



RISK AND VULNERABILITY ASSESSMENT SUMMARY

City of Hamilton
April 2022

Risk and Vulnerability Assessment Summary

In 2021, the City of Hamilton reassessed our Vulnerabilities and Risks to projected Climate Change Impacts, using ICLEI Canada’s Building Adaptive and Resilient Communities (BARC) framework. This engagement began in 2016, and has involved 32 community organizations, from across the environmental, social service, advocacy, business, institutional, and educational sectors.



Climate Change: High-Priority Impacts

These thirteen climate change impacts were prioritized as the most concerning by both City staff and community stakeholders.

Eight statements were most important to community organizations, and all eight were brought forward in the process (highlighted in the table below).

Impact Statement
Reduced capacity of flood protection measures and water storage caused by an increase in rainfall intensity leading to flooding.
Increased instances of heat-related issues due to extreme heat.
Dryer, hotter and longer summers may affect the health and safety of local vulnerable populations.
More frequent and intense heatwaves will increase instances of heat-related health and safety issues, particularly for households without access to reliable air-conditioning and the homeless
Increased intensity of rainfall leading to increasing runoff into rivers and lakes, and washing of sediment, nutrients, pollutants and other materials.
Rising summer temperatures and extreme heat will increase energy demand for air conditioning, causing a financial burden for low-income households.
Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways and sidewalk conditions.
Changes in precipitation resulting in resulting in erosion of natural systems (i.e. waterbanks, escarpment erosion) leading to washouts of bridges and roadways.
Increased temperatures and changes in precipitation increasing incidences of infectious diseases and vector borne diseases as result of longer transmission periods or changes in geographic distribution of disease vectors.
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.
Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns.
More intense summer precipitation combined with increasing temperatures lowering water supply as well as increasing water demand for drinking, landscaping, and irrigation. (rural)
Increase in average annual temperatures (especially in the summer) leading to increased food insecurity in the region (i.e. decrease in local crop yields, food cost fluctuations, etc.)

Contributors

Internal Contributors

The internal core team included staff from the following Departments: Healthy and Safe Communities (Healthy Environments, Emergency Management, and Children’s Services and Neighbourhood Development), Corporate Services (Risk Management), Planning and Economic Development (Strategic Initiatives, and Community Planning), and Public Works (General Manager’s Office).

Community Contributors

External contributors were first approached in 2016/17 through ICLEI Canada’s Train the Trainer project. A wide array of community stakeholders aided in identifying climate impacts of concern and the scoring of these impacts through two separate workshops.

These contributors were as follows:

- Hamilton Regional Indian Centre
- Green Venture
- Royal Botanical Gardens
- Union Gas
- Hamilton Industrial Environmental Association (HIEA)
- Sustainable Hamilton Burlington
- McMaster University
- YWCA
- Hamilton Conservation Authority
- Environment Hamilton
- HCE Energy Inc
- Faith and the Common Good
- Bay Area Climate Change Council (BACCC)
- West End Homebuilders Association
- Alectra
- Mohawk College
- Social Planning and Research Council of Hamilton
- Hamilton Halton Home Construction Association
- Wesley Urban Ministries
- CF Lime Ridge Mall
- Hamilton Health Sciences
- Hamilton Utilities Corporation
- Hamilton Airport
- ACORN Hamilton
- Welcome Inn
- Immigrant Working Centre
- Senior Advisory Council
- Hamilton-Oshawa Port Authority
- Hamilton Poverty Roundtable
- United Way Halton and Hamilton
- EcoWHAM
- Community Response to Extreme Weather (CREW)

What are Climate Change Impact Statements?

Climate impact statements answer three questions:

What changes are expected to the climate?

Ex. One change expected to the climate is **more frequent and intense rainfall**

What are the outcomes of these changes?

Ex. An outcome of more frequent and intense rainfall is **more flooding**

What consequences are associated with these outcomes?

Ex. Consequences of more flooding can include **damaged property, health and safety impacts from increased mold, and sediment and pollution runoff into local water bodies**

The City uses this process to think through not only how the climate is expected to change, but to anticipate for how those changes might affect residents, businesses, property and infrastructure.

The impact statements cover infrastructure, natural environment, public health and safety, and more. They have been organized by climate event to help the City and community better understand each impact.

Climate events can include:

- Increase in temperature (fall, winter, spring)
- Drier conditions (summer)
- Increasing extreme summer temperatures and heatwaves
- Changes in precipitation (all seasons) and changes in Intensity-Duration-Frequency (IDF)
- More extreme weather
- Increased frequency and intensity of ice storms
- Increased frequency and intensity of windstorms
- Increased intensity and duration of extreme heat
- Local risks from non-local impacts (e.g. supply chain disruptions increasing food security risks)

Including both corporate and community climate change impact statements, over 70 were rescored and prioritized through this assessment.



Vulnerability Assessment

Vulnerability reflects two criteria:

- the **sensitivity** of the community to a given climate change impact,
- and its **adaptive capacity** (ability to respond, recover and/or cope).

For example, when it comes to flooding, sensitivity would include things like elevation (are you in a valley, or on a hill?) and building type (is your house made of a material that is more likely to get moldy?). Adaptive capacity would include things like whether or not you have a sump pump, insurance, or savings that can cover the cost of replacing damaged items or renovating damaged buildings.



Risk Assessment

Risk is the combination of the probability of an event occurring and its negative consequences, expressed as Risk = likelihood x consequence. In this case, likelihood is the probability of an impact occurring, and consequence is the known or estimated outcomes of that impact.

Risk = likelihood x consequence

To use the flooding example again, the likelihood of extreme rainfall that could lead to flooding is relatively high, though would depend somewhat on stormwater control measures. The consequences of that flood would depend on things like if you are living in a basement apartment, or if you own an unfinished basement and used mostly to store low-value items, for instance.

The reassessment included three activities:

1. Community Vulnerability & Risk Reassessment Survey through Engage Hamilton

The survey provided participants the opportunity to change previous scores they felt were inaccurate. The webpage also included an infographic on the main findings of the updated Climate Science Report as well as a reference tool to aid users in their rescoring.

2. Facilitated online Vulnerability & Risk Reassessment Mini-Workshops

Community stakeholders with an equity focus were invited to re-score a group of impacts most relevant to them and brainstorm possible consequences, adaptive actions and barriers to those actions associated with each chosen impact. Andrea McDowell of the City of Hamilton's internal core team facilitated a total of six such workshops.

3. Corporate Vulnerability & Risk Reassessment (completed via e-mail-distributed worksheets)

To conduct the corporate reassessment, materials were distributed to relevant departments. These materials included a slide deck with essential background information on the project as well as an overview of relevant terms, a comprehensive list of previous corporate impacts and scores, and a spreadsheet containing reassessment instructions and fillable cells in order to complete rescoring.