Town of Tillsonburg
2023 COMMUNITY RISK ASSESSMENT

July 2023

Presented to:

Presented by:

Behr Integrated Solutions Inc.
Unit 4, 545 Trillium Drive
Kitchener ON N2R 1J4

www.behrintegrated.com

ACRONYMS

CBRNE	Chemical, Biological, Radiological, Nuclear and Explosives
CCG	County Control Group
CO	Carbon Monoxide
CPR	Cardiopulmonary Resuscitation
CRA	Community Risk Assessment
EMCPA	Emergency Management and Civil Protection Act
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
FD	Fire Department
FPPA	Fire Protection and Prevention Act
FSMP	Fire Services Master Plan
HAZMAT	Hazardous Materials
HIRA	Hazard Identification and Risk Assessment
MPAC	Municipal Property Assessment Corporation
MVC	Motor Vehicle Collision
NBC	National Building Code
NFPA	National Fire Protection Association
NGO	Non-governmental Organizations
OBC	Ontario Building Code
OFC	Ontario Fire Code
OFM	Office of the Fire Marshal
PFSG	Public Fire Safety Guideline
PPE	Personal Protective Equipment
SPCA	Society for the Prevention of Cruelty to Animals
TFRS	Tillsonburg Fire and Rescue Services

TABLE OF CONTENTS

SECTION 1
INTRODUCTION

This Community Risk Assessment (CRA) has been developed for the Town of Tillsonburg to comply with Ontario Regulation 378/18: Community Risk Assessments (O. Reg. 378/18). O. Reg. 378/18 was made under the authority of the Fire Protection and Prevention Act, 1997 (FPPA) and came into effect on July 1, 2019. It requires all municipalities in Ontario to develop a CRA prior to July 1st, 2024. This regulation also requires municipalities to 'use its community risk assessment to inform decisions about the provisions of fire protection services[1].'

At this time, this CRA will inform the Town of Tillsonburg Fire Services Master Plan (FSMP) being developed as a companion document. This CRA is formatted to become a stand-alone document in the future to assist the town in sustaining compliance with O. Reg. 378/18, which includes conducting a review of the CRA when necessary and annually.

In addition to this CRA, Part II of FPPA requires that municipalities shall

2 (1)

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

Responsibilities of Council:

5 (0.1) The council of a municipality may establish, maintain and operate a fire department for all or any part of the municipality. 2001, c. 25, s. 475 (2).

Responsibilities of Fire Department:

(1) A fire department shall provide fire suppression services and may provide other fire protection services in a municipality, group of municipalities or in territory without municipal organization. 1997, c. 4, s. 5(1)

The FPPA also assigns duties to the Office of the Fire Marshal (OFM) to 'advise municipalities in the interpretation and enforcement of this Act and the regulations[2].' The OFM has developed Technical Guideline-02-2019 (T.G.-02-2019) to assist municipalities and fire services in the process of developing a CRA and utilizing the completed CRA to inform the municipality's decisions regarding compliance with the FPPA (for additional standards see Section 1.1).

At a minimum, the regulation outlines a standard set of information profiles that must be considered when conducting a community risk assessment. The guideline provides suggestions on how to record and analyze the data/information and offers sample worksheets to assist municipalities. A leading practice in Ontario would see the Town of Tillsonburg's CRA report

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

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

maintained as a living document by the Tillsonburg Fire and Rescue Services (TFRS). This would include regular (e.g., annual) review and updates to the CRA's data and information.

The methodology and analysis utilized to develop this CRA have been directly informed by T.G.-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.

The primary purpose of this CRA is twofold:

1. To develop a CRA for the Town of Tillsonburg to identify the fire-related risks within the community and comply with O. Reg. 378/18.
2. To utilize the risk conclusions of the CRA to inform comprehensive analyses of the existing and future fire protection needs of the Town of Tillsonburg through the development of a Fire Services Master Plan (FSMP).

1.1 Methodology

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

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

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

- Geographic Profile
- Building Stock Profile
- Critical Infrastructure Profile
- Demographic Profile
- Public Safety and Response Profile
- Community Services Profile
- Hazard Profile
- Economic Profile
- Past Loss and Event History Profile

Within each of the nine profiles, there are a number of sub-topics examined. These sub-topics are illustrated in Figure 1. These profiles are based on an analysis of several sources of information, including data provided by the Town of Tillsonburg, TFRS, Statistics Canada, the OFM, and desktop research.

The mandatory profile analyses result in a series of risk related conclusions that will be used to inform service levels or other strategies in alignment with the three lines of defense through a risk treatment process. These are referred to as a 'Key Finding' or an 'Identified Risk.' Those findings referred to as an 'identified risk' are taken through a risk assignment process to assist with risk prioritization as referred to within T.G.-02- 2019. In specific circumstances, being those that involve additional jurisdictional or legislative considerations, a risk-related conclusion is referred to as a 'key Finding.' All risk-related conclusions will be taken through the risk treatment process and aligned with the three lines of defense in order to inform decision making. Figure 2 illustrates the risk treatment process.

Figure 1: Community Risk Profiles and Sub-topics

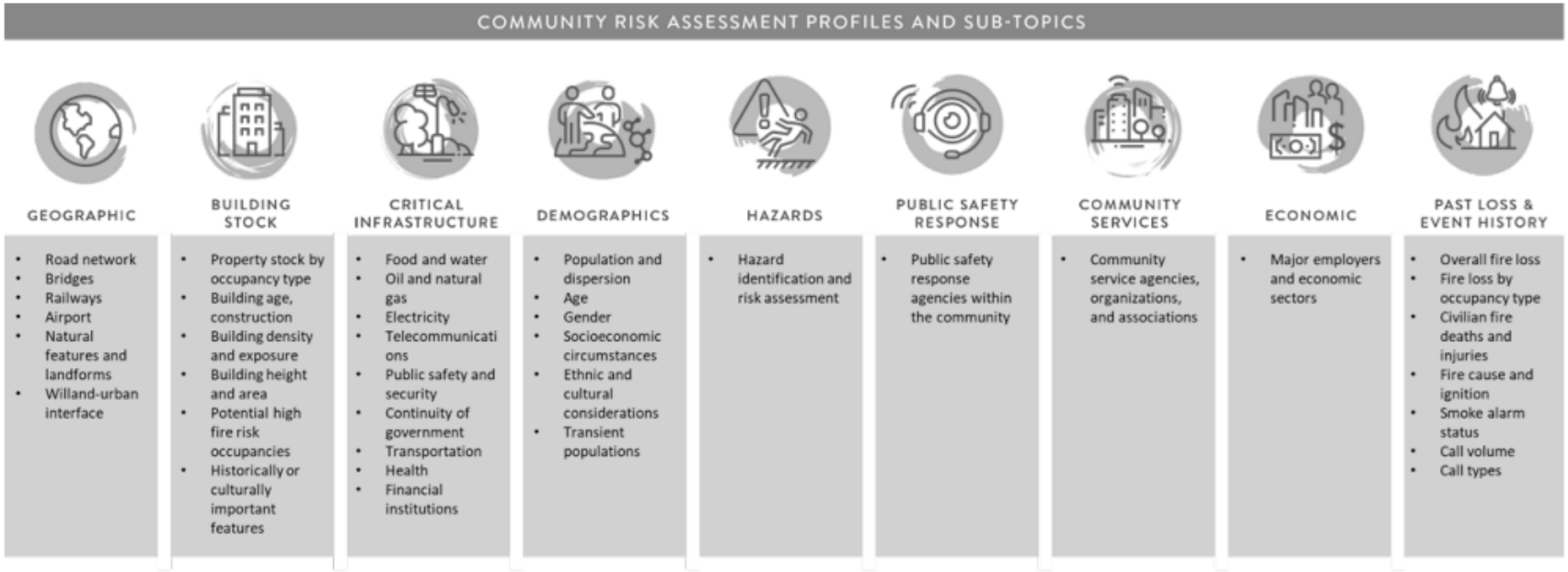
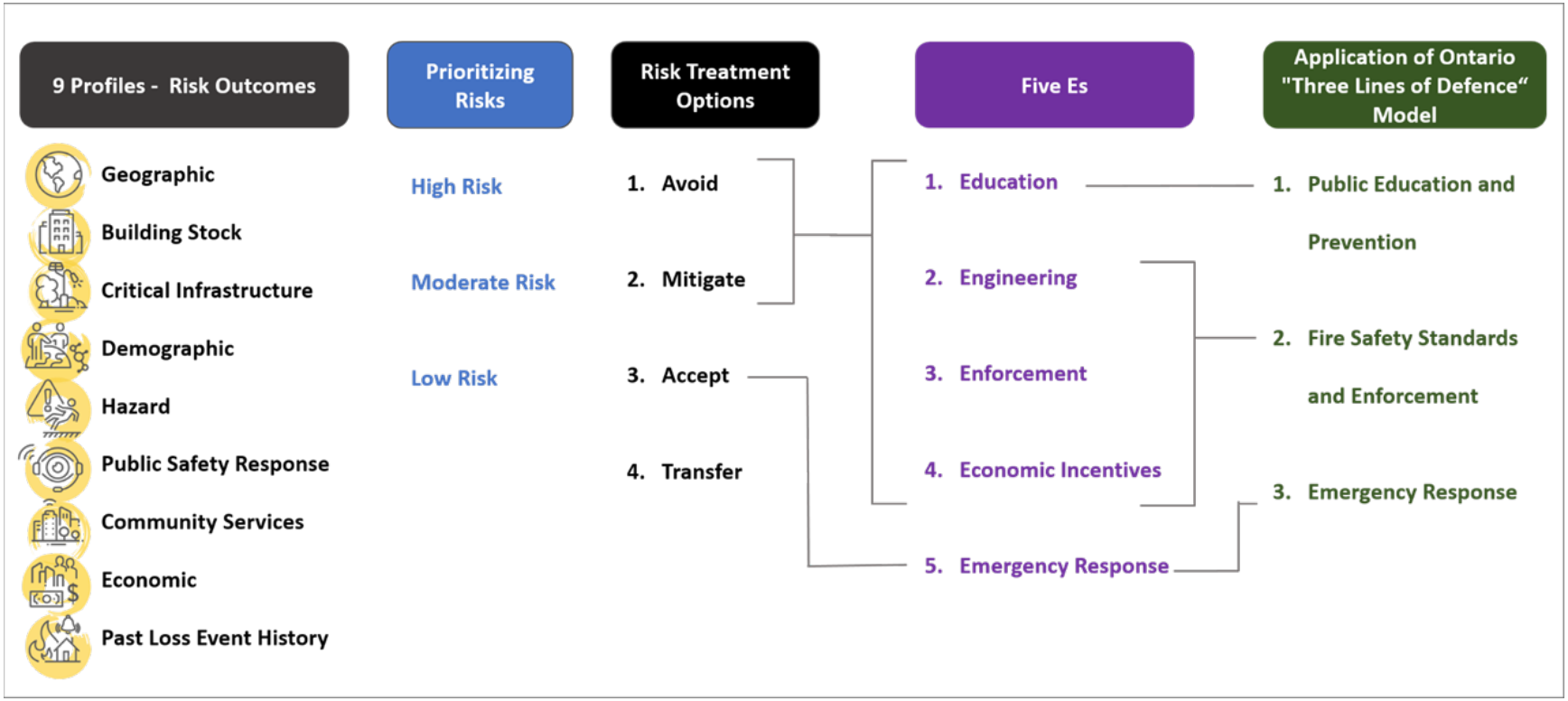


Figure 2: Risk Treatment Process



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

SECTION 2
GEOGRAPHIC PROFILE

The geographic profile of a community is an assessment of the physical features of a community such as highways, waterways, railways, bridges, landforms, quarries, and wildland-urban interfaces that may present an inherent risk to the community and impact emergency services' access to an incident and/or response times and capabilities[3]. This section contains a detailed analysis of these geographical features for the Town of Tillsonburg to assist with the determination of the type and level of fire protection services needed for the community and any potential impacts these features may pose.

2.1 Geographic Overview

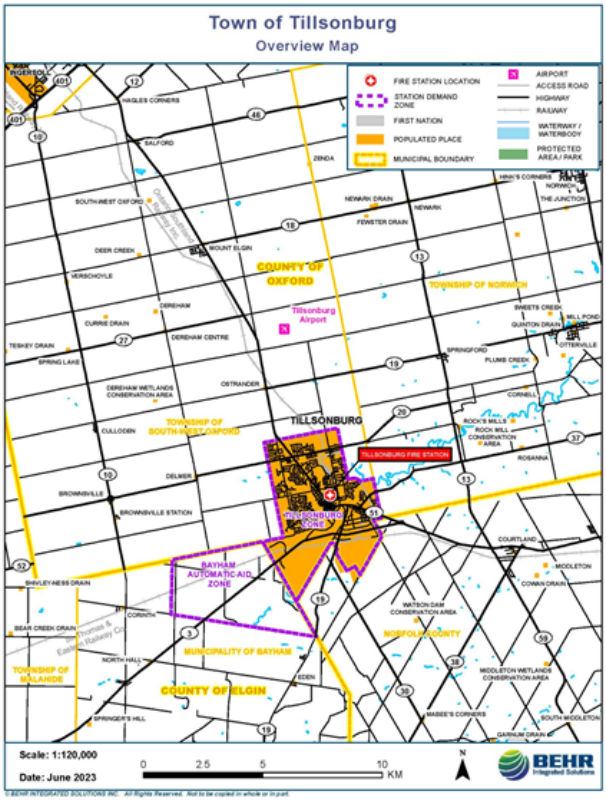
The Town of Tillsonburg is located in Oxford County, roughly 30 kms north of Lake Erie, 50 kms southeast of London, Ontario and 170 kms southwest of Toronto, Ontario. It is also conveniently located 156 km east of the US/Canada Blue Water Bridge border crossing[4].

The town has a land-based area of 22.2 km^2, with a population of 18,615 and population density of 838.6 per km^2.[5] The land use area is predominantly residential, with a small central business district and pockets of service commercial area, and a large industrial sector encompassing most of the southern portion of the community. Once geared towards the tobacco industry, the area is now home to several branch plants of major US and international automotive parts suppliers.

Lake Lisgar is a small lake located in the centre of the town and is a popular recreational site for the local rowing club and water park.

The town is located within the Long Point Region watershed, which provides the area with wetlands, woodlands, agricultural lands, as well as fish and wildlife habitat[6].

Map 1: Town of Tillsonburg Overview



[3] *Community Risk Assessment: Office of the Fire Marshal OFM-TG-02-2019, 2019.*

[4] *As retrieved from Google Maps*

[5] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

[6] *As retrieved from https://lprca.on.ca/forestry-stewardship/watershed-report-card/*

2.2 Major Transportation Network

2.2.1 Road Network

Road networks provide fire and emergency services with access throughout a community when responding to an emergency. Understanding the road network of a community is critical in determining risk from a response perspective for several reasons. The road network can present challenges and delays due to congested traffic, load restrictions and physical barriers (railway crossings, construction, and detours). Time of day may also be a factor when determining a response route to a call for these reasons. Roadways are also a common source of emergency call volume due to collisions and accidents. Under the current response model for Tillsonburg, volunteer firefighters are required to the station to get apparatus and equipment before responding to the emergency site. This double response factor increases the risks mentioned above.

The Town of Tillsonburg has a network of 121.7 kms of arterial, collector and local roadways owned by the town, as well as 15.4 kms of arterial, collector and provincial highways running through, but not owned by the town[7]. The town sits at the junction of Highway 19, which runs north-south through the centre of town to join Highway 401 north of the town and Highway 3 which runs east-west along the shores of Lake Erie to the Windsor-Detroit border crossing.

The most recent Transportation Master Plan for the town, adopted by council in 2022, indicates that roughly half (42%) of the road quality is rated as good while 27.8% is rated as fairly good, 23.7% is rated as fail and an additional 20.7% is rated as poor. The town was given a 73% condition versus performance rating for roadways, however a poor (46%) rating for funding versus need. This may indicate that the quality of the roadways in the area will continue to deteriorate if more funding is not made available[8].

According to the 2021 census, 52.3% of the workforce in Tillsonburg travel within the census area for work. Of the commuters with a regular or no fixed workplace address, 51.1% travel less than 15 minutes to their workplace, while an additional 21.6% travel between 15 and 29 minutes[9]. This may suggest most commuters are using local roads in a north-south direction to the industrial area as well as to major highways and arterials running east-west of the town (Highway 401 or Highway 3).

Key Finding: During peak commuting times, highest risk of motor vehicle collisions (MVCs) is likely to occur within a 15-minute travel time from residential areas to the core industrial areas located in the southern portion of the town and to Highway 401 north of the town.

[7] *Tillsonburg Comprehensive Asset Management Plan for Core Assets. 2022.*

[8] *Tillsonburg Comprehensive Asset Management Plan for Core Assets. 2022.*

[9] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

As all provincial highways are considered to be dangerous goods routes, cross and inter-provincial traffic carrying a variety of dangerous goods are likely to pass through the town on a daily basis using Highway 19, which passes through the central part of the town and into the industrial area. In 2022 a spill occurred in the town prompting the evacuation of several homes and the closure of a local roadway.

The County of Oxford Transportation Master Plan report (2019) identified that it was estimated that 59% of the rural businesses in the county would expand – therefore increasing the amount of people and goods being transported through the county, and the associated risk.

Key Finding: The County of Oxford Transportation Master Plan estimated that 59% of rural businesses would expand, therefore increasing the movement of people and goods throughout the town which may have an impact on service levels, call frequency and types.

In addition to the movement of goods for commercial and industrial purposes, agriculture machinery used to support the important agricultural sector in the area, also frequently use the roadways. Large heavy machinery can slow traffic and impede visibility, which could result in delayed responses and increased frequency of collisions.

Key Finding: Agricultural machinery on roadways can create hazardous condition as well as slow down response times.

2.2.2 Bridges and Culverts

Bridges must be considered when conducting a CRA, as they can create a physical barrier to a response and negatively impact response times. An apparatus may be restricted from crossing (i.e., load restrictions), or the roadway connectivity may be disrupted if a bridge is rendered out of service for maintenance/repairs. Further, incidents located on a bridge have an increased risk associated with spills, congestion and being unable to access, or have difficulty accessing the scene. Incidents may also require high angle rescue which requires specialized skill and equipment.

The Town of Tillsonburg maintains a total of eight bridges and seven structural culvers. The Tillsonburg Asset Management Plan reports that of those, the average age of the bridges is 35 years and culverts 34 years. Seven of the eight bridges are reportedly in good condition, and one is in poor condition. Two of the culvers are reportedly in good condition, three in fair and two in poor condition.

2.2.3 Rail

At-grade rail crossings (an intersection at which a road crosses a rail line at the same level) can create delays in emergency response by impeding access to a roadway. Also, the physical barrier created by the rail infrastructure itself, such as rail yards or the placement of rail infrastructure (e.g., tracks, grade separations, grade level crossings, etc.) within and throughout a town can impact emergency services travel times and overall emergency

response times. In addition to the rail infrastructure, the frequency at which trains pass through a community and the goods they carry, poses varying degrees of risk due to derailment and potentially dangerous goods releases.

The Cayuga Line, a short rail line travels from the northeast quadrant of the town, along the eastern edge of the town, then south along the southern portion of the town. This line allows businesses in the industrial areas to ship their goods to CN Rail. The short rail line systems of Ontario transports approximately 7.8 billion dollars worth of goods such as metals, lumber, agricultural and manufactured goods each year.

These rail systems pose inherent risk, as all rail systems do. The possibility of a derailment and release of dangerous goods is low, although it could have a major impact and would require a specialized response. Dangerous goods are frequently transported along these routes which pass in close proximity to populated areas as well as over water. Information sharing practices between the railway operators and emergency responders can provide insight into the types and frequencies of dangerous goods being shipped through the town.

Identified Risk: There is a low probability, however, a high degree of risk to the public and the environment associated with a train derailment in the area; with or without a release of dangerous goods.

In addition to the hazards associated with derailments, railways also create physical barriers to a response. A desktop search indicated there were 18 at-grade crossings which could present a delay in response times should an apparatus be unable to pass a roadway[10].

Key Finding: At grade level rail crossings have the potential to create a physical barrier to connectivity to the roadway network, causing delays in response time. There are 18 at-grade rail crossings throughout the town.

2.2.4 Airport

Airports present unique hazards associated with the movement of people and goods and the possibility for incidents or accidents involving one or more aircraft, hazardous materials, and fuel load. The Transportation Safety Board of Canada reported in 2020 that air accidents have decreased by up to 32% over the last decade, and air incidents have decreased 47% below the average. Accidents do still occur unfortunately, despite continual efforts to improve air travel safety.

The Tillsonburg Regional Airport is located 5.6 kms north of the town. It is classified as a registered aerodrome and is owned and operated by the Town of Tillsonburg. It primarily serves flight training providers, private and corporate aircraft owners and operators, charters and aerial work activities and flying clubs and gliders.

The airport is supported by a terminal building which houses the administration office, a restaurant, boardroom, washroom, and Tillsonburg Flying School. It has 26 stand-alone

[10] *As retrieved from Google Maps*

hangars and two buildings with 10 and 4 T-Hangars and offers maintenance and fueling services. It is classified as an airport of entry and can accept international travelers.

There is only one recorded incident involving a plane taking off from the Tillsonburg Regional Airport since 1995. The pilot was the sole occupant and there were no fatalities. On another occasion, a homemade float plane crashed near the town, however it did not take off from or land near the airport.

The airport is not in the jurisdiction of TFRS however, due to the proximity of the airport to the town, a plane could potentially crash within the town limits, and depending on the location, could result in mass casualties and the potential for TFRS to respond for support.

Key Finding: Although TFRS is not the primary responder to the Tillsonburg Regional Airport, given its proximity to the town, there is a possibility of an air incident which may require assistance from TFRS which could directly or indirectly (reduced service levels) affect the town.

2.3 Waterways and Dams

2.3.1 Waterways

Waterways pose a natural hazard due to potential flooding, ice jams, erosion etc. Incidents of this nature can trigger the need for a rapid evacuation and/or a rescue response. Additionally, waterways that are frequently used for recreational activities require that responders have specialized technical rescue training and equipment.

With several creeks (the largest being Big Otter Creek) running throughout the Tillsonburg area, as well as Lake Lisgar near the centre of the town, there is a risk of water and ice rescue. Many of the creeks run closely along walking trails and are open to the public year-round without supervision. Further, some of these areas may be difficult to access by apparatus. There is an average of one water rescue and one water ice rescue annually (call details in Section 10).

Key Finding: There is an increased risk of water or ice rescues related to recreational activities along creeks and Lake Lisgar.

Due to the proximity of the town to Lake Erie, it often experiences what is termed a 'lake effect.' The region can experience heavy precipitation leading to heavy bands of snow in the region, obstructed roads, poor driving conditions and low visibility. These factors can all greatly impact call volume and can reduce response times. Calls for rescue, motor vehicle collisions and injuries are more likely during these events. Responders are also at an increased risk of injury while responding due to poor driving and visibility conditions.

