



Corporation of the City of Sault Ste. Marie

Community Risk Assessment

Final Report

April 2025 – Project #23-003

Table of Contents

1.0	Introduction	1
1.1	Methodology.....	2
2.0	Geographic Profile	4
2.1	Geographical Snapshot of Sault Ste. Marie	4
2.2	Roads, Transit, Bridges and Rail	8
2.2.1	Road Network.....	8
2.2.2	Bridges	13
2.2.3	Rail.....	15
2.2.4	Airport.....	18
2.2.5	Location Analysis: Airport	19
2.3	Waterways, Conservation Areas and Trails	20
2.3.1	Waterways	20
2.3.2	Great Lakes Cruises	22
2.3.3	Conservation Areas	23
2.3.4	Trails	25
2.3.5	Topography	25
2.4	Wildland-Urban Interfaces	28
2.4.1	Overview of Wildfires	28
2.4.2	Wildland-Urban Interface	29
2.4.3	Legislative and Policy Framework	30
2.4.4	Identifying the Wildland-Urban Interface in Canada	31
2.4.5	Mapping Analysis: Sault Ste. Marie Wildland-Urban Interface ...	32
3.0	Building Stock Profile	35
3.1	Ontario Building Code Occupancy Classifications	35
3.2	OFM Fire Risk Sub-Model Occupancy Classifications	36

3.2.1	City of Sault Ste. Marie Existing Major Building Classification Summary.....	39
3.2.2	Mapping Property Stock	40
3.2.3	Vacant Buildings.....	42
3.2.4	Added Mapping Vacant Buildings and Fire Incidents	42
3.3	Building Density and Exposure	45
3.4	Building Age and Construction	49
3.4.2	Lightweight Construction	54
3.5	Building Height and Area	56
3.5.1	Building Height	57
3.5.2	Building Area	59
3.6	Potential High-Fire Risk Occupancies (Fuel Load)	62
3.7	Occupancies with Potential High Fire Life-Safety Risk.....	64
3.7.1	Registered Vulnerable Occupancies.....	64
3.7.2	Other High Fire Life Safety Risk Occupancies	65
3.8	Historic or Culturally Significant Buildings.....	66
4.0	Critical Infrastructure Profile	69
4.1	Critical Infrastructure in Sault Ste. Marie	69
4.1.1	Water Infrastructure – Hydrants.....	80
5.0	Demographic Profile	82
5.1	Population and Dispersion.....	82
5.1.1	Mapping Population Density and Dispersion	85
5.2	Population Age	87
5.2.1	Mapping Population Age	92
5.3	Gender	95
5.4	Socioeconomic Circumstances.....	96
5.4.1	Labour Force Status	97
5.4.2	Educational Attainment.....	98

5.4.3	Income Decile Groups	102
5.4.4	Household Tenure, Occupancy, Suitability and Costs	106
5.5	Cultural Background and Language Considerations	108
5.6	Transient Populations	110
5.6.1	Tourism	111
5.6.2	Education	112
5.6.3	Employment	112
6.0	Hazard Profile	114
6.1	Hazard Identification and Risk Assessment in Ontario (HIRA)	114
6.1.1	HIRA and the CRA	115
6.2	City of Sault Ste. Marie Hazard Identification and Risk Assessment (HIRA)	115
6.3	Impacts of Hazards on Fire Protection Services	116
7.0	Public Safety Response Profile	123
7.1	Public Safety Response Agencies in the City of Sault Ste. Marie	123
7.1.1	Mutual Aid Agreements	134
8.0	Community Services Profile	135
8.1	Community Services in the City of Sault Ste. Marie	135
9.0	Economic Profile	147
9.1	Economic Context	147
9.2	Major Industries, Occupations and Employers in Sault Ste. Marie	147
9.2.1	Labour Force by Occupation	148
9.2.2	Major Employers	151
10.0	Past Loss and Event History Profile	153
10.1	Past Loss	153
10.1.1	Total Fire Loss	153
10.1.2	Fires by Occupancy Type	157

10.1.3	Civilian Fire Fatalities and Injuries	159
10.1.4	Reported Fire Cause	160
10.1.5	Ignition Source	162
10.1.6	Smoke Alarm Status Processing Equipment	164
10.2	Event History	166
10.2.1	Emergency Call Volume – All Incident Types	167
10.2.2	Emergency Call Volume – Spatial Modelling	174
10.2.3	Emergency Call Volume – Summary	185
11.0	Applying Key Findings and Identified Risks	186
11.1	Prioritizing Risks	188
11.1.1	Risk Assignment Process Overview	188
11.1.2	Assigned Risk Levels	192
11.2	Risk Treatment Options	200
11.2.1	The ‘Five Es’ of Community Risk Reduction	201
11.2.2	Risk Conclusions, Treatment Options, and the Five Es	203

Figures

Figure 1: City of Sault Ste. Marie Land Use	7
Figure 2: Municipal Overview	11
Figure 3: Transportation Systems	12
Figure 4: Rail Crossings	17
Figure 5: Natural Features	26
Figure 6: Topography	27
Figure 7: Potential Hazardous Forest Types for Wildland Fire (MNRF)	33
Figure 8: Potential Hazardous Forest Types for Wildland Fire (MNRF) – Extreme and High Risk	34

Figure 9: Property Stock by Major Occupancy Classification (Parcel Data) 41

Figure 10: Vacant Properties and Historic Fire Incidents 44

Figure 11: Building Density and Exposures (City Analysis)..... 48

Figure 12: Fire Propagation Curve..... 52

Figure 13: Building Age 55

Figure 14: Building Height 58

Figure 15: Building Area Locations 61

Figure 16: Potential High-Fire Risk Occupancies (Fuel Load)..... 63

Figure 17: Historic or Culturally Important Buildings or Facilities..... 68

Figure 18: Hydrants 81

Figure 19: Population Counts and Estimates (2011 to 2023), City of Sault Ste. Marie 83

Figure 20: Estimated Annual Change in Population (2011 to 2023), City of Sault Ste. Marie..... 84

Figure 21: Components of Population Change (2011 to 2023), City of Sault Ste. Marie 84

Figure 22: Population Density – City of Sault Ste. Marie..... 86

Figure 23: 2011-2021 Residential Fire Death Rate by Age of Victim..... 88

Figure 24: Population Distribution by Age – Sault Ste. Marie and Ontario 91

Figure 25: Percentage of Population Aged 65 and Older by Dissemination Area.... 93

Figure 26: Percentage of Population Aged 0-14 Years Old by Dissemination Area 94

Figure 27: Median Total Income of Households in 2020 by Dissemination Area ... 101

Figure 28: Percentage of Bottom Income Decile by Dissemination Area 104

Figure 29: Percentage of Top Income Decile by Dissemination Area 105

Figure 30: Industry in Sault Ste. Marie (North American Industry Classification System (NAICS) 2017) 149

Figure 31: Occupation, City of Sault Ste. Marie - National Occupational Classification (NOC) 2021 150

Figure 32: Annual Call Volume – All Incidents January 1, 2012, to December 31, 2023 168

Figure 33: Average Call Volume by Month – All Incidents January 1, 2017, to December 31, 2023 169

Figure 34: Average Call Volume by Day of Week – All Incidents January 1, 2017, to December 31, 2023 170

Figure 35: Average Call Volume by Time of Day – All Incidents January 1, 2017, to December 31, 2023, 171

Figure 36: Percentage of Calls (SSMFS and Ontario) by OFM Response Type (2018 to 2023) 173

Figure 37: Spatial Distribution and Concentration – All Emergency Incidents 175

Figure 38: Spatial Distribution and Concentration – Medical/Resuscitator Incidents 177

Figure 39: Spatial Distribution and Concentration – Rescue Incidents 180

Figure 40: Spatial Distribution and Concentration – False Fire Incidents 182

Figure 41: Spatial Distribution and Concentration – Fire/Explosion Incidents 184

Figure 42: Risk Conclusions Application Process 187

Figure 43: Risk Matrix 191

Tables

Table 1: Sault Ste. Marie International Bridge Annual Traffic 14

Table 2: Airlines Operating at Sault Ste. Marie Airport 18

Table 3: Emergency Calls Originating from Airport Area 20

Table 4: Sault Ste. Marie Conservation Areas 23

Table 5: OBC Major Occupancy Classifications 35

Table 6: OFM Fire Risk Sub-Model Major Building Classifications 37

Table 7: City of Sault Ste. Marie Existing Property Stock (excluding Open Space) . 39

Table 8: Group C - Residential Building Stock Comparison 45

Table 9: Time to Reach 1 MW Fire in the Absence of Fire Suppression 50

Table 10: Period of Construction of City Buildings – Sault Ste. Marie and Ontario.. 53

Table 11: Summary of High-Rise Building Height Metrics 57

Table 12: Building Area 59

Table 13: Critical Infrastructure Considerations 70

Table 14: Historic Growth in Population and Households - Sault Ste. Marie 82

Table 15: Population by Age Group – Sault Ste. Marie and Ontario 89

Table 16: Gender Distribution by Age Group – Sault Ste. Marie 95

Table 17: Labour Force Status – Sault Ste. Marie and Ontario 98

Table 18: Educational Attainment – Sault Ste. Marie and Ontario..... 99

Table 19: Economic Family Income Decile Group for the Population in Private
Households – Sault Ste. Marie and Ontario 102

Table 20: Household Tenure – Sault Ste. Marie and Ontario 107

Table 21: Household Occupancy – Sault Ste. Marie and Ontario 107

Table 22: Household Suitability – Sault Ste. Marie and Ontario 107

Table 23: Shelter Costs – Sault Ste. Marie and Ontario 107

Table 24: Median Costs – Sault Ste. Marie and Ontario 108

Table 25: Immigration Status – Sault Ste. Marie and Ontario (2021 Census) 108

Table 26: Knowledge of Official Language – Sault Ste. Marie and Ontario 110

Table 27: Commuting Destinations – City of Sault Ste. Marie 113

Table 28: Top Hazards, Sault Ste. Marie HIRA, 2021 116

Table 29: Impacts of Hazards on Fire Protection Services 118

Table 30: Public Safety Response Agencies 124

Table 31: Community Service Agencies, Organizations and Associations 136

Table 32: Major Employers in Sault Ste. Marie 151

Table 33: Total Fire Loss – City of Sault Ste. Marie 154

Table 34: Structure Fires and Property Loss – City of Sault Ste. Marie and
Province of Ontario 156

Table 35: Fires by OBC Major Occupancy Classification – City of Sault Ste.
Marie and Province of Ontario (2017-2023) 158

Table 36: Civilian Fire Fatalities and Injuries by OBC Major Occupancy
Classification - City of Sault Ste. Marie 159

Table 37: Reported Fire Cause – City of Sault Ste. Marie and Province of Ontario 161

Table 38: Source of Ignition - City of Sault Ste. Marie and Province of Ontario 163

Table 39: Smoke Alarm Presence and Operation on the Floor of Fire Origin - City
of Sault Ste. Marie and Province of Ontario 165

Table 40: Rescue Incidents – Analysis (January 1, 2018, to December 31, 2023) 178

Table 41: Probability Levels 189

Table 42: Consequence Levels 190

Table 43: Risk Assignment 193

Table 44: Risk Treatment Options 200

Table 45: Overview of the NFPA 1300 - Standard on Community Risk
Assessment and Community Risk Reduction Plan Development (2020
Edition) Five “E’s” 202

Table 46: Risk Analysis Conclusions – 5 E’s Categorization..... 203

Table 47: Treatment Options and Five E’s Categorization – Identified Risks 205

Table 48: Treatment Options and Five E’s Categorization – Key Findings..... 208

1.0 Introduction

The process of assessing community risk is receiving increased attention within the fire service in North America. Assessing community risk informs the understanding of local needs and circumstances, which can then be applied to align the fire protection service levels provided by the Sault Ste. Marie Fire Services (SSMFS). The use of community risk assessments reflects a shift within the fire service towards opportunities to mitigate or avoid fire-related risks through proactive public education programs and fire inspection or enforcement programs.

This Community Risk Assessment (CRA) has been developed for the City of Sault Ste. Marie to comply with **Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18)**. **O. Reg. 378/18** came into force on July 1, 2019, under the authority of the Fire Protection and Prevention Act, 1997 (FPPA). **O. Reg. 378/18** requires all municipalities in Ontario to develop a CRA prior to July 1, 2024. It also requires municipalities to **“use its community risk assessment to inform decisions about the provisions of fire protection services.”**¹ Consistent with the regulation, this CRA should be reviewed annually and updated every five years or as needed.

In addition to this CRA, the FPPA requires that municipalities provide fire protection programs that **“must include public education with respect to fire safety and certain components of fire prevention, and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.”**² **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.

A community risk assessment is fundamental to planning and delivering fire and emergency services. The results of Community Risk Assessments are used to identify existing service gaps across the divisions of a fire department, including fire prevention, enforcement needs, and emergency response (e.g. suppression). This section presents the methodology, analysis, and outcomes of a Community Risk Assessment (CRA)

¹ Ontario Regulation 378/18: Community risk Assessments, Mandatory Use, Section 1 (b).

² Fire Protection and Prevention Act, 1997 Part II Responsibility for Fire Protection Services, Section 2.1 (a)(b).

completed for the City of Sault Ste. Marie (City or SSM). The findings of this CRA will build upon the City's 2019 Comprehensive Risk Assessment and directly inform the 2024 Fire Master Plan Update.

1.1 Methodology

The Office of the Fire Marshal (OFM) has developed Technical Guideline 02-2019 (OFM TG-02-2019) to assist municipalities and fire departments in developing a CRA to inform the municipality's decisions regarding the provision of fire protection services. The methodology and analysis applied to develop this CRA are directly informed by TG-02-2019, which 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. In addition to TG-02-2019, the methodology applied is informed by other current industry standards and best practices, including:

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

- OFM Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model
- OFM Public Fire Safety Guideline (PFSG) 04-40A-03: Simplified Risk Assessment
- NFPA 1300 - Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition)
- NFPA 1730 - Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition)
- Vision 20/20 Community Risk Assessment: A Guide for Conducting a Community Risk Assessment ³ (Version 1.5, 2016)
- Vision 20/20 Community Risk Reduction Planning: A Guide for Developing a Community Risk Reduction Plan ⁴

In our view, these documents collectively represent the most current industry best practices related to the applicable methodology and process to develop a CRA for the

³ John A. Stouffer, Community Risk Assessment: A Guide for Conducting a Community Risk Assessment, Vision 20/20, ESRI, 2016.

⁴ John A. Stouffer, Community Risk Assessment: A Guide for Conducting a Community Risk Reduction P, Vision 20/20, ESRI, 2016.

City of Sault Ste. Marie as required by **O. Reg. 378/18**. The information presented within these documents is often, complementary, having been built upon each other.

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

1. Geographic Profile
2. Building Stock Profile
3. Critical Infrastructure Profile
4. Demographic Profile
5. Public Safety and Response Profile
6. Community Services Profile
7. Hazard Profile
8. Economic Profile
9. Past Loss and Event History Profile

Within each of the nine profiles, there are a number of sub-topics examined. These profiles are based on an analysis of several sources of information, including data provided by the City of Sault Ste. Marie, Sault Ste. Marie Fire Services (SSMFS), 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 defence (1. Public Education and Prevention, 2. Fire Safety Standards and Enforcement, and 3. Emergency Response) through a risk treatment process. Throughout this document, these risk-related conclusions 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 OFM TG-02-2019.

In specific circumstances, a risk-related conclusion is referred to as a **Special Consideration** due to local or legislative considerations. All risk-related conclusions will be taken through a risk treatment process and aligned with the "three lines of defence." The summary and analysis of the CRA key findings and identified risks are provided in **Section 11.0 – Applying Key Findings and Identified Risks.**

2.0 Geographic Profile

As referenced in **O. Reg. 378/18**, the geographic profile assessment includes analysis of the physical features of the community, including the nature and placement of features such as highways, waterways, railways, canyons, bridges, landforms, and wildland-urban interfaces. These physical features may present inherent risks or potentially have an impact on fire department access or emergency response time. The following sections consider these geographic characteristics within the City of Sault Ste. Marie.

2.1 Geographical Snapshot of Sault Ste. Marie

The City of Sault Ste. Marie (City or SSM) is one of the key regional centres in Northern Ontario, found within the Algoma District. Sault Ste. Marie (colloquially known as “the Soo”) is a city bordering the United States. It is located on the St. Marys River (an approximately one-kilometre-wide river that connects and drains Lake Superior to Lake Huron). The entire length of the St. Marys River is an international border separating Michigan from Ontario. The St. Marys rapids are bypassed by freight traffic through engineered locks. There are two sets of locks that manage traffic from Lake Superior to Lake Huron: the Soo Locks and the Sault Ste. Marie Canal. The Soo Locks represent the locks owned by the United States and the Sault Ste. Marie Canal is a Canadian lock and a National Historic Site⁵. The Soo Locks provide for the transportation of approximately 86 million tons of cargo annually,⁶ and the Canadian lock is used primarily by recreational watercraft. The locks are closed during winter months when ice closes the passageway.

While the St. Marys River defines the shoreline, and the southern boundary of the City of Sault Ste. Marie, other natural features shape the City including significant outcropping of the Canadian Shield which formed as a result of pre-historic water levels on Lake Superior⁷. This is referred to within the Official Plan as the Shield Line and it

⁵ Source: “Sault Ste. Marie Canal National Historic Site”. Parks Canada, National Historic Sites. 11 Nov. 2017. Web. 14 Nov. 2017: <http://www.pc.gc.ca/en/lhn-nhs/on/ssmarie>

⁶ Source: “Soo Locks – a Wonder of Engineering and Human Ingenuity”. Sault Ste. Marie, Attractions. Web 16 May. 2024: <http://www.saultstemarie.com/attractions/soo-locks/>

⁷ Source: “Location/Climate/Setting”. Official Community Plan. 1996. Web 14 Nov 17. <http://saultstemarie.ca/Cityweb/media/Engineering-and-Planning/Planning/OfficialPlan.pdf>

impacts the development of the City due to its terrain. The Shield Line is depicted in **Figure 1**.

The City has a long history, including an Anishinaabe meeting place and a European trading post.⁸ Sault Ste. Marie became well-developed before and after World War II, largely because of growth in the steel industry. The steel economy required a freight system to ship steel to the United States and elsewhere in Canada.⁹ Today, Sault Ste. Marie has two rail lines which are operated by Canadian National and Canadian Pacific Railways and has an economy that remains connected, in part, to the steel industry.

The City of Sault Ste. Marie is approximately halfway between Toronto and Thunder Bay (700 km to each metropolis). The closest major Canadian city is Sudbury, located over 300 kilometres from Sault Ste. Marie to the east. As such, Sault Ste. Marie is a key regional and economic centre, centrally located in Northern Ontario. Its immediate neighbours include Prince Township to the northwest (2021 Census population of 975), the Algoma District to the north, and Batchewana First Nation (referred to as Rankin Location 15D by Statistics Canada) to the east.¹⁰ Similar to other metropolitan centres in Northern Ontario, the City is a hub that stands alone in the region.

Based on data released by Statistics Canada in 2024, the City's estimated 2022 population was 76,014¹¹ and estimated 2023 population was 78,574¹². The population as of 2021 was 72,051 (2021 Census Subdivision). The 2021 population reflects a decrease in population compared to other recent Census years (-1.8% decrease from

⁸ City of Sault Ste. Marie. (2017). *Local History*. Retrieved January 15, 2018, from City of Sault Ste. Marie: <http://saultstemarie.ca/City-Hall/City-Departments/Community-Development-Enterprise-Services/Community-Services/Recreation-and-Culture/Historic-Sites-and-Heritage/Local-History.aspx>

⁹ Wikipedia. (2018, January 11). *Sault Ste. Marie, Ontario*. Retrieved January 15, 2018, from Wikipedia: https://en.wikipedia.org/wiki/Sault_Ste._Marie,_Ontario

¹⁰ According to the 2021 Census, the Algoma District (North Part) has a population of 6,050 people over a land area of 43,618.95 square kilometres. No 2021 Census population data is available for Rankin Location 15D.

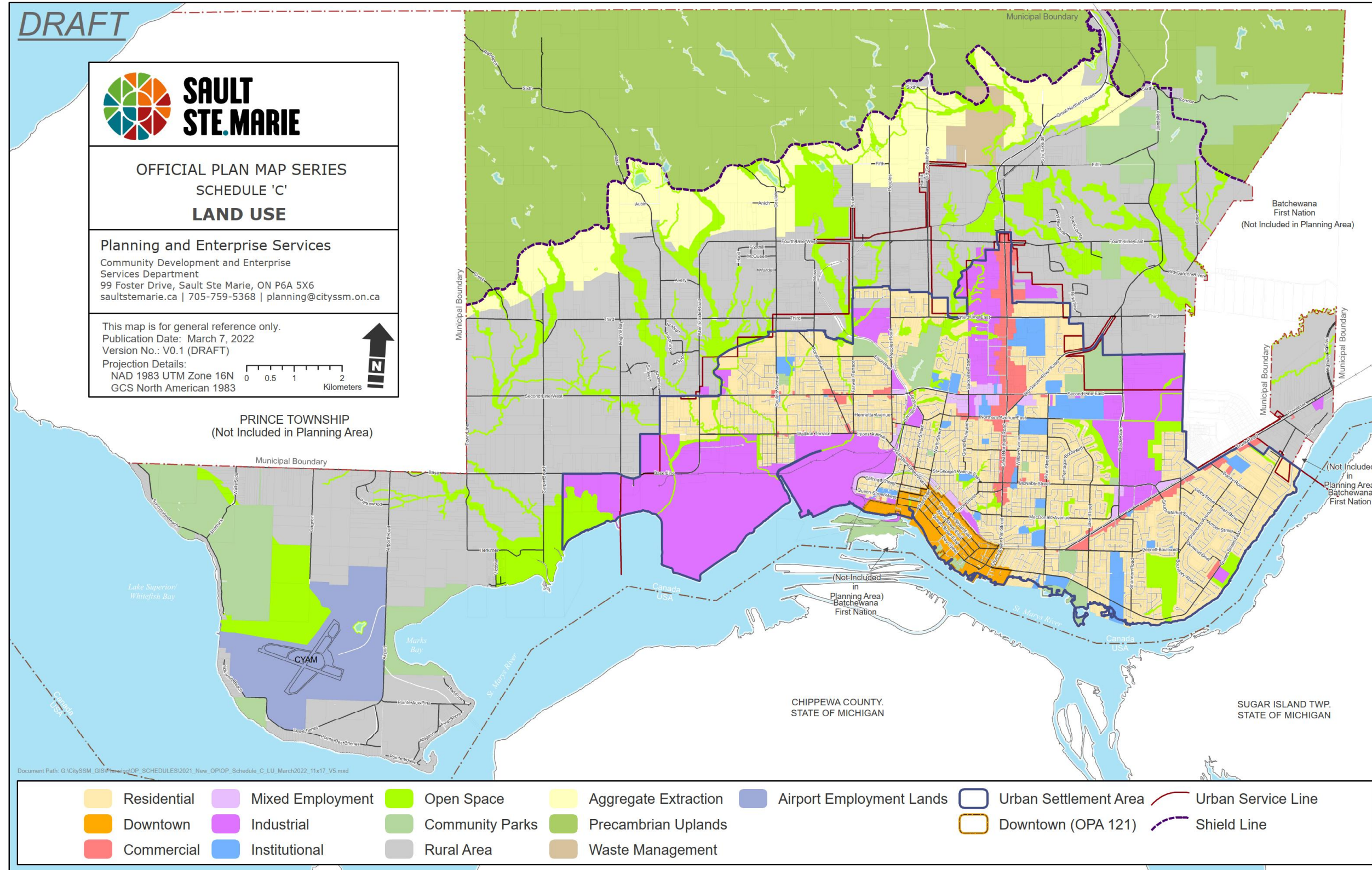
¹¹ According to Statistics Canada. Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries. Retrieved May 30, 2024, from: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015501>

¹² According to Statistics Canada. Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries. Retrieved May 30, 2024, from: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015501>

2016), however, the 2022 and 2023 estimates indicate population growth of 1,335 and 2,560 persons respectively.

The City's population is dispersed across a large geographic area of 221.99 square kilometres (2021 Census Profile). As much of this area is rural in nature (**Figure 1**), which results in an overall population density of 324.6 people per square kilometre (2021 Census Profile). The majority of the population resides within the Urban Settlement Area boundary defined by the City's Official Plan (and Draft Update) and shown in **Figure 1**. The rural area includes natural features like forested areas and wetlands, agricultural lands, clusters of residential development, the airport, and aggregate resource extraction sites. This CRA takes a closer look at the geography of the municipality, its built environment, and its population to assist in defining local needs and circumstances.

Figure 1: City of Sault Ste. Marie Land Use



2.2 Roads, Transit, Bridges and Rail

2.2.1 Road Network

Road networks and transportation systems provide fire services with access throughout a community when responding to emergency calls. The road network is how fire apparatuses travel through a municipality; therefore, it is valuable to consider where there may be a lack of connectivity due to road network design as well as other natural (e.g. rivers, lakes, etc.) or human-made barriers (e.g. rail lines, traffic calming measures, etc.). Road networks can also contribute to vehicle congestion, causing delays in emergency response travel times. Where possible, the city's transportation planning processes should include the SSMFS as a stakeholder to consider emergency service needs and challenges relating to the road network, traffic congestion, traffic calming, and related topics.

Roads are also important from a risk and emergency response perspective because motor vehicle-related incidents often account for a large portion of a fire department's call volume. As described in **Section 10.2.2.3 – Spatial Modelling - Rescue Incidents** of this CRA, 622 calls were motor-vehicle related incidents (vehicle collisions and vehicle extrication combined), and accounting for approximately 69.3% of all rescue calls (4.6% of total calls) responded to by the Sault Ste. Marie Fire Services during a six-year period (2018-2023).

As shown in **Figure 2** and **Figure 3**, the City of Sault Ste. Marie is served by a network of highways, arterial roads, collector roads, and local roads. The TransCanada Highway runs through the City. The primary road network is a modified grid network of urban and rural arterial and collector roads. The local roads are defined by a curvilinear pattern with cul-de-sacs in some areas (impacting the options for entering these areas) and a grid network in others.

As identified within Schedule C of the Official Plan, in the Urban Settlement Area, there are a number of urban arterial roads that travel east to west and north to south, providing connectivity and transportation options through this area. Some east-west arterials include Third Line, Second Line, McNabb Street, Trunk Road, Wellington Street, and Queen Street. Some north-south arterials include Peoples Road, Huron Street, Great Northern Road, Pine Street, and Black Road. Urban collector roads are distributed between the urban arterial roads and connect with the local road network.

Key collector roads include Goulais Avenue, Farwell Terrace, North Street, Willow Avenue, and Boundary Road going north-south, and Northern Avenue and MacDonald Avenue going east-west. In the downtown area of the City, the orientation of the road network is shifted to reflect the constraint of the St. Marys River.

Ontario Highway 17 is a major section of Canada's primary commercial trucking and leisure driving route and is one of the only highways linking the eastern and western regions of the country. The TransCanada Highway (or Ontario Highway 17) travels through Sault Ste. Marie. It is identified as an Urban Arterial Road in Schedule D of the Official Plan. The highway travels along the north coast of Lake Superior from the east. Ontario Highway 17 bypasses downtown Sault Ste. Marie by travelling along Trunk Road, going north along Black Road and continuing north out of the municipality along Great Northern Road.

Outside the Urban Settlement Area, there are rural arterial roads, rural collector roads and local roads. The rural arterial roads include Airport Road, Second Line West, and Highway 17 North. Rural Collectors include Allen's Side Road, Goulais Avenue, Peoples Road and Fourth Line West. Based on a desktop review, the vast majority of roads within the rural area appear to be paved.

It is common within a municipality for road networks to be a contributor to emergency call volume due to motor vehicle collisions. A road network may also impact emergency response times due to congestion. SSMFS identified that during peak hours, some congestion is experienced along major roadways such as Great Northern Road, Second Line, and Trunk Road.

As identified in the Official Plan, the City is considered a 'winter city,' which means that the city faces harsh winter conditions, including heavy snowfall and cold temperatures.¹³ With this, there are additional hazards on the road network in the winter months, including reduced visibility, icy conditions, and snow load narrowing roadways. SSMFS has indicated that hydrants are often covered during winter months because of snow load. In addition, the City's Hazard Identification and Risk assessment highlighted key risks to the road network, including flooding, wildland fires, transportation – rail/aviation, winter storms (snow and freezing rain), public safety threats (road closures), civil

¹³ Source: "Official Plan" Sault Ste. Marie Planning Division 1996. Web 14 Nov 17. <http://saultstemarie.ca/Cityweb/media/Engineering-and-Planning/Planning/OfficialPlan.pdf>

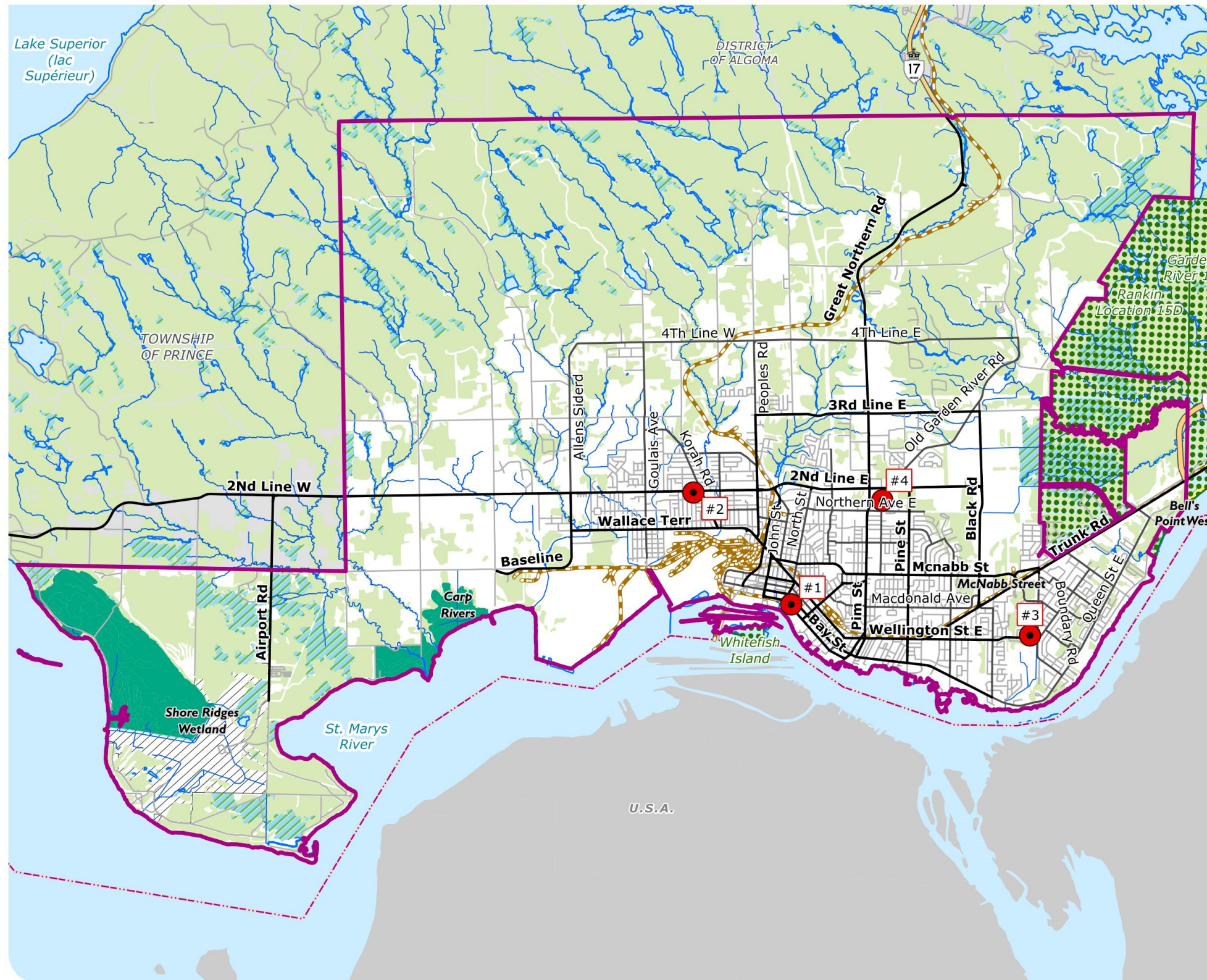
disorder, dam failure, fire/explosion, extreme heat impacting road and rail infrastructure, and hazardous material spills.

The City's road and rail network, including road classifications and rail crossings, is presented in **Figure 3**.

Identified Risk: From 2018 to 2023 motor vehicle-related incidents (collisions and extrications) on the existing road network represent 69.3% of all rescue responses (622 calls) and 4.6% of tot total calls responded to by the Sault Ste. Marie Fire Services.

Key Finding: The large geographic size of the City, divided into urban settlement areas and rural areas, results in extended emergency response times to some areas.

Figure 2: Municipal Overview



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

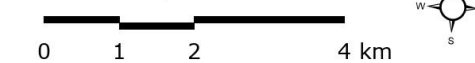
MUNICIPAL OVERVIEW

- Existing Fire Station
- Provincially Significant Wetland
- Locally Significant Wetland
- Unevaluated Wetland
- Water Feature
- Wooded Area

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

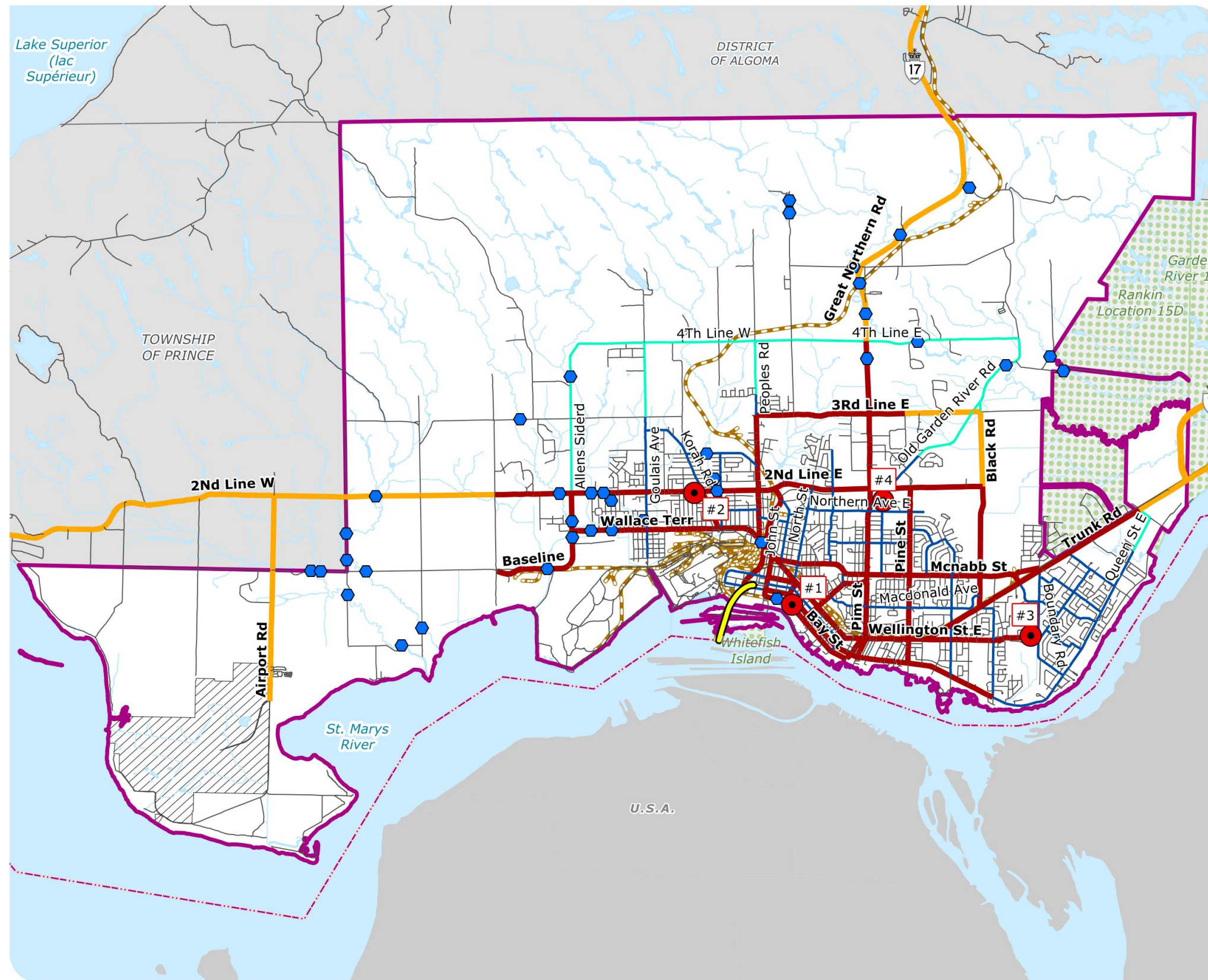
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-30



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Geographic\Geographic.aprx\Natural Features

Figure 3: Transportation Systems



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

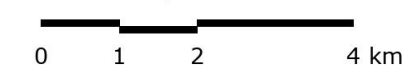
TRANSPORTATION SYSTEMS

- Existing Fire Station
- Bridge
- International Bridge
- Railway
- Airport
- Road Classification (SSM)
 - Local
 - Rural Collector
 - Urban Collector
 - Rural Arterial
 - Urban Arterial

Base Data

- City Boundary
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited

MAP PROJECTION: NAD 1983 UTM Zone 16N
PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-06-04



2.2.2 Bridges

Bridges are considered within a CRA because of a few key considerations: the potential for crossing restrictions due to weight and the potential for impact on network connectivity if a bridge were to be out of service. Based on GIS data, there are 38 bridges located throughout the City, including the International Bridge to the United States. The bridges within the City are shown in **Figure 3**. Many of these bridges are required to cross over water features within the City; however, some bridges have been developed to cross manufactured features such as railway lines or highways. Bridges within the City are geographically distributed in roughly three main areas. A cluster of several bridges cross the Big Carp River near Baseline Road and Town Line Road. Another cluster of bridges is around Allen’s Side Road and Second Line West, crossing over Bennett Creek. There is also a cluster of bridges north of Fourth Line East, where the Root River interacts with the Great Northern Road, as well as some local roads. Discussions with the SSMFS have revealed that all bridges within the City have been upgraded, and all the bridge structures can accommodate fire apparatus. Based on a visual assessment through a desktop review, there are a number of bridge structures west of Fire Station # 2 along key urban arterial roads, including Second Line West, Allen’s Side Road, Wallace Terrace and Base Line Road. However, unless a number of bridges were impacted simultaneously, alternative routes appear to be available.

Sault Ste. Marie also has an International Bridge to the United States of America, located on the southern boundary of the City. This bridge serves as a primary access point for trade and travel between Canada and the United States, crossing the international border and the St. Marys River. The International Bridge is 4.5 kilometres long and was constructed between 1960 and 1962, officially opening to traffic on October 31, 1962.¹⁴ The International Bridge is the only land crossing between the United States and Canada for almost 700 kilometres and connects to Sault Ste. Marie, Michigan. **Table 1** shows the annual traffic across the International Bridge from 2010 to 2022.¹⁵ The highest volume during this period was recorded in 2013, with 2,104,458 vehicles crossing the bridge. Since 2013, there has been a steady decline in annual traffic data to 1,353,149 vehicles per year, as recorded in 2019. The extreme decline in

¹⁴ Source: “International Bridge –Facts and Trivia” Michigan Department of Transportation 2017. Web 14 Nov 17. http://www.michigan.gov/mdot/0,1607,7-151-9618_48384-30286--,00.html

¹⁵ Source: “International Bridge Historical Traffic” International Bridge Administration Web. 28 May 2024. Data retrieved from: <http://www.saultbridge.com/international-bridge-historical-traffic/>

volumes from 2020 to 2022 is considered an anomaly related to the global COVID-10 Pandemic. Services to the bridge are provided through a mutual aid agreement with the neighbouring USA fire department.

Table 1: Sault Ste. Marie International Bridge Annual Traffic

Year	Annual Traffic
2010	1,828,524
2011	1,998,068
2012	2,070,449
2013	2,104,458
2014	1,980,841
2015	1,572,050
2016	1,429,389
2017	1,412,808
2018	1,456,020
2019	1,353,149
2020	340,318
2021	195,657
2022	624,960

Source: "International Bridge –Facts and Trivia" Michigan Department of Transportation
<https://www.saultbridge.com/international-bridge-historical-traffic/>

If one or more of the bridges or overpasses were to be out of service, it could impact the connectivity of the City's transportation network. If the International Bridge was closed or out of service, it would have significant impacts to the local connectivity to neighbouring geography and would impact the local economy of the City.

Key Finding: Bridges, with restrictions or closures, have the potential to reduce the connectivity of the City’s road network, resulting in the potential for delays in emergency response times.

2.2.3 Rail

Rail lines are considered in this CRA for a few key reasons related to emergency services. Firstly, the potential for a rail-based transport incident is a major consideration, as a derailment or accident involving the goods being transported (hazardous materials) could occur, requiring a hazardous materials response. Rail speeds are a relevant factor in the risk of rail-based incidents. Secondly, the physical barrier created by the rail infrastructure, such as a rail yard or the placement of rail infrastructure within and throughout a municipality, can slow down emergency travel and overall response times.

Two rail lines pass through the City of Sault Ste. Marie, as shown in **Figure 3** and **Figure 4**. The rail line entering the City on the east side, called the Webbwood Subdivision, is owned by Canadian Pacific and is leased to Huron Central Railway.¹⁶ Canadian National owns most of the rail yards located in the centre of the City as well as the north-to-south corridor, which moves goods into the United States and north of Sault Ste. Marie. The rail line owned and operated by Canadian National is called The Soo Subdivision. As shown in the figure, one rail line travels adjacent to Trunk Road and Wellington Street with a concentration of spur lines servicing Algoma Steel and a rail yard north of Wellington Street East and east of Bruce Street.

These rail lines necessitate at-grade rail-road crossing where grade-separated crossings are not warranted. There are 54 at-grade crossings and 14 grade-separated crossings within the City (or at the City boundary), as shown in **Figure 4**. At-grade rail crossings present the risk of stopping emergency vehicles while a train is crossing and preventing access if a crossing is closed (e.g. if there is a train accident or track construction) in Sault Ste. Marie, the redundancy provided by the street network and locations of the fire stations reduces the risk of blocked access due to closed rail crossings. Most of the at-grade rail crossings are located on local roads, with the exception of a crossing on Second Line West and in the downtown areas. In the

¹⁶ Source: Railway Investigation Report R15H0092. 2015. Transportation Safety Board of Canada. 23 Nov 17 Web <http://www.bst-tsb.gc.ca/eng/rapports-reports/rail/2015/r15h0092/r15h0092.asp>

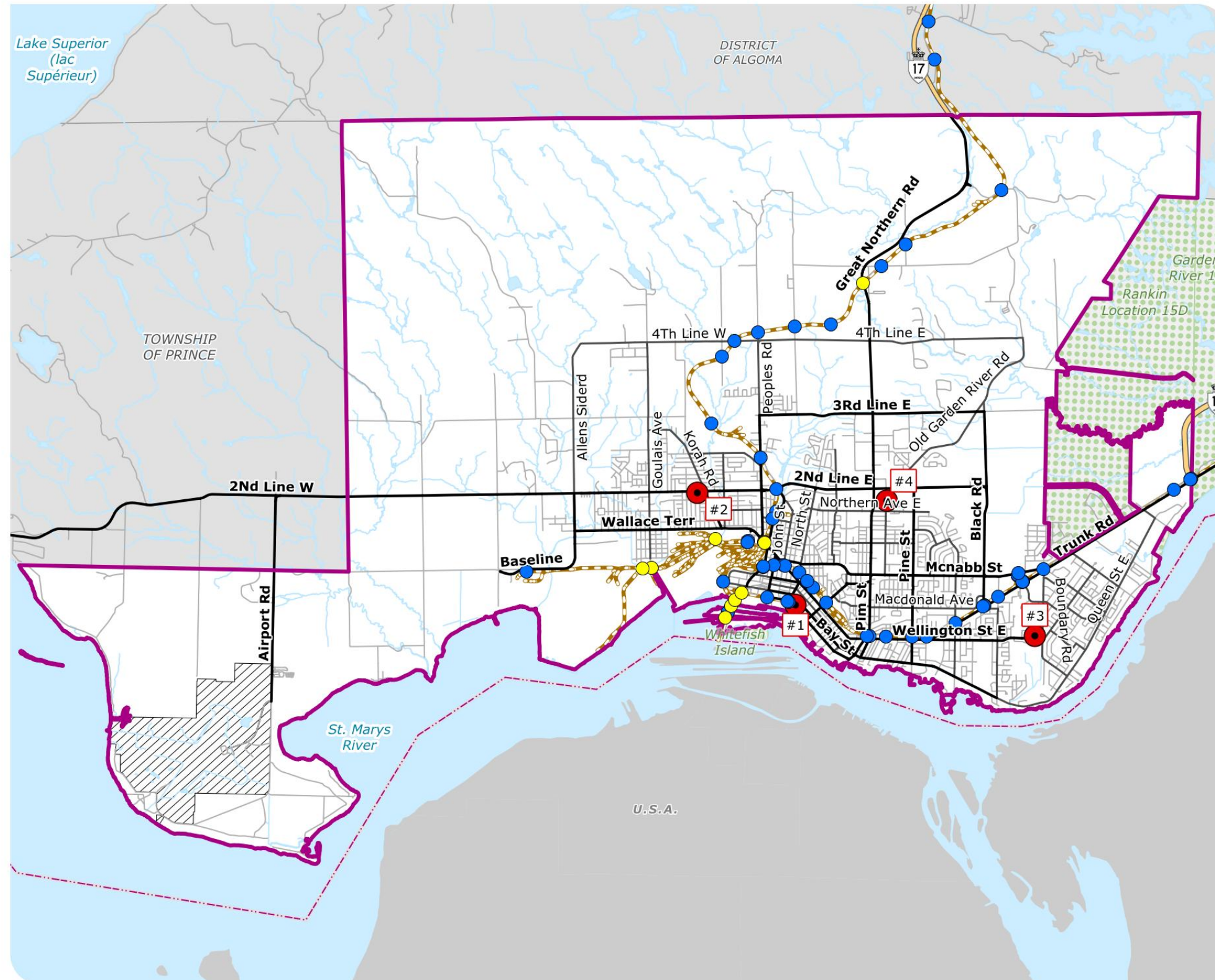
downtown area, there are seven rail crossings, with three located on urban arterial roads. The grade-separated crossings provide access for emergency response across the rail lines in the event that the rail line and at-grade crossing are blocked (e.g. during a rail incident). At-grade crossings can cause delays to emergency response travel times.

In addition to at-grade crossing considerations, depending on the goods being transported, the railway itself may present a higher risk associated with the transportation of dangerous goods through built-up areas. Such risks are receiving renewed focus in part through municipal emergency planning programs. (Transport Canada requires that railways provide historical data on dangerous goods to municipal emergency responders to better plan for emergencies). The portions of rail lines intersecting the City are used by both Canadian National and Canadian Pacific to transport goods, which may include those which are potentially flammable and explosive.

Identified Risk: The rail lines within the City present a risk of a rail-based transport incident such as a derailment or accident, including the potential of hazardous materials.

Key Finding: Grade level rail crossings could create a physical barrier to the connectivity of the City's road network that could result in delays in emergency response times.

Figure 4: Rail Crossings



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

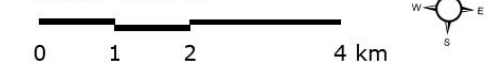
RAILWAY CROSSINGS

- Existing Fire Station
- Railway Crossing**
- At Grade
- Grade Separated

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N
PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-21



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Geographic\Geographic.aprx\Railway_Crossings

2.2.4 Airport

Airports and airline facilities facilitate the movement of material goods and people, serving as gateways of connectivity to other municipalities and regions that can contribute to the economic growth and development of the City. They play an essential role in trade, commerce and product distribution and provide a common mechanism through which people travel. Airports also present unique hazards related to aircraft and supporting infrastructure. In addition to those using this type of transportation, these hazards can include the use of aircraft fuel and the transportation of dangerous goods.

The Sault Ste. Marie Airport (YAM), located in the southwest corner of the City, is an International Airport operated by the Sault Ste. Marie Airport Development Corporation. There are three passenger airlines and five cargo services that use the airport, as summarized in **Table 2**.

