 Daily Emergency Call Volume – All Incident Types

Based on SIR reporting for 2023, call volume typically begins to increase between 6 AM and 9:00 AM and peaks between 3:00 PM and 6:00 PM (See Figure 7) The lowest percentage of emergency call volume typically takes place between the hours of 12 AM and 6 AM This is a typical trend expected with daytime commuters, and reduced call volumes when most of the population is typically sleeping.

[42] *Ibid*

Figure 7: Total Call Volume by Time of Day – All Incidents2023,

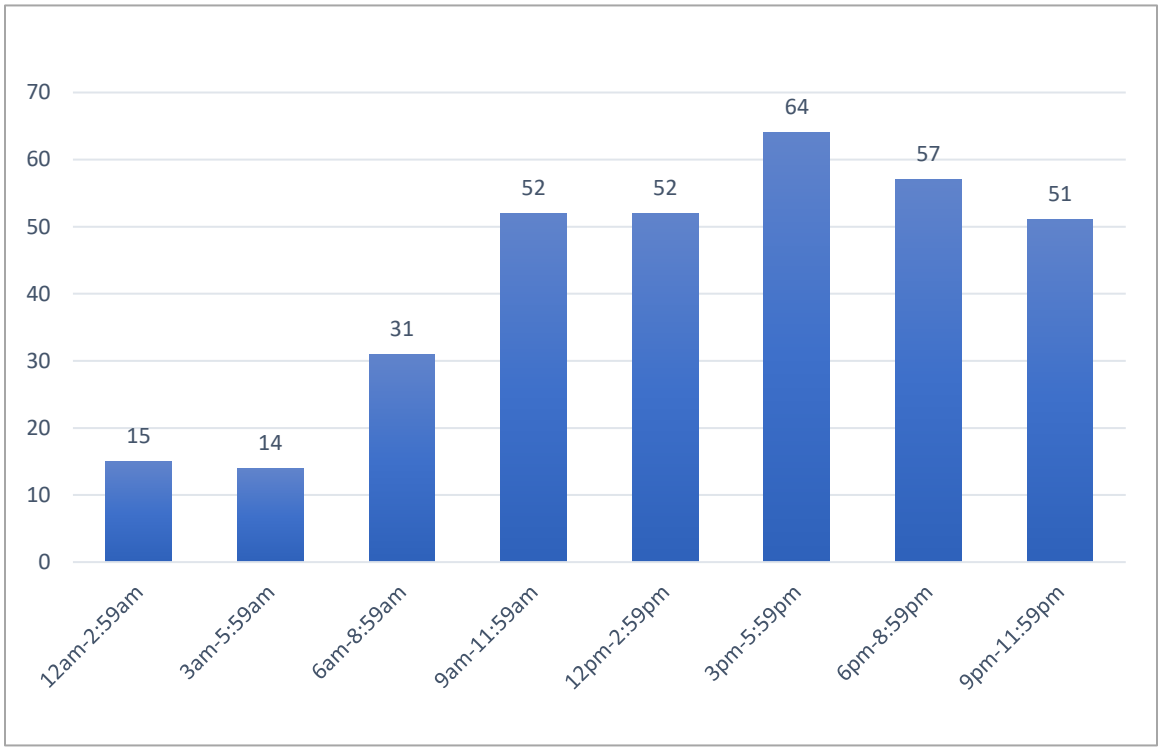


Figure Source: OFM SIR data for West Nipissing[43]

An analysis of the call volume by day of the week, incidents generally occurred with similar frequency with some increase through Friday and Saturday. This type of trend is generally expected as more of the population may be taking part in recreational activities and where there may be an increase in traffic volume throughout the municipality. Further, call volumes tend to increase in summer months as expected with the influx of tourists.

10.2.1.3 Call Type – All Incident Types

This section analyzes all emergency call volumes for the period from January 1st, 2018, to December 31st, 2022. Figure 8 and Table 40 illustrate that during this period 23.46% of the total emergency calls that WNFS responded to were rescue incidents. Property fires and explosions was the second highest percentage representing 23.02% of the department's total emergency call volume.

