Town of Amherstburg Fire Department

Community Risk Assessment

May 2024

Prepared by: Amherstburg Fire Department with information from Town of Amherstburg, Statistics Canada, MPAC and the Office of the Fire Marshal

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Introduction

The Amherstburg Fire Department has a legislated responsibility under the Fire Protection and Prevention Act r.s.o. 1997 (FPPA) to provide public fire safety education and certain components of fire prevention to the community.

In Section 2(1) of the FPPA it states that “every municipality shall,
(a) establish a program in the municipality which must include **public education with respect to fire safety and certain components of fire prevention**; and
(b) provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.”

Ontario Regulation 378/18 Community Risk Assessments under the FPPA states that
“1. Every municipality, and every fire department in a territory without municipal organization, must,
1.(a) complete and review a community risk assessment as provided by this Regulation; and
(b) use its community risk assessment to inform decisions about the provision of fire protection services.
2. (1) A community risk assessment is a process of identifying, analyzing, evaluating and prioritizing risks to public safety to inform decisions about the provision of fire protection services.”

The goal is to minimize emergency responses through education, code enforcement, and inspections, to ensure the residents and buildings are as fire safe as possible. In evaluating the fire safety programs that a municipality provides, the Office of the Fire Marshal identifies the following items as a minimum;

- Community Risk Assessment and community concerns/issues identified in the Community Risk Assessment

- a smoke alarm program
- distribution of fire safety education materials, and
- Conducting inspections upon complaint or when requested to assist with Fire Code compliance.

Conducting a Community Risk Assessment is the first step toward ensuring compliance with these requirements and is a practical information gathering and analyzing exercise for the purpose of determining the community fire risk and identifying appropriate programs and services to effectively address the community's fire safety needs. For the purpose of determining the fire risk in the Town of Amherstburg, the community risk assessment examined the demographic and building stock profile, as well as, the local and provincial fire loss profiles based on the data currently available.

The information provided in the Community Risk Assessment will serve to determine the effectiveness of the existing fire safety education and prevention programs in the community, as well as identify gaps which can form the basis for improvement in delivering systems, and give direction in facilitating future goal setting.

O. Reg 378/18 Schedule 1 provides the mandatory profiles a community risk assessment must include:

- Geographic profile
- Building stock profile of the community
- Demographic profile of the community
- Critical Infrastructure
- Hazard Profile
- Public safety response
- Community service profile
- Economic profile
- Past loss and event history profile, including:
    - Number and types of emergency responses, injuries, deaths and dollar losses

- Comparison of the community's fire loss statistics with provincial fire loss

Amherstburg Fire Department Profile

The Amherstburg Fire Department services a population of 23,540 residents, within an area of 185.67 square km. Service is provided through three fire stations which include the following, Station 1 is located in the 200 year old downtown core, station 2 in the former Anderdon Township, and station 3 in the former Malden Township. The department is classified as a composite membership consisting of a full-time Fire Chief, 2 full-time Deputy Fire Chiefs, 1 full-time Administrative Assistant and 1 full-time Fire Prevention Officer serving from station 1. Four full-time firefighters (District Chiefs) and one full-time

firefighter/training officer serving from station 2 supported by (60) sixty paid on call volunteer firefighters make up the remaining members. (Serving from groups of 20 out of the three fire stations). Apparatus consists of 3 pumpers, 3 tanker pumpers, 4 command support vehicles, 1 aerial ladder, 1 rescue boat and 1 ATV and a reserve pumper located on Bois Blanc. The department responded to over 469 calls for service in 2023 including house fires, medical calls, vehicle collisions and extrication, water & ice rescue, limited hazardous materials response, as well as other emergencies either natural or man-made. The fire department also performs complaint and request fire code inspections, all vulnerable occupancy inspections and fire drills and public fire safety education through different venues. Additionally, residential open fire site inspections to promote fire safety and ensure By-Law compliance.

Geographic Profile

The town of Amherstburg's geolocation is 42.10187° N, -83.1089° E and borders on the Detroit River and Lake Erie in the Southern portion of the province that divides Canada and the United States of America. Within the Town of Amherstburg there is 43.7 kilometers of shoreline of the Detroit River, and Lake Erie, as well as 12.4 kilometers of shoreline on inland waterways including an inland river, a number of small creeks and hundreds of acres of wetland marsh which is home to many forms of wildlife. The municipality also includes Bois Blanc Island, commonly called Bob-Lo Island, which is 4 km long and .8 km wide and 272 acres. There are currently 150 dwelling units that include 37 condominium units. The south portion of the island will be developed to accommodate an additional 220 dwellings.

The municipality is primarily rural with the largest portion of the population (approx. 15,000) living in the suburban area surrounding the town core. There have been multiple high-rise buildings constructed in the past few years and a few more currently being developed. The rural area is primarily cash crops consisting of corn, wheat and soybean production. Its location offers a climate that is perfect for grape production which has seen growth in operating wineries.

A greenhouse was built in 2022 sitting on 88 acres, with 128 dormitories for migrant workers.

Building Stock Profile

Table 1: Occupancy Class

(Source – MPAC 2023)

Occupancy Classification		# **of Occupancies**
Group A	Assembly (411, 412, 413, 414, 441,605, 608)	18
Group B	Institutional (625,626)	3
Group C	Single family (301, 302, 303, 304, 309, 311, 313, 314, 322)	7,992
	Multi-unit residential (332, 333, 334, 335, 336, 340, 341,365,370)	575
	Hotel/Motel (450)	0
	Mobile Homes & Trailers	72
	Other (588, 597)	6 + Approx 80 Short Term Rentals (STR)
Groups D & E	Commercial (400's minus 411, 412, 414, 441, 471, 472)	102
Group F	Industrial (510, 520, 521, 523, 530, 531, 540, 558, 568, 590 and 593)	69
Other occupancies not classified in OBC such as farm buildings (210, 211, 220, 221, 222)		237
Total # of mixed occupancy buildings (303, 304, 471, 472)		70
	Totals	**9224**

Building Stock Profile Commentary

The municipality consists of an urban 200 year old downtown with many older homes with type III buildings in the core. There are a few older industrial buildings remaining in the urban section, as well as a couple new ones that have recently been built. A small industrial park with 13 businesses was established back in the late 1980's in the rural part of the municipality which consists of small to medium size buildings. Strip malls and one major big box store are located to the south of the downtown core. Most of the homes built in the 10 different subdivision projects pre 2010 are detached single family homes. There has been a move to semi-detached units and high rise buildings to meet the economic need of the population. The rural area has a number of small clusters of homes spread throughout the municipality varying in age. Buildings in the Town of Amherstburg identified as critical infrastructure such as water and waste treatment plants, financial, health and food services have been noted as part of our emergency planning process. Through our hazard identification risk assessment, our building stock could be affected by natural disasters such as tornados, windstorms, flooding, earthquakes, building collapse, explosions and fires.

Building Stock Profile Concerns

- Old downtown core. Many buildings are very close together.
- Lack of hotels/motels in the area. Short Term Rental (STR) by-law approved, an increased demand for inspections is anticipated
- Potential for economic and job loss in some industrial properties i.e. Diageo
- A number of structures have been remodelled to multi-unit residential rental properties in the downtown core, as well as an increased number of high rise buildings constructed
- Increase in semi-detached dwelling construction
- Retrofit not completed in many multi residential properties
- Buildings identified as part of our critical infrastructure, primarily the water and waste treatment buildings, would have an adverse effect on the community if destroyed by fire.

Demographic Profile

Table 2: Demographic Statistics: Amherstburg Population % compared to the Provincial Population %

(Source Statistics Canada Census Profile 2021)

Ages of population	Amherstburg number	% of Total Population	Provincial Average % of Population
Age 0 - 4	1140	4.8	4.8
Age 5 - 14	2585	11	11
Age 15 - 19	1400	5.9	5.6
Age 20 - 24	1325	5.6	6.3
Age 25 - 44	5195	22.1	26.7
Age 45 - 54	3145	13.4	12.9
Age 55 – 64	3765	16	14.1
Age 65 - 74	3095	13.1	10.6
Age 75 - 84	1405	6	5.6
Age 85 and over	485	2.1	2.4
Median age of population	45.6		41.6
Total Population	**23,540**		**14,223,945**

Barriers to Public Education

Approximately 89% of the population in Amherstburg speaks English as a first language. The remainder of the population may have limited translation requirements for languages such as Italian, French, Balto-Slavic, German, Portuguese and Cantonese/Mandarin. Public Education messaging specifically for the purposes of vital information i.e. nuclear and emergency preparedness, smoke and carbon monoxide alarm along with fire safety information.

Demographic Profile Commentary

Approximately 50% of the community is over 45 years of age, the median age of Amherstburg residents is 45.6 years old compared to the provincial median age is 41.6 years old. This could be due to Amherstburg being marketed as an area to retire due to lower housing prices compared to the GTA and surrounding communities.

The majority of the population does speak and understand English. There is one exclusively French Elementary School and a few French Immersion Elementary Schools, which Amherstburg Fire attends to deliver fire safety messages and can do so in French.

Population growth has increased over the past few years, many new subdivisions have been and are being developed. The rezoning of large areas of farm land into residential has allowed for continued growth in Amherstburg.

While COVID-19 impacted the economy and the income of many families, some losing their jobs as businesses closed or were temporarily shut down, the unemployment rates have stabilized. However, there continues to be a need for more housing and for more low income homes in our area.