Table 2: Airlines Operating at Sault Ste. Marie Airport

Airport Services	Airlines
Regular Passenger Service	Air Canada Bearskin Airlines Porter Airlines Air Canada Cargo Bearskin Airlines Cargo
Cargo Service	Canpar Express FedEx (Federal Express) SkyLink Express

Source: Sault Ste. Marie Airport Development Corporation. (n.d.). Retrieved May 2024, from Airlines: <http://saultairport.com/services/airlines/>

The airport provides most of its own services, including emergency response and fire suppression, and has its own water supply.¹⁷ It has been identified as part of the data collection for this CRA that support services are provided to the airport by SSMFS in the form of fire suppression staff, providing incident command, and complementing the existing airport water supply. However, from the perspective of the road network, there

¹⁷ Source: Sault Ste. Marie Airport Development Corporation. (n.d.). Retrieved November 2018, from Airlines:

<http://saultairport.com/investment/>

is some concern regarding access to the airport, as currently, the airport can only be accessed from Airport Road. Any incidents along this primary access route could impede the ability of SSMFS to respond, which is already roughly 15 minutes (from Station #2).

Identified Risk (Special Consideration): The Sault Ste. Marie Airport presents unique fire-related risks associated with aircraft, supporting infrastructure, and the transportation of potentially dangerous goods, requiring specialized fire protection services.

2.2.5 Location Analysis: Airport

Though the airport has some dedicated emergency response services, SSMFS responds to certain airport emergency calls, as well as to emergencies extending beyond the airport boundary. **Table 3** outlines calls received by SSMFS from within the airport area based on SSM Mapped Unit Response Data from 2012 to 2016. The annual number of calls originating from the Airport area has remained consistently low (approximately 10 calls per year) over the past five years, with the majority of calls (59% of the total calls over the five years) being ‘False Fire Calls.’

Table 3: Emergency Calls Originating from Airport Area

Call Type	2017	2018	2019	2020	2021	2022	2023	Total	%
False Alarm Call	1	10	6	2	2	6	1	28	76%
Other Response	2	0	0	0	1	1	0	4	11%
Medical/Resuscitator Call	1	1	1	0	0	0		3	8%
Rescue	0	0	0	0	0	1	0	1	3%
Pre-Fire Conditions/No Fire	0	0	0	1	0	0	0	1	3%
Property Fires/Explosions	0	0	0	0	0	0	0	0	0%
TOTAL	4	11	7	3	3	7	1	37	100%

Air transportation-related incidents were identified as ‘low risk’ through the City’s 2021 Hazard Identification and Risk Assessment (document), discussed further in the **Hazard Profile**.

Key Finding: From 2017 to 2023, SSMFS responses to the airport are primarily for calls categorized as False Alarm Calls.

2.3 Waterways, Conservation Areas and Trails

Waterways and Conservation Areas are important from a risk perspective in part due to recreational activities that take place and the natural hazards that they present (e.g., flooding). **Figure 5** shows the natural features which are located throughout the City including rivers, creeks, wetlands, parks and significant woodlands surrounding the City.

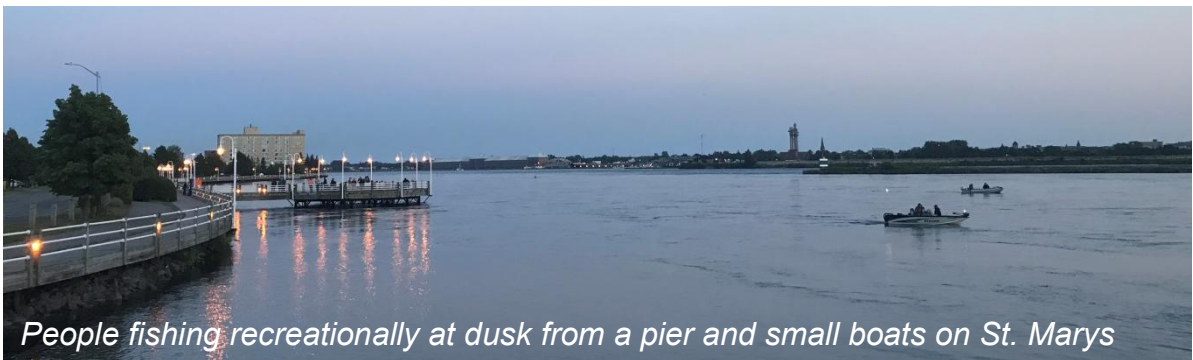
2.3.1 Waterways

As identified in Section 1.0 of the Official Plan, Sault Ste. Marie “has a river valley setting” and is nestled on the shores of Lake Superior and St. Marys River. The river is a major corridor connecting Lake Superior and Lake Huron, separating Canada from the

United States. Other rivers and creeks within the City boundary, as shown in **Figure 5**, include:

- Big Carp River;
- Little Carp River;
- Bennett Creek;
- Fort Creek;
- Root River;
- Coldwater Creek;
- Crystal Creek; and
- Clark Creek.

Waterways throughout the City pose a potential risk in part due to the recreational activity that occurs on them. Residents and tourists alike, for example, enjoy fishing in local areas, including the St. Marys River. An additional consideration is that during summer months, flooding and/or faster currents could occur, and there is potential for swift water, which has unique needs from a rescue perspective. During winter months, the frozen streams and rivers pose a risk, and incidents could necessitate ice rescues.



People fishing recreationally at dusk from a pier and small boats on St. Marys

Identified Risk: The presence of waterways within the City of Sault Ste. Marie, including the unique characteristics of the St. Marys River, creates a potential risk for water-based incidents.

2.3.1.1 Marinas and Boating Facilities

There are two marinas along the St. Marys River that are owned and operated by the City. Bellevue Marina, located at 1 Pine Street, provides 155 slips, including both serviced and unserviced. The marina offers fuel (diesel and unleaded) and oil, as well as washrooms, shower facilities and boater information services. This location is also a

Canada Customs check-in point. Roberta Bondar Transient Marina, located at 65 Foster Drive, is a transient boater facility with 38 serviced slips and 450 feet of dock face. It provides fuel (diesel and unleaded), as well as boater services.

The Algoma Sailing Club is located at 41 Lake Street, Bellevue Park on the shore of the St. Marys River, and allows members to store and launch sailboats.

In general, the recreational use of private boats can, at times, generate calls for emergency services, such as water rescue. Marinas and boating clubs, during their open seasons, can present unique and complex fire safety risks. For example, boats are often aligned in close proximity to one another, which presents a fire risk, as a fire aboard one boat can rapidly spread to an adjacent boat if adequate fire safety measures are not in place. The fuel tanks on boats (and even small fuel tanks on sailboats) add to the overall fuel load where boats are docked. Many vessels also have fuel on board for the purpose of cooking.

At the two marinas in Sault Ste. Marie and the sailing club boats are stored closely together, so there is a large fuel load in one area. There are no hotels associated with the marinas or the sailing club, but some larger boats include living quarters. This presents an increased fire risk due to the presence of cooking facilities, more complex mechanical systems, and occupants sleeping on the boat.

NFPA 303 Standard for Marinas and Boatyards includes a number of important topics related to a safer marine environment and is intended to provide a minimum level of safety from fire as well as electrical safety at marinas and boatyards. Educating boat owners and marina operators about potential fire and electrical risks will help them identify the hazards in this setting. Regular inspection cycles of local marinas by the SSMFS could assist in the prevention of marina fires.

Key Finding: The presence of two marinas and a boating club along the City's shoreline presents unique and complex fire safety risks due to fuel load, boats stored in close proximity to one another, and the potential for occupants to sleep on boats.

2.3.2 Great Lakes Cruises

The City of Sault Ste. Marie is a 'Port of Call' for two cruise tours offered by the Great Lakes Cruises company. The cruises travel on the 'Pearl Mist' cruise ship, which can accommodate up to 210 cruise guests in addition to cruise staff. These tours bring an

influx of tourists to the City. The cruise ship activity presents some unique risks with the high population of people travelling on one vessel. Fires on board the ships are the responsibility of the crews.

Key Finding: The use of the City as a Port of Call for cruise ships travelling within the Great Lakes presents unique and complex fire safety risks when cruise ships are docked at the City’s shoreline.

2.3.3 Conservation Areas

As depicted in **Figure 5**, two provincially significant wetlands are located in the western portion of the City called Carp Rivers Wetland and Shore Ridges Wetland. The Shore Ridges Wetland is a part of one of the four Conservation Areas (CA) in the City – the Shore Ridges Conservation Area. The three other conservation areas are Mark’s Bay Conservation Area, Fort Creek Conservation Area, and the Hiawatha Highlands Conservation Area. Some traits of these areas, including location and recreational opportunities, are summarized in **Table 4**. The Fort Creek Conservation Area includes a portion of the Hub Trail (a 25-kilometre trail for non-motorized uses that circles the City), with a portion that travels along the waterfront. Given the location of some of these recreational opportunities within the City and limited access to the trail system, there is a potential impact on emergency response in the event of an incident.

Table 4: Sault Ste. Marie Conservation Areas

Conservation Area	Size	Location	Recreational Opportunities
Shore Ridges Conservation Area ¹	443 ha	The western boundary of the Municipality, on the shores of Lake Superior	Hiking, cross-country skiing, and snowshoeing
Mark’s Bay Conservation Area ²	103 ha	East of Airport Road, on the shores of St. Marys River	Old logging roads and deer corridors provide the opportunity for hiking and winter activities. Boat launch and swimming.

Conservation Area	Size	Location	Recreational Opportunities
Fort Creek Conservation Area ³	77 ha	North-east intersection of Peoples Road and Second Line	Hiking, cycling, cross-country skiing, and snowshoeing. Includes a portion of the Hub Trail. Originally purchased for flood control purposes.
Hiawatha Highlands Conservation Area ⁴	892 ha	East of Great Northern Road, between Fifth and Sixth Line	Hiking, park amenities, cycling, mountain biking, winter cycling, snowshoeing, and cross-country skiing (Soo Finnish Nordic Ski Club)

¹ Source: Conservation Ontario. (2015). Shore Ridges Conservation Area. Retrieved September 20, 2017, from Conservation Ontario:

<https://ontarioconservationareas.ca/component/mtree/conservation-authorities-of-ontario/sault-ste-marie-region/sault-ste-marie-region-explore-the-shore/shore-ridges-conservation-area>

² Source: Sault Ste. Marie Region Conservation Authority. (2017). Mark's Bay Conservation Area. Retrieved September 20, 2017, from Sault Ste. Marie Region Conservation Authority: <http://ssmrca.ca/recreation/marks-bay-conservation-area/>

³ Source: Sault Ste. Marie Region Conservation Authority. (2017). Fort Creek Conservation Area. Retrieved September 20, 2017, from Sault Ste. Marie Region Conservation Authority: <http://ssmrca.ca/recreation/fort-creek-conservation-area/>

⁴ Source: Conservation Ontario. (2015). Hiawatha Highlands Conservation Area. Retrieved September 20, 2017, from Conservation Ontario: <https://ontarioconservationareas.ca/component/mtree/conservation-authorities-of-ontario/sault-ste-marie-region/hiawatha-highlands-con-area?Itemid>

Emergency incidents experienced in these types of natural settings could require services such as water rescue or high-angle rescue, for example. The Response Profile

presents the results of the analysis of technical rescue calls, including those related to water rescues.

Key Finding: Recreational activities within the City’s conservation areas, such as hiking, cycling, and snowmobiling, have the potential to generate calls for emergency services, such as rescue calls.

2.3.4 Trails

A vast network of non-motorized trails (used for walking, hiking, cycling, etc.) and motorized trails (used for snowmobiling, All Terrain Vehicles (ATVs) and dirt bikes), exist within the City and the surrounding area.

The City of Sault Ste. Marie is experiencing an increase in active transportation, supported by the City’s network of bike lanes, paths and trails. This includes the John Rowsell Hub Trail, a 25-kilometre multi-use (non-motorized) trail system that connects points such as the Fort Creek Conservation Area, Bellevue Park, Algoma University, Sault College, the hospital, and the waterfront walkway. The trail is used by residents, students, and tourists.

The City and Algoma County host hundreds of kilometres of motorized snowmobiling trails, such as the Soo Highlands Loop, and marked ATV trails. The trails provide recreation and are a tourist attraction within the City and region.

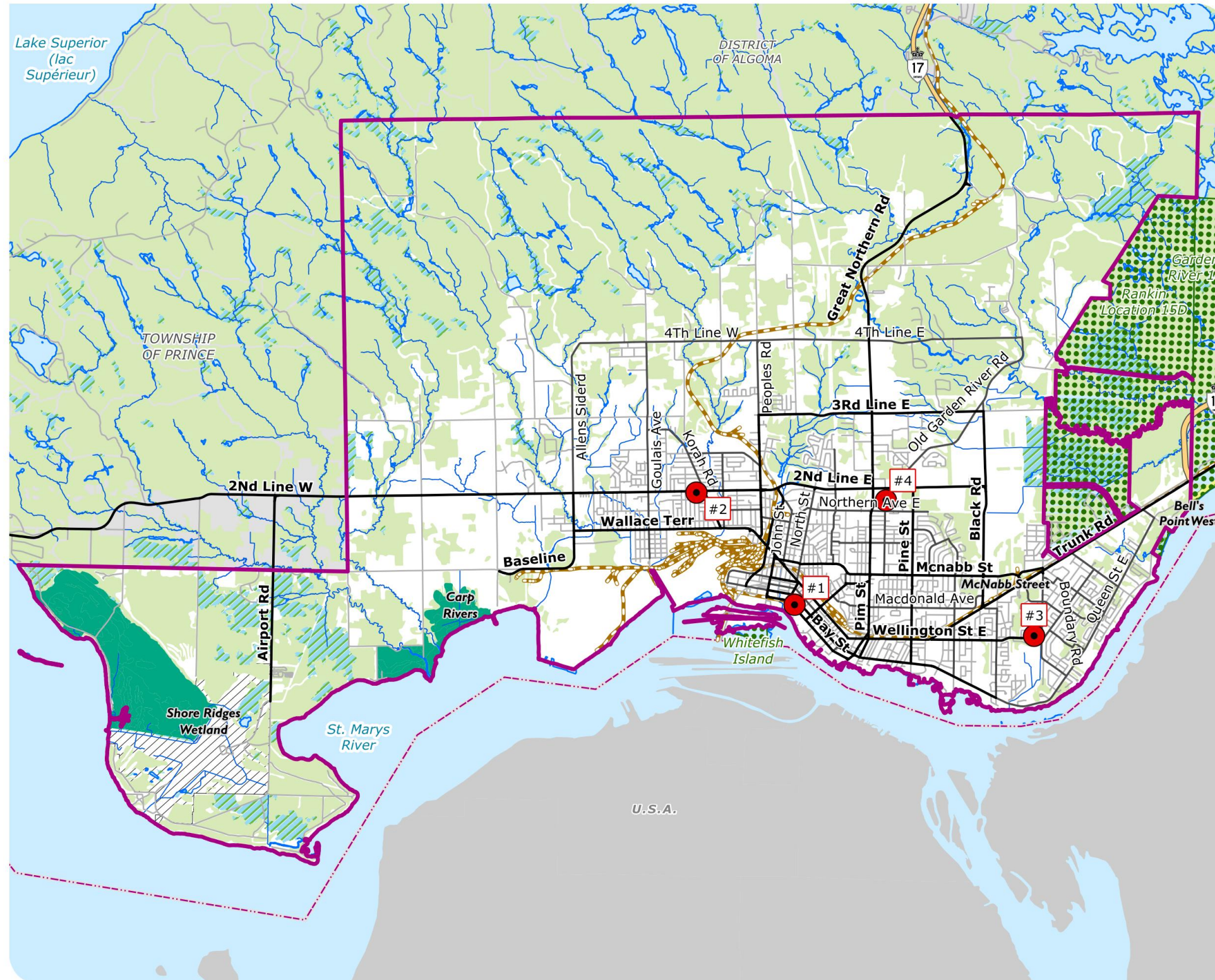
Key Finding: Recreational trails, including multi-use non-motorized trails and motorized trails within the City and surrounding area, have the potential to generate calls for emergency services, such as rescue calls.

2.3.5 Topography

Figure 6 shows the topography of the City. A key distinctive feature within the municipality is referred to in the Official Plan as the ‘shield line’ and is a result of a historic low land plateau with the shield line being “outcroppings of Precambrian rock of the Canadian Shield Highland” 30 metres above the shore line (pg., 1 of the Official Plan).¹⁸ This feature results in a natural boundary with the rural area and is illustrated in **Figure 6**.

¹⁸ Sault Ste. Marie (1996) Official Plan <http://saultstemarie.ca/Cityweb/media/Engineering-and-Planning/Planning/OfficialPlan.pdf>

Figure 5: Natural Features



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

NATURAL FEATURES

- Existing Fire Station
- Provincially Significant Wetland
- Locally Significant Wetland
- Unevaluated Wetland
- Water Feature
- Wooded Area

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

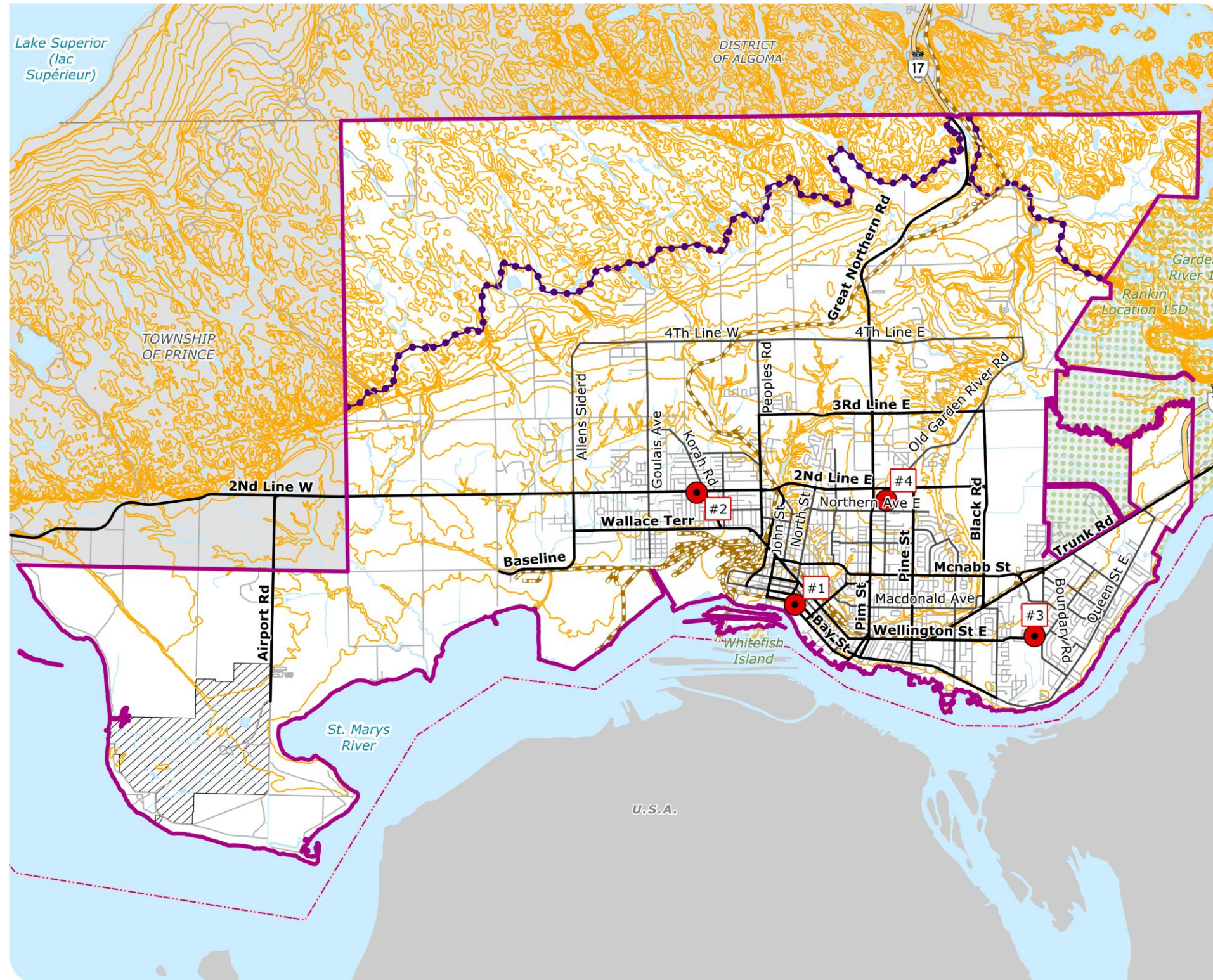
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-30



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Figure 6: Topography



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

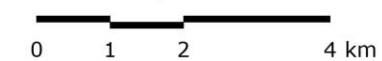
TOPOGRAPHY

- Existing Fire Station
- Shield Line
- 5m Contour

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-21



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2.4 Wildland-Urban Interfaces

TG 02-2019 and NFPA 1730 - Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition) identify wildland-urban interface as geography-based risk for consideration. This interface refers to the area of transition between unoccupied land and human development. This transition area can be comprised of a mix of woodlots, bush, or grass.

The frequency and intensity of wildfires and major incidents, such as the Fort McMurray forest fire in 2016, have garnered significant attention in the fire industry, media, municipalities, and the general public. This section provides an overview of wildfires, the wildland-urban interface, legislative context and policy tools, and spatial analysis.

2.4.1 Overview of Wildfires

As identified in the Province of Ontario's Wildland Fire Risk Assessment and Mitigation Reference Manual (Reference Manual), wildfires are the second most common type of natural disaster that is reported in Canada next to flooding, though wildfires occur more frequently.¹⁹ Based on the Canadian National Fire Database, over 8,000 forest fires occur each year, burning an annual average of 2.1 million hectares of land²⁰. This has increased from approximately 1,000,000 hectares per year in the early 1970s.²¹ The key ignition sources of wildfires are either human-caused or through lightning, with lightning fires accounting for 35% of total fires in Canada and 85% of the area burned, according to the Forestry Adaptation Community of Practice Webinar (FACoP).²²

As described in the FACoP webinar, overall climate change will have an impact on the frequency and intensity of wildfires (recognizing that there would be spatial and temporal variability in the impact). This is in part because of the four key factors that impact forest fires: fuel, ignition, weather, and human footprint (such as land use and

¹⁹ Source: Ontario Ministry of Natural Resources. April 2017. Wildland Fire Assessment and Mitigation Reference Manual in Support of Provincial Policy Statement, 2014. Toronto: Queen's Printer for Ontario

²⁰ Source: Canadian National Fire Database (CNFDB). Retrieved from: <https://cwfis.cfs.nrcan.gc.ca/ha/nfdb> June 2024.

²¹ Source: Forestry Adaptation Community of Practice Webinar (2017) The Future of Wildland Fire in Canada – Hot and Smoky? By: Mike Flannigan

²² Source: Forestry Adaptation Community of Practice Webinar (2017) The Future of Wildland Fire in Canada – Hot and Smoky? By: Mike Flannigan

fire management policies). Climate change has a direct impact on the weather factor from the perspective of impacting temperature, precipitation, and atmospheric moisture, for example. Warmer temperatures will increase the potential for lightning, therefore increasing the potential for a wildfire ignition source. Warmer temperatures will also lead to less air moisture and, in some cases, less precipitation to mitigate the spread of wildfire. In addition, warmer temperatures will lead to longer fire seasons and more susceptibility to wildfires. According to the Province of Ontario's Wildland Fire Risk Assessment and Mitigation Reference Manual, research shows that the total number of fires in Ontario could increase by 15 percent by 2040 and by 50 percent by 2100.²³

2.4.2 Wildland-Urban Interface

The wildland-urban interface is defined within the Reference Manual as “*any point where the fuel feeding a wildland fire changes from natural (wildland) fuel to human-made fuel*”.²⁴ Therefore, wildland fire hazard and associated risks are created where human activity and development intersect with forested areas. However, historically, wildfires were thought to be primarily a fuel load (forested area) problem, and efforts were taken to combat the wildfire after ignition including direct firefighting costs. This traditional approach is becoming less attractive economically and from an effectiveness perspective. This is compounded when considering the possible impacts of climate change.²⁵

Similar to the application of the first two lines of defence within the fire service in Ontario, where fire suppression is the failsafe, a prevention/mitigation lens can also be applied to wildfires. As mentioned, historically, this lens was applied to manage wildfires through suppression. However, as stated in an article published in the Proceedings of the National Academy of Sciences, the impact of wildfires can be more effectively reduced by focusing on the surrounding vegetation as well as the ignition potential of

²³ Source: Ontario Ministry of Natural Resources. April 2017. Wildland Fire Assessment and Mitigation Reference Manual in Support of Provincial Policy Statement, 2014. Toronto: Queen's Printer for Ontario

²⁴ Source: Ontario Ministry of Natural Resources. April 2017. Wildland Fire Assessment and Mitigation Reference Manual in Support of Provincial Policy Statement, 2014. Toronto: Queen's Printer for Ontario, pg. 8.

²⁵ Source: Forestry Adaptation Community of Practice Webinar (2017) The Future of Wildland Fire in Canada – Hot and Smoky? By: Mike Flannigan

buildings, not just fighting the fire.²⁶ This approach is supported through recent guiding policy documents explored in the next section.

2.4.3 Legislative and Policy Framework

Within Ontario, the legislative framework for wildfires is established primarily in the *Forest Fires Prevention Act*, 1990 (FFPA), as well as the *Emergency Management and Civil Protection Act*, 1990 (EMCPA), which outlines the emergency management program requirements required from municipalities. (Further discussion on the EMCPA can be found in the Fire Master Plan). The FFPA sets out the legislation that guides wildland fire management, including establishing the fire season, permitting, fire restriction zones, and fire suppression responsibilities of local authorities.²⁷ The implementation of *Forest Fires Prevention Act* and the EMCPA is supported by Ontario's FireSmart program, which is a voluntary program that focuses on reducing wildfire risks through identification of hazards, education, and mitigation.²⁸

Land use in Ontario is regulated by the *Planning Act*, 1990 with policy direction provided through the 2014 Provincial Policy Statement (PPS). PPS policy 3.1.8 states that development shall be directed outside of lands that have a presence of hazardous forest types for wildland fire and that if development is permitted, risk must be mitigated in accordance with the wildland fire assessment and mitigation standards.²⁹ The Ontario Ministry of Natural Resources and Forestry's **Wildland Fire Risk Assessment and Mitigation Reference Manual** (Published July 24, 2018, and updated June 16, 2021) was created in support of the Provincial Policy Statement in part to provide clarity on the stated policies. Local policy approaches - including Official Plans, zoning by-laws, site plan control tools, and Ontario Building Code enforcement through planning authorities - emphasize the opportunity to reduce risk by focusing on buildings through land use planning.

²⁶ Calkin, David E, Cohen, Jack D, Finney, Mark A, Thompson, Matthew P (2013) How risk management can prevent future wildfire disasters in the wildland-urban interface.

²⁷ Source: Ontario. 2017. *Forest Fire and Protection Act*, R.S.O. 1990, Chapter F. 24

²⁸ Source: What is FireSmart? 2017. FireSmart Canada 23 Nov 17. Web.

<https://www.firesmartcanada.ca/what-is-firesmart>

²⁹ Source: Ontario Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement, 2014. 3.1.8. Toronto: Queen's Printer for Ontario.

Part 2 of the Reference Manual provides Wildland Fire Assessment and Wildland Fire Mitigation Techniques. This includes guidance on conducting a wildland fire assessment through a “*review of generalized MNRF wildland fire hazard mapping, planning authority mapping, [and] broad level site assessment*” (pg. 19). The Reference Manual recommends that “local planning authorities undertake a broad-level/municipal-wide wildland fire assessment.”³⁰ While this CRA considers available information to review this risk at a high level, this study does not reflect a wildland fire assessment as described within the Reference Manual. However, it does review the generalized MNRF wildland fire hazard mapping, as well as additional source of spatial information from Natural Resources Canada, as described in the section that follows.

2.4.4 Identifying the Wildland-Urban Interface in Canada

In 2016, research was conducted at the University of Alberta to define and map the wildland-urban interface in Canada. The analysis was based on national datasets around structures/infrastructure as well as land cover to identify interface areas. An interface refers to those areas where a structure may be at risk of a fire due to wildfires. Interfaces were defined spatially by assessing the fuel area surrounding structures based on a buffer. This research resulted in national spatial mapping of the wildland-urban interface, which is housed at and provided by the Government of Canada’s Canadian Forest Service, Natural Resources Canada.³¹

The resulting spatial data reflects three different datasets: wildland-urban interface; wildland-industrial interface; and infrastructure interface. The wildland-urban interface (WUI), as defined in the research, refers to areas “*where homes or other community structures meet with or are interspersed with wildland fuels*”.³² The wildland-industrial interface (WII) shows the interface of wildland fuels with industrial structures such as oil and gas or mining structures. The infrastructure interface illustrates the interface of infrastructure such as transmission lines, roads, or railways.

³⁰ In addition to the Reference Material, the National Fire Protection Association has standards on wildfire including NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas, NFPA 1143 Standard for Wildland Fire Management, and NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire.

³¹ Johnston, Lynn M. (2016) Mapping Canadian Wildland Fire Interface Areas. MSc thesis. Department of Renewable Resources. University of Alberta. 161 pgs. doi: 10.7939/R3GT5FR9Z.

³² Johnston, Lynn M. (2017). Interface Mapping Readme

It is important to note that the WUI, WII, and infrastructure interface identified in the mapping **do not reflect an area at risk** but an area of potential risk. In addition, data was generated based on information that lends itself to analysis at a regional or community scale, not at smaller scales (neighbourhood/single structure).³³ The mapping analysis of this data is presented in the following section.

2.4.5 Mapping Analysis: Sault Ste. Marie Wildland-Urban Interface

This section explores the spatial data described above, including the Ministry of Natural Resources and Forestry's Potential Hazardous Forest Types for Wildland Fire and the three interface datasets from Natural Resources Canada.

Figure 7 illustrates the potential hazardous forest types for wildland fires based on data provided by the MNFR. This figure shows that the majority of potential forest-type hazard levels in the City are low and are located primarily in the northern part of the City (around and above the Shield Line) as well as around the airport. There are some pockets of moderate hazardous forest type and an 'edge' of high hazardous forest types roughly south of Fourth Line West.

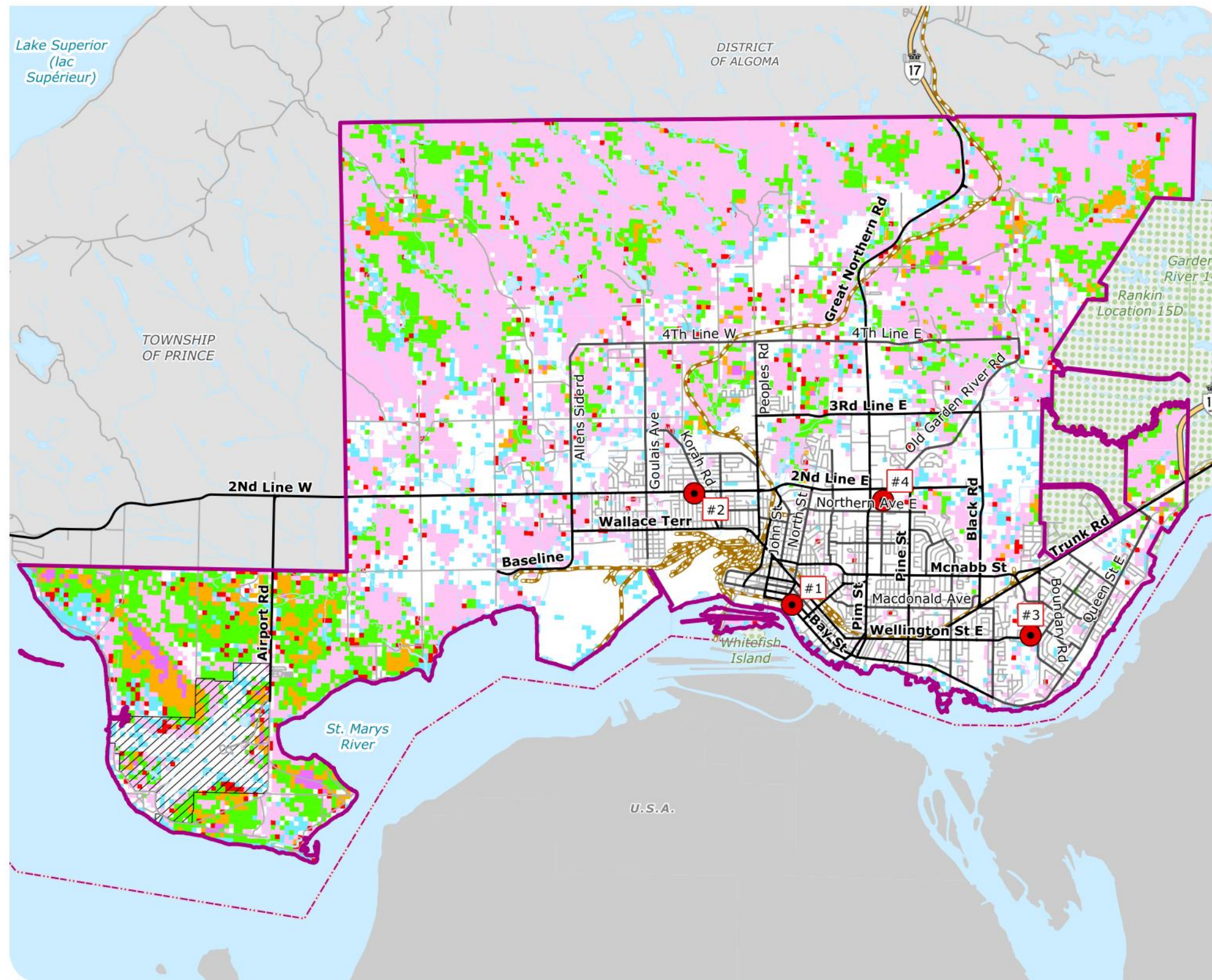
Figure 8 depicts the extreme and high-risk forest types. This identifies the wildland-urban interface throughout Sault Ste. Marie, which is generally located outside of the Urban Settlement Area. A key area where the wildland-urban interface is prevalent is around the Sault Ste. Marie Airport and Airport Road. There is also a large portion of the interface located north-east of the Great Northern Road Fourth Line East. Both of these areas are characterized by dense forest and some residential development.

The Wildland Urban interface is present along the western, northern, and eastern boundaries of Sault Ste. Marie, where there is an interaction of wildland fuel with community infrastructure or structures. Most of the wildland-urban interface is outside the Urban Settlement Area.

Identified Risk: The City has risk of wildland fire due to potential hazardous forest types and the wildland-urban interface primarily outside of the Urban Settlement Area.

³³ Johnston, Lynn M. (2017). Interface Mapping Readme

Figure 7: Potential Hazardous Forest Types for Wildland Fire (MNRF)



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

POTENTIAL HAZARDOUS FOREST TYPES FOR WILDLAND FIRE

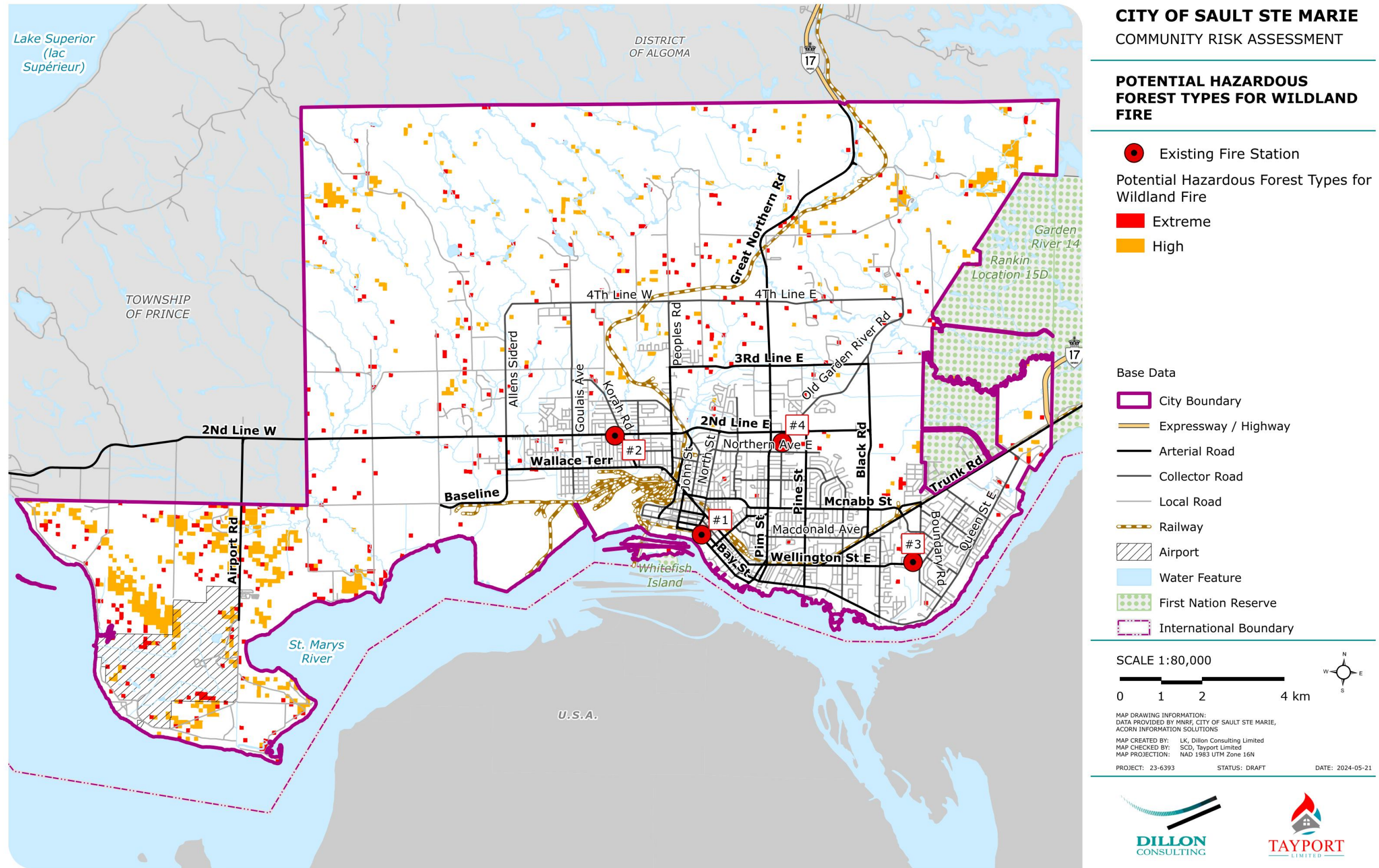
- Existing Fire Station
- Potential Hazardous Forest Types for Wildland Fire
 - Extreme
 - High
 - Moderate
 - Pine Needs Evaluation
 - Low
 - Water
- Base Data
 - City Boundary
 - Expressway / Highway
 - Arterial Road
 - Collector Road
 - Local Road
 - Railway
 - Airport
 - Water Feature
 - First Nation Reserve
 - International Boundary

SCALE 1:80,000
0 1 2 4 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N
PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-21



Figure 8: Potential Hazardous Forest Types for Wildland Fire (MNRF) – Extreme and High Risk



3.0 Building Stock Profile

The building stock found in a community is one of the key drivers of risk from the perspective of fire services. 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 City. Important considerations include the Ontario Building Code occupancy classification, the number of buildings of each type, the number of buildings of each use, and any building-related risks known to the fire service. There are potential fire risks associated with different types or uses of buildings, given the presence or absence of fire safety systems and equipment at the time of construction and maintenance thereafter. This section considers these building characteristics within the City of Sault Ste. Marie.

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 building uses. This includes consideration of each occupancy classification's prevalence 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. Utilizing the OBC major building occupancy classifications is consistent with the intent of TG-02-2019 to provide a recognized definition and baseline for developing a community risk assessment.

The OBC is divided into six major building occupancy classifications (groups). Within each group, the occupancies are further defined by division. The OBC major classification groups and divisions are presented in **Table 5**.

Table 5: OBC Major Occupancy Classifications

Group	Division	Description of Major Occupancies
Group A	1	Assembly occupancies intended for the production and viewing of the performing arts
Group A	2	Assembly occupancies not elsewhere classified in Group A
Group A	3	Assembly occupancies of the arena type
Group A	4	Assembly occupancies in which occupants are gathered in the open air
Group B	1	Detention occupancies
Group B	2	Care and treatment occupancies

Group	Division	Description of Major Occupancies
Group B	3	Care occupancies
Group C	All divisions	Residential occupancies
Group D	All divisions	Business and personal services occupancies
Group E	All divisions	Mercantile occupancies
Group F	1	High-hazard industrial occupancies
Group F	2	Medium-hazard industrial occupancies
Group F	3	Low-hazard industrial occupancies

Source: Ontario Building Code ³⁴

3.2 OFM Fire Risk Sub-Model Occupancy Classifications

The Fire Risk Sub-model developed by the OFM utilizes the major group classifications (i.e. Group A, B, C, D, E, F), but does not use the detailed division classifications as included in the OBC. This strategy provides the ability to assess buildings within a community comparatively by major occupancy groups, thus providing a consistent and recognized definition for each major occupancy type. This strategy provides the opportunity for further analysis of a specific occupancy group. Subject to any site-specific hazards or concerns, occupancies within this group can be assessed individually and then included where required within the scope of the broader Community Risk Assessment. The OFM Fire Risk Sub-Model OBC classifications, definitions and associated fire-related risks are presented in **Table 6** along with potential proactive measures to reduce risk within these occupancy types.

³⁴ Ontario Regulation 332/12: Building Code, Part III Fire Protection, Occupant Safety and Accessibility, Section 3.1.2.1.

Table 6: 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 people for civic, political, travel, religious, social, educational, recreational or similar 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.	<ul style="list-style-type: none"> • Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved fire safety plan and staff training • Pre-planning by fire suppression staff
Group B	Care or Detention Occupancies	<p>A care or detention occupancy means the occupancy or use of a building or part thereof by people who:</p> <ul style="list-style-type: none"> • 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 are available and prepared to quickly respond according to the facility’s approved fire safety plan.	<ul style="list-style-type: none"> • 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 people 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.	<ul style="list-style-type: none"> • Home smoke alarm programs • Public education programming, including home escape planning • Retrofit 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.	<ul style="list-style-type: none"> • 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, in addition to the hazards of a higher number of occupants.	<ul style="list-style-type: none"> • Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved Fire Safety Plan and staff training • Pre-planning by fire suppression staff
Group F	High/Medium/Low Hazard Industrial	An industrial occupancy is defined as one for the assembling, fabricating, manufacturing, processing, repairing or storing of goods and materials. This category is divided into low hazard (F3), medium hazard (F2) and high hazard (F1) based on its combustible content and the potential for rapid fire growth.	These occupancies constitute a special fire hazard due to 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).	<ul style="list-style-type: none"> • 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

Source: OFM Fire Risk Sub-Model³⁵

³⁵ Office of the Fire Marshall and Emergency Management. (2016, February). Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model. Retrieved from Ministry of the Solicitor General Website

3.2.1

City of Sault Ste. Marie Existing Major Building Classification Summary

A summary of the existing major building occupancy types, provided by the City of Sault Ste. Marie is presented in **Table 7**.

As presented in **Table 7**, the majority of the City's existing property stock is comprised of Group C - Residential Occupancies (95.25%) representing 25,432 residential occupancies. The second largest occupancy type within the City is Group D & E – Commercial Occupancies accounting for 2.13% of the City's property stock. There are a number of Group A – Assembly Occupancies (219), Group F – Industrial (375), and Other – not classified (72) occupancies.

There are 35 Group B – Care or Detention Occupancies in the City of Sault Ste. Marie based on property parcel data. It should be noted that not all registered City of Sault Ste. Marie VOs are Group B - Care or Detention Occupancies. Registered vulnerable occupancies are discussed further in **Section 3.7.1 – Vulnerable Occupancies**.

Table 7: City of Sault Ste. Marie Existing Property Stock (excluding Open Space)

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Percentage of Occupancies
Group A	Assembly Occupancies	219	0.82%
Group B	Care or Detention Occupancies	35	0.13%
Group C	Residential Occupancies - Total	25,432	95.25%
Group D	Business and Personal Services	165	0.62%
Group E	Mercantile	403	1.51%
Group F (all Divisions combined)	Industrial Occupancies	375	1.40%
Other	Not classified in the Ontario Building Code - Farm	72	0.27%
Total Occupancy Classification	Total Building Classifications	26,701	100.0%

Source: City of Sault Ste. Marie, Parcel Data

Group C - Residential Occupancies represent the most prominent type of building occupancy type within the City of Sault Ste. Marie, which is consistent with most municipalities across Canada. Within Ontario, information provided by the OFM (as described in **Section 10.0 – Past Loss and Event History Profile**) indicates that the majority of structure fires over the five year period from January 1, 2017 to December 31, 2023, occurred within Group C - Residential Occupancies (76.8%).

Group E – Mercantile occupancies reflect the second highest properties of property stock at 1.51%. These occupancies can range in size from smaller corner stores and strip plazas to larger big box retail outlets. The third highest category of property stock by occupancy type is Group F – Industrial occupancies.

Identified Risk: Group C - Residential Occupancies represent 95.25% of the City's existing building stock, and over the five-year period from January 1, 2017, to December 31, 2023, Group C occupancies were associated with 76.8% of the structure fires within the City.

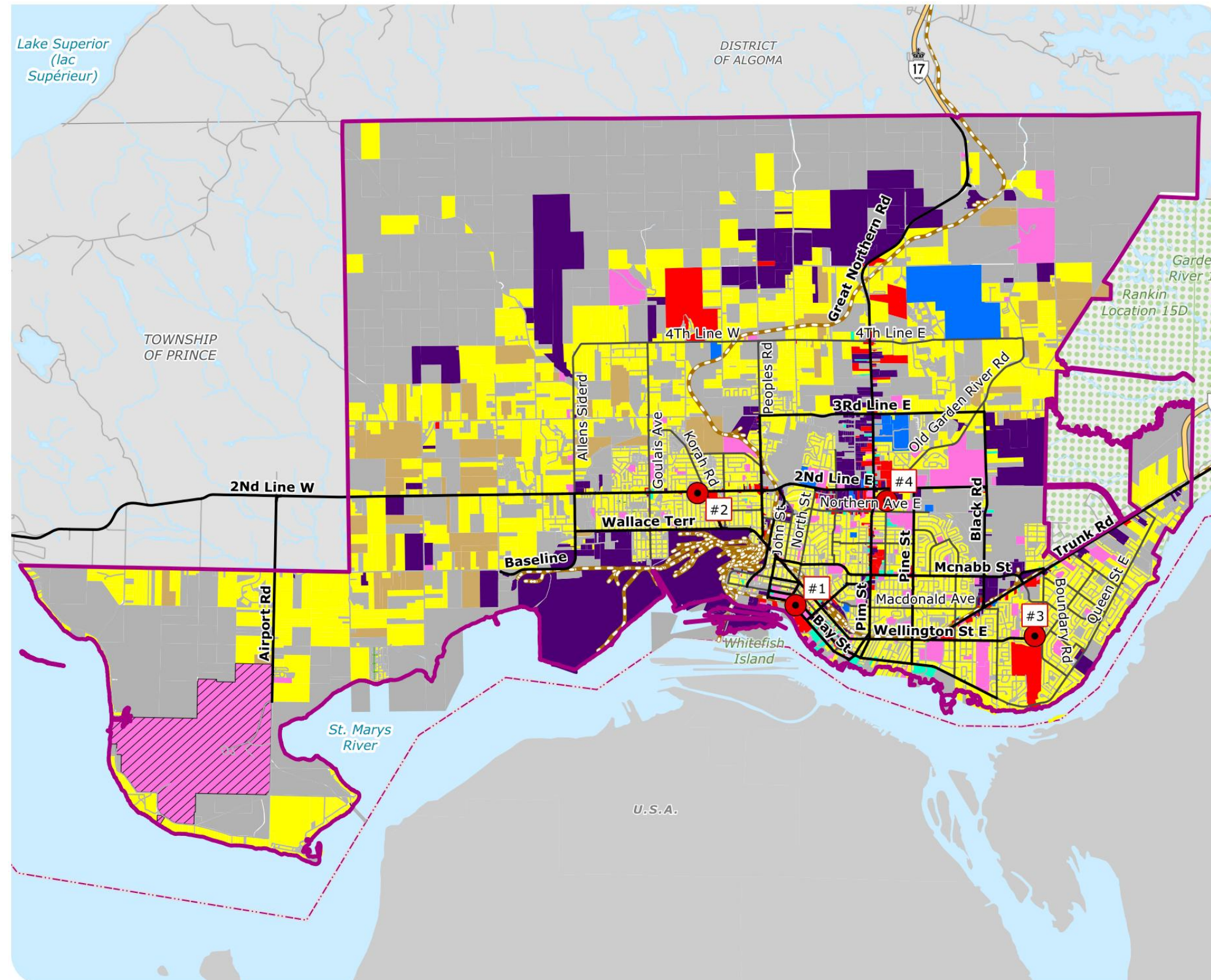
3.2.2 Mapping Property Stock

Figure 9 below shows the property stock by occupancy type in the City of Sault Ste. Marie. Group C residential occupancies, shown in yellow, make up the vast majority of occupancies in the City and are well distributed throughout the Urban Settlement Area. The map shows several clusters of Group F – Industrial uses (shown in dark purple) west of the downtown and west of Great Northern Road, and north of Second Line West. The large industrial parcel (represented as dark purple), which is shown along the southern boundary of the City, just west of the downtown area, is where the steel mill is located, along with the associated rail spur lines. Group A – Assembly, Group B – Care or Detention, and Group C – Residential occupancies are well-distributed within the City, with clusters of Group D – Business and Personal Services and Group E – Mercantile occupancies found in the downtown, along Great Northern Road, and Trunk Road. There is a substantial amount of vacant land, shown in grey, located between the defined urban boundary and the City boundary.