[43] *Ibid*

Figure 8: Call Type as a Percentage of Total Calls

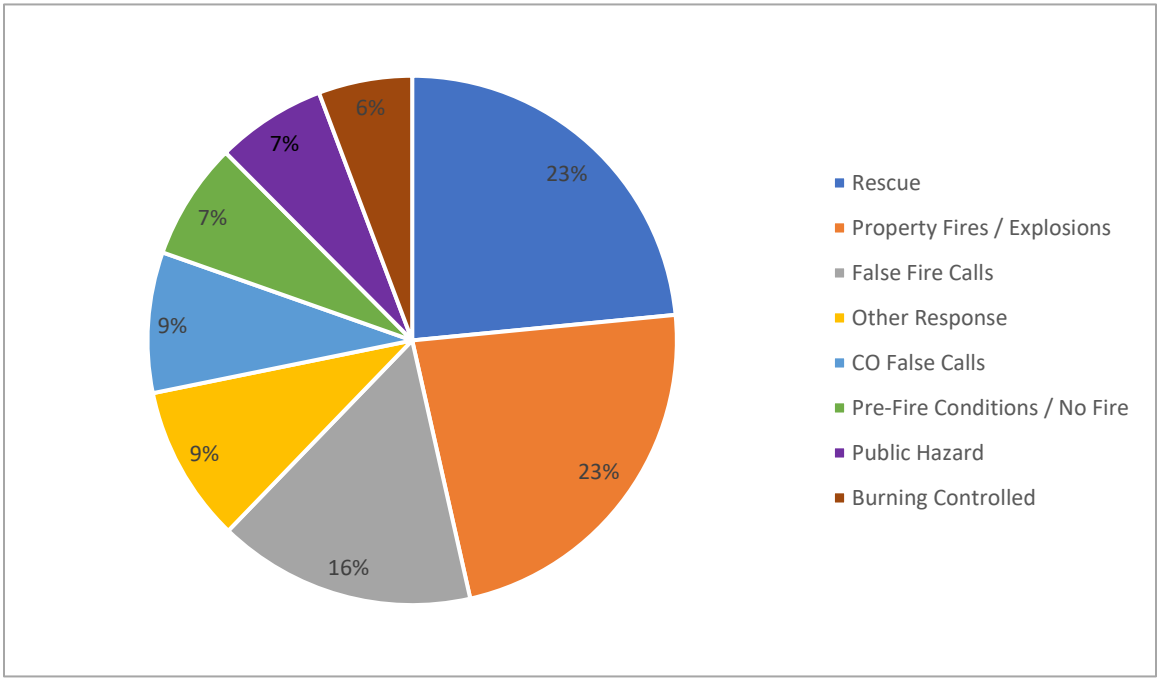


Table 40: Total Number of Incidents – Summary - January 1, 2018, to December 31, 2022.

Incident Type	2018	2019	2020	2021	2022	Total	Total %
Burning Controlled	3	0	5	2	42	52	5.73%
CO False Calls	13	14	15	17	19	78	8.59%
False Fire Calls	27	45	16	23	32	143	15.75%
Other Response	19	12	16	14	26	87	9.58%
Property Fires/Explosions	43	41	33	44	48	209	23.02%
Pre-Fire Conditions/no Fire	16	12	12	12	13	65	7.16%
Public Hazard	6	15	13	8	19	61	6.72%
Rescue	26	40	35	45	67	213	23.46%
Total						908	100.00%

Table Source: OFM SIR data for West Nipissing[44]

[44] *Ibid*

Table 41: Total *Number of Incidents – Breakdown - January 1, 2018, to December 31, 2022*

Call Type	2018	2019	2020	2021	2022	Total	Total %
A. Structure Fire	19	26	13	16	16	90	9.91
B. Other Fire	1	0	0	0	1	2	0.22
C. Vehicle Fire	8	11	9	9	18	55	6.06
D. No Loss Fire	2	0	0	0	3	5	0.55
E. No Loss Fire (Excluded)	13	4	11	19	10	57	6.28
F. Non-Fire Call	110	138	112	121	218	699	76.98
Total	153	179	145	165	266	908	100
F. Non-Fire Call Breakdown							
Burning Controlled	3	0	5	2	42	52	7.44
Authorized controlled burning complaint	*1*	*0*	*0*	*1*	*0*	*2*	*3.85*
Open Air Burning/unauthorized controlled burning	*2*	*0*	*5*	*1*	*42*	*50*	*96.15*
CO False Fire Calls	13	14	15	17	19	78	11.16
CO false alarm - equipment malfunction	*11*	*12*	*14*	*16*	*12*	*65*	*83.33*
CO false alarm - perceived emergency	*2*	*2*	*1*	*1*	*7*	*13*	*16.67*
False Fire Calls	27	45	16	23	32	143	20.46
Alarm System Equipment Accidental Activation	*1*	*4*	*3*	*4*	*3*	*15*	*10.49*
Alarm System Equipment Malfunction	*18*	*27*	*9*	*10*	*13*	*77*	*53.85*
Human - Accidental	*3*	*2*	*0*	*5*	*7*	*17*	*11.89*
Human - Malicious	*2*	*0*	*0*	*0*	*2*	*4*	*2.80*
Human - Perceived Emergency	*2*	*2*	*0*	*2*	*4*	*10*	*6.99*
Other False Fire Call	*1*	*10*	*4*	*2*	*3*	*20*	*13.99*
Other Response	19	12	16	14	26	87	12.45
Assistance not required by other agency	*1*	*0*	*0*	*1*	*1*	*3*	*3.45*
Assistance to other agencies	*0*	*1*	*2*	*1*	*8*	*12*	*13.79*
Assistance to Police	*3*	*0*	*0*	*0*	*3*	*6*	*6.90*
Assisting other Fire Department (Automatic Aid)	*1*	*3*	*5*	*2*	*3*	*14*	*16.09*
Assisting other Fire Department (Mutual Aid)	*0*	*0*	*1*	*1*	*0*	*2*	*2.30*
Cancelled on Route	*3*	*0*	*2*	*4*	*2*	*11*	*12.64*
Incident Not Found	*2*	*6*	*1*	*0*	*1*	*10*	*11.49*
Other Public Service	*0*	*0*	*0*	*1*	*1*	*2*	*2.30*
Other Response	*9*	*2*	*5*	*4*	*7*	*27*	*31.03*

