

# Hamilton Fire Department

## 2023 Community Risk Assessment



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*Section 1*

# Purpose of Report & Requirements

"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." (Reference: Ontario Fire Marshal). Community Risk Assessments are mandated and regulated by the Ontario Fire Marshal through the Fire Protection and Prevention Act, 1997 and ONTARIO REGULATION 378/18. As outlined in the regulation "Every municipality, and every fire department in a

territory without municipal organization, must (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." Community Risk Assessments must be completed by municipalities' fire departments every five (5) years and reviewed annually.

The Hamilton Fire Department completed its first Community Risk Assessment in 2019 that formed a part of the 10-Year Service Delivery Plan.

All nine (9) mandatory profiles are contained in this report:

1. Geographic profile: The physical features of the community, including the nature and placement of features such as highways, waterways, railways, canyons, bridges, landforms, and wildland-urban interfaces.
2. Building stock profile: The types of buildings in the community, the uses of the buildings in the community, the number of buildings of each type, the number of buildings of each use and any building-related risks known to the fire department.
3. Critical infrastructure profile: The capabilities and limitations of critical infrastructure, including electricity distribution, water distribution, telecommunications, hospitals, and airports.
4. Demographic profile: The composition of the community's population, respecting matters relevant to the community, such as population size and dispersion, age, gender, cultural background, level of education, socioeconomic make-up, and transient population.
5. Hazard profile: The hazards in the community, including natural hazards caused by humans, and technological hazards.
6. Public safety response profile: The types of incidents responded to by other entities in the community, and those entities' response capabilities.
7. Community services profile: The types of services provided by other entities in the community, and those entities' service capabilities.
8. Economic profile: The economic sectors affecting the community that are critical to its financial sustainability.
9. Past loss and event history profile: The community's past emergency response experience, including the following analysis:
  - The number and types of emergency responses, injuries, deaths, and dollar losses.
  - Comparison of the community's fire loss statistics with provincial fire loss statistics

Each profile helps to describe and understand community risk as they relate to fire. The Ontario Fire Marshal provides corresponding worksheets for each profile that guide the type of information to be reviewed and/or gathered. The completed worksheets are found in the appendices of this report and referenced throughout.

The core data collected and required for this report includes:

- 2020, 2021, and 2022 Hamilton Fire Department statistics that inform the Past Loss Profile;
- 2016 and 2021 Statistics Canada data that informs the Demographic Profile and Economic Profile; and
- The building stock list comes from the Geographic Information Services section via a range of sources such as the City of Hamilton's Planning & Economic Development Department (data date: November 2023).



MESSAGE FROM

# The Fire Chief

In keeping with the Hamilton Fire Department's consistent history of evidence-based decision making – this Community Risk Assessment contains important information and data that will help us reflect, plan, and prioritize. Hamilton's Community Risk Assessment is a critical tool that allows the Hamilton Fire Department to comprehensively assess current and future fire risk. And while the data in this report highlights overall fire risk in Hamilton, it can also be used to identify specific high-risk level areas, evaluate probability and consequences, and capture emerging trends. An additional benefit of the Community Risk Assessment is that it helps identify potential future actions and informs changes to the 10-Year Service Delivery Plan updates. Beyond data collation, this report also includes a thoughtful review using the Ontario Fire Marshal's risk assessment tools combined with staff knowledge and expertise to identify, analyze, evaluate, and prioritize the risks to public safety in Hamilton. Collectively, these elements support service delivery decisions across the three lines of defense: public fire safety education; fire safety standards and enforcement; and emergency response.

This report reflects the dedication of staff from all divisions of the Hamilton Fire Department. When the Leadership Team and I reviewed the data and trends to determine risk, we were reminded of the large scope of work performed by our entire team, as well as their adaptability to change. I am grateful for the collaborative effort of all parties – internal staff who make our community safe, other City of Hamilton departments, and various external organizations. Their participation contributed significantly to this report.

Frequently revisiting and tracking changes within the profiles is essential. Data collection and careful analysis assist both tactical and strategic decision-making. Compared with the previous 2019 Community Risk Assessment, we're seeing an increased volume of fires and emergency incidents; changes and increases in building stock and the City's population, and a shift relative to the



behavioral causes of fires. There were also significant and alarming changes related to unsheltered persons; increasing concerns and levels of risk from hazards like wildland fires; and an upward trend in residential fires - including associated deaths and injuries. Critically, we continue to see the very concerning trend that a significant number of residences experiencing fires do not have working smoke alarms.

I am confident this report achieves the Ontario Fire Marshal's goal of undertaking a community risk assessment to inform decisions relative to the provision of fire protection services. As the People's fire department, this Community Risk Assessment maintains our commitment to keeping the Hamilton community safe and informed.

**FIRE CHIEF DAVID CUNLIFFE**

**SERVICES PROVIDED BY**

# The Hamilton Fire Department

THE HAMILTON FIRE DEPARTMENT HAS A BYLAW (BY-LAW NO. 19-0345) THAT REGULATES THE TYPES AND LEVELS OF SERVICES PROVIDED. THIS IS CALLED THE ESTABLISHING AND REGULATING BYLAW, APPROVED BY CITY COUNCIL AND PERMITTED BY THE FIRE PROTECTION AND PREVENTION ACT. THE FIRE PROTECTION AND RESCUE SERVICES CURRENTLY PROVIDED BY THE HAMILTON FIRE DEPARTMENT INCLUDE:

- (a) fire suppression, fire prevention, fire safety education;
- (b) rescue and hazardous materials response;
- (c) emergency first response services in accordance with the tiered-response agreement with Hamilton Paramedic Service;
- (d) mitigation and prevention of risk created by the presence of unsafe levels of carbon monoxide and safety education related to the presence of those levels;
- (e) communication in respect of any matter described in (a)-(d);
- (f) training of persons involved in the provision of any services described in (a)-(e) in accordance with National Fire Protection Association (NFPA) standards; and
- (g) delivery of all services described in (a)-(f) above.

## *Section 2*

# How Risk is Measured & Determined

The Ontario Fire Marshal provides three (3) tools to help cities determine and review the risks associated with their building stock, past fire loss and non-fire emergency calls, hazards, demographics, and economy. These risk reviews help a) identify features and characteristics that may impact fire and life safety risks and b) prioritize risks based on probability and consequences. Hamilton's building stock; past fire loss

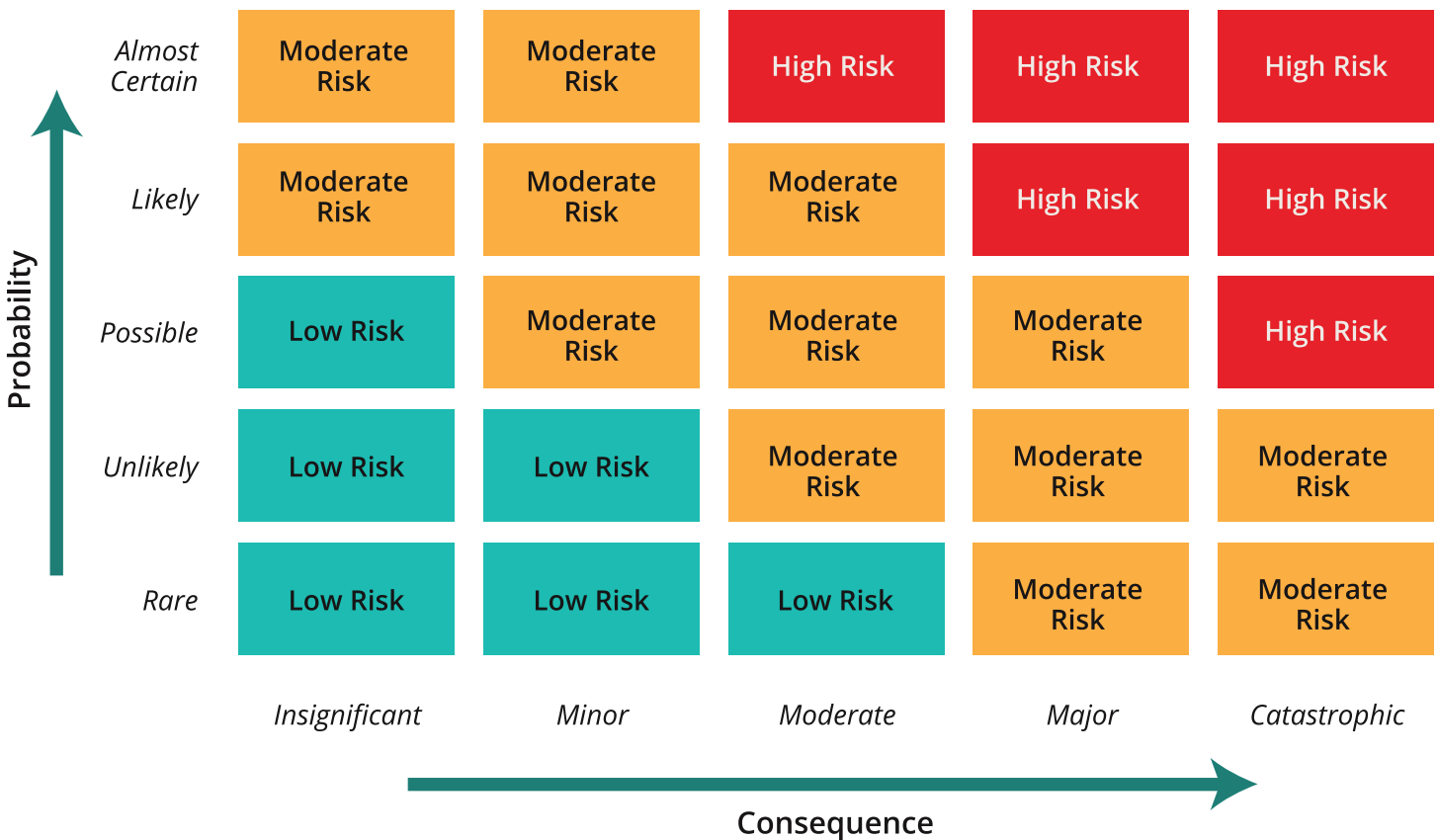
and non-fire emergency calls; hazards; demographics; and economic profiles all had individual risk reviews completed to identify the probability, consequences, and assigned level of risk for several different features within each profile. For example, within Hamilton's Building Stock Profile the assembly building type was identified as having a moderate risk level.

The way risk level is determined is by assigning probability and then consequence. Once probability is determined, cities use the Risk Level Matrix tool:

**DETERMINING PROBABILITY AND CONSEQUENCE**

The Ontario Fire Marshal provided the following tables to determine the probability level (Table 1) and consequence level (Table 2).

These levels were determined by the data collected and reviewed for each of the profiles.



**TABLE 1**  
Probability Level

Rare	May occur in exceptional circumstances. No incidents in the past 15 years.
Unlikely	Could occur at some time, especially if circumstances change. 5 to 15 years since the last incident.
Possible	Might occur under current circumstances. 1 incident in the past 5 years.
Likely	Will probably occur at some time under current circumstances multiple or recurring incidents in the past 5 years.
Almost Certain	Expected to occur in most circumstances unless circumstances change. Multiple or recurring incidents in the past year.

**TABLE 2**  
Consequence Levels

Insignificant	<ul style="list-style-type: none"> <li>• no life safety issue</li> <li>• limited valued or no property loss</li> <li>• no impact to local economy, and/or</li> <li>• no effect on general living conditions</li> </ul>
Minor	<ul style="list-style-type: none"> <li>• potential risk to life safety of occupants</li> <li>• minor property loss</li> <li>• minimal disruption to business activity, and/or</li> <li>• minimal impact on general living conditions</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>• threat to life safety of occupants</li> <li>• moderate property loss</li> <li>• poses threat to small local businesses, and/or</li> <li>• could pose a threat to the quality of the environment</li> </ul>
Major	<ul style="list-style-type: none"> <li>• potential for a large loss of life</li> <li>• would result in significant property damage</li> <li>• significant threat to large businesses, local economy, and tourism, and/or</li> <li>• impact to the environment would result in a short term, partial evacuation of local residents and businesses</li> </ul>
Catastrophic	<ul style="list-style-type: none"> <li>• significant loss of life</li> <li>• multiple property damage to a significant portion of the municipality</li> <li>• long-term disruption of businesses, local employment, and tourism, and/or</li> <li>• environmental damage that would result in long-term evacuation of local residents and businesses</li> </ul>



Hamilton's building stock; past fire loss and non-fire emergency calls, hazards, demographics, and economic profile risk reviews were determined based on collated data along with a review by an internal team of experts within the Hamilton Fire Department. This team has significant combined experience and includes: the Hamilton Fire Chief, Deputy Chief - Operational Support and Community Safety, Deputy Chief - Operations, Manager - Operations/Assistant Deputy Chief, Chief Fire Prevention Officer, Assistant Chief Fire Prevention Officer, Technology & Analytics Specialist - Fire, and Senior Project Manager - Fire.

### *Section 3*

## Geographic Profile

Hamilton is centrally located in the Golden Horseshoe – within Canada's most densely populated region – and under an hour away from several major border crossings to the USA. The City of Hamilton borders on five (5) regions or cities and the Hamilton Fire Department has Mutual Aid agreements with all five (5) regions and cities. The City's size is 276,300 acres (or 1,118 km<sup>2</sup>) with 128,532 acres (or 520 km<sup>2</sup>) made up of farmland (Reference: 2016 Stats Canada and Hamilton Agriculture Profile and Economic Report). Hamilton has many unique geographic features that create potential impacts on the delivery of Fire Protection and Rescue Services. The geographic features that most impact or have the potential to impact the Hamilton Fire Department's protection and rescue services include:

### Large Bodies of Water and Beaches

Hamilton has four (4) large bodies of water that include Lake Ontario with public access to water from five (5) different locations (Confederation Park, Bayfront Park, Pier 4 Park, Copsps Pier Park, and Fifty

Point Conservation Area) plus three conservation areas that include Binbrook Conservation Area, Christie Lake Conservation Area, and Valens Conservation Area. The size and number of bodies of water in Hamilton impacts the Hamilton Fire Department's need to maintain and potentially enhance water rescue services. To assist with water rescue, the Hamilton Fire Department has water rescue units and equipment (i.e., remote controlled water rescue device) and provides specialized training to staff. The open water rescue for Lake Ontario is currently provided by the Hamilton Beach Rescue Unit (a volunteer Coast Guard Auxiliary) and the Hamilton Police Service. Some harbours allow owners and passengers overnight stay in boat sleeping quarters presenting additional high fire and life safety concerns. Recreational and tourist activities on and near the water and trails are the busiest during the months of April through October. Looking at data from 2020 through 2022 related to bodies of water and beaches; the Hamilton Fire Department responded to a total of 35 water rescues. There were also some higher concentrations of calls/complaints regarding open air burning along Hamilton's shoreline.

In addition to Hamilton's shoreline attracting residents and tourists – this feature has and continues to attract significant business and industry. The 45 km length of Hamilton's shoreline and Lake Ontario's connection to the Atlantic Ocean via the St. Lawrence River creates significant opportunities for commercial and industrial ports and harbours. Hamilton is home to the busiest of all Canadian Great Lake Ports with access to multi-modal transportation including rail. A significant amount of cargo (26% of all Canadian Great Lakes-St. Lawrence Seaway) moves through Hamilton including steel, agri-food, manufacturing, and construction materials. (Reference: Invest in Hamilton, Goods Movement sector) The Port is also a "major regional import gateway from the U.S. for liquid bulk petrochemical products, such as consumer gasoline and asphalt cement used in GTHA road construction" (Reference: Hamilton Oshawa Port Authority website). While Hamilton has experienced a hand full of major fires over the years and some minor Hazardous

Materials (HAZMAT) incidents related to the industrial and commercial section of its shoreline; the clustering of buildings, types of businesses, and volume and types of materials coming in and out of this area have the potential to create increased fire risk. In terms of non-fire emergencies, the Hamilton Fire Department has responded to industrial accidents and other non-fire emergencies in this area with the water and docks creating unique challenges at times.