Key Finding: Due to the 'lake effect,' severe weather events and temperatures are possible during any time of the year and may increase call volume and create hazardous conditions for responders.

During summer months, the lake effect can produce a great amount of humidity and the potential for severe storms in the region. Tornado warning and funnel cloud sightings have been reported in the area. Tornadoes pose an extreme danger to communities and responders, as they are unpredictable, can cause falling debris and destruction of buildings and create dangerous rescue conditions[11].

In addition to the severe storms, the humidity in the region can reach levels that are particularly dangerous to vulnerable populations (elderly, children, and infants, those experiencing homelessness and mental health and addiction issues etc.). Inability to access cooling centres is a major risk which increases the number of medical calls.

Key Finding: Summer months pose an additional risk of severe storms, tornados, and health hazards to vulnerable populations.

2.4 Conservation Areas

Conservation and outdoor recreation areas are taken into consideration when conducting a CRA, due to the activities that take place in this locale and certain geographical features that may be present in these areas. Conservation areas are frequently used for strenuous recreational activities such as hiking, biking, swimming, etc. and may have a varying degree of terrain such as steep embankments, dirt trails, rivers, and creeks etc. which poses the risk of a medical call.

There is one conservation area within the town and an extensive network of trails throughout the area. The trail system is frequently used, particularly by the senior population. Portions of trails are not accessible, or not easily accessible by vehicles or apparatus.

Identified Risk: The town has an extensive network of trails frequented by visitors on a regular basis, including a large number of seniors in the area. Many portions of the trail are inaccessible to difficult to access by vehicle or apparatus, which could impede a rescue response.

2.5 Wildland Urban Interface

NFPA 1730 identifies wildland-urban interface as geography-based risk for consideration. This interface refers to the area of transition between unoccupied land and human development. This transition area can be comprised of a mix of woodlots, bush, or grass. These open unoccupied areas can experience fuel buildup and pose a threat of ignition and wildfire in the spring/summer months. To date Ontario has experienced three times the number of wildfires in comparison to 2022. The previous year (2021) there were four reportable wildfires, and the 10-year average is currently reported as 42[12]. Although typically in the Tillsonburg region of southern Ontario wildfires are less frequent and less severe, with climate change and increasingly hot and dry conditions, it is expected that wildfires will increase in number and intensity. The Town of Tillsonburg has agricultural lands and natural features and therefore does possess an element of

[11] *As retrieved from Public Safety Canada https://cdd.publicsafety.gc.ca/dtpg-eng.aspx?cultureCode=en-Ca&provinces=9&eventTypes=%27TO%27&normalizedCostYear=1&dynamic=false&eventId=134*

[12] *As retrieve from: https://www.ontario.ca/page/forest-fires#section-5*

risk related to wildland and grass fires. The frequently used trail system and ravines along the creeks abutting the wild land areas pose a risk and are difficult to access. Furthermore, the areas surrounding the town are largely farm and forest land and increase the risk of a grassfire impinging on the town.

Identified Risk: There is a considerable risk of a grass fire in areas of urban interface and along difficult to access terrain surrounding the trail system throughout the town and surrounding area.

SECTION 3
BUILDING STOCK PROFILE

As referenced in O. Reg. 378/18, the building stock profile assessment includes an analysis of the types and uses of the building stock within the municipality. Important considerations include the time of construction (age) of a building, number, type and use of the buildings, 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. Many older buildings in particular, were built before the introduction of modern fire and building codes and pose an inherent risk of not being to standards consistent with newer buildings. This section considers these building characteristics within the Town of Tillsonburg.

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 1.

Table 1: OBC Major Occupancy Classifications[13]

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

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

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 also 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 2 along with potential proactive measures to reduce risk within these occupancy types.

Table 2: OFM Fire Risk Sub-Model Major Building Classifications

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM Fire Related Risks	Proactive Measures for Reducing Risk
Group A	Assembly Occupancies	An assembly occupancy is defined as one that is used by a gathering of persons for civic, political, travel, religious, social, educational, recreational or like purposes or for the consumption of food or drink.	Assembly buildings are often occupied by a large number of people and may contain high quantities of combustible furnishings and decorations. Occupants are generally unfamiliar with the building's exit locations and may not know how to react in the event of an emergency. Low light conditions are inherent to some of these occupancies and can contribute to occupant confusion during an evacuation. Numerous examples exist of disastrous events that have occurred throughout the world, resulting in multiple fire fatalities in these occupancies. Therefore, these facilities require special attention. Accordingly, it is paramount to ensure that maximum occupant load limits are not exceeded, detection is available, an approved fire safety plan is in place and adequate unobstructed exits/means of egress are readily available.	• Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved fire safety plan and staff training • Pre-planning by fire suppression staff

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM Fire Related Risks	Proactive Measures for Reducing Risk
Group B	Care or Detention Occupancies	A care or detention occupancy means the occupancy or use of a building or part thereof by persons who: • Are dependent on others to release security devices to permit egress. • Receive special care and treatment; or, • Receive supervisory care.	In addition to the presence of vulnerable occupants, these occupancies may contain quantities of various flammable/combustible liquids and gases, oxidizers and combustible furnishings that will impact the intensity of the fire if one should occur. The evacuation or relocation of patients, residents, or inmates to an area of refuge during an emergency poses additional challenges in these facilities. It is essential to ensure that properly trained staff is available and prepared to quickly respond according to the facility's approved fire safety plan.	• Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved Fire Safety Plan and staff training • Pre-planning by fire suppression staff
Group C	Residential Occupancies	A residential occupancy is defined as one that is used by persons for whom sleeping accommodation is provided but who are not harbored or detained to receive medical care or treatment or are not involuntarily detained.	In Ontario, residential occupancies account for 70% of all structural fires and 90% of all fire deaths. Residential units that are located in multi-unit buildings, including secondary units in a house, pose additional risks due to egress and firefighting accessibility challenges.	• Home smoke alarm programs • Public education programming including home escape planning • Retro-fit and compliance inspection cycles for OFC compliance • Pre-planning by fire suppression staff • Fire Drills as required by the OFC

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM Fire Related Risks	Proactive Measures for Reducing Risk
Group D	Business & Personal Services	A business and personal services occupancy is defined as one that is used for the transaction of business or the rendering or receiving of professional or personal services.	Many office buildings are occupied by a large number of people during business hours and contain high combustible content in the form of furnishings, paper, books, computers, and other office equipment/supplies. Those that are located in a high-rise building pose additional risks due to egress and firefighting challenges.	• Regular fire prevention inspection cycles to maintain OFC compliance • Targeted fire prevention inspections for OFC retrofit compliance • Staff training in fire prevention and evacuation procedures • Public education programs • Pre-planning by fire suppression staff
Group E	Mercantile	A mercantile occupancy is defined as one that is used for the displaying or selling of retail goods, wares, or merchandise.	Larger mercantile occupancies such as department stores are generally occupied by a large number of people and contain high quantities of combustibles in the form of merchandise, furnishings, and decorations. Customers may be unfamiliar with the building's exit locations and not know how to react in the event of an emergency. Additional hazards will be present in "big box" type stores that sell and store large volumes of combustible materials in bulk. These stores generally have similar properties to industrial warehouses with the additional hazard of higher number of occupants.	• Regular fire prevention inspection cycles • Automatic fire detection and monitoring systems • Approved Fire Safety Plan and staff training • Pre-planning by fire suppression staff

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	OFM Definitions	OFM Fire Related Risks	Proactive Measures for Reducing Risk
Group F	High/Medium/Low Hazard Industrial	An industrial occupancy is defined as one for the assembling, fabricating, manufacturing, processing, repairing, or storing of goods and materials. This category is divided into the following sub-categories based on its combustible content and the potential for rapid fire growth: • low hazard (F3) • medium hazard (F2) • high hazard (F1)	These occupancies constitute a special fire hazard due to high levels of combustible, flammable or explosive content and the possible presence of oxidizing chemicals and gases. Processing and other activities that involve various ignition sources often occur in these occupancies. The lack of security during non-operational hours also makes them susceptible to incendiary type fires. Industrial fires generally involve large quantities of combustible materials and potentially result in large financial losses (e.g., building, contents) and significant damage to the community's environment and economic well-being (e.g., loss of jobs).	• Regular fire prevention inspection cycles • Staff training in fire prevention and evacuation. • Public education • Pre-planning by fire suppression staff • Installation of early detection systems (e.g., fire alarm systems, heat detectors) • Installation of automatic sprinkler systems • Approved Fire Safety Plans • Fire extinguisher training

Source: OFM Fire Risk Sub-Model[14]

[14] *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 Town of Tillsonburg Existing Major Building Classification Summary

Analysis of the town's major building occupancy types was conducted using data provided by the Municipal Property Assessment Corporation (MPAC). Table 3 summarizes the town's existing major building occupancy classifications.

The majority of the town's existing property stock is comprised of Group C - Residential Occupancies (96.17%) representing 12,984 residential units. The second largest occupancy type within the town is Group D&E– Commercial Occupancies accounting for 2.21% of the town's property stock. There are 32 occupancies that are not classified within the OBC.

Table 3: Town of Tillsonburg Total Existing Property Stock[15]

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Percentage of Occupancies
Group A	Assembly Occupancies	51	0.38%
Group B	Care or Detention Occupancies	5	0.04%
Group C	Residential Occupancies - Total	7,369	54.58%
Group C	Single Family	5,575	41.29%
Group C	Multi-unit Residential	33	0.24%
Group C	Hotel / Motel	6	0.04%
Group C	Mobile Homes / Trailers (park)	1	0.01%
Groups D & E	Commercial	299	2.21%
Group F (all Divisions combined)	Industrial Occupancies	130	0.96%
Other	Not classified in Ontario Building Code - Farm	28	0.21%
Other	Not classified in Ontario Building Code - Government	4	0.03%
	Total Occupancy Classification	13,501	100.00%

Consistent with most other municipalities in Canada, Group C - Residential Occupancies represent the most prominent type of building occupancy type within Tillsonburg. Within Ontario, information provided by the OFM indicates that the majority of structure fires loss over the five-year period from January 1, 2018, to December 31, 2022, occurred within Group C - Residential Occupancies (67%). It is also important to note that 93% of the civilian fire related injuries, 100% of the civilian fire related fatalities and 74% of the dollar loss also occurred in residential occupancies.

[15] *Difference between MPAC and Census occupancy totals is related to MPAC classifications vs Census Groupings*

Table 4: Town of Tillsonburg Property Stock Risk of Fire

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Issues / Concerns	Probability	Consequence	Assigned Risk Level
Group A	Assembly Occupancies	51	There are 21 places of worship, 10 schools and 20 communities. Potential for large crowds. 2 occurrence 2018-2022	Likely	Moderate	Moderate
Group B	Care or Detention Occupancies	5	There is 1 hospital, 1 long-term care facility and 2 retirement residences[16] 1 occurrence 2018-2022	Possible	Major	Moderate
Group C	Single Family	5,575	49.27% of all dwellings were built before OBC[17]	Almost Certain	Moderate	High
Group C	Multi-unit Residential	33	49.27% of all dwellings were built before OBC[18] There are 1,140 apartments in complexes with less than 5 storeys, 500 in complexes with more than 5 storeys and 205 duplexes. 2 occurrence 2018-2022, high dollar loss	Likely	Major	High
Group C	Hotel / Motel	6	No known loss to date	Possible	Major	Moderate
Group C	Mobile Homes / Trailers	1	No known loss to date Not many properties in this class in the town	Possible	Minor	Moderate

[16] *Ibid*
[17] *Ibid*
[18] *Ibid*

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Issues / Concerns	Probability	Consequence	Assigned Risk Level
Groups D & E	Commercial	299	Office properties that have been converted from residential may have been built before OBC.	Unlikely	Moderate	Moderate
Group F (all Divisions combined)	Industrial Occupancies	130	There are several manufacturing companies which are high risk occupancies	Possible	Catastrophic	High Risk
				Unlikely	Catastrophic	High Risk

Source: Municipal Property Assessment Corporation (MPAC)

Identified Risk: Group C - Residential Occupancies represent 91.51% of the town's existing property stock, and over the five-year period from January 1, 2018, to December 31, 2022, were associated with 74.29% of the structure fires within the town.

Identified Risk: Group C – Residential Occupancies represent 100% of the civilian fire related injurie over a four-year period (January 2018-December 2022).

Identified Risk: There are several large manufacturing companies in the town with high fuel load and potential for damaging fires.

Table 5 illustrates a comparison of the town's existing Group C - Residential building stock compared with that of the province based on the 2021 Statistics Canada Census.

Table 5: Group C - Residential Building Stock Comparison[19]

Structural Dwelling Type	Tillsonburg Total Number of Dwellings	Tillsonburg Total Percentage of Dwellings	Ontario Total Number of Dwellings	Ontario Total Percentage of Dwellings
Single-detached house	5,575	67.74%	2,942,990	53.59%
Apartment in a building that has five or more storeys	500	6.08%	984,665	17.93%
Movable dwelling	10	0.12%	14,985	0.27%
Semi-detached house	285	3.46%	303,260	5.52%
Row house	500	6.08%	505,265	9.20%
Apartment or flat in a duplex	205	2.49%	181,030	3.29%
Apartment in a building that has fewer than five storeys	1,140*	13.85%	548,785	9.99%
Other single-attached house	25	0.30%	10,220	0.18%
Total	8,230	100.00%	5,491,200	100.00

* Two additional apartment complexes have been built since the release of these statistics

This analysis highlights that the town has a higher percentage of single detached houses (67.74%) compared to the province at 53.59%. Tillsonburg has a much lower percentage of apartments in

[19] *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.*

buildings of five stories or higher, however a higher percentage of apartments in low rise buildings with fewer than five stories.

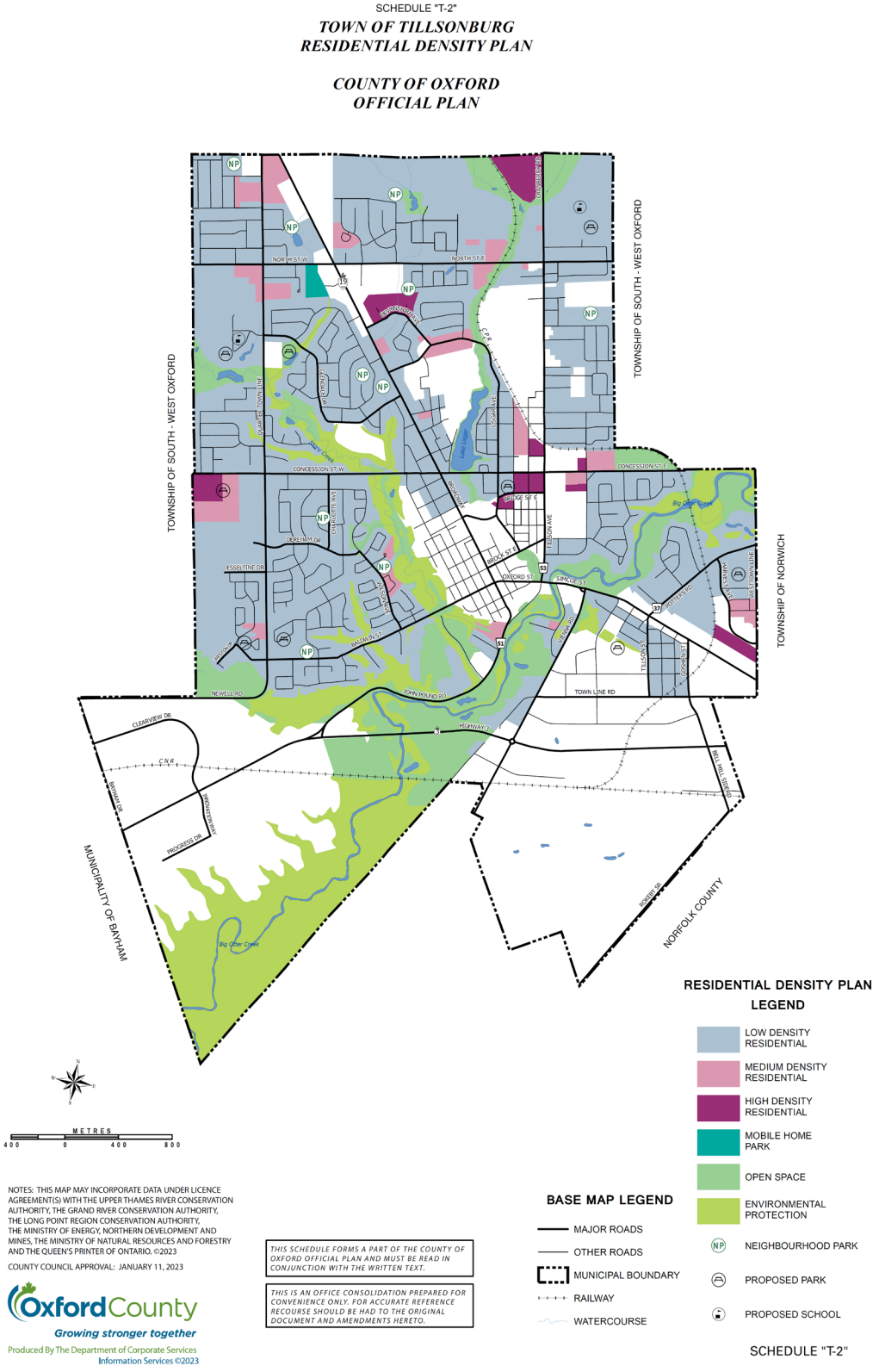
Identified Risk: Apartment complexes with fewer than five stories pose a greater fire risk than those with greater than five stories due to less engineering and fire detection practices. Tillsonburg may have a greater risk of fires in these types of buildings when compared to the province.

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 particular consideration given to core areas (downtown). Closely spaced buildings, typical of historic downtown core areas and newer infill construction, may have a higher risk of a fire spreading to an adjacent exposed building. In a built-up area with minimal building setbacks, a fire originating in one building could extend to a neighbouring structure due to the close proximity. The close proximity of buildings can also impede firefighting operations due to the limited access for firefighters and equipment.

The 2022 Oxford County Official Plan identifies plans to promote and support the development of medium and high-density occupancies, as shown in Figure 3 below. As shown in Table 5 the town currently has nearly 4% more apartments in low rise buildings compared to that of the province, therefore this new development further increases the risk of fires in these dwelling types. Although the town has a much lower count of higher density apartments when compared to the province, their new development could bring the town closer to provincial averages, therefore increasing that risk as well.

Figure 3: Town of Tillsonburg Residential Density Plan



Source: 2021 Oxford County Official Plan

Identified Risk: The town has significantly more apartments in low rise buildings when compared to the province. There is greater potential for exposure in the event of a fire. Further to this the town intends to construct more high and medium density occupancies, therefore further increasing the fire risk associated with these occupancy types.

3.4 Building Age and Construction

The OBC was adopted in 1975, and the 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 service 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) that is a high strength engineered wood product now used commonly in residential and commercial buildings. Although these techniques and materials have enhanced the efficiency and cost of construction, this construction presents very different challenges to firefighters from those of historical construction methods. For example, the 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. Lightweight construction is discussed further in Section 3.4.1 below.

In addition to building construction, fire growth rate depends on the flammability of the materials and contents within the building which introduces variances into the growth rates presented above.

The impact of increasing fire growth rates is directly related to the time lapse from ignition to flashover when the combustible items within a given space reach a temperature that is sufficiently high for them to auto-ignite.

Listed in Table 6 are 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 6: Time to Reach 1 MW Fire Growth Rates in the Absence of Fire Suppression

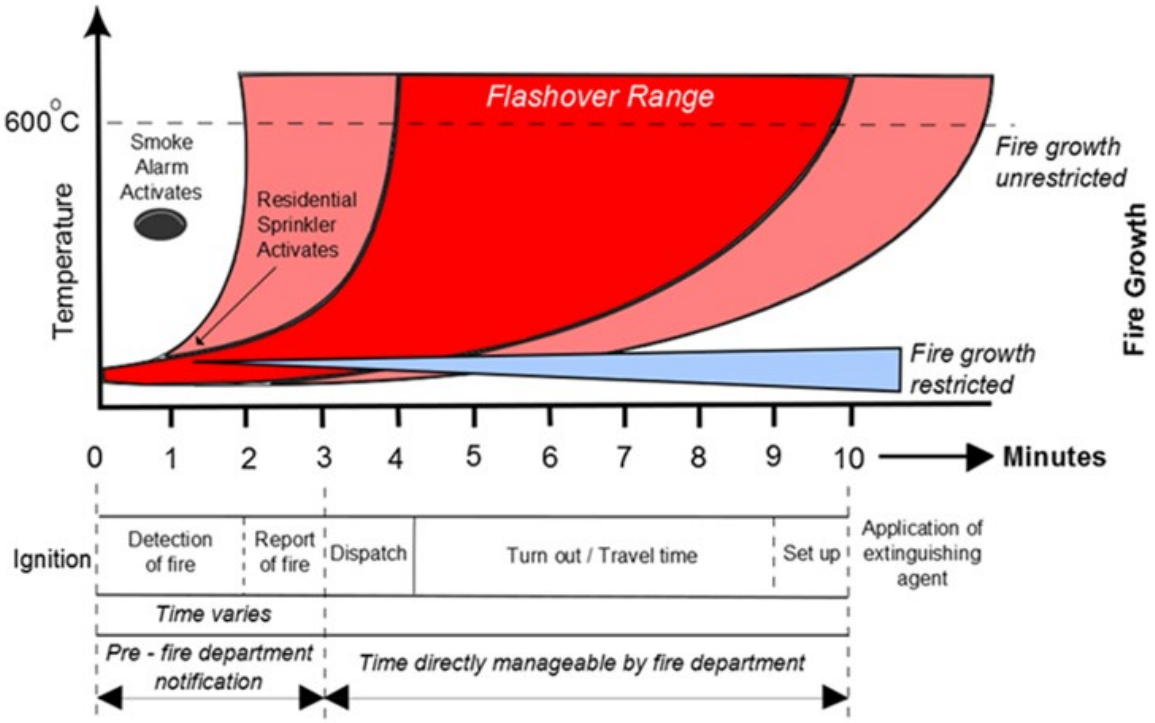
Fire Growth Rate	Time in Seconds (Minutes) to Reach 1 MW	Time in Second (Minutes) to Reach 2 MW
Slow	600 seconds (10 minutes)	848 seconds (14.13 minutes)
Medium	300 seconds (5 minutes)	424 seconds (7.07 minutes)
Fast	150 seconds (2.5 minutes)	212 seconds (3.53 minutes)

Source: OFM, Operational Planning: An Official Guide to Matching Resource Deployment and Risk Workbook.[20]

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 Figure 4 (below) highlights the exponential increase in fire temperature and the potential for loss of property/loss of life with the progression of time.

