

# Burlington's Climate Adaptation Plan

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ENVIRONMENT, INFRASTRUCTURE AND COMMUNITY SERVICES MEETING

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MARCH 4, 2021

# Overview

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Background

Climate projections and impacts

Climate adaptation plan – process

Next steps

# Climate Mitigation vs. Adaptation

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## Mitigation

- Addresses the root causes of climate change: **to reduce GHGs**
- Burlington's council approved carbon neutral goals
  - 2040 – corporate emissions
  - 2050 – community emissions

## Adaptation

- Taking action to **reduce a community's vulnerability to the impacts of climate change**
- Living with the new normal

Council  
Direction and  
Support for  
Climate  
Adaptation Plan

*Burlington's Strategic Plan 2015-2040*

A Healthy and Greener City improves energy efficiency, protects the natural environment and **mitigates climate change impacts**

*From Vision to Focus 2018-2022*

Focus Area 3: Supporting Sustainable Infrastructure and a  
**Resilient Environment**

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*Climate Emergency Declaration – April 2019*

... deepening our commitment to **protecting our economy, environment and community from climate change**

...applying a **climate lens** to City plans and actions including the Council strategic workplan and future budgets

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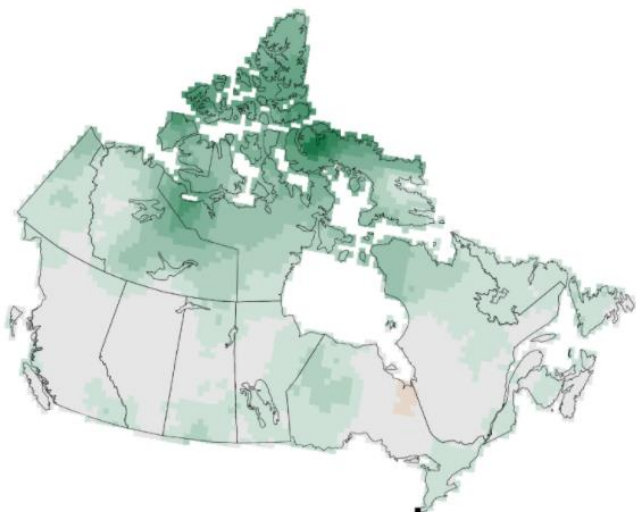
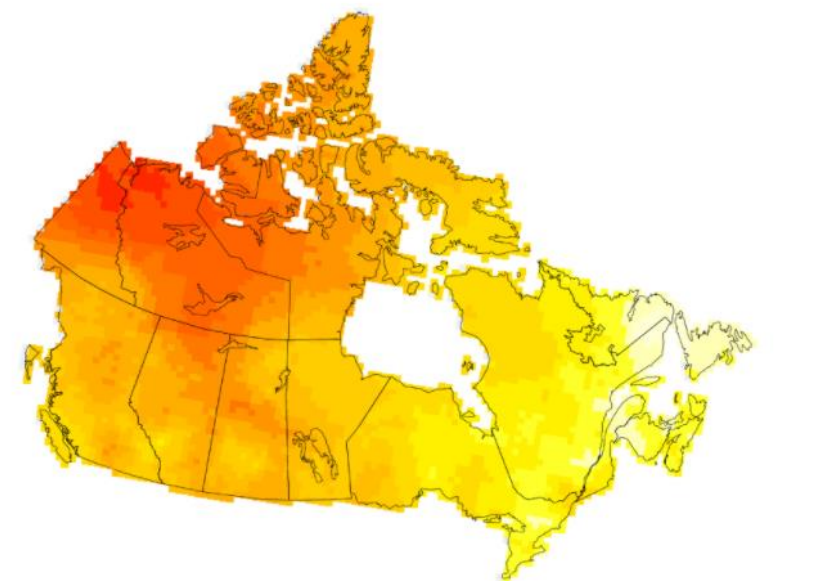
*City joins Global Covenant of Mayors (GCoM) – Dec '19*

The background is a stylized illustration. The left side is a solid orange-to-yellow gradient. The right side is a light blue sky with white clouds, white rain falling diagonally, and a white house silhouette. The bottom of the slide is a solid green band.

# Climate Projections and Impacts

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# Global and National Change



- World has warmed about 1°C from preindustrial levels due to human activities
- Canada has warmed 1.7°C between 1948-2016, about double the global rate
  - Canada's north warmed 2.3°C
  - Annual precipitation rates and extreme events – more frequent and intense