Demographic Profile Concerns

- Large and further increasing senior population adds to the number of medical responses annually
- Increased population in good weather due to seasonal homes add to overall population taxing already overstretched services
- Increase in vulnerable occupancies due to aging population
- Short Term Rental inspection and enforcement programming
- Area being marketed as a seniors retirement area

Population Fluctuation
(e.g., tourism, special events)

The Town of Amherstburg is host to many recreational and cultural events throughout the year such as The Uncommon Festival, Woof-a-roo, Cars Gone Crazy, Rib Fest, River Lights, Art by the River, Santa Claus Run and Open Air Weekends to name a few. Each event can see anywhere from a couple hundred

to over 25,000 visitors for a weekend event. The Bois Blanc Island community is home to seasonal and year round residents that require a short ferry ride across the river to access. The population increases in the summer months for the cottage life and many island residents travel south for the winter months. A number of cottages along the Detroit River and Lake Erie also add to the population growth in the summer months as cottagers head to the water front for relaxation.

Vulnerable groups / individuals (e.g., non-ambulatory)

Combined total number of 278 vulnerable individuals within Amherstburg:

- Community Living Essex County has 9 special needs homes which house 37 residents spread out in the community with 24 hour staffing
- Seasons Amherstburg Assisted Living Retirement Home with 128 residents
- Richmond Terrace Long Term Care with 106 residents
- Heritage Community Residence with 7 residents

Critical Infrastructure Profile

Critical Infrastructure inventory is informed by the Town of Amherstburg Critical Infrastructure portion of the Municipal Emergency management program and is updated annually. (See Appendix A)

Infrastructure may be deemed to be critical if their failure or disruption may jeopardize the safety, security, and quality of life of the community or region. Amherstburg's critical infrastructure includes:

- Water storage, treatment, and distribution plant
- Police department
- Fire department
- Public works
- Town hall including Finance, Licensing, Tax department, IT
- Diageo (2nd largest employer)
- ETR Rail Lines

- Canadian Coast Guard Facilities
- Essex Power and Hydro One
- Union Gas

Our community relies heavily on critical infrastructure for essential services, very few people keep sufficient stores of non-perishable food and water in their homes in case of emergency. Many require electricity and refrigeration for medical reasons.

Hazard Profile

One of the hazards identified which has gained a lot of public attention is the Fermi II Nuclear Generating Station located across the Detroit River at the mouth of Lake Erie within the United States. The southern portion of Amherstburg is located within the 16.1 kilometre primary zone. A Nuclear Response Plan has been developed and was updated June 2022.

Another hazard is the extreme weather events that range from high winds, heavy rainfall, large snow falls, ice storms, to extreme heat and humidity and drought. In the past few years the community has experienced a downbursts, F1 tornado, flooding, multiple field fires in 2021 due to drought and an intense ice storm in 2023. The risk of flooding and erosion are likely based on the total number of heavy rain events noted by Environment Canada in the Hazard Identification and Risk Assessment (HIRA) 2023 (see appendix B) which is an integral part of the Community Emergency Management Program. The community has also experienced multiple technological events such as extended power outages that disrupt residents and business alike.

Hazard Ranking

Included in the Emergency Management program is a hazard ranking which identifies the vulnerabilities based on past occurrences and likelihood. The hazard ranking are:

1. Thunderstorm

2. Tornado
3. Flood
4. Lightning
5. Erosion
6. Fire/Explosion
7. Nuclear (Facility)
8. Cyber Attack
9. Chemical Release
10. Water Quality

Public Safety Response Profile

- Windsor Police Department – Amherstburg Branch services the entire municipality at the present.
- Essex-Windsor Emergency Medical Services provides first responder emergency medical/transportation services for the municipality of Amherstburg as well as the County and City of Windsor. They provide basic as well as advanced life support.
- Canadian Coast Guard Base maintains and deploys as necessary. Caribou Isle, a Coast Guard navigational aids tender, and the Coast Guard Cutter Thunder Cape, a search and rescue vessel, both operational from the end of March until December each year.
  There is a pollution response trailer for early response and containment in the event of an environmental spill.
- Hazardous material incidents which requires specialized equipment and training is provided by Windsor Fire and Rescue Services which is one of the provincial Level 3 Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) teams.

Community Services Resources Profile

- Canadian Red Cross
- City of Windsor Social Services

- Community Living Essex
- Amherstburg Food Mission
- Amherstburg Community Services
- Amateur Radio Club
- Numerous Service Groups

Economic Profile

Amherstburg is a bedroom community to the City of Windsor with the majority of the Town's resident's employment being within the City.
The town has a variety of small to medium sized businesses that provide employment for some residents. These include an alcoholic beverage bottling plant, wineries in the rural areas, automotive related suppliers in the industrial park located in the east part of town, commercial components in the downtown core as well as the village of McGregor. In recent years we have seen some new businesses come to Amherstburg, a few are currently being built. These businesses provide employment and pay tax to the Town of Amherstburg.

Fire Loss Profile

A review of the local and provincial fire loss statistics has confirmed residential properties as being the predominant community fire risk, based on occupancy, in regards to the total number of fire occurrences; and the greatest amount of dollar loss in property. Based on the fire loss statistics for the three year period (2020-2022), residential occupancies contributed to:

- **48.3%** of all fires in Ontario and **42.2%** of all fires in the Town of Amherstburg
- **82.5%** of all injuries in Ontario and **100%** of all injuries in the Town of Amherstburg
- **85.0%** of all fatalities in Ontario and **0%** of all fatalities in the Town of Amherstburg
- **62.1%** of all dollar loss in Ontario and **38.3%** of all dollar loss in the Town of Amherstburg

Table 3: Ontario Fire Losses compared to Amherstburg Fire Losses 2020 - 2022
(Source - OFM Fire Summary 2020-2022)

PROPERTY CLASSIFICATION	ONTARIO FIRE LOSSES 2020-2022				AMHERTSBURG FIRE LOSSES 2020-2022			
	TOTAL LOSS FIRES	INJURIES	FATAL	$ LOSS	TOTAL LOSS FIRES	INJURIES	FATAL	$ LOSS
Assembly	210	4	0	23,862,109	0	0	0	0
Care & Detention	68	9	0	3,346,915	0	0	0	0
Residential	5,143	540	106	549,107,886	9	1	0	400,200
Business, Personal Services Mercantile	377	21	0	60,669,195	2	0	0	1,400,000
Industrial	488	25	1	92,234,165	1	0	0	2,500
Other/Not Class.	556	11	2	61,478,317	0	0	0	0
Vehicle Fires	2,921	29	3	96,218,612	6	0	0	78,000
Outdoor	837	25	3	16,647,830	0	0	0	0
2020 Total:	**10,600**	**664**	**115**	**903,565,029**	**18**	**1**	**0**	**1,880,700**
Assembly	200	5	3	15,064,029	0	0	0	0
Care & Detention	110	8	2	5,683,551	1	0	1	5
Residential	5,281	544	99	617,709,699	5	0	0	661,000
Business, Personal Services Mercantile	396	16	0	41,937,471	1	0	0	500
Industrial	487	30	2	102,366,272	1	0	0	2,000
Other/Not Class.	607	17	0	75,347,366	1	0	0	2,000
Vehicle Fires	2,770	29	7	98,345,395	2	0	0	68,000
Outdoor	857	15	8	20,957,538	1	0	0	1,000
2021 Total:	**10,708**	**664**	**121**	**977,411,321**	**12**	**0**	**1**	**734,505**
Assembly	254	5	0	25,893,110	1	0	0	10,000
Care & Detention	116	8	0	2,843,305	0	0	0	0
Residential	5,461	508	102	803,912,328	5	0	0	315,600
Business, Personal Services Mercantile	481	15	1	98,770,538	0	0	0	0
Industrial	524	19	9	148,003,946	0	0	0	0
Other/Not Class.	646	15	1	82,459,477	3	0	0	200,500
Vehicle Fires	3,106	16	6	112,302,129	2	0	0	450,000
Outdoor	1,010	16	6	15,843,333	4	0	0	7,500
2022 Total:	**11,598**	**602**	**125**	**1,290,028,166**	**15**	**0**	**0**	**983,600**
TOTAL 2020-2022	**32,906**	**1930**	**361**	**3,171,004,516**	**45**	**1**	**1**	**3,598,805**

Table 4: Amherstburg Residential Fire Losses (Group C)

(Source - OFM Fire Summary 2020-2022)

RESIDENTIAL TYPE	TOTAL FIRES	INJURIES	FATALITIES	$ LOSS
Single Family	6	0	0	$315,200
Multi-Unit Residential	1	0	0	$10,000
Hotel/Motel	0	0	0	0
Mobile Homes & Trailers	1	0	0	$15,000
Other residential	1	1	0	$60,000
2020 Total:	**9**	**1**	**0**	**$400,200**
Single Family	3	0	0	$606,000
Multi-Unit Residential	1	0	0	$15,000
Hotel/Motel	0	0	0	0
Mobile Homes & Trailers	0	0	0	0
Other residential	1	0	0	$40,000
2021 Total:	**5**	**0**	**0**	**$661,000**
Single Family	3	0	0	$240,100
Multi-Unit Residential	0	0	0	0
Hotel/Motel	0	0	0	0
Mobile Homes & Trailers	1	0	0	$500
Other residential	1	0	0	$75,000
2022 Total:	**5**	**0**	**0**	**$315,600**
TOTAL 2020-2022	**20**	**1**	**0**	**$1,376,800**

