essex

Community Risk Assessment

Prepared by:
THE LOOMEX GROUP

Town of Essex
Community Risk Assessment

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Cover photo source: Town of Essex website.

Disclaimer

The Loomex Group has made every effort to ensure that the information provided in this community risk assessment is accurate and complete.

The Town of Essex should review its community risk assessment annually to ensure the document remains up to date. The town should also consider completing a new community risk assessment if its circumstances change significantly.

In order to meet legislative requirements of O. Reg. 378/18, the Town of Essex or its fire department must complete a new community risk assessment no later than five years after the day its previous community risk assessment was completed.

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Executive Summary

Purpose

In July 2023, the Town of Essex contracted The Loomex Group to develop a community risk assessment ("**CRA**").

The project had the following objectives:

- Fulfill the mandate of O. Reg. 378/18, which requires every municipality in the province to complete a CRA by July 1, 2024.
- Identify and examine Essex's public safety risks from a fire services perspective.
- Recommend strategies that Essex and Essex Fire and Rescue ("**the Department**") can use to mitigate the town's public safety risks.

Process

The Loomex Group developed this CRA by reviewing the nine community profiles mandated by O. Reg. 378/18. This process followed the instructions given in the worksheets created by the Ontario Fire Marshal ("**OFM**") as part of OFM-TG-02-2019.

The Loomex Group also conducted site visits and met with stakeholders from Essex. The visits and consultations provided first-hand insights into the town's current and potential public safety risks.

After completing its analyses and stakeholder engagement, The Loomex Group used a risk assessment tool to calculate the risk score of each hazard it identified in Essex. The Loomex Group then evaluated the administrative and operational concerns associated with each threat.

Findings

This CRA identifies nine public safety risks in Essex that are real and measurable threats. The Loomex Group determined each risk's likelihood and consequence to calculate its total risk score. Section 12 of this CRA details the methodology for determining risk scores.

Table 1 lists the six potential risk level categories.

Table 1: Risk level categories

Category	Total Score
Very Low	1 to 30
Low	31 to 60
Moderate	61 to 90
High	91 to 120
Very High	121 to 150
Extreme	151 to 180

Figure 1 illustrates the public safety risks identified in Essex, ranked in order of their risk levels and total risk scores.

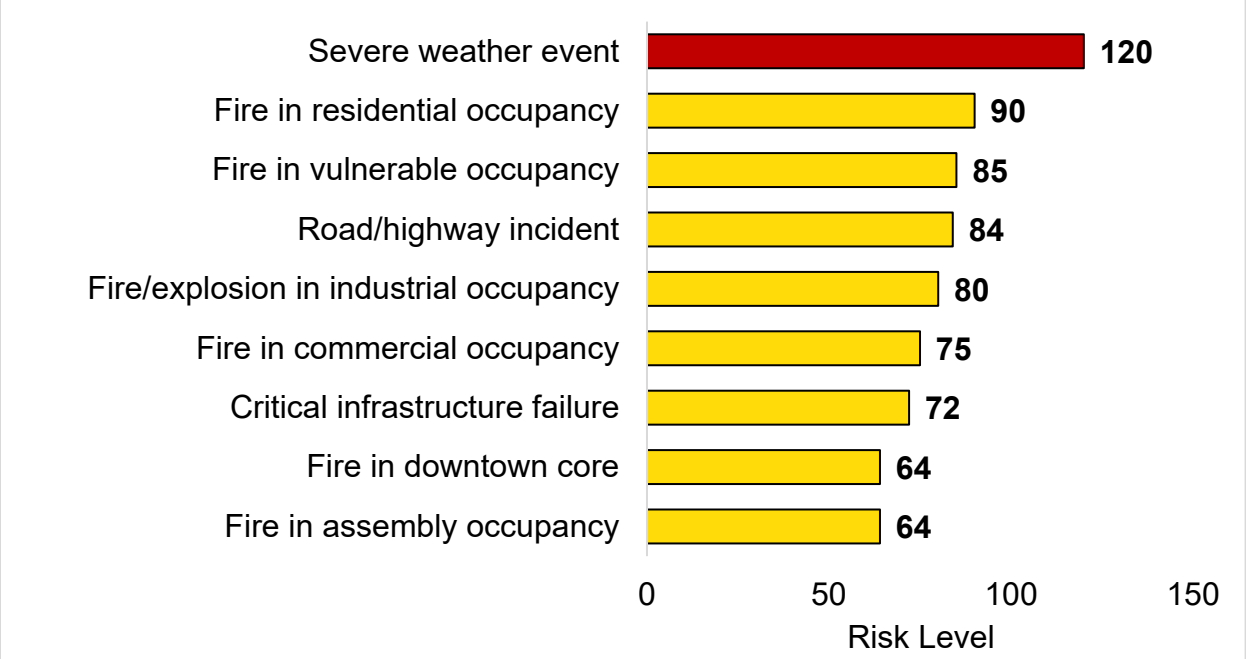

Figure 1. Public safety risks identified in the Town of Essex.

In addition to the nine risks, this CRA provides information about other concerns in Essex that could not be included in a risk level matrix due to a lack of definite statistics. These concerns are discussed throughout the document as applicable. It is important for the town and the Department to familiarize themselves with all additional concerns because they include potential threats and issues that may intensify the danger of the town's identified risks.

Recommendations

The final step of this CRA's development was the creation of a risk treatment plan ("**RTP**") for each public safety risk identified in Essex.

The Loomex Group based the RTPs on the three lines of defence model. This model recommends using proactive fire prevention and protection initiatives to help reduce the need for fire suppression services. The Loomex Group believes that following the three lines of defence is the best way to protect communities from fires and other life safety threats.

The Town of Essex Council ("**Council**") and the Department should review the RTPs in this CRA and discuss implementing them into their operations.

1.0 Introduction

1.1 Community Risk Assessments: Context

A CRA is a document that identifies and evaluates fire and life safety risks.

Risks are defined as events that can harm any one or more of the following:

- communities
- organizations
- human health
- properties
- the environment

All municipalities must plan ways to manage and mitigate the risks identified in their CRAs. Failing to do so could lead to consequences such as damaged property, tarnished reputations, and lost lives. To help municipalities avoid potential consequences, CRAs include RTPs that outline the actions, strategies, resources, and timelines fire departments will need to implement effective risk mitigation measures.

As a best practice, a fire department should develop strategies to address all risks identified in its CRA, starting with the risks most likely to occur.

1.2 Approach and Methodology

1.2.1 Guiding Principle

The Loomex Group used the OFM's three lines of defence as its guiding principle throughout this project.

The three lines of defence are as follows:

1. **Public education and prevention**: To address this line of defence, fire departments must develop programs to teach members of the community how they can take steps to protect their life safety (such as by preventing fires).
2. **Fire safety standards and code enforcement**: To address this line of defence, fire departments must develop programs to ensure all buildings in the community adhere to the Ontario Fire Code ("**OFC**") and maintain the required fire protection systems to reduce the risk and potential severity of fires.
3. **Emergency response**: To address this line of defence, fire departments must have well-trained and equipped firefighters who can prevent injury or loss of life and stop the spread of fires. Emergency response is the failsafe when either fire prevention or code enforcement programs have failed.

The three lines of defence recommend a proactive approach to community fire safety. By focusing on fire prevention and public education programs, fire departments can help reduce the need for fire suppression services.

The Honourable John B. Webber first outlined the three lines of defence in the Report of the Public Inquiry into Fire Safety in Highrise Buildings (published in 1983). The OFM has since endorsed the model, including it as a vital part of OFM TG-02-2019 and other documents. The concept of this model also aligns with the requirements of the Fire Prevention and Protection Act ("**FPPA**").

1.2.2 Data Collection Process

The Loomex Group gathered information for this CRA using the following data collection methods:

- document reviews
- site visits
- engagement sessions

These forms of data collection provided The Loomex Group with the information needed to identify and thoroughly assess Essex's public safety risks from a fire services perspective.

1.2.3 Development Process

The Loomex Group developed this CRA in accordance with the instructions of O. Reg. 378/18 and OFM-TG-02-2019.

As per O. Reg. 378/18, a CRA must review the following nine community profiles:

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

The Loomex Group completed the nine community profiles by following the instructions in the worksheets created by the OFM as part of OFM-TG-02-2019.

In addition to reviewing the community profiles and completing the OFM worksheets, The Loomex Group held engagement sessions with the Department's Fire Chief, Deputy Chief, and Assistant Deputy Chief. These stakeholders provided valuable first-hand insights into Essex's operations and demographics.

1.2.4 Ranking Public Safety Risks

After identifying the public safety risks in Essex, The Loomex Group assessed the likelihood and consequence levels of each threat (as per the OFM definitions summarized below).

The Loomex Group then ranked the identified risks based on their level of severity and the threat posed to the community.

Likelihood Levels

The OFM states that a fire department should use professional judgment along with historical information about past incidents in the community to estimate how likely it is for a given emergency to occur.

Table 2 shows how the OFM classifies risk likelihood levels.

Table 2. OFM risk likelihood levels.

Likelihood Level	Specifics
Rare	• May occur in exceptional circumstances. • No incidents in the past 15 years.
Unlikely	• Could occur at some time if circumstances significantly change. • Five to 15 years since the last incident.
Possible	• Might occur under current circumstances. • One incident in the past five years.
Likely	• Will probably occur at some time under current circumstances. • Multiple or recurring incidents in the past five years.
Almost certain	• Expected to occur in most situations unless circumstances change. • Multiple or recurring incidents in the past year.

Consequence Levels

The OFM defines the consequence of a fire or other emergency as the potential losses or negative outcomes that result from the incident. When estimating consequence levels, fire departments should consider the potential impacts on lives, property, the local economy, and the environment.

Table 3 shows how the OFM classifies risk consequence levels.

Table 3. OFM risk consequence levels.

Consequence Level	Specifics
Insignificant	• No life safety issue. • Limited value or no property loss. • No impact on the local economy. • No effect on general living conditions.
Minor	• Potential risk to the life safety of residents. • Minor property loss. • Minimal disruption to business activity. • Minimal impact on general living conditions.
Moderate	• Definite threat to the life safety of residents. • Moderate property loss. • Poses a threat to small local businesses. • Could pose a threat to the quality of the environment.
Major	• Potential for a massive loss of life. • Significant property damage. • Significant threat to large businesses, local economy, and tourism. • Environmental impact resulting in a short-term, partial evacuation of residents and businesses.
Catastrophic	• Significant loss of life. • Property damage to a significant portion of the community. • Long-term disruption of businesses, local employment, and tourism. • Environmental damage resulting in the long-term evacuation of residents and businesses.

Risk Level Matrix

After assessing the likelihood and consequence levels of the public safety risks identified in Essex, The Loomex Group used the risk level matrix shown in Table 4 to determine the overall level of community risk in the town.

The matrix works by comparing likelihood and consequence levels to calculate total risk levels.

Table 4. Risk level matrix.

	Insignificant Consequence	Minor Consequence	Moderate Consequence	Major Consequence	Catastrophic Consequence
Almost Certain	**Moderate risk**	**Moderate risk**	**High risk**	**High risk**	**High risk**
Likely	**Moderate risk**	**Moderate risk**	**Moderate risk**	**High risk**	**High risk**
Possible	**Low risk**	**Moderate risk**	**Moderate risk**	**Moderate risk**	**High risk**
Unlikely	**Low risk**	**Low risk**	**Moderate risk**	**Moderate risk**	**Moderate risk**
Rare	**Low risk**	**Low risk**	**Low risk**	**Moderate risk**	**Moderate risk**

2.0 Overview of Community, Fire Department, and By-laws

2.1 Overview of the Town of Essex

Essex is one of Canada's most southerly municipalities. According to Essex's official website, the town experiences hot summers and mild winters, and there is rich agricultural land throughout the region.

Essex comprises four urban communities:

- Essex Centre: Essex Centre is the largest urban community in Essex. It contains many local shops and services, and its location provides easy access to the area's main transportation routes.
- Harrow: Harrow contains prime agricultural land and is home to Canada's research centre for greenhouse vegetables and field crops. Harrow also offers several local shops and services, and the community is a hub for some of the region's largest manufacturing companies, such as Sellick Equipment Limited and Atlas Tube.
- Colchester: Colchester is a waterfront community on the shores of Lake Erie. The community has several popular attractions, including a marina, a public beach, several wineries, and the Lake Erie Waterfront Trail.
- McGregor: McGregor is a predominantly agricultural community. The area also hosts various outdoor sports and an annual music festival. McGregor is also home to the Essex County Steam and Gas Engine Museum.

Essex is also home to several other smaller communities.

Essex's official website also notes that the town was named one of the safest places to live in Canada in 2012.

2.2 Overview of Essex Fire and Rescue

Structure and Personnel

The Department provides fire suppression, code enforcement, and public education for the residents, businesses, and visitors of Essex.

The Department consists of the following personnel:

- 1 full-time fire chief
- 1 full-time deputy chief
- 1 full-time assistant deputy chief
- 1 part-time administrative assistant

- 3 district chiefs
- 12 captains
- 48 firefighters
- 1 part-time support staff member

Fire Stations

The Department's personnel operate from the following three fire stations:

- Station 1 (located at 55 Alice Street North in Essex Centre)
- Station 2 (located at 3575 North Malden Road in Gesto)
- Station 3 (located at 25 Centre St. E. in Harrow)

Each station has a complement of 21 firefighters, including each stations' district chief, captains, and firefighters.

2.3 Establishing and Regulating By-law

A community's establishing and regulating by-law ("**E&R By-law**") specifies which services the local fire department must provide.

As of this CRA, the E&R By-law in Essex is By-law no. 2012.