**2020 Tied for Warmest Year on Record, NASA Analysis Shows**

# Climate Projections for Burlington Region

## Emission Scenarios

- “Low” – stabilizing without overshoot
- “High” – continued rising

## Timelines

- Baseline – 1976-2005
- Immediate future – 2021-2050
- Near future – 2051-2080

## Climate Categories

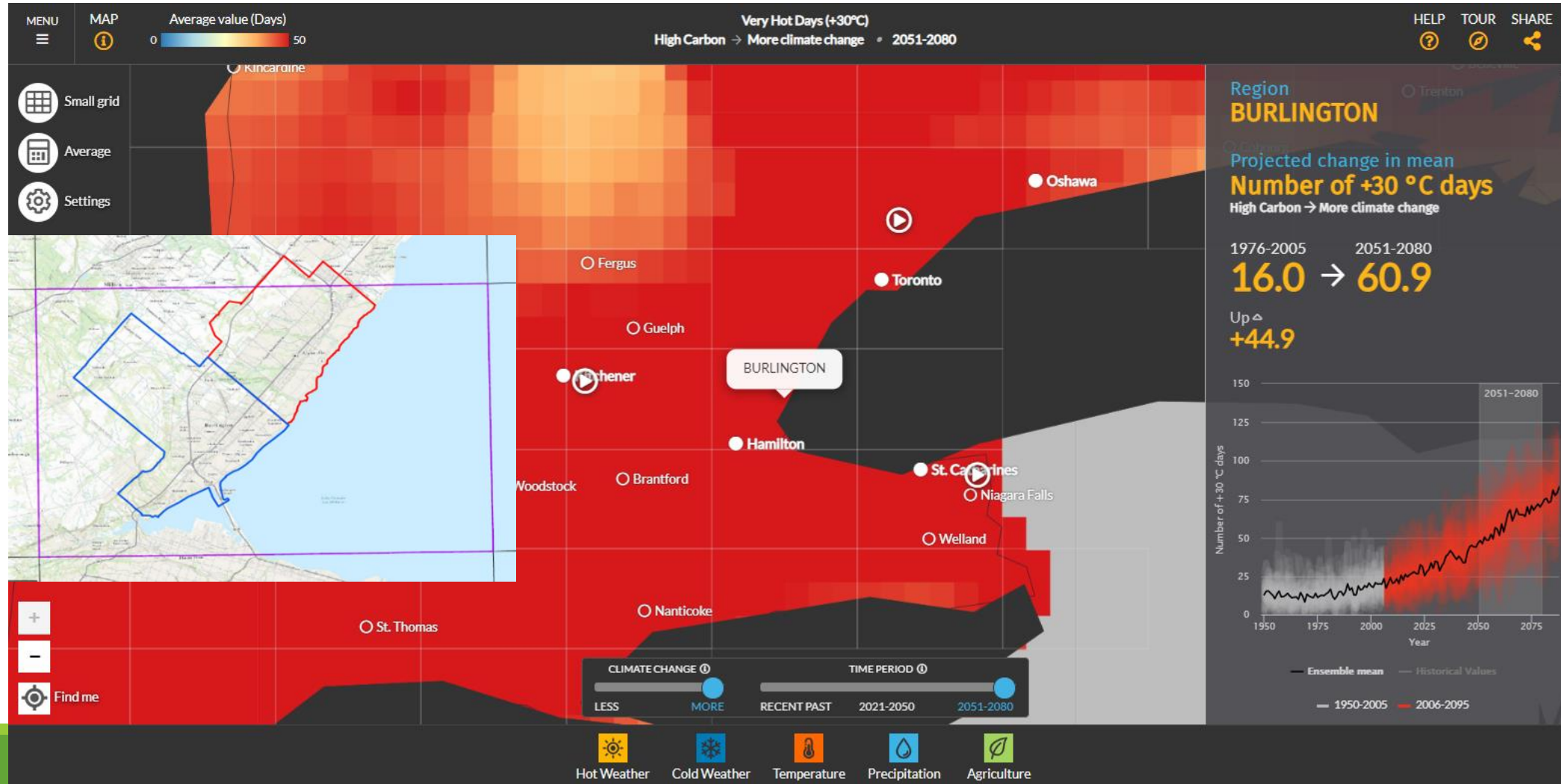
- Temperature, Hot Weather, Cold Weather, Precipitation, Agriculture, Extreme Weather, Lake Ontario
- 40+ climate variables



Prepared by: City of Burlington, Town of Oakville and ICLEI Canada  
January 2021



# Climate Projections for Burlington











Warmer, Wetter, Wilder

# Local Climate Projections


High emissions, near future (2051-2080) scenario for warmer and wetter infographics




## WARMER SUMMERS




30°C days  from 16 to 60.9 days  
>20°C nights  from 8.1 to 44.8 days  
Average warmest max temp  from 34.2 to 39°C




## WARMER WINTERS




Average winter temp  from -3.4 to 1.3°C  
Average coldest min temp  from -20.8 to -13°C  
Mild winter days [ $<-5^{\circ}\text{C}$ ]  from 66.6 to 27.3 days




## WETTER



Annual precipitation  10%  
Spring precipitation  17%  
Winter precipitation  18%

## WILDER



More intense and extreme rainfall events   
Freezing rain  40% in 2050  
70km/h wind gusts  17% by 2046-2065

## Warmer

**annual** **+4.2°C** Rise in average **annual** temperatures  
(Baseline 8.6°C; Future scenario 12.8°C)  
\*w/out humidex