Key Finding: Based on the property stock mapping Group F – Industrial Occupancies are typically located west of Great Northern Road north of Second Line West, and along the waterfront west of Downtown.

Key Finding: Based on the property stock mapping Group C – Residential uses are distributed across the City including outside of the Urban Settlement Area.

Figure 9: Property Stock by Major Occupancy Classification (Parcel Data)



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

PROPERTY STOCK - OBC
OCCUPANCY CLASSIFICATION

- Existing Fire Station
- Occupancy Type
- Group A - Assembly
- Group B - Care or Detention
- Group C - Residential
- Group D - Business and Personal Services
- Group E - Mercantile
- Group F - Industrial
- Farm
- Open Space
- Vacant
- Base Data
- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Water Feature
- Airport
- First Nation Reserve
- International Boundary

SCALE 1:80,000

0 1 2 4 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-29



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Building_Stock\building_stock.aprx\PropertyStockOBC

3.2.3 Vacant Buildings

Buildings can become vacant due to a variety of circumstances, such as during transitions between building owners/uses, when land use or zoning changes, if the building owner experiences financial hardship, due to general neglect or abandonment, as a result of real estate instability, or in times of economic downturn. The COVID-19 pandemic appeared to trigger several conditions which resulted in increased numbers of vacant buildings, especially in urban and commercial areas. Unfortunately, vacant buildings typically experience increased risk of vandalism and arson.

The City of Sault Ste. Marie adopted a Vacant Building By-Law in 2023 (By-Law 2023-110) that addresses challenges within the City related to an increase in the number of vacant buildings and improves public safety. The by-law provides the following definition of a vacant building: *“a building that is not being used or occupied for a period exceeding 30 consecutive days, including days vacant prior to the passage of the by-law, but does not include:*

- a) a dwelling unit occupied by the owner on a seasonal basis but otherwise maintained throughout the year;*
- b) the owner is away for an extended period of time because of health treatment;*
- c) a building, except a dwelling unit, on property used as a farm; or*
- d) a building that is owned by the City.”*

The by-law identifies that the City’s Building Division maintains a list of vacant buildings known as the City’s Vacant Building Registry. The by-law also required that the owner of a vacant building protect it against the risk of “fire, accident or other danger.”

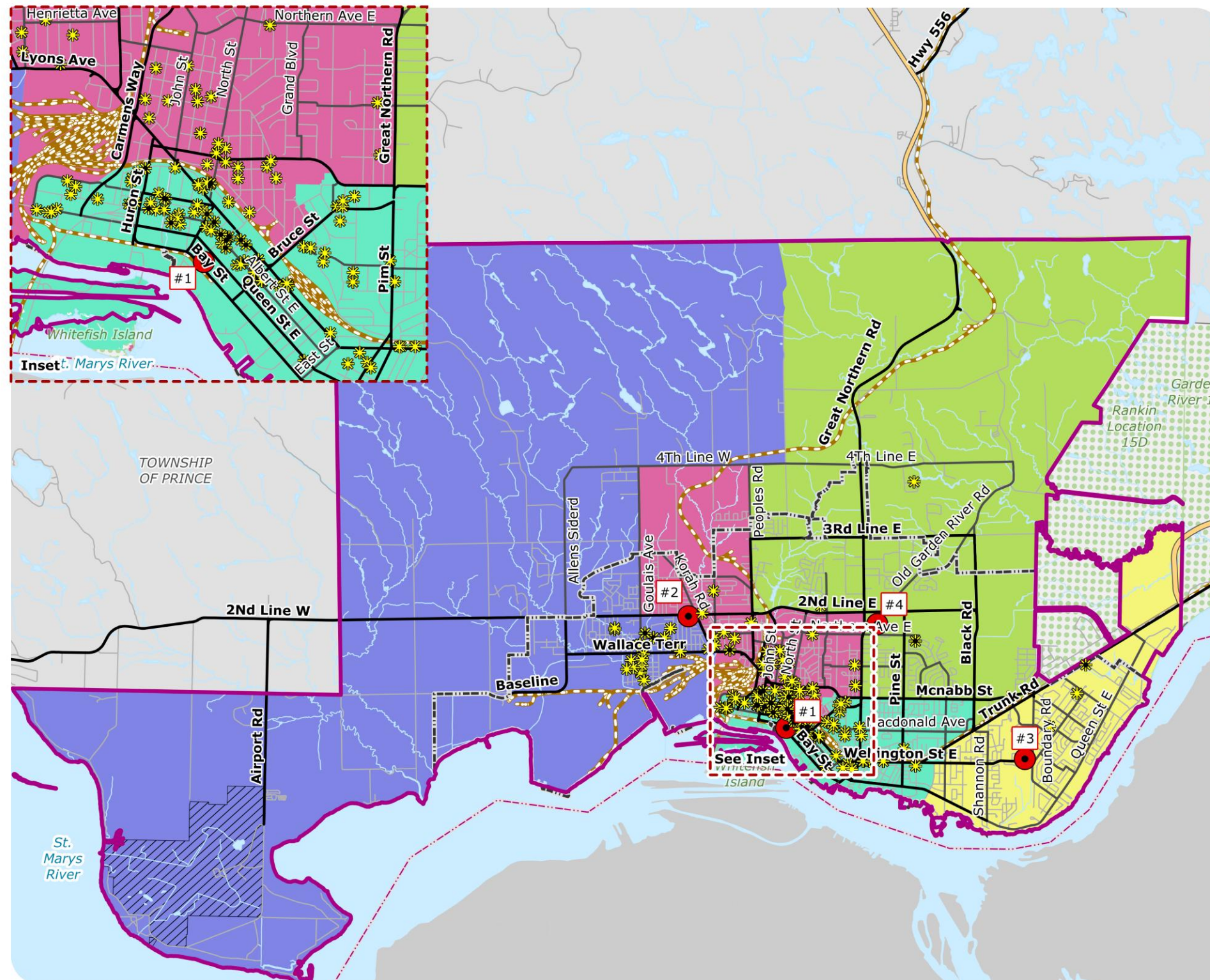
The City also introduced a Vacant Home Tax of 4% in October of 2024 as a measure to mitigate the number of vacant buildings.

3.2.4 Added Mapping Vacant Buildings and Fire Incidents

In order to support the analysis of the fire risk associated with vacant buildings in the City of Sault Ste. Marie, the SSMFS provided a list of known vacant properties/buildings (as of September 2024) and data on historic fire incidents (April 2020 to September 2024) that occurred in vacant buildings. This included 143 vacant properties and 34 historic fire incident locations. This data is presented visually in **Figure 10**.

The figure highlights the concentration of vacant properties, and historic fire incidents in vacant properties, in the downtown, and southwest of Fire Station 2.

Figure 10: Vacant Properties and Historic Fire Incidents



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

VACANT PROPERTIES

- Existing Fire Station
 - Historic Fire Incident (Vacant)
 - ★ Vacant Property
 - Urban Settlement Boundary
- Ward
- 1
 - 2
 - 3
 - 4
 - 5
- Base Data
- City Boundary
 - Expressway / Highway
 - Arterial Road
 - Collector Road
 - Local Road
 - Railway
 - Airport
 - Water Feature
 - First Nation Reserve
 - International Boundary

SCALE 1:80,000

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE, ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2025-01-24



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Additional_Figures\additionalfigures_aprx\additionalfigures_aprx.aprx\Vacant Properties

Identified Risk: Between April 2020 and September 2024, the SSMFS identified 34 fire incidents that occurred in vacant properties within the City.

3.3 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) lists building density as a key factor for understanding potential fire risk with additional consideration given to core areas (downtown). Closely spaced buildings, typical of historic downtown core areas and newer infill construction, may have a higher risk of a fire spreading to an adjacent exposed building. In a built-up area with minimal building setbacks, a fire originating in one building could extend to a neighbouring structure due to the proximity.

The proximity of buildings can also impede firefighting operations due to the limited access for firefighters and equipment. **Table 8** illustrates a comparison of the City's existing Group C - Residential building stock with that of the Province based on the Statistics Canada, 2021 Census of Population.

Table 8: Group C - Residential Building Stock Comparison

Structural Dwelling Type	Sault Ste. Marie Total Number of Dwellings	Sault Ste. Marie Total Percentage of Dwellings	Ontario Total Number of Dwellings	Ontario Total Percentage of Dwellings
Single-detached house	21,150	65.02%	2,942,990	53.59%
Apartment in a building that has five or more storeys	2,060	6.33%	984,665	17.93%
Movable dwelling	80	0.25%	14,985	0.27%
Other attached dwellings ³⁶	9,245	28.42%	1,548,560	28.20%
Semi-detached house	1,810	5.56%	303,260	5.52%
Row house	945	2.91%	505,265	9.20%
Apartment or flat in a duplex	1,425	4.38%	181,030	3.30%

³⁶ The category 'Other attached-dwelling' is a subtotal of the following categories: semi-detached house, row house, apartment or flat in a duplex, apartment in a building that has fewer than five storeys and other single-attached house.

Structural Dwelling Type	Sault Ste. Marie Total Number of Dwellings	Sault Ste. Marie Total Percentage of Dwellings	Ontario Total Number of Dwellings	Ontario Total Percentage of Dwellings
Apartment in a building that has fewer than five storeys	4,965	15.26%	548,785	9.99%
Other single-attached house	100	0.31%	10,220	0.19%
Total	32,535	100.00%	5,491,200	100.00%

Table Source: 2021 Census, Statistics Canada ³⁷

This analysis highlights that the existing residential building stock within the City has more single-detached dwellings (65.02%) than the Province (53.59%) and fewer apartments in buildings with five or more storeys (6.33%) compared to the Province (17.93%). The City and the Province have comparable percentages of other attached dwellings at approximately 28%. Within that category, the City of Sault Ste. Marie has a lower percentage of row housing, but a higher occurrence of apartments in duplexes or low-rise apartments. Refer to **Section 3.3 – Building Density and Exposure** for more information.

In addition to the data above, the City has a number of existing areas where the presence of building density and potential exposure as a result of minimal setbacks should be highlighted. These were analyzed in the City's 2018 Comprehensive Risk Assessment.

The majority of residential dwellings in Sault Ste. Marie are single-detached housing, however, exposure risk is also linked to the proximity of these types of buildings to one another. To spatially identify potential exposure risks, the City previously completed an analysis of the average distance between structures throughout the City. The mapping analysis was based on residential and commercial buildings only (excluding secondary structures). The results of the analysis are shown in **Figure 11**. The mapping highlights in red those structures separated by less than three metres and illustrates separations

³⁷ Statistics Canada. 2022 (table). [Census Profile. 2021 Census of Population](#). Statistics Canada Catalogue number 98-316-X2021001. Ottawa. Released August 17, 2022, and accessed August 22, 2022.

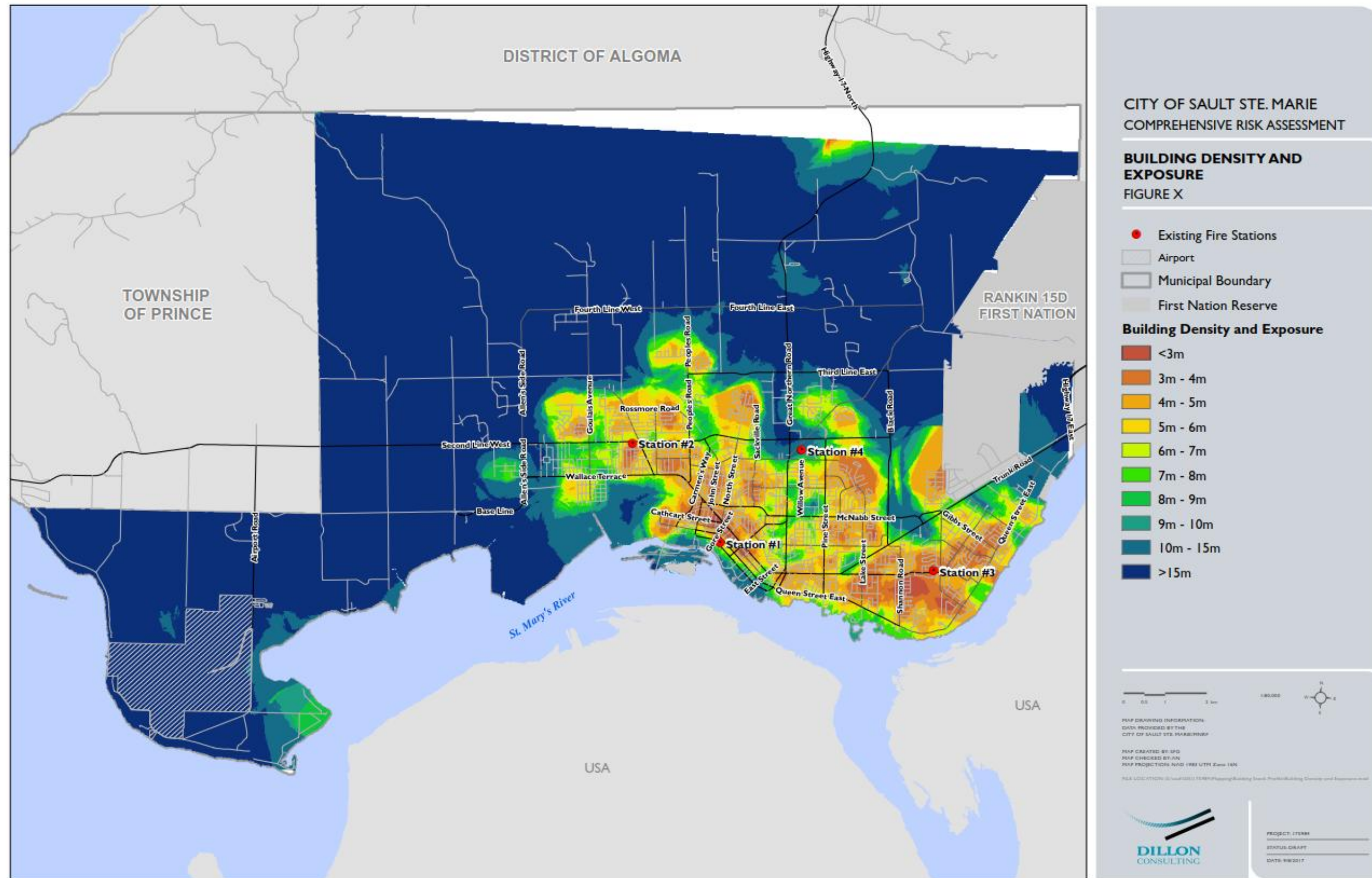
of four to 10 metres in approximately one metre increments. The results of this analysis show that greater exposure risks exist primarily within the Urban Settlement Area Boundary, with clusters of increased exposure within the downtown area and across residential neighbourhoods east and west of downtown.

Source: City of Sault Ste. Marie Comprehensive Risk Assessment 2018

Key Finding: The City includes areas of building stock that have higher density and, as such, greater potential for exposure in the event of a fire. Statistics Canada 2021 census data indicates that 28.2% of the City's building stock is comprised of attached dwellings (e.g. semi-detached, row housing, low-rise apartment buildings, etc.).

Key Finding: Potential building exposures are largely linked to the built-up areas primarily found Downtown and throughout residential areas within the Urban Settlement Area boundary.

Figure 11: Building Density and Exposures (City Analysis)



3.4 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 of the inconsistencies in building construction and maintenance that were present before adoption.

The OBC and the OFC were developed to ensure that uniform building construction and maintenance standards are applied for all new building construction. The codes also provide for specific fire and life safety measures depending on the use of the building.

Examples of the fire and life safety issues that are addressed include:

- occupancy
- exits/means of egress, including signs and lighting
- fire alarm and detection equipment
- fire department access
- inspection, testing, and maintenance

In many situations the age and construction of a building can be directly associated with whether the building was constructed prior to, or after the introduction of these codes. For example, during the late 19th century and early 20th century, balloon frame construction was a common wood framing technique that was used in both residential and small commercial construction.

This technique allowed for exterior walls to be continuous from the main floor to the roof, in some cases extending multiple stories through a building. The result was the potential for fire and smoke to spread unobstructed from the basement to the roof of a building. In many cases, the result was a fire that started in the basement, spreading to the roof very quickly and without the knowledge of building occupants or fire service personnel. The OBC implemented requirements to change this construction method and introduce additional requirements to mitigate the potential of fire spread through wall cavities.

Similarly, the new codes have recognized new construction techniques such as light weight wood frame construction. This includes the use of wood trusses to replace conventional wood frame roofing techniques and new construction materials, including Laminated Veneer Lumber (LVL), which is a high-strength engineered wood product now commonly used in residential and commercial buildings. Although these techniques

and materials have enhanced the efficiency and cost of construction, this construction presents very different challenges to firefighters from those of historical construction methods. For example, the lightweight wood frame construction used in an engineered wood truss roof system relies on all of the structural components to work together. In the event one of the components fails due to exposure to high heat or fire, the result is the potential for the entire roof system to fail.

In addition to building construction, fire growth rate depends on the flammability of the materials and contents within the building, which introduces variances into the growth rates. The impact of increasing fire growth rates is directly related to the time lapse from ignition to flashover when the combustible items within a given space reach a temperature that is sufficiently high for them to auto-ignite.

Listed in **Table 9** are the fire growth rates, measured by the time it takes for a fire to reach a one-megawatt (MW) fire. Fire growth rate depends on the flammability of the materials and contents within the building which introduces variances into the growth rates presented below.

Table 9: Time to Reach 1 MW Fire in the Absence of Fire Suppression

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)

Source: OFM.³⁸

In addition to building construction, fire growth rate depends on the flammability of the materials and contents within the building, which introduces variances into the growth rates presented above. The impact of increasing fire growth rates is directly related to the time lapse from ignition to flashover when the combustible items within a given space reach a temperature that is sufficiently high for them to auto-ignite. The graph in

³⁸ Office of the Fire Marshal and Emergency Management. (2017, May). Operational Planning: An Official Guide to Matching Resource Deployment and Risk Workbook.

Figure 12 (below) highlights the exponential increase in fire temperature and the potential for loss of property/loss of life with the progression of time.

Figure 12: Fire Propagation Curve

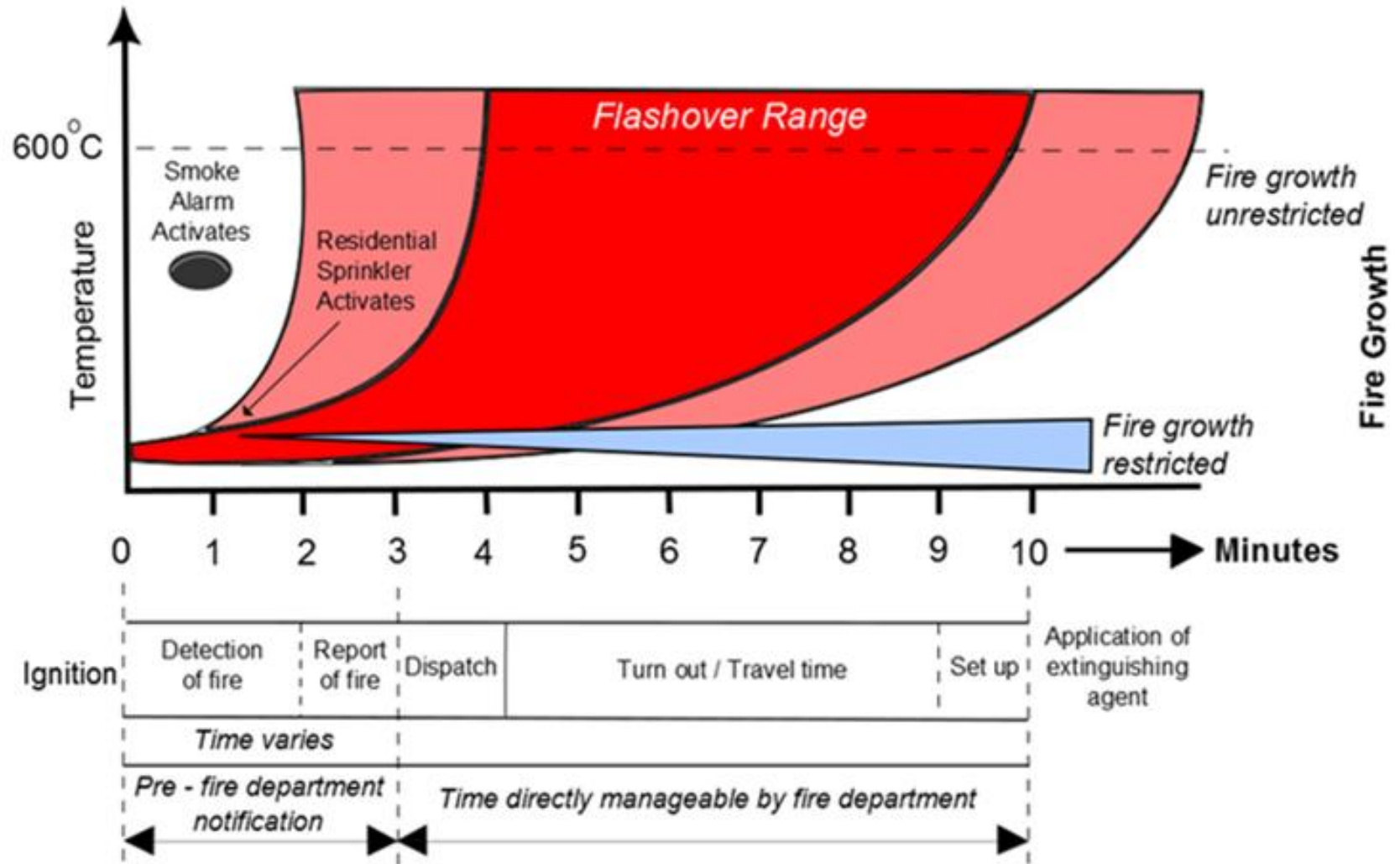


Figure Source: Fire Underwriters Survey “Alternative Water Supplies for Public Fire Protection: An informative Reference Guide for Use in Fire Insurance Grading” (May 2009) and NFPA “Fire Protection Handbook” (2001)

Understanding building construction and building materials is a critical component for firefighters in determining the appropriate type of fire attack and safety measures that need to be in place. As such, having knowledge of the age of a building may be directly related to the type of construction methods and materials used to build it, making building age and construction essential components of this Community Risk Assessment.

Table 10 summarizes the age of the building stock within the City prior to the new codes (OBC and OFC). This analysis indicates that at least 69.4% of the City's building stock was built prior to 1981, preceding the adoption of the 1981 Ontario Fire Code. The dataset includes 14.49% categorized as unknown. For comparison, the 2021 Census presented statistics on the period of construction of occupied private dwellings, based on a 25% sample. That dataset indicates that 73.4% of occupied private dwellings were constructed prior to 1981, before the OFC was in place. The high percentages of the City's building stock constructed prior to the Ontario Fire Code represent a fire risk within the community. The use of balloon framing was prevalent in the years prior to 1941.

Table 10: Period of Construction of City Buildings – Sault Ste. Marie and Ontario

Period of Construction	Sault Ste. Marie Total Number of Buildings	Sault Ste. Marie Total Percentage of Buildings
Prior to 1941	4,096	13.89%
1942 to 1974	13,369	45.34%
1975 to 1981	3,001	10.18%
1982 to present	4,748	16.10%
Unknown	4,274	14.49%
Total	29,488	100.00%

Source: City of Sault Ste. Marie, Parcel Data

Identified Risk: An analysis of the City's parcel data indicates that 69.4% of the City's total building stock was built prior to the introduction of the 1981 Ontario Fire Code. Census data from 2021 indicates that 73.4% of occupied private dwellings were constructed prior to the Ontario Fire Code.

3.4.1.1 Mapping Building Age

Figure 13 presents the spatial distribution of the building age data. As shown, much of the City's building stock within the Urban Settlement Area Boundary, especially in the downtown and the areas surrounding the existing fire stations, was constructed prior to the implementation of either the OBC or the OFC. The downtown core reflects an even older building stock, indicating that balloon framing may have been prevalent during the construction of those buildings.

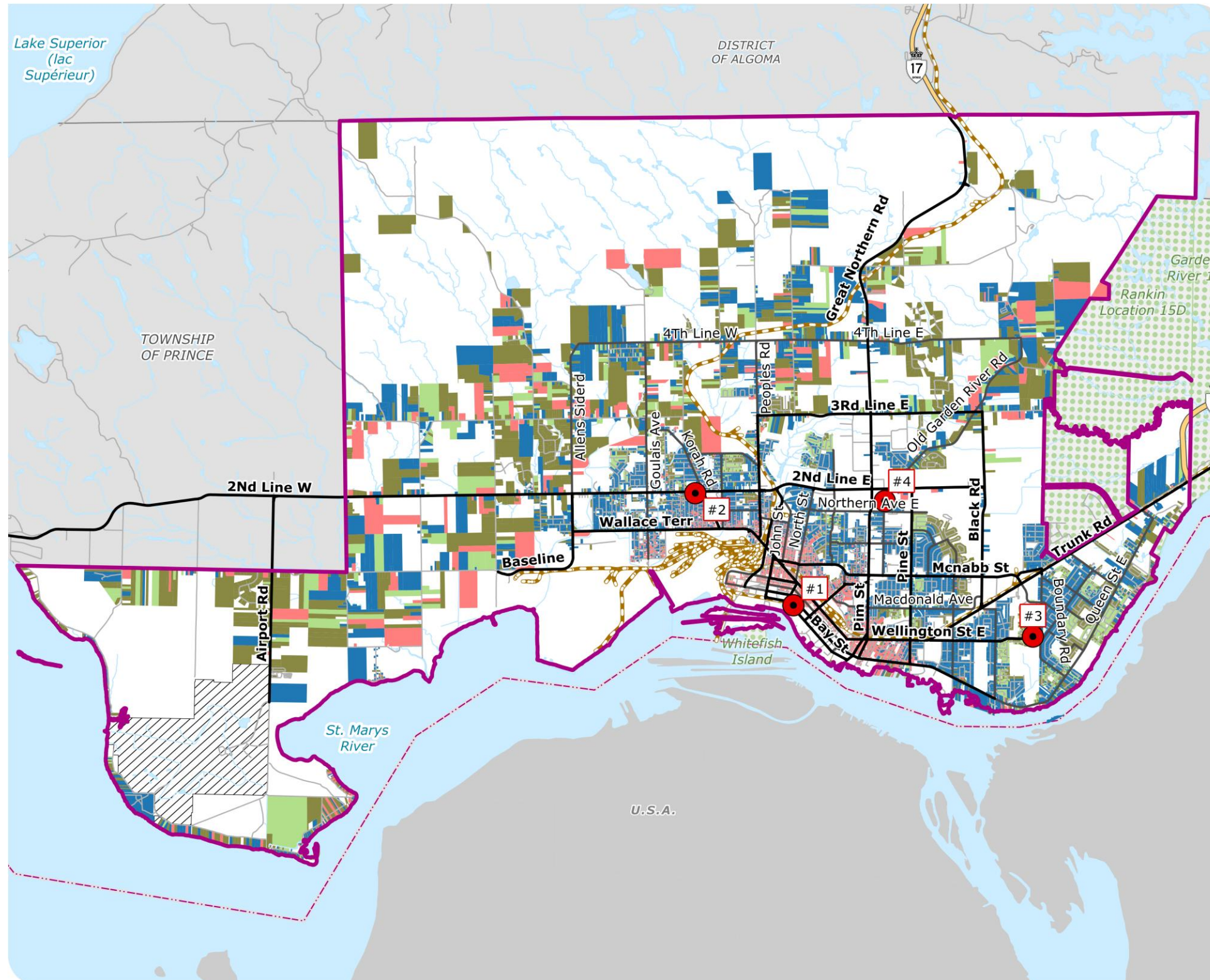
Key Finding: Within the Urban Settlement Area Boundary, there is a high concentration of buildings built prior to any provincial fire or building codes being in effect.

3.4.2 Lightweight Construction

As of February 25, 2022, the OFM provided direction that requires available information documenting the presence and location of truss and lightweight construction systems (referred to as lightweight construction) be used to inform pre-planning activities by fire departments. Buildings with lightweight construction are considered a safety risk to responding firefighters as they are known to be susceptible to premature failure and rapid collapse under fire conditions. Pre-plans provide responding fire departments with awareness of the presence of lightweight construction, providing an opportunity for proactive fire response strategies to protect the safety of responding firefighters.

The City should develop a system, through a partnership between the City's Building Department and SSMFS, to identify buildings with lightweight construction, which have been constructed using wood framing. Going forward this information can be updated within the CRA during the annual review and updating process.

Figure 13: Building Age



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

BUILDING AGE

● Existing Fire Station

Building Age (Period of Construction)

- >= 83 Years (1941 or Earlier)
- 50 to 82 Years (1942 to 1974)
- 43 to 49 Years (1975 to 1981)
- 2 to 42 Years (1982 to 2022)

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRE, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-29



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Building_Stock\building_stock.aprx\BuildingAge

3.5 Building Height and Area

Buildings that are taller in height or contain a large amount of square footage (building footprint) can have a greater fire loss risk and life safety concern. One of the unique characteristics and risks of tall/multi-storey buildings is known as the “stack effect”. This is characterized as vertical air movement occurring throughout the building, caused by air flowing into and out of the building, typically through open doors and windows. The resulting buoyancy caused by the differences between the indoor/outdoor temperature and elevation differences causes smoke and heat to rise within the building.

This can 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 gain entry into the building and ascend to the upper floors by the stairwells. Options such as “shelter-in-place,” whereby occupants are directed by the fire department to stay within their units, can be an effective life safety strategy. However, ensuring internal building communications systems are in place and functioning is critical to the success of this strategy. Targeted public education campaigns addressing strategies like shelter-in-place are also critical to educating building occupants.

Building areas can cause challenges comparable to those present in taller buildings. Horizontal travel distances rather than vertical can mean extended response times by firefighters attempting rescue or fire suppression activities in buildings with a very large footprint.

3.5.1 Building Height

3.5.1.1 Defining High-Rise Buildings

It is important to note that there are a variety of metrics associated with the terms “high rise”, “tall buildings,” and “high buildings.” Some key definitions are outlined in **Table 11**.

Table 11: Summary of High-Rise Building Height Metrics

Source	Simplified Definition
Ontario Building Code/Ontario Fire Code	A building with its floor level 18 metres (59 feet) above grade, or six storeys
NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations	Building height greater than 75 feet (23 metres), or seven storeys
Statistics Canada ³⁹	Buildings with five or more storeys

The variance in these definitions is directly related to the different applications required by these organizations. For example, the OBC has detailed considerations to define a high-rise building based on the occupancy classification, floor area and occupant load. Within all occupancy classifications, additional OBC requirements apply when a building is or exceeds 18 meters in height.

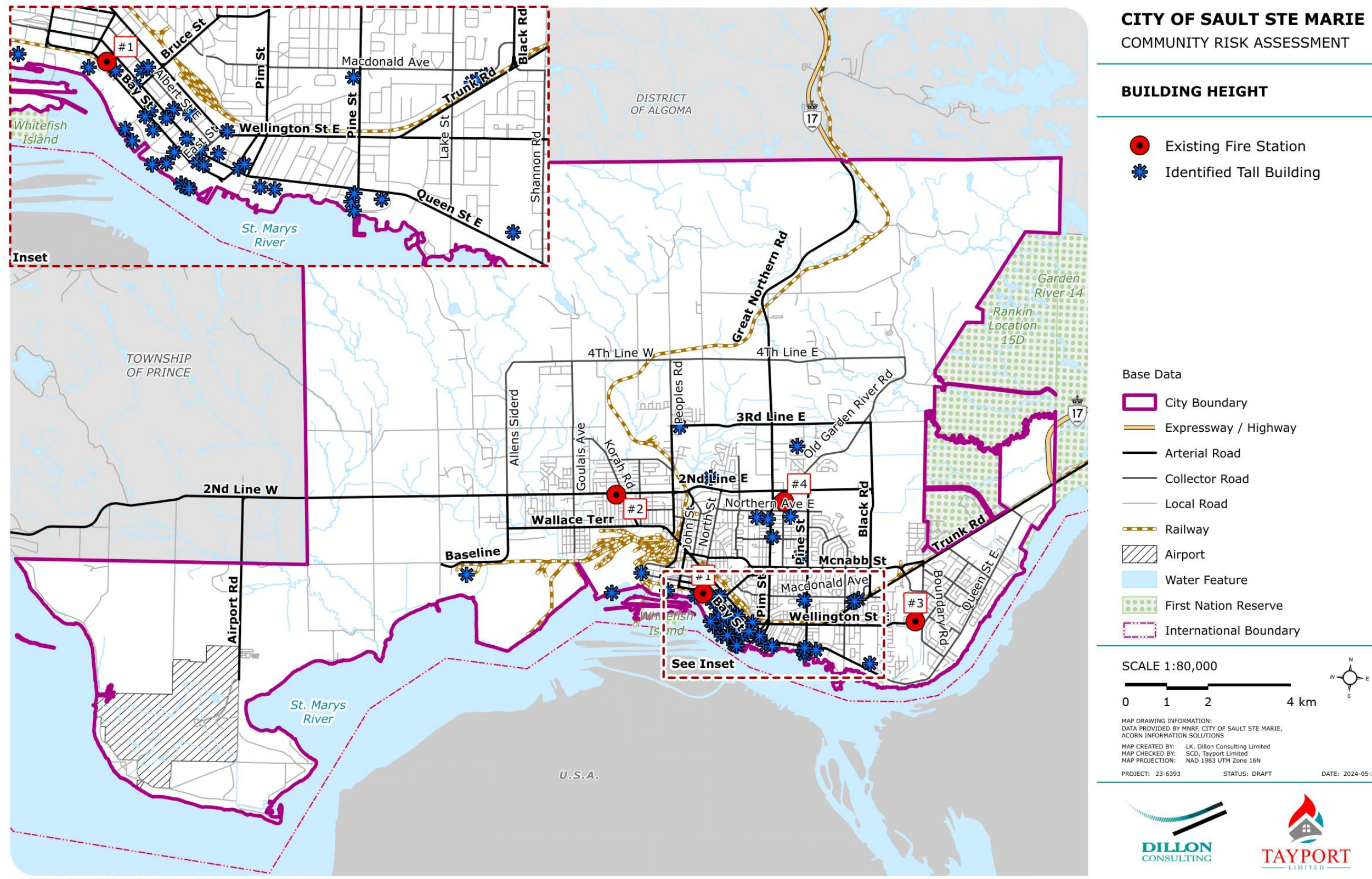
For the purposes of developing this CRA, the OBC/OFC definition has been used to analyze building height within the City.

3.5.1.2 Mapping Building Height

As part of the data provided for this CRA, the City provided building height data from which buildings with a height greater than 18 metres were identified, reflecting a high-rise occupancy as per Section 3.2.6 of the OBC. For the purposes of this analysis, it has been assumed that buildings under 18 metres (roughly five storeys or less) are not considered high-rise. Buildings identified with a height of 18 metres or more are illustrated in **Figure 14**.

³⁹ Statistic Canada’s references to building height are a strict definition of building height consideration but provide insight as to the overall built form of housing within a community.

Figure 14: Building Height



In total, 51 buildings as defined by the OBC were identified by the City as high-rise buildings. As shown, the buildings identified as high-rise are mostly clustered in the downtown of the City, with a few distributed throughout the urban settlement area.

Identified Risk: Data provided by the City identified 51 buildings defined by the OBC as high-rise buildings with a floor level 18 metres (59 feet) above grade, or 6 storeys or more. These buildings are mostly clustered in the downtown of the City, with a few distributed throughout the urban settlement area.

3.5.2 Building Area

Building area can cause comparable challenges as those present in taller buildings. Horizontal travel distances rather than vertical can mean extended response times by firefighters attempting rescue or fire suppression activities. Large buildings, such as industrial plants and warehouses, department stores, and big box stores, can also contain large volumes of combustible materials. In many of these occupancies the use of high rack storage is also present. Fires within this type of storage system can be difficult to access and may cause additional risk to firefighter safety, due to collapse-related risks.

As part of the data collection process, the City provided building footprint data for Sault Ste. Marie. The information presented in **Table 12** indicates that the majority of the City's building stock (94.89%) has a total building area (footprint) of 2,500 square feet or less. This summary also indicates that 0.12% (65) buildings have an area greater than 50,000 square feet or approximately 4,655 square metres.

Table 12: Building Area

Building Size (Square Feet)	# of Buildings	% of all Buildings
0-2,500	53,158	94.89%
2,500-5,000	1,895	3.38%
5,000-10,000	513	0.92%
10,000-20,000	229	0.41%
20,000-50,000	163	0.29%
>50,000	65	0.12%
Total	56,023	100.0%

Source: City of Sault Ste. Marie

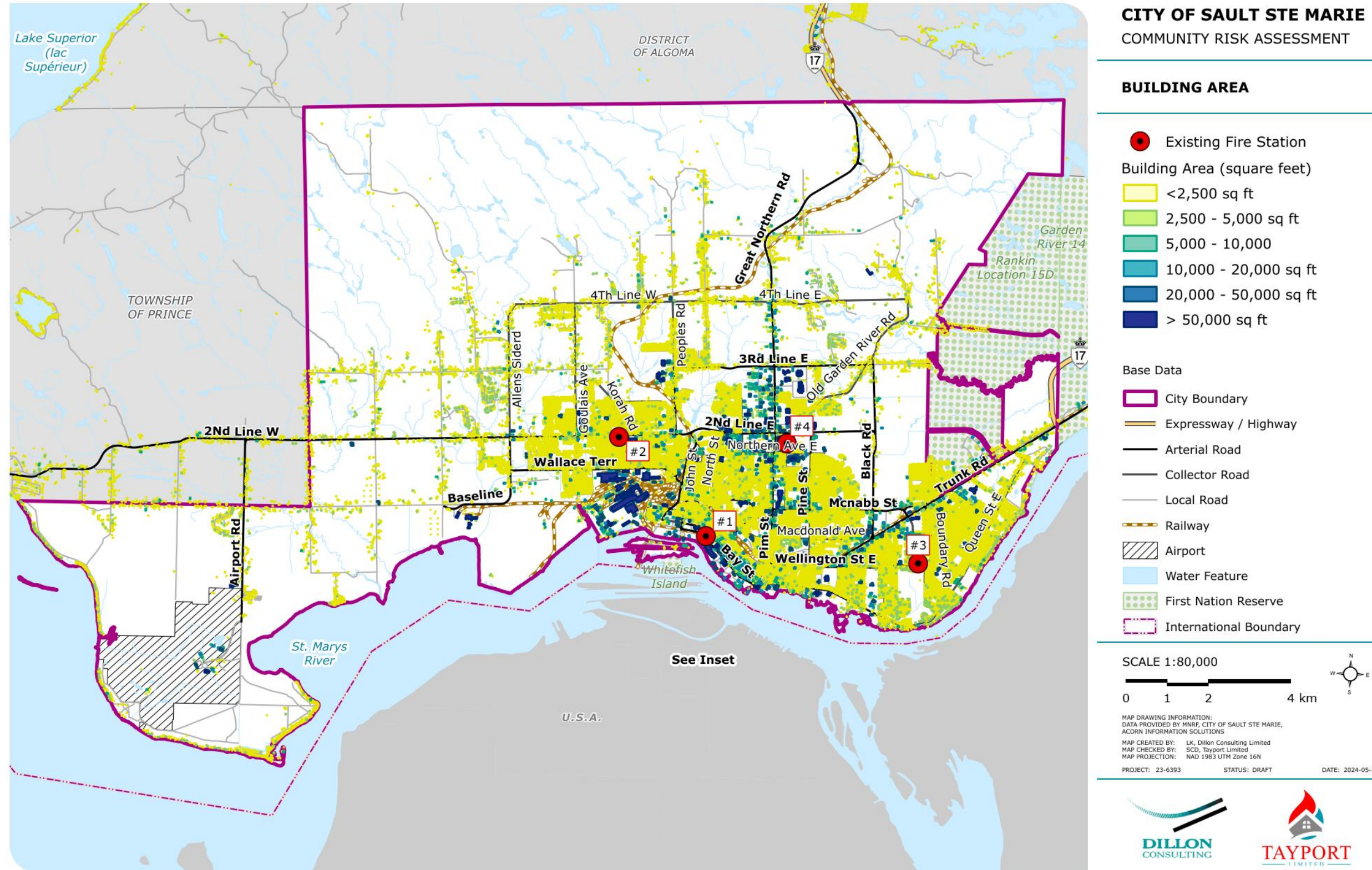
Identified Risk: 94.9% of the buildings have a footprint of 2,500 sq. ft. or less which is consistent with the proportion of the property stock that is Group C – Residential occupancies.

3.5.2.1 Mapping Building Area

Figure 15 illustrates the locations of buildings with a larger footprint within the City. The location of those buildings with a larger footprint are consistent with industrial and commercial land uses, such as west of Downtown, south of Wallace Terrace on the waterfront, along Great Northern Road, and along Trunk Road.

Identified Risk: The City has 65 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). A large cluster of large buildings are located in the City’s industrial area located west of downtown. Other large buildings exist in the downtown, and in commercial and industrial areas along Arterial Roads.

Figure 15: Building Area Locations



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3.6 Potential High-Fire Risk Occupancies (Fuel Load)

Potential high-fire risk occupancy is another factor for consideration within a City's building stock. High fire risk can be linked to a combination of factors such as building density (exposures), building age, and construction. Fuel load typically refers to the amount and nature of combustible content and materials within a building. This can include combustible contents, interior finishes as well as structural materials.

Combustible content tends to create the greatest potential fire loss risk. Higher fuel loads results in increased fire loss risk due to increased opportunity for ignition and increased fire severity.

In many communities, large amounts of fuel load can be contained within a single occupancy, such as a building supply business, within a large multi-unit residential building, or within a historic downtown core. As presented previously within this report, age and construction of a building can also have an impact on fuel load given that older buildings likely have a larger volume of combustible construction such as wood framing rather than newer construction utilizing concrete and steel products. This section of the CRA will focus primarily on fuel load for industrial occupancies.

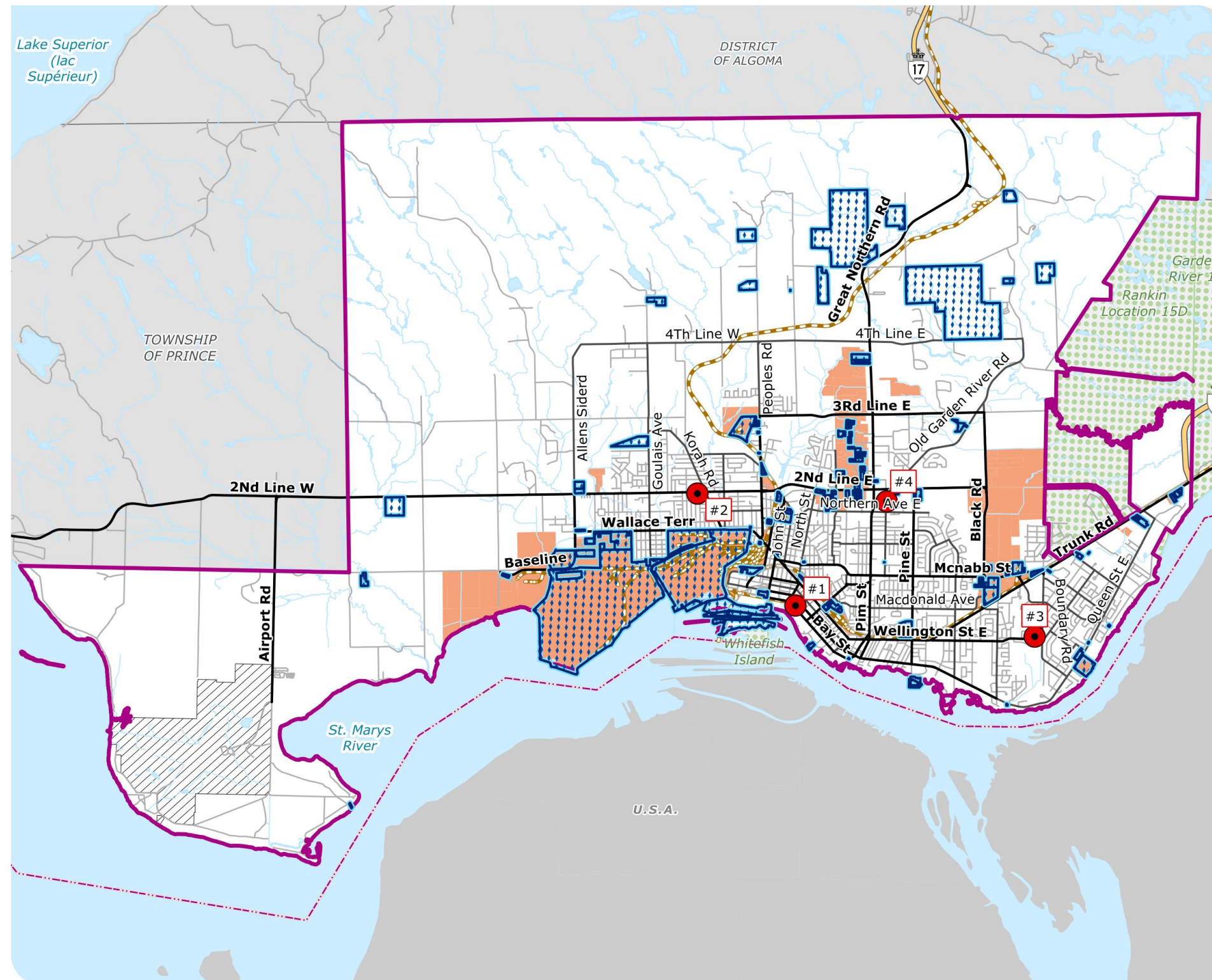
In order to identify potential fuel load concerns for the purposes of this CRA, high-level consideration was given to select occupancies based on MPAC codes and the identified property description.⁴⁰ The industrial lands within the City were also identified as areas of potential high-fire risk / fuel-load potential. These are shown in **Figure 16**.

Occupancies with fuel load concerns typically contain materials such as oxidizers and flammable and combustible liquids and chemicals or large stores of flammable products, such as big box stores or warehouses.

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

⁴⁰ While this analysis is focused on fuel load informed by the description of the use of an industrial occupancy, it is recognized that other factors can impact risk within an individual building such as improper use of equipment, poor maintenance, hazardous processes, etc.

Figure 16: Potential High-Fire Risk Occupancies (Fuel Load)



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

POTENTIAL HIGH FIRE RISK OCCUPANCIES (FUEL LOAD)

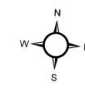
- Existing Fire Station
- Industrial Land Use (Official Plan)
- Potential Fuel Load Concern

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000

0 1 2 4 km



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF, CITY OF SAULT STE MARIE, ACORN INFORMATION SOLUTIONS
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N
PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-06-05



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Building_Stock\building_stock.aprx\PotentialHighRiskFuelLoad

Key Finding: There are properties within the City that may have an increased potential for high fire risk due to fuel load conditions, primarily linked to the identified Industrial land uses

3.7 Occupancies with Potential High Fire Life-Safety Risk

Fire risk does not affect all people equally. Those who are at an increased risk of fire injury or fatality are known as vulnerable individuals. In the event of a fire, these individuals may be unable to self-evacuate and/or require assistance in their evacuation efforts. Identifying the location and number of vulnerable individuals or occupancies within the community provides insight into the magnitude of this particular demographic within a community.