## Escarpment

The Hamilton Escarpment is an 11 km long, east-west portion of the Niagara Escarpment. Hamilton's escarpment runs through the middle of the city, bisecting the city into "upper" and "lower" parts. The maximum high point is 250m (820') above the level of Lake Ontario (Reference: Wikipedia). The impacts this geographical feature has on the Hamilton Fire Department's protection and rescue services include the potential for significant road closures due to falling rocks and/or proactive maintenance requiring the re-



routing of vehicles. This can result in longer response times; potential for human or vehicular accidents (falls on trails or serious car accidents on roads near the escarpment); and open air burning that leads to fires in this area which can be very challenging to access.

From 2021 to November 2023 there was a total of 104 road closures related to escarpment maintenance or repair (i.e., Claremont Access, Kenilworth Access, Sherman Access, Jolly Cut and Sydenham Road etc.) with closures ranging from less than one (1) day to six (6) months. Broken down by year, escarpment road closure details include 2021 – 6 closures (closure length: 2 days to 3 months); 2022 – 48 closures (closure length: <1 day to 2.5 months); and 2023 (as of November 20) – 50 closures (closure length: <1 day to 6 months). (Reference: stats provided by City of Hamilton's Transportation Operations Division)

## Waterfalls

Hamilton has more than 100 waterfalls across the city that attract visitors and residents. Some of the popular waterfalls (in no specific order) are Felker Falls, Tiffany Falls, Devil's Punchbowl, Albion Falls, Smokey Hollow Falls, Sherman Falls, Borer's Falls, Hermitage Cascade, Webster Falls, and Tews Falls. In addition to the promotion of outdoor activities such as trail hiking and waterfall visitation, the Tourism Hamilton website provides safety tips and warnings along with a link to a City of Hamilton waterfall safety video available on YouTube. The volume of people who access waterfalls during the months of April to October caused an impact to technical rescue services (i.e., rope rescues). From 2020 to 2022 the Hamilton Fire Department received 65 calls for service related to rope rescues. If broken down by year these number: 20 in 2020; 24 in 2021; and 21 rope rescues in 2022. (Note: Not all rope rescues are directly connected to waterfalls, however most incidents are related to a recreational activity that includes walking on a trail that may or may not have a waterfall nearby.)

There are several impacts, risks, and challenges to rescues at waterfall locations and/or nearby trails. Some features that make rescues particularly challenging are steep drops on or near trails; the ground on trails near waterfalls can become unstable; and visibility is significantly impacted at night and dusk as these areas are very dark. There were two (2) firefighter injuries from 2020 – 2022 related to rope rescues - one (1) in 2020 and one (1) in 2021. Due

to the number of rope rescues and the associated risks, the Hamilton Fire Department has implemented specialized equipment, training, and vehicles to assist with rescue efforts and minimize risks. For example, the Hamilton Fire Department uses thermal imaging camera equipped drones to assist in safely locating victims in a timely manner and avoid potential risk to firefighters.

## Trails & Conservation Areas

The City of Hamilton has a large network of trails and conservation areas. Trails include Battlefield Creek Trail, Bayfront Park Trail, Breezeway Trail, Chedoke Radial Recreation Trail, Cootes Drive Trail, Desjardins Recreation Trail, Escarpment Rail Trail, Waterfront Trail that includes the Green Millen Waterfront Trail and Hamilton Harbour Waterfront Trail, Harvey Park trail, Keddy Access Trail, Pier 4 Park Trail, Red Hill Valley Recreation Trail, Shrewsbury Trail, Spencer Creek Trail, and Lake Ontario Waterfront Trail (Reference: City of Hamilton website). Additional and popular areas for hiking and exploring include: Christie Lake and Conservation Area, Binbrook Conservation Area, Eramosa Karst, Devil's Punchbowl, Dundas Valley Trail System (intersects with the Bruce Trail and the 32-kilometre Hamilton to Brantford Rail Trail), Sassafras Point Trail in Churchill Park connected to Cootes Paradise, Escarpment Rail Trail to Albion Falls, and Indigenous Plant Medicine Trail (located at the Arboretum at the RBG) (Reference: Tourism Hamilton website).

The number, length, and terrain of trails and conservation areas impacts the accessibility and rescue apparatus required for response efforts. In 2023 Hamilton Fire Department implemented a new Utility Task Vehicle (UTV), which is a multi-purpose vehicle to assist with trail rescues and other firefighting and rescue efforts. Further demonstrating the impacts of trails on overall emergency services in Hamilton, the Hamilton Paramedic Service purchased bicycles in 2023 to help with emergency responses on Hamilton trails.

Open air burning in or near hiking areas is a concern; however, in reviewing response data from 2020 to 2022, Hamilton's urban areas had a higher incidence of such events compared to rural areas.

From 2021 to November 2023 there was a total of 104 road closures related to escarpment maintenance or repair (i.e., Claremont Access, Kenilworth Access, Sherman Access, Jolly Cut and Sydenham Road etc.)

with closures ranging from less than one (1) day to six (6) months. Broken down by year, escarpment road closure details include 2021 – 6 closures (closure length: 2 days to 3 months); 2022 – 48 closures (closure length: <1 day to 2.5 months); and 2023 (as of November 20) – 50 closures (closure length: <1 day to 6 months). (Reference: stats provided by City of Hamilton's Transportation Operations Division)

## Large Percentage of Rural Lands

79% of Hamilton's land mass, some 219,504 acres is rural (Reference: Hamilton Agriculture Profile and Economic Impact Report, 2019). 1.4% of Ontario's total number of farms and approximately 13.7% of Golden Horseshoe farms are in Hamilton. (Reference: 2021 Census of Agriculture, Agriculture in Hamilton, 2022/2023 Prepared by Invest/EcDev).

Large areas of rural and agricultural lands create several potential impacts on the Hamilton Fire Department such as wildland fires. Wildland and urban (open-air fires) fires are expected to increase due to environmental factors (i.e., extreme heat, warmer and dryer temperatures mixed with high winds). Extreme heat was identified as one of the top hazards in Hamilton's 2022 Hazard Identification and Risk Assessment report. From 2020 to 2022, complaints and responses for open air burning peaked during the summer months, which when combined with extreme heat events occurring during this timeframe creates significant risk for major fires. Furthermore, the trend of higher incidents of open air burning in urban areas could create higher risk for residential (urban) areas in Hamilton that are located close to large rural or agricultural areas (i.e., Binbrook, Ancaster, Flamborough).

## Transportation

Hamilton's geography impacts and is impacted by its multi-modal transportation. The City is one of a handful across Canada that has all four (4) major transportation methods within its boundaries – road, rail, air, and water (port). Concerns regarding these modes of transportation are covered in the Critical Infrastructure Profile.

## Building Stock Profile

The Ontario Fire Marshal identifies and defines building categories by type (group). The Hamilton Fire Department has slightly modified these types by creating distinct sub-categories for residential buildings and adding a category for agricultural. These categories are:

*Assembly:* buildings where people typically gather - schools, theatres, stadiums, malls, community or recreational centres, clubs or community group facilities, places of worship/churches, libraries, childcare facilities, gyms, licensed beverage establishments, restaurants with 30+ occupancy, museums, lecture halls, concert/entertainment venues, arenas, art galleries, dance halls, etc.

*Institutional:* includes detention and care and treatment:

*Detention:* strictly detention centres, prisons, or jails.

*Care and Treatment:* healthcare facilities such as hospitals, residential care facilities, group homes, custodial homes for children, long-term care, psychiatric hospitals, etc.

*Residential* broken down into sub-categories of:

*Single-detached:* houses or dwellings that are not attached to other homes.

*Semi-detached/row/town/duplex:* includes dwellings that are attached on one or more walls, row homes, townhouses, or duplexes.

*Multi-Unit Residential:* a building with three (3) or more separate dwelling units (does not include single detached homes with basement apartment/unit) and has between two (2) to six (6) floors: includes rooming houses, residences connected to schools/universities/colleges, hotels or motels, shelter housing, etc.

*High-Rise Residential:* apartment buildings with seven (7) or more floors: includes residences connected to schools/universities/colleges, hotels or motels, shelter housing, etc.

Note: For fire services high-rise residential includes buildings with seven (7) or more floors as this aligns with rescue protocols, apparatus, and equipment.

*Mobile homes and Trailers:* include RV parks, recreational camp sites.

*Dual Use:* properties containing a commercial (mercantile and business/personal services) typically on the first or second floors with residential units above.

*Business/Personal Services and Mercantile:* includes commercial businesses, retail stores, offices, supermarkets, markets, restaurants with occupancies of less than 30 people, personal service business such as banks, hair-dressers, nail salons, dental offices, laundromats, small tool and appliance rental and service establishments.

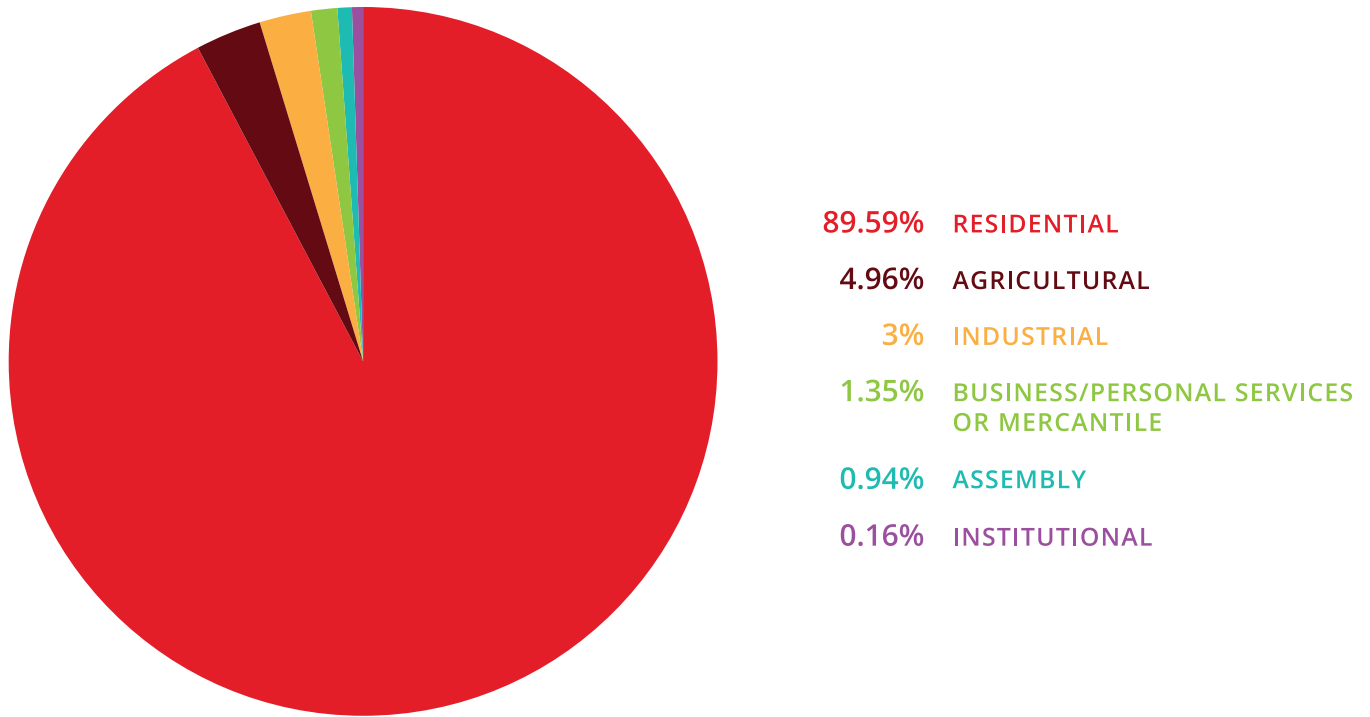
*Industrial:* includes a wide variety of industrial sector businesses and specific examples such as bulk storage warehouses for hazardous substances, chemical manufacturing or processing plants, distilleries, aircraft hangars, repair garages, self-service storage buildings, warehouses, and flour, cereal mills.

*Agricultural properties:* buildings that are used for agricultural purposes. (Note: single family homes that are the only building on the property are categorized as single family detached.)

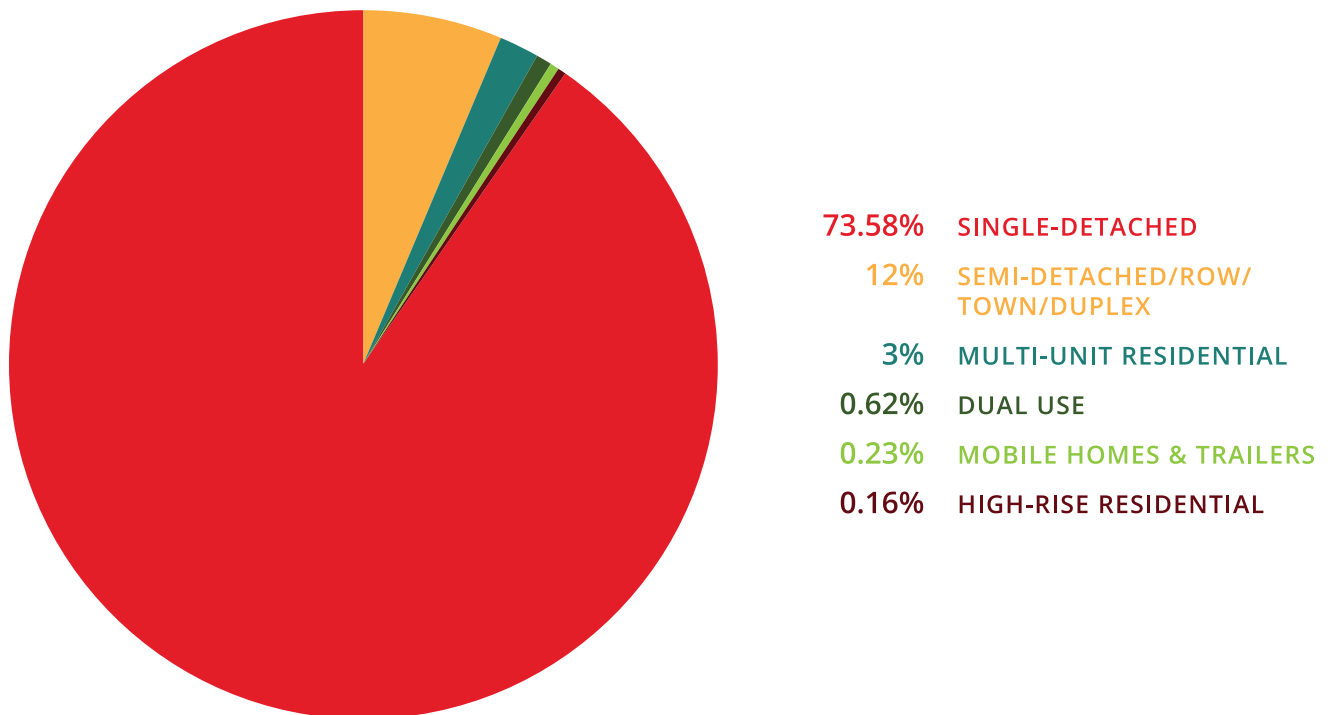
The data used to develop Hamilton's Building Stock profile comes from the City of Hamilton's Geographic Information Services (GIS) with records (as of November 2023) from various sources such as the Municipal Property Assessment Corporation's Structures Data; General Property Data, July 2023; and the City of Hamilton's Planning Division (i.e., 2023 Site Plans, Development applications etc.), and Building Division (issued Building Permits). The total number of properties (as of November 2023) was 217,999. Vacant building and light weight construction data comes from the City of Hamilton's Municipal Bylaw & Licensing Division (vacant buildings); and the City of Hamilton's Building Division (light weight construction). Hamilton's building stock (by largest to small percentage) based on type is:



### Hamilton's Building Stock by Type (category)



### Residential Building Breakdown: Sub-Categories



# Map of Hamilton's Building Stock

NOVEMBER 2023

To determine the risk level for each building type, information reviewed included number of buildings, number of vacant buildings by type, number of buildings by type that were identified as containing light weight construction, and overall fire knowledge

from a prevention and suppression perspective. For each building type the following risk levels were assigned: (high risk building types are identified first, then medium, and then low risk.)