Call Type	2018	2019	2020	2021	2022	Total	Total %
Pre-Fire Conditions (no fire)	16	12	12	12	13	65	9.30
Fireworks (no fire)	*1*	*0*	*0*	*0*	*0*	*1*	*1.54*
Other (cooking, smoke, steam)	*7*	*4*	*3*	*2*	*4*	*20*	*30.77*
Other pre fire conditions (no fire)	*5*	*4*	*7*	*7*	*7*	*30*	*46.15*
Overheat (no fire- mechanical devices)	*2*	*2*	*0*	*3*	*2*	*9*	*13.85*
Pot on Stove	*1*	*2*	*2*	*0*	*0*	*5*	*7.69*
Public Hazard	6	15	13	8	19	61	8.73
CO incident, CO present	*2*	*5*	*5*	*3*	*6*	*21*	*34.43*
Gas Leak - Natural Gas	*1*	*3*	*3*	*2*	*4*	*13*	*21.31*
Gas Leak - Propane	*0*	*2*	*0*	*0*	*0*	*2*	*3.28*
Other Public Hazard	*2*	*0*	*0*	*0*	*3*	*5*	*8.20*
Power Lines Down, Arcing	*1*	*3*	*2*	*1*	*2*	*9*	*14.75*
Public Hazard call false alarm	*0*	*1*	*1*	*0*	*0*	*2*	*3.28*
Public Hazard no action required	*0*	*0*	*1*	*0*	*4*	*5*	*8.20*
Spill- Gasoline or Fuel	*0*	*1*	*1*	*2*	*0*	*4*	*6.56*
Rescue	26	40	35	45	67	213	30.47
Animal Rescue	*0*	*1*	*0*	*0*	*0*	*1*	*0.47*
Other Rescue	*2*	*2*	*1*	*0*	*1*	*6*	*2.82*
Rescue No Action Required	*0*	*2*	*0*	*0*	*1*	*3*	*1.41*
Vehicle Collision	*13*	*34*	*31*	*43*	*60*	*181*	*84.98*
Vehicle Extrication	*9*	*0*	*1*	*0*	*4*	*14*	*6.57*
Water Ice Rescue	*0*	*0*	*0*	*1*	*0*	*1*	*0.47*
Water Rescue	*2*	*1*	*2*	*1*	*1*	*7*	*3.29*

Table Source: OFM SIR data for the Municipality of West Nipissing[45]

[45] *Ibid*

10.3 Past Loss & Event History Profile – Identified Risks and Key Findings

Identified Risk / Key Finding	Rationale
Identified Risk	
Identified Risk	For the period from January 1st, 2018, to December 31st, 2022, the municipality experienced a total of 90 structure fires of which 77.78% occurred in Group C-Residential Occupancies.
Identified Risk	100% of the civilian fire related injuries, and civilian fire related fatalities occurred in Group C -residential occupancies
Identified Risk	Over the five-year period from January 1st, 2018, to December 31st, 2022, 13.33% of the reported fires had an ignition source related to heating equipment which is 5.98% higher than that of the province at 7.35%
Identified Risk	Over the five-year period from January 1st, 2018, to December 31st, 2022, in 18.03% of incidents, there was a smoke alarm present on the floor of origin, but it did not operate. This is 5.63% higher than that of the province.
Identified Risk	Over the five-year period from January 1st, 2018, to December 31st, 2022, 26.67% of the unintentionally set fires in the municipality occurred due to Mechanical/Electrical Failure which is 11.61% higher than that of the province
Key Finding	
Key Finding	There was a 61.21% increase in the call volume from 2021 to 2022. This trend should be monitored.
Key Finding	Over the five-year period from January 1st, 2018, to December 31st, 2022, 23.02% of the total emergency calls that WNFS responded to were rescue calls of which 84.97% were vehicle collisions.
Key Finding	Over the five-year period from January 1st, 2018, to December 31st, 2022, there were 143 false fire calls of which 53.84% were related to an alarm system malfunction.