From an occupancy perspective, vulnerable occupancies contain vulnerable individuals who may require assistance to evacuate in the event of an emergency due to cognitive or physical limitations, representing a potential high-life safety risk. As part of its registry of vulnerable occupancies, the OFM defines vulnerable occupancy as any care occupancy, care and treatment occupancy, or retirement home regulated under the Retirement Homes Act.

These occupancies house individuals such as seniors or people requiring specialized care. It is important to note, however, that **not all vulnerable individuals live in vulnerable occupancies**; for example, some seniors who are vulnerable due to physical limitations can live on their own or in subsidized housing, making them a key demographic to reach.

3.7.1 Registered Vulnerable Occupancies

Ontario Regulation 150/13: Fire Code, which amends **Ontario Regulation 213/07: Fire Code**, identifies vulnerable occupancies as care, care and treatment and retirement homes. This includes hospitals, certain group homes, seniors' residences and long-term care facilities. The regulation requires fire departments to perform annual inspections, approve and witness fire drill scenarios and file certain information regarding the occupancy with the Fire Marshal's office. As indicated by the SSMFS, there are 42 vulnerable occupancies in the City of Sault Ste. Marie.

Identified Risk: The City of Sault Ste. Marie currently has 40 registered vulnerable occupancies.

3.7.2 Other High Fire Life Safety Risk Occupancies

From the perspective of risk, and for the purposes of the services provided by the fire department, including enhanced and targeted fire inspections and public education programming, it can be valuable for a fire department to identify additional potential high fire life-safety risk considerations, including daycare facilities and schools, where due to their age, children may have cognitive or physical limitations to preventing or delaying self-evacuation in the event of an emergency. For the purposes of this CRA, potential high life-safety risk occupancy considerations include schools and licensed day care facilities. Analysis of data provided by the SSMFS identified that there are 26 elementary schools, nine secondary schools, two post-secondary schools, 12 EarlyON Child and Family Centre locations, and 26 licensed daycares.⁴¹

The City also has two detention centres, the Algoma Treatment and Remand Center and the Donald Doucette Youth Centre, as well as a live-in treatment facility operated by Algoma Family Services.

In order to enhance community safety and address the risks associated with vulnerable persons, it would be beneficial for SSMFS to conduct pre-planning activities for all occupancies with vulnerable occupants. Pre-planning activities increase the fire service's familiarity with buildings of special interest. A fire service can help reduce the risk faced by vulnerable individuals or vulnerable occupancies by performing regularly scheduled fire safety inspections; approving and witnessing fire drill scenarios; enforcing the OFC; providing public education on fire safety issues; conducting pre-planning exercises to increase fire department personnel's familiarity with the facility; reviewing fire safety plans for accuracy and encouraging facility owners to update facilities as needed; providing staff training; and encouraging fire drills. Many of these activities are now legislated responsibilities under **O. Reg. 150/13: Fire Code** for those facilities classified as vulnerable occupancies.

Key Finding: In addition to registered vulnerable occupancies, the City has 37 schools, 12 EarlyON centres, and 26 licensed daycare centres, representing

⁴¹ Ontario Ministry of Education "Find Licensed Child Care", Retrieved from: <https://www.earlyyears.edu.gov.on.ca/LCCWWeb/childcare/searchResults.xhtml>

higher fire life-safety risks due to the number of children attending these facilities.

Key Finding: The City has two detention centres, as well as a live-in treatment facility, which house vulnerable individuals that may be at increased risk in the event of a fire.

3.8 Historic or Culturally Significant Buildings

An understanding of the location of historic or culturally significant buildings, sites, or facilities is an important consideration within the building stock profile of a Community Risk Assessment. Such buildings or facilities provide a sense of heritage, place, and pride, and act as tourism destinations with associated local economic impacts. They are important to the City's cultural fabric. The City is dedicated to conserving its heritage sites to stabilize, revitalize and enhance the community's character. Historic areas can present a high fire risk due to age, the materials used to construct the buildings, exposure to other buildings, and importance to the community. Regular fire inspection cycles and 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 City of Sault Ste. Marie regulates a number of heritage homes and properties through the municipal register under the Ontario Heritage Act. The register of designated heritage properties includes 42 properties of historical significance, including buildings, plaques and monuments.⁴² The locations of these historic and culturally significant sites are mapped in **Figure 17**. As shown, most of the majority of the historic sites are located within the downtown core and surrounding neighbourhoods, the areas where the City first began to develop.

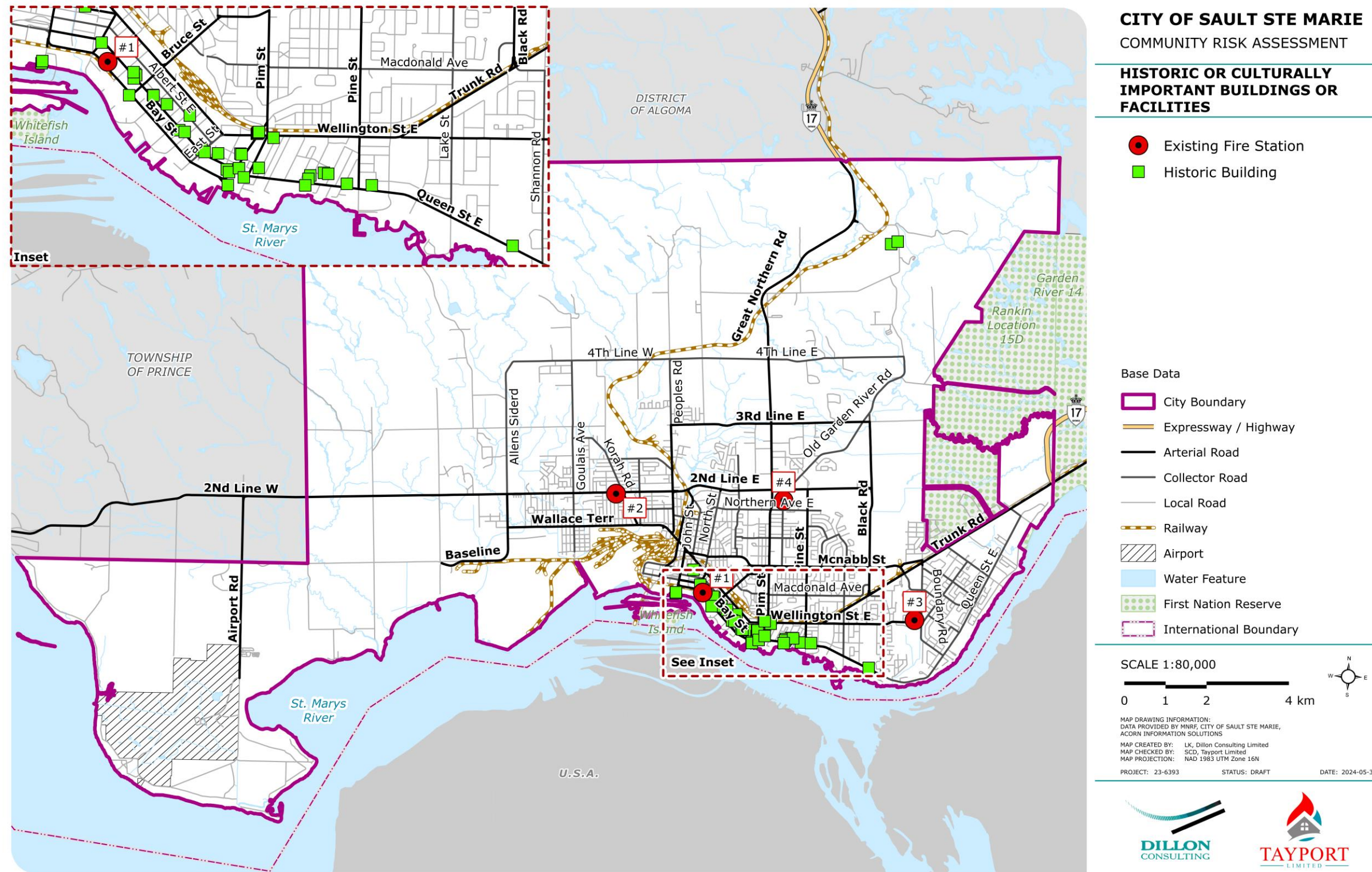
Pre-fire planning activities, conducted by fire service personnel, can enhance familiarity with buildings of historic, cultural, and special interest. These buildings can often be very unique in comparison to more modern buildings. The fire service can help reduce the risk of fire loss within heritage properties through regularly scheduled fire safety

⁴² Ontario Heritage Trust. (2025). Ontario Heritage Act Register: City of Sault Ste. Marie Retrieved from: <https://www.heritagetrust.on.ca/oha/advanced-search>

inspections, enforcement of the Ontario Fire Code, regular review of fire safety plans for accuracy, and encouragement of facility owners to upgrade facilities as needed.

Key Finding: There are a number of identified heritage buildings within Sault Ste. Marie, primarily located in the downtown area, the majority of which were constructed prior to the introduction of the Ontario Building Code or the Ontario Fire Code.

Figure 17: Historic or Culturally Important Buildings or Facilities



4.0 Critical Infrastructure Profile

As referenced in **O. Reg. 378/18**, the critical infrastructure profile assessment includes analysis of the capabilities and limitations of critical infrastructure, including electrical distribution, water distribution, telecommunications, hospitals and airports. The following section considers these critical infrastructure characteristics within the City of Sault Ste. Marie.

4.1 Critical Infrastructure in Sault Ste. Marie

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."⁴³ The program also sets out nine critical infrastructure sectors, namely: continuity of government, electricity, financial institutions, food and water, health, oil and natural gas, public safety and security, telecommunications and transportation networks.

Infrastructure is a complex system of interconnected elements whereby the failure of one could lead to the failure of others. The vulnerability of infrastructure is often connected to the degree to which one infrastructure component depends upon another. Therefore, it is critical that these elements be viewed in relation to one another and not in isolation.

An extensive list of the City's CI for each sector was provided by the City of Sault Ste. Marie. For the purposes of this CRA, general considerations and concerns related to each CI sector as it pertains to the provision of fire protection services for each asset included within the City's CI list are included in **Table 13**.

⁴³ Ministry of the Solicitor General. (2017). Critical Infrastructure. Retrieved from [Emergency Management Ontario website](#)

Table 13: Critical Infrastructure Considerations

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Continuity of Government	City Civic Centre Legal Department/Provincial Offences Accessibility Centre GFL Memorial Gardens Community Centres City Marinas District of Sault Ste. Marie Social Services Administration Board - Social Housing Ontario Works Ministry of Government and Consumer Services: Service Ontario Federal Government - Service Canada Canada Border Services Agency (Sault Ste. Marie Port of Entry)	<p>Municipal services are often interconnected. Therefore, the failure of one may lead to the failure or damage to other services or the loss of continuity of operations.</p> <p>In the event of emergencies, government agencies/services will be integral to the coordination and management of emergency responses. Without operational government infrastructure, fire services would struggle to manage large-scale fires/responses.</p> <p>Maintaining governmental functions during significant fire events ensures public trust and social stability. Citizens look to government authorities for leadership, support, and reassurance during crises. If the government cannot function, it can create confusion and social unrest, especially in the face of significant emergency incidents.</p>

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Public Safety and Security	Sault Ste. Marie Fire Services (SSMFS) – operating from Fire Stations 1 through 4. Emergency Medical Services (EMS) Emergency Operations Centre/Community Emergency Management Coordinator Sault Ste. Marie Police Service RCMP OPP Anishinabek Police Corrections Services – Algoma Treatment and Remand Centre, Donald Doucet Youth Centre	<p>SSMFS provides fire and emergency services response across the City of Sault Ste. Marie. Public safety infrastructure, including fire stations, fire apparatus/trucks, communication systems, and training facilities, is required to provide an effective firefighting response. The infrastructure must be well-maintained and resilient to ensure that fire services can operate quickly and efficiently during a fire emergency.</p> <p>Where required, emergency responses include a combination of fire, EMS and Police (department responding depends upon the jurisdiction).</p> <p>Large fire emergencies often result in injuries, burns, smoke inhalation, and other health-related issues. Access to hospitals, emergency medical services (EMS), and medical equipment is crucial for treating fire victims and protecting public health.</p> <p>During community fires/emergencies, law enforcement plays a vital role in maintaining public order, ensuring evacuation procedures are followed, and preventing looting or criminal activity in areas affected by fires. Critical infrastructure for police, such as stations, patrol vehicles, and surveillance systems, is vital for public safety.</p>

<p>Transportation</p>	<p>Roads: City’s Public Works, Ministry of Transportation Ontario Sault Ste. Marie Airport Rail: Huron Central Railway, CN Steelton Yard, Agawa Canyon Tour Train, Sault Multimodal Terminal, Public Transit: City Buses, First Student School Buses Bridges: International Bridge, local bridges – City Engineering</p>	<p>Transportation Accidents (whether road, rail or air) may require emergency response from fire services.</p> <p>During fire emergencies, ensuring the safe evacuation of residents is essential. Critical infrastructure such as roads, bridges, transportation networks, and public transit systems are needed for the timely and safe movement of people away from danger zones.</p> <p>Accidents involving transportation of hazardous cargo could result in the release of hazardous material requiring a hazardous materials response. There can be a potential for explosions, fires and destabilization of surrounding structures. For motor vehicle collisions, passenger train derailments or collisions, or aviation incidents, passenger and employee extrication and technical rescue may be required. Motor vehicle collisions drive fire department and ambulance call volume.</p> <p>Traffic hazards (distracted drivers, high speed movement) present safety considerations for responding crews.</p> <p>Major incidents resulting in long-term recovery could delay daily shipment of goods and services, with potential negative effects on the local economy.</p> <p>Transportation incidents can impact the use of other vehicles on transportation networks (including road, rail and air). Multi-lane and vehicle collisions on the road network can obstruct lane access for responding apparatus.</p>
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CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Food and Water	<p>Water Conservation and Flood Control – Sault Ste. Marie Region Conservation Authority</p> <p>Municipal Water Facilities - PUC Municipal Water Treatment Plant, Intake Pipe - Gros Cap Intake & Pumping Station, Wells – Goulais Well, Steelton Well, Lorna Well, Shannon Well, Reservoirs (storage) – Zone 1 and Zone 2, Wastewater Treatment Plants – West Plant, East Plant</p> <p>Garbage and Recycling – Landfill, Collection & Recycling, GFL Environmental,</p> <p>Food Distribution: Grocery stores (approximately 15 locations within the City)</p>	<p>Access to clean water and nutritious food is integral to the overall health and safety of a community, especially during and after a disaster, such as a fire. Without these essentials, the ability of a community to recover and sustain itself is challenged.</p> <p>Water: Fire services responding to fires and emergencies rely heavily on an adequate and reliable water supply. If there's insufficient access to water, it becomes much harder to extinguish fires (especially in areas prone to wildfires). If the water infrastructure is compromised, firefighting capabilities can be significantly impacted. This could lead to longer response times, reduced fire suppression efforts, and greater property loss. Water supply through the City's system of hydrants is discussed further in the Section 4.1.1.</p> <p>Food: If critical food infrastructure, such as storage facilities, transportation routes, or production farms, is destroyed, the community could face food shortages, higher costs, and increased vulnerability. The disruption of food supply may lead to economic instability, hunger, and reliance on external aid, particularly in communities.</p> <p>Communities that prioritize and maintain robust critical infrastructure—especially related to food and water—are more resilient in the face of fire risks. Preparing these systems to withstand potential fire-related disruptions is key to disaster response and recovery.</p>

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Electricity	Electrical Transmission & Distribution: Distribution Lines – Hydro One (Third Line Station), Transformers – PUC (St. Mary's Transformer Station, Tarentorus Transformer Station), Sub-Stations (1,2,4,5,10-21) – PUC, Hydroelectricity: Hydroelectric Power Plan (Brookfield Renewable Power) Solar-Electricity – Starwood SSM (various locations)	Electricity infrastructure is vital for fire services, both as a fire risk and as a critical support system for emergency response. Effective coordination between fire departments, utility companies, and community emergency managers ensures safer communities, faster response times, and reduced risks from electrical hazards. Fire services should work closely with electrical providers to manage hazards and restore power safely. Pre-planned emergency shutoffs can help firefighters operate safely in dangerous environments. Joint training exercises can improve response times to electrical fires and outages.

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Gas and Oil	Gas Service Stations: Retailers (16 locations), Truck/Travel Centres (3 locations), Fuel Distributors/Wholesalers – Shell Canada Products Limited (Tank Farm), Heating Fuel Suppliers (3 suppliers), Propane Suppliers (3 suppliers)	<p>Gas, oil, and propane infrastructure can present fire risks within a community due to the potential for fires, explosions, and hazardous material incidents. Fire services should integrate these energy sources into their emergency planning, response strategies, and risk mitigation efforts.</p> <p>Natural gas leaks in homes, businesses, and pipelines can lead to explosions if ignited.</p> <p>Propane is highly flammable and can explode under high heat or pressure.</p> <p>Oil refineries, storage tanks, and fuel transportation networks pose significant fire hazards due to volatile materials.</p> <p>Large tanks storing gas, oil, or propane require fire departments to have specialized firefighting techniques, such as foam suppression.</p> <p>Firefighters must understand evacuation distances and protective measures for gas and oil incidents.</p>

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Health Care	<p>There is one major hospital in the City of Sault Ste. Marie – the Sault Area Hospital.</p> <p>Clinics: Algoma Public Health and Group Health Centre, Walk-Ins (seven locations), Long-Term Care Homes – nursing homes and retirement homes</p> <p>Pharmacies – 17 locations</p>	<p>Medical facilities are essential for treating fire-related injuries and other emergencies. Health care infrastructure is significant from the perspective of fire protection services because a health-related emergency can increase demand for health care services, specifically ambulance services and medical response (e.g. tiered response).</p> <p>In the event of a fire /emergency at Sault Ste. Marie General Hospital in Sault Ste. Marie would require complex evacuation procedures for a large number of immobile and medically dependent individuals. Fire prevention measures (sprinklers, fire-resistant construction, evacuation plans, etc.) are critical in health care settings.</p> <p>Fire services play a role in ensuring healthcare facilities can withstand disasters (fires, wildfires, natural disasters). Backup power, fire-resistant design, and emergency water supply are critical for healthcare continuity.</p>

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Communications Systems	911 Communications – Fire, SSMFS 911 Communications – Police, OPP (Smiths Falls / Orillia) RCMP 911 Communications – Ambulance (CACC), Ministry of Health Telephones/Cell Phone Providers: (Telus Mobility, Bell Mobility, Rogers, AT&T, Fido, Solo Mobile, Virgin Mobile, Chatr Wireless, etc.) Radio Stations: Kiss (100.5 /104) Air/Airport – Sault Ste. Marie Airport	<p>Communication infrastructure is vital for effective fire response, public safety, and disaster coordination. Fire services depend on reliable communication systems to dispatch emergency crews, coordinate with other agencies, and inform the public about fire risks and evacuation procedures. Any failure in these systems can delay response times, increase casualties, and hinder firefighting efforts.</p> <p>There are several radio communication towers within Sault Ste. Marie. If wires or towers are compromised, the ability to communicate with emergency personnel could be extended, possibly leading to extended emergency response times.</p>
Financial Institutions	13 locations within the City	In the event of a significant emergency, residents may not have access to their financial institutions and banking services.

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Shelter and Reception Centres	George Leach Centre, Algoma University Superior Heights C&VS, Algoma District School Board GFL Memorial Gardens, City of Sault Ste. Marie	<p>Critical infrastructure that provides emergency shelters, temporary housing, and support services during fire events is essential for the displaced population. Many fires leave residents without homes. Access to safe shelters can prevent further harm and provide a stable environment for recovery.</p> <p>Inadequate shelters can lead to overcrowding, health risks, and a longer recovery period. Providing safe and accessible shelters is key to reducing the impact of fires on public safety.</p>
Education	Algoma District School Board: Board Office, Elementary Schools (17 sites), and Secondary Schools (three sites) Huron Superior Catholic District School Board: Board Office, Elementary Schools (7 sites), Secondary Schools (1 site), Post Secondary Institutions: Sault College and Algoma University	<p>Education infrastructure is a priority for fire services due to the population density, presence of vulnerable individuals (e.g. children/youth), and need for structured evacuation plans. Fire services should plan and deliver fire prevention, emergency response, and safety education services to these institutions. Fire services should work closely with educational institutions to reduce fire risks, protect vulnerable students, and ensure preparedness for fire-related / emergency situations. By prioritizing fire safety education, building resilience, and emergency coordination, communities can better safeguard their educational facilities and those who rely on them.</p>

CI Sector	City's Infrastructure Components	Fire Related Issues/Concerns
Manufacturing	Algoma Steel, Tenaris, ARAUCO, Heliene Canada, SIS Group, Boniferro Mill Works,	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. Significant fires or emergencies at manufacturing locations can impact the local economy.
Lottery and Gaming	OLG	No special considerations noted for SSMFS.

4.1.1 Water Infrastructure – Hydrants

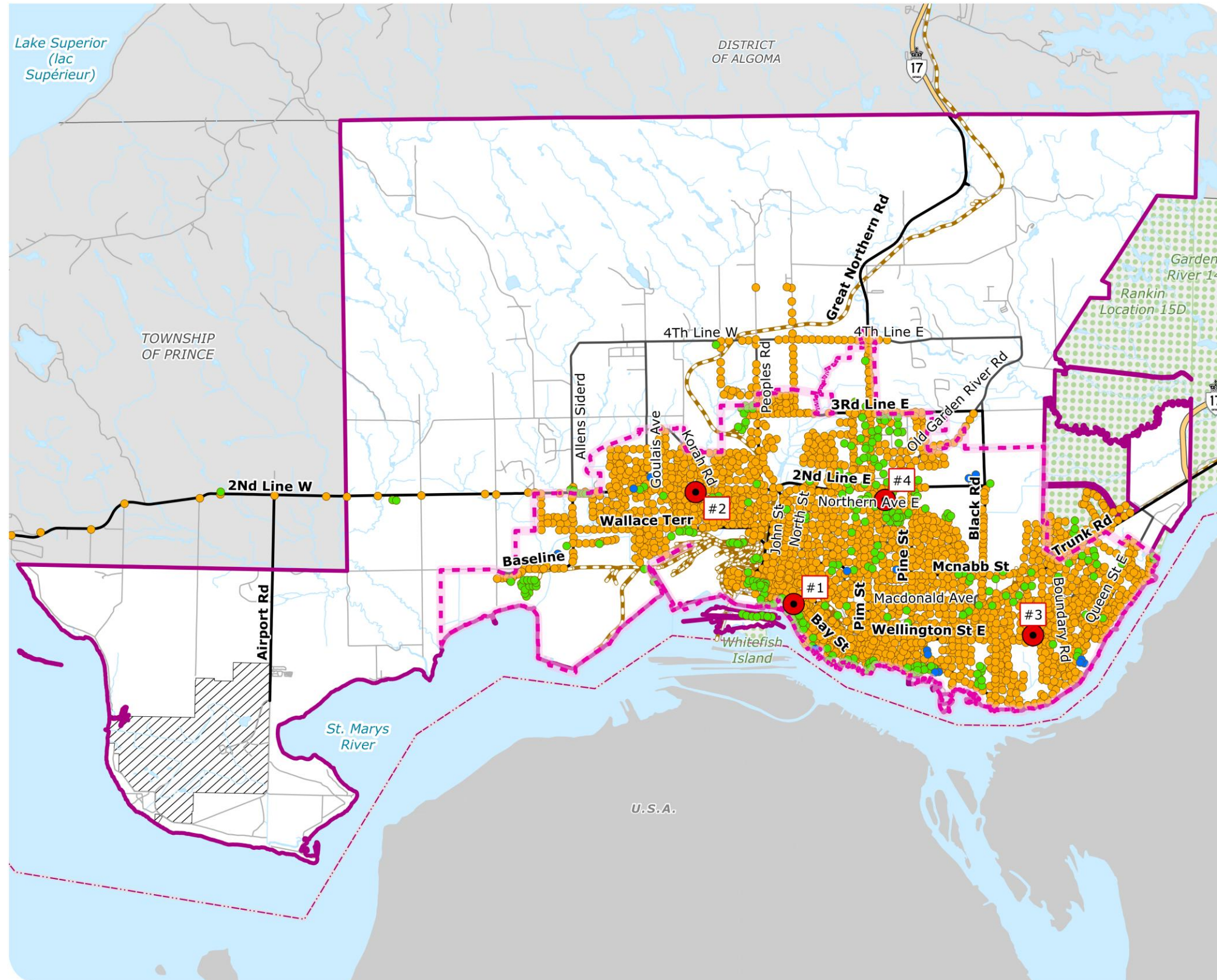
Sault Ste. Marie has a water supply system consisting of water treatment, water storage, and distribution stations, as well as numerous fire hydrants mostly in the Urban Settlement Area of the City. **Figure 18** illustrates the location of fire hydrants throughout Sault Ste. Marie.

Water supply is essential for firefighting, accessible to the fire department through municipal water delivery systems, or the fire department itself (tanker shuttles). Equally important to the presence of water supply is the quantity of water available for fire protection purposes, referred to as fire flow. As described in the NFPA Glossary of Terms (2019 Edition), fire flow is “the flow rate of water supply measured at 20psi (137.9 kPa) residual pressure, that is available for firefighting.” The control of structure fires in urban areas are typically delivered by hose lines supplied by a local water delivery system via hydrants.

A water supply shortage or water system disruption could impede the flow rate of water delivered to hydranted areas resulting in inadequate water supply and distribution needed for the delivery of fire protection services.

Where no municipal water systems exist, supplementary water supply sources are considered. It is a common occurrence for rural and undeveloped areas, not to have pressurized hydranted water supply systems.

Figure 18: Hydrants



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

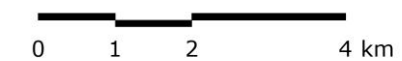
FIRE HYDRANTS

- Existing Fire Station
- Urban Settlement Boundary
- Fire Hydrant (Administration)
 - City
 - Private
 - PUC

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-05-30



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Geographic\Geographic\Geographic.aprx\Hydrants

5.0 Demographic Profile

As referenced in **O. Reg. 378/18**, the demographic profile assessment includes analysis of the composition of the community's population, respecting matters relevant to the community such as population size and dispersion, age, gender, cultural background, level of education, socioeconomic make-up, and transient population. The following sections consider these demographic characteristics within the City of Sault Ste. Marie.

5.1 Population and Dispersion

Between 2001 to 2021, the population of the City of Sault Ste. Marie increased to a peak of 75,141 people in 2011 and has been decreasing since then to a population of 72,051 in 2021. The total number of private dwellings, however, has increased steadily during the two decades between 2001 and 2021 to a current total of 34,818. **Table 14** shows that the percentage change for both the population and total private dwellings between 2011 and 2021.

Table 14: Historic Growth in Population and Households - Sault Ste. Marie

Year	Population	% Change	Total Private Dwellings	% Change
2001	74,566	No Data	32,822	No Data
2006	74,948	+0.51%	33,378	+1.69%
2011	75,141	+0.26%	33,901	+1.57%
2016	73,368	-2.36%	34,485	+1.72%
2021	72,051	-1.80%	34,818	+0.97%

Source: 2021, 2016, 2011, 2006, 2001 Census, Statistics Canada

Based on data released by Statistics Canada in 2024, the City's estimated 2022 population was 76,014⁴⁴ and estimated 2023 population was 78,574⁴⁵. The population

⁴⁴ According to Statistics Canada. Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries. Retrieved May 30, 2024, from:

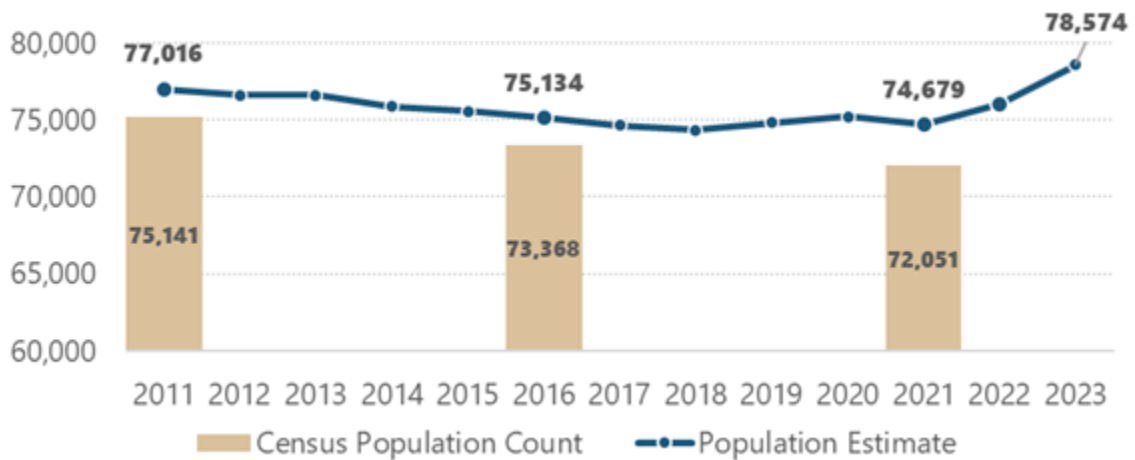
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015501>

⁴⁵ According to Statistics Canada. Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries. Retrieved May 30, 2024, from:

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015501>

as of 2021 was 72,051 (2021 Census Subdivision). Although the 2021 population reflects a decrease in population compared to other recent Census years (-1.8% decrease from 2016), the 2022 and 2023 estimates indicate population growth of 1,335 and 2,560 persons respectively. The comparisons of census population counts and Statistics Canada population estimates for the time period of 2011 to 2023 are presented in **Figure 19**. The annual changes in population, based on population counts and estimates (as available) are presented in **Figure 20**.

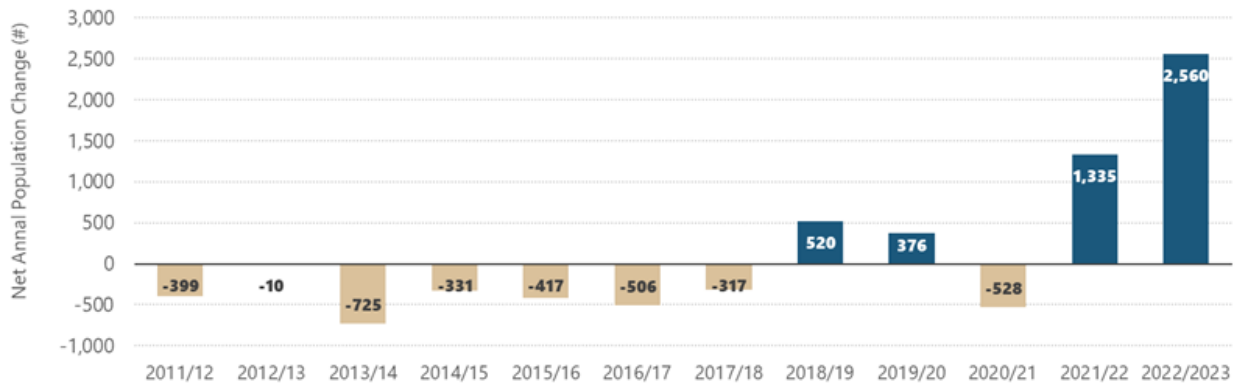
Figure 19: Population Counts and Estimates (2011 to 2023), City of Sault Ste. Marie



Source: Statistics Canada⁴⁶

⁴⁶ *Statistics Canada. [Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries.](#)*

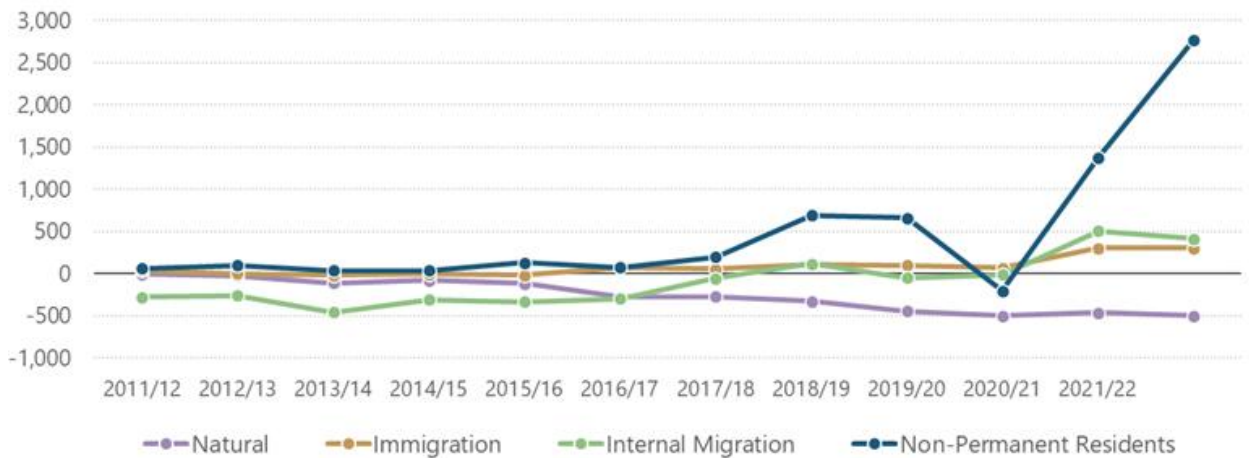
Figure 20: Estimated Annual Change in Population (2011 to 2023), City of Sault Ste. Marie



Source: Statistics Canada⁴⁷

The components of population change within the City of Sault Ste. Marie, in the time period from 2011 to 2023, are shown in **Figure 21**. As shown, the growth is attributed to immigration, internal migration, and most significantly, non-permanent residents.

Figure 21: Components of Population Change (2011 to 2023), City of Sault Ste. Marie



Source: Statistics Canada⁴⁸

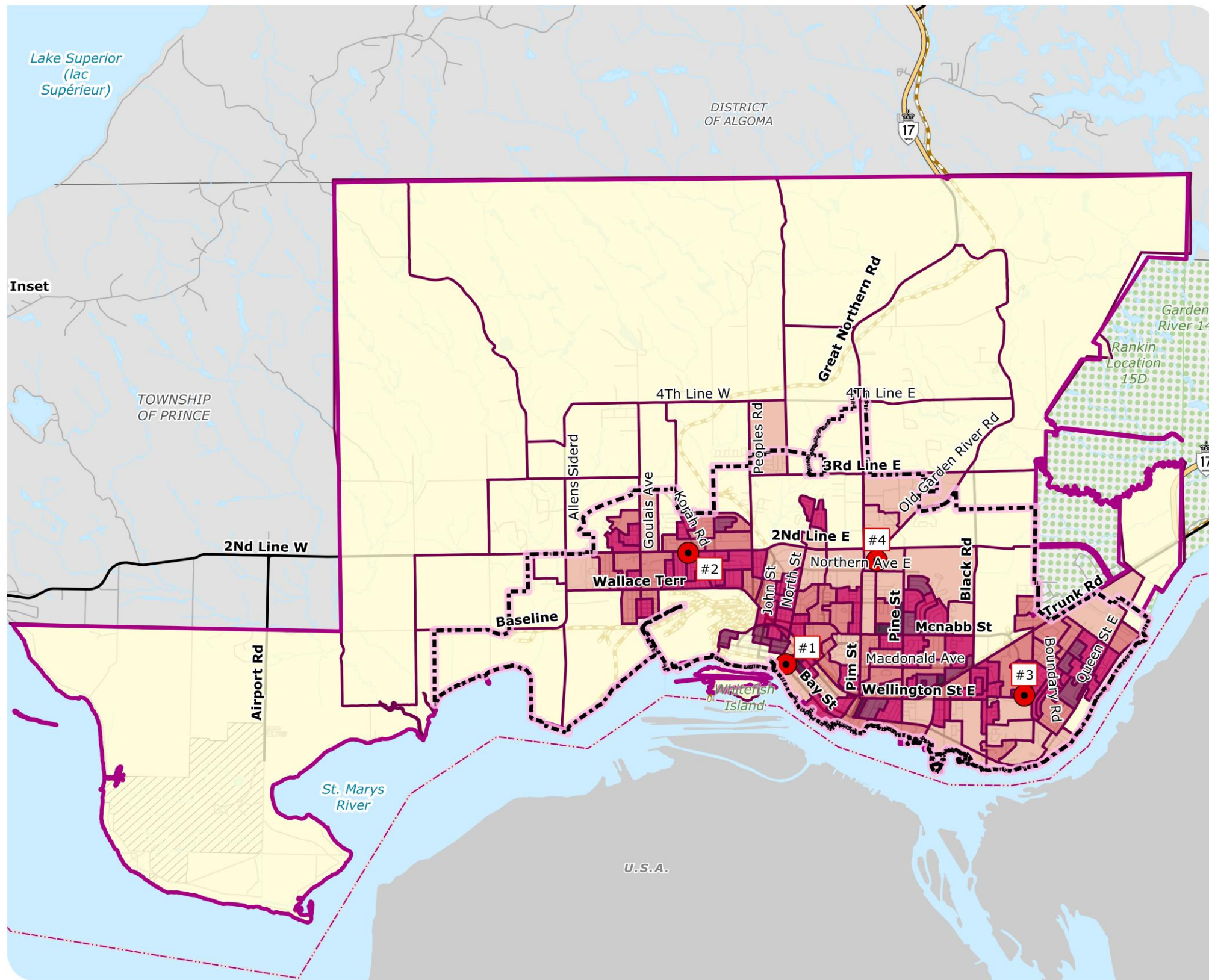
⁴⁷ Statistics Canada. [Table 17-10-0155-01 Population estimates, July 1, by census subdivision, 2021 boundaries.](#)

⁴⁸ Statistics Canada. [Table 17-10-0149-01 Components of population change by census metropolitan area and census agglomeration, 2021 boundaries](#)

5.1.1 Mapping Population Density and Dispersion

The density and dispersion of the population is presented in **Figure 22**. The most densely populated areas of Sault Ste. Marie are found within the City's Urban Settlement Area. Higher density areas of note include the downtown core, along Cathcart Street, Queen Street and Wellington Street. There is also a noticeable higher population density east of the downtown at Pine Street and McNabb Street, Trunk Road and Wellington Street.

Figure 22: Population Density – City of Sault Ste. Marie



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

POPULATION DENSITY

- Existing Fire Station
- People per Square Kilometre**
- 14 - 420
- 421 - 1,265
- 1,266 - 2,049
- 2,050 - 2,848
- 2,849 - 3,957
- 3,958 - 6,645
- Urban Settlement Boundary
- Base Data**
- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000
0 1 2 4 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS, STATISTICS CANADA
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N
PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-06-03



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Demographic\demo_aprx\demo_aprx.aprx\Population_Density



5.2 Population Age

A community's population by age is an important factor in identifying specific measures to mitigate risks associated with a specific age group, such as seniors. Canada's aging population has been recognized as one of the most significant demographic trends. According to Statistics Canada, from 2016 to 2021, Canada experienced a large increase in the proportion of seniors since Confederation," due to the baby boomer generation reaching the age of 65. There are more Canadians over the age of 65 (19.0% of the population) than there are children aged 14 years and younger (16.3%).⁴⁹ Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the province based on the residential fire death rate (fire deaths per million of population). **Figure 23** illustrates the results of an analysis revised by the OFM's Fire Statistics in November 2021. Through this analysis, seniors are identified as being at an increased risk of fatality in residential occupancies when compared to other age groups.

⁴⁹ Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released October 26, 2022. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed November 22, 2022). Statistics Canada. (2017, May). The Daily: Age and sex, and type of dwelling data: key results from the 2016 Census. Retrieved from [Statistics Canada, 2016 Census Page](#)

Figure 23: 2011-2021 Residential Fire Death Rate by Age of Victim

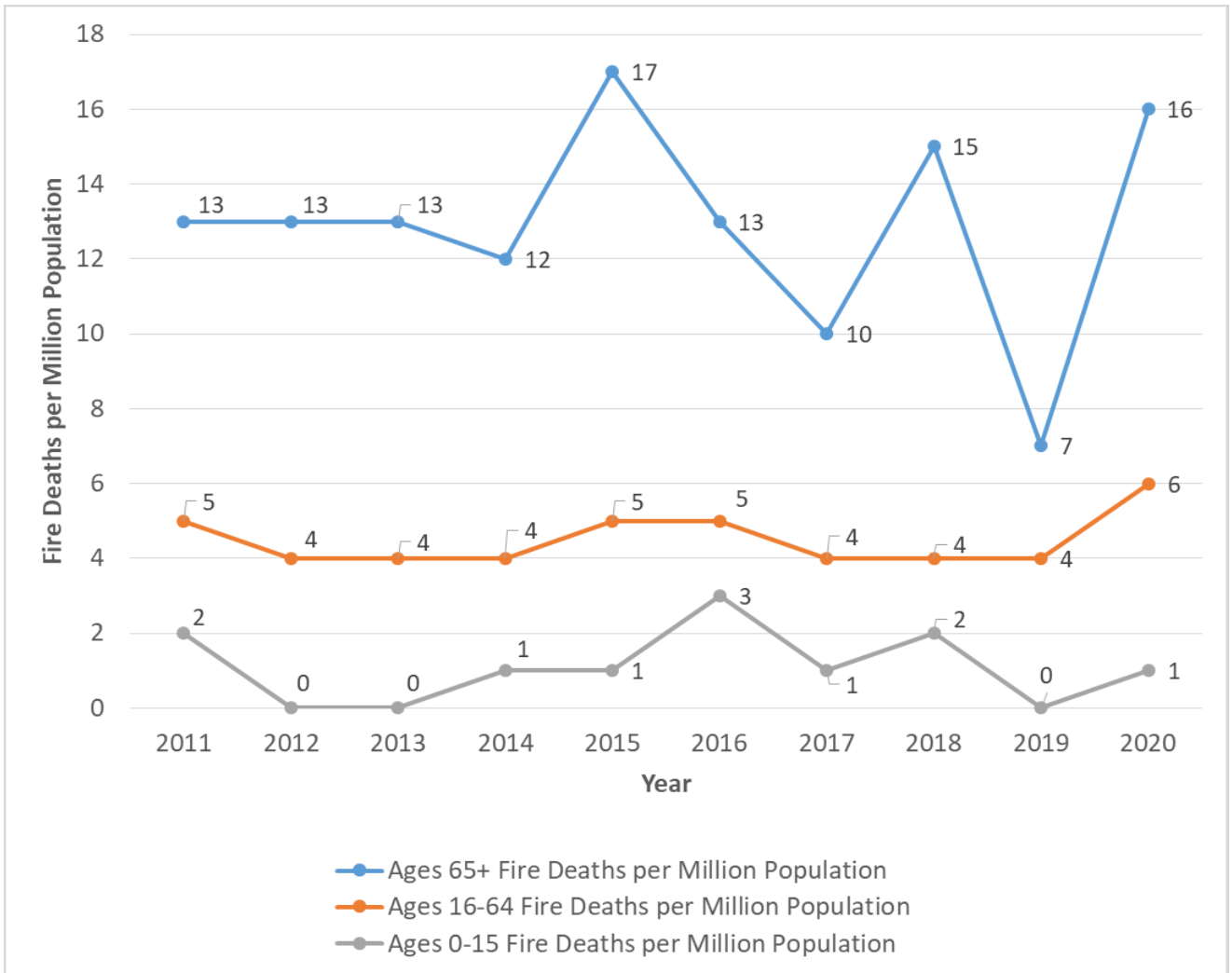


Figure Source: Adapted based on OFM reported residential fatal fires from 2011 to 2020.⁵⁰

The 2021 Census identified the City of Sault Ste. Marie’s total population as 72,051. The age distributions of the City’s population and Ontario’s population are summarized and compared in **Table 15** and further illustrated in **Figure 24**.

⁵⁰ Office of the Fire Marshal. (Revised 2022, February). Ontario Residential Fatal Fires.

Table 15: Population by Age Group – Sault Ste. Marie and Ontario

Age	Sault Ste. Marie Population	Sault Ste. Marie Percentage of Population	Ontario Population	Ontario Percentage of Population
0 to 4 years	3,040	4.2%	683,515	4.8%
5 to 9 years	3,675	5.1%	764,430	5.4%
10 to 14 years	3,530	4.9%	803,850	6.6%
15 to 19 years	3,510	4.9%	801,455	6.6%
20 to 24 years	4,035	5.6%	895,600	6.3%
25 to 44 years	16,605	23.0%	3,794,800	26.7%
45 to 54 years	8,230	11.4%	1,835,850	12.9%
55 to 64 years	11,485	15.9%	2,006,735	14.1%
65 to 74 years	9,725	13.5%	1,504,495	10.6%
75 to 84 years	5,600	7.8%	794,595	5.6%
85 + years	2,605	3.6%	338,620	2.48%
Total	72,050⁵¹	100.00%	14,223,942	100.00%
Median Age of the Population	47	Not Applicable	41.6	Not Applicable
Population aged 14 and under	10,250	14.2%	2,251,795	15.8%
Population aged 65 and over	17,930	24.9%	2,637,710	18.5%

Source: 2021 Census, Statistics Canada⁵²

⁵¹ For the purposes of this CRA, the total population counts provided are a sum of the values provided by Statistics Canada. Of note, these totals may be different from the totals provided by Statistics Canada because of the following “Statistics Canada is committed to protect the privacy of all Canadians and the confidentiality of the data they provide to us. As part of this commitment, some population counts of geographic areas are adjusted in order to ensure confidentiality. The adjustment to counts of the total population for any dissemination block is controlled to ensure that the population counts for dissemination areas will always be within 5 of the actual values. The adjustment has no impact on the population counts of census divisions and large census subdivisions.”

⁵² Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released July 13, 2022. [Statistics Canada, 2021 Census Page.](#)

The youngest demographic (those 14 years of age and under) represents 14.2% of the City's total population, which is slightly lower in comparison to the Province (15.8%). While at a lower risk of fatality in residential occupancies overall when compared to seniors or adults, youth (aged 14 years and under) represent an important demographic for the purposes of public education. Learning fire safety practices at a young age is likely to instill these practices as youth become adults. As a result, there is value in targeting public education and prevention programs to this demographic. Structured education programs consistently provided to children and youth can help to engrain fire and life safety awareness and knowledge into future generations.

The percentage of the population aged 65 years and older in Sault Ste. Marie represents 24.9% of the total population, significantly higher when compared to the Province (18.5%) by 6.3%. An additional 15.9% of the City's population falls between the age group of 55 and 64, who are aging towards the senior demographic of 65 years of age and older. Based on historic residential fire fatality data, this population will become seniors who will be at greater risk. These demographic trends are important considerations for the development of informed targeted public education programs and risk reduction strategies within the community.

Figure 24: Population Distribution by Age – Sault Ste. Marie and Ontario

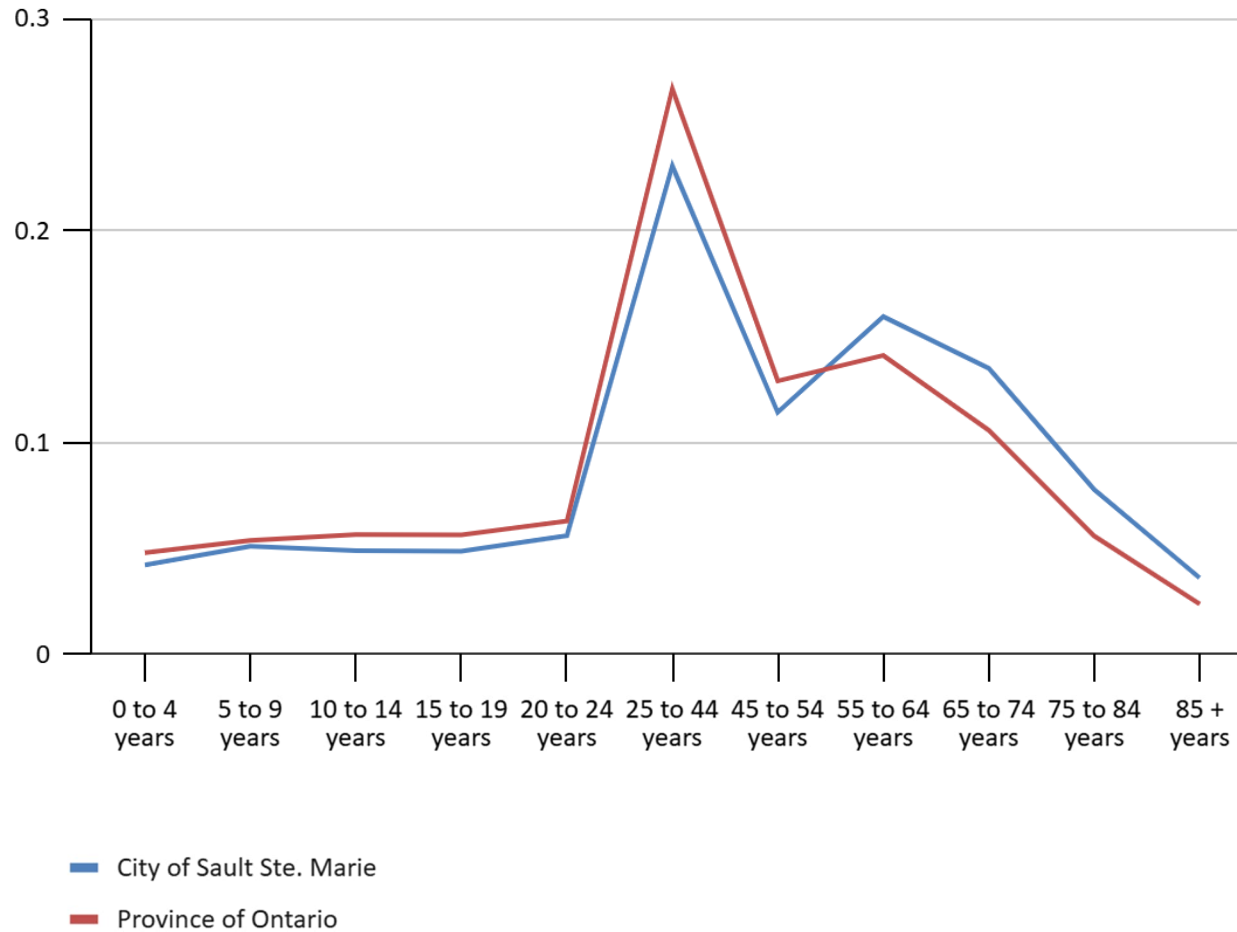


Figure Source: 2021 Census, Statistics Canada⁵³

⁵³ Ibid.