## Summary of Hamilton's Building Stock

Building Type	Number of Buildings	Percentage of Buildings	Assigned Risk Level
Single-detached house	160,397	73.58%	High Risk
Multi-Unit Residential: buildings with two or more units with two (2) - six (6) floors	6,536	3%	High Risk
High-Rise Residential: buildings with seven (7) or more floors	363	0.16%	High Risk
Business/Personal Service or Mercantile	2,951	1.35%	Moderate to High Risk
Industrial	6,503	3%	Moderate to High Risk
Semi-detached/Row/Townhouse/Duplex	26,150	12%	High Risk
Assembly	2,055	0.94%	Moderate Risk
Institutional	Total: 359 Detention: 8 Care & Treatment: 351	0.16%	Moderate Risk
Dual Use (residential with business/personal service or mercantile)	1,358	0.62%	Moderate Risk
Mobile Home and/or Trailers	511	0.23%	Moderate Risk to Lower Risk
Agricultural	10,816	4.96%	Low Risk
Other (non-property and includes sheds, vehicles, garages, etc.)	N/A These are considered accessory buildings within a property file asset or not a property type at all.	N/A	Low Risk







For the complete Ontario Fire Marshal worksheet (Risk Review), with buildings by type: total # of buildings, number of vacant buildings within each type, number of light weigh construction within each type, please see Appendices section.

In looking at the 2018 Community Risk Assessment, building types in this report are slightly different because the new types outlined by the Ontario Fire Marshal have changed. This means there can't be direct comparisons by type. One of the main changes in building types from 2018 to the current report is that the 2018 data did not include a count of agricultural properties and

listed "Barns/Farm Properties" as an occupancy type. This 2023 report gathered all property types to include broader agricultural properties which increased the overall total number of buildings.

However, in comparing the 2018 Community Risk Assessment against 2023; the breakdown of percentages is similar with residential as the highest percentage of buildings followed by agricultural/barns, then industrial, mercantile, and business/personal services, assembly, and finally institutional having the smallest number/percentage of buildings.

## Economic Profile

Hamilton has the third-largest urban economy in Ontario and has one of the most diverse economies in Canada (Reference: Government of Canada website - Economic Profile: Hamilton, Ontario - Immigration Matters). The City is often connected with its history in steel manufacturing, and advanced manufacturing continues to be a major contributor to the local economy. The City of Hamilton's Economic Development Division focuses on a variety of key sectors that include Agri-Business and Food Processing; Creative Industries; Finance, Insurance and Real Estate; Goods Movement; Information Computer Technology (ICT) & Digital Media; Life Sciences; and Tourism. These sectors provide significant economic impacts by contributing to the city's financial sustainability, attracting investment to the community, contributing to the city's quality of life, and providing jobs to the local economy.

The Economic Profile builds upon the Building Stock Profile by adding more details to the non-residential buildings and helps develop a better understanding of

potential fire risks. By identifying sectors that represent significant economic drivers of our economy and their key patterns or features, we can examine the impact to the overall community and local economy if a fire or other emergency occurred in occupancies representing these sectors.

To gain an understanding of the scope of Hamilton's economy and the potential size of buildings that would house different sectors, it is helpful to review data that shows corresponding business counts for each industry or sector, and categorization by size of business. The Building Stock Profile provides the number of buildings within each the broad categories of industrial, agricultural, business/personal Service or mercantile, institutional, and assembly; whereas the Economic Profile digs deeper into these categories providing further insights into potential fire risks (i.e. 20 different types of industries that may indicate potential storage of hazardous materials etc., size of business or number of employees etc.).

## Sectoral Business Counts in Hamilton

Source: Canadian Business Counts, June 2021, and Invest in Hamilton website.

Industry	Micro-businesses 1-4 employees	Small 5-99 employees	Medium 100-499 employees	Large 500+ employees
Manufacturing	241	383	40	5
Educational Services	76	106	4	4
Health care and social assistance	118	750	47	10
Construction	1200	702	16	1
Transportation and Warehousing	790	186	13	3
Wholesale Trade	257	316	16	1

Industry	Micro-businesses 1-4 employees	Small 5-99 employees	Medium 100-499 employees	Large 500+ employees
Administrative and support, waste management and remediation services	368	337	27	1
Retail Trade	687	1008	48	1
Professional, scientific, and technical services	1209	388	10	0
Management of companies and enterprises	25	29	9	1
Finance and insurance	339	240	10	0
Arts, entertainment, and recreation	86	95	5	0
Accommodation and food services	295	766	11	0
Other services (except public administration)	950	470	6	0
Public administration	15	2	0	1
Agriculture, forestry, fishing, and hunting	91	98	4	0
Mining, quarrying and oil and gas extraction	2	4	1	0
Utilities	2	7	1	0
Information and cultural industries	123	78	5	0
Finance and Insurance	339	240	10	0

# The top five large and medium-sized businesses in Hamilton are:

## **TOP FIVE (5) LARGE BUSINESSES (500+ EMPLOYEES):**

*Source: Canadian Business Counts, June 2021, and Invest in Hamilton website.*

- 7 large Hospital employers/businesses
- 4 large Educational Services businesses
- 2 large Primary Metal Manufacturing businesses
- 2 large Transportation Equipment Manufacturing businesses
- 2 large Postal Services employers/businesses

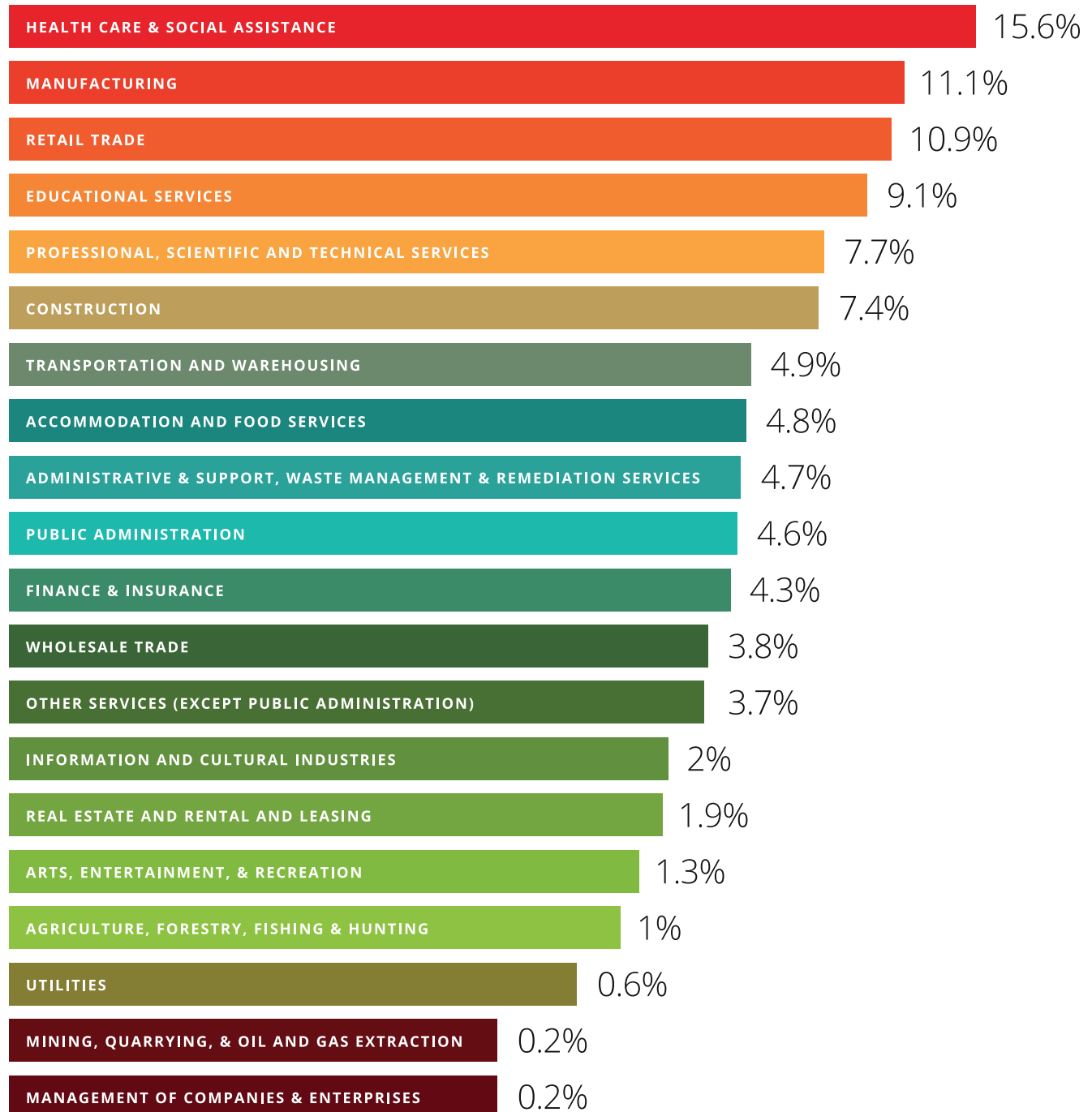
## **TOP FIVE (5) MEDIUM-SIZED (99-499 EMPLOYEES):**

*Source: Canadian Business Counts, June 2021, and Invest in Hamilton website.*

- 25 medium Food and Beverages Services businesses
- 25 medium Administrative Services businesses
- 23 medium Nursing and Residential Care businesses
- 15 Ambulatory Health Care Services businesses
- 12 Specialty Trade Contractor businesses/buildings

# Breakdown of the Labour Force in Hamilton by Sector

SOURCE: STATISTICS CANADA, 2021



For the risk review, the Hamilton Fire Department looked at 12 different industries/business types, and aligned each of them with the building type most likely located in. These 12 business types (except for Vulnerable Occupancies) represented more than 500 businesses and at least 3% of the labour force, making them the ones that provide the most significant economic impacts. These business types include: Health Care and Social Assistance, Manufacturing, Construction, Transportation and Warehousing, Wholesale Trade (distribution of merchandise), Administrative and Support, Waste Management and Remediation Services, Retail Trade, Professional, Scientific and Technical Services, Finance and Insurance, Accommodation and Food Services, and Other services (except public administration).

The risk review of Hamilton's economy (See Appendices) identifies the industry/business type and corresponding building type, number of businesses and key data, key risks, probability, consequence, and assigned risk level. The two (2) industry types assigned a high-risk level were vulnerable occupancies - consisting of hospitals, long

term care facilities, retirement homes, group homes, and residential care facilities, and the broader category of health care and social assistance. Key risks associated with vulnerable occupancy businesses/buildings are the mobility of residents with cognitive and physical disabilities. Key risks associated with health care and social assistance include the fact this industry type has the greatest number of businesses, highest percentage of Hamilton's labour force, significant number and size of buildings (i.e., 7 hospitals), and represents critical infrastructure that serves and impacts the entire community.

The industry/business types that were assigned a moderate or moderate-to-high risk level were: manufacturing, transportation and warehousing, administrative and support, waste management and remediation services, professional, scientific, and technical services, and accommodation and food services. The remaining five (5) industries were assigned low or low-to-moderate risk levels.

Industry/Business Types	Assigned Risk Level
Vulnerable Occupancies; Health Care and Social Assistance	High Risk
Manufacturing; Transportation and Warehousing; Administrative and Support, Waste Management and Remediation Services; Professional, Scientific and Technical Services; and Accommodation and Food Services.	Moderate or Moderate to High Risk
Construction Wholesale Trade; Retail Trade; Finance and Insurance; and Other services (except public administration).	Low or Low to Moderate Risk

The number of buildings/industry or business type would require further review and gathering of data.

## Demographic Profile

A city's demographics offer key trends and insights into community risks, which are often connected with the statistics associated with fires and other emergency responses (i.e., next profile or section of this report that covers Hamilton's Past Loss Profile).

Hamilton is a medium-sized city with a population of 597, 655 (Reference: Growth Related Integrated Development Strategy projection data (2021-2051) population rate for 2023) that has seen a steady

increase in population growth over the last several years. It ranks 9th largest in Canada and 5th largest provincially based on population. From 2016 to 2021 Hamilton's population increased by 6%, surpassing the provincial average of 5.8%. The total of occupied dwellings also increased by 5.3% in 2021 compared to 2016 (Reference: 2021 Census Data, Statistics Canada).

The elements or characteristics examined in this profile are guided by the Ontario Fire Marshal and include age, place of birth, immigration, language, transient populations, income, education, and persons with disabilities. These not only inform potential risks but assist with understanding how we can enhance our fire prevention (education and awareness) efforts. In addition to the Ontario Fire Marshal's requirements, the Hamilton Fire Department gathered additional demographic data such as population by housing type (including some information on persons living unsheltered) and the City of Hamilton's Ward Profiles (2016 Stats Canada). This information offered additional demographic detail through the lens of housing type and geographic area to help determine if there were correlations with demographics and past loss (specifically fires). Details and trends relating to ward profiles are found within the Past Loss Profile as fire data is cross-referenced with wards/geographic areas.

### Ages in Hamilton

The ages of residents in Hamilton, broken down by age ranges (highest to lowest percentages) are: 27.6% aged 20-39; 25.7% aged 40-59; 21.6% are 19 or younger; 20.2% aged 60-79; and 4.9% are 80+ (Reference: Statistics Canada, 2021). [potentially create a pie chart] Using a smaller age range of five (5) years, the top six (6) age groups with the highest population percentage (in order) are ages: 30-34; 55-59; 25-29; 35-39; 60-64; and 20-24. Seniors (aged 65+) represent 18% of Hamilton's population (Reference: Statistics Canada, 2021).

Age can be a risk factor for fire safety, especially when connected to other factors

Age Range	# of People	% of Total Population
0-4	29,100	5.1%
5-9	30,700	5.4%
10-14	31,450	5.5%
15-19	31,795	5.6%
20-24	36,405	<b>6.4%</b>
<b>25-29</b>	40,525	<b>7.1%</b>
<b>30-34</b>	41,330	<b>7.3%</b>
35-39	38,945	<b>6.8%</b>
40-44	35,025	6.1%
45-49	34,155	6%
50-54	36,670	6.4%
<b>55-59</b>	40,930	<b>7.2%</b>
60-64	38,045	<b>6.7%</b>
65-69	31, 635	5.6%
70-74	26,695	4.7%
75-79	18,285	3.2%
80-84	12,985	2.3%
85 and over	14,680	2.6%
<b>Total Pop.</b>	569,355	100%

like mobility issues or disability, gender, and whether a person lives alone. Current day or societal trends (impacted by generational characteristics, the economy, cultural norms, increase access to or new products and technology etc.) have varying impacts on activities and human behaviours that lead to some of the top fire causes (i.e., careless smoking or failure to properly extinguish smoking materials, unattended cooking, etc.)

In terms of national fire statistics related to age and gender - according to a report released on June 16, 2022, called Circumstances surrounding unintentional fire-related deaths in Canada, 2011 to 2020 (based on Statistics Canada data), males and adults aged

45 and older are more likely to die in a residential fire. The report goes on to state, "Unintentional residential fire-related deaths affect people of both sexes and all ages; however, men and older adults are overrepresented. From 2011 to 2020, males were 1.5 times more likely than females to die in an unintentional residential fire. This trend is consistent with previous research on fire-related death rates in Canada and internationally." In Hamilton, 21% of the population are males over the age of 45, which parallels percentages across Ontario.

#### **Immigration, Places of Birth, and Languages**

The 2021 Census for Hamilton showed that 25.9% of the population were foreign-born (immigrants),



IMAGE PROVIDED BY THE HAMILTON TIGER-CATS



71.8% were Canadian born (non-immigrants), and 2.3% were non-permanent residents. Of note, the number of non-permanent residents has nearly doubled since the last Census. Among immigrants in 2021, 20,145 arrived between 2016 and 2021 and made up 13.8% of the immigrant population.

The top three places of birth among immigrants living in Hamilton in 2021 were the United Kingdom, India, and Italy. For recent (arriving between 2016 and 2021) immigrants living in Hamilton, the top places of birth were India, Syria, and the Philippines.