2.3.1 Services Listed in By-law no. 2012

Core Services

Under By-law 2012, Council is responsible for approving the Department's core services, which include the following:

- fire suppression services
- fire prevention services
- fire safety education services
- mitigation and prevention services (regarding risks created by the presence of unsafe levels of carbon monoxide)
- communication services
- training services (regarding persons who provide fire protection services, rescue services, and emergency services, as well as the delivery of such services)

Specific Fire Protection and Emergency Services

According to schedules "C" and "D" of By-law 2012, the Department must provide

specific fire protection and emergency services, including:

- basic firefighting services (including structural and rescue services)
- vehicle rescue, extrication, and firefighting services
- grass, brush, and forestry firefighting services
- marine firefighting services (for small vessels)
- marine firefighting services (for large vessels)
- shore-based water and ice rescue services
- basic medical assistance (including CPR and defibrillation services)
- hazardous material response services (at the awareness level)
- emergency assistance (for police crews, ambulance crews, and the public)

Limited/Agreement Services

Under By-law 2012, the Department provides services as part of the following agreements:

- mutual aid
- automatic aid
- fire protection agreements
- transportation incidents involving vehicles, trains, watercraft, and aircraft

Services Not Provided

Under By-law 2012, the Department is not required to provide the following services:

- dive rescue services
- trench rescue services

2.3.2 Mutual Aid and Automatic Aid Agreements

A mutual aid agreement is an agreement between fire departments that stipulates how and when they will respond to incidents beyond their jurisdiction. A community can activate its mutual aid agreement when a fire occurs that requires a response beyond the capabilities of the local fire department.

As of this CRA, Essex and the Department participate in the County Mutual Aid Plan (the terms of which are currently under review). Under the County Mutual Aid Plan, the OFM has appointed a county fire coordinator (the Fire Chief of Windsor Fire and Rescue Services) to work with local fire chiefs during responses to major incidents. The

county fire coordinator is responsible for coordinating mutual aid fire services agreements for the City of Windsor and all municipalities in the County of Essex. The county fire coordinator is also responsible for arranging specialty teams (such as hazardous materials teams) as needed. The county fire coordinator can also arrange a mobile communications and command vehicle (if required).

2.3.3 Automatic Aid Programs and Fire Protection Service Agreements

A municipality can take part in an automatic aid agreement to provide or receive the initial or supplemental response to fires and other emergencies. These agreements operate at all times, irrespective of municipal boundaries, and aim to ensure that the closest emergency services provider can respond to an incident. Willing parties can also enter into other types of agreements, such as fire protection service agreements.

As of this CRA, the County of Essex and the City of Windsor have implemented a county-wide automatic aid agreement.

3.0 Geographic Profile

3.1 Context of a Geographic Profile

As per OFM-TG-02-2019, a geographic profile examines a community's physical features, including the nature and placement of the following:

- highways
- waterways
- railways
- canyons
- bridges
- landforms
- wildland-urban interfaces

A CRA reviews these features because they may impact how quickly emergency responders can arrive at an incident or access an emergency site. When a fire department is aware of those potential impacts, it can plan its services and response procedures accordingly.

3.2 Geography of the Town of Essex

Size

Essex is 277.53 square kilometres in area, with a population density of 76.4 persons per square kilometre.

Boundaries

The town's boundaries are as follows:

- North: County Road 8
- East: County Road 23
- South: Lake Erie
- West: County Road 20/41, Smith Road, and County Road 11

Landscape

According to the town's website, Essex has a "unique mix of urban centres, rural landscapes and lakeside vistas." As a result of its abundant land and temperate climate, Essex is home to a significant number of wineries and agricultural operations.

Bodies of Water

Essex is bordered to the south by Lake Erie. Colchester Beach and Harbour is located on the shore of the lake and is a popular destination for fishing and boating.

Essex is also home to a small portion of Cedar Creek and several other small bodies of water.

During the winter, the shoreline of Lake Erie is prone to extensive erosion due to unfrozen lake surfaces and higher wave action from high wind and precipitation events. This erosion may lead to the loss of shoreline, breakwall failures, shoreline flooding, and bank failures.

Forested Areas and Trails

Essex contains several trails, including the following:

- Chrysler Canada Greenway, which runs from Harrow to Windsor
- Cypher Systems Group Greenway, which runs from Amherstburg through Essex toward Lakeshore
- Kinsmen Participark Trail, a 1.47-kilometre-long trail in Harrow
- Sadler's Nature Park and Trail, a nature park in Essex Centre that includes a kilometre-long walking path which connects to the Cypher Systems Group Greenway
- Tulley Meadows Bush and Trail, a woodland and trail in Essex Centre

Essex also contains a portion of Cedar Creek Provincial Park.

Downtown Core

Essex's primary downtown core located in the community of Essex Centre.

Roadways

Municipal roads in Essex are maintained by the town's Infrastructure and Development Department.

Several county roads and highways run through Essex and connect the town to neighbouring municipalities, including:

- County roads 8, 11, 12, 13, 15, 18, 20, 23, 34, 41, and 50.
- Highway 3, which connects Essex to the United States of America via the Ambassador Bridge in Windsor.

County roads and Highway 3 are maintained by the County of Essex and the Province of Ontario respectively.

3.3 Commercial Oil Wells

Essex is part of an area in Ontario which has been used for oil, natural gas and water well drilling for many years. Some wells remain operational throughout Essex.

Many oil and gas wells have been abandoned and plugged for over fifty years. Unfortunately, the materials used to plug these wells have corroded over time. As a result, dangerous gases (such as hydrogen sulphide) have surfaced and can pose a threat if they migrate to aquifers or otherwise pollute the environment.

There are 26,674 recorded oil and gas wells in Ontario, primarily located in Southwestern Ontario. Over half of the recorded wells are plugged and no longer in use, while the status of 6,210 wells is unknown. Another 3,000 “orphan wells,” wells with no registered owner, may exist; however, the number and location of these wells are largely unknown.

According to Ontario’s oil and gas legislation and the Water Resources Act, landowners must plug any wells found on their property regardless of when the well was drilled, who drilled the well, or how much the process will cost the landowner.

3.4 Proximity to Nuclear Power

According to the 2022 County of Essex Emergency Response Plan, Essex is within the Ingestion Planning Zone (“**IPZ**”) and the Contingency Planning Zone (“**CPZ**”) of the Enrico Fermi Nuclear Power Plant (“**Fermi 2**”) in Newport, Michigan, U.S.A. The Fermi 2 IPZ is the area within 80-kilometre radius of the reactor facility. The CPZ is a smaller area within that radius.

Figure 2 shows a diagram of the Fermi 2 CPZ and IPZ, including subzones[1].

[1] https://www.ontario.ca/document/provincial-nuclear-emergency-response-plan-pnerp-master-plan/chapter-2-planning-basis

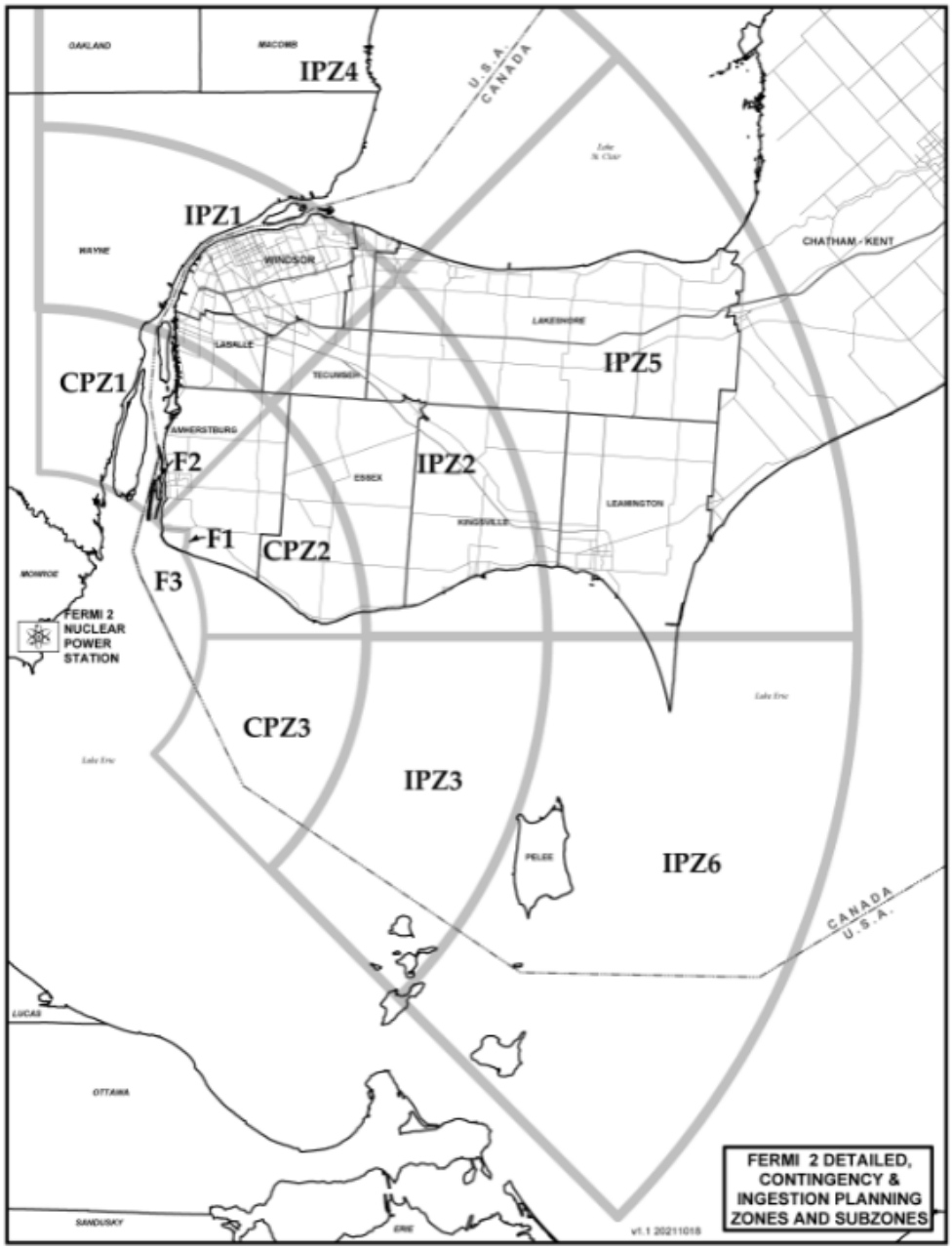

Figure 2. Ingestion planning zone around Fermi 2.

As seen in Figure 2, Essex is located within the CPZ2 and IPZ2 subzones. The IPZ also encompasses Essex County, the City of Windsor, and an area of Chatham-Kent.

Due to the risks of nuclear facilities, provincial plans and arrangements are undertaken in this area for the following reasons:

- Protect the food chain.
- Protect drinking water supplies.

- Restrict the consumption and distribution of potentially contaminated produce, wild-grown products (such as mushrooms and game), milk from grazing animals, rainwater, and animal feed.
- Restrict the distribution of non-food commodities until further assessments are performed.

The Provincial Nuclear Emergency Response Plan also designates Essex and the City of Windsor as host municipalities in the event of a nuclear emergency at Fermi 2. As such, the town must prepare reception centres and evacuation centres for evacuees.

3.5 Geographic Profile Summary

Table 5 lists Essex's main geographic features. The table indicates if the features impact training and equipment, response and travel time, station locations, or response protocol.

Table 5. Geographic features in the Town of Essex.

Geographic Feature	Training & Equipment Impact	Response & Travel Time Impact	Fire Station Location Impact	Response Protocol Impact
Agricultural land and wineries	✓	✓		✓
Colchester Beach and Harbour	✓	✓	✓	✓
Lake Erie shoreline	✓	✓	✓	✓
Trails	✓	✓	✓	✓
Downtown Essex	✓	✓	✓	✓
Provincial highways	✓			✓
County roads	✓			✓
Municipal roads	✓	✓	✓	✓
Commercial oil wells	✓	✓		✓

3.6 Risks Identified by the Geographic Profile

Table 6 summarizes the risks identified by the geographic profile for Essex.

Table 6. Geographic profile risk summary.

Risk	Likelihood	Consequence	Risk Level
Road/highway incident	Almost certain	Minor	**Moderate**
Fire in downtown core	Possible	Moderate	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

Additional Considerations

In addition to the risks listed in the table above, the Department should remain aware of the risks posed by the potential erosion of the Lake Erie shoreline, as well as abandoned oil wells.

4.0 Building Stock Profile

4.1 Context of a Building Stock Profile

As per OFM-TG-02-2019, a building stock profile examines the types, numbers, ages, and uses of the buildings in a community. For reference purposes, the profile categorizes buildings according to the major occupancy classifications defined in the Ontario Building Code ("**OBC**").

A CRA includes a building stock profile because fire departments must know the different types, classifications, and uses of buildings in the community. Each kind of building has different safety concerns, such as:

- Older buildings often lack the fire and life safety systems included in newer buildings.
- Industrial chemical storage facilities are likely at a higher fire risk than commercial retail occupancies.
- The configuration and age of a residential occupancy can influence the probability and consequence of a fire. For example, single-family dwellings present different risks than townhouses or row houses.

Due to considerations like these, it is important to note which types of buildings are prevalent in the community, as well as where they are located.

By reviewing the information in a building stock profile, a fire department can develop initiatives to address public safety risks such as fires, explosions, and structural failures.

4.2 Ontario Fire Marshal Directive 2022-001

On February 25, 2022, the OFM issued Directive 2022-001. The directive is in response to facts regarding the use of truss and lightweight construction systems ("**LWC**").