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

Figure 4: Fire Propagation Curve



Source: Fire Underwriters Survey "Alternative Water Supplies for Public Fire Protection: An informative Reference Guide for Use in Fire Insurance Grading" (May 2009) and 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 an essential component of this CRA.

Table 7 summarizes the age of the building stock within the town prior to the new codes (OBC and OFC). This analysis indicates that 49.27% of the town's building stock was built prior to 1981, preceding the adoption of the 1981 OFC. This represents a significant fire risk within the community.

Table 7: Period of Construction of all Dwellings

Period of Construction	Tillsonburg Total Number of Dwellings	Tillsonburg Total Percentage of Dwellings
Prior to 1960	1,820	22.11%
1961-1980	2,235	27.16%
1981-1990	950	11.54%
1991-Present	3,225	39.19%
Total	8,230	100.00%

Identified Risk: Data provided by Statistics Canada indicates that 49.27% of the town's total building stock was built prior to the introduction of the 1981 Ontario Fire Code which increases the risk of fire and potential for loss.

3.4.1 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 services. 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 services with awareness of the presence of lightweight construction, providing opportunity for proactive fire response strategies to protect the safety of responding firefighters.

It is anticipated that the town will collect and document information on buildings with lightweight construction. This information will be used to update the CRA during the annual review and updating process.

Key Finding: The town should begin to collect a list of buildings that are identified as known lightweight construction. This should be built into the fire service pre-planning program.

3.5 Building Height and Area

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 as a result 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 ascent to the upper floors by the stairwells. Options such as "shelter-in-place" whereby occupants are directed

by the fire service to stay within their units can be an effective life safety strategy. However, ensuring internal building communications systems are in place and functioning is critical to the success of this strategy. Targeted public education campaigns addressing strategies like shelter-in-place are also critical to educating building occupants.

It is important to note that there are a variety of meanings associated with the terms "high rise," "tall buildings" and "high buildings." For the purposes of developing this CRA, the OBC/OFC definition has been used to analyze building height within the town which defines high-rise as 18 metres above grade, or six storeys.

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

- Building Services (ventilation, firefighter elevators, water supply, etc.)
- Non-combustible construction (concrete and steel)
- Interior finishes (drywall, block, concrete slab)
- Fire detection and notification of occupants (pull stations, heat detectors, fire detectors, alarm system)
- Compartmentation (containment of fire and smoke spread, fire doors, fire shutters, self-closing mechanisms on doors, etc.)
- Means of egress (stairwells constructed with non-combustibles)
- Fire protection system (automatic sprinklers, standpipes and hose cabinets, fire pumps, fire extinguishers, etc.)

These fire safety features serve to keep the public and firefighters safe.

Building areas can cause comparable challenges 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. 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.

3.6 Potential High-Fire Risk Occupancies

Potential high-fire risk occupancy is another factor for consideration within a town's building stock. High fire risk can be linked to a combination of factors such as building density (exposures), building age, and construction. Fuel load typically refers to the amount and nature of combustible content and materials within a building. This can include combustible contents, interior finishes as well as structural materials. Combustible content tends to create the greatest potential fire loss risk. Higher fuel loads results in increased fire loss risk due to increased opportunity for ignition and increased fire severity. In many communities, large amounts of fuel load can be contained within a single occupancy, such as a building supply business, within a large multi-unit residential building, or within a historic downtown core. This section of the CRA will focus primarily on fuel load for industrial occupancies.

3.6.1 Fuel Load Concerns

Buildings with potential fuel load concerns are identified in Table 8. These include buildings housing materials such as oxidizers and flammable and combustible liquids and chemicals.

Table 8: Potential High-Fire Risk Occupancies

Address	Facility Name/Organization	Risk Description
1265 Jackson Side Road RR#2	Townsend Lumber Inc.	Sawmill
301 Tilson Ave	Martinrea International Inc	Automotive Industry Supplier
22 Clark St E	Kissner Milling Company	Salt and Packaged Ice Melt Bagging Facility
21 Clearview Dr	Fleetwood Metal Industries Inc.	Metal Stamping
1417 Bell Mill Side Road	THK Rhythm Automotive Canada Limited	Automotive Industry Supplier
95 Spruce Street	Inovata Foods Corp	Food Processing Plant
105 Spruce St	Marwood International	Automotive Industry Supplier
1451 Bell Mill Side Road	Autoneum Canada Ltd	Automotive Industry Supplier
65 Spruce Street	Freudenberg-NOK, Inc	Sealing Technology
91 Lincoln Street	Electrical Components Canada, Inc	Electrical Distribution Systems Manufacturer
68 Spruce Street	J/E Bearing & Machine Ltd	Machine Shop
81 Lincoln Street	Hoover Enterprises Inc	Metal Fabricator
1494 Bell Mill Side Road	Wellmaster Pipe and Supply Inc	Pipe Manufacturer
1250 Jackson Side Road	Breeze Dried Inc	Lumber Industry Manufacturer
24 Clearview Drive	Xcel Fabrication & Design Ltd	Returnable Packaging Manufacturer
131-B Townline Road	Foldens Machine Works Ltd	Machine Shop
111 Townline Road	Tillsonburg Recreation & Industrial Products ULC	Metal Fabricator
102 Spruce Street	MIL-SIM-FX International Inc	Air Battlefield Simulator Manufacturer
47 Clearview Drive	Tillsonburg Tube Inc	Metal Furniture Manufacturer
20 Clearview Drive	Wise Line Metal Sales Inc	Metal Roofing Manufacturer
30 Clearview Drive	Dyco Tool Inc	Machine Shop
45 Clearview Drive	Kraushaar Machine Services Inc	Machine Shop
61 Townline Road	CedarCrest Wood Products Limited	Wood Products Manufacturing
21 Watson Mill Road	DBK Machine & Tool	Tool Manufacturer

Address	Facility Name/Organization	Risk Description
3 Rouse Street	Future Transfer	Distribution Warehouse
50 Clearview Drive	Future Transfer	Distribution Warehouse
281 Tilson Avenue	Future Transfer	Distribution Warehouse
51 Clearview Drive	Future Transfer	Distribution Warehouse
291 Tilson Avenue	Future Transfer	Distribution Warehouse

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. It should be noted that some of these companies do routinely update emergency response plans and share them with the fire services.

Identified Risk: There are several properties within Tillsonburg that have a potentially high fuel load and therefore an increased high fire risk.

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 demographic within a community.

3.7.1 Registered Vulnerable Occupancies

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 limitation can live on their own or in subsidized housing, making them a key demographic to reach.

Ontario Regulation 150/13: Fire Code, which amends Ontario Regulation 213/07: Fire Code, identifies vulnerable occupancies as care, care and treatment and retirement homes. This includes hospitals, certain group homes and seniors' residences and long-term care facilities. The regulation requires fire service to perform annual inspections, approve and witness fire drill scenarios and file certain information regarding the occupancy with the Fire Marshal's office. A list of vulnerable occupancies is presented in Table 9.

Table 9: Vulnerable Occupancies

Property Name	Occupancy Type	Location
Tillsonburg District Memorial Hospital	Hospital	161 Rolph Street
Maple Manor Nursing Home	Nursing Home	73 Bidwell Street
Woodingford Lodge	Long-term Care	52 Venison Street W
Tillsonburg Retirement Residence	Retirement Home	4866 Old Highway 2
Aspira Harvest Crossing Retirement Living	Group Home	5103 Old Highway 2
Tillsonburg District Association for Community Living	Supported Living	10 Allen Street
Tillsonburg District Association for Community Living	Supported Living	59 Potters Road
Tillsonburg District Association for Community Living	Supported Living	4 & 6 John Street
Tillsonburg District Association for Community Living	Supported Living	95 Tilson Avenue
Tillsonburg District Association for Community Living	Supported Living	23 Queen Street
Tillsonburg District Association for Community Living	Supported Living	71 Queen Street
Tillsonburg District Association for Community Living	Supported Living	30 Lisgar Avenue

There are 12 vulnerable occupancies in Tillsonburg. These include care occupancies, care and treatment occupancies and retirement homes.

Key Finding: The Town of Tillsonburg currently has 12 registered vulnerable occupancies.

3.7.2 Other Vulnerable Populations

Tillsonburg, as with many other towns across Ontario, is experiencing an increase in homelessness partly due to the increased cost of living and shortage in housing supply, as well as mental health and addiction. According to the Oxford Housing Action Collaborative, there are 103 people in the County experiencing homelessness. In 2019, figures indicated there were 10-12 (7-12% of total) known homeless people in the town and it is deduced this number has since grown given the recent establishment of overnight temporary shelters in the town which can accommodate up to 12 people. Homelessness can often be less visible in small towns where individuals may resort to staying with family and friends. There is a growing encampment on the outskirts of town. Encampments are unsheltered areas where one or more homeless people are living. Encampments are a growing trend as homelessness increases in Ontario. They can generate many different types of calls for emergency services including medical calls, carbon monoxide calls and fire-related calls.

Key Finding: With increasing homeless numbers in the town and county, location of any encampments within or around Tillsonburg should be identified as they are associated with numerous fire and life safety risks to the residents of encampments, the public and emergency responders.

3.7.3 Other High Fire Life Safety Risk Occupancies

From the perspective of risk, it can be valuable for a fire service to identify additional potential high fire life-safety risk considerations. This includes day care facilities and schools. Children, due to age and potential cognitive or physical limitations may prevent or delay 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 Municipal Property Assessment Corporation Data identified that there are 10 schools, 1 daycare facility and 1 additional institutional facility dedicated to special education/training.

It would be beneficial for TFRS to conduct pre-planning activities for all occupancies with vulnerable occupants. Pre-planning activities increase fire service personnel 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; providing public education on fire safety issues; conducting pre-planning exercises to increase fire service personnel's familiarity with the facility; reviewing fire safety plans for accuracy and encouraging facility owners to update facilities as needed; providing staff training; and encouraging fire drills.

Key Finding: In addition to registered vulnerable occupancies the town has 10 schools, 1 daycare and one other facility dedicated to special education/training that represent higher fire life-safety risks.

SECTION 4
CRITICAL INFRASTRUCTURE PROFILE

4.1 Critical Infrastructure in the Town of Tillsonburg

Critical infrastructure within the town includes the facilities and services required to meet essential needs, sustain the local economy, ensure public safety and security, and maintain continuity in government.

The Ontario Critical Infrastructure Assurance Program identifies nine categories of critical infrastructure: continuity of government, electricity, financial institutions, food and water, health, oil and natural gas, public safety and security, telecommunications, and transportation networks[21]. The interconnectedness of these critical infrastructures further increases the risk. Infrastructure is a complex system of interconnected elements whereby failure of one could lead to the failure of others. The vulnerability of infrastructure is often connected to the degree to which one infrastructure component depends upon another. Therefore, it is critical that these elements be viewed in relation to one another and not in isolation.

For the purposes of this CRA, critical infrastructure of similar types was grouped into the categories listed above. General considerations and concerns related to each critical infrastructure as it pertains to the provision of fire protection services for the town are included in Table 10 below.

[21] *As retrieved from https://www.ontario.ca/page/emergency-management-program-resources*

Table 10: Critical Infrastructure Overview

Identified Critical Infrastructure	Critical Infrastructure Sector	Issues / Concerns
Water Distribution and Reservoirs	Food and Water	• Water supply is essential for firefighting and is accessible through hydrant system • Damage to infrastructure could impede firefighting
Electricity Transmission and Distribution	Electricity	• Downed power lines cause safety concern for firefighters responding • Lack of heat/cooling resulting in increased assistance calls • Rescue operations may be required for individuals improperly running generators • Fires can be sparked by downed lines and transformers • High voltage electrical hazards present with fires at electrical substation • Chemical hazards possible with presence of cooling agents for electrical conductors
Radio Communications	Telecommunications	• Loss of radio communications results in significant challenges for fire service operations such as inability to communicate with crew and with first responders • Lack of uninterrupted power supply to radio systems and computers results in disruption of communications
Cellular towers and phone lines (911 dispatch)	Telecommunications	• Damage to telephone lines and towers results in lack of means of notifying first responders • Downed communication lines result in inability to complete transactions (fuel, necessities, supplies etc.) • Calls not dispatched or not dispatched on time (unknown if there is a secondary backup location to route to?) • Residents cannot call for assistance
Gas Distribution	Oil and Natural Gas Distribution	• Leaks in transmission lines and/or leaks in homes and/or places of assembly could require evacuation • Ignition sources may be unknown and create a risk to responders • Loss of heating for private homes when outside distribution fails, resulting in calls particularly from vulnerable population

Identified Critical Infrastructure	Critical Infrastructure Sector	Issues / Concerns
Roadways	Transportation	• Poor road conditions due to snow, ice, heavy rain create increased calls for assistance, as well as a hazard for responders • Damaged/impassable roads create a risk of damage to apparatus as well as increased calls for service where access may be difficult
Cyber Attack	Financial Institutions	• Disruption to commerce, and inability to access important systems and records necessary for fire service and/or emergency operations
Emergency Operations Centre (EOC)	Public Safety and Security	• There are primary, alternate, and virtual EOCs designated across the area • Widespread power loss and poor weather, or large-scale emergency may also impede access to one or both EOCs delaying major emergency response actions and communication, and potentially increasing losses associated with the emergency
Fire and Emergency Service Stations	Public Safety and Security	• The fire service is composed of 30 on-call volunteers and a full-time fire chief and 2 assistant chiefs. • Tillsonburg provides emergency fire communications to dispatching service to 28 municipalities across Ontario. • There is a police detachment in the town, police services are provided by the Ontario Provincial Police (OPP) • Station 3 of Oxford County Paramedic Services is located in the town. The next closest stations are in Norwich and Ingersoll (17-20 minutes) • A large-scale emergency or frequent events affecting either the region, could result in shortages of responders across the area
Government Operations	Public Safety and Security	• Municipal government closed due to extreme weather, cyber-attack, health emergency, location, civil disruption causes disruption to decision making, financial support, declaration of emergencies etc.

Identified Critical Infrastructure	Critical Infrastructure Sector	Issues / Concerns
Supply Chain Disruption	Public Safety and Security	• Prolonged disruptions to supply chains can impact apparatus replacement due to manufacturing delays (resulting in them going over lifetime) • Supply disruptions also have an unforeseeable but potentially impactful financially impact on running apparatus, as well as the ability to obtain/replenish PPE
Retirement Residences	Health	• Disruptions large number of people with mobility issues • Potential communication issues • Need for specialized medical equipment
Outbreak/Illness	Health	• A major outbreak or illness can create unexpected shortages in the workforce. Reduced staffing can result in inability to run an apparatus in a certain part of the town, as well as affect ambulance and police services for widespread illnesses • Illnesses and outbreaks can also increase medical calls in the region and have an increased cost in replenishing medical PPE
Tillsonburg District Memorial Hospital	Health	• A long-term disruption to this centre may result in increased calls for emergency transportation to facilities outside of the town • Next closest hospital in Ingersoll (20 minutes)

4.1.1 Water Infrastructure

Water supply is a critical infrastructure that is essential for firefighting. Having access to the town's water delivery systems is critical to service delivery. The system consists of 5 treatment facilities, 11 production wells, 4 reservoirs/towers and 144,869 m of pipe. The system overall is rated good with 56.7% of assets rated in good or excellent condition and 11.9% rated as poor or critical. The asset conditions however are steadily declining due to age. Many of the assets are approaching their expected useful life.

Fire flow, which is the available water supply for fire protection purposes, is available to 100% of properties. There are a total of 661 hydrants in the town. The average age of hydrants in the town is 28 years with an expected useful life of 40 years, and 40% of the hydrants in the town are rated to be in critical condition.[22] In addition to the hydrant and distribution system, water availability must be considered. The production wells are rated as being in good condition, however the reservoir system has been rated as fair. In dry summer months, water

[22] *Oxford County Asset Management Plan 2022*

use restrictions have been put in place to ensure adequate water availability. As expected with climate change and increasingly hot and dry conditions, these restrictions have become more frequent and more restrictive.

Key Finding: To ensure fire water availability, Tillsonburg has experienced more frequent water restrictions in hot and dry conditions. This is partly attributed to the state of the production wells and water reservoir systems, and reduced availability of water in reservoirs.

Alternate water supply sources can include fire services access to ponds, streams and alternative water supplies, and the use of fire suppression apparatus that have portable tanks that can support a tanker shuttle and a continuous supply of water to support fire suppression activities. According to the Fire Underwriter's Survey, an Accredited Superior Tanker Shuttle Service is a recognized equivalent to a municipal fire hydrant protection system if it meets all the requirements for accreditation. In areas without reliable municipal water supply, a fire service should consider a water servicing strategy or formal plan for those areas requiring water flow for firefighting. Tillsonburg currently has mutual aid agreements with Norfolk, Oxford and Elgin County for shuttle tank operations.

Identified Risk: The town's hydrants (fire flow) are aging and may be unreliable and showing steady decline in older neighbourhoods, increasing the risk of failure during a response.

SECTION 5
DEMOGRAPHIC PROFILE

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

5.1 Population and Dispersion

Over the past two decades (2001-2021), the Town of Tillsonburg's population and private dwellings have generally grown at a slower pace than the province overall, as shown in Table 11. However, from 2016 to 2021, both rates have significantly increased, almost tripling that of Ontario, as demonstrated in Table 12. These trends reflect similar patterns observed in smaller communities near major cities, where housing is scarce and costly. The COVID-19 pandemic, which has allowed more people to work from home, is expected to maintain these trends.

Table 11: Historic Growth in Population and Households – Town of Tillsonburg[23]

Year	Population	% Change	Total Private Dwellings	% Change
2001	14,052	6.4%	6,153	Not available
2006	14,822	5.5%	6,519	5.95%
2011	15,301	3.2%	7,072	8.48%
2016	15,872	3.7%	7,297	3.18%
2021	18,615	17.3%	8,229	12.77%

Table 12: Historic Growth in Population and Households - Ontario[24]

Year	Population	% Change	Total Private Dwellings	% Change
2001	11,410,046	6.1%	4,556,240	15.3%
2006	12,160,282	6.6%	4,972,869	9.1%
2011	12,851,821	5.7%	5,308,785	6.8%
2016	13,448,494	4.6%	5,598,391	5.2%
2021	14,223,942	5.8%	5,929,250	5.9%

Key Finding: The population of the town has increased by 17.30% between 2016 and 2021 and continues to grow. Rapid changes in population can affect service levels due to insufficient coverage and number of personnel.

[23] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

[24] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

5.2 Population Age

Identifying a community's population by age category is a core component of developing the CRA and identifying specific measures to mitigate risks associated with a specific age group, such as seniors. The age distributions of the town's population and Ontario's population are compared in Table 13.

Table 13: Population by Age Group – Town of Tillsonburg and Ontario[25]

Age	Tillsonburg Population	Tillsonburg Percentage of Population	Ontario Population	Ontario Percentage of Population
0 to 4 years	855	4.60%	683,515	4.81%
5 to 9 years	860	4.63%	764,430	5.37%
10 to 14 years	885	4.76%	803,850	5.65%
15 to 19 years	965	5.19%	801,455	5.63%
20 to 24 years	895	4.81%	895,600	6.30%
25 to 29 years	970	5.22%	975,400	6.86%
30 to 34 years	1,010	5.43%	981,210	6.90%
35 to 39 years	990	5.33%	948,030	6.67%
40 to 44 years	985	5.30%	890,160	6.26%
45 to 49 years	980	5.27%	894,580	6.29%
50 to 54 years	1,095	5.89%	941,270	6.62%
55 to 59 years	1,280	6.89%	1,040,160	7.31%
60 to 64 years	1,370	7.37%	966,575	6.80%
65 to 69 years	1,405	7.56%	813,215	5.72%
70 to 74 years	1,395	7.50%	691,280	4.86%
75 to 79 years	1,080	5.81%	469,485	3.30%
80 to 84 years	750	4.03%	325,110	2.29%
85 to 89 years	540	2.90%	205,480	1.44%
90 to 94 years	195	1.05%	101,430	0.71%
95 to 99 years	75	0.40%	28,000	0.20%
100 +	10	0.05%	3,705	0.03%
Total	18,615	100.00%	14,223,940	100.00%
Median Age of the Population	49.2		42	
Population aged 14 and under	2,630	14.15%	2,251,795	15.83%
Population aged 65 and over	5,450	29.32%	2,637,710	18.54%
** Note due to rounding totals may not reflect individual counts*				

[25] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

The youngest demographic (those 14 years of age and under) represents 14.15% of the town's total population, which is slightly lower in comparison to the province (15.83%). While at a lower risk of fatality in residential occupancies overall when compared to seniors or adults, youth (aged 14 years and under) represent an important demographic for the purposes of public education. As a result, there 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 Tillsonburg represents 29.32% of the total population, which is 10.78% higher than the province (18.54%). This is significant. An additional 14.26% of the town's population falls between the age group of 55 and 64, who are ageing 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.

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 (18.54% of the population) than there are children aged 14 years and younger (15.83%).[26]

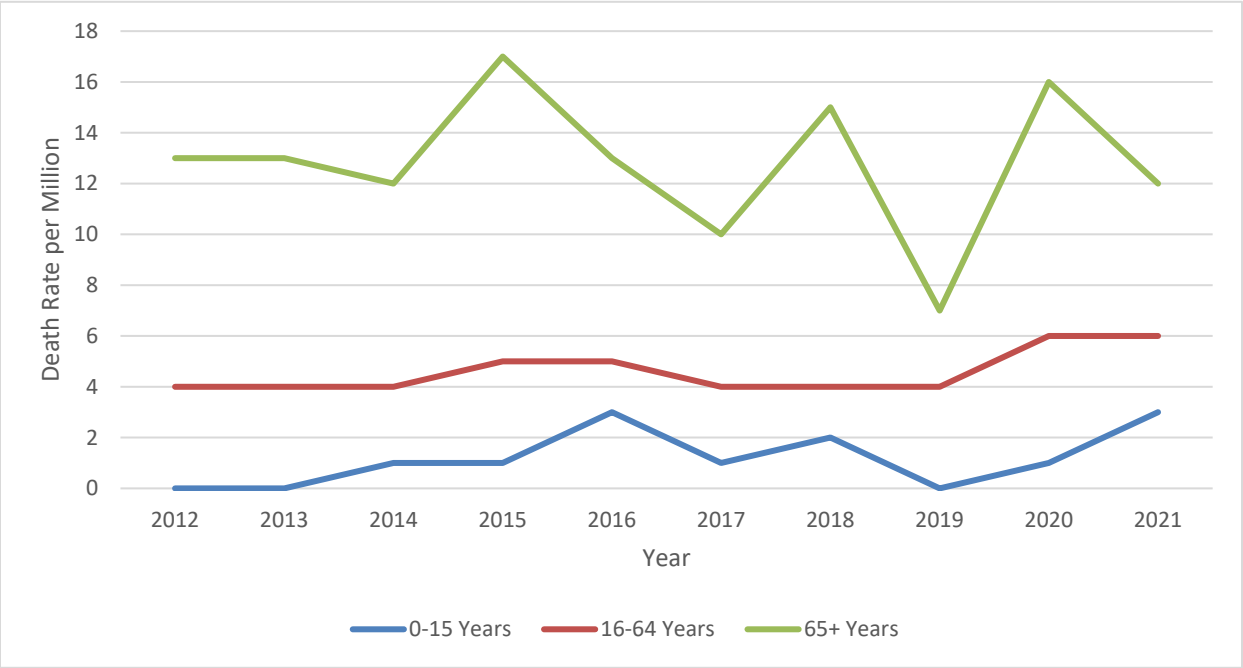
Key Finding: The population most vulnerable to fire related deaths (60 years and over) is increasing.