More than 98% of Hamiltonians reported having a working knowledge of English leaving only 2% of residents in Hamilton who do not speak English or French. Trends or changes in languages spoken in Hamilton stem from immigration patterns as indicated above. There are significant increases in people reporting Arabic, Spanish, Punjabi, and Tagalog as their mother tongues in Hamilton. Whereas there are declines for Italian, Chinese languages, Portuguese, Polish, Serbian, and German languages reported as mother tongues. The top mother tongues (other than English or French) reported by Hamiltonians were 1. Arabic, 2. Italian, 3. Spanish, 4. Chinese languages, 5. Portuguese, 6. Polish, 7. Punjab, 8. Tagalog, 9. Serbian, 10. Persian languages (Reference: Statistics Canada, 2021).

#### **Transient Populations: Students and Tourists**

Hamilton has two (2) universities; one college; and private boarding (high) school with ~ 1,800 international students. A high concentration of students live in the Westdale area. McMaster University had 36,449 students enrolled in 2022. Mohawk College had more than 13,000 students enrolled, and Redeemer University had 1,089 in 2022. 17.2% of McMaster students were international students from 120 countries. Additional schools with transient populations and student housing include Columbia International with 1,700 international students living in Hamilton, and Hillfield Strathallen school that has some of its students traveling into Hamilton during the day.

Hamilton attracts 5.9 million visitors annually (Reference: Invest in Hamilton website), with the largest percentage of tourists visiting during the months of June through October. Visitors come to Hamilton for a range of different activities. The most popular tourist activities include outdoor activities (nature, hiking, trails, waterfalls), arts and culture (outdoor festivals and events), and historical heritage

(landmarks, architecture, museums). As outlined in the Geographic Profile, outdoor activities such as visiting waterfalls and hiking - by both visitors and residents - has become a challenge requiring the need for trail and rope rescue. From 2020 to 2022 there were a total of 65 rope rescues performed representing 74% of all rescue types. Trail rescues increased from 5 incidents in 2020 (when rope rescues were the highest) to 8 incidents in 2022. Although the Hamilton Fire Department does not track where people who require rope rescuing come from; anecdotally it is believed most are tourists less familiar with the area and terrain.

#### **Housing Types**

Often, but not always, income is connected to a person's ability to afford different housing types, which is also impacted by a city's building stock (i.e., number and types of residential housing). Acknowledging that housing is a complex issue; the type of housing can be a factor related to fire safety as demonstrated by the 2020 to 2022 fire statistics (Past Loss Profile). Most Hamilton residents (56.2%) live in single detached houses. Other types of housing Hamiltonians occupy include: 16.4% live in apartments with more than five (5) stories, 12.3% live in row houses, 8.5% live in apartments less than five (5) stories, 3.3% of people live in apartments or flats in a duplex, 3% of residents live in semi-detached properties, 0.2% live in other single attached houses, and 0.1% live in moveable dwellings (Reference: Statistics Canada, 2021). An important fact and trend to note within housing types is fires within social housing. Fires that happen within social housing have particularly significant and negative impacts as these fires often impact multiple units (i.e. within the category of high rise residential or multi-unit residential), impacting more people and more units - placing this type of housing and their residents in a more precarious place. Making it especially important to prevent and reduce impacts of fires in social housing.

Absent from these statistics are people who are living unsheltered. The City of Hamilton's Housing Services Division maintains data on the number of people who are actively homeless. As of October 2023, there were 1,693 people living unsheltered in Hamilton. Encampments in Canada and Hamilton began increasing and expanding in 2020 and in August 2023, the City of Hamilton approved its Encampment Protocol. The overall purpose of the City's encampment response is to support and recognize immediate needs of unsheltered

individuals until appropriate resources are available to house and support those experiencing homelessness in Hamilton.

### Income

In 2020, the median after-tax income for households was \$75,500. Household income ranges for residents were as follows: 28.6% of households earned \$60K - \$99,999K, 24.7% earned \$30K - \$59,999K, 13.2% of households have incomes of \$150K +, 13% had incomes of \$30K or under; 12.3% make \$100K - \$124,999K, and 8.3% had incomes of \$125K - \$149,999K (Reference: Statistics Canada, 2021).

### Education

Educational backgrounds in Hamilton range from 31% of people reported to have a BA degree or higher from university, 26.2% have College, CEGEP, or other non-university certificates, 24.7% had a high school certificate or diploma, 10.4% had no certificate, diploma, or degree, 2.9% possessed an apprenticeship certificate, 2.7% had a non-apprenticeship certificate, and 2.2% had a university degree (i. e. bachelor level) (Reference:

Statistics Canada, 2021). There does not appear to be trending associated with educational background and fire safety.

### Persons with disabilities

In Hamilton, 27.7% of residents (aged 15 and up) have a disability\*. Hamilton has higher rates of disability in comparison to other Ontario and Canadian cities. In Ontario, the average percentage of persons with a disability is 24.1%, and for Canada that rate is 22.3%. 2017 stats indicate that persons with disabilities had less income than those without disabilities. As previously noted, this will likely impact housing type (Reference: Statistics Canada, 2017).

\*Disability as defined from the Canadian Survey on Disability includes ten (10) disability types: developmental, memory, dexterity, learning, seeing, hearing, mental-health related, mobility, flexibility, and pain-related.





#### *Section 4*

## Past Loss Profile

The focus of the Past Loss Profile is the different types of fire losses (i.e., number of fires, injuries, and deaths, and dollar loss) as well as the number of calls and trends associated with non-fire calls and responses. Included in Hamilton's Past Loss Profile are statistics on whether working smoke alarms were present in buildings that experienced fires, as well as statistics on the Hamilton Fire Department's Alarmed and Ready program that provides free smoke alarms, carbon monoxide alarms, and batteries to Hamilton residents. The Hamilton Fire Department responds to and tracks a variety of calls that relate to fire safety standards and

enforcement as well as emergency response. Staff in the Fire Dispatch/Communications Division receive and process emergency calls, then dispatch the Operations Division (i.e., firefighters) and, in some cases, the Prevention Division (i.e., fire inspectors) who respond. Crews then mitigate and determine suspected fire cause and origin (where applicable). In 2022, the Hamilton Fire Department responded to 14,593 calls. These include responses to emergencies such as fires, water, rope, or trail rescues, open air burning, CO alarm concerns, pre-fire or smoke conditions (no fire), medical/resuscitator; overpressure rupture (no fire), and public hazards (i.e., hazmat).

# Fires *by* Building Type, Cause, Deaths and Injuries, and Dollar Loss for 2020 – 2022

## Concerning Trends & Increases

Year over year, the Hamilton Fire Department has seen an increase in the number of fires, dollar loss value, deaths and injuries. The number of fires in Hamilton from 2020 to 2022 steadily increased from 432 in 2020 to 471 in 2021, and to 500 in 2022 (a 16% increase). Total dollar loss associated with fires has also increased - \$19,836,450 in 2020 to \$49,853,720 in 2022. Fire related fatalities increased from two (2) deaths in 2020; two (2) deaths again in 2021; then eight (8) deaths in 2022. In terms of structure fires (i.e., buildings) there were 229 in 2020, 291 in 2021, and 328 in 2022.

The percentage of homes that experienced residential fires and that did not have working smoke alarms grew from 45% in 2020 to 51% in 2022, which is extremely concerning. To attempt to reverse this trend, the Hamilton Fire Department operates its Alarmed and Ready Program where staff visit residential properties to provide education and awareness about fire safety and the importance of working smoke alarms. As part of this program the Hamilton Fire Department installs smoke alarms, carbon monoxide alarms, and replaces batteries for residents. In 2023, the Hamilton Fire Department installed 765 smoke alarms (up by 31% from 2022), 483 carbon monoxide alarms (38% increase from 2022), and 421 batteries (up by 6% from 2022). These numbers include the Alarmed and Ready Program and other efforts where staff provide assistance with alarms and batteries.

Fire safety within encampments is a new and increasing concern in Hamilton, as are fires in vacant buildings where persons who are unsheltered have been found to be staying. There were two (2) significant encampment fires in 2021 and 2023 that caused substantial or total loss of encampments. Fortunately, neither of these encampment fires incurred death or injury. In vacant buildings however, there were three (3) deaths in 2022 and 2023 of people who were homeless in 2022 and 2023 and there was one (1) firefighter injury in a vacant building. Responses to fire safety incidents at encampments increased between 2020 and 2023 with most response types categorized as open-air burning. Eight (8) encampment locations had three (3) or more calls for fire safety related incidents from June to November 2023.

## Fatalities & Injuries

All fire deaths in Hamilton from 2020 to 2022 occurred in residential buildings that included either single family detached homes, townhouse, or multi-residential (2-6 floors) or high rise (7+ floors) buildings. The total of civilian and firefighter injuries from 2020 to 2022 was 123, with 39 injuries in 2020; 43 in 2021; and 41 in 2022. Most firefighter and civilian injuries happened in single family detached homes (total injuries in this building type from 2020 to 2022: 39), townhouses (total 2020 to 2022: 19), and multi-residential\* (total injuries from 2020 to 2022: 35) buildings.

\*multi-residential includes: 2-6 floors and/or high rise: 7+ floors

### Where Fires Most Commonly Occurred

Note: From an operational firefighting perspective, buildings that are seven (7) or more floors require a different response compared to buildings with fewer floors. The data below that describes multi-residential buildings includes 2-6 floors and 7+ floors.

The top three (3) building types (year-over-year) where most fires occurred in Hamilton from 2020 to 2022 (most to least) were single family detached residential, multi-residential (2-6 floors and/or and high rise residential: 7+ floors), and industrial. In terms of average percentages by building type for this three-year period: 22% of fires happened at single family detached homes, 15% occurred at

multi-residential buildings, and 6% at industrial properties when looking at all fire types including non-structure fires (i.e., vehicles, outdoor etc.).

From 2020 to 2022 there were a total of 849 structure-only fires. The chart below provides additional details regarding percentage of fires by building type and Hamilton's building stock.

Note: *agricultural property types (as a broad category) were not captured within past loss data. The Hamilton Fire Department management tracking system does not differentiate between Multi-Unit Residential (2-6 floors) and High Rise (7+ floors).*

<b>% of Fires by Building Type</b>	<b>% of Building Stock</b>	<b># of Buildings</b>
43% Single Family Residential (Includes detached, towns, row etc.)	85.58% of Hamilton's building stock	186,204
25% Multi-Residential (2-6 floors and 7+ floors)	3% of Hamilton's building stock	6,536
10% Industrial	3%	6,503
8% Business/Personal Services and Mercantile	1.35%	2,951
4% Dual Use: residential with business/personal services or mercantile (commercial)	0.62%	1,358
4% Assembly	0.94%	2,055
3.2% Mobile Homes and Trailers (includes camps and encampments)	0.23%	511
2% Care and Treatment	0.16%	351
0.4% Hotel or Motel	Falls within Multi-residential	~520
0.4% Detention	.005%	8
N/A: Agriculture building type not specifically captured	5.1%	10,816



Consideration for potential changes should be made to:

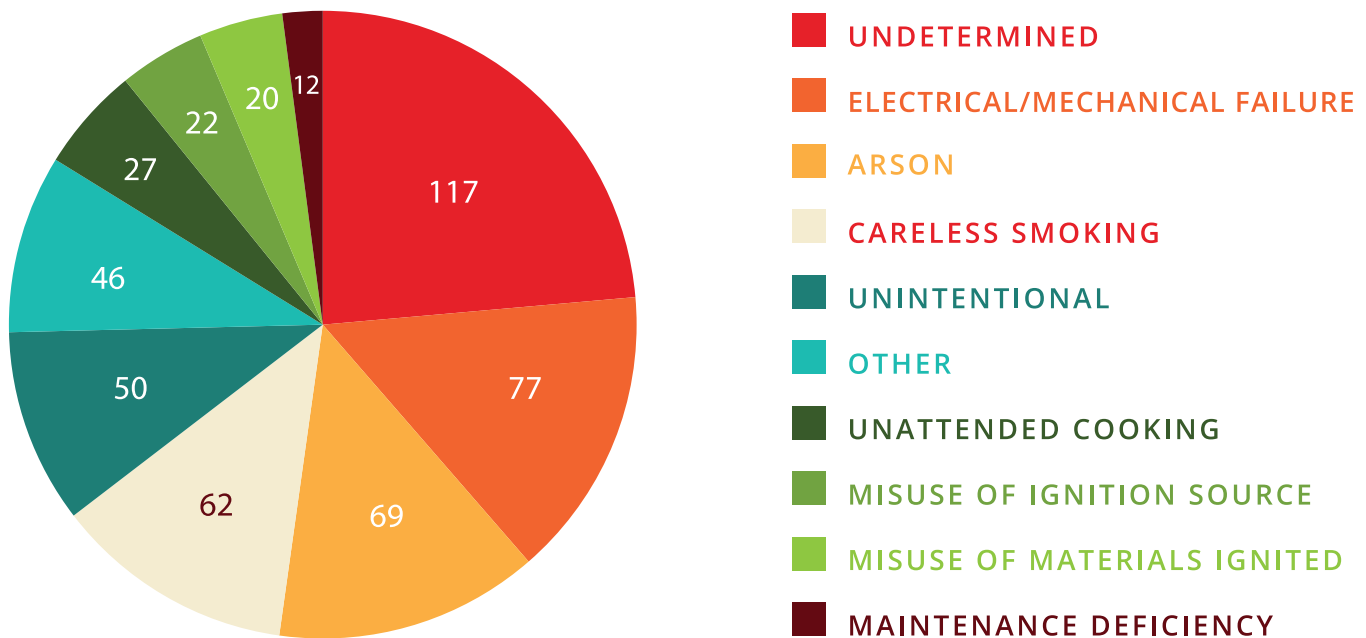
- Tracking and categorizing past loss involving agricultural properties as opposed to individual structures on agricultural lands (i.e. barns). Then create sub-categories within agriculture to identify potential trends or concerns; and
- Tracking and categorizing multi-unit (2-6 floors) and high rise (7+ floors).

In addition to property fires, the Hamilton Fire Department responds to and tracks non-building (property) fires. In 2022, non-building fires made up of 35% of fires. Non-building fires include vehicle fires, general outdoor fires (i.e., grass only fires), small, detached sheds, etc. Vehicle fires represented ~ 80% of non-building fires.

### Top Causes & Trends

The top three causes of fires between 2020 and 2022 were: Undetermined, Arson, and Electrical/Mechanical Failure. The top behavioral causes of fires in Hamilton included: careless smoking or failure to properly extinguish flame or embers, unattended cooking, and misuse of ignition. Misuse of ignition primarily refers to inadequate control of open fires, careless use of an ignition source, welding or using a torch too close to a flammable object, etc. Careless smoking or improper extinguishing of smoking materials has become an increasing concern from 2020 to 2022. Fires caused by smoking increased 106% from 30 in 2020 to 62 in 2022.