SECTION 11
IDENTIFIED RISKS AND RISK TREATMENTS

The purpose of a CRA is to identify risks that are then used to inform decision-making regarding the provision of fire protection services. The analysis throughout this CRA identifies 'Key Findings' and 'Identified Risks' to be considered. In alignment with **TG-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 CRA brings together all the key findings and identified risks. 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 for within a Fire Master Plan or other strategic document as shown in Figure 9.

Figure 9: Risk Conclusions Application Process

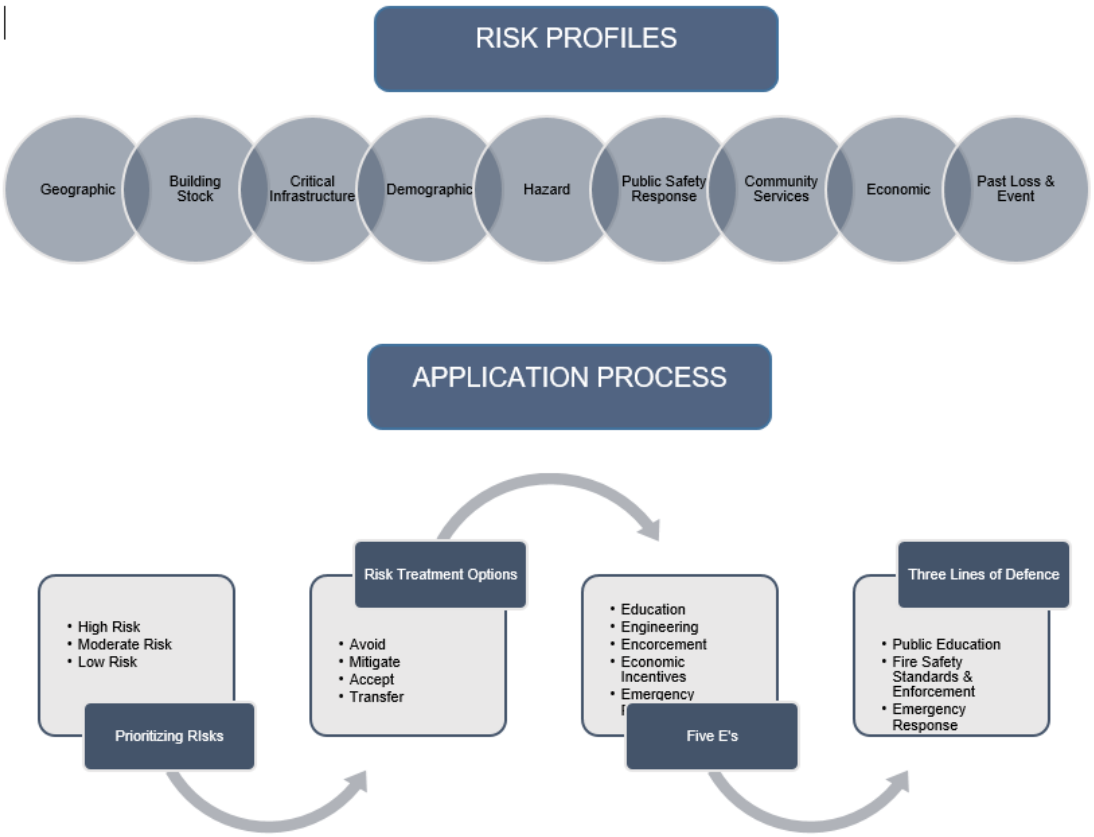


Figure Source: Adapted from OFM TG-02-2019 & NFPA 1300[46]

[46] *Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Section 6, Pg 16 & NFPA 1300, 2020 Edition, Annex A.6.3.3.2(4)*

11.1 Prioritizing Risk

Following the probability and consequence levels identified by the OFM as described in the subsections below, the risk assignment process considers the 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 a Fire Master Plan.

11.1.1 Risk assignment Process Overview

The risk assignment methodology used as part of this CRA is informed by the OFM Technical Guideline (TG)-02-2019 Community Risk Assessment Guideline. There are three steps included in the risk assignment exercise used for this CRA.:

1. **Determine a probability level:** 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. The likelihood categories, and the values presented, follow the OFM TG-02-2019 Community Risk Assessment Guideline. Table 42 presents the probability levels and the adjusted descriptions.