Seniors (those 65 years and over) are considered to represent one of the highest fire risk groups across the province based on residential fire death rate (fire deaths per million of population).

Figure 5 illustrates the number of fire deaths in Ontario from 2012 through 2021. Seniors are identified at an increased risk of fatality in residential occupancies when compared to other age groups.

[26] *Statistics Canada. (2017, May). The Daily: Age and sex, and type of dwelling data: key results from the 2016 Census. Retrieved from http://www.statcan.gc.ca/daily-quotidien/170503/dq170503a-eng.htm?HPA=1.*

Figure 5: 2012-2021 Residential Fire Death Rate by Age of Victim



Source: Adapted based on OFM reported residential fatal fires.[27]

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 sex as part of a CRA due to the finding that, based on historic data, males are more likely to be injured or die in a fire. Table 14 displays the distribution of both sexes by age for Tillsonburg. The proportion of males versus females is 47.77% male and 52.37% female. This is in line with the provincial gender breakdown of 49% men and 51% women. When specific age groups are reviewed, there are minor variations. Typically, one of the most significant differences is the proportion of males to females in the over 65 age group. In the case of Tillsonburg, the gap between men and women in the age 65 and over is 4.41% (26.91% men compared to females at 31.32%.). Based on these statistics, it is not anticipated that public education programming would be refined based on sex. The impact of sex 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.

[27] *Office of the Fire Marshal and Emergency Management. (Revised 2018, November). Ontario Residential Fatal Fires. Retrieved from Ministry of the Solicitor General Website*

Table 14: Gender Distribution by Age Group – Town of Tillsonburg[28]

Age Group	Total Population	Male	%	Female	%
0 to 4 years	855	445	5.01%	440	4.52%
5 to 9 years	860	435	4.90%	425	4.37%
10 to 14 years	885	445	5.01%	430	4.42%
15 to 19 years	965	475	5.35%	490	5.03%
20 to 24 years	895	480	5.41%	415	4.26%
25 to 29 years	970	490	5.52%	480	4.93%
30 to 34 years	1,010	490	5.52%	520	5.34%
35 to 39 years	990	495	5.57%	495	5.08%
40 to 44 years	985	460	5.18%	530	5.44%
45 to 49 years	980	505	5.69%	470	4.83%
50 to 54 years	1,095	560	6.31%	535	5.50%
55 to 59 years	1,280	590	6.64%	690	7.09%
60 to 64 years	1,370	610	6.87%	760	7.81%
65 to 69 years	1,405	630	7.09%	770	7.91%
70 to 74 years	1,395	635	7.15%	760	7.81%
75 to 79 years	1,080	475	5.35%	605	6.21%
80 to 84 years	750	350	3.94%	400	4.11%
85 to 89 years	540	205	2.31%	335	3.44%
90 to 94 years	195	70	0.79%	125	1.28%
95 to 99 years	75	25	0.28%	50	0.51%
100 +	10	0	0.00%	5	0.05%
Total	18,615	8,880	47.77%	9,735	52.37%
** Note due to rounding totals may not reflect individual counts*					

5.4 Socioeconomic Circumstances

Socioeconomic circumstances of a community are known to have a significant impact on fire risk. Socioeconomic status is reflected in an individual's economic and social standing and is measured in a variety of ways. These factors can be reflected in the analysis of socioeconomic indicators such as labour force status, educational attainment, and income as well as household tenure, occupancy, suitability, and cost.

[28] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

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.[29] The Sub-Model makes reference to the relationship between income and fire risk. As one consideration, households with less disposable income may be less likely to purchase fire safety products (e.g., smoke alarms, fire extinguishers, etc.), which puts them at higher risk of experiencing consequences from a fire. Another consideration is that households living below the poverty line may have a higher number of persons per bedroom in a household and/or children who are more likely to be at home alone. These circumstances would impact both the probability and consequence of a fire. While these complex relationships between socioeconomic circumstances and the probability / consequence of a fire are not well understood, this CRA seeks to explore these factors. The Town of Tillsonburg in particular has experienced an increase in diversity and cost of housing as well as an increased number of people living in a single house, all of which contribute to an increased risk associated with fire.

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
- 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 neighborhoods attract the homeless. This introduces risks such as careless smoking, drinking and unsafe heating practices.
- Building owners are less likely to repair building systems (electrical, mechanical, suppression) due to affordability, increasing fire risk from improper maintenance.
- Households with lower disposable income are less likely to purchase fire safety products (i.e. smoke alarms, extinguishers, cigarette ignition resistant furniture, etc.) due to affordability.
- Households with lower disposable income are more likely to have utilities shut off due to non-payment, leading to increased risks related to unsafe heating, lighting, and cooking practices.

[29] *Minister of the Solicitor General. (Modified 2016, February). Comprehensive Fire Safety Effectiveness Model: Fire Risk Sub-Model. Retrieved from Ministry of the Solicitor General Website*

- Single parent families are more economically challenged due to the fact that there is only one income. These households also have fewer resources to arrange childcare, increasing the likelihood of fires caused by unsupervised children.
- Studies have shown that cigarette smoking is inversely related to income. In Canada, findings by the Centre for Chronic Disease Prevention and Control through the National Population Health Survey established that there were nearly twice as many smokers in the lowest income group when compared against the highest (38% vs. 21% respectively).
- Those with low education and literacy levels are inhibited in their ability to read instruction manuals and warning labels and less likely to grasp fire safety messages.[30]

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

Labour force status, shown in Table 15 below, shows that Tillsonburg has a slightly lower participation rate than the province of Ontario (53.51% versus 62.80%). This would suggest that the town faces a slightly higher or comparable fire risk to the province from the perspective of labour force.

Table 15: Labour Force Status – Town of Tillsonburg and Ontario[31]

Status	Tillsonburg Population	Tillsonburg % Participation	Ontario Population	Ontario % Participation
In the Labour Force	8,385	53.51%	7,399,200	62.80%
Employed	7,415	47.32%	6,492,895	55.10%
Unemployed	975	6.22%	906,310	7.69%
Not in the Labour Force	7,285	46.49%	4,383,620	37.20%
Total	15,670	100.00%	11,782,820	100.00%

*Total - Population aged 15 years and over by labour force status

5.4.2 Educational Attainment

The relationship between educational attainment and income is complex. An analysis conducted by Statistics Canada has found that high-income Canadians are generally more likely to be highly educated. Approximately two thirds (67.1%) of the top 1% had attained a

[30] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 9, 2023).*

[30] *Statistics Canada. (Modified 2018, July). Education and occupation of high-income Canadians. Retrieved from Statistics Canada Website*

[31] *Ibid.*

university degree compared to 20.9% of all Canadians aged 15 and over.[32] Based on this national trend and for the purposes of this CRA it is assumed that a higher education leads to more disposable income and a lower fire risk. It is also assumed that households with more disposable income are more likely to invest in fire life safety products such as fire extinguishers and smoke alarms reducing the fire risk.

Table 16 displays educational attainment for the Town of Tillsonburg and the Province of Ontario.

Table 16: Educational Attainment – Town of Tillsonburg and Ontario[33]

Educational Attainment	Tillsonburg Population	Tillsonburg %	Ontario Population	Ontario %
No Certificate/Diploma/Degree	3,655	23.32%	1,799,890	15.28%
High School Diploma or Equivalent	5,150	32.87%	3,204,170	27.19%
Postsecondary Certificate; Diploma or Degree	6,865	43.81%	6,778,765	57.53%
Total	15,670	100.0%	11,782,820	100.00%

According to the 2016 Census, 43.81% of residents in Tillsonburg have a postsecondary Certificate, Diploma or Degree, which is approximately 13.72% lower than the province. This level of educational attainment is likely linked to the median household incomes found in the town.

According to the 2021 Census, the median total income of households for Tillsonburg in 2020 was $73,500, lower than the provincial median total income per household of $91,000.00.

Table 17: Median Income - Town of Tillsonburg and Ontario[34]

Geography	Median Employment Income Individual	Median Total Income Household
Tillsonburg	$35,600	$73,500
Ontario	$38,000	$91,000

5.4.3 Income Decile Groups

Income can also be viewed through the lens of income decile groups. As stated by Statistics Canada, a "decile group provides a rough ranking of the economic situation of a person based on his or her relative position in the Canadian distribution of the adjusted after-tax income of economic families."[35] Economic family income decile group for the population in private

[32] *Statistics Canada. (Modified 2018, July). Education and occupation of high-income Canadians. Retrieved from Statistics Canada Website*

[33] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

[34] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

[35] *Statistics Canada. (Updated 2016). Income Decile Group. Retrieved from Statistics Canada Website*

households in Tillsonburg is presented in Table 18**.** Tillsonburg has a higher portion of the population that falls within the bottom distribution of income decile groups (56.24%) when compared to the province (46.44%). These statistics may be suggestive of a higher fire risk.

Table 18: Economic Family Income Decile Group for the Population in Private Households – Town of Tillsonburg and Ontario - 2021 Census, Statistics Canada[36]

Decile Group	Tillsonburg Population	Tillsonburg %	Ontario Population	Ontario %
In the bottom half of the distribution	10,290	56.24%	6,516,085	46.44%
In the top half of the distribution	8,010	43.78%	7,515,670	53.56%
Total	18,295	100.00%	14,031,755	100.00%

Key Finding: When comparing the socio-economic factors of the residents of Tillsonburg in comparison to the province, it may suggest there is a slight increase of risk of fire to the town, however the fire statistics do not reflect an increased risk.

5.4.4 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 town has a higher proportion of dwellings that are owned versus rented when compared to the province (70.78% owned in Tillsonburg versus 68.40% in the province). See Table 19 below.

5.4.4.1 Occupancy

A higher proportion of multiple persons per household can result in increased fire loss (consequence) resulting in a higher risk. There are 40 households (0.49% of total households) that have more than one person per room in Tillsonburg. This reflects a lower percentage compared to the province where 3.0% of households have more than one person per room. See Table 20 below.

5.4.4.2 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, 3.10% (or 255 households) are classified as "not suitable" within the town, compared to 6.70% for the province as a whole. From the perspective of housing suitability, the town has a lower fire risk than the province. See Table 21 below.

[36] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

5.4.4.3 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 less funds to purchase household fire life safety items resulting in a higher risk. In Tillsonburg, 17.69% of households spend 30% or more of the household total income on shelter costs. This is approximately 6.54% less than the province, where 24.23% of households spend 30% or more of their income on shelter costs.

Looking closer at shelter costs, the median value of dwellings in Tillsonburg is $500,000 ($200,000 lower than the provincial median). The town also has lower median monthly shelter costs for owned and rented dwellings than the province. See Table 22 and 23 below.

Table 19: Household Tenure – Town of Tillsonburg and Ontario[37]

Household Tenure	Tillsonburg	%	Ontario	%
Owner	5,825	70.78%	3,755,720	68.40%
Renter	2,405	29.22%	1,724,970	31.41%
Total	8,230	100.00%	5,491,200	100.00%

Table 20: Household Occupancy – Town of Tillsonburg and Ontario[38]

Household Occupancy	Tillsonburg	%	Ontario	%
One person or fewer per room	8,190	99.51%	5,328,575	97.04%
More than one person per room	40	0.49%	162,625	2.96%
Total	8,230	100.00%	5,491,200	100.00%

Table 21: Household Suitability – Town of Tillsonburg and Ontario[39]

Housing Suitability	Tillsonburg	%	Ontario	%
Suitable	7,970	96.84%	5,122,185	93.28%
Not suitable	255	3.10%	369,015	6.72%
Total	8,230	100.00%	5,491,200	100.00%

[37] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*
[38] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*
[39] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

Table 22: Shelter Costs – Town of Tillsonburg and Ontario[40]

Shelter Costs	Tillsonburg	%	Ontario	%
Spending less than 30% of household total income on shelter costs	6,745	82.31%	4,103,320	75.77%
Spending 30% or more of household total income on shelter costs	1,450	17.69%	1,312,095	24.23%
Total	8,195	100.00%	5,415,420	100.00%

Table 23: Median Costs of Dwellings – Town of Tillsonburg and Ontario[41]

Median Costs	Tillsonburg	Ontario
Median value of dwellings	$500,000	$700,000
Median monthly shelter costs for owned dwellings	$900	$1,440
Median monthly shelter costs for rented dwellings	$1,000	$1,300

Key Finding: When comparing housing tenure for the town of Tillsonburg to that of the Province, Tillsonburg appears to have a lower fire risk.

5.5 Cultural Background, Language Considerations

Cultural background and language considerations can be factors for fire service providers to consider in developing and delivering programs related to fire prevention and public education. Communication barriers, in terms of language and the ability to read written material, may have an impact on the success of these programs. There may also be familiarity challenges related to fire safety standards within newcomer populations. A high proportion of immigrants could demonstrate a large population that has a potential for unfamiliarity with local fire life safety practices and/or may experience possible language barriers. Table 24 summarizes the immigration status of Tillsonburg's population. The town has less than half of the proportion of newcomers (12.54%) when compared to Ontario (29.98%), and the majority of which immigrated prior to 1980, therefore should have considerable understanding of fire safety practices and the English language, which is demonstrated in Table 25.

[40] *Ibid.*

[41] *Ibid.*

Table 24: Immigration Status – Town of Tillsonburg and Ontario[42]

Immigration Status	Tillsonburg Population	Tillsonburg %	Ontario Population	Ontario %
Non-immigrants	15,985	87.37%	9,437,320	67.26%
Immigrants	2,295	12.54%	4,206,585	29.98%
Before 1980	1,150	6.29%	860,305	6.13%
1980 to 1990	410	2.24%	506,195	3.61%
1991 to 2000	245	1.34%	852,765	6.08%
2001 to 2010	255	1.39%	941,630	6.71%
2011 to 2015	135	0.74%	461,010	3.29%
2016 to 2021	105	0.57%	584,680	4.17%
Non-permanent residents	20	0.11%	387,850	2.76%
Total	18,295	100.00%	14,031,755	100.00%

Knowledge of official languages based on the 2021 Census is included in Table 25 for Tillsonburg and Ontario.

As illustrate below, 96.69% of the population in the town have knowledge of English only, 3.04% possess knowledge of both English and French, 0.24% have no knowledge of English or French, and 0.03% speak French only. The potential for communication barriers is considered to be very low.

Table 25: Knowledge of Official Language – Town and Tillsonburg and Ontario[43]

Language	Tillsonburg Total	Tillsonburg %	Ontario Total	Ontario %
English Only	17,840	96.69%	12,196,575	86.50%
French Only	5	0.03%	39,310	0.28%
English and French	560	3.04%	1,519,365	10.78%
Neither English nor French	45	0.24%	344,545	2.44%
Total (non-institutional)	18,450	100.00%	14,099,790	100.00%

5.6 Transient Populations and Commuting

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 or week or throughout the year. Population shift can be a result of a number of factors including employment, tourism, and education. In some municipalities, residents regularly leave the community for employment. This can contribute to increased traffic resulting

[42] *Ibid.*

[43] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

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 seasonal availability of tourism activities. This can result in an increased risk due to overnight tourism accommodation (sleeping) which can impact the demand for fire protection services. Educational institutions can attract a transient student population who commute to school daily or reside in dormitories or student housing on a seasonal basis.

Student accommodations and short-term rental 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 service, posing a challenge for fire prevention division staff responsible for fire code enforcement.

5.6.1 Tourism

An increase in tourism can result in an increased risk due to overnight tourism accommodation which can impact the demand for fire protection services. There are several town-hosted events each year and attractions that draw 5,000-6,000 residents and non-residents each year. Annual events throughout the year include, but are not limited to:

- TurtleFest
- Tillsonburg Fair
- Ribfest

Tillsonburg fairs and events can draw large crowds which can increase calls for medical aid, crowd, and traffic control, however a large influx of serious incidents is not expected to overwhelm response capabilities.

5.6.2 Education

Educational institutions are a key source for population shift in larger communities as they attract people from outside of the typical community. They are important to consider since they may have school-based residences or contribute to a population that is not captured through the census. The City of London is the closest urban centre with several large post-secondary institutions. The city is approximately a one-hour commute from Tillsonburg. When looking at the age statistics for Tillsonburg, combined with commuting distance, it is unlikely that many students are living in student housing and commuting to the city.

5.6.3 Commuting

Commuter populations represent a significant portion of Tillsonburg's labour force. Table 26 shows the commuting destination trends for the residents of Tillsonburg in comparison with Ontario based on 2021 Census data. Both the province and town have roughly the same percentage of labour force which commutes to a different census subdivision within the census division of residence. An additional 30.06% commute to a different census division within the province. This is slightly higher than the provincial commuters (23.50%)

A shift in commuter population may impact the demand for fire protection services. These figures are important from a fire suppression standpoint as large numbers of people

commuting in and out of the city could increase the number of vehicle collision calls to which the fire service responds. This is unlikely to be a key risk for Tillsonburg.

Table 26: Commuting Destinations – Town of Tillsonburg[44]

Commuting Destination*	Tillsonburg Total	Tillsonburg %	Ontario Total	Ontario %
Commute within census subdivision of residence	2,880	52.32%	2,212,620	58.72%
Commute to a different census subdivision within census division of residence	970	17.62%	653,055	17.33%
Commute to a different census subdivision and census division within province or territory of residence	1,655	30.06%	885,485	23.50%
Commute to a different province or territory	0	0.00%	17,050	0.45%
Total	5,505	100.00%	3,768,210	100.00%

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

[44] *Statistics Canada. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed June 15, 2023).*

SECTION 6
HAZARD PROFILE

As referenced in the O. Reg. 378/18, the hazard profile assessment includes analysis of the hazards within the community, including natural hazards, hazards caused by humans, and technological hazards to which a fire service may be expected to respond, that may have a significant impact on the community. This section considers these hazards within the Town of Tillsonburg.

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 plan for the risks within their communities and take the appropriate action to reduce future losses. 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 has 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. Current legislation requires an annual review and update of the municipally developed HIRA.

6.1.1 HIRA and the Community Risk Assessment

The OFM T.G.-02-2019 and OFM "Question and Answers" provide guidance on the role of a completed 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 a fire service response to various types of emergencies identified in a completed HIRA."

A HIRA is a comprehensive process 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 service. For the purposes of this CRA, a "fire protection services" lens will be applied to the top hazards as identified through the municipal led HIRA.

6.1.1 Town of Tillsonburg Hazard Identification and Risk Assessment

The town's HIRA was reviewed and updated in 2022 indicating that Tillsonburg has complied with its legislative requirements. As a component of the risk assessment and risk analysis process, the top risks in Tillsonburg were identified. The HIRA assigned likelihood and consequence levels to a list of hazards based on the potential for impacts to people, property, and the environment. As a result of this analysis, the top hazards in the town include the following:

- Fire/explosion

- Winter weather (blizzard, freezing rain, snowstorms)
- Human health emergency (pandemic)
- HAZMAT spill – fixed site/transportation
- Tornado/windstorm

To better understand the risks of hazards as they pertain to fire protection services, the top five hazards have been assessed to identify possible impacts on fire protection services (excluding fire/explosion). Many of the potential impacts are not unique to a jurisdiction. The results of this review as they pertain to the top five hazards in the town are presented in Table 27.

Key Finding: The town's 2023 Hazard Identification and Risk Assessment (HIRA) identifies hazards that could each impact the ability of Tillsonburg Fire and Emergency Services to deliver fire protection services.

Table 27: Impacts of Hazards on Fire Protection Services

Hazard	Possible Impact
Winter Weather	In 2023, a major ice storm in Ontario and Quebec knocked out power for over one million people, caused fatalities and severe damage to property and infrastructure. On average the town receives 4 feet of snow during the winter. A major snow event can produce accumulation of up to 40 cm[45] **Overall Impact (from HIRA)** Above ground power lines could be impacted along with road treatments, debris clearing; salt gravel or other road treatment supplies. Visibility can cause traffic accidents on roadways or prevent movement of goods and services. Accidents on roadways may lead to leaking/spill of hazardous materials. **Fire Services** Depending on the severity of the debris on roads and downed power lines, access to various sections of the road network could be limited to fire service response delaying emergency response times. Interruptions to communication towers could impact fire service communications. The number and severity of motor vehicle collisions will increase. This could include hazardous material response.

[45] *As retrieved from https://www.tillsonburg.ca/living-here/roads-sidewalks-and-parking/snow-and-ice-control/*

Hazard	Possible Impact
Human Health Emergency (Pandemic)	The 2020 COVID 19 Pandemic implications are still having a negative impact on communities. **Overall Impact (from HIRA)** Medically vulnerable persons are at risk. Increased use of non-recyclable PPE for staff. Critical infrastructure must be maintained with planning for staffing and acquisition of critical supplies. **Fire Services** Epidemic or pandemic breakout can present significant challenges to first responders causing potential fire service workplace absenteeism, and an increased demand for medical response and supplies as was illustrated during COVID 19. PPE was severely limited and supply chain issues for all equipment impacted operations. In many cases planned programming related to inspections and public education had to be delayed or modified.
HAZMAT spill – fixed site/transportation	In 2022 a chemical spill in the town resulted in the evacuation of homes and road closures. **Overall Impact (from HIRA)** Serious injury or fatality. Possible secondary emergencies such as fire or explosion when chemicals mixed with air, water, or other agents. Could require small or large scale evacuation of homes, businesses, school etc. **Fire Services** Depending on the severity and type of release, could pose secondary risk to firefighters on-scene. Must have proper knowledge of chemical release. May not be able to access the scene until proper back-up arrives or have proper information.
Tornado/Windstorm	The Tillsonburg and surrounding area have had tornado warnings (last known 2023) in effect and funnel clouds have been reported (2009). **Overall Impact (from HIRA)** Above ground power lines, toppled trees could impact buildings or roads and winds could take down communication towers. **Fire Services** Depending on the severity of the debris on roads and downed power lines, access to various sections of the road network could be limited to fire service response delaying emergency response times. Interruptions to communication towers could impact fire service communications.