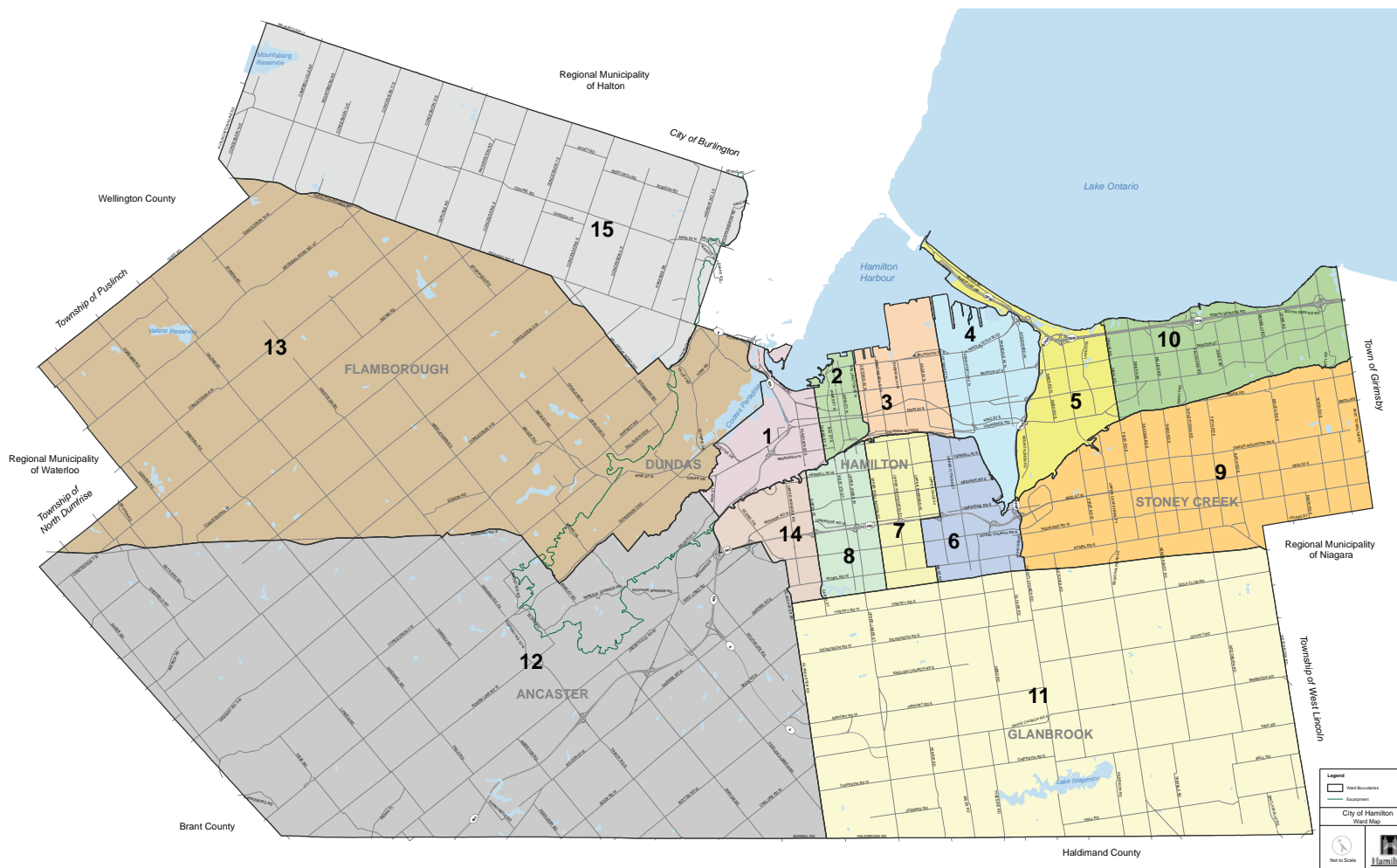
Number of Fire Incidents & their Causes in 2022



NOTE: for complete data set please see Appendices.

# Combining Past Fire Loss with Geographic Areas of the City

## CITY OF HAMILTON WARD MAP



To determine if there were any geographical trends associated with fire loss the Hamilton Fire Department looked at data by ward. Wards 3, 2, and 4 (most fires to least) consistently had the most incidents of fires from 2020 – 2022. These wards represent an average of 45% of the fires/year across the City. Other Wards that have experienced high numbers of fires include Wards 5 (always in top 5), 7 and 12.

To gain a better understanding of potential risk factors within the top three (3) wards that

experienced the greatest number of fires, the Hamilton Fire Department looked at the details/ characteristics of these wards based on the City of Hamilton Ward Profiles (2016 Stats Canada). Some of these risk factors and characteristics will potentially lead to the identification of actions and/or changes within the Fire Service Delivery Plan.

### Demographic Highlights\* by Ward

\*characteristics that could most impact risk factors associated with fire, with data sourced from Statistics Canada, 2016 and the City of Hamilton Ward Profiles.



*Ward 3*

This area is known as Central Hamilton and is home to 7.7% (3rd highest) of Hamilton's population. 1/3 of the ward is made up of industrial and commercial lands. In 2022 this ward had 87 fires. Some of the demographic highlights of this ward include:

- Top age ranges (3.8% each) are 25-29; 30-34; and 50-54.
- 5.7% moved to Hamilton (from other cities or, potentially immigrants or students).
- 40% of males smoke and 31% of females smoke.
- 86.9% people living here speak English at home and 79.1% are not immigrants.
- The countries that people immigrated from living in this ward include Africa and Asia.
- 5.9% are Indigenous and 18% are visible minorities.
- The average household income is \$54K with 11.2% of people living in this ward receiving social assistance (Ontario Works).
- 52.9% are renting (higher than Hamilton's average rental rate of 32%).
- 12.6% of people living in Ward 3 are seniors.

*Ward 2*

This area is known as Downtown Hamilton and is the smallest sized ward. 6.3% of Hamilton's population lives in Ward 2 making it the most densely populated ward. In 2022, this ward had 68 fires. Some of the demographic highlights of this ward include:

- Top age ranges (representing 31% of this population) are 25-29; 30-34; and 20-24 making it a mostly "young" population.
- 60.6% of people live alone (i.e., single/never married, divorced, or widowed).
- 9.1% moved to Hamilton (i.e., from other cities or potentially immigrants or students).
- 38% of males smoke and 29% of females smoke.
- 6.2% of people speak English at home and 64% are not immigrants.
- Asia as the most common place of birth of residents who are immigrants.
- 3.2% people are Indigenous and 31.3% are visible minorities.
- The average household income is \$51K with 9.8% receiving social assistance (Ontario Works).
- 76.4% people in this ward are renting (higher than Hamilton's average rental rate of 32%).
- 15.8% of the people who live in this ward are seniors.

*Ward 4*

This area is known as East Hamilton and 7.2% of Hamilton's population lives here.

1/3 of this ward is made up of industrial and commercial lands (same as Ward 3). In 2022 this ward had 52 fires. Some of the demographic highlights of this ward include:

- Top three age ranges (24.8% of the ward population) are 50-54; 55-59; and 30-34.
- 50.7% of the residents live alone.
- 3% moved to Hamilton (i.e., from other cities or potentially immigrants).
- 36% of males who live here smoke and 33% of females smoke.
- 90.6% of people speak English at home and 84% are not immigrants.
- 5% of population are Indigenous and 10.4% are visible minorities.
- The average household income is \$66K with 6.4% receiving social assistance (Ontario Works).
- 30.4% live in rental units (lower than Hamilton's average rental rate of 32%).
- 15.1% of people who live in this ward are seniors.

**Non-Fire Calls by Response Type for 2020 - 2022**

The Hamilton Fire Department tracks and codes non-fire calls and responses using nine (9) different category types such as burning (i.e., open air burning), carbon monoxide false calls, false fire calls, medical/resuscitator, overpressure rupture (no fire), pre-fire conditions (no actual fire), public hazard (i.e., hazmat), rescue (includes water, rope, elevator, trail rescue), and other responses (doesn't fit other categories). Non-fire calls and associated responses increased by 14.6% between 2020 and 2022. The percentage breakdown of total calls for 2020 to 2022 (highest to lowest) is: 24.67% for false fires, 22.27% for CO false calls, 21.88% for burning (open air burning), 10.44% for other responses, 7.97% for public hazard, 6.36% for medical/resuscitator, 3.37% for rescue, 3.02% for pre-fire conditions, and 0.01% for overpressure rupture (no fire).

**Trends or Changes**

The top three (3) call types consistent from 2020 through 2022 are burning, CO false calls, and false fires. Call types that decreased during the same period include: burning calls – 10% and carbon monoxide false calls - 5%. Call types that increased over the three (3) year period include a 4% increase in false fire calls, a 5% increase in medical/resuscitator calls, a 3% increase in other call types, and 2% increase in rescue calls. The remainder of call types saw small changes of 1% or less.

### How Hamilton compares nationally

The fire statistics and trends in Hamilton are mostly reflective of what is happening across Canada.

#### *Residential fire deaths*

Residential fires are the leading type of unintentional fire-related death in Canada. From 2011 to 2020, 92% of fire deaths in Canada were unintentional fire-related deaths. In Hamilton, all fire deaths occurred in residential buildings and classified as unintentional.

#### *Seasonal Trends*

In Canada, unintentional residential fire-related deaths happen more often in winter (December to March) (Reference: Circumstances surrounding unintentional fire-related deaths in Canada, 2011 to 2020, June 16, 2022). This trend aligns with Hamilton's residential fire-related deaths where there were no deaths in the summer; five (5) deaths in the winter; two (2) deaths in the spring; and two (2) deaths in the fall (2020 to 2022 data). It should be noted that all five (5) deaths that occurred in winter resulted from one fire.

Hamilton also experienced seasonal fire trends. Fire incidents gradually increased during the winter (December to February); peaked in the summer (June to August), then decreased in the fall. To determine if there were any different seasonal patterns between intentional (arson) fires and all other fire causes (unintentional), the data sets for each were separated. Both intentional and unintentional fires had the same seasonal trend as previously described. What was different was those unintentional fires having the highest number of fatalities and injuries (civilian and firefighter) occurred during the winter months, compared to almost non-existent civilian fatalities and injuries in arson-related fires across all seasons.

There are typically more fire incidents during colder months as people are indoors for longer periods of time and engage in more smoking and cooking, as well as more frequent use of candles, heaters, and wood-burning stoves (Reference: Circumstances surrounding unintentional fire-related deaths in Canada, 2011 to 2020, June 16, 2022).

#### *Fires by Building Type*

Of the building types that are similarly categorized (i.e., residential, industrial, assembly, care and treatment, detention, and business/personal services and mercantile) Hamilton compares significantly with Canada-wide stats. Hamilton tracks incidents involving mobile homes and trailers that made up 3.2% of fires. This is not a category captured in the Statistics Canada data. Conversely, a property type in the Statistics Canada data that Hamilton doesn't specifically track or categorize is storage property, which represented 6% of fires across Canada in 2021. (Reference: Statistics Canada 2021: Incident-based fire statistics, by type of fire incident and type of structure.)

#### *Causes of Fire*

In Canada, cooking equipment, smoker's materials, and open flame continue to be the leading causes of residential fires." (Reference: Statistics Canada, 2021) Hamilton's top residential fire causes mimic the national data.

#### *Working Smoke Alarms*

From 2015 to 2021, 37% of residential fires in Canada had a working smoke alarm compared to the time period between 2020 and 2022 in Hamilton that saw an average of 50% of residential fires that had a working smoke alarm.

The Hamilton Fire Department does not currently track the gender or age of people who are injured or die in fires. According to Canadian statistics, males and adults aged 45 and older are more likely to die in a residential fire.

Canadian research identified trends related to non-fatal versus fatal residential fires. Nonfatal residential fires were commonly caused by careless cooking and electrical failure. Fatal fires were found to be connected to a variety of risk factors such as the consumption of drugs or alcohol, improperly discarded cigarettes, living alone, being asleep at the time of the fire, advanced age, mostly impacting males, and fires occurring in a mobile home (Reference: Circumstances surrounding unintentional fire-related deaths in Canada, 2011 to 2020, June 16, 2022).



## Hazard Profile

In November 2022 the Hamilton Fire Department completed its Hazard Identification and Risk Assessment as required by the province's Emergency Management and Civil Protection Act. This risk assessment tool can be used to assess which hazards pose the greatest risk in terms of the likelihood to occur and the potential magnitude of the consequence. It is not intended to be used as a predictive tool to determine which hazard will cause the next emergency. The purpose of this assessment is to identify the hazards which have caused, or have the potential to cause, emergencies that may disrupt the response capabilities of the City of Hamilton.

The Hamilton Fire Department reviewed and utilized the work from the 2022 Hazard Identification and Risk Assessment to help complete Hamilton's Community Risk Assessment's Hazard Profile. The 12 hazards

identified that could have impacts on the community and the provision of fire protection and rescue services include infectious disease, fires or explosion, extreme heat, building or structural failure, flooding, erosion, chemical release, tornado, high winds, wildland fire, transportation emergencies, and winter weather (snowstorms or ice storms). Fire and explosion, infectious disease, extreme heat, high winds, and winter weather (major snowstorms and/or ice storms) were rated as likely to almost certain to occur and had an assigned risk level of at least moderate. Some of the emerging or newer hazards that were identified included erosion, extreme heat, and wildland fires. Erosion's risk level was low to moderate and extreme heat and wildland fires were both assigned the risk level of moderate.

NOTE: For complete worksheet, please see Appendices Section.

*Section 5*

# Critical Infrastructure Profile

As with most mid-sized cities Hamilton has critical infrastructure that includes hospitals, long-term care facilities, walk-in clinics, emergency/communication dispatch sites and towers, water towers, pumping stations, warming and cooling centers, sewage pumping stations, hydro lines, detention centers, rail lines, major highways, waterfront/port, bridges and overpasses, airports, reservoirs and dams, main gas and oil distribution lines, provincial, federal, and municipal buildings, and fire stations.

The Hamilton critical infrastructure listed below includes key types of transportation, utilities and healthcare facilities that could face potential fire risks and associated impacts.

## **Roads**

There are numerous major roads and highways throughout Hamilton including Hwy. 403, QEW, Red Hill Valley Parkway (RHVP), Lincoln Alexander Parkway, Industrial Drive, Burlington Street, and Highway 6 (North and South). The Hamilton Fire Department responded to 287 vehicle accidents between 2020 and 2022. Frequency of accidents, types of vehicles (i.e., large transport or cargo trucks, electric vehicles), and types of goods transported impacts risk and severity of accidents along with traffic flow. These factors can inform equipment, apparatus, and training needed (i.e., electric vehicle fires, large trucks carrying hazardous materials etc.). In addition, the type and location of accidents can have subsequent effects creating additional accidents, potentially shutting down access to portions of the city and impacting overall fire service response. In order to better understand future potential impacts and assist the creation of the next Community Risk Assessment, the Hamilton Fire Department should consider tracking and collecting information on vehicle collisions, extrications, and high trauma (fatalities). As with most cities we are seeing an increase in electric vehicles on the roads and parked in garages in single-family homes, apartment buildings, and assembly buildings. Electric vehicle fires burn significantly hotter than

gas powered vehicles and can result in nearby cars or property also catching on fire. The process of extinguishing can also result in toxic fumes and runoff. These future impacts should be tracked and considered.

## **Future impacts/considerations**

Construction of Hamilton's Light Rail Transit (LRT) project will begin sometime after 2025. This project consists of a 14 km corridor that will run east to west along Main Street, King Street and Queenston Road spanning the lower City. This multi-year construction project will affect road access across a significant portion of the City; creating detours that could impact emergency response times. Infrastructure improvements will occur throughout the project corridor and include sewer replacement, replacing gas and water mains, running new hydro and telecommunications lines, and rebuilding roadways and sidewalks (Reference: Metrolinx website).

## **Rail**

Hamilton is home to two (2) major rail lines: Canadian National Railway (referred to as CN) and Canadian Pacific Railway (referred to as CP) that provide complete rail freight services across North America. Associated with these rail lines are two (2) rail yards, one (1) tunnel and two (2) bridges with a rail transfer site on Longwood Road by Hwy. 403. Rail lines and yards impact fire station locations and response protocols. In general, rail lines create concerns for Fire Departments as there is the potential for: accidents involving hazardous cargo necessitating a hazardous materials response. Other rail related risks include explosion, fire, destabilization of surrounding structures, passenger train derailments or collisions, and overall access challenges.

## **Air**

John C. Munroe International Airport is in the southwest quadrant of Hamilton. 645,789 passengers flew to and from Hamilton International Airport in 2022. It is also the third largest cargo airport in Canada with a

total of 877,000,000 kg of billable freight moving through the facility in 2022 and is recognized as the largest domestic overnight express cargo mover in Canada (Reference: Hamilton International Airport website). Like rail, there is the potential for accidents involving hazardous cargo that would necessitate a hazardous materials response or could result in fire, explosion and/or destabilization of buildings or structures. The Hamilton International Airport has its own fire department responsible for aircraft emergencies (passenger and cargo) on runways and aprons (termed "airside"). The Hamilton Fire Department provides support and assistance to airport fire personnel for airside emergencies, including the tendering of water. The provision of fire protection and rescue services for all other emergency incident responses on airport property (buildings and structures) are the responsibility of the Hamilton Fire Department.