Key Finding: The 2021 Census data indicates that children, aged 14 and under, represent 14.2% of the City's total population, slightly less than the Provincial population at 15.8%.

Identified Risk: Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on the residential fire death rate. According to the 2021 Census, seniors represent 24.9% of the City's total population, significantly higher than the Province as a whole at 18.5%.

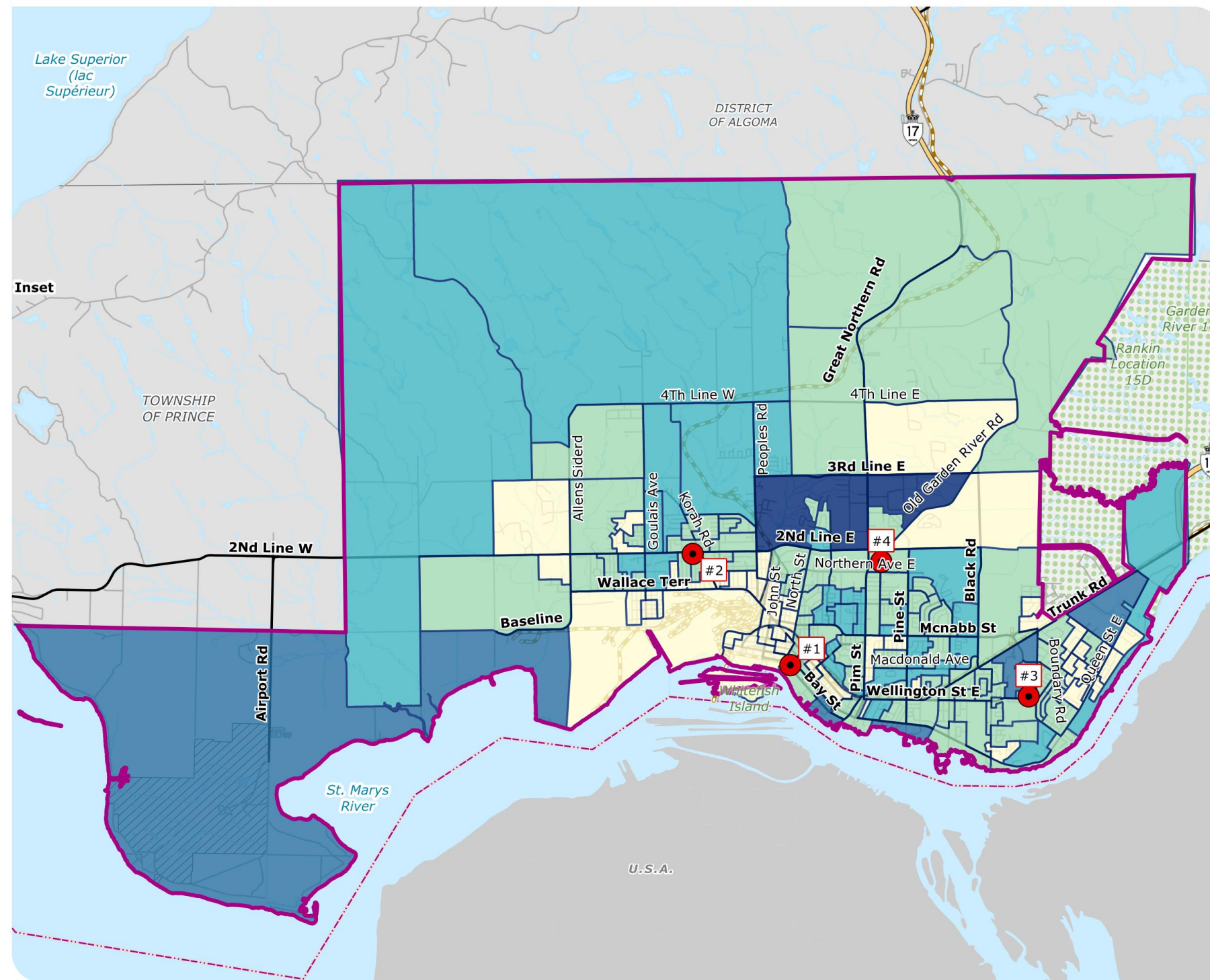
Key Finding: Of the City's total population, 15.9% fall into the age range of 55 to 64, representing a cohort aging towards the seniors' demographic of 65 years or older.

5.2.1 Mapping Population Age

Census data from 2021 was mapped by dissemination area to provide a visual representation of the spatial distribution of population by age, with the City of Sault Ste. Marie. **Figure 25** presents the distribution of the senior population (65 and older) and **Figure 26** shows the distribution of youth (0 to 14 years). Both maps present the proportion of the population within each of the age categories. **Figure 25** shows the area with the highest percentage of the population 65 years and older reside immediate north of Station 4, between 2nd Line East and 3rd Line East. There are also pockets of higher seniors' populations in the downtown core, in the area surrounding and to the east of Station 3 and in the southwest corner of the City (south of Base Line and surrounding the airport).

Figure 26 shows the highest proportions of youth (0-14 years) are located in the area surrounding and to the east of Station 3 and in the southwest corner of the City (south of Base Line and surrounding the airport). There is also a higher youth population identified in the northeast corner of the City's geography.

Figure 25: Percentage of Population Aged 65 and Older by Dissemination Area



CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

PERCENTAGE OF POPULATION AGED 65 AND OLDER BY DISSEMINATION AREA

● Existing Fire Station

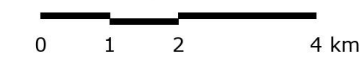
Percentage of Population 65 Plus as a Percentage of Total

- 0.2% - 0.5%
- 0.6% - 0.8%
- 0.9% - 1.2%
- 1.3% - 2.3%
- 2.4% - 3.3%

Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000

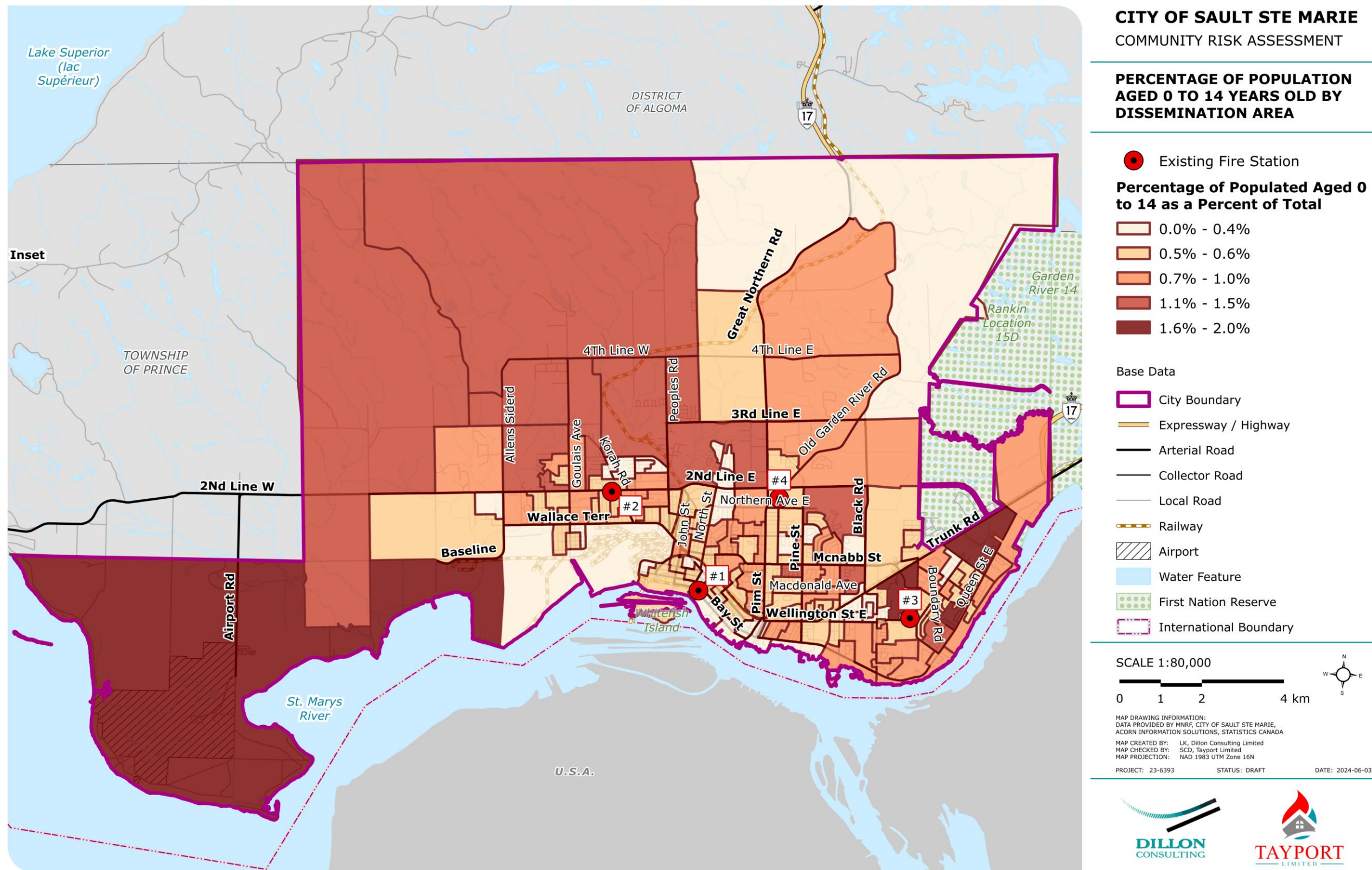


MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE, ACORN, INFORMATION SOLUTIONS, STATISTICS CANADA
MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-06-03



Figure 26: Percentage of Population Aged 0-14 Years Old by Dissemination Area



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5.3 Gender

NFPA 1730 - Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations (2019 Edition) considers gender as part of a Community Risk Assessment due to the finding that, based on historic data, males are more likely to be injured or die in a fire.

Table 16 displays the distribution of both genders by age for the City of Sault Ste. Marie. We note that Statistics Canada refers to gender as an individual's personal and social identity as a man, woman or non-binary person. Due to the small non-binary population, individuals who identify as "non-binary persons" are distributed into the other two gender categories to protect confidentiality. The proportion of males versus females is comparable at 48.6% male to 51.4% female. When specific age groups are reviewed, there are minor variations. One of the greater differences is the proportion of males (39.0%) compared to females (61.0%) for the 85 years and over age group. Based on these statistics, it is not anticipated that public education programming needs to be refined based on gender. The impact of gender ratio on public education programming would be more notable in a community with unique demographics, such as those that have transient populations due to employment, for example.

Table 16: Gender Distribution by Age Group – Sault Ste. Marie

Age Group	Total Population	Male	%	Female	%
0 to 4 years	3,040	1,600	52.6%	1,445	47.5%
5 to 9 years	3,675	1,885	51.3%	1,790	48.7%
10 to 14 years	3,530	1,875	53.1%	1,660	47.0%
15 to 19 years	3,510	1,795	51.1%	1,710	48.7%
20 to 24 years	4,035	2,155	53.4%	1,880	46.6%
25 to 44 years	16,605	8,220	49.5%	8,385	50.5%
45 to 54 years	8,230	4,030	49.0%	4,210	51.2%
55 to 64 years	11,485	5,340	46.5%	6,140	53.5%
65 to 74 years	9,725	4,650	47.8%	5,080	52.2%
75 to 84 years	5,600	2,480	44.3%	3,120	55.7%
85 + years	2,605	1,015	39.0%	1,590	61.0%
Total	72,051	35,035	48.6%	37,020	51.4%

Source: 2021 Census, Statistics Canada⁵⁴

5.4 Socioeconomic Circumstances

Research has established that fire risk does not impact a community homogeneously. Socioeconomic circumstances are known to significantly impact fire risk. Just as communities are diverse, so too is the potential for fire risk. Socioeconomic status is reflected in an individual's economic and social standing and is measured in a variety of ways. These factors can be reflected in the analysis of socioeconomic indicators such as labour force status, educational attainment and income, as well as household tenure, occupancy, suitability, and cost.

Socioeconomic factors intersect in a number of ways and have direct and indirect impacts on fire risk. One such example is outlined in the OFM's Fire Risk Sub-Model.⁵⁵ 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 the consequences 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

⁵⁴ Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released October 26, 2022. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed November 18, 2022).

⁵⁵ Minister of the Solicitor General. (Modified 2016, February). Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model.

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

5.4.1 Labour Force Status

Those who are economically disadvantaged, including low-income families, the homeless and perhaps those living alone, may experience a higher fire risk. The OFM's Fire Risk Sub-Model references a number of reports that suggest there is a correlation between income levels and fire risk. The reports identify the following factors:

- The higher number of vacant buildings found in low-income neighbourhoods attracts 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 Neighbourhoods in Toledo, Ohio," determined that the incendiary fire rate in low-income neighbourhoods is 14.4 times higher compared to areas with the highest median income. Further, fires caused by smoking and children playing occurred at rates 8.5 and 14.2 times higher, respectively.
- Single parent families are more economically challenged with 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).

- Individuals with low education and literacy levels are inhibited in their ability to read instruction manuals and warning labels, and are less likely to grasp fire safety messages.⁵⁶

Labour force status is a possible indicator of income levels which directly influence fire risk (e.g. lower income, increased fire risk). The participation rate (i.e. the proportion of residents in the labour force) can also be an indicator of income and can be considered alongside unemployment rates (e.g. lower participation rate and higher unemployment could mean lower income, higher fire risk).

Labour force status, shown in **Table 17** below, shows that the City of Sault Ste. Marie has a lower participation rate than the Province of Ontario (54.9% versus 62.8%). This would suggest that, from the perspective of labour force, the City faces a higher fire risk in comparison to the Province.

Table 17: Labour Force Status – Sault Ste. Marie and Ontario

Status	Sault Ste. Marie Population	Sault Ste. Marie %	Ontario Population	Ontario %
In the Labour Force ⁵⁷	33,210	54.9%	7,399,200	62.8%
Employed	28,895	47.8%	6,492,895	55.1%
Unemployed	4,315	7.1%	906,310	7.7%
Not in the Labour Force	27,275	45.1%	4,383,620	37.2%
Total	60,485	100%	11,782,820	100%

Source: 2021 Census, Statistics Canada⁵⁸

5.4.2 Educational Attainment

The relationship between educational attainment and income is multi-layered and complex. An analysis conducted by Statistics Canada has found that high-income Canadians are generally more likely to be highly educated. Over two-thirds (67.1%) of

⁵⁶ Ibid.

⁵⁷ The category 'In the Labour Force' is a subtotal of the following categories: employed and unemployed.

⁵⁸ Statistics Canada. 2017. Sault Ste. Marie, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. [Statistics Canada, 2016 Census Page](#) (accessed July 4, 2022).

the top 1% had attained a university degree compared to 20.9% of all Canadians aged 15 and over.⁵⁹ Based on this national trend, and for the purposes of this risk assessment, it is assumed that a higher education leads to more disposable income and, therefore, a lower fire risk. It is also assumed that households with more disposable income are more likely to invest in fire life safety products, such as smoke alarms, home monitoring systems with direct connection to emergency services alerting, and fire extinguishers, which reduce household fire risk. **Table 18** displays educational attainment for the City of Sault Ste. Marie and the Province of Ontario.

Table 18: Educational Attainment – Sault Ste. Marie and Ontario

Educational Attainment	Sault Ste. Marie Population	Sault Ste. Marie %	Ontario Population	Ontario %
No Certificate/Diploma/Degree	9,640	15.9%	1,799,890	15.3%
High School Diploma or Equivalent	18,570	30.7%	3,204,170	27.2%
Postsecondary Certificate, Diploma, or Degree	32,285	53.4%	6,778,765	57.5%
Total	60,495	100%	11,782,825	100%

Source: 2021 Census, Statistics Canada ⁶⁰

Based on 2021 Census data, 53.4% of residents in the City of Sault Ste. Marie have a postsecondary certificate/diploma/degree, which is approximately 4.1% lower than the Province. This level of educational attainment could be linked to the industrial base of the City of Sault Ste. Marie. It may be an indicator of increased fire-risk, in comparison to the province as a whole.

According to the 2021 Census, the median total income of Sault Ste. Marie households in 2020 was \$73,500, significantly lower than the Provincial median total income per household of \$91,000.00. The data also indicates potential increased fire risk within the City of Sault Ste. Marie, in comparison to the overall province.

⁵⁹ Statistics Canada. (Modified 2018, July). Education and occupation of high-income Canadians. Retrieved from [Statistics Canada, Census Page](#)

⁶⁰ [Statistics Canada, 2016 City of Sault Ste. Marie Census Page](#)

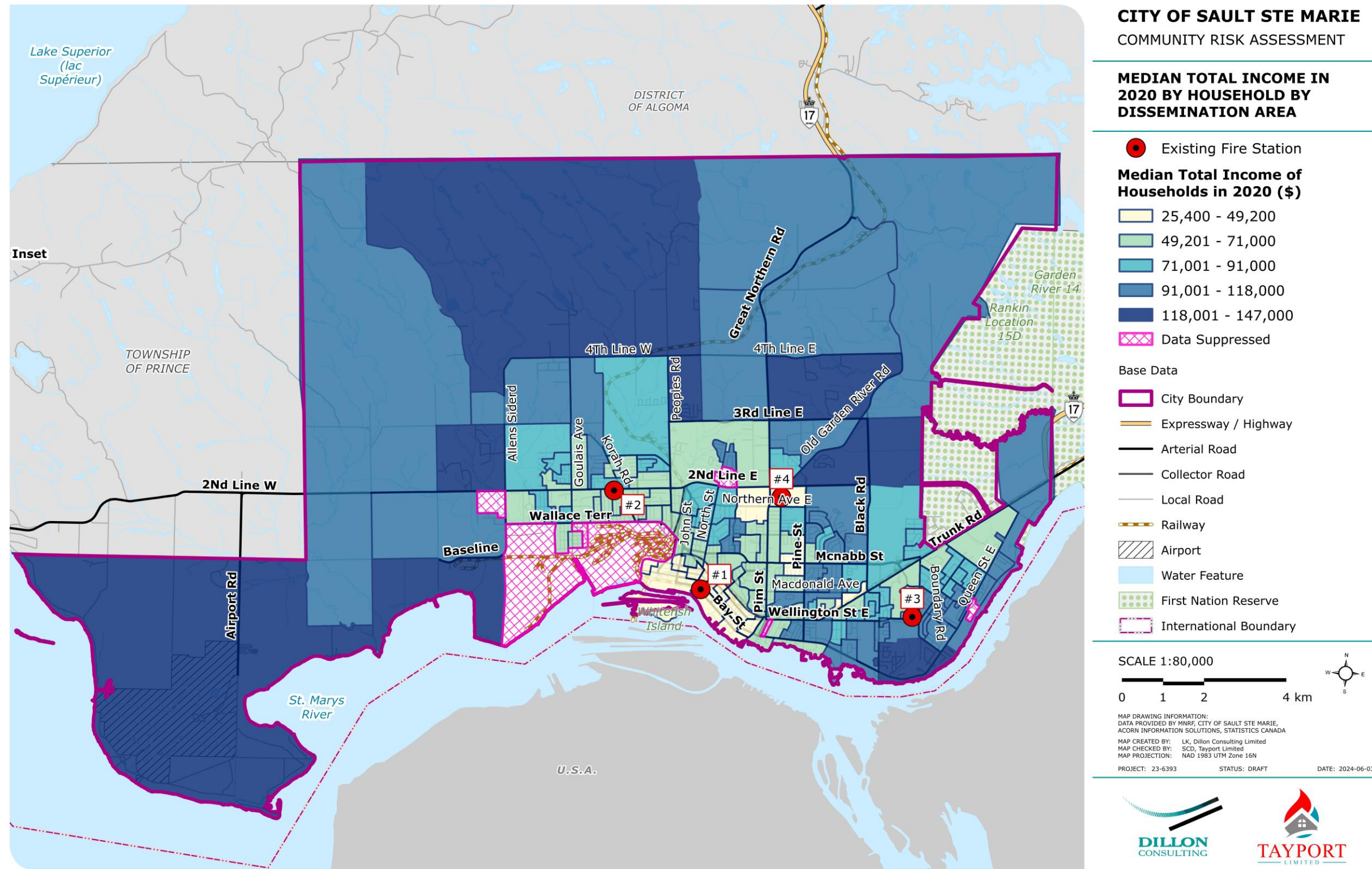
Key Finding: Based on socioeconomic factors, such as a lower participation rate in the labour force, lower levels of educational attainment and lower median incomes than the Province there is a potential increased fire risk within the City of Sault Ste. Marie, in comparison to the overall province.

5.4.2.1 Mapping Income

Median household income data is presented spatially in **Figure 27**. The downtown shows a notable area of the lowest household incomes. There are also pockets of low household income in the neighbourhoods surrounding Fire Station 4. These areas are predicted to experience increased fire risk, as a result.

High income areas are notable south of Fire Station 3, along the waterfront as well as the northern and western fringe areas of the City.

Figure 27: Median Total Income of Households in 2020 by Dissemination Area



5.4.3 Income Decile Groups

Income can be assessed at a community-wide level by considering income decile groups. As stated by Statistics Canada, a “decile group provides a rough ranking of the economic situation of a person based on his or her relative position in the Canadian distribution of the adjusted after-tax income of economic families”.⁶¹ Economic family income decile groups for the population in private households in Sault Ste. Marie is presented in **Table 19**. This analysis shows that the City has a higher proportion of the population in the bottom-income decile groups compared to the Province, with 1.1% more in total. There are also higher proportions of high-income families in the Province than in the City. This is illustrated in the eighth, ninth, and top decile groups with a difference of -4.7% compared to the Province. These statistics may indicate that the more disposable income a family can generate, the higher the likelihood that the family will purchase fire safety equipment. These statistics may be suggestive of a higher fire risk within the City from the perspective of income.

Table 19: Economic Family Income Decile Group for the Population in Private Households – Sault Ste. Marie and Ontario

Income Decile Group	Sault Ste. Marie Population	Sault Ste. Marie %	Ontario Population	Ontario %
Bottom Decile	7,405	10.5%	1,318,120	9.4%
Second Decile	7,945	11.2%	1,283,940	9.2%
Third Decile	7,560	10.7%	1,292,030	9.2%
Fourth Decile	7,085	10.0%	1,296,710	9.2%
Fifth Decile	6,970	9.9%	1,325,280	9.4%
Sixth Decile	7,010	9.9%	1,365,960	9.7%
Seventh Decile	7,225	10.2%	1,415,070	10.1%
Eighth Decile	7,345	10.4%	1,482,300	10.6%
Ninth Decile	7,070	10.0%	1,581,535	11.3%
Top Decile	5,125	7.2%	1,670,800	11.9%
Total	70,735	100%	14,031,755	100%

⁶¹ Statistics Canada. (Updated 2016). Income Decile Group. Retrieved from [Statistics Canada, Income Decile Group Page](#)

Source: 2021 Census, Statistics Canada ⁶²

5.4.3.1 Mapping Income Distribution

To understand the spatial distribution of income decile groups, **Figure 28** and **Figure 29** display the percentages of the population in the bottom and top income distribution groups by dissemination area.⁶³ **Figure 28** shows that there are dissemination areas with a high percentage of the population in the bottom half of income distribution, depicted in the darkest blue colour, in the Downtown area (and the area surrounding Fire Station 1), at the southwest end of Wellington Street East, and in some smaller areas west of Pine Street at McNabb Street and at Northern Avenue East. As discussed above, these areas are predicted to be at greater risk of fire incidents and fire losses.

Figure 29 shows there are dissemination areas (identified with the dark brown colour) with a high percentage of the population in the top-income decile, which is assumed to translate to relatively lower fire risks. These areas are located south of Fire Station 3, southwest of the Pine Street and MacDonald Avenue intersection, northwest of 2nd Line West and Allens Sideroad intersection, northwest of the intersection of McNabb Street and Black Road, and in rural areas northeast of Fire Station 4, in the northwest corner of the municipality as well as the southwestern corner of the municipality (including the area around the airport).

Key Finding: Spatial analysis of the bottom income decile shows the Downtown area (and the area surrounding Fire Station 1), at the southwest end of Wellington Street East, and in some smaller areas west of Pine Street at McNabb Street and at Northern Avenue East may be at increased risk of fire incidents and fire losses as a result of lower incomes.

⁶² Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released July 13, 2022. [Statistics Canada, 2021 Census Page](#) (accessed July 13, 2022).

⁶³ Data obtained from Statistics Canada was used in the creation of both income decile maps. Some areas of the City are not included within the income decile group maps. According to the dataset obtained through Statistics Canada and viewed in the Beyond 20/20 data viewer, these areas were suppressed to meet the confidentiality requirements of the Statistics Act.

Figure 28: Percentage of Bottom Income Decile by Dissemination Area

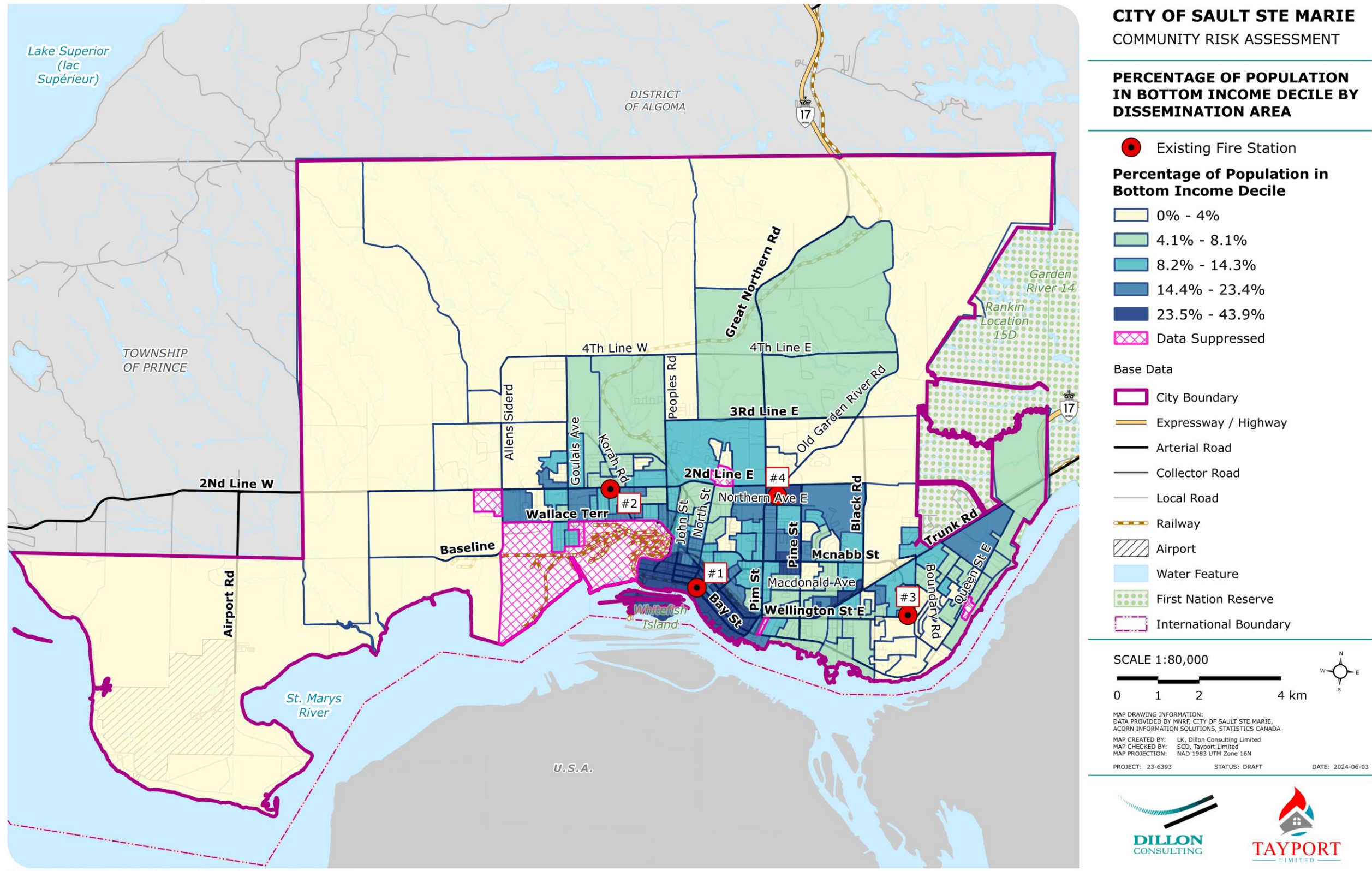
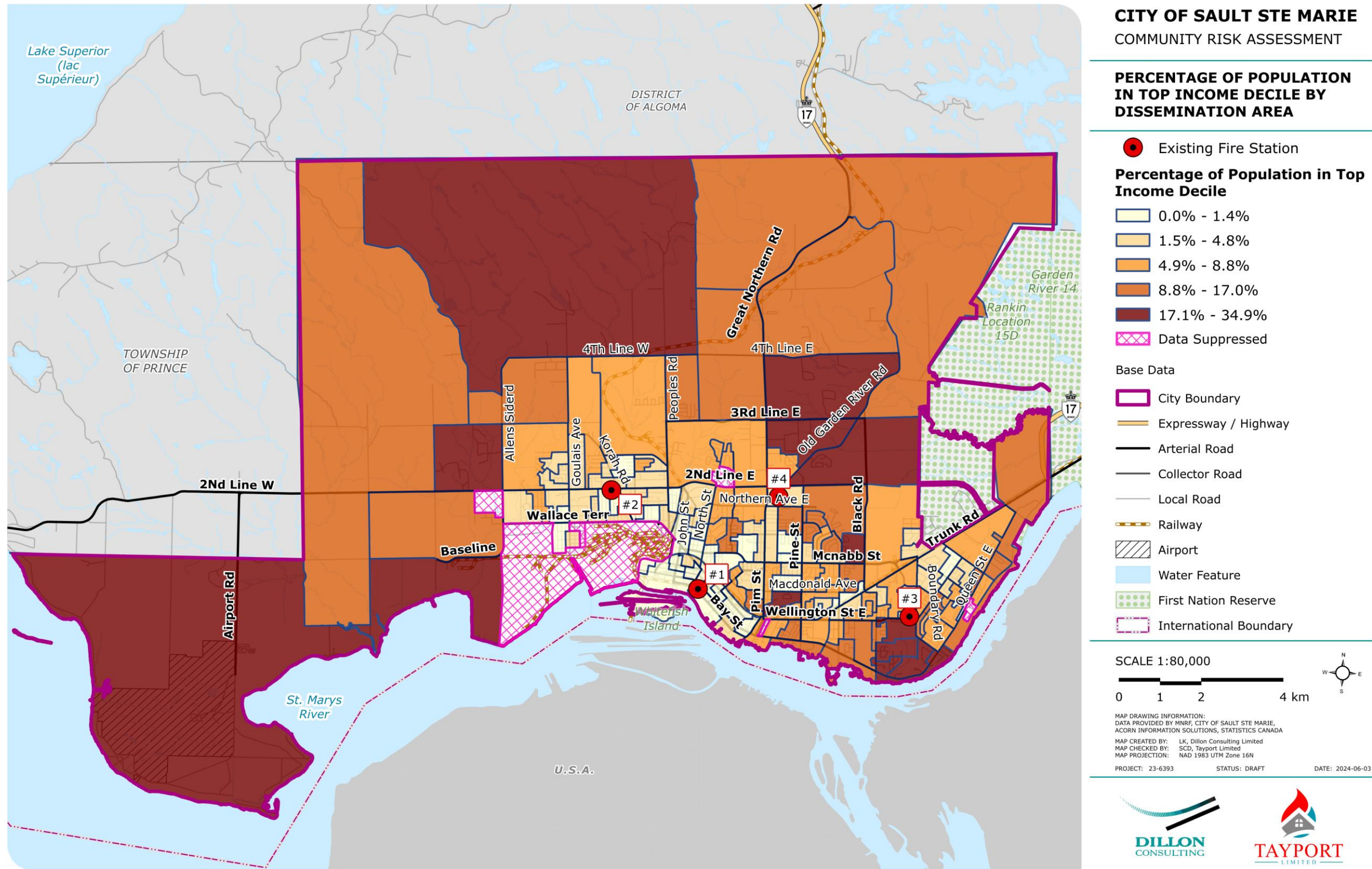


Figure 29: Percentage of Top Income Decile by Dissemination Area



5.4.4 Household Tenure, Occupancy, Suitability and Costs

Table 20 through to **Table 24** summarizes household statistics for the City of Sault Ste. Marie and the Province, including tenure, occupancy, suitability and costs, based on 2021 Census data.

5.4.4.1 Housing Tenure

Housing tenure reflects socioeconomic status whereby a low home ownership rate may reflect lower incomes in the community and a higher overall fire risk. The City has a very similar proportion of dwellings that are owned versus rented when compared to the Province (68.3% owned in Sault Ste. Marie versus 68.4% in the Province).

5.4.4.2 Occupancy

A higher proportion of multiple persons per household can result in increased fire loss (consequence), resulting in higher fire risk. There are 135 households (0.4% of total households) that have more than one person per room in Sault Ste. Marie. This reflects a lower percentage compared to the Province, where 3.0% of households have more than one person per room.

5.4.4.3 Suitability

The 2021 Census reports on housing suitability, which, according to Statistics Canada, refers to whether a private household is a suitable accommodation according to the National Occupancy Standard. Suitable accommodations are defined by whether the dwelling has enough bedrooms based on the ages and relationships among household members. Based on this measure, 2.8% (or 900) households within the City are classified as “not suitable”, compared to 6.7% for the Province as a whole. Therefore, from the perspective of housing suitability, the City has a relatively lower fire risk.

5.4.4.4 Housing Costs

The cost of shelter may also be indicative of the amount of disposable income within a household. Households with less disposable income have fewer funds to purchase household fire life safety items, resulting in a higher risk. In Sault Ste. Marie, 16.1% of households spend 30% or more of their household total income on shelter costs. This is approximately 8.1% less than the Province, where 24.2% of households spend 30% or more of their income on shelter costs.

Looking more closely at shelter costs, the median value of dwellings in Sault Ste. Marie is \$250,000 (\$450,000 lower than the provincial median). The City also has lower median monthly shelter costs for owned and rented dwellings than the Province.

Table 20: Household Tenure – Sault Ste. Marie and Ontario

Household Tenure	Sault Ste. Marie	%	Ontario	%
Owner	22,215	68.3%	3,755,720	68.4%
Renter	10,315	31.7%	1,724,970	31.4%
Total Households	32,530	100.0%	5,491,200	100.0%

Table 21: Household Occupancy – Sault Ste. Marie and Ontario

Household Occupancy	Sault Ste. Marie	%	Ontario	%
One person or fewer per room	32,395	99.6%	5,328,575	97.0%
More than one person per room	135	0.4%	162,625	3.0%
Total Households	32,530	100.0%	5,491,200	100.0%

Table 22: Household Suitability – Sault Ste. Marie and Ontario

Housing Tenure	Sault Ste. Marie	%	Ontario	%
Suitable	31,630	97.2%	5,122,185	93.3%
Not suitable	900	2.8%	369,015	6.7%
Total Households	32,530	100.0%	5,491,200	100.0%

Table 23: Shelter Costs – Sault Ste. Marie and Ontario

Shelter Costs	Sault Ste. Marie	%	Ontario	%
Spending less than 30% of the household's total income on shelter costs	27,195	83.9%	4,103,320	75.8%
Spending 30% or more of household total income on shelter costs	5,215	16.1%	1,312,095	24.2%
Total Households	32,410	100.0%	5,415,415	100.0%

Table 24: Median Costs – Sault Ste. Marie and Ontario

Median Costs	Sault Ste. Marie	Ontario
Median value of dwellings	\$250,000	\$700,000
Median monthly shelter costs for owned dwellings	\$910	\$1,440
Median monthly shelter costs for rented dwellings	\$890	\$1,300

Source: 2021 Census, Statistics Canada⁶⁴

5.5 Cultural Background and Language Considerations

Cultural background and language considerations can be important factors for local fire service providers to consider in developing and delivering programs related to fire prevention and public education. Communication barriers, in terms of language and the ability to read written material, may have an impact on the success of the programs. There may also be familiarity challenges related to fire safety standards within newcomer populations. A high proportion of immigrants may indicate a large population that has a potential for unfamiliarity with local fire life safety practices and/or may experience possible language barriers. **Table 25** summarizes the immigration status of the City of Sault Ste. Marie's population as of the 2021 Census data. At that time, only 8.5% of the City's population was identified as newcomers, which is significantly lower (by 21.1%) when compared to Ontario (29.6%). This population should be monitored as new Census data becomes available for consideration when planning public education programs and materials.

Table 25: Immigration Status – Sault Ste. Marie and Ontario (2021 Census)

Immigration Status	Sault Ste. Marie Population	Sault Ste. Marie %	Ontario Population	Ontario %
Non-immigrants	63,820	90.7%	9,437,320	66.3%
Immigrants	5,990	8.5%	4,206,585	29.6%
Before 1980	3,930	5.6%	860,305	6.0%

⁶⁴ Statistics Canada. 2017. Sault Ste. Marie, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. [Statistics Canada, 2016 Census Page](#) (accessed July 4, 2022).

Immigration Status	Sault Ste. Marie Population	Sault Ste. Marie %	Ontario Population	Ontario %
1980 to 1990	325	0.5%	506,195	3.6%
1991 to 2000	320	0.5%	852,765	6.0%
2001 to 2005	500	0.7%	941,630	6.6%
2006 to 2010	910	1.3%	1,045,695	7.3%
2011 to 2016	320	0.5%	461,010	3.2%
Non-permanent residents	590	0.8%	584,680	4.1%
Total	70,400	100.0%	14,228,585	100.00%

Source: 2021 Census, Statistics Canada ⁶⁵

Through its participation in the Rural Northern Immigration Pilot Program (RNIP), the City of Sault Ste. Marie welcomed approximately 1,094 new permanent residents with local employment. The RNIP ended on August 31, 2024. As of January 2025, the City of Sault Ste. Marie has been selected as one of the 18 communities across Canada to participate in the new Rural Community Immigration Pilot (RCIP). This program is expected to increase the number of immigrants and new Canadians within the City. As the City experiences increased diversity, the SSMFS will need to align its programs and services to meet community needs.

Knowledge of official languages based on the 2021 Census is included in **Table 26** for the City of Sault Ste. Marie and the Province of Ontario.

As shown, 90.3% of the population in the City has knowledge of English only, 9.3% possess knowledge of both English and French, approximately 300 people (0.4% of the City population) have no knowledge of English or French, and approximately 35 people (0.05%) speak French only. Additional research into language by “mother tongue”⁶⁶ indicates that, beyond English and French, some of the top languages in Sault Ste. Marie include Italian, German, Punjabi, Polish, and Spanish. It is anticipated that the

⁶⁵ Statistics Canada. 2017. Sault Ste. Marie, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. [Statistics Canada, 2016 Census Page](#) (accessed July 4, 2022).

⁶⁶ Ibid.

language statistics will reflect increased diversity as a result of the City’s successful participation in the RNIP and the RCIP. SSMFS should monitor these trends over the coming years and take the information into consideration when planning programs and services to align with the language needs of the community.

Table 26: Knowledge of Official Language – Sault Ste. Marie and Ontario

Language	Sault Ste. Marie Total	Sault Ste. Marie %	Ontario Total	Ontario %
English Only	64,300	90.3%	12,196,575	86.5%
French Only	35	0.05%	39,310	0.3%
English and French	6,605	9.3%	1,519,365	10.8%
Neither English nor French	300	0.4%	344,545	2.4%
Total population (non-institutional)	71,235	100.00%	14,099,790	100.00%

Source: 2021 Census, Statistics Canada ⁶⁷

5.6 Transient Populations

Ontario Regulation 378/18 requires the consideration of “transient populations”. This refers to the concept of population shift, where the population within a community can shift at various times during the day, week, or throughout the year. Population shift can be a result of a number of factors, including employment, tourism, and education. In some municipalities, residents regularly leave the community for employment. This can contribute to increased traffic, resulting in an increase in the number of motor vehicle collision calls. Other communities may be major tourist and vacation destinations, resulting in large population shifts related to the seasonal availability of tourism activities. This can result in an increased risk due to overnight tourism accommodation (sleeping), which can impact the demand for fire protection services. Educational institutions can attract a transient student population who commute to school daily or reside in dormitories or student housing on a seasonal basis.

⁶⁷ Statistics Canada. 2017. Sault Ste. Marie, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. [Statistics Canada, 2016 Census Page](#) (accessed July 4, 2022).

Student accommodations and short-term rental units present unique fire safety issues that may be attributed to the conversion of houses into boarding houses or rooming house-type accommodations that do not conform to the OFC or OBC. These properties are not always known to the fire department, posing a challenge for Fire Prevention Division staff responsible for fire code enforcement. The City of Sault Ste. Marie has a post-secondary student population associated with Algoma University and Sault College.

5.6.1 Tourism

An increase in tourism can result in an increased risk due to overnight tourism accommodation, which can impact the demand for fire protection services. In terms of seasonal recreational population, there are a number of features and events that would draw tourists to the region, including the natural features in the area and outdoor adventure opportunities. Specific tourist destinations and attractions include cruise ship docking; national historic sites (e.g. Sault Ste.. Marie Canal and Ermatinger-Clergue); Agawa Canyon Tour Train; snowshoeing/skiing (e.g. Searchmont Resort, Stokely Creek Lodge; Hiawatha Highlands, etc.); fat biking trails; skating; ice caves; ice climbing; snowmobiling; mountain biking; hiking; nearby Provincial Parks (e.g. Pancake Bay, Batchawana Bay, Lake Superior); a regional mall; museums; casino; specific attraction packages; and resorts and lodges. As a result, the City experiences some population shift due to the tourism draw for recreational opportunities. There are several City-hosted events each year and attractions that draw residents and non-residents to the City of Sault Ste. Marie. Annual festivals and events include, but are not limited to:

- Bon Soo Winter Carnival
- Blueberry Festival
- Arts & Culture Festival
- Canada Day
- Summer Moon Festival
- Hub Trail Festival

While each event draws tourists at various times throughout the year, it is important to consider population shifts from a fire protection, education and prevention standpoint. Specific fire protection strategies to address population shifts should be accommodated as part of broader services, such as pro-active fire inspections of the facilities occupied by these demographics (e.g., hotels and motels).

5.6.2 Education

Educational institutions, and primarily post-secondary schools, are a key source for population shift in larger communities as they attract people from outside the typical community. They are important to consider since they may have school-based residences. Post-secondary schools can contribute to a population that is not captured through the census. Algoma University (Sault Ste. Marie Campus), Sault College, Laurentian University (Sault Ste. Marie), and CRA Canadian Career College represent the main post-secondary institutions in the City of Sault Ste. Marie.

5.6.3 Employment

A shift in commuter population can impact the demand for fire protection services, as large numbers of people commuting in and out of the City could increase the number of vehicle collision calls to which the fire service responds.

As shown in **Table 27** below, the commuting population travelling outside the census subdivision of residence does not represent a significant portion of Sault Ste. Marie's labour force. Intuitively, there is no notable shift in population, from either commuters travelling into, or out of the City for employment.

The unique commuting patterns within the City of Sault Ste. Marie is due to its location in Northern Ontario. This location and the urban structure likely impact the potential for population shift based on employment.

Table 27: Commuting Destinations – City of Sault Ste. Marie

Commuting Destination ⁶⁸	Population
Commute within the census subdivision of residence	20,370
Commute to a different census subdivision within the census division of residence	600
Commute to a different census subdivision and census division within the province or territory of residence	195
Commute to a different province or territory	60
Total	21,235

Source: 2021 Census, Statistics Canada ⁶⁹

⁶⁸ Commuting destination for the employed labour force aged 15 years and over in private households with a usual place of work - 25% sample data

⁶⁹ Statistics Canada. 2017. Sault Ste. Marie, CY [Census subdivision], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue number 98-316-X2016001. Ottawa. Released November 29, 2017. [Statistics Canada, 2016 Census Page](#) (accessed July 4, 2022).

6.0 Hazard Profile

As referenced in the **O. Reg. 378/18**, the hazard profile assessment includes an analysis of the hazards within the community, including natural hazards, hazards caused by humans, and technological hazards to which fire departments may be expected to respond. Hazards are important to consider from a fire risk, emergency response and overall public safety perspective. Hazardous incidents may have a significant impact on the community. This profile assessment summarizes the context within which municipalities identify hazards and presents the top hazards identified for Sault Ste. Marie presents an assessment of those hazards through the lens of the fire and emergency risks to inform fire and emergency services planning, prevention, and management.

6.1 Hazard Identification and Risk Assessment in Ontario (HIRA)

A hazard is defined as a phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Hazards can be natural, human-caused or technological. It is important to identify and consider these hazards from a fire-risk, emergency response, and overall public safety perspective in order to assist local governments and emergency management personnel in planning for the risks within their communities and taking the appropriate action to reduce future losses.

At the provincial and municipal level, emergency management and fire services are complementary. In practice at the municipal level, staff within municipal fire departments play a leadership role in identifying natural, human-caused, or technical hazards based on those detailed by the province as well as developing emergency management programs.

Under the Emergency Management and Civil Protection Act (EMCPA), municipalities are required to 'identify and assess the various hazards and risks to public safety that could give rise to emergencies and identify the facilities and other elements of the infrastructure that are at risk of being affected by emergencies' (2002, c. 14, s. 4). The OFM recently released methodology guidelines outlining a process for the development

of a HIRA program, to assist municipalities in assessing their local hazards and potential risks.

The City's Emergency Response Plan is dated June 26, 2023. Emergency response documentation also includes a Flood Plan (2017), Hazardous Materials Response Plan (2017), Hot Weather Response Plan (2020), and an Evacuation Plan (2017). Current legislation requires an annual review (and revision if necessary) of the City's emergency plan.

6.1.1 HIRA and the CRA

The OFM TG-02-2019 and OFM "Question and Answers" provide guidance with respect to developing a community HIRA in the context of a Community Risk Assessment. The guidelines acknowledge that these processes are separate but complementary. The OFM "Question and Answers" states that the CRA process "may result in decisions about fire department responses to various types of emergencies identified in a completed HIRA."

The HIRA is a comprehensive process used to identify the hazards to a community as a whole. A CRA provides an opportunity to examine the impact that these hazards would have on the services provided by a fire department. For the purposes of this CRA, a "fire protection services" lens will be applied to the top hazards as identified through the City's HIRA.

6.2 City of Sault Ste. Marie Hazard Identification and Risk Assessment (HIRA)

The HIRA process is used to identify local hazards and assign risk levels. The City's HIRA was reviewed and updated in 2021. As a component of the risk assessment and risk analysis process, the top risks in Sault Ste. Marie were identified. The HIRA assigns likelihood and consequence levels to a list of hazards based on the potential for impacts to health, the environment and public safety. As a result of this analysis, the hazards and assigned risk levels in the City are listed in **Table 28**. The current HIRA does not identify any 'extreme' or 'high' risk hazards for the City. There are two 'moderate,' 16 'low,' and one 'very low' risk hazards listed.