SECTION 7
PUBLIC SAFETY RESPONSE PROFILE

7.1 Public Safety Response Agencies in Tillsonburg

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

Table 28 lists the public safety response agencies who could be able to assist the town in a collective emergency response effort and may contribute to the minimization of risk within the community. Identifying the public safety response agencies within the community can help the fire service understand the agencies that may be able to assist in the response to an emergency.

Table 28: Public Safety Response Agencies

Public Safety Response Agency	Types of Incidents they Respond to	Agency Role in Incident
Tillsonburg Fire and Emergency Services	• Residential, commercial, and industrial fires • Motor vehicle collisions • Medical emergencies • Natural gas and propane emergencies • Water rescue • Carbon monoxide emergencies • Hazardous and flammable materials spills and leaks • Elevator rescues	• Firefighting • First on scene medical response • Vehicle extrication • Dangerous goods containment/clean up (from vehicle) • Rescue • Leak detection and containment
Ontario Provincial Police (Oxford County)	• Provincial highway and waterway incidents • Major crimes i.e., homicide, kidnapping, organized crime	• Respond to incidents on provincial highways and waterways • Investigate cross-jurisdictional and major crimes • Provide air support for search and rescue • Offender transport
Office of the Fire Marshal	• Fire	• Assistance with managing fire and obtaining resources beyond capability of town
Oxford County Paramedic Services	• Advanced EMT pre-hospital care • Mass casualty incidents • Evacuation of health facilities (hospital, nursing homes etc.) • Disease related emergencies	• Ensuring provision of paramedic services at the site of the emergency • Ensuring continuity of paramedic services coverage is maintained throughout the remainder of the community/county. • Liaise with the Medical Officer of Health to help facilitate medical services at the hospital.
Southwest Public Health	• Communicable Diseases • Health Inspection Services • Advice on Medical Services • Public Health Advisory • Liaise with long term care facilities, hospitals, retirement homes, and other vulnerable populations as required	• Provide information and instructions to the County Control Group (CCG) and the population on matters concerning public health. • Protect the health of the community from inherent health threats by enforcement of the applicable legislation. • Continue delivery of established programs to ensure continuity of care and general health protection.

Public Safety Response Agency	Types of Incidents they Respond to	Agency Role in Incident
Victim Services of Oxford County	• Serious assault • Domestic violence • Sexual assault • Stalking	• Immediate crisis response • Vitim assistance • Victim support and needs assessment
CANUTEC	• Hazardous spills/emissions	• Product information • Safe handling information • emergency actions
Ministry of Natural Resources	• Spills • Environmental disasters	• Provide personnel and equipment for cleanup and remediation
Ministry of Environment	• Spills • Environmental disasters	• Provide personnel and equipment for cleanup and remediation
Emergency Management Ontario	• Large-scale emergencies requiring declaration of state of local emergency	• Provincial level support • Communication

7.1.1 Mutual Aid Agreements

Large emergency events quickly overwhelm the response capacity of most municipal fire departments. This is especially true for smaller fire departments with limited resources. As a result, mutual aid and automatic aid agreements are a necessary component in adding response capacity for these low frequencies but potentially high or extreme consequence events.

Mutual aid agreements between fire departments allow them to assist each other across jurisdictional boundaries. Typically, this happens when local emergencies exceed local resources. They may include fire response, and/or specialty response services including rescue, dangerous goods. Any response would be made by the requesting agency and is not pre-determined in the case of automatic aid. The requested agency may or may not be able to fulfill the request.

Automatic aid agreements ensure a provision of initial or supplemental response to fires, rescues, and emergencies where a fire department situated in a neighbouring municipality can provide a response quicker than any fire department situated in the requesting municipality.

The Province of Ontario through the Office of the Fire Marshall has developed a provincial wide mutual aid plan (MAP) to formalize and maintain mutual aid and automatic aid agreements for identified areas coordinated through an Ontario Fire Marshall appointed fire coordinator. Each area will develop and maintain their respective MAP consistent with the Ontario plan.

The principle of operation of MAPs is to promote and ensure adequate and coordinated efforts to minimize loss of human life and property, as well as damage to the environment through the efficient utilization of fire department and provincial resources in the event of a mutual aid activation during times of natural or human-made emergencies.

In the event of an emergency, the Town of Tillsonburg Emergency Management Plan (By-law 2022-083) guides the municipality's response, mitigation and recovery. This Bylaw assigns designated corporate positions to the Emergency Management Program Committee (EMPC) including the position of Emergency Management Program Coordinator (CEMC) as well as ad Hoc members from other agencies based on the nature of the emergency.

In the event an emergency over tasks the resources of the municipality, and requires additional assistance, the EOC Commander may request assistance from neighbouring municipal or the Office of the Fire Marshal and/or Emergency Management through the Provincial Emergency Operations Centre (PEOC). The Town of Tillsonburg participates in mutual aid with Oxford, Norfolk and Elgin Counties. Automatic aid is provided by TFES to Bayham in the Elgin County.

SECTION 8
COMMUNITY SERVICES PROFILE

The community services profile assessment includes analysis of the types of services provided by other entities in the community, and those entities' service capabilities. This includes the presence or absence and potential abilities of other agencies, organizations, or associations to provide services that may assist in mitigating the impacts of emergencies to which the fire service responds. The following sections consider these community service characteristics within the Town of Tillsonburg

8.1 Community Services in Tillsonburg

Fires and other emergency events can have devastating effects on a community and at times can overwhelm public safety and security agencies' capacity to respond. In an emergency event, community-based agencies, organizations, and associations can provide surge capacity to the response and recovery efforts of first responders and a useful resource to call upon if integrated into the emergency management framework early on. These types of affiliations can contribute a variety of capabilities essential to response and recovery efforts including support in the areas of communications, health care, logistics, shelter, food and water supply, emergency clothing, and more specialized skill sets. Table 29 lists the community agencies, as well as members of the network of Non-governmental Organizations (NGO) Alliance of Ontario, which area available to all municipalities.

Table 29: Community Service Agencies

Community Service Agency	Assistance Provided
Tillsonburg Legion Branch #153	• Reception centre for evacuees • Distribution of goods and essential items
Oxford County Human Services	• Support to families and children struggling with mental health issues • Provide child protective services • Support to families struggling with financial issues
London Search and Rescue	• Assist emergency services with search and rescue: ice/water, ground, ELT detection, aircraft searching, rope rescue
Local School Boards: Thames Valley District School Board, London District School Board	• Life safety education
In-Home Personal Support Services Oxford and Norfolk	• Health care at home, school and in community • Supported living • Long-term care
Community Living Tillsonburg	• Supports adults with developmental disabilities • Residential services and community participation support
Oxford County Walk-In Counselling	• Addiction and mental health support

Community Service Agency	Assistance Provided
Non-Governmental Organizations Alliance of Ontario	
Canadian Red Cross	• Assist with obtaining basic needs of those victims of large-scale disaster • Emergency shelter and feeding locations • Donation management
Salvation Army	• Donation management • Food/clothing • Victim support • Long-term recovery support for victims
St John's Ambulance	• Medical support for reception centres • Health related screening • Transportation for victims • Assist with evacuation of hospitals and health care facilities • Training
Ontario SPCA	• Responds to needs of animals in event of emergency/disaster
Mennonite Disaster Service	• Cleanup and debris removal
Samaritan's Purse	• Can remove damaged or destroyed content from homes • Clean and remediate flooded homes
Team Rubicon	• Incident management assistance • Disaster management • Infrastructure support • Hazard mitigation • Light demo and debris removal
Society of Saint Vincent de Paul	• Provide vouchers to obtain furniture, clothing, and accessories
ADRA	• Manages collection, triage, storing and distribution of in-kind donations
GlobalMedic	• Deploy large field tents for infrastructure and logistical needs, filed hospitals, clinics • Medically trained paramedics, first responders, doctors, and nurses
Billy Graham Rapid Response Team	• Chaplains trained for emotional and spiritual care following a disaster
World Renew Disaster Response Services	• Rebuilding projects • Unmet needs assessment

Key Finding: This list of community services demonstrates that the town is very well supported in the event of a major or serious emergency.

SECTION 9
ECONOMIC PROFILE

An economic profile assessment includes analysis of the economic sectors affecting the community that are critical to its financial sustainability. This involves economic drivers in the community that have significant influence on the ability of the community to provide or maintain service levels. The following sections consider these economic characteristics within Tillsonburg.

9.1 Economic Sectors and Employers in Tillsonburg

Certain industries, employers and events contribute to the financial sustainability and economic vitality of a community. A fire or other emergency at key sectors and employment facilities within a community could have significant impacts on the local economy and employment.

The top manufacturing and non-manufacturing employers in the town are summarized in Table 30 and 31 below.

Table 30: Major Manufacturing Employers in Tillsonburg

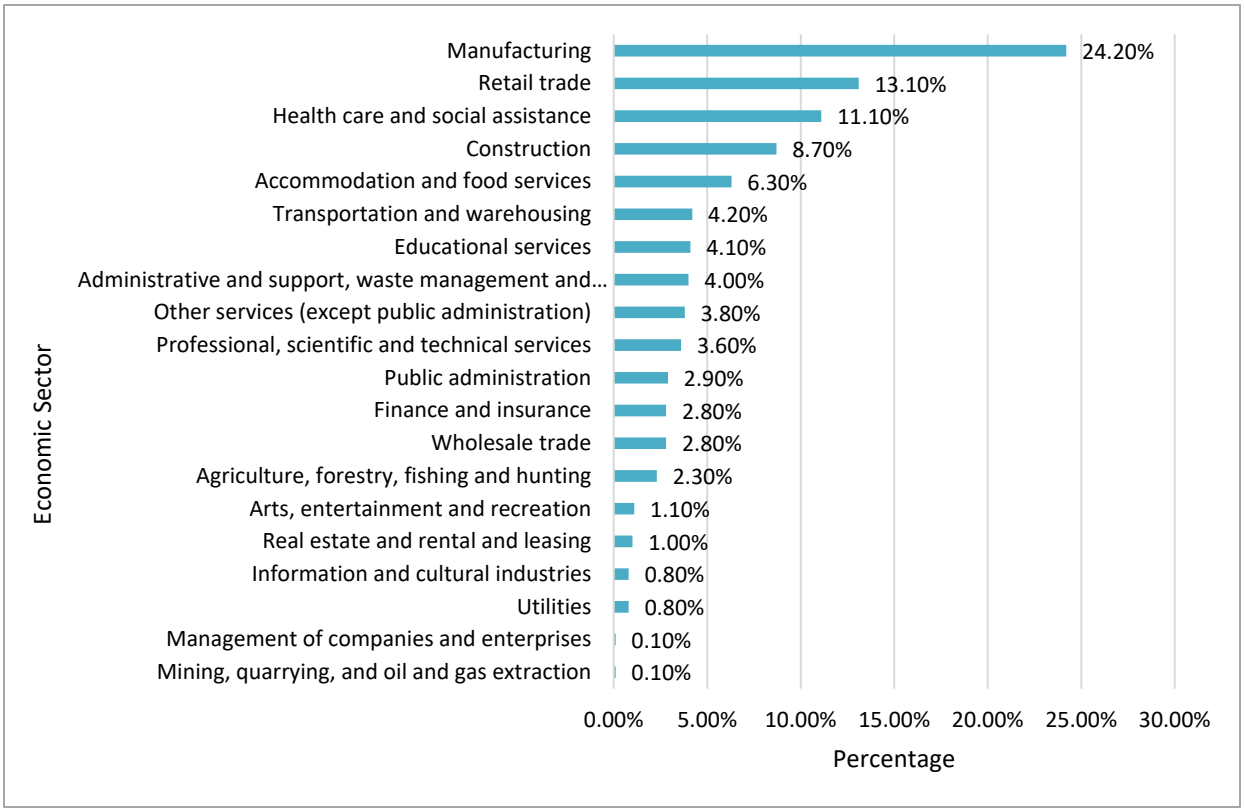
Company	Product/Service	Number of Employees
Marwood International	Manufacturer of stamped automotive components	450
THK Rhythm Automotive Canada	Steering components	345
Autoneum Canada Ltd.	Noise control and thermal insulation systems for automobiles	340
Inovata Foods	Frozen food entrees	259
Fleetwood Metal Fabrication	Metal stampings	200
Adient Seating Canada LP	Foam seating 200	180
Electrical Components International	Electrical component services	150
Freudenberg – NOK	Elastomeric seals and custom molded products	135
Martinrea International Inc	Automotive component	100
Hoover Enterprises	Fabrication and weld shop	78

Table 31: Major Non-Manufacturing Employers in Tillsonburg

Company	Product/Service	Number of Employees
Tillsonburg District Memorial Hospital	Medical services	305
Community Living	Health care & social services	158
Metro	Retail	150
Walmart Tillsonburg	Retail	150
Town of Tillsonburg	Government	135
Maple Manor Nursing Home	Health care & social services	132
Sobeys	Retail	118
Ontario Provincial Police	Government	110
Glendale High School	Education	81

Key Finding: The town has identified top employers that contribute to the economic vitality of the community. The largest of these are industrial type manufacturing plants. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the town.

Figure 6: Economic Sectors (2021)



As displayed, roughly 24.20% of the employed population works in manufacturing, with an additional 13.10% in retail and 11.10% in health care and social assistance. Tillsonburg has a strong and diverse labour force. A large percentage tend to be skilled in the trades sectors, related to the automotive sector. There are several large and mid-sized companies that hire a relatively large percentage of the workforce, however there is no single large employer responsible for the majority of the employment in the town, although the disruption to one or more companies in these top sectors could put a significant amount of people out of work.

SECTION 10.0
PAST LOSS & EVENT HISTORY

As referenced in O. Reg. 378/18, the past loss and event history profile assessment includes analysis of the community's past emergency response experience, including an analysis of the number and types of emergency responses, injuries, deaths and dollar losses, and a comparison of the community's fire loss statistics with provincial fire loss statistics. Evaluation of previous response data will inform decisions on fire protection services delivery including public fire safety education and inspection programs. The following sections consider these past loss and event history characteristics within the town of Tillsonburg (*note some data not currently available for the province at time of analysis*).

10.1 Past Loss

Analysis of historical data provides valuable insight into understanding the specific trends within a community. Assessing the key factors of life safety risk and fire risk in relation to provincial statistics provides a foundation for evaluating where specific programs or services may be necessary. The analysis within this section is based on the OFM's Standard Incident Reporting for the period of January 1st, 2018, to December 31st, 2022 (*note some data not currently available for the province at time of analysis*).

10.1.1 Total Fire Loss

Analysis of the total fire loss within the town over the five-year period from January 1st, 2018, to December 31st, 2022, as displayed in Table 32 includes three categories representing the primary types of fires and the total amount of dollar loss associated with these fires. This includes 43 structure fires, 13 outdoor fires, and 6 vehicle fires representing $12,396,800 in total dollar loss. It should be noted however there were two significant fires in multi-storey (<5 storeys) buildings in 2022, which greatly impacted the average loss over this time. Over this five-year period, the town averaged 14.2 fires per year and $2,479,360 in property loss per year. On average, 8.6 structure fires occur per year with an average structural fire property loss of $2,446,220 per year. It should be noted that losses are estimated, and the actual loss amount is unknown and not published by the Insurance Board of Canada.

Table 32: Total Fire Loss - Town of Tillsonburg[46]

Year	# Structure Fires	Loss ($) *	# Outdoor Fires	Outdoor Loss ($)	# Vehicle Fires	Vehicle Loss ($)	Total # of Fires	Total Loss ($)
2018	5	$376,500	1	$1,000	0	$0	6	$377,500
2019	7	$1,080,000	0	$0	2	$62,200	9	$1,142,200
2020	9	$377,000	1	$15,000	2	$12,000	12	$404,000
2021	13	$2,260,500	0	$0	2	$75,500	15	$2,336,000
2022	9	$8,137,100	11	$0	0	$0	29	$8,137,100
TOTAL	**43**	**$12,231,100**	**13**	**$16,000**	**6**	**$149,700**	**71**	**$12,396,800**
% of All Fires/Loss	60.56%	98.66%	18.31%	0.13%	8.45%	1.21%	100.00%	100.00%
Average	8.6	$2,446,220	2.6	$3,200	1.2	$329,940	14.2	$2,479,360
** Loses are estimated. Actual loss unknown and not published by Insurance Bureau of Canada.*								

Table 33 compares the number of structure fires and the associated total property loss within the Town of Tillsonburg, to the number of structure fires and total property loss that occurred across Ontario for the same period (*note some data not currently available for the province at time of analysis*). The town experienced an average of 8.6 structure fires per year over the five-year period representing an average of 12.11% of all fires that occurred in the town. Between 2018 and 2021, the province experienced an average of 6,911 structure fires per year representing an average of 16.06% of all fires that occurred in the province. This structure fire analysis indicates that the average number of structure fires in Tillsonburg is slightly lower than the provincial average, however it is noted that the sample size is comparably low for Tillsonburg and data for Ontario is incomplete.

[46] *OFM SIR Data -Tillsonburg 2018-2022*

Table 33: Structure Fires and Property Loss – Town of Tillsonburg and Province of Ontario[47]

Year	Tillsonburg Structure Fires	Structure Loss ($)	% All Fires	% All Loss ($)	Ontario Structure Fires	Structure Loss ($)	% All Fires	% All Loss ($)
2018	5	$376,500	7.04%	3.04%	7,012	$734,300,000	16.29%	19.91%
2019	7	$1,080,000	9.86%	8.71%	6,715	$860,400,000	15.60%	23.33%
2020	9	$377,000	12.67%	3.04%	6,841	$790,700,000	15.90%	21.44%
2021	13	$2,260,500	18.31%	18.23%	7,076	$857,800,000	16.44%	23.26%
2022	9	$8,137,100	12.67%	65.64%	No Data	No Data	No Data	No Data
Average	8.6	$2,446,220	12.11%	19.73%	6,911	$810,800,000	16.06%	21.98%
Total for all Structure Fires	43	$12,231,100	60.55%	98.66%	27,644	$3,243,200,000	64.24%	87.93%
Total for all fires with Loss	71	$12,396,800	100.00%	100.00%	43,032	$3,688,300,000	100.00%	100.00%

[47] *OFM SIR Data – Ontario 2018-2021, Tillsonburg 2022*

10.1.2 Fires by Occupancy Type

This section assesses the structure fires that occurred over the period from January 1st, 2018, to December 31st, 2022, based on the type of occupancy. Information retrieved from the OFM's Standard Incident Reporting was utilized to inform this analysis.

The analysis in Table 34 indicates that during this period, Tillsonburg experienced a total of 44 structure fires (26 of these fires, or 74.29% occurred in Group C-Residential Occupancies. These fires were responsible for 96.32% of the town's total fire loss for this period. In comparison, structure fires in Group C-Residential Occupancies accounted for 74.1% of structure fires across the province and 66.8% of all fire loss. Over this period, Tillsonburg experienced a similar rate of fires in Group C-Residential Occupancies than that of the province however a 30% higher dollar loss in Group C-Residential Occupancies.

The second most significant source of property loss in the town accounting for 5.71% of structure fires and 2.44% of the total structure fire loss over the same period are Group E – Mercantile occupancies. Tillsonburg has roughly 2% higher occurrence of fires in Group F occupancies than the province however the fire loss is 2.0% lower.

Table 34: Fires by OBC Major Occupancy Classification – Town of Tillsonburg (2018-2022) and Province of Ontario (2018-2021)[48]

Group	Occupancy Classification	# of Fires	Tillsonburg % of Structure Fires	Tillsonburg Fire Loss	Tillsonburg % of Fire Loss	Ontario % of Structure Fires	Ontario % Fire Loss
A	Assembly	2	4.65%	$15,000	0.12%	3.30%	4.30%
B	Care & Detention	0	0.00%	$0	0.00%	1.40%	0.90%
C	**Residential**	**34**	79.07%	**$12,080,600**	98.76%	**74.10%**	**66.80%**
D	Business & Personal Services	1	2.33%	$1,000	0.01%	2.40%	2.40%
E	Mercantile	2	4.65%	$100,000	0.82%	3.30%	4.20%
F	Industrial	3	6.98%	$35,000	0.29%	7.30%	11.70%
Other	Not Classified in OBC	1	2.33%	$500	0.00%	5.30%	1.10%
Farm	Classified in the National Building Code (NBC)	0	0.00%	$0	0.00%	2.70%	8.50%
	Total	43	100.00%	$12,232,100	100.00	100.00%	100.00%

Key Finding: For the period from January 1st, 2018, to December 31st, 2022, Tillsonburg experienced a similar rate of fires in Group C-Residential Occupancies than that of the province but a much higher percentage of dollar loss. This can be attributed to a significant mire with loss in a multi-unit residential building in 2022.

[48] *OFM SIR data, Tillsonburg 2018-2021*

10.1.3 Civilian Fatalities and Injuries

As shown in Table 35, according to OFM Standard Incident Reporting, over the five-year period from January 1st, 2018, to December 31st, 2022, there were 2 reported injuries and no reported fire fatalities within Tillsonburg. The only injuries 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 town occurred in Group C – Residential occupancies.

Table 35: Civilian Fire Fatalities and Injuries by OBC Major Occupancy Classification – Town of Tillsonburg (2018-2022)

Group	Occupancy Classification	Injuries	Fatalities
A	Assembly		0
B	Care & Detention		0
C	Residential	2	0
D	Business & Personal Services		0
E	Mercantile		0
F	Industrial		0
Other	Not Classified in OBC		0
Farm	Classified in the NBC		0
	Total	**2**	0

Key Finding: For the period from January 1st, 2018, to December 31st, 2022, 100% of the civilian injuries and fatalities were in residential occupancies. This is comparable to that of the province.

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."[49] 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 36 presents the reported fire causes for the town compared to the province over the five-year period from January 1st, 2018, to December 31st, 2022. Overall, the leading reported fire causes are consistent with the province.

The "intentional" category recognizes the cause of a fire to be started for a specific reason. These are typically classified as arson fires, acts of vandalism, or to achieve personal gain

49 Source: N.F.P.A., Glossary of Terms, 2019 Edition.

through insurance payment for example. As indicated in Table 36, 5.00% of the fires reported (arson and vandalism combined) over the five-year period from January 1st, 2018, to December 31st, 2022, while the percentage experienced in the province was 7.76%.

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 82.50% of the fires during this period compared to 66.80% for the province. The leading cause of unintentionally set fires in Tillsonburg occurred due to misuse of ignition source at 45.00% (18 fires), compared to 28.93% in the province, followed by mechanical/electrical failure at 15.00% (6 fires), compared to 15.16% in the province.

Key Finding: Over the five-year period from January 1st, 2018, to December 31st, 2022, the leading cause of unintentionally set fires in Tillsonburg occurred due to misuse of ignition source at 45.00%.

Key Finding: Over the five-year period from January 1st, 2018, to December 31st, 2022, misuse of ignition cause 16.00% more fires than that of the province (note provincial data for 2022 unavailable at time of analysis).