#### *Port and Harbours*

The Port of Hamilton is the largest in Ontario and is the busiest (largest volume of cargo and shipping traffic) of all Canadian Great Lake Ports. It is an import and export gateway to the Greater Toronto-Hamilton Area (GTHA) with access to multimodal transportation options including rail. From a Fire perspective, impacts to consider include types and amounts of storage, type and size of vessels, inland water incidents and dry docks (patient recovery), and ownership or jurisdiction of land (i.e., some port lands are federally owned). More specifically, some of the fire risks associated with cities located close to waterways include vessel collisions, fire, and explosions, electrical malfunctions and high voltage electrical incidents, dangerous goods and hazardous substance spills, and storage of hazardous cargo. Major incidents in these areas could also significantly affect the local economy.

#### *Utilities*

Hamilton has a range of critical infrastructure including hydro, oil and gas, and water. There's nothing specifically unique about Hamilton's utilities in terms of size, number, or history. Accidents or incidents that impact utilities or happen near hydro or oil and gas utilities have the potential to impact public and firefighter safety. Hazardous materials responses can expose firefighters to toxic or hazardous substances or environments via inhalation, absorption (skin contact), and/or ingestion. Incidents involving hydro lines can disrupt communications, prevent the use of medical devices, and have other impacts on public health. It is important to note and consider that more than a dozen major oil and gas pipelines run

through Hamilton's rural areas and beneath populated neighbourhoods including the city's industrial north end.

#### *Healthcare Facilities*

As highlighted in the Economic Profile, Hamilton has a significant number of businesses and labour force associated with healthcare facilities. The Building Stock Profile also demonstrates numerous Care and Treatment type buildings in Hamilton. Large fires, hazmat incidents, or other emergencies occurring at or near these critical buildings have the potential to inflict significant short or longer-term impacts on the public, workers, first responders, building stock, and the economy. As indicated in the risk review rating for the health care and social assistance industry and its associated building type, this critical infrastructure type has been assigned a high-risk rating. (Refer to Appendices' Economic Profile Risk Review).

## Public Safety Response

The Ontario Fire Marshal requires cities to complete a worksheet containing a list of agencies; the types of incidents they respond to; and the agency's role in any incidents connected to Fire Department responses and rescues. In Hamilton, the agencies involved with public safety responses along with the Hamilton Fire Department include the Hamilton Police Service (Land & Marine), the Hamilton Paramedic Service, Hydro One, Alectra Utilities, Enbridge Gas Inc., Hamilton Beach Rescue Unit, and the Ontario Provincial Police. Please see Appendices Section.

## Community Services Profile

There are a wide range of community service agencies, organizations and associations that support the Hamilton Fire Department in the delivery of public fire safety education, Ontario Fire Code inspection, and enforcement and emergency response. These agencies contribute services in-kind, financial support, provision of training venues, increased access to high-risk community groups, and temporary accommodations. The key community service concern in Hamilton is the availability of temporary shelter for displaced residents following a fire or significant incident as demand for this service is constant. The impact is particularly high should a fire or other emergency evacuation happen in a multi-residential building that affects multiple units or the entire structure.



*Section 7*

## Areas of Moderate or High Risk

### AREAS OF MODERATE OR HIGH RISK

This section highlights and summarizes the areas that were found to have a moderate or high risk and provides additional information from the 2018 Community Risk Assessment to help indicate any longer-term trends or changes.

Residential was assessed as High & Moderate Risk Single-detached homes, semi-detached/row/ townhouse homes, multi-unit residential; and high-rise residential were categorized as high risk in terms of building stock, demographics, and past loss data. There are wide-ranging factors that contribute to the high-risk level: more people live in these property types, most

fires occur here, and most injuries and deaths occur in residential buildings. Single-detached homes had the highest risk of the two building types. Single-detached homes also represent the highest percentage (73.58%) of buildings in Hamilton compared with multi-residential (two or more units with 2-6 floors and residential buildings with 7+ floors) which account for 3.16% of buildings. The highest percentage (43%) of fires happened in single-detached homes and these property types also incurred the highest number of injuries. 23% of fires happened in multi-residential (apartment) buildings, which had the second highest number of injuries. Most (56.2%) of Hamiltonians live

in single detached homes and 27.4% of the population live in multi-residential apartments.

There is a high risk for semi-detached/row/townhouse homes as these exist as the second highest percentage of buildings, were found to have a high number of injuries associated with fires, and there is an increased risk of fire spreading to adjacent buildings as these properties are attached by one or more walls. Dual-use (residential with commercial) also had a moderate risk level. Frequencies of fires in this type was a contributing factor for that rating.

In Hamilton's 2018 Community Risk Assessment, residential buildings were determined to be moderate risk as these had the highest number and percentage of fires and deaths. Like the recent statistics, the 2018 report found that single detached homes and multi-residential apartments presented the highest risk. Shifts or changes in trends from 2018 to the current report include:

- a reduction in fires in social housing units and no deaths occurring in these structures in 2020 to 2022 (i.e., six (6) deaths in 2014 – 2018 vs. no (0) deaths from 2020 – 2022);
- an increase in semi-detached/row/townhouse building stock and an associated high injury rate;
- the sub-category of dual use was employed for the current Community Risk Assessment, and due to number of fires within this building type, it has been assessed as moderate risk, and;
- new and concerning trends for fire risk and death for persons experiencing homelessness and/or living outdoors in encampments or in vacant buildings.

Hamilton's residential area assessment has shifted from moderate risk to moderate to high risk due to a combination of increased residential building stock, higher population, and increased fires in these building types. This increase from moderate to moderate-high risk could be attributed to construction materials and building layout (open concept) used in modern home design, as well as the type and quantity of contents found in most

homes. Materials used to manufacture furniture and fixtures are increasingly flammable, burn hotter, and produce greater amounts of dense toxic smoke. Property and content fires are growing in size much faster and pose a greater risk of fire spreading to adjoining rooms and/or dwelling units and increased the potential for death or serious injury to firefighters and civilians.

**Non-Residential Areas with Moderate to High Risk**  
The building type and economic sector having the highest risk (moderate to high) are care and treatment facilities and/or the healthcare sector, as these occupancy types are both numerous (quantity of buildings) and contain the highest percentage of Hamilton's labour force. The moderate to high-risk rating of these buildings is due to the current perceived risk and potential impacts – not the past loss history, as healthcare buildings only represented 2% of fires over the last three years. The high level of risk associated with healthcare remains unchanged from 2018.

Assembly occupancy buildings (where groups of people gather) have a moderate risk rating, unchanged from 2018. This building type only represents 4% of fires, however these buildings can contain large quantities of people who could be impacted by fires in these structures. This creates increased risks as many people who gather in these buildings aren't overly familiar with the layout or exits, which could create an additional risk to firefighters who are conducting rescue efforts. This can delay evacuation in an emergency, adding to the risk.

The remaining types of non-residential buildings with moderate risk include manufacturing facilities, which are frequently located in industrial buildings and represented 10% of fires in Hamilton. This rating is the same as in 2018. With the inclusion of the Economic Profile to the current report, additional economic sectors were added that include Transportation and Warehousing, Administrative and Support, Waste Management and Remediation Services, Professional, Scientific and Technical Services, and Accommodation and Food Services. These were all categorized as moderate risk due to

the types of products and nature of activities present in these locations.

**Hazards & Trends with Moderate to High Risk**  
The hazards identified as moderate to high risk in Hamilton include infectious disease, fire or explosion, flooding, chemical release, tornado, and major transportation emergencies. Fire or explosion and chemical release incidents have the most direct impact on Hamilton Fire Department resources and specific risks to the community. However, the remaining hazards still represent a significant impact on the ability to provide firefighting and rescue services and response (i.e., impacts to staffing, response times, etc.). Wildland fires, building or structure fires, and extreme heat were categorized as moderate risk. Fires increased by 15.7% from 2020 to 2022; as did the risks associated with wildland fires and the occurrence and duration of extreme heat events.

Although open air burning complaints decreased 10% over the last three years; there is a concerning trend open-air burning happening more frequently in urban versus rural areas. This presents a greater risk for structure fires in residential buildings.

Non-working smoke alarms is still an extremely concerning trend in residences where fires have occurred. Continued effort and engagement are required to help increase the number of working smoking alarms in residential buildings/units to assist with reducing community risk.

#### **Causes of Fire**

As previously noted, the 106% (or more than two-fold) increase in fires caused by careless smoking (includes failure to properly extinguish smoking materials) is a concerning pattern that needs to be addressed. In 2022, careless smoking was the fourth highest cause of all fires. Since the categories of causes have changed slightly since the previous report in 2018, it is challenging to determine the change in specific careless smoking related incidents. Regardless, careless smoking was still a top three (3) behavioral cause within the 2014 to 2017 timeframe.



Section 8  
Appendices

TABLE A

Ontario Fire Marshal reference: Worksheet 2: Building Stock Profile

Building Stock by Occupancy Type: Total number of buildings, number of vacant, number of light weight construction, and Risk Review

Type of Occupancy	# of Building's	# Vacant	# Light Weight Construction	Probability	Consequence	Assigned Risk Level
Assembly	2,055	20	1	Likely	Moderate	Moderate Risk
Institutional (Detention and care and treatment)	Total: 359 Detention: 8 Care & Treatment: 351	4 (Care & Treatment)	0	Likely	Moderate	Moderate Risk
Single Family Residential Semi-Detached	160,397	234	5 (one was for a deck/ porch, one was for an accessory building)	Almost Certain	Moderate to Major	High Risk
Single Family Residential Semi-detached/ Row/ Townhouse	26,150	109	0	Almost Certain	Moderate to Major	High Risk
Multi-Unit Residential (2-6 floors)	6,536	29	1 (retirement home)	Almost Certain	Moderate to Major	High Risk
Highrise Residential (7 floors)	363	0	4	Almost Certain	Moderate to Major	High Risk
Residential Mobile Homes	511	0	0	Likely	Moderate	Moderate Risk
Residential over Mercantile or Personal/ Business Services	1,358	19	0	Likely	Moderate	Moderate Risk
Business & Personal Service and Mercantile	2,951	42	7	Almost Certain	Moderate	High Risk
Industrial	6,503	9	7	Almost Certain	Moderate	High Risk
Agricultural (Farm Properties)	10,816	48	0	Likely	Moderate	Moderate Risk

TABLE B

## Ontario Fire Marshal reference: Worksheet 8: Economic Profile

### Economic Profile Risks Review

Ontario Fire Marshal notes to only review significant or key industries: anything under 500 total business not included.

Type of Industry & Occupancy Most Aligned	# of Businesses and Key Data	Key Risks	Probability	Consequence	Assigned Risk Level
<b>Vulnerable Occupancies Institutional and Multi-Residential Occupancy</b>	124 businesses/buildings (8 Hospitals, 3 Institutional, 28 Long Term Care, 36 Retirement Homes (licensed), 47 Group Homes, and 2 Residential Care Facilities.)	Mobility of residents who will have a range of cognitive and physical disabilities.	Likely	Moderate to Major	High Risk
<b>Health care &amp; Social Assistance Institutional Occupancy</b>	1,925 businesses 15.6% of labour force (highest) works here.  10 businesses have 500+ employees (industry with most large businesses)	Significant and 2nd highest occupancy of people (residents/patients and workers) in these buildings and includes the 7 hospitals in building stock.	Likely	Moderate to Major	High Risk
<b>Manufacturing Industrial Occupancy</b>	669 businesses 11.1% of labour force  5 businesses have 500+employees	Flammable and/or combustible liquid/ materials and all within Industrial Occupancy	Likely	Moderate to Major	Moderate to High Risk
<b>Construction Industrial and Business and Personal Service Occupancy</b>	1,919 businesses Most businesses (63%) are 1-4 employees		Possible	Minor to Moderate	Low to Moderate Risk
<b>Transportation and Warehousing Industrial Occupancy</b>	992 businesses 4.9% of labour force	Flammable and/or combustible liquids/ materials and all within Industrial Occupancy	Possible	Minor to Moderate	Moderate Risk
<b>Wholesale Trade (distribution of merchandise) Business and Personal Service Occupancy</b>	590 businesses 3.8% labour force	Depends on if business stores products onsite	Possible	Minor to Moderate	Low to Moderate Risk
<b>Administrative and support, waste management and remediation services Business and Industrial Occupancy</b>	733 businesses 4.7% labour force  95% of businesses have less than 100 employees	With inclusion of waste management companies: potential for flammable or combustible liquids and materials	Likely	Moderate	Moderate Risk
<b>Retail Trade Mercantile Occupancy</b>	1,744 businesses 10.9% labour force 58% of businesses have 5-99 employees		Possible	Moderate	Low to Moderate Risk
<b>Professional, scientific, and technical services Business and Personal Service Occupancy</b>	1,609 businesses 7.4% labour force  75% have 1-4 employees	Consider potential for larger use of electrical equipment and sources combined with the size of labour force and significant number of businesses.	Possible	Moderate	Moderate to High Risk
<b>Finance and insurance Business and Personal Service Occupancy</b>	589 businesses 4.3% labour force		Possible	Minor to Moderate	Low Risk
<b>Accommodation and food services Multi-Residential, Assembly, &amp; Mercantile Occupancies</b>	1,072 businesses 4.8% labour force	Most diverse industry: Wide range of businesses and activities as well as occupancy types. Includes a range of residential uses.	Likely to Almost Certain	Moderate to High	Moderate Risk
<b>Other services (except public administration) Business and Personal Services and Mercantile Occupancy</b>	1,426 businesses 3.7% labour force	Likely mainly offices	Possible	Minor	Low Risk

TABLE C

## Ontario Fire Marshal reference: Worksheet 9a: Past Loss and Event History Profile

Past Loss Risks Review by Occupancy

Occupancy	# of Fires 2020-2022	Top Causes	Probability	Consequence	Assigned Risk Level
Assembly	26	Arson, Unattended Cooking, Careless Smoking, and Undetermined	Likely	Minor to Moderate	Moderate Risk
Institutional	25	Careless Smoking, Arson, and Electrical/Mechanical	Likely	Minor to Moderate	Moderate Risk
Residential Single Family - Detached	309	Electrical/ Mechanical, Unattended Cooking, Careless Smoking, and Undetermined	Almost Certain	Moderate to Major	High Risk
Residential Semi - Detached (towns and row houses)	59	Unattended Cooking, Electrical/Mechanical, Careless Smoking	Likely	Moderate	High Risk
Residential Multi-residential (includes apartments and hotels)	220	Careless Smoking, Arson and Unattended Cooking.	Almost Certain	Moderate	High Risk
Residential Mobile, Tent, Trailer etc.	22	Arson, Undetermined and Misuse of Materials Ignited	Likely	Minor to Moderate	Moderate Risk to Low Risk
Residential Dual Residential/ Commercial	33	Arson, Electrical/ Mechanical, and Misuse of Materials Ignited	Likely	Minor to Moderate	Moderate Risk
Commercial: Personal and Business, Mercantile	64	Arson, Electrical/ Mechanical, and Undetermined	Almost Certain	Moderate	Moderate to High Risk
Industrial	88	Arson, Other, and Electrical/ Mechanical	Almost Certain	Moderate	Moderate to High Risk
Barns	4	Unintentional, Electrical/Mechanical, Undetermined	Possible	Minor	Low Risk
Other (non-property and includes sheds, vehicles, garages etc.)	558	Arson, Careless Smoking, Electrical/ Mechanical, Undetermined	Likely	Minor	Low Risk