Table 42: Probability Level

Likelihood Category	Numerical Value[47]	Description
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 last incident
Possible	100	• Might occur under certain 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 unless circumstances change • Multiple or recurring incidents in the past year

Table Source: OFM TG 02-2019[48]

[47] *Numeric scales are taken from Dillon Consulting, The Corporation of the city of Mississauga Community Risk Identification: Introduction and Methodology, July 2017*

[48] *Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Section 4.1, Pg 13*

2. **Determine a consequence level:** 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:
   a) **Life Safety:** Injuries or loss of life due to occupant and firefighter exposure to life threatening fire or other situations.
   b) **Property Loss:** Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks, and critical infrastructure due to fire.
   c) **Economic Impact:** Monetary losses associated with property income, business closures, downturn in tourism, tax assessment value and employment layoffs due to fire.
   d) **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 because of fire or fire suppression activities. Table 43 presents the consequence levels.

Table 43: Consequence Levels

Likelihood Category	Numerical Value[49]	Description
Insignificant	1	• No life safety issue • Limited value or no property loss • No impact to local economy • No effect of 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 • 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 • Impact to environment would result in a short term, partial evacuation of local residents and businesses

[49] *Numeric scales are taken from Dillon Consulting, The Corporation of the city of Mississauga Community Risk Identification: Introduction and Methodology, July 2017*

Likelihood Category	Numerical Value[49]	Description
Catastrophic	10,000	• Significant loss of life • Multiple property damage to a significant portion of the municipality • Long term disruption of businesses, local employment, and tourism and/or Environmental damage that would result in long-term evacuation of local residents and businesses

Table Source: OFM TG 02-2019[50]

3. **Establish the risk level:** (i.e., low, moderate, or high) for each risk based on the identified probability and consequence for each event. Once probability and consequence are determined the level of risk is calculated by multiplying the numerical values[51] 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 directions on how to assign the probability and consequence of an event. Table 44 shows the risk matrix for this CRA.

Table 44: Probability & Consequence Risk Matrix

Probability/ Consequence	Insignificant 1	Minor 10	Moderate 100	Major 1,000	Catastrophic 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

Table Source: OFM TG 02-2019[52]

[50] *Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Section 4.2 pg 14*

[51] *Numeric scales are taken from Dillon Consulting, The Corporation of the city of Mississauga Community Risk Identification: Introduction and Methodology, July 2017*

[52] *Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Appendix B Pg B1*

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 CRA. The results of the risk assignment process are presented in Table 45. Where possible, quantitative data was used to inform the risk assignment as described in the rationale in the table.

Table 45: Risk Assignment

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Geographic	The road network is a contributor to emergency call volume due to motor vehicle collisions and vehicle fires.	Almost Certain	• Approximately 195 emergency calls responded to between 2018 and 2022 pertain to motor-vehicle related incidents, this represents 91% of rescue calls and approximately 21% of all calls responded to by WNFS during that period	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
Geographic	Major Rail line through the municipality presents a risk related primarily to the movement of goods.	Possible	• The Ottawa Valley Railway track runs along Highway 17 through the Municipality of West Nipissing, there are tracks running through most major neighborhoods of the municipality	Catastrophic	• 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	High

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Geographic	Waterways in the municipality, such as the Sturgeon River, Cache Bay, Temagami River, and Lake Nipissing, pose rescue and accident risks from boating and snowmobiles, and natural hazards like flooding, ice jams, and erosion, necessitating swift evacuations and rescue responses.	Unlikely	• The Minnehaha Bay Marina, with its 50 boat slips, increases the potential for boating accidents and collisions due to the high volume of boats in the area • Waterfront activities increase the risk of an incident both on the water and onshore. WNFS reported a total of 8 water and/or ice rescues over the period of January 1, 2018, to December 31, 2022.	Moderate	• Threat to life safety of occupants • Moderate property loss	Moderate
Building Stock and Past Loss and Event History	Group C- Residential Occupancies represents 84.86% of the existing property stock and, over the period from January 1, 2018 - December 31, 2022, were associated with 77.78% of the structure fire loss.	Almost Certain	• The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%) • 77.78% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. • 100.00% of the civilian fire related injuries, 100.00% of the civilian fire related fatalities occurred in residential occupancies. • There is a considerably diverse portfolio of non-profit housing in the community. • In accordance with the growth projections an estimated range of 282 to 578 new dwellings units will be required to meet housing stock needs in 2031.	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 • Potential for exposure risk depending on dwelling type and building age • Potential presence and maintenance of fire protection equipment would influence consequence level	High