Table 28: Top Hazards, Sault Ste. Marie HIRA, 2021

Hazard	City HIRA Risk Level
Infectious Disease	Moderate
Flood	Moderate
Hazardous Materials	Low
Electrical Energy	Low
Extreme Cold	Low
Active Threat	Low
High Wind	Low
Substance Abuse & Overdose	Low
Winter Storm	Low
Water Quality	Low
Aviation	Low
Rail	Low
Extreme Heat	Low
Civil Disorder	Low
Cyber Attack	Low
Wildland Fire	Low
Fire/Explosions	Low
Marine	Low
Dam Failure	Very Low

6.3 Impacts of Hazards on Fire Protection Services

To better understand the risks of hazards as they pertain to fire protection services, the City's 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 as they pertain to the top hazards in the City of Sault Ste. Marie are

presented in **Table 29**. The table also includes hazards expected to have a high frequency (even if the calculated risk is low) that would result in service demands for SSMFS.

Table 29: Impacts of Hazards on Fire Protection Services

Hazard (City HIRA)	Possible Impact on Fire Protection Services
Infectious Disease (Health Emergencies)	The City's HIRA identifies the risk of Infectious Disease events as Moderate Risk. As experienced in 2020 and the years following, a pandemic presents significant challenges to first responders and the community, causing potential fire department workplace absenteeism and an increased demand for medical response and supplies. For example, during the severe acute respiratory syndrome (SARS) outbreak in Toronto, declared as a medical state of emergency in March of 2003, of Toronto EMS's 850 paramedics, 436 were placed in a 10-day home quarantine, 62 developed SARS-like illnesses, and 4 developed suspected or probable SARS requiring hospitalization. ⁷⁰ The COVID-19 global pandemic that began in 2020 was a more severe and wide-reaching human health emergency. The impact of this recent pandemic was challenging for all aspects of community services and had a number of impacts on members of the community, which are still being qualified and quantified.
Flood (Environmental Hazard)	Flooding is identified within the City's HIRA as a moderate risk. The Sault Ste. Marie Region Conservation Authority oversees Flood Management for the City and the surrounding area and issues flood warnings for local rivers and streams and the Lake Superior Shoreline. Flooding is most likely to occur during the spring snow melt, or because of high levels of precipitation or heavy rain events. During heavy rain events in the summer, the City's stormwater systems may be challenged to handle the surge, resulting in flash flooding. Depending on the severity of the flooding, access to various sections of the road network could be impacted and potentially delay fire department response times. Severe flooding could potentially cause damage to homes (basements) or infrastructure (water treatment facilities, roads, bridges, etc.) in the impacted areas.

⁷⁰ Alexis Silverman, Andrew Simor, Mona R. Loutfy. (2004). Toronto Emergency Medical Services and SARS. Emerging Infectious Diseases., Volume 10(9): 1688–1689, doi: 10.3201/eid1009.040170

Hazard (City HIRA)	Possible Impact on Fire Protection Services
Hazardous Materials (Health, Environment, and Public Safety)	This hazard involves the release of chemical, biological, radiological, nuclear, and explosive materials. These materials are hazardous and can have harmful effects on human life, property and the environment. The City's HIRA identified hazardous materials / chemical incidents in 2020, 2017, and 2014, and selected the frequency of 'likely to occur every five years or less' over the last ten years. These included industrial releases and a transportation (rail) incident. A fire department can perform hazardous materials response or partner with a neighbouring jurisdiction to provide the same service if they are properly trained. It is important for a fire department to possess the proper training and certification required to perform hazardous materials response safely and securely in order to prevent firefighter injury.
Oil/Natural Gas	The City of Sault Ste. Marie is almost entirely served by natural gas (Enbridge Gas Inc.). There are a number of risks associated with pipelines due to volatile properties and characteristics. Natural gas, for example, is highly combustible and explosive when placed under pressure. A pipeline rupture or leak could result in prolonged or uncontrolled product release, requiring specialized emergency response and/or evacuation of the exposed surrounding area. Pre-incident planning, training and exercise activities with the pipeline operator and other response partners, such as the Sault Ste. Marie Fire Services is crucial to ensuring that emergency response personnel are equipped with the right knowledge, skills and equipment needed to respond to a pipeline-related incident. Establishing partnerships and procedures before an incident occurs is conducive to building awareness and a safe and effective response.

Hazard (City HIRA)	Possible Impact on Fire Protection Services
Road and Highway	Road and highway hazards include transportation emergencies involving vehicles on the road network. A transportation emergency along a road or highway could translate into partial or full closure of a road or major highway route or to the system as a whole, with impacts that include injury or loss of life, environmental damage, hazardous materials leak, and/or economic loss. Although Road and Highway Emergencies have a low level of risk, the likelihood of them happening is almost certain. A road or highway emergency in Sault Ste. Marie could require a hazardous materials response or other specialized rescue service from the fire department. Based on historical emergency calls from 2018 to 2022, motor vehicle-related incidents (collisions and extrications) on the existing road network represented 70.3% (528) of all rescue responses and 4.6% of all calls for service by the Sault Ste. Marie Fire Services.
Electrical Energy	Energy emergencies that include power outages can affect critical infrastructure, essential services, or a large portion of local residents and businesses and can last for long periods of time. Common causes of power outages include extreme weather events and storms (e.g. freezing rain, sleet/snow, high winds, etc.), increased demand on the system (e.g. during cold snaps/heat waves), or energy infrastructure failure. Such an event could result in the loss of energy for heat, cooling, cooking, refrigeration, fire protection equipment, building elevators, life assistance equipment, and more. The City experienced a multi-day electrical emergency incident from December 30, 2019, to January 2, 2023, that impacted approximately 7,000 customers. The SSMFS has generated power on-site for all fire station facilities. City-owned and operated Public Works and Engineering Services buildings have generator power. The City facilities identified as potential shelter sites are GFL Memorial Gardens, Northern Community Centre and John Rhodes Community Centre. There is also an agreement with Algoma University to use the George Leach Centre as a potential shelter. GFL is the only shelter that could currently accommodate a large-scale outage, as it has a generator to power heat and electricity needs. The City recently purchased dozens of cots, sleeping bags, and pillows (funded with a grant) to shelter people in an emergency.

Hazard (City HIRA)	Possible Impact on Fire Protection Services
Winter Weather	Severe winter weather events typically include precipitation that forms at low temperatures, such as snow, freezing rain and ice. Episodes of freezing rain, ice or heavy snowfall can result in an array of consequences. For example, freezing rain can weigh down electrical transmission lines or branches, causing them to break, which in turn can block roadways, impeding the fire department or other first response agencies' ability to access the road network, leading to extended emergency response and extended travel times. Downed electrical wiring presents electrical current exposure hazards, which can cause injuries requiring medical assistance, and overall, damage to the electrical grid could lead to energy system disruption. Freezing rain, heavy snowfall or ice can also result in dangerous driving conditions, leading to motor vehicle collisions or crashes, and generating emergency response call volume.
High Winds	Windstorms or severe weather events that are accompanied by high winds can also cause varying levels of property or structural damage; disrupt multi-modal transportation services and interfere with the delivery of utilities (e.g. hydro) or other critical infrastructure (e.g. telecommunications). Similar to winter weather events, the damage to property and infrastructure caused by high winds can obstruct first responder access to the road network, leading to a delay in emergency response times.
Extreme Heat	Extreme heat occurs when the temperature or humidity for a region is significantly above the average high for an extended period. Extreme heat events have a moderate level of risk to vulnerable populations such as seniors living alone or in assisted living/care facilities (e.g. Montreal 2018). Based on demographic data, seniors make up 24.9% of the population of Sault Ste. Marie and are at risk during extreme heat events. Extreme heat may also cause blackouts if demand outpaces the ability to produce. Additionally, they can cause electrical fires in high-risk facilities. The 2021 HIRA has identified the related risk as low. During extreme heat events, the City identifies facilities for residents that can be used as cooling centres. The City provides information about Extreme Heat on their website.

Hazard (City HIRA)	Possible Impact on Fire Protection Services
Rail / Aviation	<p>An incident involving a derailment or rail accident (potentially involving hazardous materials and/or dangerous goods) could be a significant emergency event within a community. An emergency involving rail in Sault Ste. Marie could require a hazardous materials response or other specialized rescue service from the SSMFS. With the proximity of the Sault Ste. Marie Airport, there is also a potential for an aviation-related emergency within the City, which could require emergency response from SSMFS, in addition to the airport’s emergency responders.</p> <p>The 2021 HIRA has identified the risks related to rail and aviation as low.</p>
Cyber-Attack	<p>With the advancement of technology and its integration into many, if not all, critical infrastructure sectors, cyberattacks may become more prevalent. Emergency Management Ontario’s 2019 Hazard Identification Report defines cyber-attacks as “unauthorized access or malicious code to alter computer code, logic or data, resulting in disruptive consequences that can compromise data or misappropriate key systems and resources.”⁷¹ As cybercrime continues to rise, there is potential for critical infrastructure from the local to national level to be compromised, resulting in a real threat to public safety and security as well as economic well-being. Fire departments, like all public safety response agencies, retain sensitive data pertaining to fire loss and emergency call history. The systems that house this data are not exempt from being compromised. The 2021 HIRA has identified the related risk as low.</p>

Source: City of Sault Ste. Marie’s Emergency Response Plan and 2021 HIRA

Key Finding: The City’s 2021 Hazard Identification and Risk Assessment identifies hazards that could each impact the ability of the City to deliver fire protection services.

⁷¹ Hazard Identification Report 2019. (Modified May 8, 2019). [Emergency Management Ontario](#). Retrieved February 19, 2020.

7.0 Public Safety Response Profile

As required by **O. Reg. 378/18**, the Public Safety Response Profile includes an analysis of the types of incidents responded to by other entities in the community and those entities' responsibilities. These entities could include police, ambulance, fire, and other entities that may be tasked with or able to assist in some capacity in the collective response to an emergency situation. The following sections consider these characteristics of public safety response within the City of Sault Ste. Marie.

7.1 Public Safety Response Agencies in the City of Sault Ste. Marie

Public safety and response agencies refer to agencies and organizations that respond to specific types of incidents within a community and provide trained personnel and resources critical to upholding public safety. Each of these entities offers specialized skillsets in support of front-line operations. The types of response services offered might include fire protection, medical attention, rescue operations, policing activities or hazardous materials response. In addition to responding individually to certain types of incidents, these entities work closely with one another in the event of major emergencies through a structured, standardized response approach to ensure effective coordination among all response agencies.

Table 30 lists the public safety response agencies within Sault Ste. Marie that will be able to assist in a collective emergency response effort and may contribute to the mitigation of risk within the community. Identifying the public safety response agencies within the community can help the fire service become familiar with other public safety response agencies and each agency's specific response capabilities.

Table 30: Public Safety Response Agencies

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Sault Ste. Marie Police Service	All incidents requiring police presence/support within the City and Prince Township: <ul style="list-style-type: none"> • Motor vehicle collisions • Medical incidents • Fire incidents • False fire incidents • Public hazard / public assistance • Other response – e.g. drug operations 	<ul style="list-style-type: none"> • General patrol • Traffic control, scene stabilization, investigation • Patient contact / initial first aid • Evacuations • Assist in coordinating public information • Canine unit • Criminal investigations/drug enforcement/tech crime • Forensic Identification Services 	<ul style="list-style-type: none"> • Good working relationship with SSMFS • Communication and information sharing continue to be noted as a growth/improvement area

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Ontario Provincial Police	<ul style="list-style-type: none"> • Incidents requiring a police presence in the areas surrounding/beyond the City and Prince Township. • Motor vehicle collisions on provincial highways (e.g. Highway 17) • Emergency responses • Search and rescue 	<ul style="list-style-type: none"> • Traffic control, scene stabilization, investigation • Patient contact / initial first aid • Evacuations • Assist in coordinating public information • Canine tracking unit 	<ul style="list-style-type: none"> • Limited on-scene interactions with SSMFS • Good working relationship with SSMFS.
Royal Canadian Mounted Police (RCMP)	<ul style="list-style-type: none"> • Water-based emergencies • Emergency response for federal jurisdiction in Sault Ste. Marie and the surrounding area from the RCMP Sault Ste. Marie detachment 	<ul style="list-style-type: none"> • Marine Security Enforcement Team - Patrol boat 	The boat may not be in the area if/when needed for rescue on the St. Marys River, as it is actively used for patrolling down the line into Lake Huron.

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Batchewana Police	<ul style="list-style-type: none"> Emergency response in Batchewana Communities (SSMFS responds to fire alarms, medical assist calls, and carbon monoxide calls in the First Nation via Fire Protection Services Agreement) 	<ul style="list-style-type: none"> General patrol Traffic control, scene stabilization, investigation Patient contact / initial first aid Evacuations Assist in coordinating public information Criminal investigations 	No issues/concerns
Anishinabek Police Service	<ul style="list-style-type: none"> Emergency response in Anishinabek Communities 	<ul style="list-style-type: none"> General patrol Traffic control, scene stabilization, investigation Patient contact / initial first aid Evacuations Assist in coordinating public information Criminal investigations 	No issues/concerns

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Sault Ste. Marie Fire Department (Michigan)	International Mutual Aid Agreement: fire suppression, rescue and emergency response	The agreement is activated when aid is required in the form of additional apparatus or staff for emergency service operations.	Positive working relationship with SSMFS
Chippewa County Sheriff	Emergency responses in Chippewa County	<ul style="list-style-type: none"> Large area emergency involving both the City of Sault Ste. Marie and Chippewa County 	No issues/concerns
Michigan State Police	Emergency responses in Michigan State	<ul style="list-style-type: none"> Large area emergency involving both Ontario and Michigan 	No issues/concerns
City of Sault Ste. Marie (Michigan) Police Department	Emergency responses in Sault Ste. Marie, Michigan	<ul style="list-style-type: none"> Large area emergency involving both the Cities of Sault Ste. Marie in Ontario and Michigan 	No issues/concerns

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Sault Ste. Marie Paramedic Services	<ul style="list-style-type: none"> • Motor vehicle collisions • Medical incidents • Fire incidents • False fire incidents • Public assistance 	<ul style="list-style-type: none"> • Patient stabilization, extrication, reporting • Patient stabilization, transport, reporting • Standby for firefighter safety, patient stabilization, transport, reporting • Standby for firefighter safety, patient stabilization, transport, reporting • Assist in coordinating public information 	<ul style="list-style-type: none"> • Offload delays are becoming longer at Sault Area Hospital; there are often periods during the day when no ambulances are available. • EMS shares facility space with SSMFS at Stations 1 and 4.
St. John Ambulance	<ul style="list-style-type: none"> • Community emergencies • Community events 	<ul style="list-style-type: none"> • Provide volunteer first aid at local community events • Can assist in administering first aid during disasters and emergencies 	No issues/concerns
Central Ambulance Communications Centre	We process 9-1-1 requests for emergency ambulance services	Provincially mandated Central Ambulance Communication Centre responsible for servicing the Algoma District	<ul style="list-style-type: none"> • Ongoing discussions regarding medical call types where SSMFS are dispatched

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Chippewa County's 911 Central Dispatch	Emergency call taking in Chippewa County	<ul style="list-style-type: none"> • Answer all 911 and non-emergency calls within Chippewa County and provide direction or instruction to those callers • Dispatch police, fire and ambulance services 	No issues/concerns
Office of the Fire Marshal	The office of the Fire Marshal is responsible for administering provincial legislation as it relates to fire prevention and public safety in Ontario	<ul style="list-style-type: none"> • Field Advisory Services • Fire investigation services • Academic Standards and Evaluation • Ontario Fire College 	No issues/concerns
Sault Search and Rescue	land, air and marine search and rescues	On call 24/7 to respond to land, air and marine search and rescues	Response is not immediate; it can take time for volunteers to get called out, pick up equipment and vehicles, and arrive on location. This is the only local option for boat-based water rescue within the City.

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Canadian Coast Guard (CCG)	Water-based emergencies/incidents	Tasked with marine search and rescue, transportation issues and marine pollution response on the Great Lakes	No local base. Often provides incident command virtually until they can arrive (can be several hours).
United States Coast Guard Sector Sault	<ul style="list-style-type: none"> • Water-based emergencies/incidents • Search and rescue 	<ul style="list-style-type: none"> • Search and rescue, marine pollution response, law enforcement, marine safety and navigation on the Great Lakes • Based in Sault Ste. Marie, MI on the St. Marys River 	Responds to incidents on the Ontario side of the waterway much quicker than CCG.
Joint Rescue Coordination Centre (JRCC) - Trenton	<ul style="list-style-type: none"> • Search and rescue (air and marine incidents) 	Coordinates the SAR response to air and marine incidents	Takes several hours to arrive
Canadian Border Services Agency	<ul style="list-style-type: none"> • Incidents at the Canadian Border 	Manages all customs, immigration, import and export requirements in Sault Ste. Marie, Ontario	No issues/concerns
US Customs and Border Protection	<ul style="list-style-type: none"> • Incidents at the US Border 	Manages all customs, immigration, import and export requirements in Sault Ste. Marie, Michigan	No issues/concerns

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Ministry of the Environment	<ul style="list-style-type: none"> Environmental Emergencies 	Responsible for protecting and improving the environment to ensure public health and environmental quality	No issues/concerns
Ministry of Natural Resources	<ul style="list-style-type: none"> Wildland/forest fires 	Forest fire management	No issues/concerns
Sault Ste. Marie Armoury (49th Field Artillery Regiment RCA)	As required	As available/required	Requests for their assistance must be made to the Province
Sault Ste. Marie Region Conservation Authority (SSMRCA)	<ul style="list-style-type: none"> Flooding Emergency planning 	<ul style="list-style-type: none"> Watershed Management: Monitor water levels during times of flood or anticipated flooding Operate local conservation areas Role in permits and planning 	<ul style="list-style-type: none"> (SSMFS to review and comment on any strengths/issues/concerns)
CN and CP Railway Police	<ul style="list-style-type: none"> Derailments Rail crashes 	<ul style="list-style-type: none"> Scene stabilization/investigation 	No issues/concerns

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Enbridge Gas	<ul style="list-style-type: none"> • Distribution emergency • Gas supply emergency 	<ul style="list-style-type: none"> • Affected customer notification • Incident support teams for emergencies • Pipeline shutdown • Service restoration 	No issues/concerns
Civil Air Search and Rescue Association CASARA (several units across Ontario and Canada)	<ul style="list-style-type: none"> • Incidents requiring volunteer air search and rescue service throughout Southwestern Ontario • Military training exercises 	<ul style="list-style-type: none"> • Support Canada's Search and Rescue (SAR) program and promote SAR Awareness • May also be called upon to supply certified CASARA members trained as spotters onboard military aircraft • Tasked on SAR missions by the Joint Rescue Coordination Centre, located at Canadian Forces Base Trenton 	No issues/concerns

Identified Public Safety Response Agency	Types of Incidents They Respond To	Agency Role in Incident	Comments (e.g. Strengths, Issues or Concerns)
Ontario Volunteer Emergency Response Team (OVERT) – services available through request for assistance	<ul style="list-style-type: none"> • Large-scale disasters that may require evacuation, including floods, power outages, public health emergencies and more • Incidents requiring technical rescue • Search and rescue/missing persons 	<ul style="list-style-type: none"> • Provides emergency assistance to first responders and emergency management agencies • Incident command • Ground and marine search and rescue • Canine unit support • Technical rescue • Communications 	No issues/concerns
Provincial CBRNE/HazMat	<ul style="list-style-type: none"> • CBRNE / Hazardous material incidents 	<ul style="list-style-type: none"> • Provide specialized expert (technician) Level 3 Chemical / Biological / Radiological / Nuclear / Explosive (CBRNE) Response Teams 	No issues/concerns

7.1.1 Mutual Aid Agreements

Mutual aid agreements can provide additional depth of resources and response that may not have been dispatched as part of a municipality's initial response. These agreements establish a mutual relationship between multiple public safety and response agencies whereby emergency services and resources are shared to promote a more effective response and strengthen the depth of emergency response provided by a fire department. The SSMFS is a participant in the District of Algoma Mutual Aid Program and holds an International Intermunicipal Mutual Aid Agreement (for civil defence and emergency/disaster compact for Fire Services) with the City of Sault Ste. Marie, Michigan.

Agreements between public safety and response agencies, such as fire departments, can also provide for initial or supplemental emergency response services. Automatic aid agreements are programs designed to provide and/or receive assistance from the closest available resource, regardless of municipal boundaries, on a day-to-day basis.

The City of Sault Ste. Marie has a Fire Protection Service Agreement to provide fire protection services to the Rankin Reserve, First Nations.

8.0 Community Services Profile

As referenced in **O. Reg. 378/18**, the community service profile assessment includes analysis of the types of services provided by other entities in the community, and those entities' service capabilities. This includes the presence or absence of 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 characteristics of community service within the City of Sault Ste. Marie.

8.1 Community Services in the City of Sault Ste. Marie

Fires and other emergency events can have devastating effects on a community, and at times, can overwhelm public safety and security agencies' capacity to respond. In an emergency event, community-based agencies, organizations and associations can provide surge capacity to the response and recovery efforts of first responders and a useful resource to call upon if integrated into the emergency management framework of a municipality early on. These types of affiliations can contribute a variety of capabilities essential to response and recovery efforts, including support in the areas of communications, health care, logistics, shelter, food and water supply, emergency clothing, and more specialized skillsets.

Investigating new community partnerships and strengthening existing ones may be an effective strategy for consideration towards enhancing the current public fire and life safety education program, fire inspection efforts and emergency response and recovery capabilities of the SSMFS. **Table 31** identifies community agencies, organizations and associations within the City of Sault Ste. Marie.

Table 31: Community Service Agencies, Organizations and Associations

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
<p>Canadian Red Cross Society – Sault Ste. Marie and District Branch</p>	<p>In the event of a fire incident or emergency, the Sault Ste. Marie and District Branch of the Red Cross can provide temporary lodging, clothing and food to persons who cannot return to their home or, who cannot find alternate accommodations. In larger emergencies requiring evacuation, the organization has the capability to set up reception and information services to greet evacuees, provide information, provide family reunification and control facility access.</p>	<ul style="list-style-type: none"> • CRC confirmed earlier this year that they likely will not be able to support more than 20 people as their volunteer pool has diminished. • There have been instances where the on-call volunteer has not answered the phone. • During COVID (and post-COVID) PDA measures where PDA responses were “virtual” meaning no volunteers come to the scene. Under current conditions PDAs have returned to in-person. • In 2025, the City received a Community Emergency Preparedness Grant from the Province, which will support the development of an Emergency Social Service Plan, including options for City-operated shelters for large emergency events.

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Children’s Aid Society of Algoma	Children’s Aid Society has a legal mandate to promote the best interests, protection, and well-being of children and youth. Services are available by phone 24 hours per day, seven days a week to report concerns about a family or a child’s safety. Head office located in Sault Ste. Marie.	According to information on their website, all Children’s Aid Societies provide emergency service 24 hours a day, 7 days a week. If the report suggests that a child or youth has been harmed or is in immediate danger, a protection worker may respond within 12 hours of receiving the report. In all other situations, a response will occur within seven days.
Nogdawindamin Family and Community Services	Provides assistance when there are concerns about a child’s safety and the family is a member of one of the seven First Nations member communities.	Available 24 hours per day, seven days a week; however, response may not be immediate.

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Salvation Army – Sault Ste. Marie	Typically, the Salvation Army is capable of providing both immediate and long-term recovery assistance in cooperation with Fire and Police Services. The Salvation Army’s Emergency Disaster Services program can provide food and hydration resources, emotional and spiritual care, donations management, social services, long-term recovery and training and volunteers.	Unknown current capacity.
Crisis Services (Including Mobile Crisis)	<ul style="list-style-type: none"> • Support for people suffering from mental health issues. • Over the phone support / in-person support at Sault Area Hospital • Mobile Crisis Response Team (for low-risk situations) can be requested by calling the main phone and dispatched if appropriate (2 social workers) • Mobile Crisis Rapid Response Team for severe crisis (Crisis worker & Police) can be dispatched by calling the police 	<ul style="list-style-type: none"> • Mobile Crisis Response is only available daily from 10 am to 10 pm • MCRRT is only available 7 days a week, 8 am-10 pm

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Emergency Shelters	<ul style="list-style-type: none"> • Pauline’s Place: a 19-bed shelter that provides emergency short-term housing for youth, women, and families who are experiencing a housing crisis. • St. Vincent Place: (men only) transitional residence as a middle step between emergency housing and independent living. Residents are provided with meals, dorm-style rooms, laundry facilities, and basic life needs. • Community Resource Centre & Men’s Shelter (men 18+only): provides emergency shelter. • Women in Crisis (ALGOMA) Inc.: Provides free temporary emergency shelter & support services (24 hours a day / 7 days a week) for women who have or are experiencing abuse & violence. 	The capacity and availability of shelters for emergency needs has been an issue for significant fire events within the City in the recent past.
Social Services (Sault Ste. Marie Housing)	Available 24/7 to respond to issues in buildings owned and operated by Sault Ste. Marie Housing	No issues/concerns

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Sault Search and Rescue	In addition to the response services introduced in Section 7.17.1 , this agency operates “Project Lifesaver” for individuals who are prone to wander off. It has also provided other supports, such as delivering food to seniors and people with disabilities (e.g. during pandemic lockdowns) and has chauffeured doctors and nurses to work during major winter storms.	No issues/concerns

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Victim Services Sault Ste. Marie	<p>The organization has the capacity to provide emotional support, practical assistance, and information on referrals to victims. The purpose is to provide immediate financial aid for those who live in Sault Ste. Marie, have experienced a material loss as the result of a residential fire, and meet specific eligibility criteria.</p> <p>On-scene assistance is available 24/7 at the request of the Police for crisis intervention and support</p> <p>Can assist in providing:</p> <ul style="list-style-type: none"> • Emergency accommodation • Transportation to a safe place • Crime scene clean-up • Referrals for other services • Counselling 	No issues/concerns
United Way (Community Assistance Trust)	Can provide financial assistance for medication, baby safety items, and utilities/home heating/rental arrears .	Only available during regular business hours

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
<p>Local Radio stations:</p> <ul style="list-style-type: none"> • Q 104.3 FM • KISS 100.5 FM • CBC RADIO ONE 89.5 FM • 99.5 YES FM • TALK RADIO 1400 AM • BIG COUNTRY 105.5 FM • THE BEAR 97.5 FM 	<p>These stations can provide communications support, local information and emergency information in the event of an emergency.</p>	<p>No issues/concerns</p>
<p>Local News Websites:</p> <p>https://www.sootoday.com/</p> <p>https://www.saultstar.com/</p> <p>https://www.saultthisweek.com/</p> <p>https://firstlocalnews.com/</p> <p>https://northernontario.ctvnews.ca/</p> <p>https://www.cbc.ca/news/canada/sudbury</p>	<p>These local news agencies can provide communications support, local information and emergency information in the event of an emergency.</p>	<p>No issues/concerns</p>

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
<p>Local community faith-based organizations</p>	<p>Public fire safety messaging does not always reach the community's most vulnerable populations. Partnering with local faith-based organizations can provide the SSMFS with the opportunity to improve its public education program as a method of information sharing to a wider audience within the City. 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 the SSMFS 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.</p>	<p>No issues/concerns</p>

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Alcohol and Gaming Commission of Ontario	The SSMFS can partner with local organizations that may be able to provide additional support in the area of fire inspection and enforcement. For example, the Alcohol and Gaming Commission of Ontario may be able to assist in the enforcement of occupancy loads in nightclubs through after-hours inspections. Establishing lines of communication and collaborative partnerships early on with agencies that share a common concern for people's welfare and safety can inform and strengthen the fire department's inspection and enforcement program.	No issues/concerns
Algoma District School Board, Huron - Superior Catholic District School Board and the Conseil scolaire catholique du Nouvel-Ontario	The population of children and youth are an important consideration when planning for public fire safety education opportunities. Partnering with school boards and other agencies that work with children can provide opportunity for fire and life safety education.	No issues/concerns

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Algoma University and Sault College	Post-secondary students represent unique fire-related risks. Targeting public fire safety education to these students could enhance the safety of this potentially vulnerable group.	No issues/concerns

Community Service Agency	Types of Assistance Provided	Comments (e.g. Strengths, Issues or Concerns)
Seniors Services Sault Ste. Marie	<p>Seniors Services provides the opportunity for persons aged 55 years or over to participate in meaningful leisure pursuits by providing services that address the needs of older adults as they relate to information, communication and recreation facilities that are friendly, clean and safe.</p> <p>As reported within Section 5.2 – Population Age of this CRA, 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). Agencies that provide services to seniors can assist the SSMFS in connecting with these vulnerable individuals for public fire safety education or fire prevention programs.</p>	No issues/concerns

9.0 Economic Profile

As referenced in **O. Reg. 378/18**, the economic profile assessment includes analysis of the economic sectors affecting the community that are critical to its financial sustainability. This involves economic drivers in the community that have a significant influence on the ability of the community to provide or maintain service levels. If these facilities, employers, or events are impacted through a fire or emergency event, it could have a negative impact on the overall well-being of the City. The following sections consider these economic characteristics within the City of Sault Ste. Marie.

9.1 Economic Context

In terms of the economic well-being of a community, municipal and provincial authorities recognize the importance that businesses (i.e. industries and employers) play locally. Economic well-being is especially critical in regional centres, such as Sault Ste. Marie. This is reinforced by policy documents such as the Growth Plan for Northern Ontario, released March 3, 2011, which outlines economic-related policies with the intent to “build a strong, resilient and more diversified northern economy” (pg. 7). In addition, the Growth Plan identifies Sault Ste. Marie as a municipality containing strategic core areas, and therefore a priority area for long-term revitalization, intensification, and investment. The Demographic Profile explores some of the trends related to a decreasing and aging population, as well as educational levels within the City. As an economy with a historically strong reliance on manufacturing, the City has undergone initiatives to diversify the local economy, such as the Destiny Sault Ste. Marie initiative (a strategic partnership between private and public sectors to develop Sault Ste. Marie as a leader in creating sustainable employment and a healthy, diversified economy), as well as the recognition of the importance of local educational institutions.⁷²

9.2 Major Industries, Occupations and Employers in Sault Ste. Marie

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

⁷² Background document provided on the Destiny Sault Ste. Marie website (www.destinyssm.com).

employment facilities within a community could have significant impacts on local economy and employment.

The City of Sault Ste. Marie has been a manufacturing hub for more than 100 years. Historically known for its steel industry, the City has experienced growth in other sectors and continues to diversify its economy. The five areas of economic growth and focus include advanced manufacturing (e.g. steel, forest products, etc.), lottery and gaming, smart energy/clean tech/renewable energy, digital economy and aviation/aerospace.

As shown in **Figure 30** data from Statistics Canada (2021 Census) identifies the primary industries in the City as health care/social assistance, retail trade, manufacturing, educational services, accommodation/food services, construction and public administration. Compared to the Province, the City has a much higher proportion of health care/social assistance and retail trade industries and lower amounts of professional/scientific/technical services and finance/insurance industries.

9.2.1 Labour Force by Occupation

The breakdown of occupations within the City of Sault Ste. Marie, according to Canada's National Occupational Classification system, is presented below in **Figure 31**. Slightly less than one third (28.06%) of the City's occupations are within the Sales and Service category, which is 3.9% higher than the Province. Trades, transport, equipment operators and related occupations translate to 17.56% of the City's occupations. Occupations in education, law and social, community and government services comprise 14.53% of occupations in the City, followed closely by business, finance, and administration occupations at 13.65% (4.8% lower than the Province).

Figure 30: Industry in Sault Ste. Marie (North American Industry Classification System (NAICS) 2017)

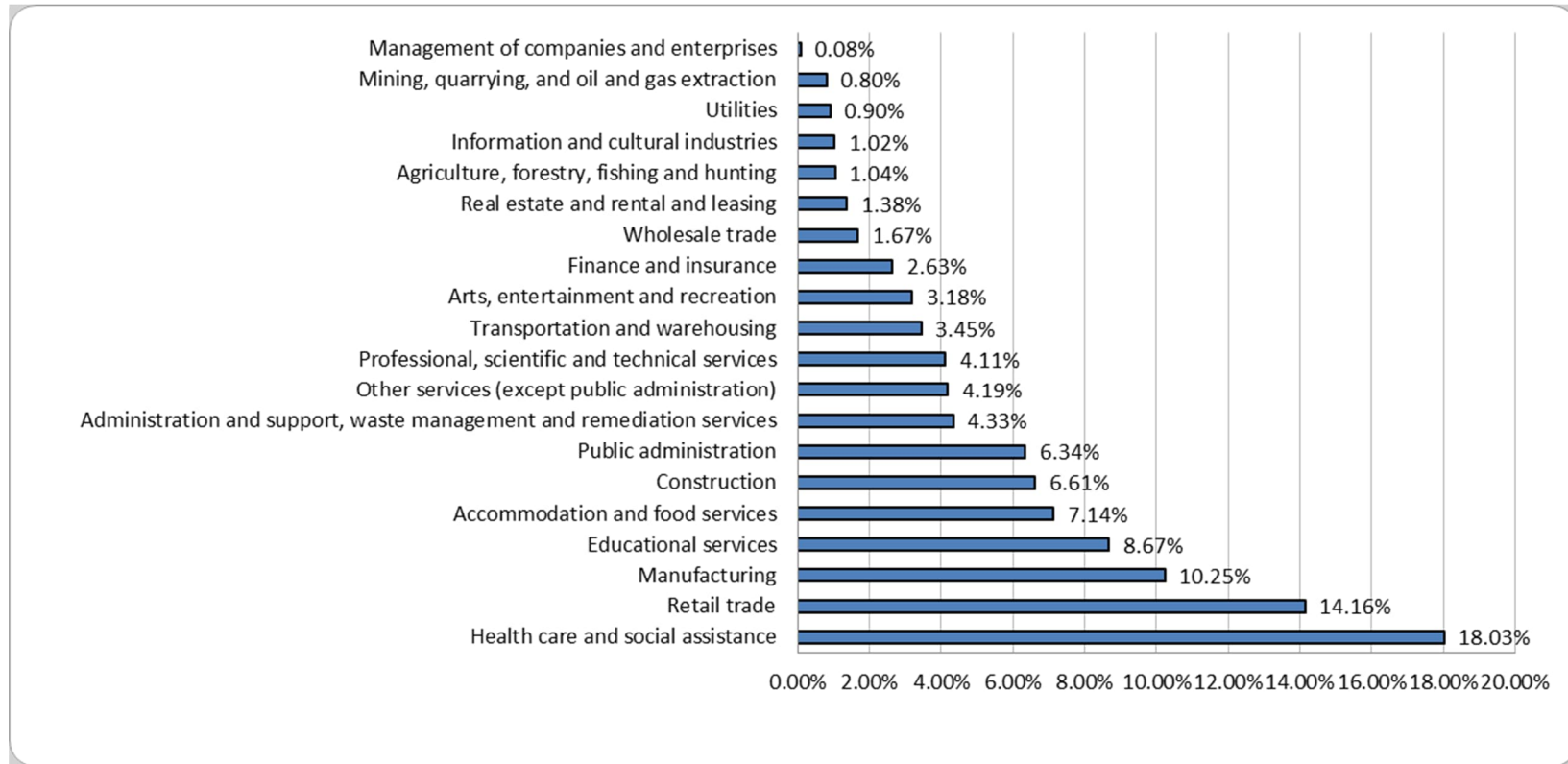


Figure Source: Statistics Canada, 2021 Census of Population ⁷³

⁷³ Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed June 17, 2024).

Figure 31: Occupation, City of Sault Ste. Marie - National Occupational Classification (NOC) 2021

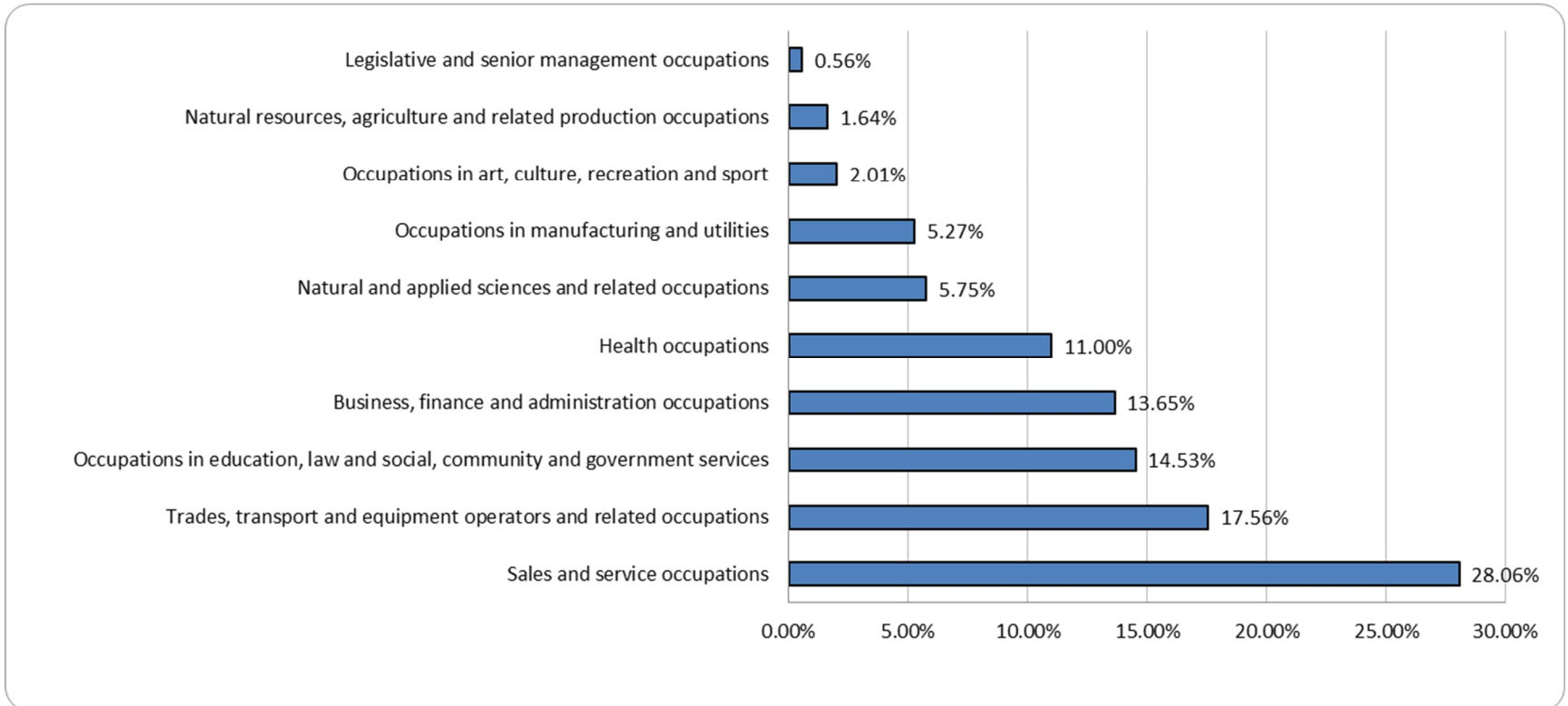


Figure Source: Statistics Canada, 2021 Census of Population ⁷⁴

⁷⁴ Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed June 17, 2024).

9.2.2 Major Employers

The current major employers within the City of Sault Ste. Marie are summarized in **Table 32**. These include employers in advanced manufacturing, healthcare, public administration, and wholesale/retail trade.

Table 32: Major Employers in Sault Ste. Marie

Employer	Public or Private Sector
Algoma Steel	Private Sector
Sault Area Hospital	Public Sector
Algoma District School Board	Public Sector
City of Sault Ste. Marie	Public Sector
Huron-Superior Catholic District School Board	Public Sector
Sault College of Applied Arts & Sciences	Public Sector
Ontario Lottery and Gaming Corporation	Public Sector
F.J. Davey Home	Public Sector
Tenaris Algoma Tubes	Private Sector
Wal-Mart	Private Sector
Group Health Centre	Public Sector
Natural Resources Canada - Canadian Forest Service	Public Sector
Ontario Ministry of Natural Resources	Public Sector
McDougall Energy	Private Sector
Canadian Tire	Private Sector
Algoma Energy Solutions	Private Sector
Algoma University	Public Sector

Employer	Public or Private Sector
Aigoma Public Health Unit	Public Sector
SIS Group	Private Sector
JD Aero	Private Sector
Arauco North America	Private Sector
S&T Group	Private Sector
Sault Ste. Marie Police Services	Public Sector
Sault Ste. Marie Innovation Centre	Public Sector
Sault Ste. Marie Public Utilities Commission (PUC)	Public Sector

Source: Sault Ste. Marie 2023 Community Profile and City Website

Key Finding: The City's major employers contribute to the economic vitality of the community. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the City.

10.0 Past Loss and Event History Profile

As referenced in **O. Reg. 378/18**, the past loss and event history profile assessment includes analysis of the community's past emergency response experience, including an analysis of the number and types of emergency responses, injuries, deaths and dollar losses, and a comparison of the community's fire loss statistics with provincial fire loss statistics. Evaluation of previous response data will inform decisions on fire protection service delivery, including public fire safety education and inspection programs. The following sections consider these past loss and event history characteristics within the City of Sault Ste. Marie.

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 1, 2017, to December 31, 2023, to provide a comparison with Provincial fire loss data. This is consistent with the same years of data assessed for the Response Profile. The City's Comprehensive Risk Assessment presented the results of fire loss data analysis for the five-year period from 2015 to 2016.

10.1.1 Total Fire Loss

Analysis of the total fire loss within the City over the seven-year period from January 1, 2017, to December 31, 2023, as displayed in **Table 33**, includes three categories representing the primary types of fires and the total amount of dollar loss associated with these fires. This includes 482 structure fires, 96 outdoor fires, and 134 vehicle fires representing \$42,040,513 in total dollar loss.

Over this seven-year period, the City averaged 102 fires and \$6,005,788 in property loss per year. On average, 69 structure fires occur per year, with an average structural fire property loss of \$5,469,107 per year.

Table 33: Total Fire Loss – City of Sault Ste. Marie

Year	Structure # of Fires	Structure Loss (\$)	Outdoor # of Fires	Outdoor Loss (\$)	Vehicle # of Fires	Vehicle Loss (\$)	Total # of Fires	Total Loss (\$)
2017	59	\$2,277,600	11	\$11,234	16	\$112,600	86	\$2,401,434
2018	63	\$4,397,775	12	\$4,100	19	\$267,500	94	\$4,669,375
2019	62	\$6,504,350	12	\$24,195	24	\$679,300	98	\$7,207,845
2020	66	\$2,658,585	10	\$7,250	13	\$205,124	89	\$2,870,959
2021	85	\$5,907,350	11	\$13,410	13	\$360,600	109	\$6,281,360
2022	82	\$11,116,050	20	\$1,113,150	36	\$390,700	138	\$12,619,900
2023	65	\$5,422,040	20	\$82,600	13	\$485,000	98	\$5,989,640
Total (2017-2023)	482	\$38,283,750	96	1,255,939	134	2,500,824	712	42,040,513
% of All Fires (2017-2023)	67.7%	91.1%	13.5%	3.0%	18.8%	5.9%	100%	100%
Average (2017-2023)	69	\$5,469,107	14	\$179,420	19	\$357,261	102	\$6,005,788

Source: OFM Standard Incident Reporting (2017 to 2023 data)

Table 34 compares the number of structure fires and the associated total property loss within the City of Sault Ste. Marie for the period from January 1, 2017, to December 31, 2023, to the number of structure fires and total property loss that occurred across Ontario for the same period.

Over the seven-year period, the City of Sault Ste. Marie experienced an average of 69 structure fires per year over the seven-year period from January 1, 2017, to December 31, 2023, representing an average of 68.1% of all fires that occurred in the City. Over this same period, the Province experienced an average of 7,000 structure fires per year representing an average of 64.3% of all fires that occurred in the Province.

Structure fires accounted for the highest percentage of fires and total dollar loss for fires in the City and in the Province. The average structure fire loss (2017 to 2023) as a percentage of all fire loss in Sault Ste. Marie was 92.1%, which is slightly higher than that of the Province at 88.9%. Structure fires represented 68.1% of all fires averaged from 2017 to 2023, which is higher than the Province at 64.3%. It is typical for urban municipalities, such as the City of Sault Ste. Marie, to have higher structure fire percentages than the province, as they typically have more building density (therefore more structures).

Table 34: Structure Fires and Property Loss – City of Sault Ste. Marie and the Province of Ontario

Year	City of Sault Ste. Marie Structure Fires	City of Sault Ste. Marie Loss (\$)	City of Sault Ste. Marie % All Fires	City of Sault Ste. Marie % All Loss (\$)	Ontario Structure Fires	Ontario Loss (\$)	Ontario % All Fires	Ontario % All Loss (\$)
2017	59	\$2,277,600	68.6%	94.8%	6,683	\$658,345,490	64.8%	89.1%
2018	63	\$4,397,775	67.0%	94.2%	7,012	\$734,340,655	63.4%	87.6%
2019	62	\$6,504,350	63.3%	90.2%	6,715	\$860,408,256	62.9%	88.7%
2020	66	\$2,658,585	74.2%	92.6%	6,841	\$790,693,587	64.5%	87.5%
2021	85	\$5,907,350	78.0%	94.0%	7,081	\$858,108,388	66.1%	87.8%
2022	82	\$11,116,050	59.4%	88.1%	7,482	\$1,161,882,704	64.5%	90.1%
2023	65	\$5,422,040	66.3%	90.5%	7,183	\$1,571,127,652	63.5%	91.5%
Average (2017-2023)	68.9	\$5,469,107	68.1%	92.1%	7,000	\$947,843,819	64.3%	88.9%
Total for Structure Fires (2017-2023)	482	\$38,283,750.0	67.7%	91.1%	48,997	\$6,634,906,732.0	64.2%	89.2%
Total for All Fires with a Loss (Structure, Vehicle, Outdoor) (2017-2023)	712	\$42,040,513.0	Not Applicable	Not Applicable	76,266	\$7,435,463,523.0	Not Applicable	Not Applicable

Source: OFM Standard Incident Reporting (2017 to 2023 data).

Key Finding: Over the seven-year period from January 1, 2017, to December 31, 2023, the City experienced a total of 482 structure fires, averaging 68.9 per year.

10.1.2 Fires by Occupancy Type

This section assesses the structure fires that occurred over the period from January 1, 2017, to December 31, 2023, based on the type of occupancy. OFM's Standard Incident Reporting data was utilized to inform this analysis. The analysis in **Table 35** indicates that during this period, Sault Ste. Marie experienced a total of 482 structure fires, 370 of which, or 76.8%, occurred in Group C-Residential occupancies. These fires account for 53.3% of the City's total fire loss for this period. In comparison, structure fires in Group C-Residential occupancies across the Province accounted for 75.2% of structure fires and 70.4% of all fire loss. Over this period, Sault Ste. Marie experienced a 1.6% higher rate of fires in Group C-Residential occupancies than that of the Province, and a 17.1% lower fire loss in Group C-Residential occupancies.

The second most significant source of property loss in the City, accounting for 32.0% of structure fire loss (compared to 16.7% across the Province) and 5.8% of the total structure fires (compared to 7.6% Provincially) over the same period, is Group F – Industrial occupancies.

Some of the trends within this historical fire loss reporting for the City could be explained by the distribution of property stock by major occupancy classification within the City. For example, as found within **Section 3.2.1 – City of Sault Ste. Marie Existing Major Building Classification Summary** of this CRA, 95.25% of the property stock classified by the Ontario Building Code is Group C – Residential. It is therefore reasonable to expect that Group C would account for the highest proportion of structure fires. The second most prevalent occupancy classification in Sault Ste. Marie is Group D & E – commercial, at 1.77% of the total building stock, followed by Group F at 1.4%. Group D & E combined accounted for 5.2% of all structure fires and 7.6% of the total fire loss from 2017 to 2023.