Table 5: Municipal Fire Loss Profile

(Source - OFM Fire Summary 2020-2022)

Occupancy Classification		2020		2021		2022		Total Deaths + Injuries
		Deaths	Injuries	Deaths	Injuries	Deaths	Injuries	
Group A	Assembly	0	0	0	0	0	0	**0**
Group B	Institutional	0	0	1	0	0	0	**1**
Group C	Residential	0	1	0	0	0	0	**1**
Groups D & E	Commercial	0	0	0	0	0	0	**0**
Group F	Industrial	0	0	0	0	0	0	**0**
Mobile Homes & Trailers (Group C)		0	0	0	0	0	0	**0**
Other		0	0	0	0	0	0	**0**
Total Deaths / Injuries		**0**	**1**	**1**	**0**	**0**	**0**	**2**

Municipal Property Dollar Loss

Occupancy Classification		2020		2021		2022		% of Total Dollar Loss from 2020-2022
		Total Loss Fires	$	Total Loss Fires	$	Total Loss Fires	$	
Group A	Assembly	0	0	0	0	1	$10,000	**0.33%**
Group B	Institutional	0	0	1	$5	0	0	**negligible**
Group C	Residential	8	$385,200	5	$661,000	4	$315,100	**45%**
Groups D & E	Commercial	2	$1,400,000	1	$500	0	0	**47%**
Group F	Industrial	1	$2,500	1	$2,000	0	0	**.15%**
Mobile Homes & Trailers (Group C)		1	$15,000	0	0	1	$500	**1**
Other		0	0	1	$2,000	3	$200,500	**7%**
Total Dollar Loss			**$1,802,700**		**$665,505**		**$526,100**	**$2,994,305**

Table 6: Municipal Fire Loss – 2023 Preliminary Data subject to revision

(Source – OFM Preliminary Municipal Summary)

Occupancy Classification		2023			
		Total Loss Fires	Deaths	Injuries	Estimated $ Loss
Group A	Assembly	1	0	0	$500
Group B	Institutional	0	0	0	0
Group C	Residential	15	0	1	$4,586,750
Groups D & E	Commercial	1	0	0	$1,300,000
Group F	Industrial	0	0	0	0
Mobile Homes & Trailers (Group C)		0	0	0	0
Other		1	0	0	$1,000
Total		**18**	**0**	**1**	**$5,888,250**

Municipal Fire Loss Profile Commentary

During this three year period, 42% of all fires in Amherstburg were residential accounting for 38% of fire loss dollars. Considering just structure fires from 2020 to 2022, 63% were residential, accounting for 46% of fire loss dollars.

Fire loss dollars fluctuate from year to year, in 2020 there were two major commercial building fires which resulted in $1,400,000-dollar loss. Compared to only one major residential fire with $600,000 loss in 2021. Residential occupancies continue to be the largest percentage of fire loss in our municipality similar to provincial trends.

With a large rural area in the municipality, it is not unusual to have motor vehicle collisions or fires involving farm machinery. With the cost of these large pieces of farm machinery, the dollar loss can range from a few thousand to upwards of one million dollars. Also within these rural farm properties we have large farm equipment maintenance, and storage buildings that house these expensive pieces of farm machinery. A fire in these structures could total 2 million dollars in damage.

The civilian fatality was determined to be caused by smoking while wearing oxygen in a nursing home facility. The resident succumbed to burn related injuries while in hospital days after an incident. It is of note, Amherstburg Fire was notified of this incident days later by the OFM as AFD was not dispatched to this incident. One firefighter suffered a minor injury while on the scene of a barn fire.

Municipal Fire Loss Profile Concerns
• Large number of older homes converted to multi unit residential • Downtown core consists of 200-year-old building stock • Retrofit has not been completed for many of the structures requiring upgrades • Majority of fires are in residential occupancies

As residential fires represent the greatest risk to the community, the Amherstburg Fire Prevention Division must focus on efforts to target this risk through initiatives such as: enhanced public education activities; appropriate inspection programs and the support of legislative changes to require the installation of residential sprinklers.

Concern Analysis and Evaluation Summary

Based on the profiles and identified concerns, the following will provide a summary of the community's potential fire concerns and a recommended means of addressing each concern.

IDENTIFIED CONCERN	RECOMMENDATION
FPPA legislated responsibilities > community fire safety minimum program requirements	Conduct a comprehensive service delivery review of the Fire Prevention Division to confirm the Fire Services ability to meet its mandated responsibility and that the delivery of fire prevention activities is addressing the community fire risk in a cost effective and efficient manner
Old downtown core with many buildings in very close proximity of one another	Pre-planning initiatives
A number of structures have been converted to multi-unit residential rental properties in the downtown core	Coordinate with Chief Building Officer to ensure current Ontario Building Code requirements are being met
Lack of hotels/motels in the area. STR by-law has been approved, anticipate an increased number of applications in 2023	Public education Fire Prevention Officer conduct inspections and enforcement of STR requirements to meet FPPA standards. A Municipal GIS system to track the locations of STR as a part of the licencing process
Retrofit requirement not completed in many multi residential properties	Demands for legislated inspection programs, such as program for residential retrofit
Increase in number of high-rise buildings	Pre-planning initiatives and firefighter training
Buildings identified as part of our critical infrastructure, primarily the water and waste treatment buildings, would have an adverse effect on the community if	Enhance Water Supply pre-planning and engage community partners to participate in planning activities

destroyed by fire	
Cultural and linguistic concerns	Public Education programs directed towards these target audiences
Service delivery in both official languages	Increased demands for program development (translation and creation of new programs to meet the community's need). Bilingual firefighters.
Auxiliary dwelling units legislation has created property numbering challenge	Collaborate with the municipality to make changes to the way dwellings are addressed

Priority Setting for Compliance

Priority Setting Worksheet					
Priority	Status		Effectiveness, Goals/Objectives		
Fire Safety Priority	Current fire prevention / public education programs that address the fire safety priority		Existing programs adequately address the fire safety priority & ensure compliance with minimum FPPA requirements		
	Fire Prevention (inspection) Activities	Public Education Activities	Y/ N	Fire Prevention (Inspection) Activities	Public Education Activities
Retrofit of multi residential properties	Compile list of buildings requiring retrofit inspections	None	N	With only 1 FPO, start with larger buildings as time permits	Use Social Media and local paper to notify owners that AFD will begin retrofit inspections
Non-compliance of smoke and carbon monoxide alarms	Implemented fees for installing alarms, fines for non-compliance	Use of social media re: smoke and CO alarms campaigns	Y		
200 year old Downtown core	Annual business licenses in commercial area. Pre-planning activities	None	Y		

Smoke and CO alarm program to be expanded	Partnered with Rotary for purchase of CO alarms.	Use of social media re: smoke and CO alarms.	Y		Expanding to a door to door campaign in neighborhoods where a fire just occurred
Nuclear Emergency Management Preparedness	Nuclear Emergency Response plan in place and updated yearly	Social media and advertising of nuclear Preparedne ss	Y	Working with Fermi to prepare a drill in 2025	Social media campaigns for emergency preparedness New Booklet published
Other language fire safety messages	Bilingual Firefighters	No other language messaging at this time	N	Work with community partners to identify demographics.	Work with community partners to deliver fire safety messages in those languages.
Open air burning	Continue to inspect and approve open burn permits	Educate public on safe distances and types of open burns permitted	Y		
Older homes converted to multi-unit residential	Joint inspection with building dept. for new applications	None	Y		
Bois Blanc	Open burn inspections	None	N	Assessing need for firefighters that live on the island. Pre-planning events	Door to door campaign. Increase fire safety messaging and emergency planning education.

High Rise	Ensure a fire safety plan is in place. Pre-planning activities	Pub ed conducted at the buildings request	Y		

CRITICAL INFRASTRUCTURE OF THE TOWN OF AMHERSTBURG

Reviewed and Updated July 2023				
Sector	**Type of Critical Infrastructure**	**Component**	**Location**	**Owner/Operator**
Water	Water Treatment	Amherstburg Water Treatment Plant	415 Front Road North	Owned by the town of Amherstburg. Operated by Ontario Clean Water (OCWA) operator on duty 24/7. 519-736 5447, cell 519 796 4801
		Amherstburg Waste Water Treatment Plant	496 Sandwich Street South	Owned by the Town of Amherstburg. Operated by O.C.W.A.
Electricity	Electrical Transmission & Distribution	Serving Leamington, Amherstburg, Tecumseh, LaSalle	2730 Highway 3 Oldcastle, Ontario N0R 1L0	Essex Power Services Corporation 519-737-9811 519-561-6366 (after hours) Area Contact: [redacted] General Manager Tel: (226) 252-6258 Fax: (519) 737-1353 E-mail: [redacted] Manager of Health and Safety [redacted]
		Serving Amherstburg	Hydro One Networks Inc. 483 Bay Street South Tower, 8th Floor Reception Toronto, Ontario M5G 2P5	Area Contact: Hydro One [redacted] Customer Operations Manager Tel: (888) 664-9376 Email: [redacted]
Communications	911 Communications	911 PPSAP	City of Windsor	Windsor Police Service 519-255-6700
		Local Fire Dispatch Centre	City of Windsor (815 Goyeau St.)	WFRS Local fire services Dispatch (24hrs) [redacted]