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Building Stock	Data provided by the Municipal Property Assessment Corporation (MPAC) indicates that 49.24% of the municipality's residential building stock was built prior to the introduction of the 1981 OFC.	Almost Certain	• 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC • Buildings built prior to the adoption of the 1981 OFC or the 1975 OBC may not be in conformance with current smoke alarm and CO alarm requirements and likely will not have interconnected devices.	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 • Occupants could be vulnerable individuals including seniors and youth within Group C – Residential	High
Building Stock	There are several properties within West Nipissing that have a potentially high fuel load and therefore an increased high fire risk.	Possible	• There are 181 industrial occupancies (2.48% of property stock) -some with known high fuel load concerns • Certain industrial operations may have increased fuel loads and conduct higher risk activities. Proactive inspections should target these facilities to ensure compliance with codes, maintenance, and emergency planning requirements. • There have been 4 industrial fires over the past 5 years resulting in over $816k fire loss (9.41% of the total fire loss)	Major	• Significant threat to businesses, local economy, and tourism • Impact to environment could result in a short term, partial evacuation of local residents and businesses • Prolonged disruptions to supply chains	Moderate

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Building Stock	The municipality has identified 12 registered vulnerable occupancies and 7 Community Living spaces.	Possible	• The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%) • 81% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. • 100% of the civilian fire related injuries, and civilian fire related fatalities occurred in residential occupancies.	Major	• Ontario Regulation 150/13 requires fire departments to perform annual inspections and approve and witness fire drill scenarios • Presence and maintenance of fire protection equipment, for example, fire alarm system, sprinklers, etc. • Potential for vulnerable individuals including those who receive special care or treatment within a Group B occupancy	High
Building Stock	In addition to registered vulnerable occupancies the municipality has 10 elementary and secondary schools (9 buildings).	Likely	• 10 elementary and secondary schools. There are 9 buildings with one building housing both French and English high.	Moderate	• Children, due to age and potential cognitive or physical limitations may prevent or delay self-evacuation in the event of an emergency.	Moderate
Critical Infrastructure	There were 195 emergency calls responded to between 2018 and 2022 pertaining to motor-vehicle related incidents, this represents 91.54% of rescue calls.	Almost Certain	• 195 emergency calls responded to between 2018 and 2022 pertain to motor-vehicle related incidents, this represents 91.54% of rescue calls • 50.00% of the labour force begins their commute between the hours of 7 and 9 AM.	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

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Demographic	The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population, which is 7.87% higher than the province's rate of 18.54%.	Almost Certain	• Canada's aging population has been recognized as one of the most significant demographic trends. • Trending indicates that seniors are residing in their own independent homes longer. • 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). • The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population • 18.48% of the municipality's population falls between the age group of 55 and 64, who are aging towards the senior's demographic of 65 years of age and older • that 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC • Buildings built prior to the adoption of the 1981 OFC or the 1975 OBC may not be in conformance with current smoke alarm and CO alarm requirements and likely will not have interconnected devices.	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age • Potential presence and maintenance of fire protection equipment would influence consequence level	High

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Demographic	18.48% of the municipality's population falls between the ages of 55 and 64, gradually aging into the senior demographic of 65 years and older. This is 4.37% higher than that of the province.	Almost Certain	• This group over the next 5 years will fall into the senior's category presenting a greater risk. • Canada's aging population has been recognized as one of the most significant demographic trends. • 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). • The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population • 18.48% of the municipality's population falls between the age group of 55 and 64, who are aging towards the senior's demographic of 65 years of age and older	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age • Potential presence and maintenance of fire protection equipment would influence consequence level	High
Demographic	West Nipissing has a notably higher proportion of Indigenous population at 19.71% compared to the province at of 2.90%.	Almost Certain	• The municipality has a higher proportion of indigenous population (19.71%) when compared to Ontario (2.90%) • 32.03% (900 individuals) identify as First Nations, 65.30% (1,835 individuals) as Métis, and 0.88% (25 individuals) as Inuit.	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age	High

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Hazard	Small communities such as North Monetville, Lavigne, Kipling, River Valley, Field and Crystal Falls are at a greater risk of a forest fire. This statement does not exclude the other rural areas and shoreline properties of lakes and rivers in the Municipality that are surrounded by forest.	Possible	• The majority of the Municipality is surrounded by forest. The different fuel load of the forest is approximately: • 50% is 30-70% softwood • 35% is Mixed wood with less than 30% Softwood • 10% is open Forest and Grass (Brush) • 4% Mature Jack Pine • 1% Wetland	Catastrophic	• Significant loss of life • Multiple property damage to a significant portion of the municipality • Long term disruption of businesses, local employment, and tourism and/or Environmental damage that would result in long-term evacuation of local residents and businesses	High
Building Stock & Past Fire Loss	For the period from January 1st, 2018, to December 31st, 2022, the municipality experienced a total of 90 structure fires of which 77.78% occurred in Group C-Residential Occupancies.	Almost Certain	• Structure Fires were responsible for 88.61% of the total fire loss for this period • 100.00% of the civilian fire related injuries, 100.00% of the civilian fire related fatalities occurred in residential occupancies. • 70 new dwellings were added to the market in 2021. Based on data for housing starts and in-progress construction for 2021, an additional 91 new units will be completed in the future, composed of 66 Single Detached, 8 Semi-Detached, 17 Apartment	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age • Potential presence and maintenance of fire protection equipment would influence consequence level	High