According to the OFM, LWC may experience premature failure and rapid collapse under certain fire conditions. Because of those risks, a fire department needs to know which buildings in its community have LWC. That information is essential for delivering effective fire suppression services and protecting the safety of responding fire crews.

Directive 2022-001 requires a CRA to indicate how many local buildings have LWC. (If a municipality does not have a list that indicates which local buildings use LWC, it should strive to compile those records.) Overall, the intent of Directive 2022-001 is to provide firefighters with information that they can use to complete the pre-planning process and deliver suppression services safely and effectively.

For a copy of Directive 2022-001, refer to Appendix D.

LWC Occupancies in Essex

At the time of this CRA's development, Essex did not have complete records of which local buildings have LWC. It is imperative that the town starts tracking this information and includes in its CRA when the document undergoes its required update.

4.3 Building Stock in the Town of Essex

Table 7 lists the building stock in Essex (based on information provided by the Department).

Table 7. Buildings per classification in the Town of Essex.

OBC Classification	Type of Occupancy	# of Buildings in Essex
Group A	Assembly occupancy	73
Group B	Care and treatment occupancy	15
Group C	Residential occupancy	8,207
Groups D & E	Mercantile/commercial occupancy	75
Group F	Industrial occupancy	29
Other/non-occupancies	N/A	440

Building Stock Summary

Tables 8 to 13 summarize Essex's building stock and identify the fire and life safety issues/concerns for each occupancy type. The building stock summary considers the following factors to determine the fire and life safety issues/concerns:

- building use
- building density
- building height and square footage
- building location
- the building's historical or cultural significance
- the building's economic impact
- the use of LWC

Note: As of this CRA, Essex did not have complete records regarding which local buildings have LWC.

Table 8. Group A occupancies in the Town of Essex.

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Restaurant	14	No data.	• Patrons may not be aware of secondary exits. • Staff may not be aware of emergency procedures or the fire safety plan. • Equipment requires proper servicing. • Compliance levels of life safety systems.	Possible	Minor	**Moderate**
School	8	No data.	• Status of the fire safety plan. • Staff may not be aware of emergency procedures or the fire safety plan. • Need confirmation that six fire drills are completed during the school year.	Unlikely	Moderate	**Moderate**
Community hall	1	No data.	• Patrons may not be aware of secondary exits. • Staff may not be aware of emergency procedures or the fire safety plan. • Routine inspections are required for code compliance. • Some public functions serve alcohol.	Unlikely	Moderate	**Moderate**
Arena or pool	2	No data.	• Large occupant loads. • Patrons may not be aware of secondary exits. • Staff may not be aware of emergency procedures or the fire safety plan. • Routine inspections are required for code compliance.	Unlikely	Moderate	**Moderate**

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Service club	12	No data.	• Renters may not be aware of emergency procedures. • On-site equipment (such as commercial cooking equipment) must comply with OFC requirements. • Large gatherings of people. • Status of the fire safety plan.	Unlikely	Minor	**Low**
Library	3	No data.	• Patrons may not be aware of secondary exits. • Staff may not be aware of emergency procedures or the fire safety plan. • Routine inspections are required for code compliance.	Unlikely	Minor	**Low**
Childcare facility	5	No data.	• Staff may not be aware of emergency procedures or the fire safety plan. • Routine inspections are required for code compliance.	Unlikely	Minor	**Low**
Church	26	No data.	• On-site equipment (such as commercial cooking equipment) must comply with OFC requirements. • Large gatherings of people. • Status of the fire safety plan. • Use of open flames (such as candles).	Unlikely	Minor	**Low**
Museum or art gallery	1	No data.	• Patrons may not be aware of secondary exits. • Staff may not be aware of emergency procedures or the fire safety plan. • Routine inspections are required for code compliance.	Unlikely	Minor	**Low**

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Community hall	1	No data.	• Patrons may not be aware of secondary exits. • Staff may not be aware of emergency procedures or the fire safety plan. • Routine inspections are required for code compliance.	Unlikely	Minor	**Low**

Table 9. Group B occupancies in the Town of Essex.

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
B2: Care and treatment facility	3	No data.	• Staff may need help evacuating building occupants. • Need time to verify that fire safety plans are in place. • Need time to verify that fire drills are completed. • Need to verify that staff have the required training. • Flammable and combustible materials on-site.	Possible	Moderate	**Moderate**
B3: Care facility	12	No data.	• Staff may need help evacuating building occupants. • Need time to verify that fire safety plans are in place. • Need time to verify that fire drills are completed. • Need to verify that staff have the required training. • Flammable and combustible materials on-site.	Possible	Moderate	**Moderate**

Table 10. Group C occupancies in the Town of Essex.

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Single-detached house	7,095	No data.	• Homes constructed before 1975 predate the OBC. • Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • No LWC documentation.	Almost certain	Moderate	**High**
Semi-detached housing unit	55	No data.	• Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • No LWC documentation.	Almost certain	Moderate	**High**
Residential, business, or apartment unit	73	No data.	• Homes constructed before 1975 predate the OBC. • Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • No LWC documentation.	Likely	Moderate	**Moderate**

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Row-house unit	295	No data.	• Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • No LWC documentation.	Likely	Moderate	**Moderate**
Apartment unit in a duplex	75	No data.	• Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • TIme and resources are needed to deliver public education to all residents. • No LWC documentation.	Likely	Moderate	**Moderate**
Apartment unit in a building with fewer than five storeys	380	No data.	• Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • Status of the fire safety plan. • High-density living configurations. • Detailed building inspections are required. • Status of the life safety systems. • No LWC documentation.	Likely	Moderate	**Moderate**

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Apartment unit in a building with more than five storeys	60	No data.	• Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • Status of the fire safety plan. • High-density living configurations. • Detailed building inspections are required. • Status of the life safety systems. • No LWC documentation.	Likely	Moderate	**Moderate**
Hotel/motel	3	No data.	• High-density living configurations. • Staff must complete the appropriate training. • Detailed building inspections are required. • Status of fire safety plan.	Likely	Moderate	**Moderate**
Seasonal dwelling unit	169	No data.	• Homes constructed before 1975 predate the OBC. • Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents. • No LWC documentation.	Likely	Moderate	**Moderate**

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Mobile home park	2	2	• Need time and resources to verify that smoke/carbon monoxide alarms are installed and maintained. • Need time and resources to verify that residents have home escape plans. • Time and resources are needed to deliver public education to all residents.	Likely	Moderate	**Moderate**

Table 11. Group D and E occupancies in the Town of Essex.

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Retail business	31	No data.	• Staff may not be aware of emergency procedures or the fire safety plan. • Patrons may not be aware of secondary exits. • Routine inspections are required. • Storage of significant fuel loads (such as tires and oils).	Possible	Minor	**Moderate**
Retail service station	3	No data.	• Flammable fuels on-site. • Status of staff training regarding fires and fuel spills.	Possible	Moderate	**Moderate**
Grocery store	5	No data.	• Staff may not be aware of emergency procedures or the fire safety plan. • Patrons may not be aware of secondary exits. • Routine inspections are required.	Possible	Minor	**Moderate**
Office building	23	No data.	• Patrons may not be aware of secondary exits. • Routine inspections are required.	Possible	Minor	**Moderate**
Medical/dental office	6	No data.	• Patrons may not be aware of secondary exits. • Routine inspections are required.	Possible	Minor	**Moderate**
EMS station	2	No data.	• No issues or concerns.	Possible	Minor	**Moderate**
Fire station	3	No data.	• No issues or concerns.	Possible	Minor	**Moderate**
Police station	2	No data.	• Staff may need help to evacuate building occupants. • Need to ensure fire safety plans are in place. • Staff must complete the required training.	Possible	Minor	**Moderate**

Table 12. Group F occupancies in the Town of Essex.

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Warehouse	3	No data.	• Fuel loads. • Staff may not be aware of emergency procedures. • Unknown commodities on-site. • Hazardous materials on-site.	Possible	Moderate	**Moderate**
Industrial site	16	No data.	• Fuel loads. • Staff may not be aware of emergency procedures. • Unknown commodities on-site. • Hazardous materials on-site.	Possible	Moderate	**Moderate**
Grain elevator	2	No data.	• Staff may not be aware of emergency procedures. • Unknown commodities on-site. • High risk of dust explosion.	Possible	Moderate	**Moderate**
Water and wastewater facility	7	No data.	• Staff may not be aware of emergency procedures. • Unknown commodities on-site. • Hazardous materials on-site.	Possible	Minor	**Moderate**
Waste transfer station	1	No data.	• Fuel loads. • Staff may not be aware of emergency procedures. • Unknown commodities on-site. • Hazardous materials on-site.	Possible	Minor	**Moderate**

Table 13. Other occupancies or non-occupancies in the Town of Essex.

Type of Building	Number of Buildings	Number of LWC Buildings	Issues/Concerns	Risk Likelihood	Risk Consequence	Risk Level
Non-classified occupancy	440	No data.	• Occupancies include greenhouses, farms, and vacant buildings. • Inspections are required to determine the use of non-classified occupancies. • The use or contents of a non-classified occupancy may present fire or other life safety risks/hazards.	Possible	Minor	**Moderate**

4.4 Legislation Governing Inspections

According to O. Reg. 365/13, fire departments must work under the direction of the OFM to complete the following tasks:

- Complete a fire safety assessment and inspection for every building for which a fire safety complaint is received.
- Complete a fire safety assessment and inspection for every building for which a request for assistance to comply with the Fire Code is received and the involvement of the Chief Fire Official is required.

Other regulations that govern building inspections are as follows:

- O. Reg. 364/13: This legislation requires vulnerable occupancies to undergo fire safety assessments and inspections and complete annual fire drills.
- OFC, section 2.8.2: This legislation requires applicable occupancies to have a fire safety plan prepared, approved, and implemented.
- OFC, section 2.13: This legislation mandates the installation of smoke alarms.
- OFC, section 2.16: This legislation mandates the installation of carbon monoxide alarms.

Fire safety legislation also requires each municipality to have a smoke/CO program that includes OFC inspection and enforcement components.

4.5 Public Education Initiatives and Fire Inspections in the Town of Essex

Public Education Initiatives

Table 14 summarizes the number of public events the Department attended from 2018 to 2022. The table also indicates how many hours the Department allocated to attending public events in each of those years.

Table 14. Fire department participation in community events.

Event Statistics	2018	2019	2020	2021	2022
Number of events attended	95	103	10	24	83
Number of hours allocated to event attendance	240	263	12	40	255

(Note: Due to COVID-19 restrictions, the Department attended relatively few public events in 2020 and 2021.)

One of the Department's annual public education initiatives is Fire Prevention Week. During Fire Prevention Week, each of the Department's stations participated in smoke alarm surveys. Smoke alarm survey numbers from 2018 to 2022 are as follows:

- There were 2,259 responses in 2018.
- There were 848 responses in 2019.
- There were 104 responses in 2020.
- There were 859 responses in 2021.
- There were 194 responses in 2022.

As part of the smoke alarm survey, the Department distributed door hangers that provided the residents of Essex with instructions for checking the functionality of the smoke alarms in their residences.

The Department has also implemented a residential smoke/CO alarm awareness program. The program has received support from the Rotary Club of Essex, which generously donated 120 battery-powered smoke/CO alarms for the Department to distribute to local senior citizens. Safe Community Project Zero (facilitated by Enbridge Gas) and the Rotary Club of Harrow have also donated battery-powered smoke/CO alarms for the residents of Essex. The Department's staff is available to help install alarms for any residents who cannot complete the installation independently.

Inspection Statistics

According to its records, the Department inspected 580 residential occupancies between 2018 and 2022 as part of its smoke alarm program. Statistics related to these inspections are presented as follows:

- Table 15 summarizes the number of inspections the Department completed from 2018 to 2022.
- Table 16 summarizes the reasons for the inspections the Department conducted from 2018 to 2022.
- Table 17 summarizes the number of violations the Department identified and the number of notices it issued from 2018 to 2022.

Table 15. Inspections by occupancy type, 2018 to 2022.

Type of Occupancy	2018	2019	2020	2021	2022
Group A (assembly)	89	96	86	54	68
Group B (care and treatment)	15	18	14	16	14

Type of Occupancy	2018	2019	2020	2021	2022
Group C (residential)	78	69	94	157	182
Group D & E (mercantile/commercial)	123	139	115	74	48
Group F (industrial)	6	9	18	12	7
Other/non-occupancy	4	5	1	7	4
Total Number of Inspections	**315**	**336**	**328**	**320**	**323**

Table 16. Inspection reasons, 2018 to 2022.

Year	Complaint Inspection	Owner Request	Safety Concern or Smoke Alarm	Routine Inspection	Licensing Inspection	Total
2018	8	36	102	166	3	315
2019	4	37	125	170	0	336
2020	23	38	107	160	0	328
2021	22	79	99	120	0	320
2022	12	67	76	110	58	323
Total	**69**	**257**	**509**	**726**	**61**	**1,622**

Table 17. Violations and issued notices, 2018 to 2022.

Year	Verbal Notice	Letter Notice	Order Notice	Fire Inspection Report	Total	Resolved
2018	102	0	0	17	119	100%
2019	124	0	0	17	141	100%
2020	104	0	0	15	119	100%
2021	92	0	0	19	111	100%
2022	59	0	0	67	126	100%
Total	**481**	**0**	**0**	**135**	**616**	**100%**

4.6 Risks Identified by the Building Stock Profile

Table 18 summarizes the risks identified by the building stock profile for Essex.

Table 18. Building stock profile risk summary.