Table 35: Fires by OBC Major Occupancy Classification – City of Sault Ste. Marie and Province of Ontario (2017-2023)

Group	OBC Major Occupancy Classification	City of Sault Ste. Marie Structure Fires	City of Sault Ste. Marie's % of Structure Fires	City of Sault Ste. Marie Fire Loss (\$)	City of Sault Ste. Marie % of Fire Loss	Ontario % of Structure Fires	Ontario % of Fire Loss
Group A	Assembly	11	2.3%	\$2,400,100	6.3%	3.6%	4.0%
Group B	Care or Detention	11	2.3%	\$138,800	0.4%	1.5%	0.8%
Group C	Residential	370	76.8%	\$20,398,400	53.3%	75.2%	70.4%
Group D	Business and Personal services	17	3.5%	\$2,856,200	7.5%	2.8%	2.5%
Group E	Mercantile	8	1.7%	\$54,700	0.1%	3.5%	4.5%
Group F	Industrial	28	5.8%	\$12,244,300	32.0%	7.6%	16.7%
Other	Not Classified within the OBC	37	7.7%	\$191,250	0.5%	5.8%	1.2%
All Groups	Classification Totals	482	100.0%	\$38,283,750	100.0%	100.0%	100.0%

Source: OFM Standard Incident Reporting (2017 to 2023)

Key Finding: Over the seven-year period from January 1, 2017, to December 31, 2023, structure fires occurring in Group C – Residential Occupancies account for 76.8% of total structure fires within the City (higher than the Province at 75.2%) and 53.3% of total structure fire loss (lower than the Province at 70.4%).

Key Finding: Over the seven-year period from January 1, 2017, to December 31, 2023, structure fires occurring in Group F – Industrial Occupancies account for 5.8% of total structure fires within the City and 32.0% of total structure fire loss.

10.1.3 Civilian Fire Fatalities and Injuries

As shown in **Table 36**, according to OFM Standard Incident Reporting, over the seven-year period from January 1, 2017, to December 31, 2023, there were 64 reported civilian injuries and nine fire fatalities within the City of Sault Ste. Marie. The majority of injuries and all fatalities occurred in Group C – Residential Occupancies. This finding is consistent with the fire loss statistics by occupancy type, whereby the majority of fire losses within the Province and within the City occurred in Group C – Residential occupancies.

Table 36: Civilian Fire Fatalities and Injuries by OBC Major Occupancy Classification - City of Sault Ste. Marie

Group	Occupancy Classification	Injuries	Fatalities
Group A	Assembly	0	0
Group B	Care or Detention	1	0
Group C	Residential	62	9
Group D	Business and Personal services	0	0
Group E	Mercantile	0	0
Group F	Industrial	1	0
Other	Not Classified within the OBC	0	0
Total	All Classifications and Other	0	0

Source: OFM Standard Incident Reporting (2017 to 2023 data)

Key Finding: From 2017 to 2023, most reported fire-related civilian injuries (62) and all fire-related fatalities (9) in the City of Sault Ste. Marie occurred in Group C – Residential Occupancies.

10.1.4 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”.⁷⁵ 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 City compared to the Province over the five-year period from January 1, 2017, to December 31, 2023.

The “intentional” category recognizes the cause of a fire to be started for a specific reason. These are typically classified as arson fires, acts of vandalism, or to achieve personal gain through insurance payment, for example. From 2017 to 2023, 14.6% of the fires reported were listed as intentional (i.e. combined categories of arson and vandalism), which is higher than the Provincial total of intentional fires (8.3%).

The “unintentional” category recognizes a number of the common causes of a fire that represent both human behavioural causes (e.g., playing with matches) and equipment failures (e.g., mechanical failure). In total, unintentional fire causes represented 60.3% of the cause for the 481 fires during this period (compared to 70.9% within the Province). This suggests a need for targeted education programs about fire causes and prevention.

Misuse of ignition was the leading unintentional fire cause in the City from 2018-2023 at 29.7% (143 fires), compared to 27.7% in the Province, followed by mechanical/electrical failure at 9.4% (45 fires), compared to 15.0% in the Province.

Fires with undetermined/unknown causes accounted for 22.5% of the total fires in Sault Ste. Marie from 2017 to 2023, and 20.8% of fires in the Province during the same time period.

⁷⁵ Source: NFPA, Glossary of Terms, 2019 Edition.

Table 37: Reported Fire Cause – City of Sault Ste. Marie and the Province of Ontario

Case Type/Nature	Reported Fire Cause	City of Sault Ste. Marie # of Fires	City of Sault Ste. Marie % of Fires	Ontario # of Fires	Ontario % of Fires
Intentional	Arson	48	10.0%	3,239	6.6%
Intentional	Vandalism	22	4.6%	787	1.6%
Intentional	Other Intentional	0	0.0%	45	0.1%
Unintentional	Children Playing	0	0.0%	194	0.4%
Unintentional	Design/Construction/Maintenance Deficiency	29	6.0%	3,076	6.3%
Unintentional	Mechanical/Electrical Failure	45	9.4%	7,328	15.0%
Unintentional	Misuse of Ignition Source	143	29.7%	13,569	27.7%
Unintentional	Other Unintentional	15	3.1%	3,585	7.3%
Unintentional	Undetermined	30	6.2%	4,243	8.7%
Unintentional	Vehicle Collision	0	0.0%	44	0.1%
Other	Other	41	8.5%	2,684	5.5%
Undetermined	Undetermined	108	22.5%	10,050	20.5%
Unknown, not reported	Unknown, not reported	0	0.0%	154	0.3%
All Cases	Reported Totals	481	100.0%	48,998	100.0%

Source: OFM Standard Incident Reporting (2017 to 2023 data)

Key Finding: Of the fires occurring in the City over the seven-year period from January 1, 2017, to December 31, 2023, the leading cause of unintentionally set fires was due to misuse of ignition source at 29.7% (143 fires), compared to 27.7% in the Province.

Key Finding: Of the fires occurring in the City over the seven-year period from January 1, 2017, to December 31, 2023, the second most frequent cause of unintentionally set fires was due to mechanical/electrical failure at 9.4% (45 fires), compared to 15.0% across the Province.

Key Finding: Of the fires occurring in the City over the seven-year period from January 1, 2017, to December 31, 2023, undetermined/unknown causes accounted for 22.5% of fires (108), compared to 20.8% across the Province.

10.1.5 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 vapours that could occur at the site or onboard the vehicle”.⁷⁶ **Table 38** provides fire loss by source of ignition for the City of Sault Ste. Marie and the Province.

For the period 2017 to 2023, the most common reported ignition sources within the City are “undetermined” at 29.3% (higher than the Province by 2.7%), “Cooking Equipment” at 20.7% (higher than the Province by 5.1%), and “Open flame/tools/smoker articles at 13.3% (lower than the Province by 0.5%). This presents the opportunity to further investigate sources of ignition and incorporate key messages relating to cooking equipment, open flame, tools and smokers’ articles tools in public education materials.

⁷⁶ Source: NFPA Glossary of Terms, 2019 Edition.

Table 38: Source of Ignition - City of Sault Ste. Marie and the Province of Ontario

Reported Ignition Source	City of Sault Ste. Marie # of Fires	City of Sault Ste. Marie % of Fires	Ontario # of Fires	Ontario % of Fires
Appliances	20	4.1%	2,110	4.3%
Cooking Equipment	100	20.7%	7,679	15.7%
Electrical Distribution	21	4.4%	4,054	8.3%
Heating Equipment, chimney, etc.	30	6.2%	3,483	7.1%
Lighting Equipment	9	1.9%	1,369	2.8%
Open flame tools/smokers' articles	64	13.3%	6,768	13.8%
Other electrical/mechanical	16	3.3%	2,534	5.2%
Processing Equipment	8	1.7%	576	1.2%
Miscellaneous	35	7.3%	4,833	9.9%
Exposure	38	7.9%	2,383	4.9%
Undetermined	141	29.3%	13,029	26.6%
Unknown, not reported	No Data	No Data	180	0.4%
Total	482	100%	48,998	100%

Source: OFM Standard Incident Reporting (2017 to 2023 data)

Key Finding: Of the fires occurring within the City over the seven-year period from January 1, 2017, to December 31, 2023, 29.3% of fires had an undetermined reported ignition source, which is 2.7% higher than the Province (26.6%).

Key Finding: Of the fires occurring within the City over the seven-year period from January 1, 2017, to December 31, 2023, 20.7% of fires had a reported ignition source that was classified as Cooking Equipment, which is 5.1% higher than the Province (15.7%).

Key Finding: Of the fires occurring within the City over the seven-year period from January 1, 2017, to December 31, 2023, 13.3% of fires had a reported ignition source of open flame/tools/smokers' articles, which is 0.5% lower than the Province (13.8%).

10.1.6 Smoke Alarm Status Processing Equipment

Smoke alarms are required on every level of a dwelling and between sleeping areas in the Province of Ontario, notifying building occupants of a fire and allowing for prompt escape. As a result, smoke alarm programs and compliance are a key component of public education and fire prevention activities provided by the municipal fire departments across the Province.

Data is publicly available at the provincial level for the smoke alarm status in the event of a fire and municipalities collect smoke alarm status information and report it to the Province. This data was provided by the OFM as part of the CRA for the City of Sault Ste. Marie and the Province of Ontario over a seven-year period from January 1, 2017, to December 31, 2023, for Group C - Residential occupancies. **Table 39** highlights whether a smoke alarm was present and operating on the floor or in the suite of fire origin.

Table 39: Smoke Alarm Presence and Operation on the Floor of Fire Origin - City of Sault Ste. Marie and the Province of Ontario

Smoke Alarm Status on Floor of Origin	Sault Ste. Marie 2017	Sault Ste. Marie 2018	Sault Ste. Marie 2019	Sault Ste. Marie 2020	Sault Ste. Marie 2021	Sault Ste. Marie 2022	Sault Ste. Marie 2023	Sault Ste. Marie Total (2017-2023)	Sault Ste. Marie % (2017-2023)	Ontario Total (2017-2023)	Ontario % (2017-2023)
No Smoke Alarm Present	5	6	10	12	11	13	12	69	21.2%	5,959	17.3%
Smoke Alarm Present and Operated	17	14	17	13	23	17	10	111	34.2%	15,361	44.7%
Smoke Alarm Present, Did Not Operate	10	8	9	11	9	8	12	67	20.6%	4,272	12.4%
Smoke Alarm Present, Operation Undetermined	3	5	3	4	5	4	3	27	8.3%	2,811	8.2%
Smoke Alarm Presence Undetermined	2	11	6	6	12	9	5	51	15.7%	5,952	17.3%

Source: OFM Standard Incident Reporting (2017 to 2023 data)

Over the seven-year period from January 1, 2017, to December 31, 2023, there was no smoke alarm present for 21.2% of residential fire events in the City compared to 17.3% in the Province. A further 67 incidents (or 20.6%) had a smoke alarm present, but it did not operate (compared to 12.4% Provincially). In Sault Ste. Marie, in 34.2% of residential fire occurrences, a smoke alarm was present and operated, which is lower than the Province at 44.7%. Smoke alarm present and did not operate, or operation undetermined and presence undetermined, made up a combined 44.6% of residential fires in the City.

Provincial and local statistics support focusing efforts on targeted and proactive smoke alarm program and suggest the need for increased enforcement strategies for those properties that are non-compliant. Further the number of non-operational smoke alarms suggest education specific to checking and testing smoke alarms is warranted.

Key Finding: Over the seven-year period from January 1, 2017, to December 31, 2023, of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present (compared to 17.3% in the Province).

Key Finding: Over the seven-year period from January 1, 2017, to December 31, 2023, of the fire loss incidents in Group C – Residential occupancies, 34.2% of incidents had a smoke alarm present and operating compared to 44.7% in the Province.

10.2 Event History

The analyses of event history seek to apply the SSMFS's historic emergency call data to develop an understanding of community risk. The profile assesses the historical emergency response capabilities of Sault Ste. Marie Fire Services, based on data collected by the department. This section provides a statistical assessment of historic emergency call volumes for the City as a whole by different time segments (e.g. annual calls, monthly calls, weekly calls, daily calls, etc.). The analysis also assesses call volumes by response type, compares them to provincial data, and analyzes the spatial distribution of calls. Most of the analysis in this section is based on data provided by SSMFS, including all historical calls for the seven-year period from January 1, 2017, to December 31, 2023. A data set, provided by the OFM, of the SSMFS historical emergency responses from 2018 to 2023 was also relied upon.

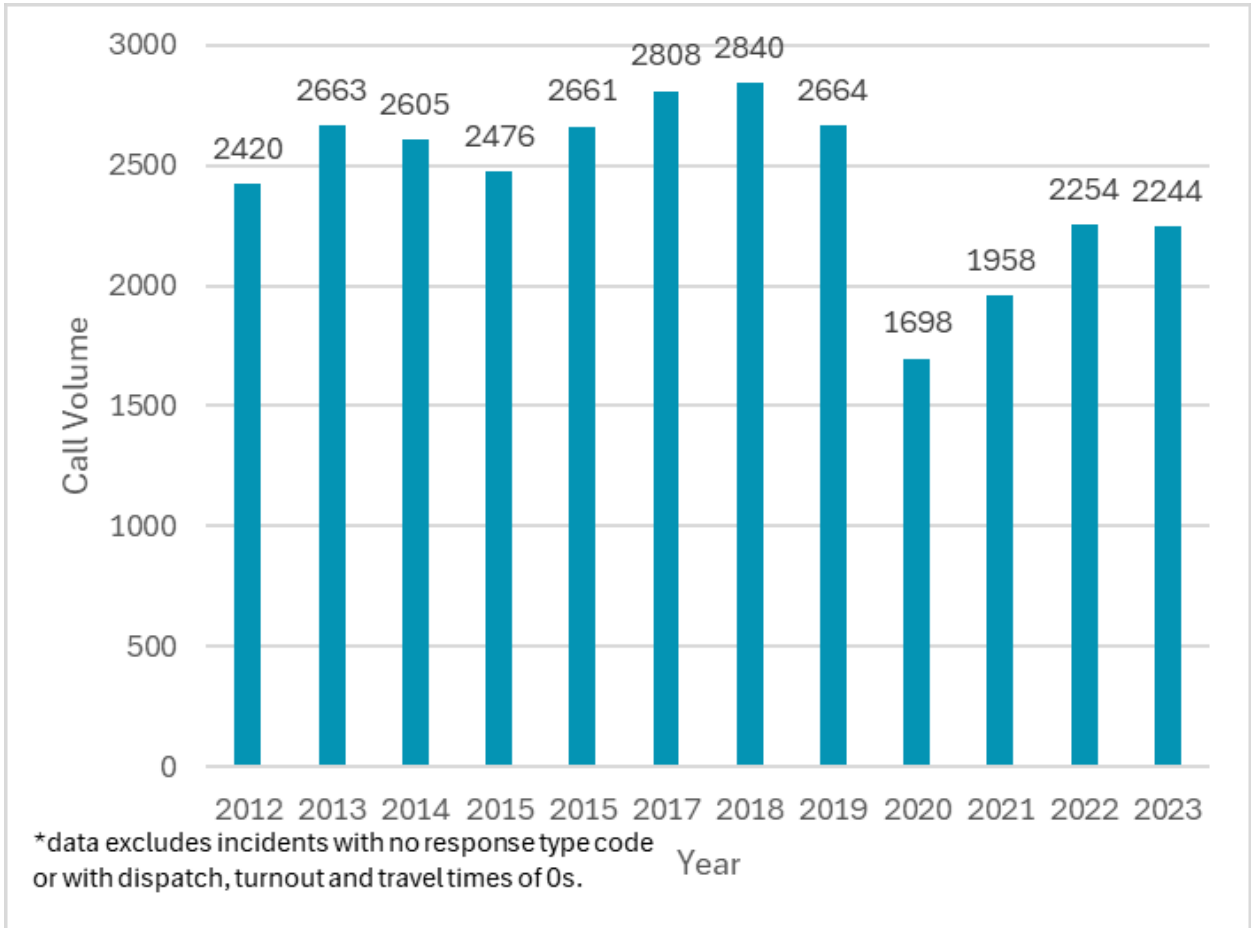
The volume and frequency of historic calls inform the understanding of response probability. The types of calls inform the potential consequences of SSMFS responses and calls for service. The combined consideration of these elements provides an understanding of community risk, based on past calls for service.

10.2.1 Emergency Call Volume – All Incident Types

10.2.1.1 Annual Emergency Call Volume – All Incident Types

The analysis of annual emergency call volume can be beneficial in garnering an understanding of where trends may be evolving or changes in community emergency response demand may be occurring. A summary of the total number of emergency calls for the period from January 1, 2017, to December 31, 2023, is shown in **Figure 32**. Overall, there was an average of 2,441 calls per year over this twelve-year timeframe. The analysis indicates an increasing trend and equates to 10.1% growth in the total annual emergency call volumes within the City between 2012 and 2019. However, the annual call volume varied within that period, going from 2,420 calls (in 2012) to 2,840 calls (in 2018). The average annual call volume between 2012 and 2019 was 2,642. The significant decrease in calls that occurred in 2020 and 2021 can be attributed to the unique circumstances of the COVID-19 pandemic, resulting in two anomalous years of call volume. Following the pandemic, the tiered response agreement for medical calls has not reflected pre-pandemic conditions. This has resulted in an average call volume of 2,249 calls between 2022 and 2023. For some types of medical calls, the fire has not been called to respond in 2022 and 2023, where they were previously responding prior to March 2020. It is our understanding that there are ongoing discussions to revise the tiered response agreement, which is expected to bring the annual call volume in alignment with pre-pandemic conditions.

Figure 32: Annual Call Volume – All Incidents January 1, 2012, to December 31, 2023



Source: Sault Ste. Marie Fire Services Emergency Response Call Data

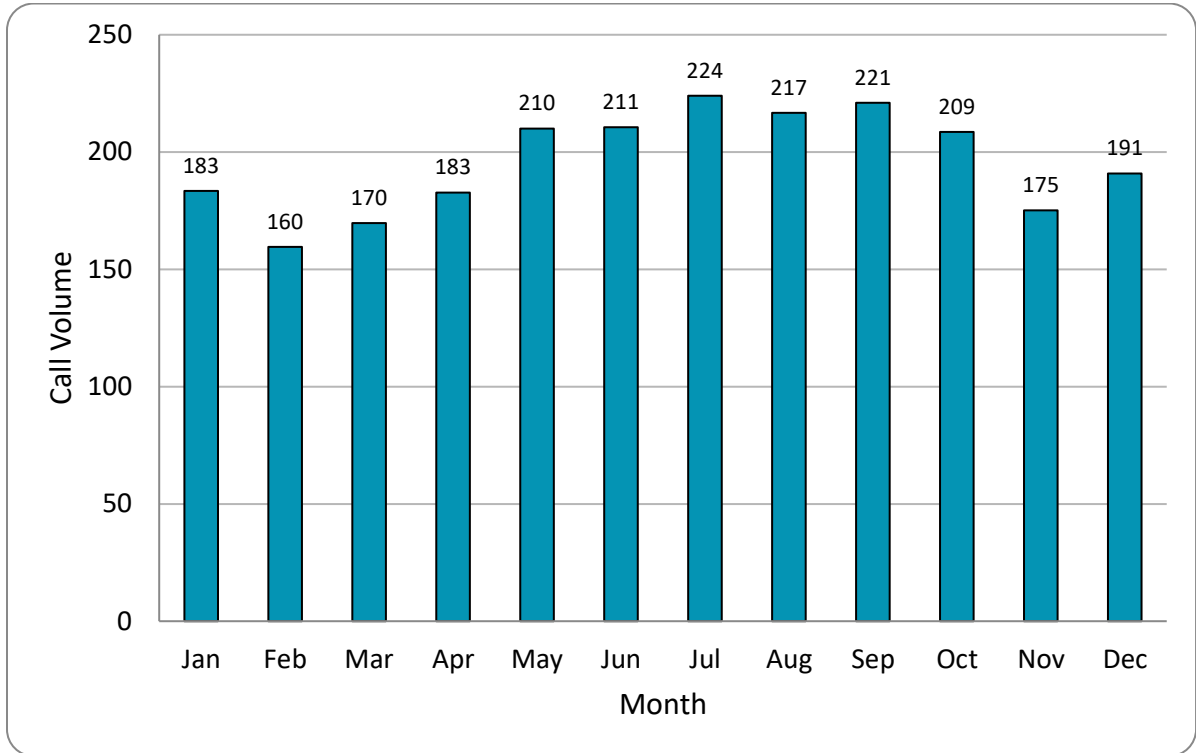
Key Finding: During the period from January 1, 2012, to December 31, 2019, the total annual volume of emergency calls for services to the Sault Ste. Marie Fire Services increased by 10.1% and averaged 2,642 calls. The annual call volumes decreased in 2020 to 2021 as a result of the COVID 19 pandemic. The average annual calls for service between 2012 to 2023 was 2,441 calls.

10.2.1.2 Monthly Average Emergency Call Volume – All Incident Types

The analysis of average emergency call volume for the period from January 1, 2017, to December 31, 2023, by month can be beneficial to identifying any potential variances that may be associated with seasonal trends related to activities such as more motor vehicle travel during summer months, or use of heating devices during winter months.

With an average monthly emergency call volume of 196 calls **Figure 33** illustrates that the highest percentage of emergency calls occurred in July (224 calls) and September (221 calls).

Figure 33: Average Call Volume by Month – All Incidents January 1, 2017, to December 31, 2023

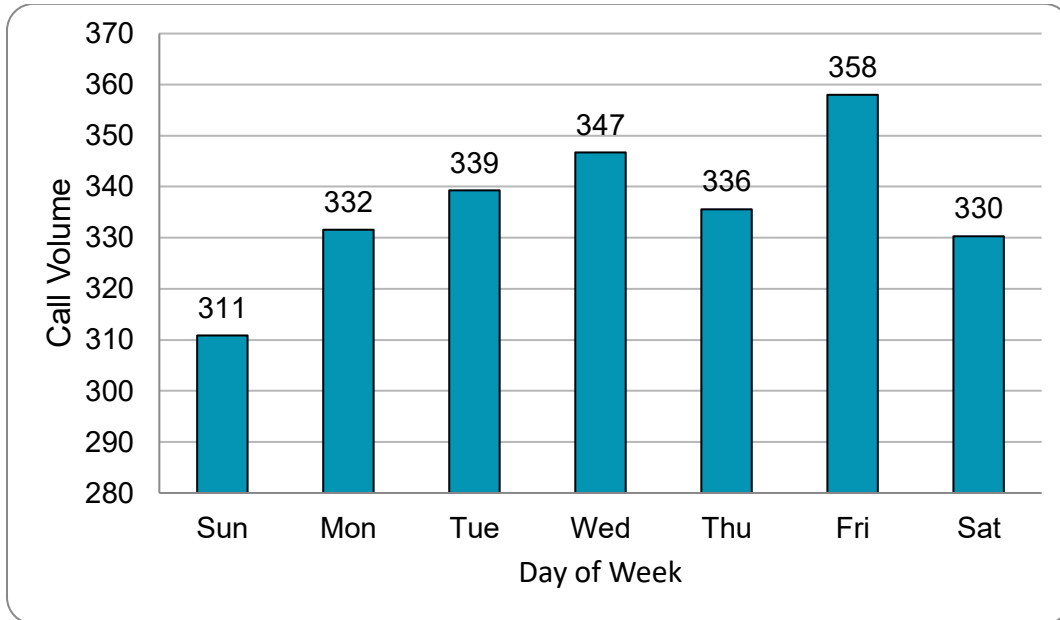


Source: Sault Ste. Marie Fire Services Emergency Response Call Data

10.2.1.3 **Weekly Average Emergency Call Volume – All Incident Types**

The analysis of average call volume by day of week for the period from January 1, 2017, to December 31, 2023, as shown in **Figure 34**, illustrates that overall, the call volume is relatively consistent Monday to Saturday. The highest number of emergency calls occur on Fridays, while the lowest emergency call volume occurs on Sundays.

Figure 34: Average Call Volume by Day of Week – All Incidents January 1, 2017, to December 31, 2023

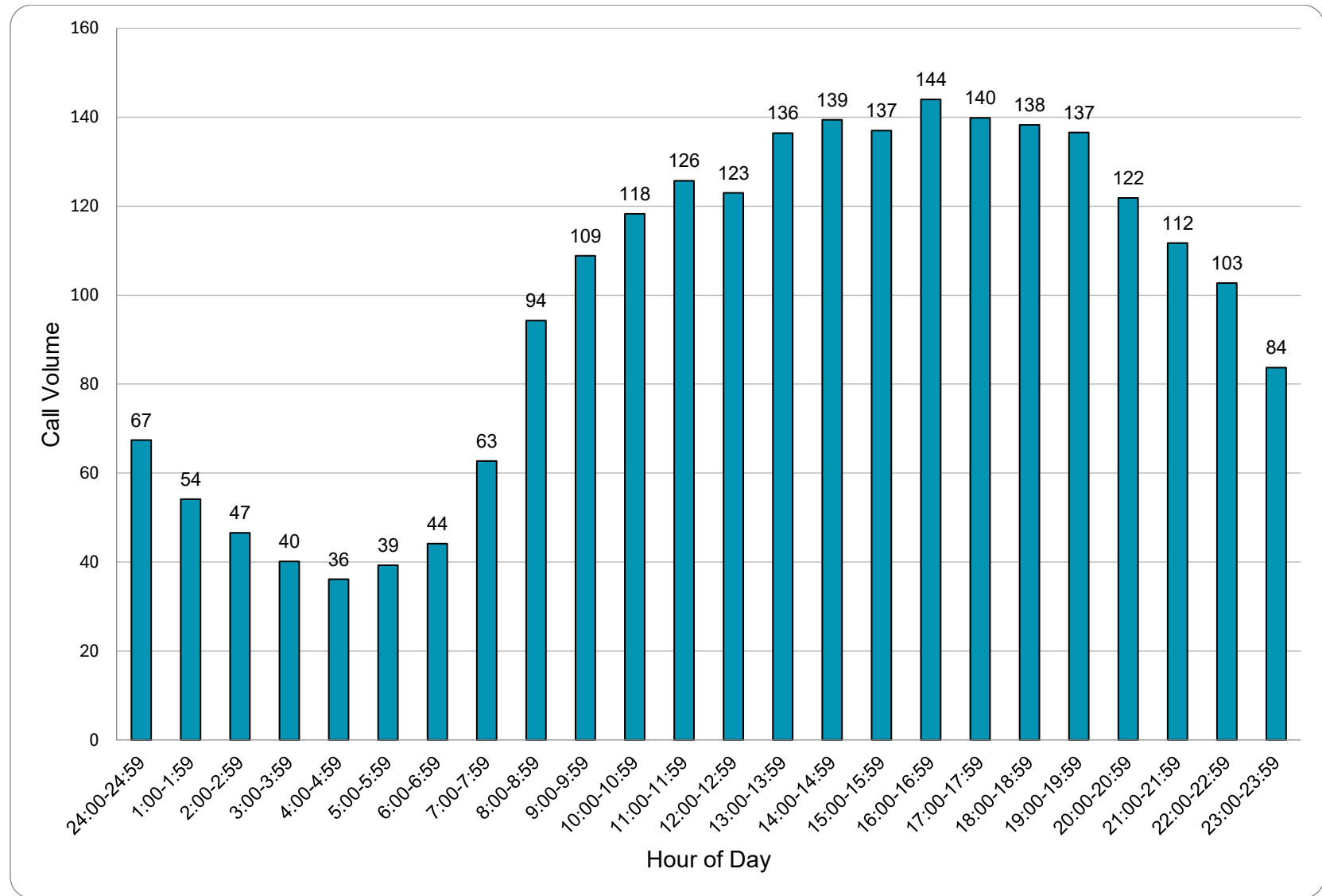


Source: Sault Ste. Marie Fire Services Emergency Response Call Data

10.2.1.4 **Daily Emergency Call Volume – All Incident Types**

Figure 35 indicates that for the period from January 1, 2017, to December 31, 2023, a higher emergency call volume (between 109 and 103 calls) is typically experienced between 9:00 AM and 10:00 PM. The call volumes appear to peak in the period from 1:00 PM to 7:00 PM, with volumes from 136 to 144. The lowest volume of emergency calls (36 to 47 calls) typically takes place between the hours of 2:00 AM and 7:00 AM, when most of the population is typically sleeping.

Figure 35: Average Call Volume by Time of Day – All Incidents January 1, 2017, to December 31, 2023



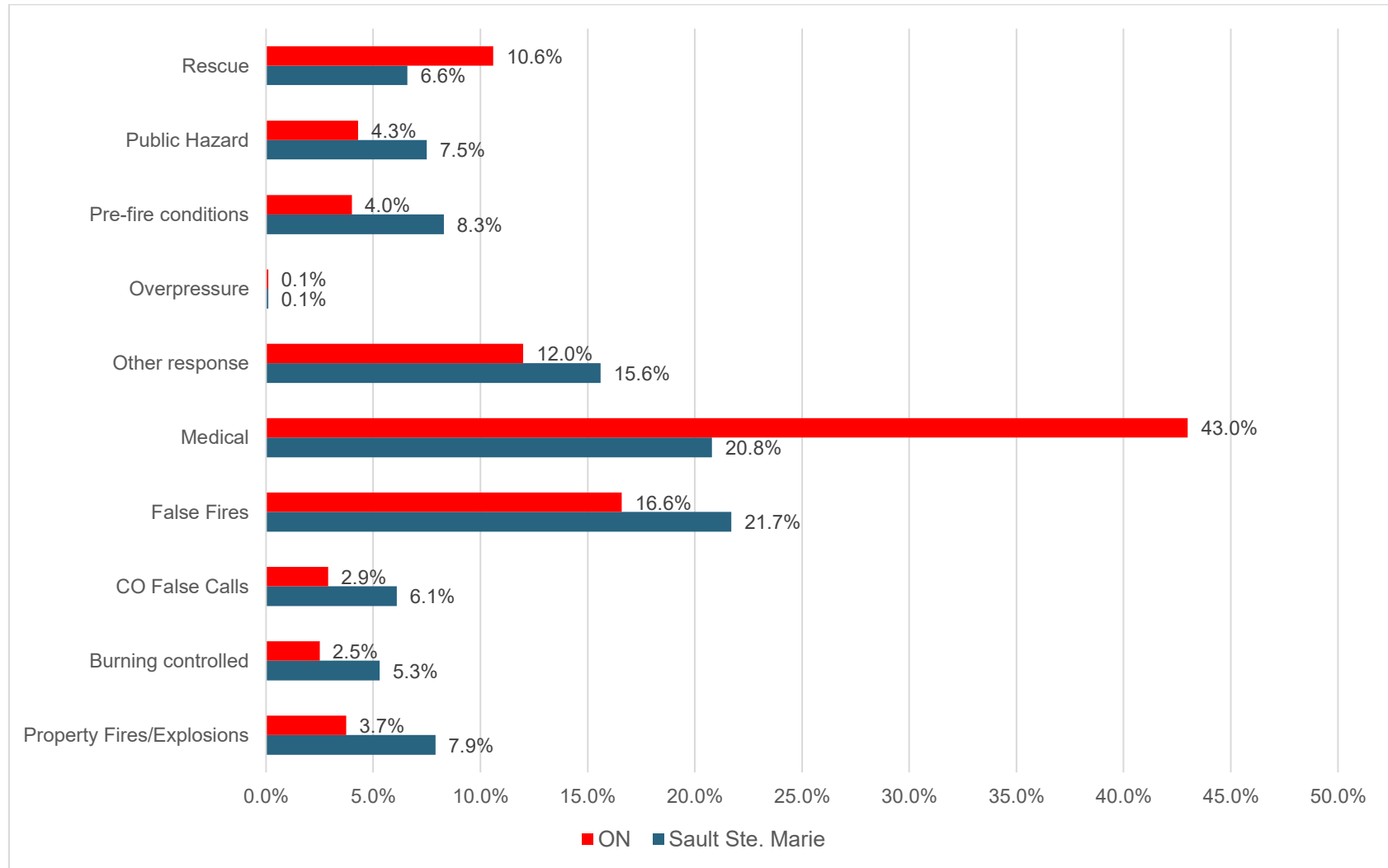
Source: Sault Ste. Marie Fire Services Emergency Response Call Data

10.2.1.5 Total Emergency Call Volume – All Incident Types

This section illustrates the analysis of all emergency call volume for the City of Sault Ste. Marie and the Province of Ontario for the period from January 1, 2018, to December 31, 2023, by OFM emergency response type. Note that the 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 as a whole.

Figure 36 illustrates that during this period, responding to false fire calls was the highest percentage of the City's total emergency calls, representing 21.7% of the total emergency call volume (higher than the Province by 5.1%). During this period, the second highest response type in the City was medical calls, representing 20.8% of the total emergency calls that the SSMFS responded to (lower than the Province by 22.2%). Other types of calls represent the third highest percentage of emergency call volume responded to by the SSMFS at 15.6% (higher than the Province by 3.6%).

Figure 36: Percentage of Calls (SSMFS and Ontario) by OFM Response Type (2018 to 2023)



Source: Office of the Fire Marshal and Emergency Management, Municipal Emergency Calls by Response Type Class (2018-2023)

Key Finding: For the period from January 1, 2018, to December 31, 2023, the highest percentage of emergency call volume responded to by Sault Ste. Marie Fire Services as defined by the OFM response types was false fire calls representing 21.7% of the total emergency call volume.

Key Finding: For the period from January 1, 2018, to December 31, 2023, the second highest percentage of emergency call volume responded to by Sault Ste. Marie Fire Services as defined by the OFM response types was medical/resuscitator calls representing 20.8% of the total emergency call volume.

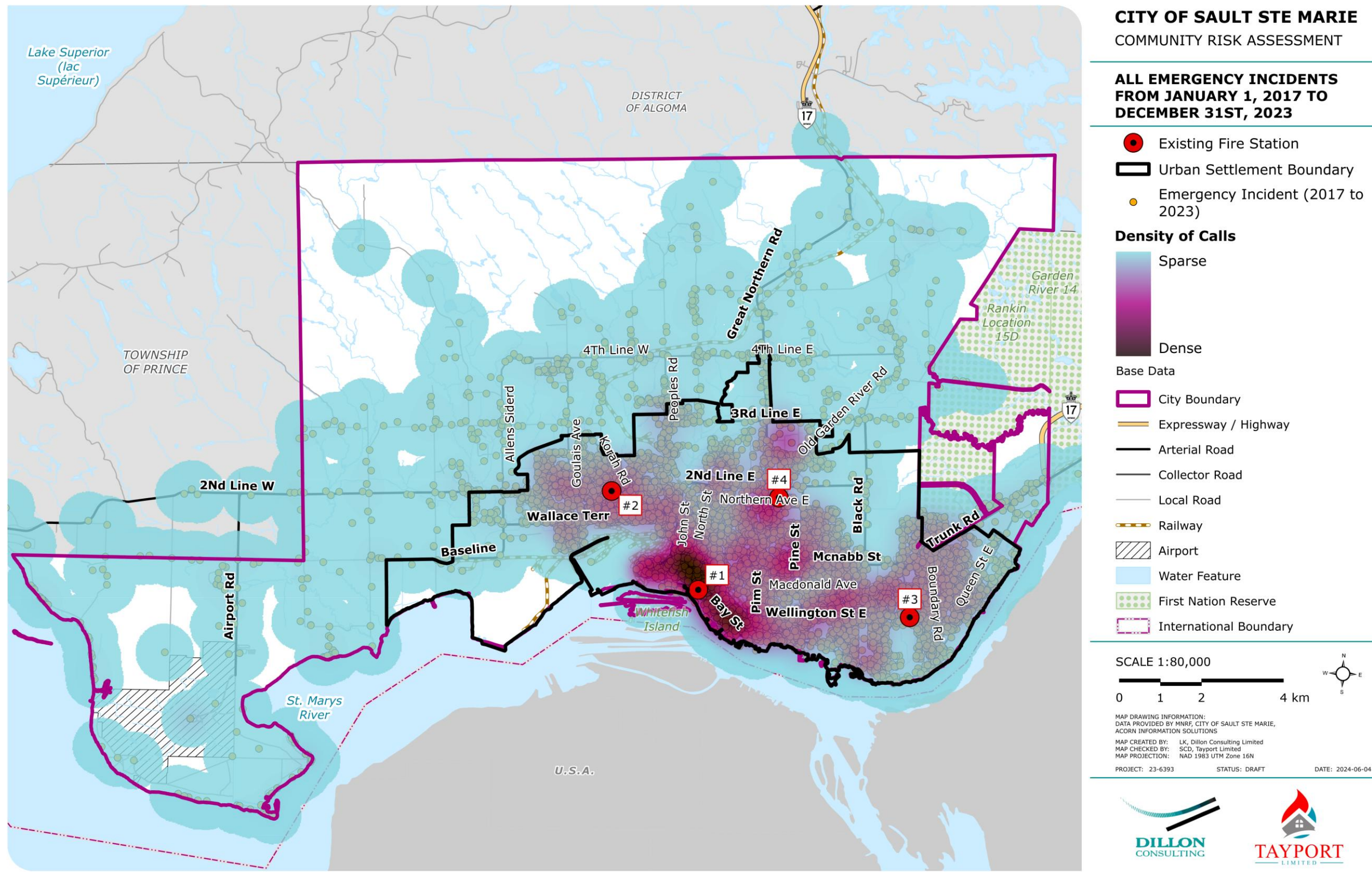
10.2.2 Emergency Call Volume – Spatial Modelling

The analysis within this section illustrates the distribution of the emergency call volume within the City for the period from January 1, 2017, to December 31, 2023. The analysis includes the spatial distribution of all emergency incidents that occurred during this period based on the OFM response types including medical/resuscitator, rescue, false fire and fire /explosions incidents over this seven-year period. Call density maps were computed using the Spatial Analyst tool on ArcGIS for each respective response call category. The spatial distribution of calls provides insight into where a higher volume of calls has historically occurred within the City.

10.2.2.1 Spatial Modelling – All Emergency Incidents

Figure 37 illustrates the distribution and spatial concentration of all emergency incidents that occurred within the City over this seven-year period. The model shows a wide distribution of emergency incidents across the City, with the areas of highest call concentration (shown in dark purple) in the downtown and Steelton areas. Station 1's location falls immediately within the area of highest call concentration. The geography surrounding Stations 2, 3, and 4, as well as the areas in between, also show pockets of increased call density. The historic location of emergency call density supports the existing locations of the City's four fire stations.

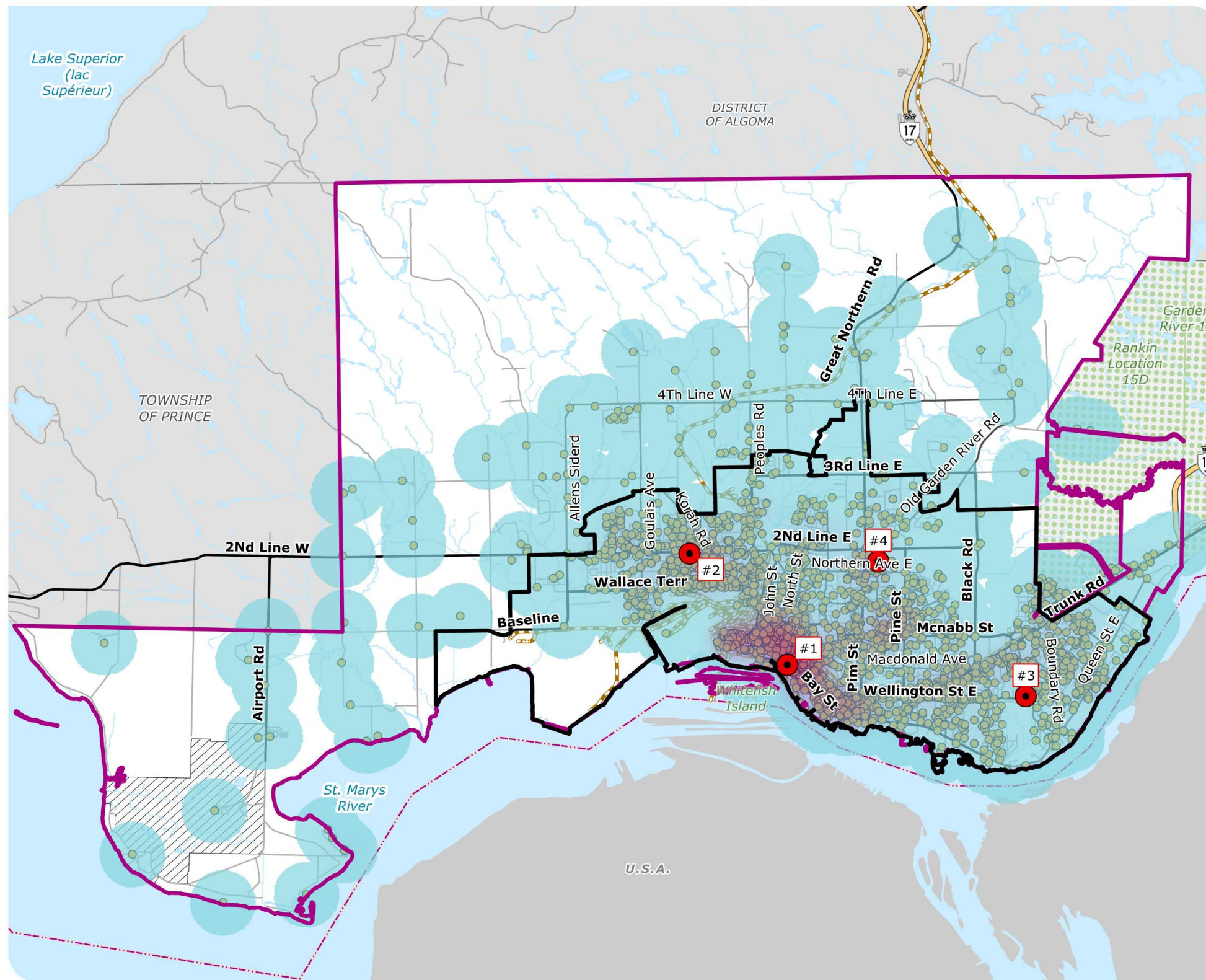
Figure 37: Spatial Distribution and Concentration – All Emergency Incidents



10.2.2.2 Spatial Distribution and Concentration – Medical/Resuscitator Incidents

The spatial distribution and concentration of Medical Calls from January 1, 2017, to December 31, 2023, are shown in **Figure 38**. The analysis indicates a higher density of medical calls historically occurred in the in the Downtown area, and Steelton neighbourhood (the areas surrounding Fire Station 1) with a notable distribution of medical calls throughout the City and primarily within the Urban Settlement Area. The areas of increased call density align with the locations of the existing four fire stations.

Figure 38: Spatial Distribution and Concentration – Medical/Resuscitator Incidents

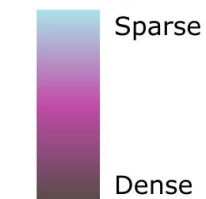


CITY OF SAULT STE MARIE
COMMUNITY RISK ASSESSMENT

MEDICAL / RESUSCITATOR INCIDENTS FROM JANUARY 1, 2017 TO DECEMBER 31ST, 2023

- Existing Fire Station
- Urban Settlement Boundary
- Medical / Resuscitator Incident (2017 to 2023)

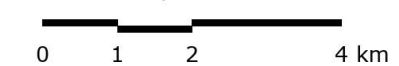
Density of Calls



Base Data

- City Boundary
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Railway
- Airport
- Water Feature
- First Nation Reserve
- International Boundary

SCALE 1:80,000



MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR, CITY OF SAULT STE MARIE,
ACORN INFORMATION SOLUTIONS

MAP CREATED BY: LK, Dillon Consulting Limited
MAP CHECKED BY: SCD, Tayport Limited
MAP PROJECTION: NAD 1983 UTM Zone 16N

PROJECT: 23-6393 STATUS: DRAFT DATE: 2024-06-04



FILE LOCATION: K:\2023\236393\Product\Client\CRA\Response_Profile\response_aprx\response_aprx\Medical_Resuscitator

10.2.2.3 Spatial Distribution and Concentration – Rescue Incidents

Table 40 presents a comprehensive analysis of rescue incidents that SSMFS responded to from 2018 to 2023. The SSMFS experienced 898 calls (shown in **Table 40**) of which 69.3% of the rescue incidents were related to vehicle collisions or vehicle extrication.

Table 40: Rescue Incidents – Analysis (January 1, 2018, to December 31, 2023)

Response Type	Number of Calls	% of Calls
Animal Rescue	37	4.1%
Building Collapse	2	0.2%
Commercial/Industrial Accident	1	0.1%
Confined Space Rescue (non-fire)	0	0.0%
High Angle Rescue (non-fire)	2	0.2%
Home/Residential Accident	6	0.7%
Low Angle Rescue (non-fire)	2	0.2%
Other Rescue	83	9.2%
Persons Trapped in an Elevator	77	8.6%
Rescue False Alarm	9	1.0%
Rescue No Action Required	51	5.7%
Trench Rescue (non-fire)	0	0.0%
Vehicle Collision	559	62.2%
Vehicle Extrication	63	7.0%
Water Ice Rescue	0	0.0%
Water Rescue	6	0.7%

Source: OFM Municipal Emergency Calls by Response Type Classification, Sault Ste. Marie

Figure 39 illustrates the locations where rescue-type incidents occurred and the areas of higher concentrations of rescue incidents during the period from January 1, 2017, to December 31, 2023. Rescue Calls are shown to occur throughout the Urban Settlement Area, consistent with land use.

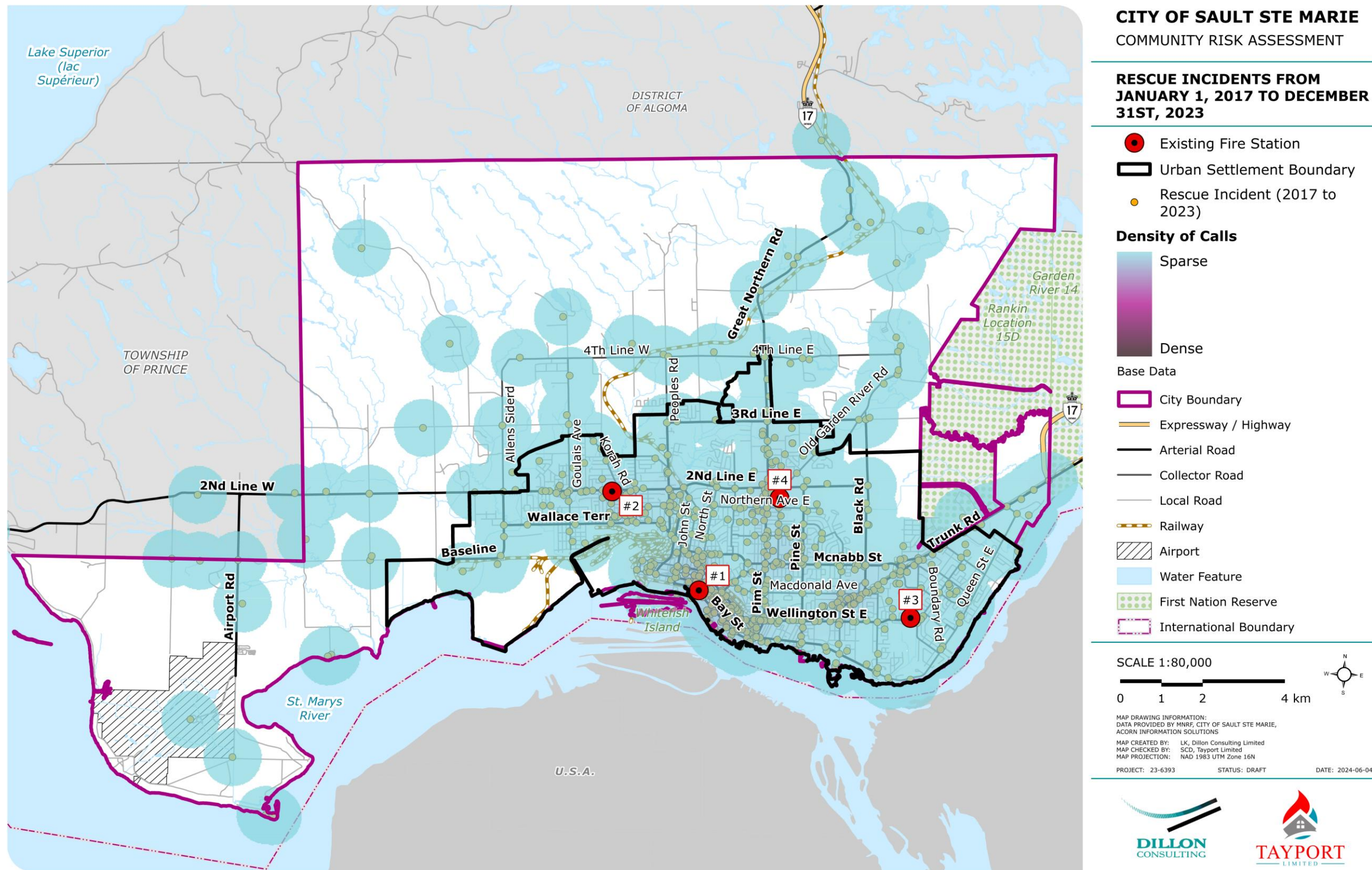
As the most prevalent type of rescue calls are associated with motor vehicles, the majority of the rescue-type incidents the SSMFS responds to are distributed along major arterial roads within the City, and along the major highways. There is also a noticeable prevalence of calls in the downtown of the City of Sault Ste. Marie.