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Past Fire Loss	100% of the civilian fire related injuries, and civilian fire related fatalities occurred in Group C - residential occupancies.	Almost Certain	• The majority of the municipality's existing property stock is comprised of Group C - Residential Occupancies (84.86%) • 81% of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies. • 100% of the civilian fire related injuries, and civilian fire related fatalities occurred in residential occupancies	Major	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age • Potential presence and maintenance of fire protection equipment would influence consequence level	High
Past Loss and Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 13.33% of the reported fires had an ignition source related to heating equipment which is 5.98% higher than that of the province at 7.35%.	Likely	• 13.33% of fires were related to heating equipment • incidents where a smoke alarm was present but failed to operate accounted for 18.03%, higher than the provincial rate of 12.40%. • 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC. • Buildings built prior to the adoption of the 1981 OFC or the 1975 OBC may not be in conformance with current smoke alarm and CO alarm requirements and likely will not have interconnected devices.	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age • Potential presence and maintenance of fire protection equipment would influence consequence level	Moderate

Risk Profile	Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
Past Loss and Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, in 18.03% of incidents, there was a smoke alarm present on the floor of origin, but it did not operate. This is 5.63% higher than that of the province.	Likely	• There were 11 incidents (or 18.03%) where a smoke alarm was present but did not operate. • there was no smoke alarm present in 13.11% of occurrences • 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC • Buildings built prior to the adoption of the 1981 OFC or the 1975 OBC may not be in conformance with current smoke alarm and CO alarm requirements and likely will not have interconnected devices.	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age	Moderate
Past Loss and Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 26.67% of the unintentionally set fires in the municipality occurred due to Mechanical/ Electrical Failure which is 11.61% higher than that of the province.	Likely	• There were 11 incidents (or 18.03%) where a smoke alarm was present but did not operate. • there was no smoke alarm present in 13.11% of occurrences • 49.24% of the municipality's building stock was constructed before 1981, preceding the adoption of the 1981 OFC	Moderate	• Could pose a threat to the life safety of occupants • Could result in moderate property loss • Potential for exposure risk depending on dwelling type and building age	Moderate

11.2 Risk Treatment

NFPA 1300 and the OFM TG-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. (See Table 46).

Table 46: Risk Treatment Options

Treatment Option	Description
Avoid	Implementing programs and initiatives to prevent a fire or emergency from happening.
Mitigate	Implementing programs and initiatives to reduce the probability and/or consequence of a fire or emergency.
Accept	After identifying and prioritizing a risk, the fire service determines that no specific programs or initiatives will be implemented to address this risk.
Transfer	The fire service transfers the impact and/or management of the risk to another organization or body. (i.e. fire protection agreements, automatic aid)

Table Source: OFM TG 02-2019[53]

Section 7 of TG 02-2019 discusses setting the levels of service. To assist with application of the Identified Risks in the CRA, municipalities must consider the "Establishment of goals and objectives, strategies, timelines, and evaluation for the proposed fire protection services to be provided."[54] This includes the identification of programming or resource gaps and the plan to close those gaps. Typically, this articulated as part of a Fire Master Plan or Community Risk Reduction strategy.

Recommendations of a Fire Master Plan should focus on ways to proactively reduce risk through education, prevention, and enforcement with fire suppression as the fail-safe.

The Five Es is a framework outlined in NFPA 1300, and the Institution of Fire Engineers' Vision 20/20 National Strategy for Fire Loss Prevention, is a tool that helps to provide a lens through which identified risks can be reviewed to inform and support the Fire Master Plan. Table 47 identifies and describes each of the 5 Es of risk mitigation.

[53] *Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Section 6 pg 16*

[54] *Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, 7 pg 18*

Table 47: 5 Es of Risk Mitigation

Mitigation Type	Description
Education	Aims to provide information that creates awareness and knowledge and subsequently changes behaviour.
Enforcement	Intended to correct negative human behaviour through legislation such as the Ontario Building Code and the Ontario Fire Code and the Provincial Offences Act.
Engineering	When education does not change an individual's behavior, this component removes the human factor and introduces technology to improve safety such as smoke alarms.
Economic Incentives	Provided to reinforce positive impacts (e.g., insurance discounts or tax levy reductions) and discourage negative impacts (e.g., fines and charges)
Emergency Response	Necessary only if the first 4 Es are unsuccessful, and a fire incident occurs. The level of service for a community is determined by Council based on the needs and circumstances identified locally.