Risk	Likelihood	Consequence	Risk Level
Fire in residential occupancy	Almost certain	Minor	**Moderate**
Fire in vulnerable occupancy	Likely	Moderate	**Moderate**
Fire/explosion in industrial occupancy	Likely	Moderate	**Moderate**
Fire in commercial occupancy	Likely	Minor	**Moderate**
Fire in assembly occupancy	Possible	Moderate	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

5.0 Critical Infrastructure Profile

5.1 Context of a Critical Infrastructure Profile

As per OFM-TG-02-2019, a critical infrastructure ("**CI**") profile examines the capabilities and limitations of a community's CI.

CI includes the interconnected networks, services, and systems that meet vital human needs, sustain the economy, and protect public safety. Typical forms of CI include the following:

- electricity distribution
- water distribution
- telecommunications
- hospitals

A CRA includes a CI profile because the presence, availability, and capacity of CI can significantly impact factors such as:

- dispatch
- communications
- transportation
- fire suppression services
- community healthcare

If any of its CI services or systems become compromised, a community may be put at a high level of risk. The size or design of a specific type of CI may also pose a risk to the community.

A fire department can use the information in a CI profile to set response priorities and develop strategies to ensure it can meet the community's public safety education, fire prevention, and emergency response pre-planning needs.

5.2 Critical Infrastructure Profile Summary

Table 19 summarizes the CI found in Essex (according to information provided by the town). The table lists the fire and emergency issues/concerns associated with each type of CI, as well as general observations (where applicable).

Table 19. Critical infrastructure in the Town of Essex.

Critical Infrastructure	Issues/Concerns/Observations

Electricity distribution	• Essex has two electricity providers:
	  ○ Entegrus Energy Inc. is located in Harrow and Essex Centre.
	  ○ Hydro One services outlying areas.
	• Essex contains large transmission lines and towers, which may be damaged by severe weather.
	• Most electrical CI in Essex uses above-ground distribution.

Water distribution	• There are two water treatment plants in Essex:
	  ○ Most residents of wards 1 and 2 receive their water supply from the Union Water Treatment Plant. Some residents receive their water from the Amherstburg Treatment Plan.
	  ○ Residents of wards 3 and 4 receive their water supply from the Harrow and Colchester South Water Treatment Plant.
	• Essex has a contract with the Ontario Clean Water Agency regarding the operation of the town's two water treatment plants.
	• Potential risks associated with the water distribution CI in Essex include:
	  ○ water main breaks
	  ○ chemical spills
	  ○ boil water advisories
	  ○ SCADA system malfunctions

Radio communication systems and 911 communication systems	• Windsor Fire Rescue Services provides dispatch services for the Department. • 911 communication systems rely heavily on radio towers and phone/internet lines, which may be damaged by severe weather. • There are radio and 911 communication towers located in Harrow and Essex.
Telecommunications	• Bell Media, Telus, and Rogers provide telecommunication services in Essex.

Critical Infrastructure	Issues/Concerns/Observations
Cellular towers	• Bell Media and Telus provide cellular service in Essex.
Provincial, county, and municipal roads and bridges	• Essex maintains a system of urban and rural roads, many of which connect to nearby county and provincial highways. • Damage to the roads and bridges in Essex could cause serious delays during emergency responses.
Police services (OPP)	• Essex has a contract with the OPP regarding police services. • A team of 23 sworn officers and two civilian staff members provide 24-hour-a-day police protection throughout Essex.
EMS (Essex-Windsor Emergency Medical Services)	• Essex-Windsor Emergency Medical Services is the sole provider of ambulance services in Essex County. • Essex-Windsor Emergency Medical Services responds to urgent calls, life-threatening emergencies, and requests for patient transfers.
Central Ambulance Communication Centre	• EMS is often in a Code Red or Code Black scenario. • EMS crews respond to fires and medical calls.

5.3 Risks Identified by the Critical Infrastructure Profile

Table 20 summarizes the risks identified by the CI profile review for Essex.

Table 20. Critical infrastructure profile risk summary.

Risk	Likelihood	Consequence	Risk Level
Severe weather event	Almost certain	Moderate	**High**
Road/highway incident	Almost certain	Minor	**Moderate**
Critical infrastructure failure	Almost certain	Minor	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

Additional Considerations

The Department relies on several types of CI when making emergency responses. For example, the Department requires the roads, highways, and bridges in Essex to be accessible and in good repair when it responds to motor vehicle accidents. If there is a CI failure, it may impact the safety, effectiveness, or timeliness of an emergency response.

Due to the role CI plays in the Department's operations, it is imperative for Essex to ensure its CI remains in place and functioning. This responsibility involves performing routine maintenance, monitoring for incidents that could damage the CI (such as severe weather), and repairing any damaged CI as soon as possible.

6.0 Demographic Profile

6.1 Context of a Demographic Profile

As per OFM-TG-02-2019, a demographic profile examines a community's population based on the following factors:

- size and dispersion
- age
- gender
- cultural background
- level of education
- socioeconomic makeup
- transient population

When a fire department knows its community's demographics, it can identify specific groups that may be at high risk of suffering or causing a fire or other emergency. The fire department can then develop programs and outreach initiatives to communicate with those groups and reduce fire risk in the community.

As it develops public safety initiatives, a fire department must ensure it respects the demographics in its community. Doing so will allow the fire department to provide all community residents with programs and services that are meaningful to them.

6.2 Population

According to Statistics Canada's 2021 Census of Population, Essex has a population of 21,216 year-round residents. Essex has the 85th largest population in Ontario and the 213rd largest population in Canada.

Essex's population increased by 3.9 per cent from 2016 to 2021. During this period, Ontario's population grew by 5.8 per cent, and Canada's population grew by 5.2 per cent.

In 2021, there were 8,391 private dwellings occupied by permanent residents of Essex, representing an increase of 3.8 per cent from 2016.

6.3 Age

Table 21 compares the age distribution in Essex to the Province of Ontario (based on the findings of the 2021 Statistics Canada census).

Table 21. Age distribution in the Town of Essex vs. the Province of Ontario.

Age Range	Essex	Ontario
0 to 14 years	15.3%	15.8%
15 to 64 years	62.8%	65.6%
65 years and over	21.9%	18.5%
85 years and over	2.6%	2.4%

Based on the census data, the average age in Essex is 44.1 (compared to the provincial average of 41.8). The median age in Essex is 46.8 (compared to the provincial average of 41.6).

6.4 Language and Cultural Considerations

It is essential for fire departments to acknowledge language and cultural considerations when developing community programs and services. From a communications perspective, not all residents speak English as their first language. This means fire prevention and public education materials must account for possible language barriers. From a cultural perspective, many groups have differing fire safety practices, which means fire departments must ensure they develop programs that promote safety while respecting cultural beliefs.

According to the 2021 Statistics Canada census, Essex is a predominantly English-speaking community, with 92.6 per cent of its population identifying English as their first language. Overall, 99.8 per cent of the town's residents can hold a conversation in English, and 6.9 per cent are bilingual in English and French.

6.5 Level of Education

Table 22 compares the highest level of education in Essex to the provincial average (based on the findings of the 2021 Statistics Canada census).

Table 22. Education levels in the Town of Essex vs. the Province of Ontario.

Education Level	Essex	Ontario
No certificate	12.8%	15.3%
High school	28.9%	27.2%
Some post-secondary	38.5%	57.5%

6.6 Socioeconomic Makeup

Table 23 lists the socioeconomic makeup of Essex in 2020, according to the 2021 Statistics Canada census.

Table 23. Socioeconomic statistics for the Town of Essex, 2020.

Statistic	Essex	Ontario
Number of total income recipients aged 15 years and over in private households.	17,430	11,782,845
Average total income among recipients	$51,350	$56,350
Average after-tax income among recipients	$43,960	$46,280
Average family size of economic families	3.0 people	3.1 people
Average total income of economic family	$123,400	$137,200
Prevalence of low income based on the Low-income measure, after tax	7.3%	10.1%

6.7 Transient and Seasonal Population

Throughout the summer, Essex's population grows by approximately 7,000 people.

Temporary residents visit Essex to stay at campgrounds, marinas, and cottages. There are several children's campgrounds within Essex, including Camp Cedarwin (operated by Scouts Canada), Kiwanis Sunshine Point Camp, and Gesstwood Camp and Education Centre.

In addition, an undetermined number of migrant workers live in Essex each year during the growing and harvesting seasons. In most cases, these workers live in seasonal housing facilities.

6.8 Schools, Day Cares, and Vulnerable Occupancies

The Department must keep itself aware of all schools, day cares, and vulnerable occupancies in Essex, as these sites may be at a heightened risk of fire or other emergencies.

Tables 24 to 26 list the schools, day cares, and vulnerable occupancies in Essex. The tables indicate applicable demographic considerations for each site.

Table 24. List of schools in the Town of Essex.

School	Type of School	Students	Staff
Essex Public School	Elementary	606	78 full-time 15 part-time
Colchester North Public School	Elementary	276	26
Harrow Public School	Elementary	398	40
Essex District High School	Secondary	701	73
Holy Name Catholic Elementary School	Elementary	363	37
St. Anthony Catholic Elementary School	Elementary	206	25 full-time 5 part-time
École élémentaire catholique Sainte-Ursule	Elementary (French immersion)	202	25 full-time 4 part-time
Ebenezer Christian Academy	Elementary (private)	30	8 full-time 4 part-time

Table 25. List of day care facilities in the Town of Essex.

Day Care Centre	Children	Staff
Once Upon A Time Child Care Centre	64	20
Before and After School Program (Once Upon A Time Child Care Centre)	56	20
Story Book Early Learning Centre	122	37 full-time 24 part-time
Harrow Daycare	73	10 full-time 2 part-time
First Steps Childcare Centre	99	25 full-time 13 part-time

Table 26. List of vulnerable occupancies in the Town of Essex.

Vulnerable Occupancy	Type of Facility	Beds	Min. Staff
Community Living: 85 Gosfield Townline E	Residential care	5	1
Community Living: 94 Kingsway Cres.	Residential care	3	1
Community Living: 167 Maidstone Ave. E	Residential care	4	1
Community Living: 168 Albert St.	Residential care	3	1
Community Living: 169 Fairview Ave. W	Residential care	4	1
Community Living: 27 Shepley Ct.	Residential care	3	1
Community Living: 315 Brien Ave. W	Residential care	2	1
Community Living: 7414 County Rd. 18	Residential care	3	1
Community Living: 9511 Walker Rd.	Residential care	3	1
Community Living: 12064 County Rd. 15	Residential care	4	1
Harrowood Seniors Community	Long-term care	67	2
St. Francis Advocates	Residential care	5	1
Village Lodge Rest Home	Rest home	14	1
Extendicare Iler Lodge Retirement Residence	Long-term care	130	7
Christian Horizons	Residential care	3	1

According to numbers provided by the town, Essex has 252 residents living in vulnerable occupancies.

6.9 Demographic Profile Summary

Table 27 summarizes the demographic considerations identified in Essex, as well as issues, concerns, and observations for each demographic category.

Table 27. Demographic profile summary for the Town of Essex.

Demographic Consideration	Issues/Concerns/Observations
Age	• Children may not have an adequate level of education about fire safety and other emergencies. • 21.9% of Essex's population is over the age of 65. • It takes time and resources to verify that seniors have working smoke alarms in their residences. • Some seniors may require assistance to evacuate in the event of an emergency. • It can be difficult to provide fire safety and other emergency information to seniors because of their existing knowledge, practices, and beliefs. • Seniors may not have the ability to ensure their homes have fire safety measures in place. • Some seniors may rely on traditional sources of communication (such as radio, newspaper, or television) to receive information. If the Department exclusively uses newer methods of communication (such as social media) to deliver information, some seniors may not receive it.
Level of education	• 12.8% of Essex's population does not have a high school diploma or equivalent. • The Department must strive to provide all residents with fire and life safety education that is clear, applicable, and meaningful to their demographic.
Socioeconomic makeup	• As of 2020, the average before-tax income for an individual in Essex was $51,350. The average before-tax income for an economic family in Essex was $123,400. • The Department must ensure all residents have access to fire prevention materials (such as fire alarms) regardless of income.

Demographic Consideration	Issues/Concerns/Observations
Transient and seasonal population	• Essex has an annual influx of about 7,000 seasonal residents/tourists during the summer. • Many children visit Essex's camp facilities during the summer. • An underdetermined number of migrant workers live in Essex during the growing and harvest seasons. • An increase in residents leads to an increased traffic volume. • It takes time and resources to ensure that all seasonal residents receive fire safety education.
Schools	• It takes time and resources to conduct inspections, witness fire drills, and review fire safety plans. • It takes time and resources to deliver education about fire and life safety. • On-site visits to schools are required to identify hazards and determine risk levels.
Day cares	• It takes time and resources to conduct inspections, witness fire drills, and review fire safety plans.
Vulnerable occupations	• It takes time and resources to conduct inspections, witness fire drills, and review fire safety plans.

6.10 Risks Identified by the Demographic Profile

Table 28 summarizes the risks identified by the demographic profile for Essex.

Table 28. Demographic profile risk summary.

Risk	Likelihood	Consequence	Risk Level
Fire in residential occupancy	Almost certain	Minor	**Moderate**
Fire in vulnerable occupancy	Likely	Moderate	**Moderate**
Fire in assembly occupancy	Possible	Moderate	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

7.0 Hazard Profile

7.1 Context of a Hazard Profile

As per OFM-TG-02-2019, a hazard profile examines the natural, technological, and human-made threats a community might face, such as:

- severe weather (such as freezing rain, ice storms, tornadoes, or hurricanes)
- forest fires
- floods
- transportation emergencies
- cyber-attacks
- human health emergencies
- energy supply disruptions
- hazardous materials spills

It is vital for the local fire department to review all potential risks identified in the hazard profile section of its community's CRA. The fire department must also understand which of those risks it is expected to respond to if an emergency occurs.