				Windsor Police Services (PPSAP) – 258-6111 Windsor Fire Services - 258-4444
	Mail Delivery	Retail Outlets, Mail Boxes, Home to Home delivery, Sorting Stations, Delivery Vehicles, Office Facilities	Amherstburg	Government of Canada
Gas, Oil & Pipelines	Pipelines and Pumping Stations	Natural Gas	385 Front Road North	Union Gas –1-800-969-0999
Transportation	Amherstburg Roads	Snow Removal, Salting Equipment, Pothole Repairs, Traffic Signage	512 Sandwich Street South	Town of Amherstburg
	Marine Support	Spill Response Search and Rescue	Amherstburg	Canadian Coast Guard 1-800-267-7270 Amherstburg 736-6533
	Ferry	Bob Lo Island Ferry Service	144 Boblo Island Blvd.	Amico 2199 Black Acre Drive Oldcastle, Ontario N0R 1L0
	Railway	Engines, Cabooses, Freight Cars, Tracks	Essex Terminal Railway 1601 Lincoln Road Windsor, Ontario	Essex Terminal Windsor Head Office 973-8222
Financial Services	Banks/Credit Unions	Credit Union	463 Sandwich Street South	Libro Credit Union
		Credit Union	322 Sandwich Street South	Windsor Family Credit Union
		Bank	48 Richmond	Canadian Imperial Bank of Commerce
		Bank	99 Richmond Street	Scotia Bank
		Bank	89 Richmond Street	Toronto Dominion Bank
		Bank	243 Dalhousie	Bank of Montreal
		Bank	400 Sandwich Street South	Royal Bank of Canada

CRITICAL INFRASTRUCTURE OF THE TOWN OF AMHERSTBURG

Sector	Type of Critical Infrastructure	Component	Location	Owner/Operator
Health Services	Health	Doctor Office	1249 Front Road South	Dr. David Coates
		Medical Clinic	290 Sandwich Street South	Emrose Medical Clinic
		Medical Clinic	721 Front Road South	Amherstburg Family Health Team
		Medical Clinic	71 Sandwich Street South	Amherstburg Medical Clinic
Continuity of Government Services	Municipal Government	Town of Amherstburg	271 Sandwich Street South	Town of Amherstburg
Public Safety and Security	Emergency Operations Center	Office Facilities, Phone Lines, Internet, Fax	99 Thomas Rd	Town of Amherstburg
	Fire Fighting Services	Amherstburg Fire Department	Station #1 271 Sandwich St. #2 3400 Middle Side Rd #3 6744 Concession 6 South	Town of Amherstburg Dispatch By Windsor Fire [redacted] (all locations)
	Police Service	Windsor Police Service	532 Sandwich Street South	City of Windsor Dispatch- 911
	Emergency Medical Services	Windsor Essex EMS Ambulance Base	360 Fairview Ave. Essex and 920 Mercer St Windsor 549 Simcoe, Amherstburg	County of Essex Dispatched by CACC [redacted]
	Health Unit	Windsor-Essex County Health Unit	1005 Ouellette Ave, Windsor	519-258-2146
	Evacuation Centres	Emergency Worker Centre	Libro Credit Union Centre 3295 Meloche Amherstburg, Ontario	Coordinated by Red Cross/Social Services and contacted through Windsor Fire Dispatch – 258-4444
		Reception/Evacuee Centre	Libro Credit Union Centre/ Western Secondary School 5791 North Townline Road Amherstburg, Ontario	Coordinated by Red Cross/Social Services and contacted through Windsor Fire Dispatch – 258-4444
Food	Food	Grocery Store	83 Sandwich Street South	Sobey's
		Grocery Store	400 Sandwich Street South	Walmart
		Grocery Store	181 Sandwich Street South	No Frills
		Meat Store	30 Renaud	Wigle Gourmet Meats
		Meat Store	241 Sandwich Street South	Romano's Specialty Meats

Hazard Identification and Risk Assessment

Town of Amherstburg

Reviewed July 2023

Table of Contents

Natural Hazards

UNLIKELY

Agricultural and Food Emergency

Categories

- Food contamination
- Farm animal disease
- Agricultural plant disease/ crop infestation

Local Assessment

The Southern Ontario Region is home to 17,094 farms. The Town of Amherstburg claims 151 according to the 2011 Census.

Town of Amherstburg Farms by Industry Group, 2011 Census (number of farms)

Dairy cattle and Milk production	2
Beef cattle ranching and farming	1
Sheep and goat farming	1
Poultry and egg production	3
Other animal production	11
Oilseed and grain farming	111
Vegetable and melon farming	1
Fruit and tree nut farming	5
Greenhouse, nursery and floriculture	10
Other crop farming	6

POSSIBLE

Drinking Water Emergency
Categories
Quality and Quantity affected by • Natural events • Technological events • Human-caused events
Local Assessment
In Ontario, the Safe Drinking Water Act and the Clean Water Act provide standards for water quality testing and the regulations for drinking water systems and source water protection. Compliance with these acts is mandatory. Drinking water is regularly tested in order to ensure water quality and the operators of drinking water systems are required to be certified and trained. Locally, ERCA has prepared a drinking water source protection plan. **Municipal Water Treatment Plant (WTP) Intake Origin** ***Detroit River*** • Amherstburg WTP Less than 5% of the regional population depends on groundwater or hauled water. **Potential Threats** • Above grade fuel storage • Sewage discharge • Shipping accidents **For more information: essexregionsourcewater.org**

Drought/Low Water

Local Assessment

Ontario has experienced drought/low water conditions in the past and is likely to continue to do so in the future. Short periods of dry conditions growing occur at some time every year, while longer droughts (over four weeks in duration) occur approximately once every 3 years in Ontario (Brown & Wyllie, 1984).

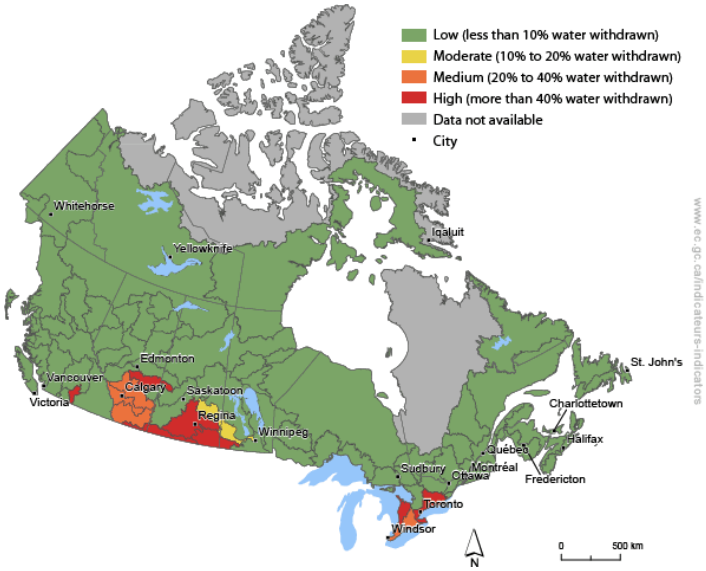


Figure 1 Threats to Water Availability 2009

Drought/low water conditions from mid-1997 through 1999 in southern Ontario concerned municipalities, conservation authorities and the province to the extent that it led the province to develop the Ontario Low Water Response (OLWR) Plan to ensure that Ontario is prepared for low water conditions in the future. The Plan was developed in 1999, implemented in 2000 and revised in 2003. The Ontario Low Water Response was developed by the Province of Ontario in order to assist in the preparation, co-ordination and to support local response to a drought (MNR, 2009). South-western and eastern Ontario experienced an extended period of low rainfall and high temperatures as recently as 2001.

Concern about the future of water resources in Ontario still remains due to the recent drought/low water conditions within the province, coupled with the risk of climate change which may result in an increase in severity and frequency of drought/low water conditions.

A study by Kreutzwiser et al. (2003) on the drought sensitivity of municipal water supply systems in Ontario identified several characteristics that increase the system's sensitivity to drought. These include:

- Groundwater and river water sources
- Rapid population growth
- Aging water system components
- Poorly maintained water system components

- Limited storage capacity relative to demand
- Lack of demand management measures
- Industrial growth

(Kreutzwiser et al., 2003)

People in Ontario are not particularly vulnerable to drought/low water emergencies. It is extremely rare in developed countries for people to die or be injured by drought. In fact, there were no deaths or fatalities reported in any of the droughts recorded in Ontario.

Property is not especially vulnerable to drought/low water; however, a sudden decrease in groundwater does have the potential to increase the occurrence of land subsidence (sinkholes) in some areas.

Agriculture and the environment are vulnerable to drought/low water emergencies. A shortage of water, especially if combined with high air temperatures can cause vegetation to be stunted or die. Since wildlife has greater mobility, which can assist in helping them find sources of water, they are less likely to be affected as severely as plants during a drought. However, if the drought is particularly long or severe, then wildlife may suffer as well. Irrigation practices have lessened the impact of drought on agriculture and livestock. However, as with wildlife, if the drought is particularly long or severe, they too may suffer losses. The loss of soil moisture and plant life can led to soil erosion causing further damage.

Industries that rely on large volumes of water for production, such as manufacturing, may also suffer during periods of drought/low water. They may be forced to decrease their production or find other methods of production that are less dependent on water. This could have significant economic repercussions for a company.