TABLE C

## Past Loss Worksheet A:

Municipal Fire Losses, Deaths, Injuries, and Causes 2018 – 2022

## 2020

Occupancy Classification		# of Fires	\$ Loss	# of Injuries	# of Deaths	Causes
Group A	Assembly 131 132 134 157 & Restaurants	11	\$0.6 M	1	0	4 Arson 3 Unattended Cooking 1 Electrical Failure 1 Maintenance Deficiency 1 Misuse of Ignition Source 1 Unintentional
	Detention 299 206	1	\$20,000	0	0	1 Careless Smoking
Group B	Care and Treatment/Care 212 223 233 234 NOTE: codes seem to change year over year for this category in FDM	3	\$.22 M	1	0	1 Electrical Mechanical 1 Misuse of Ignition Source 1 Misuse of Materials Ignited
	Single Family 301 Detached 302 303	107	\$15.45 M	10 Firefighters Injuries and 6 civilian Total: 16	2	20 Electrical/Mechanical 14 Undetermined 19 Unattended Cooking 12 Careless Smoking 11 Unintentional 8 Other 9 Misuse of Ignition Source 7 Misuse of Materials Ignited 3 Maintenance Deficiency 4 Arson
Group C	Multi-Unit Residential 321 322 323 334 361 399	41	\$1.53 M	3 Firefighters and 4 civilian Total: 7	0	13 Careless Smoking 6 Arson 5 Unattended Cooking 5 Electrical/Mechanical Failure 5 Undetermined 4 Misuse of Ignition Source 2 Misuse of Materials Ignited 2 Unintentional
	Hotel/Motel 355	1	\$0.03M	0	0	1 Electrical/Mechanical
	Mobile Homes & Trailers 341 Mobile Home Camper/Trailer 342 Tent 343 (2021) Other residential Residential Camp	6	\$0.56M	1 civilian	0	2 Arson 2 Undetermined 1 Electrical/Mechanical 1 Misuse of Materials Ignited
	Other: Live/Work Residential w- Business 331, 332, 333, 334 Detached Garage	6	\$0.11M	0	0	2 Arson 2 Electrical/Mechanical 1 Careless Smoking 1 Unattended Cooking

Occupancy Classification		# of Fires	\$ Loss	# of Injuries	# of Deaths	Causes
<b>Groups D &amp; E</b>	<b>Business &amp; Personal Service/Mercantile</b> 401, 410, 499, 501 503, 510, 521, 599	15	\$0.47 M	5 Firefighters Total: 5	0	3 Arson 2 Electrical/Mechanical 1 Careless Smoking
<b>Groups F</b>	<b>Industrial</b> 601, 603, 615, 619, 623, 624, 633, 639, 659, 671, 672, 673, 679, 690, 717, 739, 741, 743, 749, 760, 791, 792, 799	37	\$1.87 M	4 Firefighters and 1 civilian Total: 5	0	4 Arson 2 Electrical/Mechanical 1 Careless Smoking
	<b>Other: Non Structure Vehicles, Barn, Sheds, Outdoor etc.</b>  <b>Miscellaneous</b>	203	\$0.7M	0	0	6 Arson 2 Electrical/Mechanical 1 Careless Smoking
<b>Summary</b>		<b>Total Fires</b>	<b>Total \$ Loss</b>	<b>Total Injuries</b>	<b>Total Deaths</b>	<b>Summary Causes</b>
<b>Totals</b>		432 fires	\$20.98 M	Total: 37  23 Total Firefighters  14 Total Civilians	2 Civilian	Top 3: Undetermined Electrical/Mechanical and arson  97 Undetermined 86 Electrical/Mechanical 69 Arson 41 Unintentional 31 Unattended Cooking 30 Careless Smoking 28 Other 23 Misuse of Materials Ignited 9 Maintenance Deficiency 1 Exposure Fire

## Past Loss Worksheet A:

Municipal Fire Losses, Deaths, Injuries, and Causes 2018 – 2022

### 2021

Occupancy Classification		# of Fires	\$ Loss	# of Injuries	# of Deaths	Causes
Group A	Assembly 131 132 134 157 & Restaurants	8	\$0.9 M	0	0	2 Careless Smoking 1 Electrical/Mechanical Failure 1 Unattended Cooking 1 Arson 1 Undetermined 1 Misuses of Materials Ignited 1 Other
	Detention 299 206	1	\$0	1 Civilian	0	Arson
Group B	Care and Treatment/Care 212 223 233 234 NOTE: codes seem to change year over year for this category in FDM	8	\$3.05 M	1 Civilian	0	2 Undetermined 2 Careless Smoking 1 Misused of Ignition Source 1 Maintenance Deficiency 1 Misuse of Ignition Source 1 Unattended Cooking
	Single Family 301 Detached 302 303	122	\$10.3M	7 Firefighters 13 civilian Total: 20	0	27 Electrical/Mechanical 18 Unattended Cooking 16 Careless Smoking 16 Unintentional 14 Arson 12 Misuse of Ignition Source 9 Undetermined 8 Other 4 Maintenance Deficiency 3 Misuse of Materials Ignited
Group C	Multi-Unit Residentail 321 322 323 334 361 399	88	\$3.16 M	3 Firefighters 16 civilian Total: 19	0	20 Careless Smoking 16 Unattended Cooking 11 Misue of Ignition Source 9 Unintentional 9 Arson 8 Misuse of Materials Ignited 5 Undetermined 4 Electrical/Mechanical Failure
	Hotel/Motel 355	0	\$0	0	0	n/a
	Mobile Homes & Trailers 341 Mobile Home Camper/Trailer 342 Tent 343 (2021) Other residential Residential Camp	9	\$0.2M	0	0	4 Undetermined 3 Electrical/Mechanical 1 Misuse of Materials Ignited 1 Other
	Other: Live/Work Residential w- Business 331, 332, 333, 334 Detached Garage	14	\$0	2 Firefighters	0	4 Undetermined 2 Arson 2 Electrical/Mechanical 2 Careless Smoking 2 Misuse of Ignition Source 1 Unattended Cooking 1 Unintentional

Occupancy Classification		# of Fires	\$ Loss	# of Injuries	# of Deaths	Causes
<b>Groups D &amp; E</b>	<b>Business &amp; Personal Service/Mercantile</b> 401, 410, 499, 501 503, 510, 521, 599	19	\$1.04 M	2 Firefighters Total: 2	0	5 Arson 5 Electrical/Mechanical 3 Unattended Cooking 2 Misuse of Materials Ignited 1 Careless Smoking 1 Other
<b>Groups F</b>	<b>Industrial</b> 601, 603, 615, 619, 623, 624, 633, 639, 659, 671, 672, 673, 679, 690, 717, 739, 741, 743, 749, 760, 791, 792, 799	19	\$1.28 M	0	0	6 Unintentional 4 Other 2 Arson 2 Undetermined 1 Electrical/Mechanical 1 Misuse of Ignition Source 1 Misuse of Materials Ignited
	<b>Other: Non Structure Vehicles, Barn, Sheds, Outdoor etc.</b>  <b>Miscellaneous</b>	180	\$0.98M	1	0	
<b>Summary</b>		<b>Total Fires</b>	<b>Total \$ Loss</b>	<b>Total Injuries</b>	<b>Total Deaths</b>	<b>Summary Causes</b>
<b>Totals</b>		471 fires	\$22.74 M	Total: 46  14 Total Firefighters  32 Total Civilians	2 Civilian	Top 3: Undetermined, arson, and Electrical/Mechanical  81 Undetermined 79 Arson 77 Electrical/Mechanical 63 Unintentional 46 Careless Smoking 40 Unattended Cooking 32 Misuse of Ignition 28 Other 17 Misuse of Materials Ignited 7 Maintenance Deficiency 1 Exposure Fire

## Past Loss Worksheet A:

Municipal Fire Losses, Deaths, Injuries, and Causes 2018 – 2022

### 2022

Occupancy Classification		# of Fires	\$ Loss	# of Injuries	# of Deaths	Causes
Group A	Assembly 131 132 134 157 & Restaurants	14	\$0.52 M	1 Firefighter	0	5 Undetermined 5 Arson 1 Unintentional 1 Electrical/Mechanical Failure 1 Misues of Ignition Source 1 Other
	Detention 299 206	0	\$0	0	0	n/a
Group B	Care and Treatment/Care 212 223 233 234 NOTE: codes seem to change year over year for this category in FDM	11	\$0.44 M	0	0	4 Arson 4 Careless Smoking 1 Electrical/Mechanical Failure 1 Misuse of Ignition Source 1 Other
	Single Family 301 Detached 302 303	136	\$24.38 M	10 Firefighters 14 civilian Total: 24	6	25 Undetermined 23 Electrical/Mechanical 23 Careless Smoking 15 Unattended Cooking 12 Unintentional 9 Misuse of Ignition Source 9 Other 7 Arson 5 Misuse of Materials Ignited 4 Maitenance Deficiency
Group C	Multi-Unit Residentail 321 322 323 334 361 399	84	\$2.41 M	1 Firefighters 9 civilian Total: 10	2	25 Careless Smoking 9 Unattended Cooking 5 Misue of Ignition Source 5 Unintentional 14 Arson 8 Misuse of Materials Ignited 9 Undetermined 5 Electrical/Mechanical Failure 3 Other 1 Maintenance Deficiency
	Hotel/Motel 355	1	\$0	0	0	1 Arson
	Mobile Homes & Trailers 341 Mobile Home Camper/ Trailer 342 Tent 343 (2021) Other residential Residential Camp	7	\$0	1 Civilian	0	2 Misuse of Materials Ignited 1 Electrical/Mechanical 1 Misuse of Ignition Source 1 Other
	Other: Live/Work Residential w- Business 331, 332, 333, 334 Detached Garage	13	\$0.91 M	Total: 3	0	2 Misuse of Materials Ignited 1 Unintentional



Occupancy Classification		# of Fires	\$ Loss	# of Injuries	# of Deaths	Causes
Groups D & E	<b>Business &amp; Personal Service/Mercantile</b> 401, 410, 499, 501 503, 510, 521, 599	30	\$14.73 M	1 Firefighters 1 Civilian Total: 2	0	9 Undetermined 7 Arson 3 Electrical/Mechanical 3 Unattended Cooking 3 Unintentional 2 Other 1 Careless Smoking 1 Misuse of Ignition Source 1 Misuse of Materials Ignited
	<b>Industrial</b> 601, 603, 615, 619, 623, 624, 633, 639, 659, 671, 672, 673, 679, 690, 717, 739, 741, 743, 749, 760, 791, 792, 799	32	\$5.69 M	0	0	9 Other 6 Undetermined 5 Unintentional 5 Electrical/Mechanical 2 Misuse of Ignition Source 2 Careless Smoking 1 Arson 1 Misuse of Materials Ignited 1 Maintenance Deficiency
	<b>Other: Non Structure Vehicles, Barn, Sheds, Outdoor etc.</b>  <b>Miscellaneous</b>	172	\$0.75M	0	0	Careless Smoking Misuse of Ignition Source Electrical/Mechanical
<b>Summary</b>		<b>Total Fires</b>	<b>Total \$ Loss</b>	<b>Total Injuries</b>	<b>Total Deaths</b>	<b>Summary Causes</b>
<b>Totals</b>		500 fires	\$49.9 M	Total: 41  13 Total Firefighters  28 Total Civilians	8 Civilian	Top 3: Undetermined, Electrical/Mechanical, and arson.  Careless smoking is consistently in top 5 and increasing each year (i.e. 30 cases in 2020 and 62 in 2022)  117 Undetermined 77 Electrical/Mechanical 69 Arson 62 Careless Smoking 50 Unintentional 44 Other 27 Unattended Cooking 22 Misuse of Ignition source 20 Misuse of Materials Ignited 12 Maintenance Deficiency

TABLE D

## Ontario Fire Marshal reference: Worksheet 6

Public Safety Response Profile

Identified Public Safety Response	Types of Incidents They Respond To	Agency Role in Incident
<b>Hamilton Police Services</b>	<ul style="list-style-type: none"> <li>• Motor vehicle collisions.</li> <li>• Fire incidents.</li> <li>• False fire incidents.</li> <li>• Arson.</li> <li>• Missing persons.</li> <li>• CBRNE.</li> <li>• Hazmat.</li> <li>• Any of the incident types above.</li> </ul>	<ul style="list-style-type: none"> <li>• Investigation, Traffic Control, Stabilization, Return to Normalcy.</li> <li>• Traffic Control, Scene Stabilization, Patient Contact, First Aid, Evacuation, Investigation.</li> <li>• Traffic Control, Scene Stabilization, Investigation</li> <li>• Traffic Control, Evacuation, Investigation.</li> <li>• Search and Rescue, Investigation, Patient Contact.</li> <li>• Scene Stabilization, Investigation, Traffic Control, Return to Normalcy.</li> <li>• Traffic Control.</li> <li>• The Hamilton Police's Victim Services Branch assists as necessary (i.e. resources, info or guidance) with anyone impacted by any of the types of incidents outlined here by Hamilton Police.</li> </ul>
<b>Hamilton Paramedic Services</b>	<ul style="list-style-type: none"> <li>• Motor vehicle collisions.</li> <li>• Medical incidents.</li> <li>• Fire incidents (including but not limited to hazardous materials and rescues).</li> <li>• False fire incidents.</li> <li>• Public assistance.</li> </ul>	<ul style="list-style-type: none"> <li>• Primary care of patient with Fire assisting with extrication and initial treatment/assessment.</li> <li>• Primary care of patient with Fire assisting with extrication and initial treatment/assessment.</li> <li>• Standby for medical support of firefighters, standby for potential primary care of patient, transport, reporting, with the potential for assistance with rehabilitation</li> <li>• Standby for medical support of firefighter safety, standby for primary care of patient, transport, reporting, with the potential for assistance with rehabilitation</li> <li>• Assist in coordinating public information</li> </ul>
<b>HydroOne</b>	<ul style="list-style-type: none"> <li>• Power supply incident</li> <li>• Distribution emergency</li> </ul>	<ul style="list-style-type: none"> <li>• Customer and emergency personnel notification</li> <li>• Service restoration</li> </ul>
<b>Alectra</b>	<ul style="list-style-type: none"> <li>• Power supply incident</li> <li>• Distribution emergency</li> </ul>	<ul style="list-style-type: none"> <li>• Affected customer notification.</li> <li>• Incident support teams for emergencies</li> <li>• Pipeline shutdown</li> <li>• Service restoration</li> </ul>
<b>Enbridge Gas</b> Enbridge Gas Inc responds to over 75,000 emergency calls each year in Ontario, with a target response time of 90% within one hour. Average time is closer to 30 minutes.	<ul style="list-style-type: none"> <li>• Reported carbon monoxide calls where the cause may be associated with natural gas equipment.</li> <li>• Reported smell of gas (either inside or outside a structure).</li> <li>• Fires and/or explosions where natural gas is potentially involved, or where the natural gas needs to be shut off to make safe.</li> <li>• Environmental spills where Enbridge may be involved.</li> </ul>	<ul style="list-style-type: none"> <li>• The role of Enbridge is to assist first responders with assessing a scene where required (e.g. taking gas readings in buildings and outside), working in Unified Command structures for larger events, making a site safe (e.g. shutting off gas where appropriate), performing any necessary notifications to impacted customers related to outages, repairing our assets where applicable, and reconnecting customers who need to be shut off.</li> <li>• Enbridge assists first responders by providing education training on natural gas awareness.</li> <li>• Enbridge educates customers about natural gas safety awareness and works with the Ontario Fire Marshal Safety Council and local Fire Departments on public education.</li> </ul>
<b>Hamilton Beach Rescue Unit</b>	<ul style="list-style-type: none"> <li>• Persons lost or overdue in/on the water.</li> <li>• Vessels in distress.</li> <li>• Maritime accidents/crime scenes.</li> <li>• Fire suppression operations near water (i.e. on a pier)</li> <li>• Inland water rescue/incident support.</li> <li>• Search and Rescue prevention activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct searches for overdue/missing vessels and personnel.</li> <li>• Towing/recovery of vessels and persons in distress (or at risk of being in distress).</li> <li>• Stabilization and transport of patients to land based Fire/EMS personnel.</li> <li>• Provide vessel operating platform as needed by Hamilton Fire (i.e. inland lake; ice rescue).</li> <li>• Provide standby rescue capabilities when Hamilton Fire is operating near water (i.e. on a pier).</li> <li>• Perimeter security for events like fireworks in the harbo</li> </ul>
<b>Hamilton Police Service Marine Unit</b> The Marine Unit is responsible for policing approximately 250 square kilometers of water at the western end of Lake Ontario, including Hamilton Harbour and all other waterways within the City of Hamilton.	<ul style="list-style-type: none"> <li>• Persons lost or overdue in/on the water.</li> <li>• Vessels in distress.</li> <li>• Maritime accidents/crime scenes.</li> <li>• During the boating season, officers promote boating safety and enforce various statutes, including: Canada Shipping Act, Liquor Licence Act, Criminal Code of Canada, Fish and Wildlife Conservation Act, Controlled Drugs and Substance Act.</li> <li>• The Marine Unit also participates in the provincial Reduce Impaired Driving Everywhere (RIDE) program on area waterways.</li> </ul>	<ul style="list-style-type: none"> <li>• Responds to law enforcement and rescue operations on water or ice.</li> <li>• Respond to vessel-in-distress calls and support the Canadian Coast Guard in search and rescue operations.</li> <li>• During the boating season from April through November, the Unit actively patrols western Lake Ontario and Hamilton Harbour daily.</li> </ul>
<b>Ontario Provincial Police</b>	<ul style="list-style-type: none"> <li>• Motor vehicle collisions.</li> <li>• Fire Incidents.</li> <li>• Medical Assist Incidents.</li> <li>• Dangerous Goods Incidents.</li> </ul>	<ul style="list-style-type: none"> <li>• Scene stabilization, First Aid, investigation, traffic control, public information.</li> <li>• Scene stabilization, First Aid, evacuation, investigation, traffic control, public information.</li> <li>• Scene stabilization, First Aid, investigation, traffic control.</li> <li>• Scene stabilization, First Aid, evacuation, investigation, traffic control, public information.</li> </ul>