7.2 Hazards in the Town of Essex

Road/Highway Incident

A road/highway incident can impact Essex in the following ways:

- Fires may occur.
- Explosions may occur.
- Injuries may occur.
- Deaths may occur.
- The Department may need to rescue trapped or injured people.

Severe Weather Event

A severe weather event can impact Essex in the following ways:

- Power interruptions may occur.
- Communication systems may become disrupted.
- Essex's residents may be unprepared for severe weather.

- Visitors in Essex may be unprepared for severe weather, especially those unfamiliar with the area.
- Some severe weather conditions can result in periods of low visibility.
- Some severe weather conditions may cause delays in emergency responses.
- Severe weather conditions may cause motorists to become stranded on the highways, which may require the Department to assist them.
- A severe weather event may reduce the Department's service delivery. Potential impacts include service delays and the inability to deliver services.

Note: While conducting an on-site visit in Essex in the summer of 2023, The Loomex Group's personnel witnessed firsthand a severe weather event that disrupted the town's services for an extended period.

Human Health Emergency

A human health emergency can impact Essex in the following ways:

- Some health emergencies may require Essex to issue evacuation or quarantine orders.
- A health emergency may cause businesses to close.
- First responders may become exposed to pathogens while responding to health emergencies.

Localized Flooding

Localized flooding can impact Essex in the following ways:

- Emergency responders may need to rescue endangered people.
- Flooding may prevent emergency responders from accessing certain areas of Essex.

7.3 Risks Identified by the Hazard Profile

Table 29 summarizes the risks identified by the hazard profile for Essex.

Table 29. Hazard profile risk summary.

Hazard	Likelihood	Consequence	Risk Level
Severe weather event	Almost certain	Moderate	**High**
Road/highway incident	Almost certain	Minor	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

Additional Considerations

In addition to the risks listed in the table above, the Department should remain aware of the risks posed by human health emergencies and localized flooding.

8.0 Public Safety Response Entities Profile

8.1 Context of a Public Safety Response Entities Profile

As per OFM-TG-02-2019, a public safety response entities profile examines the organizations that respond to emergencies in the community. Aside from a fire department, the most common examples of public safety response agencies are police and paramedic services.

A public safety response entities profile considers the following questions:

- What incidents do the non-fire department organizations respond to?
- What are the response capabilities of the non-fire department organizations?
- Does the fire department have any potential interdependencies?

The data in this profile gives insight that allows a fire department to consider the level of fire protection services it provides. For instance, a community may have an industrial facility with an internal fire services crew. If so, the local fire department can set the level of service it provides to the facility accordingly.

A public safety response entities profile can also provide insight into the benefits of establishing a tiered/joint response to various emergencies. Such insights can help a fire department identify risk treatment options based on shared responsibilities.

8.2 Public Safety Response Entities Profile Summary

Table 30 lists the public safety response agencies for Essex and notes the potential issues that might affect their operations during an emergency response.

Table 30. Public safety response agencies in Town of Essex

Response Agency	Types of Incidents	Role at Incident	Issues or Concerns
Essex-Windsor EMS	• Fires • Explosions • Medical emergencies • Structural failures • Road and highway incidents • Hazardous materials incidents	• Care for patients. • Transport patients as needed. • Monitor firefighter health at fire scenes.	• Delayed response times are possible.
Ontario Provincial Police	• Fires • Explosions • Sudden deaths • Structural failures • Road and highway incidents • Hazardous materials incidents	• Ensure the incident scene is secure. • Assist with investigations. • Investigate collisions, deaths, and criminal activity. • Control traffic.	• Delayed response times are possible.
E.L.K./Entegrus	• Fires • Downed power lines • Electrical fires in transmission equipment	• Ensure the affected area is safe/secure. • Isolate electrical services. • Repair electrical infrastructure. • Restore electrical services.	• Delayed response times are possible. • Lengthy outages are possible.
Hydro One	• Fires • Downed power lines • Electrical fires in transmission equipment	• Ensure the affected area is safe/secure. • Isolate electrical services. • Repair electrical infrastructure. • Restore electrical services.	• Delayed response times are possible. • Lengthy outages are possible.
Telecommunications companies	• Communication service disruptions	• Repair damaged lines and systems.	• No issues or concerns.

Response Agency	Types of Incidents	Role at Incident	Issues or Concerns
Office of the Fire Marshal	• Fires • Explosions • Large-scale emergencies	• Investigate explosions and fires that meet the FPPA's criteria (per Directive 2023-001). • Assist police with investigations. • Provide advice during large-scale emergencies (if needed). • Provide limited equipment for large-scale emergencies.	• Delayed response times are possible.
Windsor-Essex County Health Unit	• Domestic water incidents • Health investigations	• Issue boiling water advisories. • Assist with health issues. • Conduct exposure investigations. • Provide advice regarding responses to health emergencies.	• No issues or concerns.
Town of Essex Infrastructure and Development Department	• Fires • Motor vehicle collisions	• Close roads. • Complete required winter operations. • Repair roads. • Conduct water/wastewater operations.	• No issues or concerns.
Technical Standards and Safety Authority	• Fires • Carbon monoxide emergencies • Elevator emergencies	• Assist with investigations. • Provide limited training as needed.	• Delayed response times are possible. • Training levels may be limited. • Training can be costly.

Response Agency	Types of Incidents	Role at Incident	Issues or Concerns
Enbridge Gas	• Gas leaks • Carbon monoxide emergencies	• Assist in carbon monoxide investigations. • Shut off gas services. • Repair damaged gas lines. • Assist in detecting gas leaks.	• Delayed responses are possible due to lengthy travel times.
Ministry of the Environment	• Hazardous spills • Hazardous materials incidents	• Order the cleanup of spill sites. • Help control spills and the release of substances.	• No issues or concerns.
Ministry of Transportation (for provincial highways only)	• Fires • Motor vehicle collisions	• Close roads. • Ensure road safety during the winter. • Repair roads.	• No issues or concerns.

8.3 Risks Identified by the Public Safety Response Entities Profile

The public safety response entities profile for Essex does not identify any current threats to the town. However, the town and the Department should review the information in this profile carefully, as it is important for them to know the capabilities and limitations of the available public response agencies. It is also in the town's best interest to maintain good working relationships with those organizations. Doing so will help improve communication and response efforts during emergencies.

Essex must also recognize that the Department is not equipped to deal with all potential incidents that can occur in the community. Some responses may require equipment the Department lacks. Other incidents may require emergency responders to have specialized training that the Department's personnel haven't received. If such an incident occurs, the Department's only responsibilities may be to contact the appropriate response agency and maintain scene security until a representative of that organization arrives.

9.0 Community Services Profile

9.1 Overview of a Community Services Profile

As per OFM-TG-02-2019, a community services profile examines the organizations in a community that can assist the local fire department with various duties, such as:

- distributing public safety education
- conducting OFC inspections or enforcement
- making emergency responses

Community service groups can also provide the following support or resources:

- financial assistance
- venues for training or exercises
- access to high-risk groups
- temporary shelter

It is important to consider these organizations and the assistance they provide, as the presence or absence of community services may dictate the types of emergencies to which the local fire department responds.

9.2 Community Services Profile Summary

Table 31 summarizes the community services that may have the capacity to assist the Department when it responds to an emergency. The table also notes issues and concerns regarding each community service (where applicable).

Table 31. Community services in the Town of Essex.

Community Service	Assistance Provided	Issues/Concerns/Observations
Health unit	The health unit provides vulnerable persons with access to public education. The health unit also provides advice and services for firefighters who were exposed to contaminants during a response.	• There are no issues or concerns.
Municipal halls and community centres	These buildings are large assembly occupancies that can serve as evacuation spaces and warming/cooling centres.	• There are no back-up power supplies (such as a generator) to provide electricity if the facilities are required during a power outage.
Schools	Schools are large assembly occupancies that can serve as evacuation spaces and warming/cooling centres. Schools are also locations where fire departments can deliver fire and life safety education programs.	• Human health emergencies may affect the availability of school facilities. • Some schools may not have emergency power or backup power generators.
Faith-based groups	Churches may offer support services for those who suffer a loss due to a fire or other emergency.	• Human health emergencies may affect the availability of community services and groups.
Red Cross	Red Cross services can support the community during a large-scale emergency. For example, the Red Cross could help organize a temporary shelter for someone who has suffered a fire in their residence.	• Delayed deployment times are possible. • There are costs involved with contacting the Red Cross for assistance (depending on the scale of the emergency and its circumstances).
Service clubs	Service groups can run fundraisers to assist community interest groups. For example, the groups can help circulate fire safety materials to seniors or provide bicycle safety materials to cyclists.	• Human health emergencies may affect the staffing levels or availability of service groups.
Victim Services of Windsor & Essex County	Victim services are activated through the police or fire department to provide immediate on-site crisis and trauma services. Victim services can also help with urgent practical matters and help arrange other support and resources.	• There are no issues or concerns.

9.3 Risks Identified by the Community Services Profile

The community services profile for Essex does not identify any current threats to the town. However, the town and the Department should review the information in this profile carefully. Knowing the availability and limitations of the identified community services will help Essex integrate support from those organizations into its emergency responses as needed.

10.0 Economic Profile

10.1 Context of an Economic Profile

As per OFM-TG-02-2019, an economic profile examines the economic sectors that affect a community and support its financial sustainability. The profile views economic information from an overall public safety perspective while considering the following questions:

- What sectors influence the community's local economy?
- What potential impacts would the community suffer if it loses the sectors influencing its economy?
- Are there industrial or commercial occupancies in the community that provide significant economic production or jobs? If so, what are the potential risks that could impact those occupancies?

The information in an economic profile can help a fire department determine which fire protection services its community's different economic sectors require. A fire department can also use the information in the profile to identify actions it can take to reduce the risk of emergencies in the local industrial or commercial occupancies, which can help reduce the risk of emergencies that require large-scale responses.

10.2 Employment Statistics

10.2.1 Economic Industries

The major employers in Essex (by industry) are as follows:

Manufacturing Industry

- AtlasTube
- EnerQuest Services
- Sellick Equipment
- Delta Wire

Healthcare Industry

- Revera Long-Term Care

Logistics Industry

- Robinson Transport & Warehousing

Industrial Services

- Essex Weld Solutions

10.2.2 Commute Times

Most residents employed in Essex's labour force drive to work and report an average work commute of less than 30 minutes.

10.2.3 Unemployment Rate

According to the 2021 Statistics Canada census, the unemployment rate in Essex is 15.7 per cent (compared to the provincial average of 12.2 per cent).

10.3 Tourism

The Essex community attracts a significant number of tourists, especially during the summer.

The main tourist attractions in Essex are as follows:

- aquatic amenities (including Lake Erie, which tourists make use of for boating and swimming activities)
- golf courses
- hiking and walking trails
- cycling trails
- local shops
- wineries
- Harrow Fair
- Essex Fun Fest

10.4 Agriculture and Food Manufacturing

Essex has established the Heritage Farm program, which recognizes family-owned farms which have been operating for over fifty years. According to the town's website, "heritage farms are an important element of [the town's] local history and celebrate family legacy."[2]

Essex also has the equipment and resources to support the various facets of food manufacturing, including food processing, packaging, warehousing, distribution, retail,

[2] https://www.essex.ca/en/discover/heritage-farm-program.aspx

and food service.

10.5 Risks Identified by the Economic Profile

Table 32 summarizes the risks identified by the economic profile for Essex.

Table 32. Economic profile risk summary.

Risk	Likelihood	Consequence	Risk Level
Fire/explosion in industrial occupancy	Likely	Moderate	**Moderate**
Fire in commercial occupancy	Likely	Minor	**Moderate**
Fire in downtown core	Possible	Moderate	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

11.0 Past Loss and Event History Profile

11.1 Context of a Past Events and Loss History Profile

As per OFM-TG-02-2019, a past loss and event history profile examines statistics about the fires and other emergencies a community has experienced in recent years.

Completing a past loss and event history profile involves the following tasks:

- Analyze the number and types of responses, injuries, deaths, and dollar losses.
- Assess previous response data.
- Compare local fire loss statistics with provincial fire loss statistics.

The data in a past loss and event history profile provides valuable insights regarding the trends, circumstances, behaviours, locations, and occupancies involved with previous fires. This information can guide a fire department as it develops public education initiatives and code inspection and enforcement programs to address the high-risk demographics and occupancies in its community.

A fire department should also review response data about its non-fire calls (such as responses to motor vehicle collisions and medical calls) to determine the level of risk and frequency of those emergencies. By reviewing response data about both fire calls and non-fire calls, a fire department gains an overall understanding of the type and level of fire protection services its community requires.

11.2 Loss History in the Town of Essex, 2018 to 2022

The past loss and event history profile for Essex assesses the town's fire loss statistics from the past five years (2018 to 2022).

Tables 33 to 37 show the following statistics for Essex:

- the number of fires in Essex per building group
- the percentage of total fires in Essex per building group
- the percentage of total fires in Ontario per building group
- the amount of dollar loss in Essex per building group
- the number of injuries and deaths caused by fires in Essex per building group
- the known causes of dollar loss fires in Essex per building group

Note: As of this CRA, provincial dollar loss data for 2022 is unavailable.

Table 33. Fire loss statistics in the Town of Essex for 2018.