Earthquake

Categories

Richter magnitudes	Earthquake effects
<2.0	Not felt.
2.0-2.9	Not felt by people, but recorded by seismographs.
3.0-3.9	Usually felt by humans, but rarely causes damage.
4.0-4.9	Noticeable visible shaking of indoor items such as windows, hanging objects etc, rattling noises.
5.0-5.9	Poorly constructed buildings may be severely damaged. At most slight damage to well designed buildings. Dishes may fall and break; plaster and bricks may crack and fall.
6.0-6.9	Can cause damage in areas up to about 160 jilometers across in populated areas. Chimneys collapse, houses ,oved from their foundations.
7.0-7.9	Can cause severe damage over greater distances. Buildings collapse, bridges twist.
8.0-8.9	Can cause serious damage in areas several hundered miles across. Objects thrown into the air.
9.0-9.9+	Devastating in areas everal thousand miles across.

The Richter Scale and Property Damage. Based on information from Natural Resources Canada (2009) and the USGS (2009).

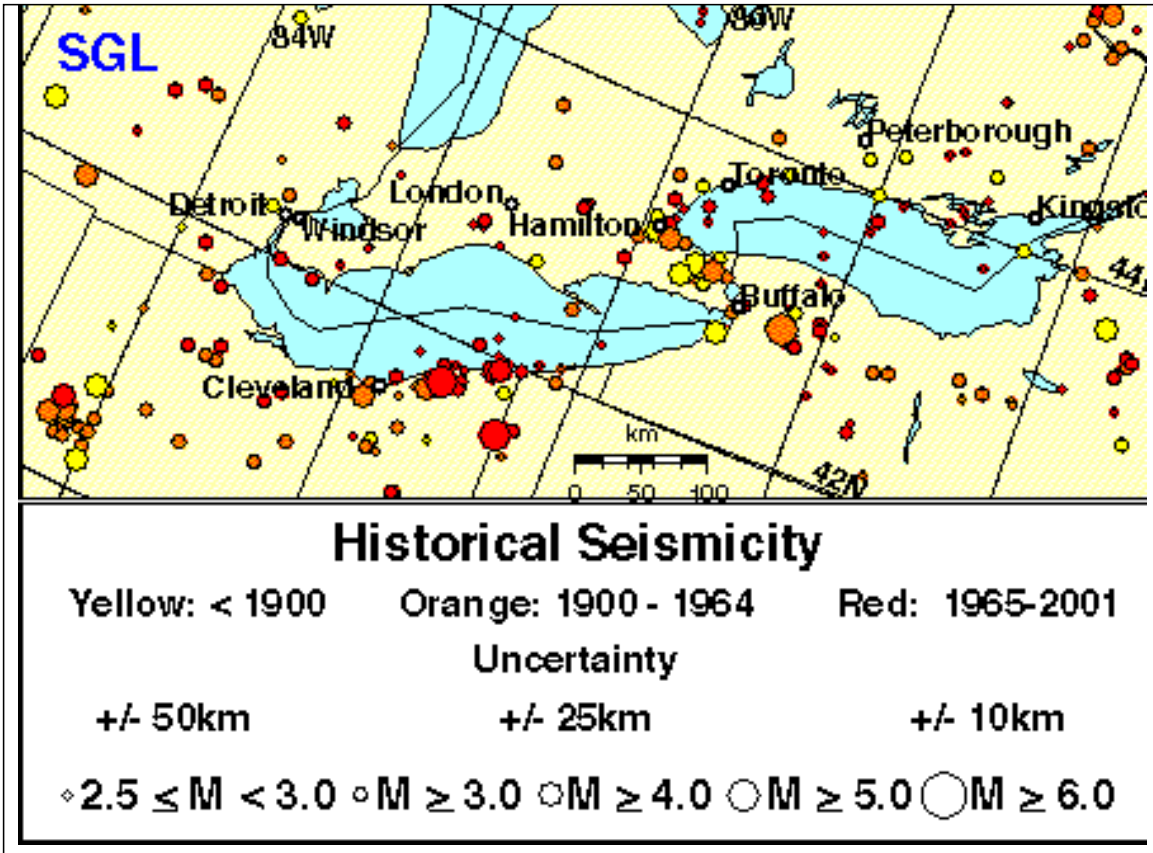
Scale	Shaking and Damage	Description
I	Shaking not felt, no damage	Not felt except by a very few under especially favourable conditions.
II	Shaking weak, no damage	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Shaking felt, no damage	Felt noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.

IV	Shaking light, no damage	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.
V	Shaking moderate, very light damage	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Shaking strong, light damage	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Shaking very strong, moderate damage	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Shaking severe, moderate to heavy damage	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Shaking violent, heavy damage	Damage considerable in specially designed structures; well- designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Shaking extreme, very heavy damage	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Shaking extreme, near total damage	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total	Lines of sight and level are distorted. Objects thrown into the air.

The Modified Mercalli Intensity Scale (Natural Resources Canada, 2010)

Local Assessment

A study done by Halchuk and A(ms (2004) examined the earthquake risk for select cities across Canada. Amherstbu rg was found to face a risk from local moderate earthquakes from the underlying Southern Great Lakes zone (Halchuk and Adams, 2004).



Southern Great Lakes Seismic Zone

This region has a low to moderate level of seismicity when compared to the more active seismic zones to the east, along the Ottawa River and in Quebec. Over the past 30 years, on average, 2 to 3 magnitude 2.5 or larger earthquakes have been recorded in the southern Great Lakes region. By comparison, over the same time period, the smaller region of Western Quebec experienced 15 magnitude 2.5 or greater earthquakes per year. Three moderate sized (magnitude 5) events have occurred in the 250 years of European settlement of this region, all of them in the United States - 1929, Attica, New York, 1986, near Cleveland, Ohio, and 1998, near the Pennsylvania/Ohio border. All three of these earthquakes were widely felt in southern Ontario but caused no damage in Ontario.

Potential Impacts

While strong earthquakes are very rare in Ontario and a significant earthquake has never occurred in Ontario based on the historic record, the people and property/infrastructure would be very vulnerable to this hazard.

Other damage can include the complete or partial destruction of rail lines, highways and bridges. Falling debris may block roads. Telecommunications structures may suffer damage. Electricity, gas lines and water mains may rupture resulting in outages. As noted in past earthquakes, environmental damage is usually noticeable only after a particularly strong earthquake. Powerful earthquakes have caused landslides, altered waterways (in terms of direction of flow, volume and debris), caused land subsidence, created ruptures and fissures etc.

POSSIBLE

Erosion
Categories
Natural Causes of Erosion: • Heavy and/or prolonged rainfall • The effect of gravity on soils that rest on steep slopes • Wind • Flooding, wave action and/or currents. • Movement of glaciers • Droughts, dry spells and/or high temperature 1. Human Causes of Erosion • The overgrazing of hoofed livestock • Removal of vegetation • Construction • Poor agricultural practices
Local Risk Assessment
Lake Erie is vulnerable when years with high levels of precipitation (high lake levels) are combined with northeasterly winds. Lake Erie has shallow offshore areas, which creates an environment that forms waves. **Local Erosion Incidents** November 13th-15th, 1972 - caused damage to both local shores. March 31st and April 6th, 1985 – Essex County estimated damages to be $8.1 million. 2019 April-December Unprecendents high water levels and significant shoreline erosion.

Extreme Temperatures

Categories

Heat Wave *period of more than three consecutive days of maximum temperatures at or above 32 ·C.*
Cold Wave: *issued when temperatures are expected to fall within 24 hours from above normal or seasonal temperatures to very cold temperatures.*

Local Assessment

The majority of heat waves in the province occur in Southern Ontario. Some areas of Southern Ontario experience approximately 20-24 hot days per year.
Most areas of Southwestern Ontario experience less than 10 cold days a year.

Date	Event	Details
06-20-1953	Highest humidex reading ever recorded in Windsor	Humidex – 52.1°C Temperature - 37 °C.
06-25-1988		Temperature - 40.2 °C
04-24-2009	Heat Wave	Temperature - 30.7 °C.
08-11-2016	Heat Wave	Temperature – 34 C Humidex- 40C

Flood

Definition

'An overflow or inundation of water from a river or other body of water which causes or threatens loss of life and property and environmental damage' (MNR, 2010).

Causes and Categories

Flooding can be caused by:

- Extreme precipitation
- Snow melt
- Ice break-up
- High winds – can result in a storm surge
- Soil moisture conditions – if the soil is already saturated, a greater percentage of precipitation will be available as runoff
- Ice jams – can act as a natural dam, allow large volumes of water and ice to build up until the jam breaks
- Wind chill – produces frazil ice
- Natural dams – beaver dams or earthen berms give way
- Structural failure

The Ministry of Natural Resources has three warning levels for floods:

1. **Flood Safety and Watershed Conditions Bulletin**: unsafe lake, river and channel conditions exist.
2. **Flood Advisory:** potential for flooding exists within specific watercourses and municipalities.
3. **Flood Warning**: flooding is imminent or occurring within specific watercourses and municipalities.