Table 36: Reported Fire Cause – Town of Tillsonburg (2018 – 2022) and Province of Ontario (2018-2021)

Nature	Fire Cause	Tillsonburg # of Fires	Tillsonburg % of Fires	Ontario # of Fires	Ontario % of Fires
Intentional	Arson	0	0.00%	1,721	6.23%
	Vandalism	2	5.00%	415	1.50%
	Other	0	0.00%	9	0.03%
Unintentional	Design/Construction/ Maintenance Deficiency	3	7.50%	1,815	6.57%
	Mechanical/Electrical Failure	6	15.00%	4,191	15.16%
	Misuse of Ignition Source	**18**	**45.00%**	**7,997**	**28.93%**
	Other Unintentional	1	2.50%	1,986	7.18%
	Vehicle Collision	0	0.00%	21	0.08%
	Children Playing	0	0.00%	105	0.38%
	Undetermined	5	12.50%	2,352	8.51%
Other	Other	0	0.00%	1,543	5.58%
Undetermined	Undetermined	5	12.50%	5,381	19.47%
Unknown	Unknown, Not reported	0	0.00%	108	0.39%
	Total	**40**	**100.00**	**100.00%**	**100.00**

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 vapors that could occur at the site or onboard the vehicle."[50] Table 37 provides fire loss by source of ignition for Tillsonburg and the province. The most commonly reported ignition sources within the town are cooking equipment and open flame tools/smokers' article, which combined account for 48.84% of reported ignition sources (significantly higher than the province at 30.27%). TFRS should consider public education campaigns/messaging relating to cooking, careless smoking.

Table 37: Source of Ignition – Town of Tillsonburg (2018 – 2022) and Province of Ontario Reported Ignition Source (2018-2022)

Reported Ignition Source	Tillsonburg # of Fires	Tillsonburg % of Fires	Ontario # of Fires	Ontario % of Fires
Appliances	0	0.00%	1,222	4.42%
Cooking Equipment	11	25.58%	4,431	16.03%
Electrical Distribution Equipment	4	9.30%	2,372	8.58%
Heating Equipment	2	4.65%	2,063	7.46%
Lighting Equipment	2	4.65%	785	2.84%
Open Flame tools/ Smokers Articles	10	23.26%	3,936	14.24%
Other Electrical/Mechanical	0	0.00%	1,398	5.06%
Processing Equipment	2	4.65%	343	1.24%
Miscellaneous	2	4.65%	2,768	10.01%
Exposure	1	2.33%	1,345	4.87%
Undetermined	9	20.93%	6,841	24.75%
Unknown/Not Reported	0	0.00%	140	0.51%
Total	**43**	100.00%	**27,644**	**100.00%**

Key Finding: Over the five-year period from January 1st, 2018, to December 31st, 2022, the leading fire ignition sources in Tillsonburg are cooking equipment (25.58%) and, open flame/tools/smoking articles (23.26%) which are both nearly double the provincial averages from 2018 – 2021.

[50] *Source: N.F.P.A. Glossary of Terms, 2019 Edition.*

10.1.6 Smoke Alarm Status

In the Province of Ontario smoke alarms are required on every level of a dwelling and are the first line of defense. As a result, smoke alarm programs and compliance are a key component of public education and fire prevention activities provided by municipal fire services 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 Town of Tillsonburg and the Province of Ontario over a five-year period from January 1st, 2018, to December 31st, 2022 (no data was provided from 2022 preliminary reports), for Group C - Residential occupancies.

As below, Tillsonburg reported that 51.52% of the time a smoke alarm was present (on floor of origin of the fire) and operated. This is more than 6% higher than the provincial reports. Tillsonburg also had a far lower percentage of reported incidents where no smoke alarms were present at all. The number of fires reported is assumed to be residential and aligns with the number of reported fires over this time period (2018-2021). This indicates that Tillsonburg is complying with reporting, there was a slightly higher percentage of undetermined reports with the province which may indicate either a true inability to determine the status or may indicate the data was not collected.

Table 38: Smoke Alarm Presence and Operation on the Floor of Fire Origin – Town of Tillsonburg and Province of Ontario

Smoke Alarm Status (on floor of Origin)	Tillsonburg							Ontario	
	2018	2019	2020	2021	2022	Total	%	Total	%
No Smoke Alarm Present	0	0	1	0	No Data	1	3.03%	3,481	17.79%
Smoke Alarm Present & Operated	2	3	3	7	No Data	17	51.52%	8,763	44.78%
Smoke Alarm Present & did not operate	1	0	3	2	No Data	6	18.18%	2,453	12.54%
Smoke Alarm Present, Operation undetermined	0	0	1	0	No Data	1	3.03%	1,570	8.02%
Smoke Alarm Presence Undetermined	1	2	2	3	No Data	8	24.24%	3,300	16.87%
Total Residential Fires	4	5	10	12	No Data	33	100.00%	19,567	100.00%

10.2 Event History

Event history seeks to apply TFRS historic emergency call data to develop an understanding of community risks. TFRS provided the data used in this analysis for all historical calls for the five-year period from January 1st, 2018, to December 31st, 2022. This section provides a statistical assessment of historic emergency call volumes for the town.

The analysis included within this section also provides a detailed breakdown of calls by OFM response type. Data used in the analysis of call volume by type was sourced from the OFM's Standard Incident Reporting.

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

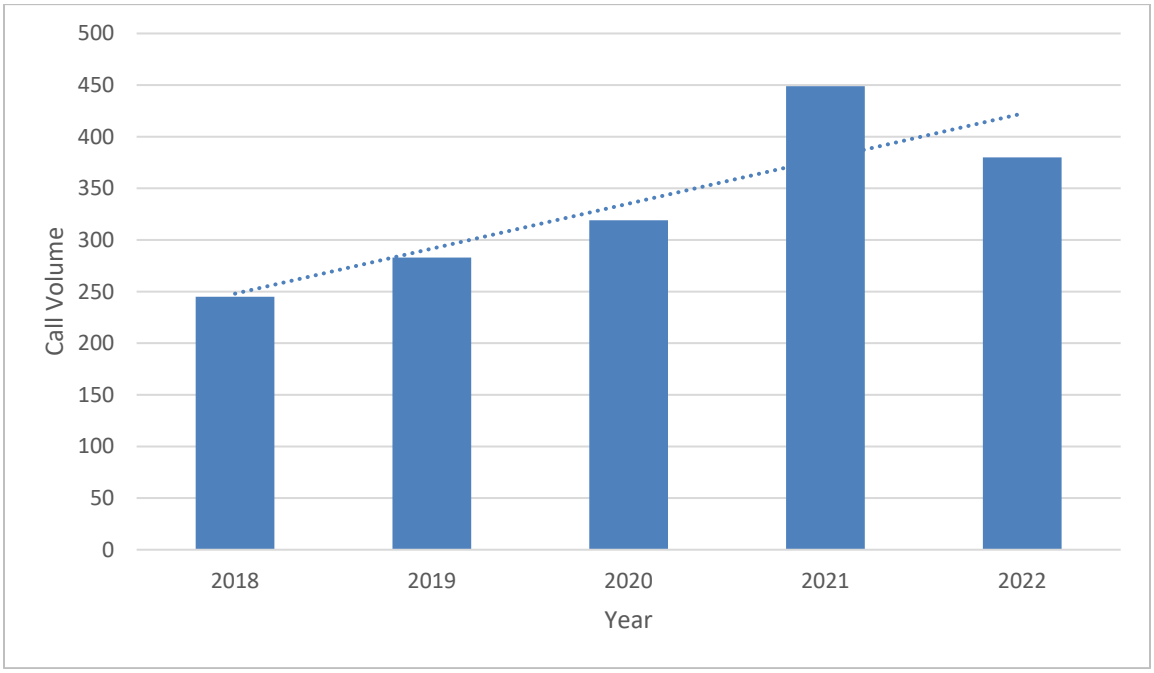
10.2.1 Emergency Call Volume – All Incident Types

This section illustrates the historical emergency call volume by year, day of week, and time of day for all types of incidents responded to by TFRS for the time period from January 1st, 2018, to December 31st, 2022.

10.2.1.1 Annual Emergency Call Volume – All Incident Types

The analysis of annual emergency call volume can be beneficial in understanding evolving trends or changes in emergency response demand. A summary of the total number of emergency calls for the period from January 1st, 2018, to December 31st, 2022, is shown in Figure 7. This analysis identifies an increase in the total emergency call volume within the town this period from 245 calls in 2018 to 380 calls in 2022. This represents a total increase of 35.53% over this five-year period with an average of 335 calls per year. This upward trend should be monitored, as it impacts service levels.

Figure 7: Annual Call Volume – All Incidents January 1st, 2018, to December 31st, 2022

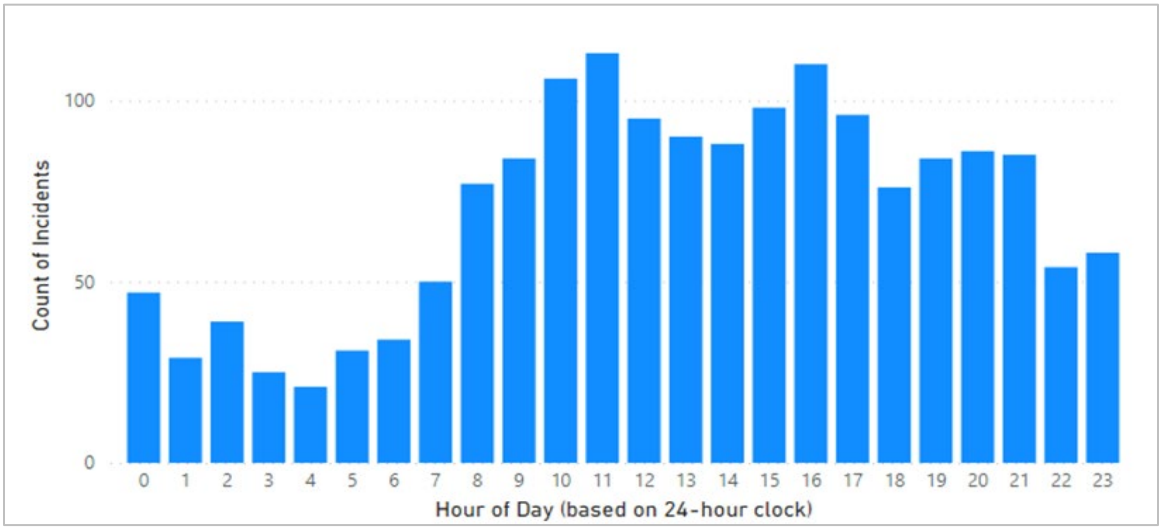


Key Finding: Over the period from January 1st, 2018, to December 31st, 2022, the volume of emergency calls responded to by TFRS increased by 35.53%.

10.2.1.2 Daily Emergency Call Volume – All Incident Types

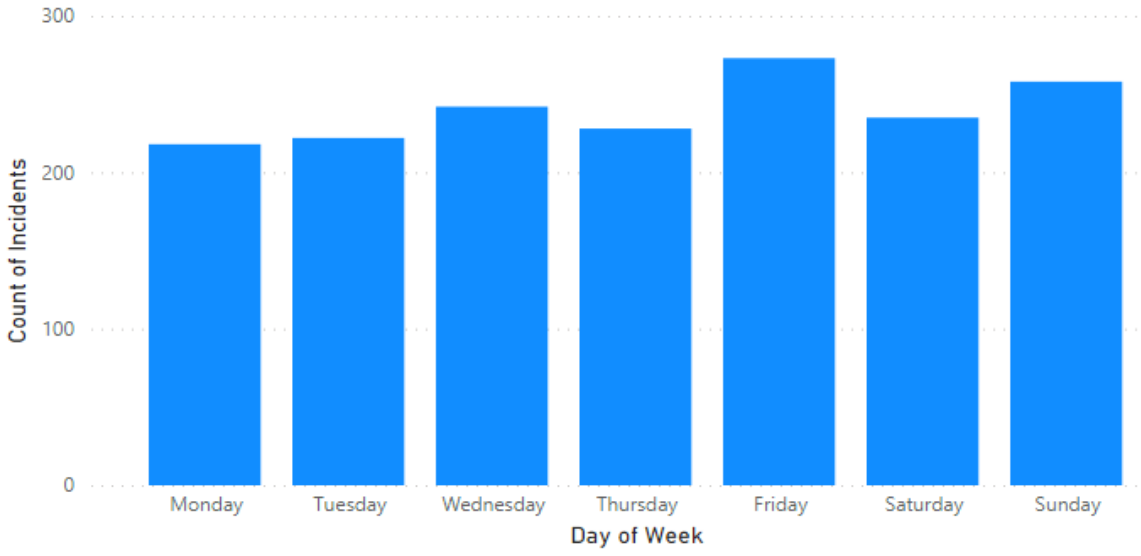
Figure 11 indicates that for the period from January 1st, 2018, to December 31st, 2022, a higher emergency call volume is typically experienced between 8 A.M. and 9 P.M. The lowest percentage of emergency call volume typically takes place between the hours of 10 P.M. and 8 A.M. This trend can be directly associated with when the majority of the population is typically sleeping.

Figure 8: *Tillsonburg Incidents by Time of Day (2018 – 2022)*



The Town of Tillsonburg shows a fairly steady trend of incidents throughout the week with a somewhat higher number of calls on weekends, which is a typical trend, given that people are more likely to be travelling and participating in recreational activities on the weekend, which can increase the frequency of calls.

Figure 9: Tillsonburg Incidents by Day of the Week (2018 – 2022)



10.2.1.3 Total Emergency Call Volume – All Incident Types

This section analyzes all emergency call volumes for the period from January 1st, 2018, to December 31st, 2022. Table 39 below illustrates that during this period 26% of the total emergency calls that TFRS responded to were alarms and false alarms. This could be attributed to the lack of maintenance and/or annual maintenance. Medical and fire incidents were the second most frequent call type at 23% each.

Table 39: Total Number of TFRS Calls January 1st, 2018, to December 31st, 2022

Call Type	2018	2019	2020	2021	2022	Total	%
Alarm	88	94	66	107	88	**443**	**26%**
Medical	14	32	96	124	113	**379**	**23%**
MVC	31	34	34	29	49	**177**	**11%**
CO	35	31	24	32	32	**154**	**9%**
Fire - Other	14	21	14	33	33	**115**	**7%**
Fire - Structure	16	16	19	25	21	**97**	**6%**
Electrical	15	14	15	38	5	**87**	**5%**
Hazmat	7	11	17	16	11	**62**	**4%**
Other / Unclassified	10	9	5	11	7	**42**	**3%**
Fire - Outdoor / Grass	3	6	7	11	9	**36**	**2%**
Mutual/Automatic Aid	8	2	10	10	2	**32**	**2%**
Rescue - Other than MVC	2	7	5	5	3	**22**	**1%**
Fire - Vehicle	1	5	4	3	4	**17**	**1%**
Assist - Outside Agencies / Public	1	1	2	4	3	**11**	**1%**
Total	**245**	**283**	**319**	**449**	**380**	**1,676**	**100%**

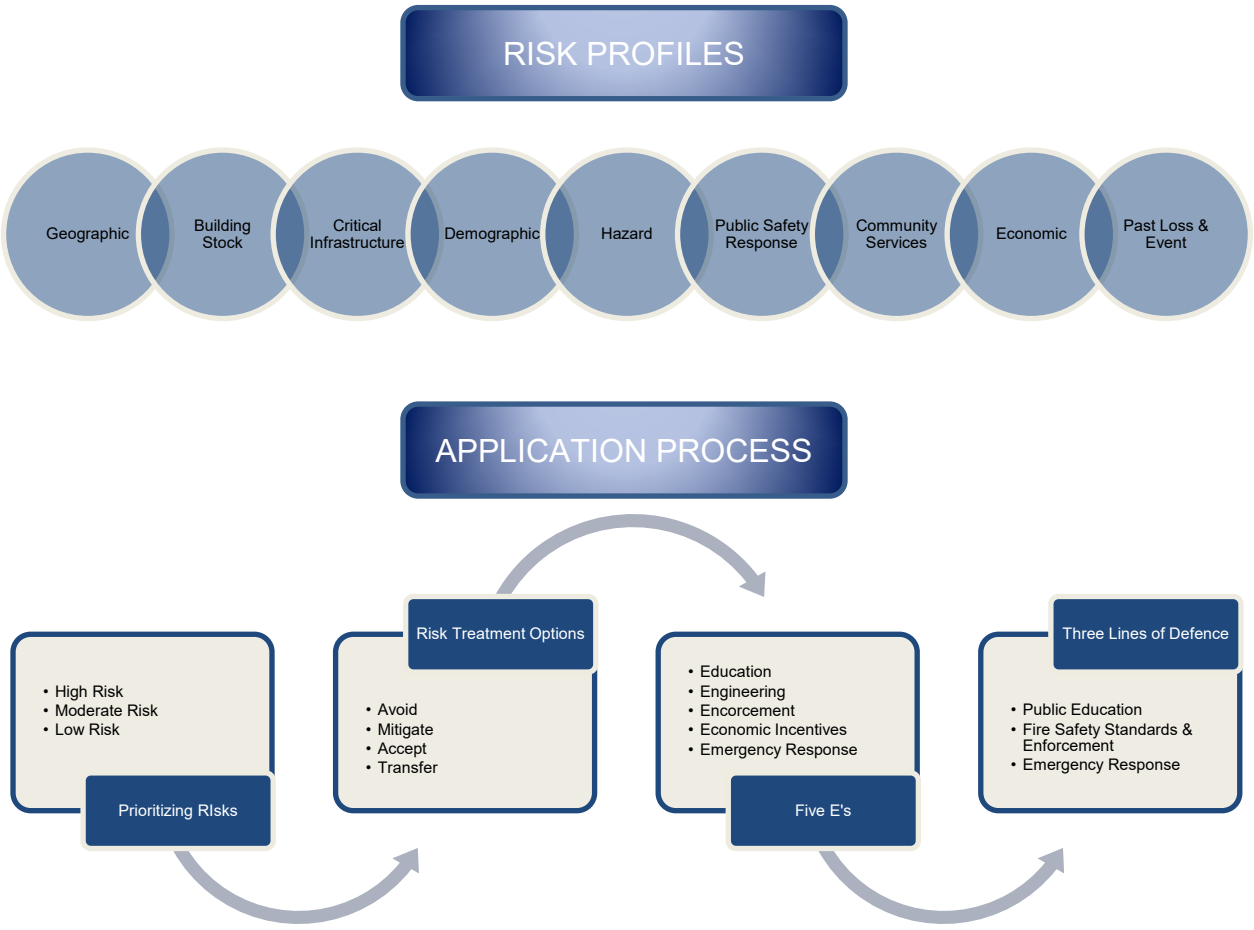
Key Finding: Between January 1, 2018, and December 31, 2022, the majority of responses were attributed to responding to alarms and false alarms. The number of fire and medical calls had an equal percentage.

Key Finding: Medical calls have been steadily increasing since 2018.

SECTION 11.0
KEY FINDINGS & 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. In alignment with T.G.-02-2019, this section takes the identified risk conclusions (both the key findings and the identified risks) through a risk assignment process to assist in the prioritization of risks, as well as a risk treatment process. This section of the CRA brings together all the key findings and identified risks. They are taken through a risk treatment process and aligned with the "Five E's" of Community Risk Reduction and three lines of defense in order to inform the analysis and recommendations for within a FSMP or other strategic document as shown in Figure 10.

Figure 10: Risk Conclusions Application Process



Source: Adapted from OFM TG-02-2019 & NFPA 1300[51]

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

11.1 Prioritizing Risk

Following the probability and consequence levels identified by the OFM as described in the subsections below, the risk assignment process considers the probability and consequence of each identified risk. This will result in each risk having a risk level (e.g., low, moderate, or high) assigned. These risk levels will then be used to assist in the prioritization of risks as part of a FSMP.

11.1.1 Risk assignment Process Overview

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

1. **Determine a probability level:** The probability of a fire or emergency event occurring can be estimated in part based on historical experience of the community and that of the province as a whole. The likelihood categories, and the values presented, follow the OFM. T.G.-02-2019 Community Risk Assessment Guideline. Table 40 presents the probability levels and the adjusted descriptions.

Table 40: Probability Level

Likelihood Category	Numerical Value[52]	Description
Rare	1	• May occur in exceptional circumstances No incidents in the past 15 years
Unlikely	10	• Could occur at some time, especially if circumstances change 5 to 15 years since last incident
Possible	100	• Might occur under certain circumstances 1 incident in the past 5 years
Likely	1000	• Will probably occur at some time under current circumstances Multiple or recurring incidents in the past 5 years
Almost Certain	10000	• Expected to occur unless circumstances change Multiple or recurring incidents in the past year

Source: OFM TG 02-2019[53]

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

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

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

a) Life Safety: Injuries or loss of life due to occupant and firefighter exposure to life threatening fire or other situations.

b) Property Loss: Monetary losses relating to private and public buildings, property content, irreplaceable assets, significant historic/symbolic landmarks, and critical infrastructure due to fire.

c) Economic Impact: Monetary losses associated with property income, business closures, downturn in tourism, tax assessment value and employment layoffs due to fire.

d) Environmental Impact: Harm to human and non-human (e.g., wildlife, fish, and vegetation) species of life and general decline in quality of life within the community due to air/water/soil contamination as a result of fire or fire suppression activities. Table 41 presents the consequence levels.

Table 41: Consequence Levels

Likelihood Category	Numerical Value[54]	Description
Insignificant	1	• No life safety issue • Limited value or no property loss • No impact to local economy • No effect of general living conditions
Minor	10	• Potential risk to life safety of occupants • Minor property loss • Minimal disruption to business activity and/or • Minimal impact on general living conditions
Moderate	100	• Threat to life safety of occupants • Moderate property loss • Poses threat to small local businesses • Could pose threat to quality of the environment
Major	1000	• Potential for large loss of life • Would result in significant property damage • Significant threat to businesses, local economy, and tourism Impact to environment would result in a short term, partial evacuation of local residents and businesses
Catastrophic	10000	• Significant loss of life • Multiple property damage to significant portion of the municipality • Long term disruption of businesses, local employment, and tourism and/or • Environmental damage that would result in long-term evacuation of local residents and businesses

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

Source: OFM TG 02-2019[55]

3. **Establish the risk level:** (i.e., low, moderate, or high) for each risk based on the identified probability and consequence for each event. Once probability and consequence are determined the level of risk is calculated by multiplying the numerical values[56] for probability and consequence. The relationship between probability and consequence as it pertains to risk levels can be illustrated in a risk matrix. In a risk matrix, probability and consequence are defined on separate scales with varying descriptors providing directions on how to assign the probability and consequence of an event. Table 42 shows the risk matrix for this CRA.