Occupancy	Fires	Essex %	ON %	$ Loss	Injuries	Deaths	Causes
Group A (Assembly)	0	0%	2%	$0	0	0	• N/A
Group B (Detention, Care, and Treatment)	1	7%	1%	$0	0	0	• Cooking
Group C (Residential)	9	60%	47%	$557,000	0	0	• Cutting/welding • Smoking materials
Groups D & E (Commercial and Mercantile)	0	0%	4%	$0	0	0	• N/A
Group F (Industrial)	0	0%	5%	$0	0	0	• N/A
Other	5	33%	42%	$54,000	0	0	• Undetermined • Electrical
Totals	**15**			**$611,000**	**0**	**0**	

Table 34. Fire loss statistics in the Town of Essex for 2019.

Occupancy	Fires	Essex %	ON %	$ Loss	Injuries	Deaths	Causes
Group A (Assembly)	0	0%	2%	$0	0	0	• N/A
Group B (Detention, Care, and Treatment)	0	0%	1%	$0	0	0	• N/A
Group C (Residential)	7	50%	46%	$82,500	0	0	• Cutting/welding • Smoking materials • Cooking • Candles • Suspected arson
Groups D & E (Commercial and Mercantile)	2	14%	4%	$21,000	0	0	• HVAC malfunction • Smoking materials
Group F (Industrial)	0	0%	5%	$0	0	0	• N/A
Other	5	36%	42%	$22,000	0	0	• Undetermined (vehicle) • Electrical • Mechanical
Totals	**14**			**$125,500**	**0**	**0**	

Table 35. Fire loss statistics in the Town of Essex for 2020.

Occupancy	Fires	Essex %	ON %	$ Loss	Injuries	Deaths	Causes
Group A (Assembly)	0	0%	2%	$0	0	0	• N/A
Group B (Detention, Care, and Treatment)	0	0%	1%	$0	0	0	• N/A
Group C (Residential)	14	58%	49%	$577,850	0	0	• Electrical appliances • Exposures • Woodstove • Arson
Groups D & E (Commercial and Mercantile)	0	0%	4%	$0	0	0	• N/A
Group F (Industrial)	0	0%	5%	$0	0	0	• N/A
Other	10	42%	41%	$103,000	0	0	• Electrical • Mechanical • Arson
Totals	**24**			**$680,850**	**0**	**0**	

Table 36. Fire loss statistics in the Town of Essex for 2021.

Occupancy	Fires	Essex %	ON %	$ Loss	Injuries	Deaths	Causes
Group A (Assembly)	1	5%	2%	$5,000	0	0	• Electrical
Group B (Detention, Care, and Treatment)	0	0%	1%	$0	0	0	• N/A
Group C (Residential)	11	58%	49%	$308,000	0	0	• Undetermined • Exposures • Accidental • Smoking materials • Electrical
Groups D & E (Commercial and Mercantile)	0	0%	4%	$0	0	0	• N/A
Group F (Industrial)	0	0%	5%	$0	0	0	• N/A
Other	7	37%	39%	$120,000	0	0	• Mechanical • Electrical • Arson
Totals	**19**			**$433,000**	**0**	**0**	

Table 37. Fire loss statistics in the Town of Essex for 2022.

Occupancy	Fires	Essex %	ON %	$ Loss	Injuries	Deaths	Causes
Group A (Assembly)	0	0%	No data.	$0	0	0	• N/A
Group B (Detention, Care, and Treatment)	0	0%	No data.	$0	0	0	• N/A
Group C (Residential)	7	39%	No data.	$1,040,500	0	0	• Undetermined • Electrical • Exposures • Smoking materials
Groups D & E (Commercial and Mercantile)	0	0%	No data.	$0	0	0	• N/A
Group F (Industrial)	2	11%	No data.	$1,400,000	0	0	• Undetermined • Cutting/welding
Other	9	50%	No data.	$260,000	0	0	• Mechanical • Electrical • Arson • Overheated engine
Totals	**18**			**$2,700,500**	**0**	**0**	

Table 38 summarizes the information from the above tables. (Note**:** The Ontario percentage in this table only includes data from 2018 to 2021.)

Table 38. Total fire loss statistics in the Town of Essex, 2018 to 2022.

Occupancy	Fires	Essex %	ON %	$ Loss
Group A (Assembly)	1	1%	2%	$5,000
Group B (Detention, Care, and Treatment)	1	1%	1%	$0
Group C (Residential)	48	53%	48%	$2,565,850
Groups D & E (Commercial and Mercantile)	2	2%	4%	$21,000
Group F (Industrial)	2	2%	5%	$1,400,000
Other	36	40%	41%	$559,000
Totals	**90**			**$4,550,850**

11.3 Response Statistics for Essex Fire and Rescue

11.3.1 Fire Call Responses and Non-Fire Call Responses

Table 39 lists the Department's number of fire call responses from 2018 to 2022, noting the number of fires per category, as well as the number of non-fire calls, such as road/highway incidents and false alarms.

Table 39. Fire responses in the Town of Essex, 2018 to 2022.

Year	Loss Fires: Structures	Loss Fires: Other	Loss Fires: Vehicles	No Loss Fires	Non-Fire Calls	Total Calls
2018	10	4	1	1	306	322
2019	9	5	0	0	259	273
2020	14	10	0	0	275	299
2021	12	7	0	0	286	305
2022	9	9	0	0	310	328
Total	**54**	**35**	**1**	**1**	**1,436**	**1,527**
Average	**10.8**	**7**	**0.2**	**0.2**	**287.2**	**305.4**

11.3.2 Response Times

According to its records, the Department responded to 1,527 incidents from January 2018 to December 2022.

Table 40 uses the Department's response data for the emergency responses it completed from 2018 to 2022 to show the Department's average response times (dispatch time to on-scene time) for those years.

Table 40. Average response times, 2018 to 2022.

Year	Calls Reviewed	Average Minutes per Call
2018	322	9m 46s
2019	273	9m 26s
2020	299	9m 42s
2021	305	9m 31s
2022	328	9m 42s
2018 to 2022	**1,527**	**9m 38s**

11.4 Risks Identified by the Past Loss and Event History Profile

As noted above, the Department responded to 91 fires between 2018 and 2022. Some of the fires that occurred in residential and commercial occupancies occurred in the downtown core of Essex Centre.

Table 41 summarizes the risks identified by the past loss and event history profile for Essex.

Table 41. Past loss and event history profile risk summary.

Risk	Likelihood	Consequence	Risk Level
Fire in residential occupancy	Almost certain	Minor	**Moderate**
Fire in vulnerable occupancy	Likely	Moderate	**Moderate**
Road/highway incident	Almost certain	Minor	**Moderate**
Fire/explosion in industrial occupancy	Likely	Moderate	**Moderate**
Fire in commercial occupancy	Likely	Minor	**Moderate**
Fire in downtown core	Possible	Moderate	**Moderate**
Fire in assembly occupancy	Possible	Moderate	**Moderate**

For more information about these risks, refer to the following sections of this CRA:

- Section 12: This section contains the risk level matrix used to calculate the overall likelihood levels and risk scores for the indicated risks.
- Section 13: This section contains the RTPs developed for the indicated risks.

12.0 Scoring Methodology and Risk Matrix

12.1 Context of Risk Scores

The Loomex Group determined risk scores for the hazards it identified in Essex by assessing each threat's likelihood and consequence levels. This process involved using a hazard identification and risk assessment ("**HIRA**") scoring methodology developed by Emergency Management Ontario ("**EMO**"). However, The Loomex Group modified the consequence portion of the HIRA scoring system (as discussed below) to ensure that the scoring system in this CRA reflects the realities of delivering fire protection services.

12.2 Likelihood Scoring

The first component of the risk-scoring process is likelihood scoring. Likelihood levels are determined by thoroughly examining the results of the nine community profiles reviewed during a CRA's development. Particular focus is given to the findings of the past loss and event history profile.

Table 42 explains each level of risk likelihood.

Table 42. Risk matrix likelihood levels.

Likelihood	Category	Rate of Occurrence	Likelihood Per Year
1	Rare	Occurs every 100 years or more.	Less than 1%
2	Very Unlikely	Occurs every 50 to 99 years.	1–2%
3	Unlikely	Occurs every 20 to 49 years.	2–5%
4	Probable	Occurs every five to 19 years.	5–20%
5	Likely	Occurs within a five-year period.	21-99%
6	Certain	The hazard occurs annually.	100%

12.3 Consequence Scoring

The second component of the risk score process is consequence scoring. To complete the consequence scoring for this CRA, The Loomex Group used eight of the ten consequence categories in EMO's HIRA methodology (as defined in Table 43).

Table 43. Risk matrix consequence levels.

Consequence Type	No Consequence	Low Consequence	Moderate Consequence	High Consequence
Life safety	Not likely to result in injuries or fatalities. No life safety issues.	Medical treatment may be required, but no fatalities are involved. Minor treatment or limited hospitalization may be required.	Extensive injuries occur and hospitalization is required. A fatality may be involved.	Many severe injuries requiring hospitalization have occurred. Multiple fatalities may be involved.
Evacuation	Not likely to result in an evacuation, a shelter-in-place order, or people stranded.	A small or localized portion of the population is evacuated, sheltered-in-place, or stranded.	A moderate and generally localized portion of the population is evacuated, sheltered-in-place, or stranded.	A large or widespread portion of the population is evacuated, sheltered-in-place, or stranded.
Psychosocial	Not likely to result in significant impacts on an individual's mental health and emotional well-being.	Moderate or generally short-term impacts on the mental health and emotional well-being of one or more people.	Significant and possibly long-term impacts on the mental health and emotional well-being of one or more people.	Widespread and possibly long-term impacts on the mental health and emotional well-being of the community.
Property damage	Not likely to result in property damage.	Could cause minor to moderate property damage.	Severe but localized property damage.	Widespread or severe damage to multiple properties.
Critical infrastructure	Not likely to disrupt assets or services.	Could cause a minor disruption of assets or services.	Could cause major but localized, short-term disruptions to critical infrastructure services.	Could cause widespread, severe, and ongoing disruptions of assets or services.
Environmental	Not likely to result in environmental damage.	Could cause localized but reversible environmental damage. A quick cleanup is possible.	Could cause major but reversible environmental damage. Clean-up efforts are difficult.	Could cause severe, irreversible environmental damage. Clean-up efforts are not possible.
Economic	Not likely to disrupt business or financial activities.	Could cause minor disruptions to businesses or financial activities. A minor disruption to the local economy is possible.	Could result in losses for one or more businesses. Could result in other negative consequences for the regional or local economy.	Could result in losses for an industry. Could cause severe economic impacts on the community or region.
Reputational	Not likely to result in significant legal, political, or reputational impacts.	Likely to result in limited or short-term legal, political, or reputational impacts.	Likely to result in significant or long-term legal, political, or reputational impacts.	Likely to result in significant or lasting legal, political, or reputational impacts.

The Loomex Group calculated consequence scores for this CRA by using the following weighting structure:

- High consequence: Score of 3
- Moderate consequence: Score of 2
- Low consequence: Score of 1
- No consequence: Score of 0

In the life safety category, The Loomex Group multiplied the consequence score by a factor of 3, making 9 the maximum score for this category. The heavier overall weighting for this category is due to the potential for severe life safety consequences during a front-line emergency response.

12.4 Total Risk Scoring

Each hazard's overall risk level is calculated by multiplying its likelihood score by its consequence score.

After multiplying the likelihood and consequence scores, each risk is categorized by its total risk score (as defined in Table 44).

Table 44. Risk level categories.

Category	Total Score
Very Low	1 to 30
Low	31 to 60
Moderate	61 to 90
High	91 to 120
Very High	121 to 150
Extreme	151 to 180

12.5 Risks Identified in the Town of Essex

Table 45 lists the public safety risks identified in Essex. The table presents the information as a risk matrix, which ranks the risks based on the severity of their total risk scores (as per the methodology defined above).

Table 45. Risk matrix for the Town of Essex.

Risk	Likelihood Score	Life Safety Consequence	Evacuation Consequence	Psychosocial Consequence	Property Damage Consequence	Critical Infrastructure Consequence	Environmental Consequence	Economic Consequence	Reputational Consequence	Consequence Score	Total Risk Score	Risk Level
Severe weather event	6	6	3	2	2	2	2	2	1	20	120	**High**
Fire in residential occupancy	6	9	1	1	1	1	1	0	1	15	90	**Moderate**
Fire in vulnerable occupancy	5	6	1	2	2	1	1	2	2	17	85	**Moderate**
Road/highway incident	6	6	1	1	1	2	1	1	1	14	84	**Moderate**
Fire/explosion in industrial occupancy	5	6	2	1	2	1	1	2	1	16	80	**Moderate**
Fire in commercial occupancy	5	6	1	1	2	1	1	2	1	15	75	**Moderate**
Critical infrastructure failure	6	3	1	1	1	2	1	2	1	12	72	**Moderate**
Fire in downtown core	4	6	1	2	2	1	1	2	1	16	64	**Moderate**
Fire in assembly occupancy	4	6	1	2	2	1	1	2	1	16	64	**Moderate**

13.0 Risk Treatment Plans

13.1 Overview of Risk Treatment Plans

The following RTPs address the fire and life safety risks identified in Essex. There is one RTP for each risk.

Each RTP begins by identifying which community profile is applicable to the risk under discussion. The RTP then presents administrative and operational observations about the risk and considers the following five questions:

1. What evidence is there to support the need for services that address this risk?
2. Does the current treatment meet the community's needs and expectations?
3. Is the community capable of delivering the required services?
4. Is there a way to make the community safer?
5. Are there any emerging risks the Department cannot manage or is not managing?

Based on the answers to those questions, the RTP recommends at least one of the following actions to address the risk under discussion:

1. Avoid: Eliminate the hazard.
2. Mitigate: Reduce the likelihood or impact of the risk.
3. Accept: Take no action.
4. Transfer: Transfer the risk to another party.
5. Share: Transfer part of the risk's ownership to another party.