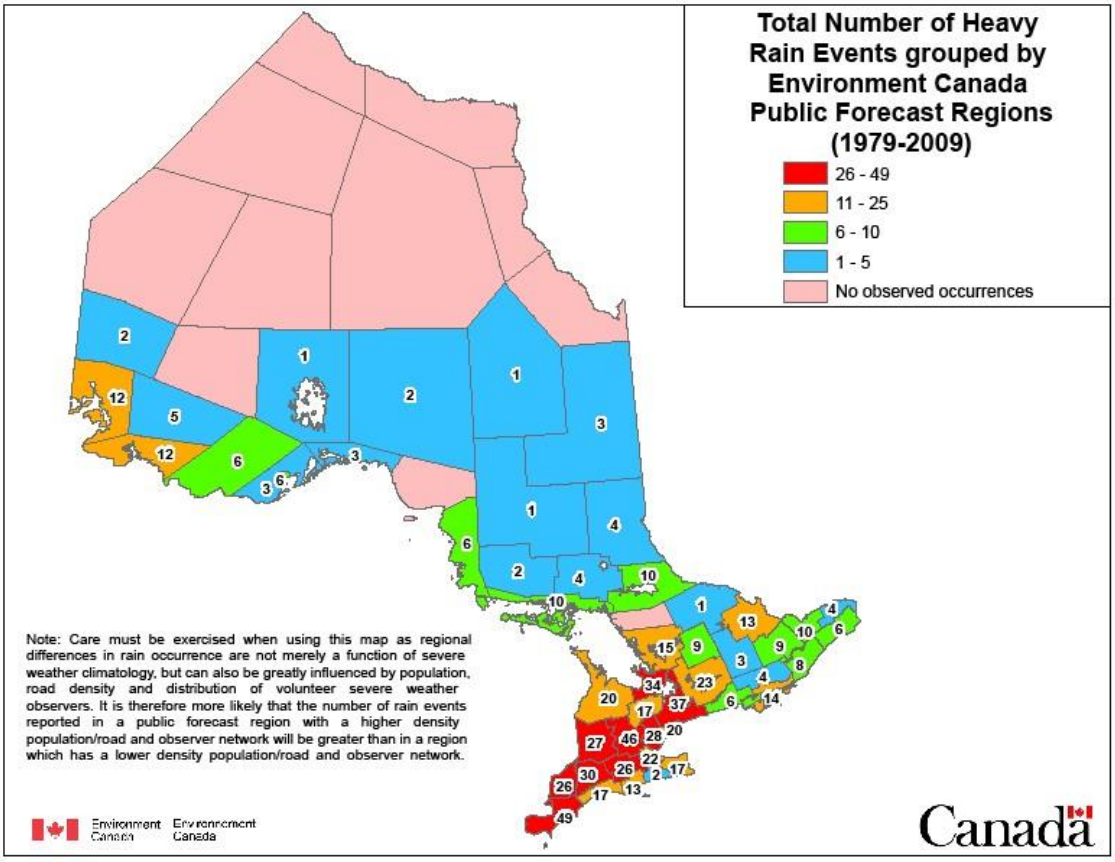
There are several different types of floods:

Riverine: A flood due to the increase of the water level beyond the capacity of a natural or somewhat natural floodplain.

Urban: A flood can be considered an urban flood if it results in the widespread flooding of an urban area. It is caused by water exceeding the capacity of the urban watershed. It is differentiated from riverine floods since the social, property and business/financial impacts are potentially much greater.

Storm Surge: Storm surge is defined as "an abnormal, sudden rise of sea (or lake) level associated with a storm event" (Goring, 1999).

Seiche: A period of oscillation of an enclosed body of water that may result in large waves.


Total Number of Heavy Rain Events grouped by Environment Canada Public Forecast Regions (1979-2009)
26 - 49
11 - 25
6 - 10
1 - 5
No observed occurrences
Note: Care must be exercised when using this map as regional differences in rain occurrence are not merely a function of severe weather climatology, but can also be greatly influenced by population, road density and distribution of volunteer severe weather observers. It is therefore more likely that the number of rain events reported in a public forecast region with a higher density population/road and observer network will be greater than in a region which has a lower density population/road and observer network.
Environment Canada
Canada

LIKELY

Fog

Categories

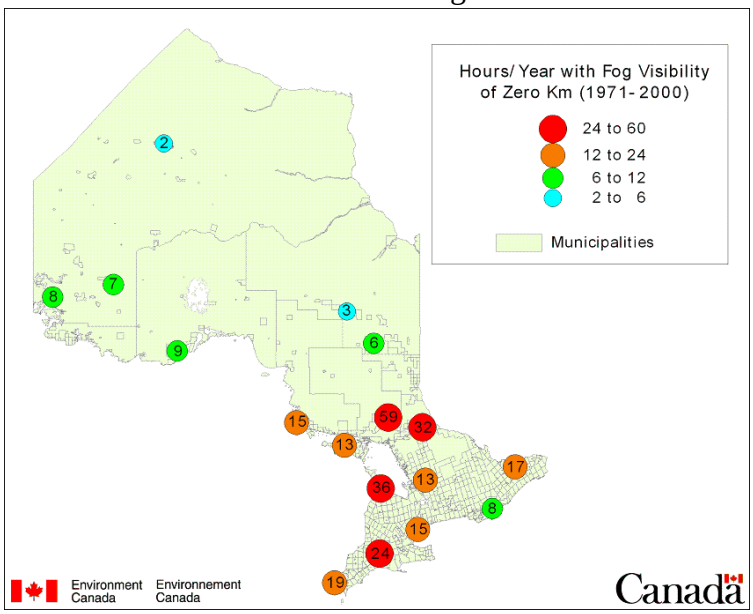
Fog is usually a small-scale, brief hazard that is common particularly around the Great Lakes. There are many types of fog. The two most common types in Ontario that pose a risk to safety are advection and radiation fogs.

Advection fog is generated when moist air travels over a cool surface. This type of fog can be widespread.

Radiation fog is more localized and is generated by surface cooling in calm weather conditions.

Local Risk Assessment

- Thick fog is most common in Southern Ontario
- Fog is more likely to result in an emergency in areas with high traffic volumes. Southern Ontario has the highest traffic volume in Ontario.



LIKELY

Freezing Rain
Definition
'Rain or drizzle, which falls in liquid form and then freezes upon contact with the ground or a cold object, forming a coating of ice' (Environment Canada, 2010).
Local Assessment
• Southern Ontario experiences freezing rain on an average of just over 11 days per year.

Geomagnetic Storm
Definition
A temporary and severe disturbance of the upper atmosphere and of the near-Earth space environment caused by the magnetic activity of the Sun (based on National Research Council, 2008).
Local Assessment
Ontario is located at fairly high latitude. Because of this, the province faces a greater risk of geomagnetic storms than locations that are geographically more southern. Ontario also is dependent on technology and electricity for critical functions and systems such as the food supply, water distribution, banking, transportation and communications. Vulnerable groups include those that depend on technology: • Seniors • Physically disabled • Medically dependent Vulnerable critical infrastructure • Portable water systems • Heating systems • Food production • Satellites • Pipelines • Radio and telecommunications • Navigation systems • Alarm systems • Street and traffic lights • Transportation (Most cars, trains and aircraft would not function. Gasoline pumps also require electricity) • Financial institutions (financial records and cash withdrawal along with the use of debit and credit cards would be inaccessible.)

POSSIBLE

Hail

Definition

Hail is defined as precipitation consisting of particles of ice in various shapes that is generally; observed during thunderstorms. Environment Canada (1996) defines hail as having a diameter of 5 mm or more (Environment Canada, 1996).

Local Risk Assessment

- South-western Ontario experiences hail much more frequently than the rest of Canada.
- From 1977 to 1993 there were 1842 days with hail in Ontario. This is not particularly high; however it is not distributed evenly across the province.
- Southern Ontario has some areas which experience higher frequencies, possibly due to lake effects and topography.
- Hail is Ontario is generally fairly small, about pea-sized and as a result, losses have been generally moderate when compared to other provinces.
- The vast majority of the potentially damaging hail occurrences (in which the hail size is large enough to cause damage) occur in Southern Ontario.

Date	Event	Details
05-30-1985	Golf ball sized hail in Windsor and Leamington	$30-40 million in damages

POSSIBLE

Human Health Emergency
Definition
Human Health Emergency: *'A widespread and/or severe epidemic, incident of contamination or other situation that presents a danger to, or otherwise negatively impacts, the general health and well being of the human population' (EMO, 2005).* ***Epidemic:*** *Major incidents of human illness caused by the transmission of a specific disease. The occurrence, in a community or region, of cases of an illness (or an outbreak), with a frequency clearly in excess of normal (EMO, 2005).* ***Pandemic:*** *An epidemic occurring worldwide or over a very wide area, crossing boundaries of several countries, and usually affecting a large number of people (WHO, 2007).*
Description
There are several ways in which a human health emergency can be introduced and spread throughout a community: **Direct contact:** a person can become infected through close physical contact (e.g. kissing, touching) a person who is already infected. Ind ire become infected by coming into contact with a surface that has been contaminated. **Droplet contact:** a person can become infected from exposure to droplets that have touched the surfaces of the eyes, mouth or nose of an infected person. Sneezing and coughing are two methods in which this type of illness can be spread. This differs from airborne transmission since the droplets are too large to remain in the air for long periods. **Airborne transmission:** a person can become infected from exposure to droplet nuclei and contaminated dust particles which are capable of staying airborne. Few diseases are capable of surviving airborne transmission (e.g. influenza, pneumonia). **Vector-borne transmission:** a person can become infected through contact with an infected animal or insect. Mosquitoes are the most common vector for disease in humans.
(Mount Sinai Hospital, 2007).
Local Risk Assessment
• A human health emergency could occur in any part of Ontario. • The elderly, infants, and toddlers are at a greater risk of suffering from illness or fatality due to human health emergency, although this depends on the agent of disease. International travel can introduce re-emerging and novel diseases into the population. Windsor and Essex County can therefore identify the following as risks: • Windsor International Airport • Ambassador Bridge • Windsor-Detroit tunnel • International Marine Travel (Morterm Terminal) The population of Ontario is very vulnerable to a human health emergency, although public health practices (e.g. hand washing) have slightly lowered the risk when compared to that of some other countries. Depending on the cause of the emergency, a large percentage of the population could become ill. Fatalities may occur depending on the mode of transmission and the virulence of the illness.