Identified Risk: Vehicle collisions account for 62.2% of rescue calls from 2018 to 2023 within the City of Sault Ste. Marie or 93.2 calls per year on average.

Identified Risk: Of the technical rescue type incidents from 2018 to 2023, vehicle extrication was the most common type of rescue response, accounting for 7.0% of all rescue calls and averaging 10.5 calls per year.

Identified Risk: Of the technical rescue type services, water rescue calls are the second most common type with a total of six calls over the six-year period from 2018 to 2023, or an average of one call annually.

Figure 39: Spatial Distribution and Concentration – Rescue Incidents

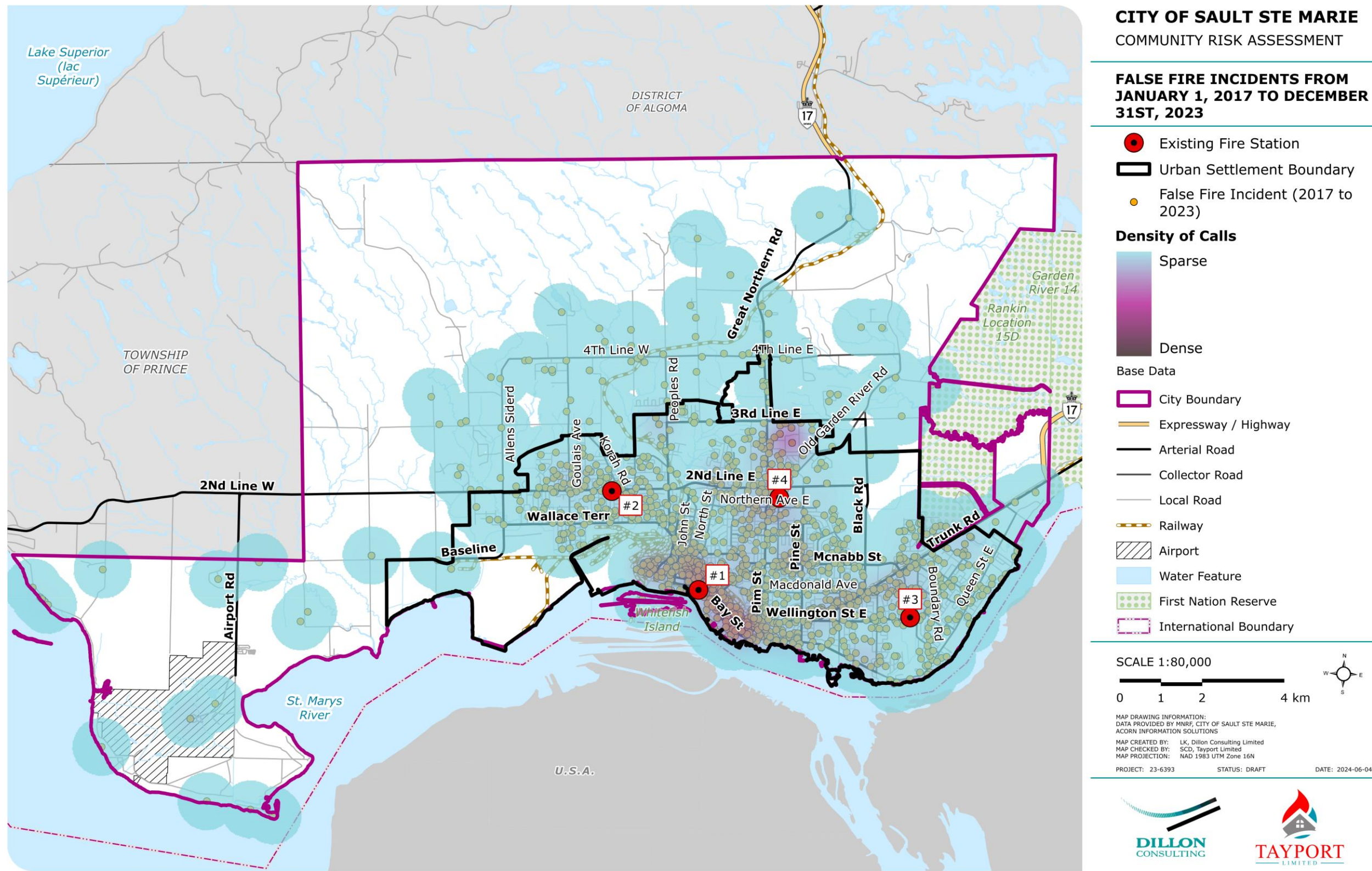


10.2.2.4 Spatial Distribution and Concentration – False Fire Incidents

Figure 40 illustrates the locations where the false fire incidents occurred and the concentration of these types of calls during the period from January 1, 2017, to December 31, 2023. From 2018 to 2023 false fire incidents accounted for 21.1% of SSMFS' total emergency call volume.

This figure illustrates a wide distribution of false fire calls across the residential areas of the Urban Settlement Boundary. The highest concentration of false fire incidents is shown to occur in the downtown area and Steelton (north/west of Fire Station 1). There is also a notable area of higher concentration of false fire calls to the north of Fire Station 4, where the Sault Area Hospital is located, as well as the Algoma Treatment and Remand Centre, seniors' residences, and a nursing home. There are also commercial uses in this area.

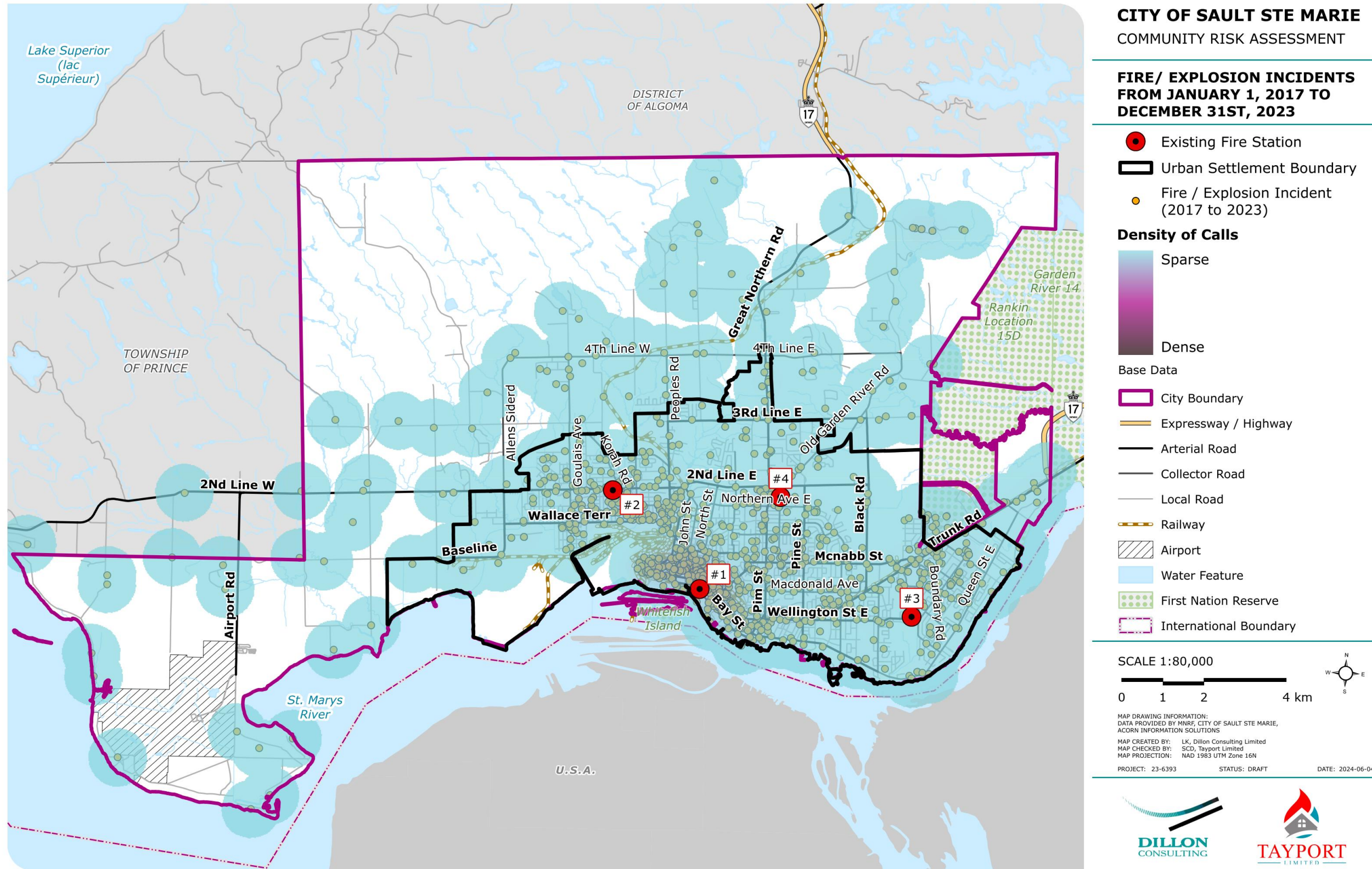
Figure 40: Spatial Distribution and Concentration – False Fire Incidents



10.2.2.5 Spatial Distribution and Concentration – Fire/Explosion Incidents

Figure 41 illustrates the locations where the fire/explosion incidents occurred and the density of calls during the period from January 1, 2017, to December 31, 2023. From 2018 to 2023, property fire/explosion incidents accounted for 8.3% of all SSMFS calls. This figure shows a wide distribution of incidents throughout the City, with a higher concentration of calls within the Urban Settlement Area and the highest concentration in the downtown and Steelton areas, in the vicinity of Fire Station 1.

Figure 41: Spatial Distribution and Concentration – Fire/Explosion Incidents



10.2.3 Emergency Call Volume – Summary

The spatial analysis of the City’s historical emergency calls for the period January 1, 2017, to December 31, 2023, provides insight into the locations where incidents have historically occurred and the areas where a higher volume of each call type has occurred within the City. Overall, the spatial distribution trends show a historically higher call volume in the downtown core and the Steelton area to the north and west of Fire Station 1. There are several areas showing higher concentrations of calls surrounding the existing four fire stations and the areas between those stations.

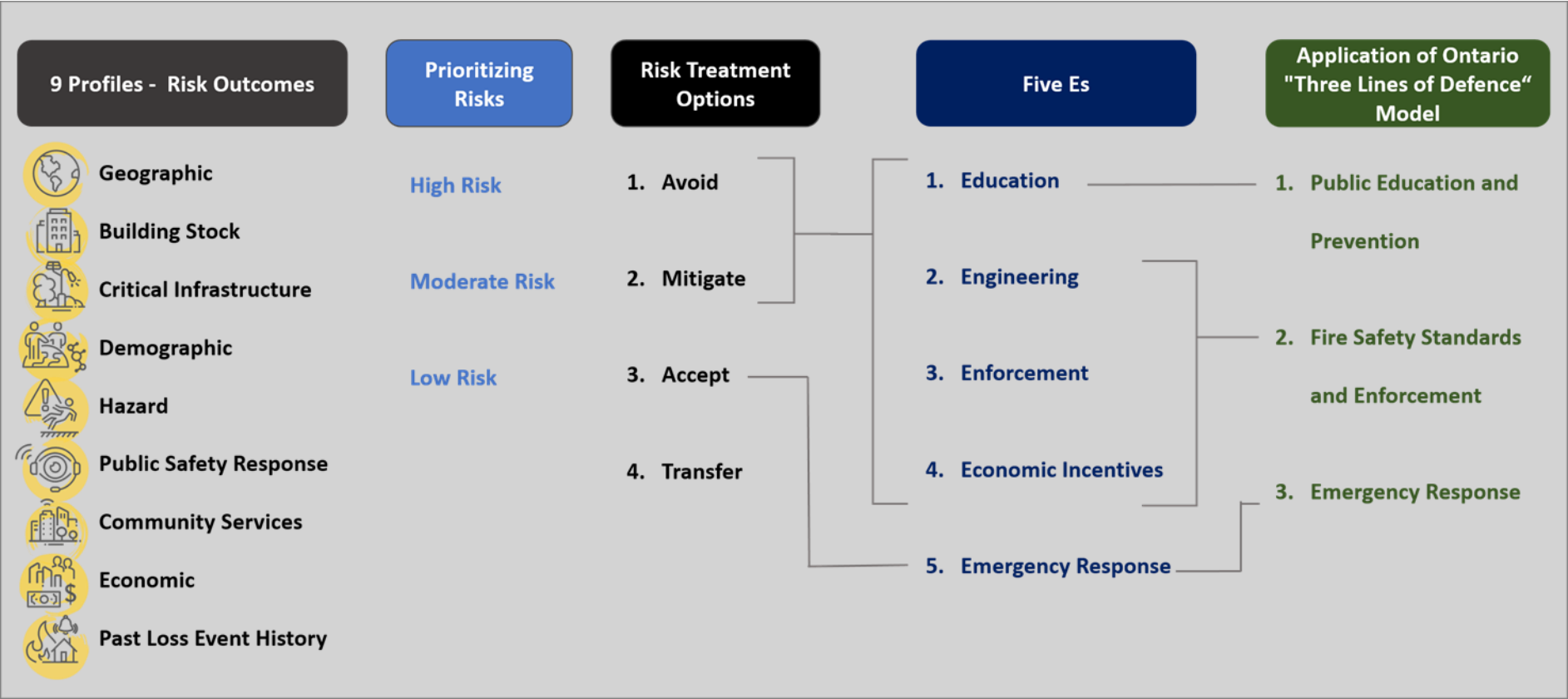
Key Finding: The downtown area and the neighbourhood surrounding Fire Station 1 (Steelton) experiences the highest concentration of all emergency call types within the City. There are several smaller areas of high emergency call concentration in close proximity to the other fire stations across the City.

11.0 Applying Key Findings and Identified Risks

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 for future planning for the delivery of fire protection services. 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 of the key findings and identified risks and frames how they can be used to inform the decisions regarding fire protection services. They are taken through a risk treatment process and aligned with the “Five E’s” of Community Risk Reduction (i.e. Education, Engineering, Enforcement, Economic Incentives and Emergency Response) and three lines of defence (i.e. Public Education and Prevention, Fire Safety Standards and Enforcement and Emergency Response), as shown in **Figure 42**, in order to inform future fire department planning.

Figure 42: Risk Conclusions Application Process



11.1 Prioritizing Risks

NFPA 1300 and OFM TG-02-2019 identify that risks can be prioritized based on probability and consequence. OFM TG-02-2019 further emphasizes that all the risk findings and profiles should be considered together.

Following the probability and consequence levels identified by the OFM as described in the subsections below, the risk assignment process considers probability and consequence of each identified risk. This will result in each risk having a risk level (e.g., low, moderate, or high) assigned. These risk levels can be used to assist the department in the planning of fire protection services for the City of Sault Ste. Marie.

111.1 Risk Assignment Process Overview

The risk assignment methodology used as part of this C.R.A 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
2. Determine a consequence level
3. Establish the risk level (i.e., low, moderate or high) for each based on the identified probability and consequence for each event

The following sections provide additional insight into the assignment process.

111.1.1 Step 1 - Probability Levels

The probability of a fire or emergency occurring can be estimated in part based on historical experience of the community and that of the province as a whole. The likelihood categories, and the values presented, follow OFM TG-02-2019 Community Risk Assessment Guideline. **Table 41** presents the probability levels and the adjusted descriptions.

Table 41: Probability Levels

Likelihood Category*	Numerical Value	Description (Adjusted)
Rare	1	<ul style="list-style-type: none"> may occur in exceptional circumstances no incidents in the past 15 years
Unlikely	10	<ul style="list-style-type: none"> could occur at some time, especially if circumstances change 5 to 15 years since the last incident
Possible	100	<ul style="list-style-type: none"> might occur under current circumstances 1 incident in the past 5 years
Likely	1,000	<ul style="list-style-type: none"> will probably occur at some time under current circumstances multiple or recurring incidents in the past 5 years
Almost Certain	10,000	<ul style="list-style-type: none"> expected to occur in most circumstances unless circumstances change multiple or recurring incidents in the past year

Source: OFM TG-02-2019 Community Risk Assessment Guideline

111.1.2 Step 2 - Consequence Levels

The consequences of an emergency event relate to the potential losses or negative outcomes associated with the incident. There are four components that should be evaluated in terms of assessing consequences. These include:

- Life Safety:** Injuries or loss of life due to occupant and firefighter exposure to life-threatening fire or other emergency situations;
- Property Loss:** Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks and critical infrastructure due to fire;
- Economic Impact:** Monetary losses associated with property income, business closures, downturn in tourism, tax assessment value and employment layoffs due to fire; and,
- Environmental Impact:** Harm to human and non-human (e.g., wildlife, fish and vegetation) species of life and general decline in quality of life within the community due to air/water/soil contamination as a result of fire or fire suppression activities.

Table 42 presents the consequence levels.

Table 42: Consequence Levels

Consequence Category	Numerical Value	Description
Insignificant	1	<ul style="list-style-type: none"> • No life safety issue • Limited value or no property loss • No impact on the local economy and/or • No effect on general living conditions
Minor	10	<ul style="list-style-type: none"> • Potential risk to the life safety of occupants • Minor property loss • Minimal disruption to business activity and/or • Minimal impact on general living conditions
Moderate	100	<ul style="list-style-type: none"> • Threat to the life safety of occupants • Moderate property loss • Poses a threat to small local businesses and/or • Could pose a threat to the quality of the environment
Major	1,000	<ul style="list-style-type: none"> • Potential for large loss of life • Would result in significant property damage • Significant threat to businesses, local economy, and tourism and/or • Impact on the environment would result in a short-term, partial evacuation of local residents and businesses
Catastrophic	10,000	<ul style="list-style-type: none"> • Significant loss of life • Multiple property damages to a significant portion of the municipality • Long-term disruption of businesses, local employment, and tourism and/or • Environmental damage that would result in the long-term evacuation of local residents and businesses

Source: OFM TG-02-2019 Community Risk Assessment Guideline

111.1.3 Step 3 - Risk Level

Once probability and consequence are determined, the level of risk is calculated by multiplying the numerical values for probability and consequence. The relationship between probability and consequence as it pertains to risk levels can be illustrated in a risk matrix. In a risk matrix, probability and consequence are defined on separate scales with varying descriptors providing direction on how to assign the probability and consequence of an event. **Figure 43** shows the risk matrix for this CRA.

Figure 43: Risk Matrix

		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Probability		1	10	100	1,000	10,000
Almost Certain	10,000	Moderate	Moderate	High	High	High
Likely	1,000	Moderate	Moderate	Moderate	High	High
Possible	100	Low	Moderate	Moderate	Moderate	High
Unlikely	10	Low	Low	Moderate	Moderate	Moderate
Rare	1	Low	Low	Low	Moderate	Moderate

111.2 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 43**. Where possible, quantitative data was used to inform the risk assignment as described in the rationale in the table. It is important to recognize that with the availability of new or updated data, the probability levels could change or be refined. It should also be recognized that, as identified in OFM TG-02-2019, “professional judgment based on experience should also be exercised in combination with historical information to estimate probability levels”.⁷⁷ Similarly, OFM TG-02-2019 acknowledges the role of professional judgment and reviews of past occurrences in determining consequence levels. The rationale provided, for both probability and consequence, takes into account information from the nine profiles, as OFM TG-02-2019 supports consideration of the profiles together in order to inform decision-making about the provision of fire protection services in the specific municipality/community.

⁷⁷ Source: OFM TG-02-2019 Community Risk Assessment Guideline, p.12

Table 43: Risk Assignment

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>From 2018 to 2023, motor vehicle-related incidents (collisions and extrications) on the existing road network represent 69.3% of all rescue responses (622 calls) and 4.6% of total calls responded to by the Sault Ste. Marie Fire Services. (Geographic Profile & Past Loss & Event History); and</p> <p>Vehicle collisions account for 62.2% of rescue calls from 2018 to 2023 within the City of Sault Ste. Marie or 93.2 calls per year on average. (Past Loss & Event History); and</p> <p>Of the technical rescue-type incidents from 2018 to 2023, vehicle extrication was the most common type of rescue response, accounting for 7.0% of all rescue calls and averaging 10.5 calls per year. (Past Loss & Event History)</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> SSMFS responded to a total of 622 calls pertaining to motor-vehicle-related incidents from 2018 to 2023 (Event History) Winter weather could contribute to motor vehicle incidents (Hazard) 	<p>Moderate</p>	<ul style="list-style-type: none"> Potential for risk to the life safety of occupants of motor vehicles Potential risk for property loss Could pose a threat to small local businesses Could pose a threat to the quality of the environment Consequence level could be impacted by the magnitude of a hazard event. 	<p>High</p>
<p>The rail lines within the City present a risk of a rail-based transport incident, such as derailment or accident, including the potential of hazardous materials. (Geographic Profile)</p>	<p>Possible</p>	<ul style="list-style-type: none"> A significant rail event might occur under certain circumstances Occurrences within northern communities (e.g. Hearst June 2024) within the last five years 2021 HIRA ranked as “Probably – occurs every 5-19 years” in the City 	<p>Moderate</p>	<ul style="list-style-type: none"> Potential for risk to the life safety of occupants of trains/vehicles Potential risk for property loss Could pose a threat to small local businesses Could pose a threat to the quality of the environment The consequence level could be impacted by the magnitude of a hazard event. 	<p>Moderate</p>

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>Special Consideration: The Sault Ste. Marie Airport presents unique fire-related risks associated with aircraft, supporting infrastructure, and the transportation of potentially dangerous goods, requiring specialized fire protection services. (Geographic Profile)</p>	Possible	<ul style="list-style-type: none"> A significant aviation event might occur at the City’s local airport 2021 HIRA ranked as “Probably – occurs every 5-19 years” in the City 	Moderate	<ul style="list-style-type: none"> Potential for risk to the life safety of occupants of airplanes Potential risk for property loss Could pose a threat to local residents/businesses Could pose a threat to the quality of the environment The consequence level could be impacted by the magnitude of a hazard event. 	Moderate
<p>The presence of waterways within the City of Sault Ste. Marie, including the unique characteristics of the St. Marys River, creates a potential risk for water-based incidents. (Geographic Profile); and</p> <p>Of the technical rescue type services, water rescue calls are the second most common type with a total of six calls over the six-year period from 2018 to 2023, or an average of one call annually (Past Loss and Event History)</p>	Likely	<ul style="list-style-type: none"> Waterways in the SSMFS response area include St. Marys River and Lake Superior shoreline as well as interior lakes, rivers, creeks, etc. within the boundary of the City. Over a six-year period (2018 to 2023), six calls pertained to water rescue (an average of one water-related rescue call per year) (Past Loss and Event History) 	Minor	<ul style="list-style-type: none"> Potential risk to the life safety of individuals needing rescue. 	Moderate
<p>The City has a risk of wildland fire due to potential hazardous forest types and the wildland-urban interface, primarily outside of the Urban Settlement Area. (Geographic Profile)</p>	Unlikely	<ul style="list-style-type: none"> Could occur within the City boundary at some time, especially if circumstances change 	Minor	<ul style="list-style-type: none"> Potential risk to the life safety of occupants in the impacted area Minor property loss Minimal disruption to business activity and/or Minimal impact on general living conditions Isolated environmental impact 	Low

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>Group C - Residential Occupancies represent 95.25% of the City's existing building stock, and over the five-year period from January 1, 2017, to December 31, 2023, Group C occupancies were associated with 76.8% of the structure fires within the City. (Building Stock)</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> The majority (95.25%) of property stock is Group C – Residential (Building Stock) 370 fires (76.8% of all structure fires) over the seven-year period (2017 to 2023) occurred in Group C – Residential (Past Loss and Event History) 	<p>Moderate</p>	<ul style="list-style-type: none"> Could pose a threat to the life safety of occupants Could result in moderate property loss Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment Potential for vulnerable individuals, including seniors and youth, within Group C – Residential (Demographic) Most reported fire-related civilian injuries (62) and all fire-related fatalities (9) from 2017 to 2023 occurred in Group C – Residential Occupancies (Past Loss) Of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present and operating (Past Loss) Potential for exposure risk depending on dwelling type and building age (Building Stock) Potential presence and maintenance of fire protection equipment would influence the consequence level (Building Stock) The City currently has 51 buildings defined by the OBC as high-rise buildings with a floor level 18 metres (59 feet) above grade, or six storeys. (Building Stock) 	<p>High</p>
<p>Between April 2020 and September 2024, the SSMFS identified 34 fire incidents that occurred in vacant properties within the City.</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> 34 fire incidents in vacant buildings within the City from April 2020 to September 2024 	<p>Moderate</p>	<ul style="list-style-type: none"> Could pose a threat to the life safety of occupants in surrounding buildings with exposures 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 exposure risk depending on dwelling type and building age (Building Stock) 	<p>High</p>

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>An analysis of the City's parcel data indicates that 69.4% of the City's total building stock was built prior to the introduction of the 1981 Ontario Fire Code. Census data from 2021 indicates that 73.4% of occupied private dwellings were constructed prior to the Ontario Fire Code. (Building Stock)</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> The majority (95.25%) of property stock is Group C – Residential (Building Stock) 370 fires (76.8% of all structure fires) over the seven-year period (2017 to 2023) occurred in Group C – Residential (Past Loss and Event History) 	<p>Moderate</p>	<ul style="list-style-type: none"> Could pose a threat to the life safety of occupants Could result in moderate property loss Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment Potential for vulnerable individuals, including seniors and youth, within Group C – Residential (Demographic) Most reported fire-related civilian injuries (62) and all fire-related fatalities (9) from 2017 to 2023 occurred in Group C – Residential Occupancies (Past Loss) Of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present and operating (Past Loss) Potential for exposure risk depending on dwelling type and building age (Building Stock) Potential presence and maintenance of fire protection equipment would influence the consequence level (Building Stock) The City currently has 51 buildings defined by the OBC as high-rise buildings with a floor level 18 metres (59 feet) above grade, or six storeys. (Building Stock) 	<p>High</p>

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>Data provided by the City identified 51 buildings defined by the OBC as high-rise buildings with a floor level 18 metres (59 feet) above grade, or six storeys or more. These buildings are mostly clustered in the downtown area of the City, with a few distributed throughout the urban settlement area. (Building Stock)</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> • 51 buildings defined by the OBC as high-rise buildings within the City • The majority (95.25%) of property stock is Group C – Residential (Building Stock) • 370 fires (76.8% of all structure fires) over the seven-year period (2017 to 2023) occurred in Group C – Residential (Past Loss and Event History) 	<p>Moderate</p>	<ul style="list-style-type: none"> • Could pose a threat to the life safety of occupants • Could result in moderate property loss • Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment • Potential for vulnerable individuals, including seniors and youth, within Group C – Residential (Demographic) • Most reported fire-related civilian injuries (62) and all fire-related fatalities (9) from 2017 to 2023 occurred in Group C – Residential Occupancies (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present and operating (Past Loss) • Potential for exposure risk depending on dwelling type and building age (Building Stock) • Potential presence and maintenance of fire protection equipment would influence the consequence level (Building Stock) 	<p>High</p>
<p>94.9% of the buildings have a footprint of 2,500 sq. ft. or less, which is consistent with the proportion of the property stock that is Group C – Residential occupancies.</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> • The majority (95.25%) of property stock is Group C – Residential (Building Stock) • 370 fires (76.8% of all structure fires) over the seven-year period (2017 to 2023) occurred in Group C – Residential (Past Loss and Event History) 	<p>Moderate</p>	<ul style="list-style-type: none"> • Could pose a threat to the life safety of occupants • Could result in moderate property loss • Could pose a threat to small local businesses, and/or pose a threat to the quality of the environment • Potential for vulnerable individuals, including seniors and youth, within Group C – Residential (Demographic) • Most reported fire-related civilian injuries (62) and all fire-related fatalities (9) from 2017 to 2023 occurred in Group C – Residential Occupancies (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present and operating (Past Loss) 	<p>High</p>

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>The City has 65 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). A large cluster of large buildings is located in the City's industrial area, west of downtown. Other large buildings exist in the downtown area, as well as in commercial and industrial areas along Arterial Roads. (Building Stock)</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> Group D – Business, Group E - Mercantile, Group F – Industrial and Farm/Not Classified Occupancies represent 3.8% of the City's existing property stock (Building Stock) Over the seven-year period (2017 to 2023), Group D, E, F and Farm/Not Classified were associated with 90 (18.4%) of the structure fires within the City (Past Loss) 	<p>Major</p>	<ul style="list-style-type: none"> Due to the potential for these buildings to contain large volumes of combustible materials, as well as horizontal travel distances for fire suppression activities, an incident occurring could result in a large loss of life Could result in significant property damage Could result in a significant threat to large businesses, the local economy and tourism, and/or impact on the environment Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinklers, etc. (Building Stock) Some of the identified occupancies may play a role in the economic well-being of the City (Economic) Potential for presence and maintenance of fire protection equipment, for example, fire alarm system, sprinklers, etc. (Building Stock) 	<p>High</p>

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
<p>The City of Sault Ste. Marie currently has 40 registered vulnerable occupancies. (Building Stock)</p>	<p>Possible</p>	<ul style="list-style-type: none"> • These vulnerable occupancies may fall into different occupancy types, such as Group B – Care or Detention, or Group C – Residential (Building Stock) • Group B – Care or Detention occupancies represent 0.13%, and Group C – Residential occupancies represent 95.25% of the City’s existing property stock (Building Stock) • 11 (2.3% of all structure fires) over the seven-year period (2017 to 2023) occurred in Group B occupancies, and 370 (76.8%) of all structure fires over the seven-year period (2017 to 2023) occurred in Group C – Residential (Past Loss and Event History) • Ontario Regulation 150/13 requires fire departments to perform annual inspections and approve and witness fire drill scenarios, which may influence the probability of a fire occurring in a vulnerable occupancy (Building Stock) 	<p>Catastrophic</p>	<ul style="list-style-type: none"> • Ontario Regulation 150/13 requires fire departments to perform annual inspections and approve and witness fire drill scenarios (Building Stock) • Presence and maintenance of fire protection equipment, for example, fire alarm system, sprinklers, etc. (Building Stock) • Most reported fire-related civilian injuries (62) and all fire-related fatalities (9) from 2017 to 2023 occurred in Group C – Residential Occupancies. One injury occurred in Group B. (Past Loss) • Potential for vulnerable individuals, including those who receive special care or treatment within a Group B occupancy (Building Stock) / potential for vulnerable individuals, including seniors and youth, within Group C – Residential (Demographic) • Potential for significant loss of life • Could result in moderate to significant property loss • Long-term disruption of business/jobs • Potential environmental damage 	<p>High</p>
<p>Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on the residential fire death rate. According to the 2021 Census, seniors represent 24.9% of the City’s total population, significantly higher than the Province as a whole at 18.5%.</p>	<p>Almost Certain</p>	<ul style="list-style-type: none"> • Seniors represent one of the most vulnerable demographics and are 18.5% of the City’s population (Demographic) • The majority (95.25%) of property stock is Group C – Residential (Building Stock) • 370 fires (76.8% of all structure fires) over the seven-year period (2017 to 2023) occurred in Group C – Residential (Past Loss and Event History) 	<p>Moderate</p>	<ul style="list-style-type: none"> • Could pose a threat to the life safety of occupants • Could result in moderate property loss • Most reported fire-related civilian injuries (62) and all fire-related fatalities (9) from 2017 to 2023 occurred in Group C – Residential Occupancies. (Past Loss) • Of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present and operating (Past Loss) • Potential for exposure risk depending on dwelling type and building age (Building Stock) • Potential presence and maintenance of fire protection equipment would influence the consequence level (Building Stock) 	<p>High</p>

11.2 Risk Treatment Options

NFPA 1300 - Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition) 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. Further details on these options can be found in **Table 44**. There are four risk treatment options:

1. Avoid
2. Mitigate
3. Accept
4. Transfer

Table 44: Risk Treatment Options

Treatment Option	NFPA 1300 Description	OFM TG-02-2019 Description
Avoid	Eliminate the hazard.	Implementing programs and initiatives to prevent a fire or emergency from happening.
Mitigate	Reduce the probability or impact (consequence) of the risk.	Implementing programs and initiatives to reduce the probability and/or consequence of a fire or emergency.
Accept	Take no action.	No specific programs or initiatives will be implemented. Accept the risk and respond if it occurs.
Transfer	Transfer the risk to another party.	Transfer the impact and/or management of the risk to another organization or body.

Most of these options, if chosen by a fire department, will require some action or consideration as they pertain to fire protection services. As part of the application of the risk conclusions, a risk treatment option will be identified for each outcome, followed by the application of the Five Es as described in the next section.

112.1 The 'Five Es' of Community Risk Reduction

NFPA 1300 - Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition) defines a Community Risk Reduction Plan as a “document that outlines the goals, objectives, programs, and resources used to reduce the risks identified by the community risk assessment”.⁷⁸ Establishing service levels regarding programs and resources in alignment with a CRA is required of Ontario municipalities as part of **O. Reg. 378/18**. Following the completion of the CRA, the next step for Sault Ste. Marie Fire Services will be to prepare a community risk reduction plan, or strategic fire services planning document, such as a fire master plan, which would incorporate strategies to address the risks and findings identified within this CRA.

To support the application of the CRA outputs, each risk conclusion ('key finding' or 'identified risk') will be reviewed through the lens of the “Five Es”. The Five Es is a framework outlined in NFPA 1300 - Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition), and the Institution of Fire Engineers' Vision 20/20 National Strategy for Fire Loss Prevention. The Five Es are summarized in **Table 45**. They include:

1. increasing awareness (Education)
2. changes to the physical environment (Engineering)
3. influencing change through economic incentives (Economic Incentives)
4. enforcing legislation through inspection programs (Enforcement)
5. mitigating injury, illness and saving lives (Emergency Response)

⁷⁸ NFPA 1300, 3.3.6.

Table 45: Overview of the NFPA 1300 - Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition) Five “E’s”

Five E’s	Description
Education	Education influences audiences to refrain from risky or unhealthy behaviour or take positive action to reduce risk.
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.
Emergency Response	Effective emergency responses can mitigate the effects of unintentional injuries and save lives.

Source: Community Risk Reduction: Doing More with More, The NFPA Urban Fire and Life Safety Task Force, June 2016.

It is important to note that NFPA 1300 - Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2020 Edition) discusses the application of the Five Es to develop specific goals and objectives to reduce risk. It also acknowledges that some strategies may require policy advocacy or legislative work. These are important considerations for a department, but are beyond the purview of typical fire services planning. The first steps for the City and Sault Ste. Marie Fire Services will be to focus on ways to reduce risk from the perspective of the typical suppression and public education/prevention operations of the department. This includes a focus on a proactive reduction of risk through education, prevention, and enforcement, with fire suppression as the fail-safe.

112.2 Risk Conclusions, Treatment Options, and the Five Es

When it comes to aligning service levels with risks that define local needs and circumstances, it is important to recognize that not all risk conclusions align with the services provided by a fire department in the same way. For this reason, the risk conclusions are categorized based on the identified treatment options and how they can be used to inform the activities, strategies, and services provided by the department through the lens of the Five Es. This categorization will then be used to inform the department’s future planning processes, as shown in **Table 46**.

Table 46: Risk Analysis Conclusions – 5 E’s Categorization

Five E’s	Description	Purpose
Education	Education influences audiences to refrain from risky or unhealthy behaviour or take positive action to reduce risk.	For consideration within the proposed Public Education Program
Enforcement	Enforcement reduces risks through enforcing legislation through inspections and fines for noncompliance.	For consideration within the proposed Inspection/Enforcement Program
Engineering	Engineering includes incorporating new products and technology to modify the environment to prevent or mitigate injuries and deaths.	For consideration within the proposed Fire Inspection and Enforcement Program
Economic Incentives	Economic incentives are typically offered to encourage better choices and changes in behaviour.	For consideration within the proposed Inspection/Enforcement Program
Emergency Response	Effective emergency responses can mitigate the effects of unintentional injuries and save lives.	For consideration within the proposed Emergency Response Deployment Options

Table 47 presents the identified risks in a matrix format to indicate the ways in which the risks can be addressed by SSMFS through future fire services planning studies. The same process is applied to the key findings in **Table 48**.

The department should use the findings of the risk assessment to review the fire protection services provided by the department to help ensure compliance with **O. Reg. 378/18** (e.g., training, by-laws, fleet, equipment, all department policies and guidelines, etc.).

Table 47: Treatment Options and Five E’s Categorization – Identified Risks

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic (Past Loss & Event History)	From 2018 to 2023, motor vehicle-related incidents (collisions and extrications) on the existing road network represent 69.3% of all rescue responses (622 calls) and 4.6% of total calls responded to by the Sault Ste. Marie Fire Services.	High	Accept Transfer	No	No	No	No	Yes
Geographic	The rail lines within the City present a risk of a rail-based transport incident, such as a derailment or accident, including the potential of hazardous materials.	Moderate	Accept Transfer	No	No	No	No	Yes
Geographic	Special Consideration: The Sault Ste. Marie Airport presents unique fire-related risks associated with aircraft, supporting infrastructure, and the transportation of potentially dangerous goods, requiring specialized fire protection services.	Moderate	Accept Transfer	No	No	No	No	Yes
Geographic	The presence of waterways within the City of Sault Ste. Marie, including the unique characteristics of the St. Marys River, creates a potential risk for water-based incidents.	Moderate	Accept Mitigate Transfer	Yes	No	No	No	Yes
Geographic	The City has a risk of wildland fire due to potential hazardous forest types and the wildland-urban interface primarily outside of the Urban Settlement Area.	Low	Accept Mitigate Transfer	Yes	No	No	No	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Building Stock	Group C - Residential Occupancies represent 95.25% of the City's existing building stock, and over the five-year period from January 1, 2017, to December 31, 2023, Group C occupancies were associated with 76.8% of the structure fires within the City.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	Between April 2020 and September 2024, the SSMFS identified 34 fire incidents that occurred in vacant properties within the City.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	An analysis of the City's parcel data indicates that 69.4% of the City's total building stock was built prior to the introduction of the 1981 Ontario Fire Code. Census data from 2021 indicates that 73.4% of occupied private dwellings were constructed prior to the Ontario Fire Code.	High	Mitigate Accept	Yes	Yes	No	No	Yes
Building Stock	Data provided by the City identified 51 buildings defined by the OBC as high-rise buildings with a floor level 18 metres (59 feet) above grade, or six storeys or more. These buildings are mostly clustered in the downtown of the City, with a few distributed throughout the urban settlement area.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	94.9% of the buildings have a footprint of 2,500 sq. ft. or less, which is consistent with the proportion of the property stock that is Group C – Residential occupancies.	Moderate	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Building Stock	The City has 65 buildings with a total building area (footprint) that exceed 50,000 square feet (4,655 square metres). A significant cluster of large area buildings are located in the City’s industrial area west of downtown. Other large buildings exist in the downtown, and in commercial and industrial areas along Arterial Roads.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City of Sault Ste. Marie currently has 40 registered vulnerable occupancies.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Demographic	Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the Province based on the residential fire death rate. According to the 2021 Census, seniors represent 24.9% of the City’s total population, significantly higher than the Province as a whole at 18.5%.	High	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Vehicle collisions account for 62.2% of rescue calls from 2018 to 2023 within the City of Sault Ste. Marie or 93.2 calls per year on average.	High	Accept Transfer	No	No	No	No	Yes
Past Loss and Event History	Of the technical rescue-type incidents from 2018 to 2023, vehicle extrication was the most common type of rescue response, accounting for 7.0% of all rescue calls and averaging 10.5 calls per year.	High	Accept Transfer	No	No	No	No	Yes
Past Loss and Event History	Of the technical rescue type services, water rescue calls are the second most common type with a total of six calls over the six-year period from 2018 to 2023, or average of one call annually.	Moderate	Mitigate Accept Transfer	Yes	No	No	No	Yes

Table 48: Treatment Options and Five E’s Categorization – Key Findings

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	The large geographic size of the City, divided into urban settlement areas and rural areas, results in extended emergency response times to some areas.	Accept	Yes	Yes	Yes	Yes	Yes
Geographic	Bridges, with restrictions or closures, have the potential to reduce the connectivity of the City’s road network resulting in the potential for delays in emergency response times.	Accept	No	No	No	No	Yes
Geographic	Grade level rail crossings could create a physical barrier to the connectivity of the City’s road network that can potentially result in delays in emergency response times.	Accept	No	No	No	No	Yes
Geographic	From 2017 to 2023, SSMFS responses to the airport are primarily for calls categorized as False Alarm Calls.	Accept Mitigate	Yes	Yes	Yes	Yes	Yes
Geographic	The presence of two marinas and a boating club along the City’s shoreline presents unique and complex fire safety risks due to fuel load, boats stored in close proximity to one another, and the potential for occupants to sleep on boats.	Accept Mitigate Transfer	Yes	No	No	No	Yes
Geographic	The use of the City as a Port of Call for cruise ships travelling within the Great Lakes presents unique and complex fire safety risks when cruise ships are docked at the City’s shoreline.	Accept Mitigate Transfer	Yes	No	No	No	Yes
Geographic	Recreational activities within the City’s conservation areas, such as hiking and snowmobiling, have the potential to generate calls for emergency services, such as rescue calls.	Accept Mitigate Transfer	No	No	No	No	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Geographic	Recreational trails, including multi-use non-motorized trails and motorized trails within the City and surrounding area, have the potential to generate calls for emergency services, such as rescue calls.	Accept Mitigate Transfer	No	No	No	No	Yes
Building Stock	Based on the property stock mapping Group F – Industrial Occupancies are typically located west of Great Northern Road north of Second Line West, and along the waterfront west of Downtown.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	Based on the property stock mapping Group C – Residential uses are distributed across the City including outside of the Urban Settlement Area.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City includes areas of building stock that have higher density and, as such, greater potential for exposure in the event of a fire. Statistics Canada 2021 census data indicates that 28.2% of the City’s building stock is comprised of attached dwellings (e.g. semi-detached, row housing, low-rise apartment buildings, etc.).	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	Potential building exposures are largely linked to the built-up areas primarily found Downtown and throughout residential areas within the Urban Settlement Area boundary.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	Within the Urban Settlement Area Boundary, there is a high concentration of buildings built prior to any provincial fire or building codes being in effect.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	There are properties within the City that may have an increased potential for high fire risk due to fuel load conditions, primarily linked to the identified Industrial land uses.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Building Stock	In addition to registered vulnerable occupancies, the City has 37 schools, 12 EarlyON centres, and 26 licensed daycare centres, representing higher fire life-safety risks due to the number of children attending these facilities.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	The City has two detention centres, as well as a live-in treatment facility, which house vulnerable individuals that may be at increased risk in the event of a fire.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Building Stock	There are a number of identified heritage buildings within Sault Ste. Marie, primarily located in the downtown area, the majority of which were constructed prior to the introduction of the Ontario Building Code or the Ontario Fire Code.	Mitigate Accept	Yes	Yes	Yes	No	Yes
Demographic	The 2021 Census data indicates that children, aged 14 and under, represent 14.2% of the City's total population, slightly less than the Provincial population at 15.8%.	Mitigate Accept	Yes	Yes	No	No	Yes
Demographic	Of the City's total population, 15.9% fall into the age range of 55 to 64, representing a cohort aging towards the seniors' demographic of 65 years or older.	Mitigate Accept	Yes	Yes	No	No	Yes
Demographic	Based on socioeconomic factors, such as a lower participation rate in the labour force, lower levels of educational attainment and lower median incomes than the Province there is a potential increased fire risk within the City of Sault Ste. Marie in comparison to the overall province.	Mitigate Accept	Yes	Yes	No	Yes	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Demographic	Spatial analysis of the bottom income decile shows the Downtown area (and the area surrounding Fire Station 1), at the southwest end of Wellington Street East, and in some smaller areas west of Pine Street at McNabb Street and at Northern Avenue East may be at increased risk of fire incidents and fire losses as a result of lower incomes.	Mitigate Accept	Yes	Yes	No	Yes	Yes
Hazard	The City's 2021 Hazard Identification and Risk Assessment identifies hazards that could each impact the ability of the City to deliver fire protection services.	Mitigate Accept	Yes	Yes	Yes	No	Yes
Economic	The City's major employers contribute to the economic vitality of the community. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the City.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the seven-year period from January 1, 2017, to December 31, 2023, the City experienced a total of 482 structure fires, averaging 68.9 per year.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the seven-year period from January 1, 2017, to December 31, 2023, structure fires occurring in Group C – Residential Occupancies account for 76.8% of total structure fires within the City (higher than the Province at 75.2%) and 53.3% of total structure fire loss (lower than the Province at 70.4%).	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the seven-year period from January 1, 2017, to December 31, 2023, structure fires occurring in Group F – Industrial Occupancies account for 5.8% of total structure fires within the City and 32.0% of total structure fire loss.	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	From 2017 to 2023 most reported fire-related civilian injuries (62) and all fire-related fatalities (9) in the City of Sault Ste. Marie occurred in Group C – Residential Occupancies.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	Of the fires occurring in the City over the seven-year period from January 1, 2017, to December 31, 2023, the leading cause of unintentionally set fires was due to misuse of ignition source at 29.7% (143 fires), compared to 27.7% in the Province.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring in the City over the seven-year period from January 1, 2017, to December 31, 2023, the second most frequent cause of unintentionally set fires was due to mechanical/electrical failure at 9.4% (45 fires), compared to 15.0% across the Province.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring in the City over the seven-year period from January 1, 2017, to December 31, 2023, undetermined/unknown causes accounted for 22.5% of fires (108), compared to 20.8% across the Province.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring within the City over the seven-year period from January 1, 2017, to December 31, 2023, 29.3% of fires had an undetermined reported ignition source, which is 2.7% higher than the Province (26.6).	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring within the City over the seven-year period from January 1, 2017, to December 31, 2023, 20.7% of fires had a reported ignition source that was classified as Cooking Equipment, which is 5.1% higher than the Province (15.7%).	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Of the fires occurring within the City over the seven-year period from January 1, 2017, to December 31, 2023, 13.3% of fires had a reported ignition source of open flame/tools/smokers' articles, which is 0.5% lower than the Province (13.8%).	Mitigate	Yes	Yes	Yes	Yes	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	Over the seven-year period from January 1, 2017, to December 31, 2023, of the fire loss incidents in Group C – Residential occupancies, 21.1% of incidents did not have a smoke alarm present (compared to 17.3% in the Province).	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	Over the seven-year period from January 1, 2017, to December 31, 2023, of the fire loss incidents in Group C – Residential occupancies, 34.2% of incidents had a smoke alarm present and operating compared to 44.7% in the Province.	Mitigate	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	During the period from January 1, 2012, to December 31, 2019, the total annual volume of emergency calls for services to the Sault Ste. Marie Fire Services increased by 10.1% and averaged 2,642 calls. The annual call volumes decreased in 2020 to 2021 as a result of the COVID 19 pandemic. The average annual calls for service between 2012 to 2023 was 2,441 calls.	Mitigate Accept	Yes	Yes	Yes	No	Yes
Past Loss and Event History	For the period from January 1, 2018, to December 31, 2023, the highest percentage of emergency call volume responded to by Sault Ste. Marie Fire Services as defined by the OFM response types was false fire calls representing 21.7% of the total emergency call volume.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes
Past Loss and Event History	For the period from January 1, 2018, to December 31, 2023, the second highest percentage of emergency call volume responded to by Sault Ste. Marie Fire Services as defined by the OFM response types was medical/resuscitator calls representing 20.8% of the total emergency call volume.	Accept Transfer	No	No	No	No	Yes

Profile	Key Finding	Risk Treatment Option: Avoid Mitigate Accept Transfer	Education For consideration within the proposed Public Education Program	Enforcement For consideration within the proposed Inspection and Enforcement Program	Engineering For consideration within the proposed Inspection and Enforcement Program	Economic Incentive For consideration within the proposed Inspection and Enforcement Program	Emergency Response For consideration within the proposed Emergency Response Program
Past Loss and Event History	The downtown area and the neighbourhood surrounding Fire Station 1 (Steelton) experiences the highest concentration of all emergency call types within the City. There are several smaller areas of high emergency call concentration in close proximity to the other fire stations across the City.	Mitigate Accept	Yes	Yes	Yes	Yes	Yes