Source: Adapted from NFPA 1300 & Vision 20/20[55]

Table 48 summarize the identified risks and present ways in which the risks can be addressed by WNFS and ultimately considered within the Fire Master Plan analysis and recommendations.

[55] *NFPA 1300, 2020 Edition, Annex A.6.3.3.2(4)*

Table 48: Identified Risk Treatment

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Geographic	The road network is a contributor to emergency call volume due to motor vehicle collisions and vehicle fires.	High	Accept	No	No	No	No	Yes
Geographic	Major Rail line through the municipality presents a risk related primarily to the movement of goods.	High	Accept	No	No	No	No	Yes
Geographic	Waterways in the municipality, such as the Sturgeon River, Cache Bay, Temagami River, and Lake Nipissing, pose rescue and accident risks from boating and snowmobiles, and natural hazards like flooding, ice jams, and erosion, necessitating swift evacuations and rescue responses.	Moderate	Accept	No	No	No	No	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Building Stock and Fire Loss and Event History	Group C- Residential Occupancies represents 84.86% of the existing property stock and, over the period from January 1, 2018 - December 31, 2022, were associated with 77.78% of the structure fire loss.	High	Mitigate	Yes	Yes	Yes	No	Yes
Building Stock	Data provided by the Municipal Property Assessment Corporation (MPAC) indicates that 49.24% of the municipality's residential building stock was built prior to the introduction of the 1981 OFC.	High	Mitigate	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Building Stock	There are several properties within West Nipissing that have a potentially high fuel load and therefore an increased high fire risk.	Moderate	Mitigate	Yes	Yes	Yes	No	Yes
Building Stock	The municipality has identified 12 registered vulnerable occupancies and 7 Community Living spaces.	High	Mitigate	Yes	Yes	Yes	Yes	Yes
Building Stock	In addition to registered vulnerable occupancies the municipality has 10 elementary and secondary schools (9 buildings).	Moderate	Mitigate	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Critical Infrastructure	There were 195 emergency calls responded to between 2018 and 2022 pertaining to motor-vehicle related incidents, this represents 91.54% of rescue calls	High	Accept	No	No	No	No	Yes
Demographic	The percentage of the population aged 65 years and older in West Nipissing represents 26.41% of the total population, which is 7.87% higher than the province's rate of 18.54%.	High	Mitigate	Yes	Yes	Yes	No	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Demographic	18.48% of the municipality's population falls between the ages of 55 and 64, gradually aging into the senior demographic of 65 years and older. This is 4.37% higher than that of the province	High	Mitigate	Yes	Yes	Yes	No	Yes
Demographic	West Nipissing has a notably higher proportion of Indigenous population at 19.71% compared to the province at of 2.90%.	High	Mitigate	Yes	Yes	Yes	No	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Hazard	Small communities such as North Monetville, Lavigne, Kipling, River Valley, Field and Crystal Falls are at a greater risk of a forest fire. This statement does not exclude the other rural areas and shoreline properties of lakes and rivers in the Municipality that are surrounded by forest.	High	Accept	Yes	Yes	No	No	Yes
Past Loss & Event History	For the period from January 1st, 2018, to December 31st, 2022, the municipality experienced a total of 90 structure fires of which 77.78% occurred in Group C-Residential Occupancies	High	Mitigate	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Past Loss & Event History	100% of the civilian fire related injuries, and civilian fire related fatalities occurred in Group C - residential occupancies	High	Mitigate	Yes	Yes	Yes	No	Yes
Past Loss & Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 13.33% of the reported fires had an ignition source related to heating equipment which is 5.98% higher than that of the province at 7.35%	Moderate	Mitigate	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Past Loss & Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, in 18.03% of incidents, there was a smoke alarm present on the floor of origin, but it did not operate. This is 5.63% higher than that of the province	Moderate	Mitigate	Yes	Yes	Yes	No	Yes
Past Loss & Event History	Over the five-year period from January 1st, 2018, to December 31st, 2022, 26.67% of the unintentionally set fires in the municipality occurred due to Mechanical/Electrical Failure which is 11.61% higher than that of the province	Moderate	Mitigate	Yes	Yes	Yes	Yes	Yes

APPENDICES

Appendix A: List of Figures, Maps, and Tables

Figures

Maps

Tables

Appendix B: References

Fire Protection and Prevention Act, 1997 Part II Responsibility for Fire Protection Services, Section 2.1 (a) (b)

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Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Section 4.2 pg. 14

Office of the Fire Marshal, Community Risk Assessment Technical Guideline TG 02-2019, Section 6 pg. 16

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