UNLIKELY

Hurricane
Definition
'Hurricanes are tropical cyclones with maximum sustained surface winds of at least 118 kilometers per hour. Hurricanes are known as typhoons in the western Pacific, very severe cyclonic storms in the North Indian Ocean, and severe tropical cyclones in Australia. There are 5 classes of hurricane intensity as outlined by the Saffir-Simpson Scale' (Environment Canada, 2010).
Description
In North America, the hurricane season runs from June to the end of November, with the peak from August to October. • A tropical storm is 'a named storm with characteristics of a tropical nature as well as maximum sustained wind speeds of between 63 and 117 km/h (EMO, 2005). • A post-tropical storm is a named storm that is losing or has lost its tropical characteristics (EMO, 2005).
Local Assessment
• Southern Ontario experiences the greatest risk of hurricane/post-tropical storms in Ontario due to its location. This coincides with the area of highest population and infrastructure density in Ontario. • Due to Ontario's geographic position, hurricanes have almost always decreased to tropical storm strength or lower by the time they reach Ontario. • On occasion, a weakened hurricane will collide with another storm system or weather front resulting in a strengthened storm. • Ontario property and infrastructure is moderately vulnerable to hurricanes/post-tropical storms. Common damage include: ▪ Flooded buildings ▪ Downed power lines ▪ Sewage backup ▪ Downed trees ▪ Damage to roofs ▪ Wind damage ▪ Roads and rails may be impassable due to debris.

LIKELY

Lightning
Definition
'Lightning is a large static discharge that develops most commonly within thunderstorms where convection and gravitational forces combine with an ample supply of particles to generate differential electrostatic charges' (Clodman and Chisholm, 1994).
Local Risk Assessment
• Southern Ontario has the highest frequency of lightning strikes in Canada. (34 days a year)

UNLIKELY

Natural Space Object Crash	
Definition	
Comet: *"Comets are bodies of ice, rock, and organic compounds that can be several miles in diameter" (NASA, 2010).* ***Meteorite:*** *A rocky or metallic body (mainly nickel and iron) from an asteroid or a meteoroid that "survives its passage through the Earth's atmosphere and lands upon the Earth's surface" (NASA, 2010).*	
Description	
Torino Scale	
NO HAZARD (white)	
0.	The likelihood of a collision is zero, or is so low as to be effectively zero. Also applies to small objects such as meteors and bodies that burn up in the atmosphere as well as infrequent meteorite falls that rarely cause damage.
NORMAL (green)	
1.	A routine discovery in which a pass near the Earth is predicted that poses no unusual level of danger. Current calculations show the chance of collision is extremely unlikely with no cause for public attention or public concern. New telescopic observations very likely will lead to re-assignment to Level 0.
MERITING ATTENTION BY ASTRONOMERS (yellow)	
2.	A discovery, which may become routine with expanded searches, of an object making a somewhat close but not highly unusual pass near the Earth. While meriting attention by astronomers, there is no cause for public attention or public concern as an actual collision is very unlikely. New telescopic observations very likely will lead to re-assignment to Level 0.
3.	A close encounter, meriting attention by astronomers. Current calculations give a 1% or greater chance of collision capable of *localized destruction*. Most likely, new telescopic observations will lead to re-assignment to Level 0. Attention by public and by public officials is merited if the encounter is less than a decade away.
4.	A close encounter, meriting attention by astronomers. Current calculations give a 1% or greater chance of collision capable of *regional devastation*. Most likely, new telescopic observations will lead to re-assignment to Level 0. Attention by public and by public officials is merited if the encounter is less than a decade away.
THREATENING (orange)	
5.	A close encounter posing a serious, but still uncertain threat of regional devastation. Critical attention by astronomers is needed to determine conclusively whether a collision will occur. If the encounter is less than a decade away, governmental contingency planning may be warranted.
6.	A close encounter by a large object posing a serious but still uncertain threat of a global catastrophe. Critical attention by astronomers is needed to determine

	conclusively whether a collision will occur. If the encounter is less than three decades away, governmental contingency planning may be warranted.
7.	A very close encounter by a large object, which if occurring this century, poses an unprecedented but still uncertain threat of a global catastrophe. For such a threat in this century, international contingency planning is warranted, especially to determine urgently and conclusively whether a collision will occur.
CERTAIN COLLISIONS (red)	
8.	A collision is certain, capable of causing localized destruction for an impact over land or possibly a tsunami if close offshore. Such events occur on average between once per 50 years and once per several thousand years.
9.	A collision is certain, capable of causing unprecedented regional devastation for a land impact or the threat of a major tsunami for an ocean impact. Such events occur on average between once per 10,000 years and once per 100,000 years.
10.	A collision is certain, capable of causing global climatic catastrophe that may threaten the future of civilization as we know it, whether impacting land or ocean. Such events occur on average once per 100,000 years, or less often.

Local Risk Assessment

- Large impacts are extremely rare.

POSSIBLE

Snowstorm/Blizzard
Description
Environment Canada Ontario can issue several different warnings for snow-related events (Environment Canada, 2009): **Heavy Snow Warning:** 15cm or more of snow is expected to fall within 12 hours. **Winter Storm Warning:** greater than 25cm of snow is expected to fall within twenty four hours or forecasters expect 2 or more of the weather conditions listed as potential warnings to occur. For instance, if more than 15cm of snow was expected to be accompanied by strong winds of more than 60km/h. **Snow Squall Warning:** issued for areas to the lee of large bodies of water when 15cm of snow or more is likely to fall in 12 hours or less OR when the visibility is likely to be near zero in snow and blowing snow for four hours or more, even without warning levels of snowfall accumulation. These conditions usually are short in duration, however, some can be prolonged and if they occur in the same location, they can result in higher snowfall amounts. **Blizzard Warning:** issued when all of the following conditions are expected to occur and last for four or more hours; • Winds of 50km/h or more • Visibility of 1km or less in snow and blowing snow. • Wind chill values of –35 or lower
Local Risk Assessment
• Blizzards are fairly rare in Ontario • Snowstorms are much more common.

Tornado

Definition

A violently rotating column of air, in contact with the ground, either pendant from a cumuliform cloud or underneath a cumuliform cloud, or often (but not always) visible as a funnel cloud (Glickman, 2000).

Description

Special atmospheric conditions are required for the formation of a tornado.

- Low-level moisture
- Atmospheric instability
- a lifting mechanism.

Enhanced Fujita Scale (in use since April 1st 2013)

	65–85	104–137	29–
	86–110	138–177	38–49
	111–135	178–217	50–60
	136–165	218–266	61–73
	166–200	267–322	74–90
EF5	>200	>322	>90

Local Risk Assessment

- According to Environment Canada, Ontario has an average of twelve tornadoes per year.
- Southern Ontario experiences the greatest number of tornadoes in all of Canada (Etkin et al., 2001).
- A 2003 study by King et al. suggested that lake-breeze circulations in Southern Ontario might be providing a trigger for the development of tornadoes. It was suggested that the lake breeze circulation may increase atmospheric moisture and wind shear, both of which are required for tornado development. This study also found a preferential corridor for tornado activity created by the suppression of thunderstorms over and downwind of the lakes, and enhanced moisture depth and wind shear between the lakes. This corridor extends to the west of Lake St. Clair and encompasses the cities of Windsor and Sarnia.
- The vast majority of tornadoes in Ontario are weak (ranking as F0 or F1 on the Fujita scale for tornado intensity).

Windstorm

Definition

Windstorms can be defined as strong, non-tornadic winds that have the potential to cause damage (Environment Canada, 2009).

Description

In Ontario, Environment Canada can issue two types of windstorm-related warnings:
High Wind Warning is issued when sustained winds of 60 km/h or more lasting at least 3 hours are forecast **and/or** any wind gusts of 90 km/h or more are forecast (Environment Canada, 2009).
A **Severe Thunderstorm Warning** may be issued since gusts of 90 km/h or greater are one of the criteria for a storm to be classified as severe. This warning is only issued if the winds are part of a thunderstorm.

Local Risk Assessment

November is the windiest time of year for the Great Lakes, but all of the records for one-minute wind speeds have been recorded from June to August (EMO, 2005). Southern Ontario experiences the highest number of annual severe wind gusts
Historical Local Occurrences

Date	Wind speeds	Damages
03-21-1913	150 km/h.	• 7 fatalities • Damaged buildings • Uprooted trees
04-07-1985	110 km/h.	• Southern Ontario power failure.
02-27-1997	110km/h	• Damaged buildings • Uprooted trees

Technological Hazards

POSSIBLE

Building/Structural Collapse
Description
Building and structures may exceed their load-carrying capacity due to the stresses of different causes: • Fire • Explosion • Snow • Ice • High Wind • Earthquake • Material Flaws • Design and Construction Flaws • Deterioration
Local Risk Assessment
• The Ontario Building Code was established in 1975 to provide standards for the design and construction of buildings. These standards have helped to reduce the risk of a building/structural collapse and in doing so, protect the public (MAH, 2002). • Since the Building Code evolves over time, there is no guarantee that a building will remain in compliance throughout its lifespan.