All recommended actions include appropriate risk management strategies, covering topics such as:

- policies and procedures
- training
- service delivery agreements
- resource allocation
- service level changes

The RTPs then list the resources and timelines needed to implement the strategies.

The Department should use the RTPs to guide the development of programs and services to lessen the impacts of the community's identified risks.

13.2 Severe Weather Event

Risk Level: High

Risk Score: 120

Applicable Community Profile

This risk was identified by the critical infrastructure profile and the hazard profile.

Current Treatment, Capability, and Services Provided

- The Department responds to all types of weather-related emergencies in Essex, including snowstorms and windstorms.
- If severe weather damages any infrastructure in Essex, the Department provides rescue/evacuation services and establishes a safety zone (if necessary) until the proper authority arrives to repair or isolate the damaged infrastructure.

Administrative and Operational Risks, Concerns, and Observations

- If a severe weather event causes damage to any buildings or infrastructure in Essex, it may take time for the proper authority to arrive at the scene of the damage.
- Severe weather can last for many days. If Essex experiences a prolonged severe weather event, the Department's firefighters may struggle to balance their personal and work commitments with their emergency response duties.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

Essex has experienced several severe weather events in the last few years, including snowstorms, tornadoes, and localized flooding. Some incidents caused significant damage to homes and farms. Other incidents caused traffic issues on the nearby highways, which impacted the town's main roadways.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations.

Is the community capable of delivering the required services?

In most cases, the Department can deliver the required services. However, responding to a prolonged severe weather event may put a strain on the Department's firefighters and resources.

If the Department needs additional resources or specialized assistance during a severe

weather event, it can receive support through its mutual aid agreement.

Is there a way to make the community safer?

The Department can continue providing public education about the importance of emergency preparedness, including what to do before, during, and after an emergency.

The Department can ensure that Essex continues conducting annual emergency management exercises.

Are there emerging risks that the Department cannot manage or is not managing?

As of this CRA, there are no unmanaged emerging risks.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should continue providing public education about the importance of emergency preparedness, including what to do before, during, and after an emergency.

Resources Needed

- Implementing this RTP will require the Department's time and resources.
- Preparing and distributing public education information (such as flyers and handouts about 72-hour emergency kits) will require resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.3 Fire in Residential Occupancy

Risk Level: Moderate

Risk Score: 90

Applicable Community Profile

This risk was identified by the building stock profile, demographic profile, and past loss and event history profile.

Current Treatment, Capability, and Services Provided

- The Department responds to fires in Essex's residential occupancies and provides exterior and interior fire attack services and rescue services (as needed).
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.
- The Department inspects residential occupancies in Essex when it receives a complaint or request. The Department maintains details of all inspections in its records, and it sends follow-up notices as required.
- As part of its Alarm for Life program, the Department checks, tests, and replaces smoke/CO alarms in Essex's residential occupancies (as needed). The Department uses the results of its Alarm for Life program to identify which residential occupancies in Essex require more targeted fire prevention and public education initiatives.
- The Department uses social media to distribute fire safety messages. The Department also distributes fire safety information at various public events.

Administrative and Operational Risks, Concerns, and Observations

- The Department should increase the frequency of inspections at the high-density dwellings and multi-residential dwellings in Essex to verify that those occupancies fulfill their code compliance and safety planning obligations.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

The Department has responded to 48 residential fires in Essex over the past five years, which represents 53 per cent of the total structure fires that occurred in the town during those years.

The 48 residential fires in Essex over the past five years resulted in a combined dollar loss of approximately $2,265,850.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations.

Is the community capable of delivering the required services?

In most cases, the Department should have the capacity to deliver the required services. If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.

Is there a way to make the community safer?

The Department can continue to conduct regular inspections of Essex's multi-unit residential occupancies, motels/hotels, and other boarding/lodging occupancies. The Department can also expand its door-to-door smoke/CO alarm program. However, completing those tasks requires a significant amount of the Department's time and resources.

The Department can also continue delivering fire safety messages to the residents of Essex by attending community events and relaying important messages through social media and similar means.

Are there emerging risks that the Department cannot manage or is not managing?

As of this CRA, there are no unmanaged emerging risks.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should conduct regular inspections of select residential occupancies in Essex, such as multi-unit dwellings and hotels/motels.
- The Department should continue delivering fire safety messages by attending community events and relaying information through various news outlets.

Resources Needed

- Implementing this RTP will require the Department to allocate an adequate amount of time and resources to ongoing public education initiatives.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.4 Fire in Vulnerable Occupancy

Risk Level: Moderate

Risk Score: 85

Applicable Community Profile

This risk was identified by the building stock profile, demographic profile, and past loss and event history profile.

Current Treatment, Capability, and Services Provided

- The Department responds to fires in Essex's vulnerable occupancies and provides exterior and interior fire attack services and rescue services (as needed).
- The Department provides code enforcement services and public education services for the vulnerable occupancies in Essex.
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.
- The Department conducts annual inspections of the vulnerable occupancies in Essex.
- The Department witnesses and audits the annual fire drills in Essex's vulnerable occupancies.

Administrative and Operational Risks, Concerns, and Observations

- The Department has not completed the pre-incident planning process for the vulnerable occupancies in Essex.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

There has been one vulnerable occupancy fire in Essex in the past five years.

As of this CRA, there is a significant number of seniors living in Essex. 21.9 per cent of Essex's population is age 65 or older, which is higher than the provincial average of 18.5 per cent. Essex has 252 residents living in vulnerable occupancies.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations.

Is the community capable of delivering the required services?

The Department can complete the required inspections of the vulnerable occupancies in Essex. The Department also has the capability to witness and audit the required fire drills at the town's vulnerable occupancies. However, completing those tasks requires a significant amount of the Department's time and resources.

Is there a way to make the community safer?

The Department can conduct the pre-incident planning process for all vulnerable occupancies in Essex. Doing so will provide information that the Department can use to enhance the safety of building occupants and responding fire crews.

Are there emerging risks that the Department cannot manage or is not managing?

As of this CRA, there are no unmanaged emerging risks.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should continue completing annual inspections of the vulnerable occupancies in Essex.
- The Department should ensure that all vulnerable occupancies in Essex have a current fire safety plan in place.
- The Department should verify that the staff working in Essex's vulnerable occupancies understand their fire safety and emergency response obligations.
- The Department should continue witnessing and auditing the annual fire drills at the vulnerable occupancies in Essex.
- The Department should complete the pre-incident planning process for all vulnerable occupancies in Essex.

Resources Needed

- Implementing this RTP will require the Department's time and resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.5 Road/Highway Incident

Risk Level: Moderate

Risk Score: 84

Applicable Community Profile

This risk was identified by the geographic profile, critical infrastructure profile, hazard profile, and past loss and event history profile.

Current Treatment, Capability, and Services Provided

- The Department responds to several types of road/highway incidents, such as motor vehicle collisions, and provides fire suppression and auto extrication/rescue services (as needed).
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.
- The Department can respond at the operations level to incidents involving hazardous materials.
- The Department delivers vehicle rescue services at the technician level.

Administrative and Operational Risks, Concerns, and Observations

- Many of the visitors and seasonal residents travelling through Essex are likely unfamiliar with the town's road network.
- Commercial vehicles travel on the roads that run through Essex, which increases the risk of road/highway incidents.
- Some vehicles travelling in and through Essex may be transporting hazardous materials.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

There is a high traffic volume on the county roads and local highways that run through Essex. Some of the vehicles travelling on those roads may be transporting hazardous materials. If one of those vehicles is involved in an accident, it could result in the release of hazardous substances that have the potential to cause severe harm to people and the environment.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations.

Is the community capable of delivering the required services?

In most cases, the Department should have the capacity to deliver the required services. If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.

Is there a way to make the community safer?

The Department can ensure that its personnel receive training about vehicle firefighting, auto extrication/rescues, and hazardous materials responses.

The Department can also ensure that its fire crews receive training about responding to incidents that involve electric vehicles.

Are there emerging risks that the Department cannot manage or is not managing?

As of this CRA, there are no unmanaged emerging risks.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should continue providing ongoing training to its personnel about vehicle firefighting, auto extrication/rescues, and hazardous materials responses.
- The Department should ensure that its personnel receive training about responding to incidents that involve electric vehicles.

Resources Needed

- Implementing this RTP will require the Department's time and resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.6 Fire/Explosion in Industrial Occupancy

Risk Level: Moderate

Risk Score: 80

Applicable Community Profile

This risk was identified by the building stock profile, economic profile, and past loss and event history profile.

Current Treatment, Capability, and Services Provided

- The Department responds to fires in Essex's industrial occupancies and provides exterior and interior fire attack services and rescue services (as needed).
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.

Administrative and Operational Risks, Concerns, and Observations

- There are several industrial buildings in Essex. Those facilities may potentially experience a fire, explosion, or hazardous materials spill. If one of those incidents occurs, the town may need to issue evacuation orders for some of its residents (depending on wind conditions and the incident's severity).
- The Department is not conducting a consistent number of inspections of the industrial occupancies in Essex.
- The Department has completed pre-incident planning for some industrial occupancies in Essex. However, the Department needs time to complete pre-incident planning at the remaining industrial occupancies.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

The Department has responded to two industrial fires in the past five years. These incidents resulted in a dollar loss of approximately $1,400,000.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations. However, if the Department does not conduct regular inspections of Essex's industrial occupancies, it may not become aware of potential risks, which could prevent the Department from fully meeting the community's needs and expectations in the future.

Is the community capable of delivering the required services?

The Department can deliver the required services for small-scale incidents. If a large-scale incident occurs, the Department can request additional or specialized assistance through its mutual aid agreement.

Is there a way to make the community safer?

The Department can inspect the industrial occupancies in Essex on a regular basis.

The Department can complete the pre-incident planning process for the industrial occupancies in Essex. Doing so will provide information that the Department can use to enhance the safety of building occupants and responding fire crews. (Note: Depending on the type of occupancy or its operations, pre-planning can be an extensive and time-consuming task.)

The Department can review the fire safety plans and the material safety data sheets at the industrial occupancies in Essex. Doing so will help the Department determine which resources it will need during emergency responses at those sites.

Are there emerging risks that the Department cannot manage or is not managing?

The Department is not conducting routine inspections of the industrial occupancies in Essex. As a result, emerging, unidentified risks may exist at those sites.

Recommended Risk Treatment Action and Strategy

Mitigate

- Ensure the Department has the time and resources needed to inspect the industrial occupancies in Essex.
- The Department should complete the pre-incident planning process for the industrial occupancies in Essex.
- The Department should review the fire safety plans and the material safety data sheets (as applicable) at the industrial occupancies in Essex.

Resources Needed

- Implementing this RTP will require the Department’s time and resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.7 Fire in Commercial Occupancy

Risk Level: Moderate

Risk Score: 75

Applicable Community Profile

This risk was identified by the building stock profile, economic profile, and past loss and event history profile.

Current Treatment, Capability, and Services Provided

- The Department responds to fires in Essex's commercial occupancies and provides exterior and interior fire attack services and rescue services (as needed).
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.
- The Department conducts fire inspections of the commercial occupancies in Essex.

Administrative and Operational Risks, Concerns, and Observations

- The Department has had limited time and resources to deliver a fire prevention program that includes regular fire safety inspections and public education initiatives for the commercial occupancies in Essex.
- The Department may face challenges completing all inspections required to verify that the commercial occupancies in Essex maintain code compliance and up-to-date safety planning.
- Some commercial occupancies in Essex have mixed-uses or contain residences. Those buildings may require the Department to conduct re-inspections in order to verify that the occupancies comply with applicable code regulations.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

The Department has responded to two commercial occupancy fires over the past five years. Those incidents resulted in a combined dollar loss of approximately $21,000.

Does the current treatment meet the community's needs and expectations?

Some components of the current treatment meet the community's needs and expectations. However, the Department does not inspect commercial occupancies in Essex frequently.

Is the community capable of delivering the required services?

The Department can deliver the required services for small-scale incidents. If a large-scale incident occurs, the Department may need to request additional or specialized assistance through its mutual aid agreement.

Is there a way to make the community safer?

The Department can increase its number of commercial occupancy inspections, which will help identify each building's level of code compliance. However, if the Department increases how frequently it conducts commercial occupancy inspections, it may require additional resources.

The Department can also complete the pre-incident planning process for the commercial occupancies in Essex. Doing so will provide information that the Department can use to enhance the safety of building occupants and responding fire crews.

Are there emerging risks that the Department cannot manage or is not managing?

The Department does not inspect the commercial occupancies in Essex on a routine basis. As a result, emerging, unidentified risks may exist at those sites.

Recommended Risk Treatment Action and Strategy

Mitigate

- Ensure the Department has the time and resources needed to inspect the commercial occupancies in Essex on a regular basis.
- The Department should complete the pre-incident planning process at the commercial occupancies in Essex.

Resources Needed

- Implementing this RTP will require the Department's time and resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.8 Critical Infrastructure Failure

Risk Level: Moderate

Risk Score: 72

Applicable Community Profile

This risk was identified by the critical infrastructure profile.

Current Treatment, Capability, and Services Provided

- The Department responds to some types of CI failures, such as downed hydro lines and gas leaks.
- If there is any damaged CI in Essex, the Department provides a safety zone (and evacuation assistance, if necessary) until the proper authorities arrive to isolate or repair the CI.

Administrative and Operational Risks, Concerns, and Observations

- The Department must ensure that its personnel receive training to recognize the risks posed by CI failures.
- The Department must ensure that its personnel receive training to recognize the safety precautions needed when responding to CI failures.
- Lengthy power outages can severely affect Essex's vulnerable occupancies and public services.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

Critical infrastructure can fail for many reasons, including lack of maintenance or damage from external forces, such as severe weather.