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

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

Table 42: Probability & Consequence Risk Matrix

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

Source: OFM TG 02-2019[57]

11.1.2 Assigned Risk Levels

The purpose of assigning a risk level is to assist in the prioritization of the range of risks that were identified as part of this CRA. The results of the risk assignment process are presented in Table 43. Where possible, quantitative data was used to inform the risk assignment as described in the rationale in the table.

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

Table 43: Risk Assignment

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
There is a low probability, however, a high degree of risk to the public and the environment associated with a train derailment in the area; with or without a release of dangerous goods.	Rare	• The 10-year average of main track derailments in Canada represents approximately 7% of all derailments • The 10-year average number of main track derailments involving dangerous goods in Canada is roughly 131 per-year and declining • The 10-year average for a main track derailment involving a release of dangerous goods is 4 per-year[58] • There are no reported main track derailments in the Town of Tillsonburg to date • There have been at least 2 every year	Moderate	• The 10-year average of rail fatalities in Canada is 73 • The 10-year average of serious injuries resulting from a rail incident is 61 (11 of these on average were employees) • The 10-year average of rail incidents resulting in fire or explosion is 36	Low Risk
The town has an extensive network of trails frequented by visitors on a regular basis, including a large number of seniors in the area. Many portions of the trail are inaccessible to difficult to access by vehicle or apparatus, which could impede a rescue response.	Almost Certain	• Between 2018 and 2022 there were 22 non-MVC rescue calls accounting for 1% of all call volume (no statistics on location of rescue) • There has been at least 3 every year	Minor	• The average rate of emergency room visits due to overexertion in the health region is approximately 860 per-year (430 aged 65-75)[59]	Moderate
There is a considerable risk of a grass fire in areas of urban interface and along difficult to access terrain surrounding the trail system throughout the town and surrounding area.	Almost Certain	• Between 2018 and 2022 there were 36 outdoor/grass fire calls accounting for 2% of all call volume (no statistics on location of rescue)	Minor	• The total loss contributed to outdoor fires from 2018-2022 equals $16,000	Moderate
Group C - Residential Occupancies represent 91.51% of the town's existing property stock, and over the five-year period from January 1, 2018, to December 31, 2022, were associated with 74.29% of the structure fires within the town.	Almost Certain	• There have been at least 3 fires in residential occupancies from 2018-2022	Major	• The property loss associated with residential occupancy fires ranges each year from over $300,000 to $8,00,000 • In 2022 there was an estimated loss of over $8,000,000 attributed to 8 fires • In 2022 there was a multi-storey unit destroyed by fire	High
The risk of a civilian being injured in a fire is greatest in Group C – Residential Occupancies.	Likely	• Group C – Residential Occupancies represent 100% of the civilian fire related injuries over a four-year period (January 2018-December 2022).	Moderate	• There have been two reported injuries in residential occupancy fires in the period from 2018-2022	Moderate
There are several large manufacturing companies in the town with high fuel load and potential for damaging fires.	Likely	• There were 3 industrial fires between 2018 and 2022 • Industrial fires have not occurred every year	Moderate	• Loss due to industrial fires has accounted for 7% of the total loss between 2018-2022 (lower than provincial average)	Moderate
Apartment complexes with fewer than five stories pose a greater fire risk than those with greater than five stories due to less engineering and fire detection practices. Tillsonburg may have a greater risk of fires in these types of buildings when compared to the province.	Possible	• A major fire resulted in the destruction of a multi-unit building in 2022 (only known incident of this magnitude between 2018 and 2022)	Major	• In 2022 there was an estimated loss of over $8,000,000 attributed to 8 fires. The majority of loss was attributed to one multi-unit building	Moderate

[58] *As retrieved from https://www.bst-tsb.gc.ca/eng/stats/rail/2020/sser-ssro-2020.html*
[59] *As retrieved from https://www.publichealthontario.ca/en/Data-and-Analysis/Injuries-Data/Injury-ER-Visits*

Identified Risk	Probability Level	Rationale	Consequence Level	Rationale	Risk Level
The town has significantly more apartments in low rise buildings when compared to the province. There is greater potential for exposure in the event of a fire. Further to this the town intends to construct more high and medium density occupancies, therefore further increasing the fire risk associated with these occupancy types.	Possible	• A major fire resulted in the destruction of a multi-unit building in 2022 (only known incident of this magnitude between 2018 and 2022) •	Major	• In 2022 there was an estimated loss of over $8,000,000 attributed to 8 fires. The majority of loss was attributed to one multi-unit building	Moderate
Data provided by Statistics Canada indicates that 49.27% of the town's total building stock was built prior to the introduction of the 1981 Ontario Fire Code which increases the risk of fire and potential for loss.	Almost Certain	• There have been at least 3 fires in residential occupancies from 2018-2022 • It is expected that older residences will attribute to the total number of residential occupancy fires	Major	• The property loss associated with residential occupancy fires ranges each year from over $300,000 to $8,00,000 • In 2022 there was an estimated loss of over $8,000,000 attributed to 8 fires • In 2022 there was a multi-storey unit destroyed by fire	High
There are several properties within Tillsonburg that have a potentially high fuel load and therefore an increased high fire risk.	Likely	• There were 3 industrial fires between 2018 and 2022 • Industrial fires have not occurred every year	Moderate	• Loss due to industrial fires has accounted for 7% of the total loss between 2018-2022 (lower than provincial average)	Moderate
The town's hydrants (fire flow) are aging and may be unreliable and showing steady decline in older neighbourhoods, increasing the risk of failure during a response.	Possible	• 40% of the town's hydrants are rated as being in critical condition	Moderate	• The town has tankers in the fleet and through mutual aid agreements • The town has a fire water management plan in place • New infrastructure for water is being installed	Moderate

11.2 Risk Treatment

NFPA 1300 and the OFM T.G.-02-2019 apply the process of identifying a risk treatment option for an identified risk. The risk treatment options include avoidance, mitigation, acceptance, and transfer. (See Table 44)

Table 44: Risk Treatment Options

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

Source: OFM TG 02-2019[60]

Section 7 of TG 02-2019 discusses setting the levels of service. To assist with application of the Identified Risks in the CRA, municipalities must consider the "Establishment of goals and objectives, strategies, timelines, and evaluation for the proposed fire protection services to be provided."[61] This includes the identification of programming or resource gaps and the plan to close those gaps. Typically, this articulated as part of a Fire Services Master Plan or Community Risk Reduction strategy.

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

The Five Es is a framework outlined in NFPA 1300, and the Institution of Fire Engineers' Vision 20/20 National Strategy for Fire Loss Prevention, is a tool that helps to provide a lens through which identified risks can be reviewed to inform and support the Fire Services Master Plan. Table 45 identifies and describes each of the 5 E's of risk mitigation.

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

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

Table 45: 5 E's of Risk Mitigation

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

Source: Adapted from NFPA 1300 & Vision 20/20[62]

Table 46 summarizes the identified risks and present ways in which the risks can be addressed by TFRS and ultimately considered within the Fire Services Master Plan analysis and recommendations.

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

Table 46: Identified Risk Treatment Matrix

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Geographic Profile	There is a low probability, however, a high degree of risk to the public and the environment associated with a train derailment in the area; with or without a release of dangerous goods.	Low Risk	Accept	No	No	No	No	Yes
	The town has an extensive network of trails frequented by visitors on a regular basis, including a large number of seniors in the area. Many portions of the trail are inaccessible to difficult to access by vehicle or apparatus, which could impede a rescue response.	Moderate	Mitigate Avoid	Yes	No	Yes	No	Yes
	There is a considerable risk of a grass fire in areas of urban interface and along difficult to access terrain surrounding the trail system throughout the town and surrounding area.	Moderate	Mitigate Avoid	Yes	Yes	Yes	No	Yes
Building Stock	Group C - Residential Occupancies represent 91.51% of the town's existing property stock, and over the five-year period from January 1, 2018, to December 31, 2022, were associated with 74.29% of the structure fires within the town.	High	Mitigate Avoid	Yes	Yes	Yes	Yes	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Building Stock	The risk of a civilian being injured in a fire is greatest in Group C – Residential Occupancies.	Moderate	Mitigate Avoid	Yes	No	No	No	Yes
	There are several large manufacturing companies in the town with high fuel load and potential for damaging fires.	Moderate	Mitigate Avoid	Yes	Yes	Yes	Yes	Yes
	Apartment complexes with fewer than five stories pose a greater fire risk than those with greater than five stories due to less engineering and fire detection practices. Tillsonburg may have a greater risk of fires in these types of buildings when compared to the province.	Moderate	Mitigate Avoid	Yes	Yes	Yes	No	Yes
	The town has significantly more apartments in low rise buildings when compared to the province. There is greater potential for exposure in the event of a fire. Further to this the town intends to construct more high and medium density occupancies, therefore further increasing the fire risk associated with these occupancy types.	Moderate	Mitigate Avoid	Yes	Yes	Yes	No	Yes

Profile	Identified Risk	Risk Level	Risk Treatment Option	Education	Enforcement	Engineering	Economic Incentives	Emergency Response
Building Stock	Data provided by Statistics Canada indicates that 49.27% of the town's total building stock was built prior to the introduction of the 1981 Ontario Fire Code which increases the risk of fire and potential for loss.	High	Mitigate Avoid	Yes	Yes	No	No	Yes
	There are several properties within Tillsonburg that have a potentially high fuel load and therefore an increased high fire risk.	Moderate	Mitigate Avoid	Yes	Yes	Yes	Yes	Yes
Critical Infrastructure	The town's hydrants (fire flow) are aging and may be unreliable and showing steady decline in older neighbourhoods, increasing the risk of failure during a response.	Moderate	Mitigate Avoid	No	No	Yes	No	Yes

APPENDICES

Appendix A: List of Figures, Maps, and Tables

Appendix B: Worksheets

Appendix A: List of Figures, Maps, and Tables

Appendix B: Worksheets

Worksheet 1: Geographic Profile

Worksheet 1 Geographic Profile	
Geographical Feature	Potential Impact of Delivery of Fire Protection Services
Waterways	• Several creeks running throughout the town and along trail network. Difficult to access recreational areas. • Impacts training and equipment for response service delivery • Potential for ice and water rescue • Recreational areas along waterways difficult to access by vehicle or apparatus
Lakes	• Lake Lisgar in centre of town – potential for water and ice rescue • Proximity to Lake Erie produces lake effect - brings heavy precipitation in winter and spring months and severe storms in summer months • Submerged, obstructed roadways slowing response time • Calls for vehicle extrication and rescue • Extreme humidity prompting more medical calls • Severe storms can produce tornados – funnel clouds and tornadoes have been reported in the area
Conservation Areas	• Cadman Park conservation area • Frequented by many senior residents • Extensive trail network difficult to access by vehicle or apparatus • Strenuous activity along rails pose risk of medical calls
Highways and Roadways	• Provincial, local, arterial and collectors' roads • Provincial Highway 401 to the north • Town is located at the junction of Highway 19 to the 401 and Highway 3 running east to west • Bisected by dangerous goods route through centre of town (Highway 19) and secondary routes to industrial sites • Dangerous goods spill in 2022 prompted road closures and evacuations • Potential need for specialized DG response training and equipment (or mutual aid partners) • 52% of workforce remains within town boundaries • Approximately 25-50% of workforce commutes more than 15 minutes (potential for outside of town boundaries) • Increased potential for MVCs along major arterials during commuting hours • Agricultural machinery on roadways can impede traffic and response times as well as increase potential for collisions • 20.7% of road conditions rated as poor

Worksheet 1 Geographic Profile	
Geographical Feature	Potential Impact of Delivery of Fire Protection Services
Bridges and Culverts	• Eight bridges and seven structural culverts maintained by the town • One bridge and two culverts rated as in poor condition – overall condition of bridges and culverts is good • Disruption on bridge can lead to response delay • Construction may create long detours • Creates hazards for motorists (falling debris, people jumping) • Creates potential for high angle rescue and need for specific training and equipment • Bridges over waterways pose risk of dangerous goods spill
Rail	• Cayuga Line in northeast quadrant of town and eastern edge – transports goods to and from industrial area to CN line • Rail in proximity to residents, schools, industrial and commercial areas • Risk of fatalities and large scale evacuations • Potential for multi-jurisdictional emergency management
Wildland Urban Interface	• The number of wildfires in Ontario has increased by three times since 2022 • Climate change indicates wildfires will become more prevalent and more severe across the region • Town surrounded by agriculture lands and natural/forested lands which pose risk of wildfire along boundaries of town (wildland urban interface) • Areas prone to grass fires may be difficult to access by apparatus • Industrial zones interface on wildland

Worksheet 2: Building Stock Profile

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Issues / Concerns	Probability	Consequence	Assigned Risk Level
Group A	Assembly Occupancies	51	There are 21 places of worship, 10 schools and 20 communities. Potential for large crowds.	Rare	Major	Moderate
Group B	Care or Detention Occupancies	5	There is 1 hospital, 1 long-term care facility and 2 retirement residences[63]	Unlikely	Major	Moderate
Group C	Single Family	5,575	49.27% of all dwellings were built before OBC[64]	Likely	Moderate	Moderate
Group C	Multi-unit Residential	33	49.27% of all dwellings were built before OBC[65] There are 1,140 apartments in complexes with less than 5 storeys, 500 in complexes with more than 5 storeys and 205 duplexes.	Likely	Major	High
Group C	Hotel / Motel	6	No major concerns- monitor	Unlikely	Moderate	Moderate
Group C	Mobile Homes / Trailers	1	No major concerns	Unlikely	Minor	Low

[63] *Ibid*
[64] *Ibid*
[65] *Ibid*

OBC Occupancy Classification	OFM Fire Risk Sub-Model Major Building Classifications	Number of Occupancies	Issues / Concerns	Probability	Consequence	Assigned Risk Level
Groups D & E	Commercial	299	There are 19 office properties that have been converted from residential all built before OBC[66]. 80% of the retail was built before OBC -several converted from residential[67]	Unlikely	Moderate	Moderate
Group F (all Divisions combined)	Industrial Occupancies	130	F occupancies are only 1.8% of the building stock but account for 10% of the fire loss. There is a chemical plant and an oil distribution centre which are high risk occupancies (see section 3.6.1 for details)[68]	Possible	Catastrophic	High Risk
				Unlikely	Catastrophic	High Risk

[66] *Ibid*
[67] *Ibid*
[68] *Ibid*

Worksheet 3: Critical Infrastructure Profile

Worksheet 3 Critical Infrastructure Profile	
Identified Critical Infrastructure	Issues / Concerns
Water Distribution and Reservoirs	• Water supply is essential for firefighting and is accessible through hydrant system • Damage to infrastructure could impede firefighting • 56.7% of water assets rated as good or excellent condition • 40% hydrants rated as critical condition
Electricity Transmission and Distribution	• Downed power lines cause safety concern for firefighters responding • Lack of heat/cooling resulting in increased assistance calls • Rescue operations may be required for individuals improperly running generators • Fires can be sparked by downed lines and transformers • High voltage electrical hazards present with fires at electrical substation • Chemical hazards possible with presence of cooling agents for electrical conductors
Radio Communications	• Loss of radio communications results in significant challenges for fire service operations such as inability to communicate with crew and with first responders • Lack of uninterrupted power supply to radio systems and computers results in disruption of communications
Cellular towers and phone lines (911 dispatch)	• Damage to telephone lines and towers results in lack of means of notifying first responders • Downed communication lines results in inability to complete transactions (fuel, necessities, supplies etc.) • Calls not dispatched or not dispatched on time (unknown if there is a secondary backup location to route to?) • Residents cannot call for assistance • Dispatch responsible for service for 28 municipalities, 59 stations and serves 275,000 people – disruption has large scale impact
Gas Distribution	• Leaks in transmission lines • Leaks in homes and/or places of assembly requiring evacuation • Ignition sources may be unknown and create a risk to responders • Loss of heating for private homes when outside distribution fails, resulting in calls particularly from vulnerable population • Loss of heating for private homes

Worksheet 3 Critical Infrastructure Profile	
Identified Critical Infrastructure	Issues / Concerns
Roadways	• Poor road conditions due to snow, ice, heavy rain create increased calls for assistance, as well as a hazard for responders • Damaged/impassable roads create a risk of damage to apparatus as well as increased calls for service where access may be difficult
Financial Institutions	• Disruption to commerce to do power failure, cyber attack, health emergency
Emergency Operations Centre	• There are primary, alternate and virtual EOCs • EOCs may be rendered inaccessible due to the emergency or require a quick move with impending threat (i.e. wildfire, flood) • Widespread power loss and poor weather, or large-scale emergency may also impede access to EOCs delaying major emergency response actions and communication, and potentially increasing losses associated with the emergency
Fire and Emergency Service Stations	• Fire service comprised of full-time Chief, Community Emergency Management Coordinator, Assistant Chief of Communications and Administration and Assistant Chief of fire Prevention and Training • Five full-time and six part-time telecommunicators and 30 paid-on-call volunteer firefighters • A large-scale emergency or frequent events affecting the region, could result in shortages of responders across the area
Government Operations	• Municipal government closed due to extreme weather, cyber attack, health emergency, location, civil disruption causes disruption to decision making, financial support, declaration of emergencies etc.
Supply Chain Disruption	• Prolonged disruptions to supply chains can impact apparatus replacement due to manufacturing delays (resulting in them going over lifetime) • Supply disruptions also have an unforeseeable but potentially impactful financially impact on running apparatus, as well as the ability to obtain/replenish PPE

Worksheet 3 Critical Infrastructure Profile	
Identified Critical Infrastructure	Identified Critical Infrastructure
Assisted Living Residences	• Disruptions large number of people with mobility issues • Potential communication issues • Need for specialized medical equipment
Outbreak/Illness	• A major outbreak or illness can create unexpected shortages in the workforce. Reduced staffing can result in inability to run an apparatus in a certain part of the city, as well as affect ambulance and police services for widespread illnesses • Illnesses and outbreaks can also increase medical calls in the region and have an increased cost in replenishing medical PPE
Tillsonburg District Memorial Hospital	• Only one hospital in the town. A long-term disruption to this centre may result in increased calls for emergency transportation to facilities outside of the city • Shortages in staff threaten to close emergency department in near future
Supply Chain Disruption	• Prolonged disruptions to supply chains can impact apparatus replacement due to manufacturing delays (resulting in them going over lifetime) • Supply disruptions also have an unforeseeable but potentially impactful financially impact on running apparatus, as well as the ability to obtain/replenish PPE
Assisted Living Residences	• Disruptions large number of people with mobility issues • Potential communication issues • Need for specialized medical equipment
Outbreak/Illness	• A major outbreak or illness can create unexpected shortages in the workforce. Reduced staffing can result in inability to run an apparatus in a certain part of the city, as well as affect ambulance and police services for widespread illnesses • Illnesses and outbreaks can also increase medical calls in the region and have an increased cost in replenishing medical PPE

Worksheet 4a: Demographic Profile

Worksheet 4a Demographic Profile		
Ages of Population	# of People	% of Total Population
0 to 4 years	855	4.60%
5 to 9 years	860	4.63%
10 to 14 years	885	4.76%
15 to 19 years	965	5.19%
20 to 24 years	895	4.81%
25 to 29 years	970	5.22%
30 to 34 years	1,010	5.43%
35 to 39 years	990	5.33%
40 to 44 years	985	5.30%
45 to 49 years	980	5.27%
50 to 54 years	1,095	5.89%
55 to 59 years	1,280	6.89%
60 to 64 years	1,370	7.37%
65 to 69 years	1,405	7.56%
70 to 74 years	1,395	7.50%
75 to 79 years	1,080	5.81%
80 to 84 years	750	4.03%
85 to 89 years	540	2.90%
90 to 94 years	195	1.05%
95 to 99 years	75	0.40%
100 years and over	10	0.05%
Total	18,590	100%

Worksheet 4b: Demographic Profile Risks

Worksheet 4b Demographic Profile Risks	
Identified Demographic Group	Issues/Concerns
Immigrant Population	• Language barriers • Traditions that present fire safety concerns • Low immigration population (12.54%, 2021) • Majority of immigrants immigrated before 1980
Senior Population	• Mobility issues • Cognitive issues • Represents 29.32% of population
Tourist Population	• Not familiar with community risk factors • No familiar with location when calling 911 • Increased risk in summer months with recreational activity in conservation areas and on trails • Currently 3 major festival events hosted by the town throughout the year which draw crowds of 5,000-6,000 increasing risk of medical and disturbance calls
Vulnerable Population (childcare, schools)	• 12 registered vulnerable occupancies • 1 long-term care facility • 10 schools • 2 retirement homes

Worksheet 5: Hazard Profile

Worksheet 5 Hazard Profile			
Identified Hazard	Probability	Consequence	Assigned Risk Level
Tornado	Unlikely	Major	High Risk
Explosion/Fire	Certain	Moderate	High Risk
Snowstorm/Blizzard	Certain	Moderate	High Risk
Transportation Emergency – Air	Unlikely	Major	High Risk
HAZMAT Spill – Fixed Site Incident	Likely	Moderate	High Risk
Freezing Rain/Ice Storm	Certain	Moderate	High Risk
Terrorism/CBRNE	Unlikely	Major	High Risk
Human Health Emergency - Pandemic	Likely	Major	High Risk
Human Health emergency - Epidemic	Probable	Moderate	Medium Risk
Critical Infrastructure Failure	Probable	Moderate	Medium Risk
Cyber Attack	Probable	Moderate	Medium Risk
Flood-Urban	Probable	Moderate	Medium Risk
Transportation Emergency-Rail	Probable	Moderate	Medium Risk
Extreme temperatures – Cold	Probable	Moderate	Medium Risk
Extreme Temperatures-Heat	Probable	Moderate	Medium Risk
HAZMAT Spill Transportation Incident	Probable	Moderate	Medium Risk
Oil/Natural Gas Emergency	Probable	Moderate	Medium Risk
Special Event	Probable	Moderate	Medium Risk
Drinking Water Emergency	Probable	Moderate	Medium Risk
Building/Structure Collapse	Probable	Moderate	Medium Risk
Transportation Emergency-Road	Likely	Moderate	Medium Risk
Lightning	Certain	Minor	Low
Windstorm	Certain	Minor	Low
Flood-Ravine	Probable	Minor	Low
Fog	Certain	Minor	Low
Drought/Low Water	Probable	Minor	Low
Earthquake	Unlikely	Moderate	Low

Worksheet 5 Hazard Profile			
Identified Hazard	Probability	Consequence	Assigned Risk Level
Dam Failure	Unlikely	Moderate	Low
Energy Emergency (Supply)	Unlikely	Moderate	Low
Forest/Wildland Fire	Probable	Minor	Low
Hurricane	Unlikely	Minor	Low
Land Subsidence	Unlikely	Minor	Low
Hail	Likely	Minor	Low
Food Emergency	Unlikely	Moderate	Low
Erosion	Unlikely	Minor	Low
Civil Disorder	Probable	Minor	Low
Geomagnetic Storm	Unlikely	Moderate	Low
Farm Animal Disease	Unlikely	Minor	Low