POSSIBLE

Critical Infrastructure Failure
Description
Infrastructures may be deemed to be critical if their failure or disruption may jeopardize the safety, security, and quality of life of the community or region affected. Critical infrastructure includes: • Electricity • Water treatment and distribution • Sewage treatment and disposal • Communications systems • Food production and distribution • Transportation services • Emergency Services • Healthcare
Local Risk Assessment
• Essex County is heavily reliant on critical infrastructure for essential services. • Few people keep sufficient stores of non-perishable food and water in their homes in case of emergency as many have grown accustom to shopping as needed. • Many people require electricity and refrigeration for medical reasons. • Severity could be dependent on the season.

POSSIBLE

Energy Supply Emergency
Definition
The disruption of the supply, production and transportation of electricity, natural gas, and/or oil severe enough to threaten public safety, business and the economy. If an energy supply emergency progresses to the point that there is a complete lack of electricity, natural gas, or oil then it may become a critical infrastructure failure emergency.
Local Assessment
• People in Ontario are especially reliant on energy sources in order to maintain their current quality of life. Ontario's installed electricity generation capacity: · Nuclear- 33% · Hydroelectric- 23% · Coal- 13% · Natural Gas (for generating electricity)- 27% · Wind and Other– 4% (Independent Electricity System Operator, 2011). Local Energy Providers • Essex Power Services (electrical) • Hydro One (electrical) • Enbridge/Union Gas (natural gas)

POSSIBLE

Explosion/Fire
Definition
Explosion: *The sudden conversion of potential energy into kinetic energy resulting in a sudden, violent release of gas/es under pressure.* ***Fire:*** *Uncontrolled and/or potentially destructive burning caused by the ignition of a fuel or material, combined with oxygen, which gives off heat and light, with or without an open flame.*
Description
The persistent and spread of a fire, and the strength and size of an explosion depends on: • The type of fuel source • The amount of fuel source • The source, type and location of initial ignition • The size and layout of the building/surroundings • Air turbulence caused by the interaction of fire and/or burning gases with obstacles • The type of vents and their locations • Additional fuel sources • The presence of prevention and mitigation systems.
Local Assessment
Structure fires and explosions can result in fatalities, injuries and significant property damage. Amherstburg has historically has a low number of fires on an annual basis. Over the past 5 years, the town averages approximately 12 structure fires a year

POSSIBLE

Hazardous Materials Incident
Definition
Hazardous Materials Incident: *the unintentional release of a material that is considered to be hazardous to humans, animals, plants or the environment due to its explosive, flammable, combustible, corrosive, oxidizing, toxic, infectious or radioactive properties.* ***Fixed Site Incident:*** *one is which the release occurs at a location in which the hazardous material is stored, produced or utilized.* ***Transportation Incident:*** *A transportation incident is one in which the release occurs during the transport (by means of road, rail, air or marine) of a hazardous material.*
Description
Classification applies primarily to transportation and is regulated by the Transportation of Dangerous Goods Act. Hazardous materials can be classified as falling into one of nine classes: Class 1 Explosives Class 2 Gasses Class 3 Flammable liquids Class 4 Flammable solids, spontaneously combustibles, substances that, on contact with water, emit flammable gases Class 5 Oxidizing substances, organic peroxides Class 6 Poisonous (toxic), infectious substances Class 7 Radioactive materials Class 8 Corrosives Class 9 Miscellaneous products or substances, Miscellaneous identified dangerous goods certain specified goods considered dangerous to the environment, dangerous wastes (EMO, 2005).
Local Risk Assessment
• Ontario has the largest chemical industry of any province in Canada. • The 401, Herb Grey Parkway, rail lines, and the Detroit River shipping corridor puts Essex County at a higher risk for hazmat incidents. • Essex Terminal Railway carries propane, butane and alcohol (Diageo) in the Town of Amherstburg and gives quarterly reports on the amount of product that goes through the Town.

UNLIKELY

Human-Made Space Object Crash
Definition
An Earth orbiting human-made object (such as a satellite) which survives atmospheric reentry to impact Earth.
Description
Non-functioning human-made objects are referred to as space debris. The amount of each types of item that can be classified as space debris is: • Operational spacecraft – (6%) • Old spacecraft – (15%) • Rocket bodies – (11%) • Mission-related objects – (11%) • Miscellaneous fragments – (56%)
Local Risk Assessment
• Due to the larger number of objects in high inclination orbits and the fact that such objects spend more time at higher latitudes, Ontario does have a higher risk than a similarly sized region near the equator. • Unlikely to hit populated area

UNLIKELY

Nuclear Facility Emergency
Definition
'An actual or potential hazard to public health and property or the environment from ionizing radiation whose source is a major nuclear installation within or immediately adjacent to Ontario.' (EMO, 2009).
Local Risk Assessment
• Fermi 2 – Monroe County Michigan, USA

POSSIBLE

Oil/Natural Gas Emergency
Definition
An event that poses a threat to public safety, property, the environment, critical infrastructure or the economy from the uncontrolled release of oil and/or natural gas from: 1) a pipeline; 2) oil/natural gas wells; 3) storage facilities and/or distribution systems.
Local Risk Assessment
Oil/Natural Gas Wells • Union Gas – Throughout county • BP – LaSalle, Windsor, Tecumseh and Lakeshore • Talismann Energy – Leamington

POSSIBLE

Radiological Emergency
Definition
A radiological emergency occurs when radiation from radioactive material is unintentionally emitted outside of protective spaces, at levels high enough hat it presents a threat (real or perceived) to people or the environment.
Local Risk Assessment
• University of Windsor • Hotel Dieu Grace Hospital • Windsor Regional Hospital • OFMEM for provincial resources

POSSIBLE

Transportation Emergency
Definition
A crash, collision or incident, of large scale, involving an air, land (road), rail or marine mode of transportation that excludes hazardous materials incidents.
Local Risk Assessment
Air • Windsor Airport • Leamington Airport Rail • Essex Terminal Railway Marine • Detroit River • Lake Erie

Human-Caused Emergency

UNLIKELY

Civil Disorder
Definition
A group or groups of people intentionally not observing a law, regulation or rule in order to disrupt a business, organization or community to bring attention to their cause, concern or agenda.
Description
Large scale civil disorder emergencies are rare. Some of their potential causes include: Resource shortages. • High profile/controversial meetings. • A victory or defeat of a sports team. • Hostile labour disputes. • Local, national or international events. • The implementation of controversial laws polices or court rulings. • Disagreements between special interest groups over a particular issue or cause.

POSSIBLE

Cyber Attack
Definition
'A criminal offence involving a computer as the object of the crime, or the tool used to commit a material component of the offence' (Canadian Police College, 2010).
Description
Cyber attacks can be divided into two very general categories depending on how computers, networks and programs are used: 1) The computer as the tool of the crime 2) The computer as the object of the crime (Kowalski, 2002). Some examples of cyber attacks are: • Hacking (including critical infrastructure) • Computer viruses and spy ware Using a computer to steal information • Fraud (including identity theft and stealing banking information) • Harassment • Defacing, altering or removing websites Obtaining sensitive documents (Kowalski, 2002).
Local Risk Assessment
• Heavily reliant on internet

POSSIBLE

Sabotage
Definition
The act of damaging, destroying, interfering, impairing or obstructive public or private property, machinery, businesses or the environment with the intention to cause harm.
Description
Acts of sabotage may include: • The damage or destruction of property, resources or machinery • The use of force or threats • Hate crime (ethnic, religious or gender intimidation) • Product or process tampering • The release of sensitive, confidential information
Local Risk Assessment
• Government facilities, critical infrastructure, businesses and organizations may be targeted. ▪ Ambassador Bridge ▪ Detroit-Windsor Tunnel

POSSIBLE

Special Event
Definition
A non-routine, lawful activity that is usually planned and that attracts large numbers of people. These events include, but are not limited to, the attendance of prominent public officials, national/international dignitaries, concerts and public events.
Local Risk Assessment
• Parades • Festivals

POSSIBLE

Terrorism/CBRNE
Definition
Chemical, biological, radiological, nuclear and explosive (CBRNE) materials that are intentionally released with the intent to cause harm to humans, property, business or the environment. These materials can be weaponized or non-weaponized.
Local Risk Assessment
• Ambassador Bridge • Detroit-Windsor tunnel • Windsor International Airport • FERMI II • ETR Rail Lines

War/International or Provincial/Territorial Emergency
Definition
International Emergency**:** *an emergency that affects Canada and at least one other country that requires joint management and response efforts between the countries.* ***Provincial/Territorial Emergency****: an emergency that affects Ontario but that occurs in another province or territory and that requires joint management and response efforts between the countries.* ***War Emergency:*** *a real or imminent war or other armed conflict that involves Canada or any of its allies that is of sufficient magnitude to be a national emergency.*
Local Risk Assessment
The political climate of the world is ever changing and the threat of war or international conflict is always present. A declaration of war anywhere in the world could have an effect on Canada and the Province of Ontario. The possible impacts vary significantly depending on the type of emergency from fatalities to business interruptions. Notwithstanding the federal lead in these matters, it is possible that Canadian participation in War or International emergencies will have an impact in Canada and this could result in a public welfare or public order emergency. In the event of a war/international emergency, Ontario would be expected to manage sub-sets of the emergency that directly impact the provincial with direction from the federal government. Increasingly, the province has also been asked to send resources and support to affected areas such as health professionals, fire fighting and medical equipment.