Essex has experienced several CI failures in the past five years due to severe weather events. In the summer of 2023, a severe weather event occurred in Essex, and it resulted in a prolonged disruption of the town's services.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations.

Is the community capable of delivering the required services?

The Department has the capacity to provide a safety zone (and evacuation assistance,

if necessary) until the proper authorities arrive to isolate or repair any damaged CI in Essex.

Is there a way to make the community safer?

Essex can continue monitoring and maintaining the CI under its control.

The Department can provide public education about the importance of having a 72-hour emergency kit.

Are there emerging risks that the Department cannot manage or is not managing?

As of this CRA, there are no unmanaged emerging risks.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should provide public education (using a variety of platforms) about the importance of having a 72-hour emergency kit.
- The Department should continue offering applicable services as required.

Share

- Essex and the Department should continue working with the authorities who are responsible for the critical infrastructure in Essex.

Resources Needed

- Implementing this RTP will require the Department's time and resources.
- Preparing and distributing public education information (such as flyers and handouts about 72-hour emergency kits) will require resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.9 Fire in Downtown Core

Risk Level: Moderate

Risk Score: 64

Applicable Community Profile

This risk was identified by the geographic profile, economic profile, and past loss and event history.

Current Treatment, Capability, and Services Provided

- The Department responds to fires in Essex's downtown core and provides exterior and interior fire attack services and rescue services (as needed).
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.

Administrative and Operational Risks, Concerns, and Observations

- Essex's downtown core contains commercial occupancies and mixed commercial-residential occupancies.
- Many of the buildings in Essex's downtown core were built prior to the introduction of the OBC, which means they may not contain the required fire and life safety systems.
- Due to a lack of available time and resources, the Department is not conducting routine inspections of the buildings in Essex's downtown core. As a result, some buildings may contain unidentified risks or hazards.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

In the past five years, the Department has responded to several emergency calls at the commercial and residential occupancies in Essex's downtown core.

Does the current treatment meet the community's needs and expectations?

Some components of the current treatment meet the community's needs and expectations. However, the Department is not completing regular inspections of the occupancies in Essex's downtown core.

Is the community capable of delivering the required services?

The Department can deliver the required services for small-scale incidents. If a large-scale incident occurs, the Department may need to request additional or specialized assistance through its mutual aid agreement.

Is there a way to make the community safer?

The Department can conduct regular inspections of the occupancies in Essex's downtown core to verify that their life safety systems remain functional and compliant with the OFC. The Department can also verify that all applicable occupancies have an approved fire safety plan.

The Department can also complete the pre-incident planning process for applicable occupancies in Essex's downtown core. Doing so will provide information that the Department can use to enhance the safety of building occupants and responding fire crews. However, completing those tasks requires a significant amount of the Department's time and resources.

Are there emerging risks that the Department cannot manage or is not managing?

The Department is not conducting routine inspections of the buildings in Essex's downtown core. As a result, some buildings may contain unidentified risks or hazards.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should conduct routine inspections of the commercial occupancies in Essex's downtown core.
- The Department should verify that all applicable occupancies in Essex's downtown core have an approved, up-to-date fire safety plan.
- The Department should complete the pre-incident planning process for all applicable occupancies in Essex's downtown core.
- The Department should deliver fire safety messages to the occupants of buildings in Essex's downtown core.

Resources Needed

- Implementing this RTP will require the Department's time and resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

13.10 Fire in Assembly Occupancy

Risk Level: Moderate

Risk Score: 64

Applicable Community Profile

This risk was identified by the building stock profile and demographic profile.

Current Treatment, Capability, and Services Provided

- The Department responds to fires in Essex's assembly occupancies and provides exterior and interior fire attack services and rescue services (as needed).
- If an incident occurs that exceeds the Department's resources or capabilities, the Department can request additional or specialized assistance through its mutual aid agreement.

Administrative and Operational Risks, Concerns, and Observations

- Some assembly occupancies have large occupant loads, on-site cooking facilities, and licenses to serve alcohol. If a fire occurs, variables like these can increase the potential for injuries or death.
- The Department has limited resources to conduct regular inspections of the assembly occupancies in Essex.
- The Department has not completed the pre-incident planning process for the assembly occupancies in Essex.

Determining Appropriate Fire Protection Services

What evidence is there to support the need for services that address this risk?

The Department has responded to one assembly occupancy fire in the past five years. The incident was a small electrical fire.

Because the Department has not conducted regular inspections of the assembly occupancies in Essex, the sites may contain unidentified risks that could lead to future incidents.

Does the current treatment meet the community's needs and expectations?

The current treatment seems to meet the community's needs and expectations.

Is the community capable of delivering the required services?

The Department can deliver the required services for small-scale incidents. If a large-scale incident occurs, the Department can request additional or specialized assistance through its mutual aid plan.

Is there a way to make the community safer?

The Department can conduct regular inspections of Essex's assembly occupancies to verify that their life safety systems remain compliant with the OFC. The Department can also verify that all applicable assembly occupancies have an approved fire safety plan. Additionally, the Department can verify that the supervisory staff working in the assembly occupancies understand their fire safety responsibilities.

The Department can also complete the pre-incident planning process for the assembly occupancies in Essex. Doing so will provide information that the Department can use to enhance the safety of building occupants and responding fire crews.

Are there emerging risks that the Department cannot manage or is not managing?

The Department is not conducting routine inspections of Essex's assembly occupancies. As a result, emerging, unidentified risks may exist at those sites.

Recommended Risk Treatment Action and Strategy

Mitigate

- The Department should conduct regular inspections of the assembly occupancies in Essex.
- The Department should complete the pre-incident planning process for all assembly occupancies in Essex.
- The Department should verify that all assembly occupancies in Essex have a fire safety plan (as applicable).
- The Department should verify that the supervisory staff working at the assembly occupancies in Essex understand their fire safety responsibilities.

Resources Needed

- Implementing this RTP will require the Department's time and resources.

Timeline

Ongoing

- The Department should incorporate the strategies in this RTP into its regular operations.

Appendix A: Resources

The Loomex Group used the following resources to help develop this community risk assessment:

- Fire Protection and Prevention Act, 1997
- Ontario Fire Marshal Technical Guideline 02-2019
- Ontario Regulation 213/07: Fire Code
- Ontario Regulation 378/18: Community Risk Assessments
- Statistics Canada 2016 Census of Population
- Statistics Canada 2021 Census of Population
- The Corporation of the Town of Essex By-Law 2020-01: Being a By-law to Establish and Regulate the Town of Essex Fire and Rescue Services
- Town of Essex Official Plan
    - Note: This document was undergoing a review at the time of this community risk assessment's development.
- Town of Essex Strategic Plan, 2023–2027
- Town of Essex Official Website

Appendix B: List of Abbreviations

This community risk assessment uses the following acronyms and abbreviations:

CI: critical infrastructure

Council: Town of Essex Council

CRA: community risk assessment

Department, the: Essex Fire and Rescue

E&R By-law: establishing and regulating by-law

EMO: Emergency Management Ontario

EOC: emergency operations centre

FPPA: Fire Prevention and Protection Act

HIRA: hazard identification and risk assessment

LWC: lightweight construction systems

OBC: Ontario Building Code

OFC: Ontario Fire Code

OFM: Ontario Fire Marshal

RTP: risk treatment plan

Appendix C: Glossary of Terms

There are varying definitions for the terms used in risk assessments and risk management. This community risk assessment uses the following definitions from Emergency Management Ontario's glossary of terms:

Assessment: The evaluation and interpretation of available data as a basis for decision-making.

Catastrophe: An emergency of particularly severe proportions.

Community: A generic term that refers to municipalities and First Nations communities.

Consequence: A result or effect of an action or condition that is expressed qualitatively or quantitatively. A consequence can manifest as a loss, injury, or disadvantage.

Critical infrastructure: The infrastructure that contributes to the interconnected networks, services, and systems that meet vital human needs, sustain the economy, and protect public safety and security.

Hazard: A phenomenon, substance, human activity, or condition that may cause a loss of life, an injury, or other health impacts. A hazard can also result in property damage, service loss, social and economic disruptions, and environmental damage. Hazards can be natural, technological, or human-caused, or some combination of these.

Hazardous material: A substance (gas, liquid, or solid) capable of causing harm to people, property, the environment, the economy, or services. Materials with toxic, flammable, or explosive properties are considered hazardous.

Mitigation: Actions taken to reduce the adverse impacts of an emergency or disaster. Such actions may include diversion or containment measures to lessen the impacts of a flood or a spill.

Probability: The likelihood of an event occurring that may result in an emergency, disaster, or service disruption.

Public education program: A program that provides focused information to a target audience to educate about protective actions to reduce the risk of life and property damage in an emergency.

Risk: The product of the probability of the occurrence of a hazard and its consequences.

Risk assessment: A process used to identify and evaluate potential risks by analyzing specific hazards and estimating the likelihood and consequences of their occurrence.

Appendix D: Copy of Fire Marshal Directive 2022 – 001

TOPIC: Use of Information on Lightweight Construction to Inform Fire Suppression Pre-Planning Activities

This directive is issued under the provisions of the *Fire Protection and Prevention Act, 1997*, (FPPA) S.O. 1997, chapter 4, clause 9.(1)(b). It is the responsibility of every assistant to the Fire Marshal to follow the Fire Marshal's directive as set out in subsection 11.(1) of the FPPA. Further, under clause 9.(2)(b) of the FPPA, the Fire Marshal has the duty to advise municipalities in the interpretation and enforcement of this Act and the regulations.

Background

It has been well established that buildings constructed with truss and lightweight construction systems[i] (commonly referred to as lightweight construction) may be susceptible to pre-mature failure and rapid collapse under certain fire conditions, and thereby pose a risk to responding fire crews. Given this risk, it is important for responding fire departments to be aware of the presence of lightweight construction buildings to inform delivery of fire suppression service and protect the safety of firefighters.

Following the tragic passing of two volunteer firefighters, Ken Rea and Ray Walter, who were killed while battling a fire in Listowel when the roof of the building they were inside collapsed, the focus is to provide firefighters with the necessary information about a building's structural composition to safely plan fire suppression activities and help ensure their safety.

Building stock profile, including any building-related risks known to the fire department, must be considered in the development of Community Risk Assessment required under O. Reg. 378/18 - Community Risk Assessments (CRA)[ii].

Identifying the presence of lightweight construction where it is known to exist in a community's building stock is required[iii] by Worksheet #2 "Building Stock Profile" included in Appendix A of Office of the Fire Marshal technical guideline TG-02-2019 (as revised on February 25, 2022). Where this information is used to inform fire suppression pre-planning activities, the goal of providing firefighters with necessary information to help ensure their safety is met.

Directive

Those assistants to the Fire Marshal, as identified in clause 11.(1)(a) of the FPPA (the fire chief of every department), are directed to:

- Ensure that information on the presence of truss and lightweight construction systems (lightweight construction) in a community's building stock, that is known and documented in the Community Risk Assessment, is used to inform fire

suppression pre-planning activities conducted within the community:

- by the local fire department; and
- by other municipalities providing fire suppression services through fire protection agreements.

Those assistants to the Fire Marshal, as identified in clause 11.(1)(b) of the FPPA (the clerk of every municipality that does not have a fire department) are directed to:

- Ensure that information on the presence of truss and lightweight construction systems (lightweight construction) in the community's building stock, that is known and documented in the Community Risk Assessment, is provided to those fire departments who provide fire protection services to the community, to inform their fire suppression pre-planning activities.

Rationale

As truss and lightweight construction systems may be susceptible to pre-mature failure and rapid collapse under certain fire conditions, and pose a risk to responding fire crews, information pertaining to the presence of lightweight construction that is known and documented in a Community Risk Assessment must be used to inform pre-planning activities so that firefighters responding to a fire emergency may appropriately plan their fire response strategy.

Jon Pegg
Ontario Fire Marshal
February 25, 2022

[i] Buildings constructed using:
   i. lightweight pre-engineered floor or roof systems containing lightweight elements such as wood I-joists, cold formed steel joists, wood truss assemblies with metal or wood plates and metal web wood joists; or
   ii. lightweight floor or roof systems containing solid sawn lumber joist less than 38 mm by 235 mm.

[ii] The CRA is an in-depth and comprehensive assessment to inform fire protection service levels and requires the identification, analysis, evaluation and prioritizing of risk, based on nine mandatory profiles. The regulation outlines a standard set of information profiles that must be considered when conducting a community risk assessment. The information and data gathered to address each of the profiles will assist in determining and prioritizing the risks to public safety in the community, and determining the fire protection services to be provided by municipalities and fire departments in territories without municipal organization to address those risks.

[iii] Section 2.(3) of the regulation requires that a CRA be in the form, if any, that the Fire Marshal provides or approves. The minimum expected level of information and detail that must be considered with respect to each of the mandatory profiles is outlined in Worksheets 1-9 included in Appendix A of TG-02-2019. While different styles and formats of the worksheets may be used, the information that is collected and considered for each profile must at minimum include the information outlined in the Appendix A worksheets.

Appendix E: Accessible Data from Figures

For accessibility purposes, Table 46 presents the data from Figure 1 as a table:

Table 46. Data from figure 1.

Risk Category	Risk Score	Risk Level
Severe weather event	120	**High**
Fire in residential occupancy	90	**Moderate**
Fire in vulnerable occupancy	85	**Moderate**
Road/highway incident	84	**Moderate**
Fire/explosion in industrial occupancy	80	**Moderate**
Fire in commercial occupancy	75	**Moderate**
Critical infrastructure failure	72	**Moderate**
Fire in assembly occupancy	64	**Moderate**
Fire in downtown core	64	**Moderate**