Worksheet 6: Public Safety Response Profile

Worksheet 6 Public Safety Response Profile			
Identified Public Safety Response Agency	Types of Incidents they Response to	What is their role at the incident	Issues/Concerns
Tillsonburg Fire and Emergency Services	• Residential, commercial, and industrial fires • Motor vehicle collisions • Medical emergencies • Natural gas and propane emergencies • Water rescue • Carbon monoxide emergencies • Hazardous and flammable materials spills and leaks • Elevator rescues	• Firefighting • First on scene medical response • Vehicle extrication • Dangerous goods containment/clean up (from vehicle) • Rescue • Leak detection and containment	• None
Ontario Provincial Police	• Provincial highway and waterway incidents • Major crimes i.e., homicide, kidnapping, organized crime • Assist municipal police as needed	• Respond to incidents on provincial highways and waterways • Investigate cross-jurisdictional and major crimes • Provide air support for search and rescue • Offender transport	• None
Office of the Fire Marshal	• Fire	• Assistance with managing fire and obtaining resources beyond capability of city	• None

Worksheet 6 Public Safety Response Profile			
Identified Public Safety Response Agency	Types of Incidents they Response to	What is their role at the incident	Issues/Concerns
Oxford County Paramedic Services	• Advanced EMT pre-hospital care • Mass casualty incidents • Evacuation of health facilities (hospital, nursing homes etc.) • Disease related emergencies	• Ensuring provision of paramedic services at the site of the emergency • Ensuring continuity of paramedic services coverage is maintained throughout the remainder of the community/county. • Liaise with the Medical Officer of Health to help facilitate medical services at the hospital.	• Oxford County Paramedic Services
Medical Officer of Health	• Communicable Diseases • Health Inspection Services • Advice on Medical Services • Public Health Advisory • Liaise with long term care facilities, hospitals, retirement homes, and other vulnerable populations as required	• Provide information and instructions to the County Control Group (CCG) and the population on matters concerning public health. • Protect the health of the community from inherent health threats by enforcement of the applicable legislation. • Continue delivery of established programs to ensure continuity of care and general health protection.	• Medical Officer of Health
Victim Services of Oxford County	• Serious assault • Domestic violence • Sexual assault • Stalking	• Immediate crisis response • Vitim assistance • Victim support and needs assessment	• Victim Services of Oxford County
CANUTEC	• Hazardous spills/emissions	• Product information • Safe handling information • emergency actions	• Not on site

Worksheet 6 Public Safety Response Profile			
Identified Public Safety Response Agency	Types of Incidents they Response to	What is their role at the incident	Issues/Concerns
Ministry of Natural Resources	• Spills • Environmental disasters	• Provide personnel and equipment for cleanup and remediation	• Unknown availability and resources • Not responsible for managing response
Ministry of Environment	• Spills • Environmental disasters	• Provide personnel and equipment for cleanup and remediation	• Unknown availability and resources • Not responsible for managing response
Emergency Management Ontario	• Large-scale emergencies requiring declaration of state of local emergency	• Provincial level support • Communication	• Support only
CN Rail Police	• Rail Emergencies	• Oversee response to all rail emergencies	• Response time

Worksheet 7: Community Services Profile

Worksheet 7: Community Services Profile		
Community Service Agency	Types of Assistance they Provide	Issues/Concerns
Tillsonburg Legion Branch #153	• Reception centre for evacuees • Distribution of goods and essential items	• Staffing and resources unknown
Oxford County Human Services	• Support to families and children struggling with mental health issues • Provide child protective services • Support to families struggling with financial issues	• Potential wait time for resource availability
London Search and Rescue	• Assist emergency services with search and rescue: ice/water, ground, ELT detection, aircraft searching, rope rescue	• Staffing and resources unknown • May be re-deployed
Local School Boards: Thames Valley District School Board, London District School Board	• Life safety education	• Staffing and resources unknown
In-Home Personal Support Services Oxford and Norfolk	• Health care at home, school and in community • Supported living • Long-term care	• Potential wait time for resource availability
Community Living Tillsonburg	• Supports adults with developmental disabilities • Residential services and community participation support	• Potential wait time for resource availability
Oxford County Walk-In Counselling	• Addiction and mental health support	• May be referral process • Potential wait time for resource availability (supported and long-term care)
Canadian Red Cross	• Assist with obtaining basic needs of those victims of large-scale disaster • Emergency shelter and feeding locations • Donation management	• May need to be redeployed • Unknown resources and availability

Worksheet 7: Community Services Profile		
Community Service Agency	Types of Assistance they Provide	Issues/Concerns
Salvation Army	• Donation management • Food/clothing • Victim support • Long-term recovery support for victims	• Low oversight of management of funds • Low availability of needed items
St John's Ambulance	• Medical support for reception centres • Health related screening • Transportation for victims • Assist with evacuation of hospitals and health care facilities • Training	• May need to be re-deployed
Ontario SPCA	• Responds to needs of animals in event of emergency/disaster	• Limited space or ability to move large livestock
Mennonite Disaster Service	• Cleanup and debris removal	• Hazardous products exposure
Samaritan's Purse	• Can remove damaged or destroyed content from homes • Clean and remediate flooded homes	• Hazardous products exposure
Team Rubicon	• Incident management assistance • Disaster management • Infrastructure support • Hazard mitigation • Light demo and debris removal	• May need to be re-deployed
Society of Saint Vincent de Paul	• Provide vouchers to obtain furniture, clothing, and accessories	• Low oversight of management of funds • Low availability of needed items
ADRA	• Manages collection, triage, storing and distribution of in-kind donations	• Low oversight of management of funds • Low availability of needed items

Worksheet 7: Community Services Profile		
Community Service Agency	Types of Assistance they Provide	Issues/Concerns
GlobalMedic	• Deploy large field tents for infrastructure and logistical needs, filed hospitals, clinics • Medically trained paramedics, first responders, doctors, and nurses	• May need to be re-deployed • Temporary only
Billy Graham Rapid Response Team	• Chaplains trained for emotional and spiritual care following a disaster	• None
World Renew Disaster Response Services	• Rebuilding projects • Unmet needs assessment	• High-cost solution

Worksheet 8: Economic Profile

Worksheet 8 Economic Profile				
Identified Occupancy	Key Risk	Probability	Consequence	Assigned Risk Level
Manufacturing	Fire/Explosion	Possible	Major	
	Power Disruption	Likely	Minor	
	Cyber Attack	Unlikely	Major	
	Sabotage	Unlikely	Moderate	
	Pandemic	Possible	Major	
	Structural Collapse	Unlikely	Moderate	
	Rail Emergency /Disruption	Unlikely	Major	
Retail	Fire/Explosion	Possible		
	Power Disruption	Likely		
	Pandemic	Possible		
	Structural Collapse	Unlikely		
	Severe Weather	Likely		
	Telecommunications Disruption	Possible		
	Cyber Attack	Possible		
Health Care and Social Assistance	Fire/Explosion	Possible		
	Power Disruption	Likely		
	Pandemic	Possible		
	Structural Collapse	Unlikely		
	Severe Weather	Likely		
	Utility Disruption	Possible		
	Telecommunications Disruption	Possible		
	Cyber Attack	Possible		

Worksheet 8 Economic Profile				
Identified Occupancy	Key Risk	Probability	Consequence	Assigned Risk Level
Construction	Fire/Explosion	Possible		
	Power Disruption	Possible		
	Cyber Attack	Possible		
	Sabotage	Possible		
	Pandemic	Possible		
	Structural Collapse	Possible		
	Severe Weather	Likely		
Transportation and Warehousing	Fire/Explosion	Possible		
	Power Disruption	Possible		
	Cyber Attack	Possible		
	Sabotage	Unlikely		
	Pandemic	Possible		
	Structural Collapse	Possible		
	Severe Weather	Possible		
Educational Services	Power Disruption	Possible		
	Cyber Attack	Possible		
	Civil Disorder	Possible		
	Pandemic	Possible		
	Severe Weather	Likely		

Worksheet 9: Past Loss and Event History Profile – Fire and Emergency Calls

Worksheet 9a Past Loss and Event History Profile – Fire and Emergency Calls										
Occupancy Classification	Year: 2018					Year: 2019				
	Fires	$ loss	Injuries	Deaths	Causes	Fires	$ loss	Injuries	Deaths	Causes
Group A	0	$0	0	0	Misuse of Ignition Source – 3 Undetermined - 2	2	$15,000	0	0	Vandalism -1 Design/Maintenance Deficiency – 1 Mechanical/Electrical – 1 Misuse of Ignition Source – 3 Undetermined – 1
Group B	0	$0	0	0		0	$0	0	0	
Group C	5	$376,500	0	0		3	$1,040,000	0	0	
Group D	0	$0	0	0		0	$0	0	0	
Group E	0	$0	0	0		0	$0	0	0	
Group F	0	$0	0	0		2	$25,000	0	0	
Not Classified by OBC	0	$0	0	0		0	$0	0	0	

Worksheet 9a Past Loss and Event History Profile – Fire and Emergency Calls										
Occupancy Classification	Year: 2020					Year: 2021				
	Fires	$ loss	Injuries	Deaths	Causes	Fires	$ loss	Injuries	Deaths	Causes
Group A	0	$0	0	0	Design/Maintenance Deficiency – 1 Mechanical/Electrical – 2 Misuse of Ignition Source – 5 Undetermined – 1	0	$0	0	0	Vandalism -1 Design/Maintenance Deficiency – 1 Mechanical/Electrical – 3 Misuse of Ignition Source – 6 Unintentional Undetermined– 1 Undetermined - 1
Group B	0	$0	0	0		0	$0	0	0	
Group C	7	$327,000	1	0		11	$2,200,000	0	0	
Group D	0	$0	0	0		0	$0	0	0	
Group E	1	$40,000	0	0		1	$60,000	0	0	
Group F	1	$10,000	0	0		0	$0	0	0	
Not Classified by OBC	0	$0	0	0		1	$500	0	0	

Worksheet 9a Past Loss and Event History Profile – Fire and Emergency Calls					
Occupancy Classification	Year: 2022				
	Fires	$ loss	Injuries	Deaths	Causes
Group A	0	$0	0	0	Design/Maintenance Deficiency – 1 Misuse of Ignition Source – 7 Undetermined – 1
Group B	0	$0	0	0	
Group C	8	$8,137,100	1	0	
Group D	1	$1,000	0	0	
Group E	0	$0	0	0	
Group F	0	$0	0	0	
Not Classified by OBC	0	$0	0	0	

Worksheet 9a Past Loss and Event History Profile – All Calls							
Call Type	2018	2019	2020	2021	2022	Total	%
Alarm	88	94	66	107	88	443	26%
Medical	14	32	97	125	113	381	23%
MVC	31	34	34	29	49	177	11%
CO	35	31	24	32	32	154	9%
Fire - Other	14	21	14	33	33	115	7%
Fire - Structure	16	16	19	25	21	97	6%
Electrical	15	14	15	38	5	87	5%
Hazmat	7	11	17	16	11	62	4%
Other / Unclassified	10	9	5	11	7	42	3%
Fire - Outdoor / Grass	3	6	7	11	9	36	2%
Mutual/Automatic Aid	8	2	10	10	2	32	2%
Rescue - Other than MVC	2	7	5	5	3	22	1%
Fire - Vehicle	1	5	4	3	4	17	1%
Assist - Outside Agencies / Public	1	1	2	4	3	11	1%
Total	245	283	319	449	380	1676	100%

Worksheet 9b: Past Loss and Event History

Worksheet 9b: Past Loss and Event History				
Occupancy Type/Location/Risk	Causes	Probability	Consequences	Assigned Risk Level
Group A	Fire	Likely	Major	High
Group B	Fire	Not applicable	n/a	n/a
Group C	Fire	Almost Certain	Moderate	High
Group D	Fire	Unlikely	Moderate	Moderate
Group E	Fire	Likely	Major	High
Group F	Fire	Likely	Major	High
Group F	Fire	Likely	Major	High
Other not Classified by OBC	Fire	Likely	Moderate	Moderate
Classified Under Farm Building Code	Fire	Likely	Minor	Moderate
Alarm		Almost Certain	Minor	Moderate
Medical		Almost Certain	Insignificant	Moderate
MVC		Almost Certain	Minor	Moderate
CO		Almost Certain	Minor	Moderate
Fire-Other		Almost Certain	Minor	Moderate
Fire-Structure		Almost Certain	Moderate	High
Electrical		Almost Certain	Minor	Moderate
Utilities		Almost Certain	Minor	Moderate
HAZMAT		Likely	Minor	Moderate
Fire – Outdoor Grass		Likely	Minor	Moderate
Mutual/Automatic Aid		Almost Certain	Moderate	High
Rescue - Other than MVC		Likely	Minor	Moderate
Fire-vehicle		Almost Certain	Minor	Moderate
Public Assist		Almost Certain	Insignificant	Moderate

Worksheet 10: Identifying Treatment Options for Top Risks in Community

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Geographic Profile	***During peak commuting times, highest risk of motor vehicle collisions (MVCs) is likely to occur within a 15-minute travel time from residential areas to the core industrial areas located in the southern portion of the town and to Highway 401 north of the town.***	Mitigate Risk – Implement appropriate response protocols, standard operating guidelines, and activities. Ensure appropriate staffing and backup at peak times.
	The County of Oxford Transportation Master Plan estimated that 59% of rural businesses would expand, therefore increasing the movement of people and goods throughout the town which may have an impact on service levels, call frequency and types.	Mitigate Risk – Implement appropriate response protocols, standard operating guidelines, and activities. Continue to implement awareness level hazardous materials training in accordance with NFPA standards. Review existing/need for dangerous goods routes.
	Agricultural machinery on roadways can create hazardous condition as well as slow down response times.	Accept Risk - Implement appropriate response protocols, standard operating guidelines, and activities associated with safe operation of apparatus.
	There is a low probability, however, a high degree of risk to the public and the environment associated with a train derailment in the area; with or without a release of dangerous goods.	Accept Risk – Ensure communication protocols with rail to stay informed of dangerous goods traveling through the city, as well as to initiate emergency response.
	At grade level rail crossings have the potential to create a physical barrier to connectivity to the roadway network, causing delays in response time. There are 18 at-grade rail crossings throughout the town.	Accept Risk – where possible, avoid at grade crossings during a response.

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Geographic Profile	***Although TFRS is not the primary responder to the Tillsonburg Regional Airport, given its proximity to the town, there is a possibility of an air incident which may require assistance from TFRS which could directly or indirectly (reduced service levels) affect the town.***	Accept Risk – Implement appropriate response protocols, standard operating guidelines, and activities.
	There is an increased risk of water or ice rescues related to recreational activities along creeks and Lake Lisgar.	Avoid and Mitigate Risk – Ensure public knowledge (signage, education) of safe water recreation, particularly targeted at tourists in the region.
	Due to the 'lake effect,' severe weather events and temperatures are possible during any time of the year and may increase call volume and create hazardous conditions for responders.	Accept Risk – Implement appropriate response protocols, standard operating guidelines, and activities.
	Summer months pose an additional risk of severe storms, tornados, and health hazards to vulnerable populations.	Accept Risk – Implement appropriate response protocols, standard operating guidelines, and activities. Public should have general knowledge of self-protecting activities and access to heating and cooling centres (including public places such as shopping centres, library, public pool etc.).
	The town has an extensive network of trails frequented by visitors on a regular basis, including a large number of seniors in the area. Many portions of the trail are inaccessible to difficult to access by vehicle or apparatus, which could impede a rescue response.	Accept and Mitigate Risk – Implement appropriate response protocols, standard operating guidelines, and activities. Review accessibility to recreational areas and response equipment (ATV).

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Geographic Profile	***There is a considerable risk of a grass fire in areas of urban interface and along difficult to access terrain surrounding the trail system throughout the town and surrounding area.***	Avoid and Mitigate Risk – Ensure public knowledge (signage, education) of proper fire safety and fire bans (when in effect). Consider enforcement actions to reduce occurrence of unsafe practices. Consider FireSmart and building practices in areas of wildland urban interface.
Building Stock Profile	***Group C - Residential Occupancies represent 91.51% of the town's existing property stock, and over the five-year period from January 1, 2018, to December 31, 2022, were associated with 74.29% of the structure fires within the town.***	Avoid and Mitigate Risk - Education and prevention activities should be largely focused on these residential types.
	Group C – Residential Occupancies represent 100% of the civilian fire related injurie over a four-year period (January 2018-December 2022).	Avoid and Mitigate Risk - Education and prevention activities should be largely focused on these residential types.
	Apartment complexes with fewer than five stories pose a greater fire risk than those with greater than five stories due to less engineering and fire detection practices. Tillsonburg may have a greater risk of fires in these types of buildings when compared to the province.	Mitigate Risk - These properties should be routinely inspected to ensure they are being properly maintained, have adequate fire water and are using safe storage practices.
	The town has significantly more apartments in low rise buildings when compared to the province. There is greater potential for exposure in the event of a fire. Further to this the town intends to construct more high and medium density occupancies, therefore further increasing the fire risk associated with these occupancy types.	Avoid and Mitigate Risk - These properties should be routinely inspected to ensure they are being properly maintained, have adequate fire water and are using safe storage practices. TFRS should be informed and involved with new structure developments to ensure service levels are maintained.

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Building Stock Profile	***Data provided by Statistics Canada indicates that 49.27% of the town's total building stock was built prior to the introduction of the 1981 Ontario Fire Code.***	Accept and Mitigate Risk - TFRS should provide public education on the fire risks associated with older homes, and how to ensure homes are updated/maintained to reduce risk.
	There are several properties within Tillsonburg that have a potentially high fuel load and therefore an increased high fire risk.	Mitigate Risk - These properties should be routinely inspected (where applicable) to ensure they are being properly maintained, have adequate fire water, suppression equipment, evacuation procedures, emergency plans and are conducting evacuation drills.
	The Town of Tillsonburg currently has 12 registered vulnerable occupancies.	Mitigate Risk - These properties should be routinely inspected (where applicable) to ensure they are being properly maintained, have adequate fire water, suppression equipment, evacuation procedures, emergency plans and are conducting evacuation drills.
	In addition to registered vulnerable occupancies the town has 10 schools, 1 daycare and one other facility dedicated to special education/training that represent higher fire life-safety risks.	Mitigate Risk - These properties should be routinely inspected (where applicable) to ensure they are being properly maintained, have adequate fire water, suppression equipment, evacuation procedures, emergency plans and are conducting evacuation drills.

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Building Stock Profile	***With increasing homeless numbers in the town and county, location of any encampments within or around Tillsonburg should be identified as they are associated with numerous fire and life safety risks to the residents of encampments, the public and emergency responders.***	Avoid and Mitigate Risk – Locate and dismantle encampments.
Critical Infrastructure Profile	***The town's hydrants (fire flow) are aging and may be unreliable and showing steady decline in older neighbourhoods.***	Avoid and Mitigate Risk - Develop a water servicing strategy for those areas requiring water flow for firefighting. Inspect hydrant system frequently.
	To ensure fire water availability, Tillsonburg has experienced more frequent water restrictions in hot and dry conditions. This is partly attributed to the state of the production wells and water reservoir systems, and reduced availability of water in reservoirs.	Avoid and Mitigate Risk - Develop a water servicing strategy for declining water availability
Demographic Profile	***The population of the town has increased by 17.30% between 2016 and 2021 and continues to grow. Rapid changes in population can affect service levels due to insufficient coverage and number of personnel.***	Accept and Mitigate Risk – TFRS should be informed of and monitor future projections to maintain service levels.
	The population most vulnerable to fire related deaths (60 years and over) is increasing.	Accept and Mitigate Risk - Outreach and education for these vulnerable households should continue.
Hazard Profile	***The town's 2023 Hazard Identification and Risk Assessment (HIRA) identifies hazards that could each impact the ability of Tillsonburg Fire and Emergency Services to deliver fire protection services.***	Accept and Mitigate Risk – Complete frequent updates of the HIRA and Emergency Plan.
Community Services Profile	***This list of community services demonstrates that the town is very well supported in the event of a major or serious emergency.***	None.

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Economic Profile	***The town has identified top employers that contribute to the economic vitality of the community. The largest of these are industrial type manufacturing plants. If a fire were to occur at one of these facilities it could have a negative impact on the financial well-being of the town.***	Mitigate Risk - These properties should be routinely inspected (where applicable) to ensure they are being properly maintained, have adequate fire water, suppression equipment, evacuation procedures, emergency plans and are conducting evacuation drills.
Past Loss and Event History	***For the period from January 1st, 2018, to December 31st, 2022, Tillsonburg experienced a similar rate of fires in Group C-Residential Occupancies than that of the province but a much higher percentage of dollar loss. This can be attributed to a significant fire with loss in a multi-unit residential building in 2022.***	Accept and Mitigate Risk - Education and prevention activities should be largely focused on these residential types.
	For the period from January 1st, 2018, to December 31st, 2022, 100% of the civilian injuries and fatalities were in residential occupancies. This is comparable to that of the province.	Accept and Mitigate Risk - Education and prevention activities should be largely focused on these residential types.
Past Loss and Event History	***Over the five-year period from January 1st, 2018, to December 31st, 2022, the leading cause of unintentionally set fires in Tillsonburg occurred due to misuse of ignition source at 45.00%.***	Avoid and Mitigate Risk - Public education should target proper ignition use, as well as fire prevention and the importance of having operable detection and extinguishing equipment available.
	Over the five-year period from January 1st, 2018, to December 31st, 2022, misuse of ignition cause 16.00% more fires than that of the province (note provincial data for 2022 unavailable at time of analysis).	Avoid and Mitigate Risk - Public education should target proper ignition use, as well as fire prevention and the importance of having operable detection and extinguishing equipment available.

Worksheet 10: Identifying Treatment Options for Top Risks in Community		
Mandatory Profile	Top Risk or Issues/Concerns	Preferred Treatment Option
Past Loss and Event History	***Over the four-year period from January 1st, 2018, to December 31st, 2022, the leading fire ignition sources in Tillsonburg are cooking equipment (25.58%) and, open flame/tools/smoking articles (23.26%) which are both nearly double the provincial averages from 2018 – 2021.***	Avoid and Mitigate Risk - Public education should be used to curb potentially unsafe cooking and open-flame practices. In severe cases, enforcement should be used.
	Over the period from January 1st, 2018, to December 31st, 2022, the volume of emergency calls responded to by TFRS increased by 35.53%.	Avoid and Mitigate – Review service levels and monitor trends associated with growth.
	Between January 1, 2018, and December 31, 2022, the majority of responses were attributed to responding to alarms and false alarms. The number of fire and medical calls had an equal percentage.	Avoid and Mitigate Risk - Public education on maintenance and increased inspections should be used to curb the frequency of false alarms.
	Medical calls have been steadily increasing since 2018.	Avoid and Mitigate Risk – Review service levels and monitor growing trends