TABLE E

# Part B: Non-Fire Emergency Calls

2020-2022

	2020	Data
Response Type Group	Count of Incident Number	Percentage of Total Calls
<b>Burning (Controlled)</b>	749	27.65%
<b>Co False Calls</b>	668	24.66%
<b>False Fire Calls</b>	587	21.67%
<b>Medical/Resucitator Call</b>	112	4.13%
<b>Other Responses</b>	240	8.86%
<b>Overpressure Rupture</b>	0	0.0%
<b>Pre Fire Conditions</b>	81	2.99%
<b>Public Hazard</b>	206	7.60%
<b>Rescue</b>	66	2.44%
<b>Grand Total</b>	2709	100%

	2021	Data
Response Type Group	Count of Incident Number	Percentage of Total Calls
<b>Burning (Controlled)</b>	618	21.42%
<b>Co False Calls</b>	659	22.84%
<b>False Fire Calls</b>	750	26.00%
<b>Medical/Resucitator Call</b>	145	5.03%
<b>Other Responses</b>	296	10.26%
<b>Overpressure Rupture</b>	0	0.0%
<b>Pre Fire Conditions</b>	97	3.36%
<b>Public Hazard</b>	243	8.42%
<b>Rescue</b>	77	2.67%
<b>Grand Total</b>	2885	100%

	2022	Data
Response Type Group	Count of Incident Number	Percentage of Total Calls
<b>Burning (Controlled)</b>	536	17.28%
<b>Co False Calls</b>	610	19.66%
<b>False Fire Calls</b>	808	26.05%
<b>Medical/Resucitator Call</b>	296	9.54%
<b>Other Responses</b>	372	11.99%
<b>Overpressure Rupture</b>	1	0.03%
<b>Pre Fire Conditions</b>	85	2.74%
<b>Public Hazard</b>	244	7.87%
<b>Rescue</b>	150	4.84%
<b>Grand Total</b>	3102	100%

Combined Totals (2020 - 2022) of Non-Fire Emergency Calls

	<b>Total</b>	<b>Total</b>
<b>Response Type Group</b>	<b>Count of Incident Number</b>	<b>Percentage of Total Calls</b>
<b>Burning (Controlled)</b>	1903	21.88%
<b>Co False Calls</b>	1937	22.27%
<b>False Fire Calls</b>	2145	24.67%
<b>Medical/Resucitator Call</b>	553	6.36%
<b>Other Responses</b>	908	10.44%
<b>Overpressure Rupture</b>	1	0.01%
<b>Pre Fire Conditions</b>	263	3.02%
<b>Public Hazard</b>	693	7.97%
<b>Rescue</b>	293	3.37%
<b>Grand Total</b>	8696	100%

**TABLE F**

## Ontario Fire Marshal reference: Worksheet 9b: Past Loss and Event History Profile

Non-Fire Call by Type Risks Review

Type of Non-Fire Calls	% of Total Calls (2020 to 2022)	# of Calls in 2022	Probability	Consequence	Assigned Risk Level
<b>Burning (open air)</b>	21.88 %	536	Almost Certain	Minor to Moderate	Moderate to High Risk
<b>CO False Calls</b>	22.27 %	610	Almost Certain	Insignificant	Moderate
<b>False Fire Calls</b>	24.67 %	808	Almost Certain	Insignificant	Moderate
<b>Medical/Resuscitator</b>	6.36 %	296	Almost Certain	Minor to Moderate	Moderate to High Risk
<b>Other responses</b>	10.44 %	372	Almost Certain	Minor to Moderate	Moderate to High Risk
<b>Overpressure Rupture (no fire)</b>	0.01 %	1	Rare	Moderate to Major	Moderate
<b>Pre-Fire Conditions (no fire)</b>	3.02 %	85	Likely	Minor	Moderate
<b>Public Hazard</b>	7.97 %	244	Almost Certain	Moderate to Major	Moderate to High Risk
<b>Rescue</b>	3.37 %	150	Almost Certain	Moderate	Moderate

**TABLE G**

## Ontario Fire Code reference: Worksheet 5: Hazard Profile

Hazard Risk Review

Identified Hazard	Probability (refer to Table 1 for suggested probability levels)	Consequence (refer to Table 2 for suggested consequence levels)	Assigned Risk Level (refer to the Risk Level Matrix for suggested risk levels)
<p><b>Infectious Disease</b></p> <p>Includes impacts to residents and on staffing.</p>	Likely	Moderate to Major	Moderate to High Risk
<p><b>Fire or Explosion</b></p> <p>Fire and Explosion are grouped together in Ontario's Hazard Report, and as such, were evaluated together through the HIRA process. They ranked collectively as second highest with a total risk score of 68.88, and a level of risk of Moderate.</p> <p>SOURCE: HIRA</p>	<p><b>Almost Certain</b></p> <ul style="list-style-type: none"> <li>Large fires, including warehouse or industrial fires, occur every year hence there is a very high likelihood these incidents will occur in our community</li> <li>Consequence</li> <li>More likely to see injuries instead of fatalities</li> <li>Psycho-social impacts on both residents impacted and first responders</li> </ul>	<p><b>Minor to Major</b></p> <ul style="list-style-type: none"> <li>Although these occurrences are frequent, they are usually short-term and/or localized</li> <li>Property damage is certain, however is usually localized. Hamilton Fire can respond quickly, and limit spread</li> </ul>	Moderate to High Risk
<p><b>Extreme Heat</b></p> <p>Extreme Heat ranked third on HIRA.</p>	<p><b>Likely to Almost Certain</b></p> <ul style="list-style-type: none"> <li>Extreme sustained heat has a higher likelihood of occurring in the next 5 years than in previous years</li> </ul>	<p><b>Minor to Moderate</b></p> <ul style="list-style-type: none"> <li>Vulnerable residents, and those in lower socio-economic populations are most impacted by this hazard</li> </ul>	Moderate Risk
<p><b>Building or Structural Failure</b></p> <p>Includes any structure covered under the Ontario Building Code. The City of Hamilton has many older buildings and structures that were built at a time prior to strict building standards. These types of buildings are particularly susceptible to collapse. Building or Structural Failure ranked fourth via HIRA.</p> <p>SOURCE: HIRA</p>	<p><b>Possible to Likely</b></p> <ul style="list-style-type: none"> <li>The sheer number of buildings and structures we have in our community increases the likelihood</li> <li>Not only older buildings in Hamilton, but also those that are vacant and may become unsafe due to neglect</li> <li>Building and structural collapse can sometimes be a secondary hazard to high wind, tornados, and explosions</li> <li>Multiple collapses or large occupied building collapses could overwhelm resources and require use of mutual aid</li> <li>There are multiple prevention strategies in place, the most important being regular inspections (both upon construction, vacant buildings, ones that have sustained fire or damage, or those reported as unsafe)</li> </ul>	<p><b>Moderate to Major</b></p> <ul style="list-style-type: none"> <li>Pressures on critical infrastructure, especially the power grid as demand for electricity for air conditioning and fans surges</li> <li>Damage to other infrastructure such as roads, bridges, and buildings with sustained extreme temperatures</li> <li>Possible risk of injury to first responders</li> <li>Possibility for evacuation, although usually localized</li> <li>Property damage is certain, but again usually localized</li> <li>Impacts to critical infrastructure such as road closures, loss of power supply and/or gas lines etc.</li> </ul>	Moderate Risk
<p><b>Flooding</b></p> <p>Impacts to roads, access/routes for fire apparatus to emergencies, vehicle accidents, flooding of buildings.</p>	<p><b>Likely</b></p> <ul style="list-style-type: none"> <li>Some flooding is predictable, such as spring thaw, but flooding from thunderstorms is less predictable, especially in terms of volume</li> <li>The City has closed 40 roads due to flooding in 2022 year-to-date (as of July 2022)</li> <li>Over a dozen homes have been flooded in 2022 to date (as of July 2022)</li> <li>Dollars on repairs to Safari Road in Flamborough</li> </ul>	<p><b>Moderate</b></p> <ul style="list-style-type: none"> <li>Property damage can be severe and can take a long time to repair</li> <li>Evacuations of homes and buildings are possible</li> <li>Impacts to critical infrastructure such as the closing of roads</li> <li>Flooding of some magnitude happens every year with varying consequences</li> <li>The likelihood (and consequence) has increased due to newly urbanized areas that were once farmland and have now been paved over with concrete and asphalt which does not absorb water</li> <li>Injuries and fatalities are rare</li> </ul>	Moderate to High Risk



<p><b>Erosion</b></p> <p><i>Impacts the ability and access of fire apparatus to emergencies and closure of major interior city roads especially access up and down the escarpment.</i></p> <p>Given the topography of Hamilton, including the Niagara Escarpment that traverses through the city, there is a risk of erosion which we have already seen happen on mountain accesses.</p> <p>SOURCE: HIRA</p>	<p><b>Possible to Likely</b></p> <ul style="list-style-type: none"> <li>• Considered past occurrences such as Claremont Access and Sydenham Hill</li> <li>• Because we have a limestone landscape (which is a softer stone) erosion is more prevalent in our area</li> <li>• The City of Hamilton is also at a higher risk due to climate change (increase in the frequency of significant rainfall events) and the root systems of trees and other plant life is not holding the soil like it used to (when the soil dries, it falls apart easily), hence risk of tree/ground erosion</li> </ul>	<p><b>Minor to Moderate</b></p> <ul style="list-style-type: none"> <li>• Road closures are generally lengthy as clean-up is significant</li> <li>• Road closures that last weeks or months can impact a large portion of the population as they must detour around the closure causing traffic disruptions</li> <li>• Access to some residences or parts of the community could be impacted</li> <li>• Fatalities and injuries are rare and would only occur if people were at the site of the erosion at the time of collapse. It is more likely for injuries to occur if a building is impacted due to its proximity to the eroded area</li> <li>• Consequences are generally localized to the area of impact meaning the risk of evacuation is low</li> <li>• Potential for property damage and damage to critical infrastructure beyond just roads (e.g., power supply lines/poles)</li> </ul>	<p><b>Low to Moderate Risk</b></p>
<p><b>Chemical Release</b></p> <p>Hamilton has large industry that utilize and produce various hazardous materials in their manufacturing processes. This includes municipal services such as large quantities of chlorine that is used in the process of water treatment. When properly contained and stored, hazardous materials are stable and safe. Hazardous materials incidents can be caused by human error such as vehicular accidents, or even technological malfunctions.</p> <p>SOURCE: HIRA</p>	<p><b>Possible</b></p> <ul style="list-style-type: none"> <li>• There is an increased potential with the prevalence of large industry, railways, the airport, and the Port in Hamilton</li> <li>• Although we have multiple small incidents in a year, larger incidents are not common. There are many mitigation strategies in place to minimize these occurrences such as storage and use regulations, inspections, alarms etc.</li> </ul>	<p><b>Minor to Catastrophic</b></p> <ul style="list-style-type: none"> <li>• With a large event, there is the potential for a medium to high impact of injury or fatalities, and the potential for long-term illness (e.g., cancer) due to exposure</li> <li>• Evacuation is a usual response to such an event – depending on severity</li> <li>• There is a potential for impact to a large portion of the population that could mean the need for emergency social services including the need for an evacuation centre</li> <li>• There is potential for psychosocial impacts to first responders (e.g., witnessing injury or fatalities including impacts to self or peers)</li> <li>• Property damage can be major, but is usually localized</li> </ul>	<p><b>Moderate to High Risk</b></p>
<p><b>Tornado</b></p> <p>Although the likelihood of a tornado is not as high as in other parts of Ontario, we have seen EF1 Tornadoes as recently as 2020. Many will also recall the EF1 Tornado that ripped through the Lawfield neighbourhood on the mountain in November 2005 causing extensive damage to a school and houses in the area.</p> <p>SOURCE: HIRA</p>	<p><b>Possible to Likely</b></p> <ul style="list-style-type: none"> <li>• In 2020, the City of Hamilton was impacted by an EF1 tornado in Strabane, a rural community in northern Hamilton</li> <li>• Continued urbanization in Hamilton means impact would be greater (i.e., if a tornado were to touchdown on an urbanized area that was once considered farmland) hence the likelihood of an impactful tornado is higher</li> </ul>	<p><b>Minor to Catastrophic</b></p> <ul style="list-style-type: none"> <li>• Property damage is the largest impact and could result in major destruction</li> <li>• Evacuation is possible if homes become inhabitable</li> <li>• Damage is localized, especially with smaller tornadoes</li> <li>• Risk of injury or fatality with EF0 or EF1 tornadoes is generally low.</li> <li>• Having a robust and well-trained first response team (Hamilton Fire) means rescues can happen quickly. Also, Hamilton Fire can leverage Toronto HUSAR unit (Heavy Urban Search and Rescue) if required.</li> <li>• Critical Infrastructure impacts could include closed roads, downed power lines/poles, which depending on area(s) impacted, could mean strain on resources to repair</li> </ul>	<p><b>Moderate to High Risk</b></p>

<p><b>High Wind</b></p> <p>We often see high wind because of other hazards such as Thunderstorms, but it can also cause cascading hazards, including Electrical Energy Failure because of downed trees on hydro infrastructure. The threshold of 90 km/h was used to define high winds. This threshold is used by Environment and Climate Change Canada as well as Alectra Utilities (hydro distributor).</p> <p>SOURCE: HIRA</p>	<p><b>Almost Certain</b></p> <ul style="list-style-type: none"> <li>High Wind scored the highest in the likelihood category with all key stakeholders noting it as "Certain" to occur every year</li> <li>There have been many High Wind events recorded in the past few years, hence there is certainty that we will have a high wind event at least once a year area of a neighbourhood)</li> </ul>	<p><b>Minor to Moderate</b></p> <ul style="list-style-type: none"> <li>Fatalities and injuries are very low and most occur due to flying debris or people touching downed power lines (electrocution)</li> <li>Property damage is guaranteed, especially in the urban environment where there is a larger number of homes (e.g., shingle damage on roofs of homes in a large</li> <li>Impact to critical infrastructure could occur</li> <li>The most notable impact will be power outages.</li> </ul>	<p><b>Low to Moderate Risk</b></p>
<p><b>Moderate to Major Wildland and/or Forested Area Fires</b></p> <p>Hamilton has a large area of land that is agricultural with some dense residential areas close to large agricultural areas and fields (i.e., Binbrook, Ancaster).</p> <p>SOURCE: HIRA</p>	<p><b>Possible</b></p>	<p><b>Minor to Major</b></p>	<p><b>Moderate Risk</b></p>
<p><b>Major Transportation Emergencies</b></p> <p>(i.e., air, rail, or road)</p>	<p><b>Possible</b></p>	<p><b>Minor to Major</b></p>	<p><b>Moderate Risk</b></p>
<p><b>Winter weather: Snowstorms and/or Ice Storms</b></p>	<p><b>Possible to Almost Certain</b></p>	<p><b>Insignificant to Moderate</b></p>	<p><b>Low to Moderate Risk</b></p>



# Hamilton Fire Department

2023 Community Risk Assessment