**winter** **+4.7°C** Rise in average **winter** temperatures  
(Baseline -3.4°C; Future scenario 1.3°C)

**+5.2°C** Rise in **minimum** **winter** temperatures  
(Baseline -7°C; Future scenario -1.8°C)

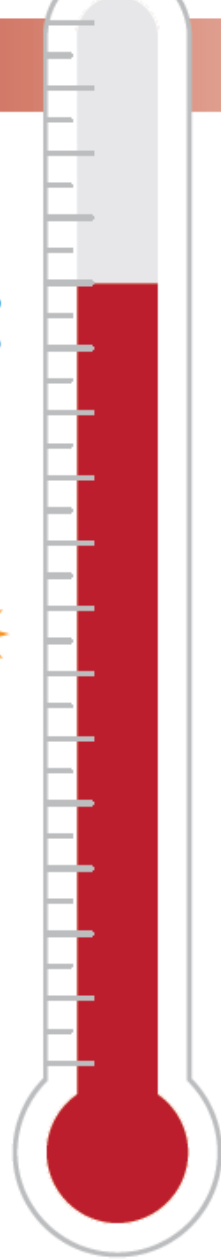
**summer** **+4.6°C** Rise in **maximum** **summer** temperatures  
(Baseline 25.7°C; Future scenario 30.3°C)  
\*w/out humidex

### Hottest day of the year

Baseline 34.2  
increasing to 36.5°C  
in 2021-2050

Expected to **reach 39.0°C**  
in 2051-2080

\*average w/out humidex

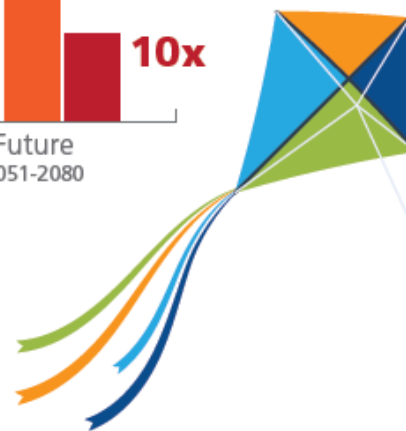
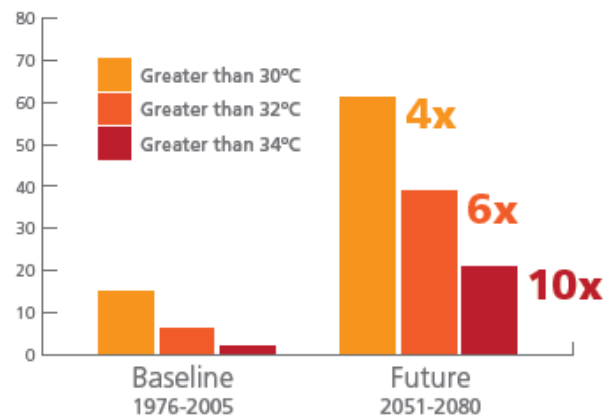


## Hot season almost doubled

(Baseline 70.5 days; Future scenario 123.7 days)

## Heat alerts and Heat waves

Annual number of and average length of heat waves are to increase



## Wetter

Increase in **heavy precipitation days over 10 & 20mm**

**Increased intensity, duration and frequency** (IDF) of precipitation events



## Windier and Wilder

Increase in **wind gusts over 70 & 90 km/hr**  
the threshold at which Environment Canada would issue a **High Wind Warning** in Ontario

**Freezing rain** to increase in winter months



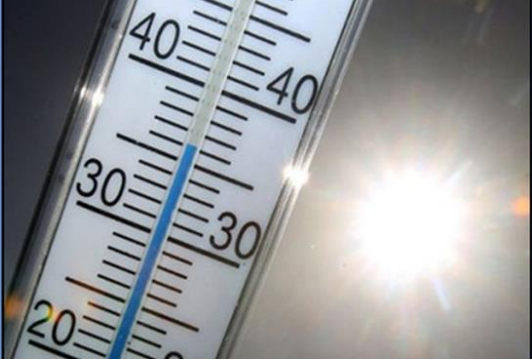
Fluctuating **great lakes levels**



Increased **thunderstorm activity** with increased temperatures







# Local Climate Impacts





# Local Climate Related Events



2002  
West Nile Virus  
in Halton



July 2013  
Extreme heat



Dec. 2013  
Ice storm



Aug. 2014  
Extreme rain  
and flooding



Jan 2014  
Extreme Cold



Nov. 2014  
High wind



March 2017  
High wind



Spring 2017  
High lake levels



Sept. 2017  
Extreme heat



Oct. 2017  
High wind



April 2018  
High wind



April 2018  
Ice storm



May 2018  
High wind



Summer 2018  
Extreme heat



Jan. 2019  
Extreme cold



March 2019  
Halton a risk  
area for Lyme  
disease



Spring 2019  
High lake levels



July 2019  
Extreme heat



Oct. 2019  
High wind



Dec. 2019  
High wind and  
freezing rain



July 2020  
Extreme heat



Nov. 2020  
Extreme heat




Nov. 2020  
High wind

# Climate Change Impacts Story Map

<https://storymaps.arcgis.com/stories/d3d173cc02b947bd909e326c4baaaf36>

 Climate Change Impacts



## Climate Change Impacts

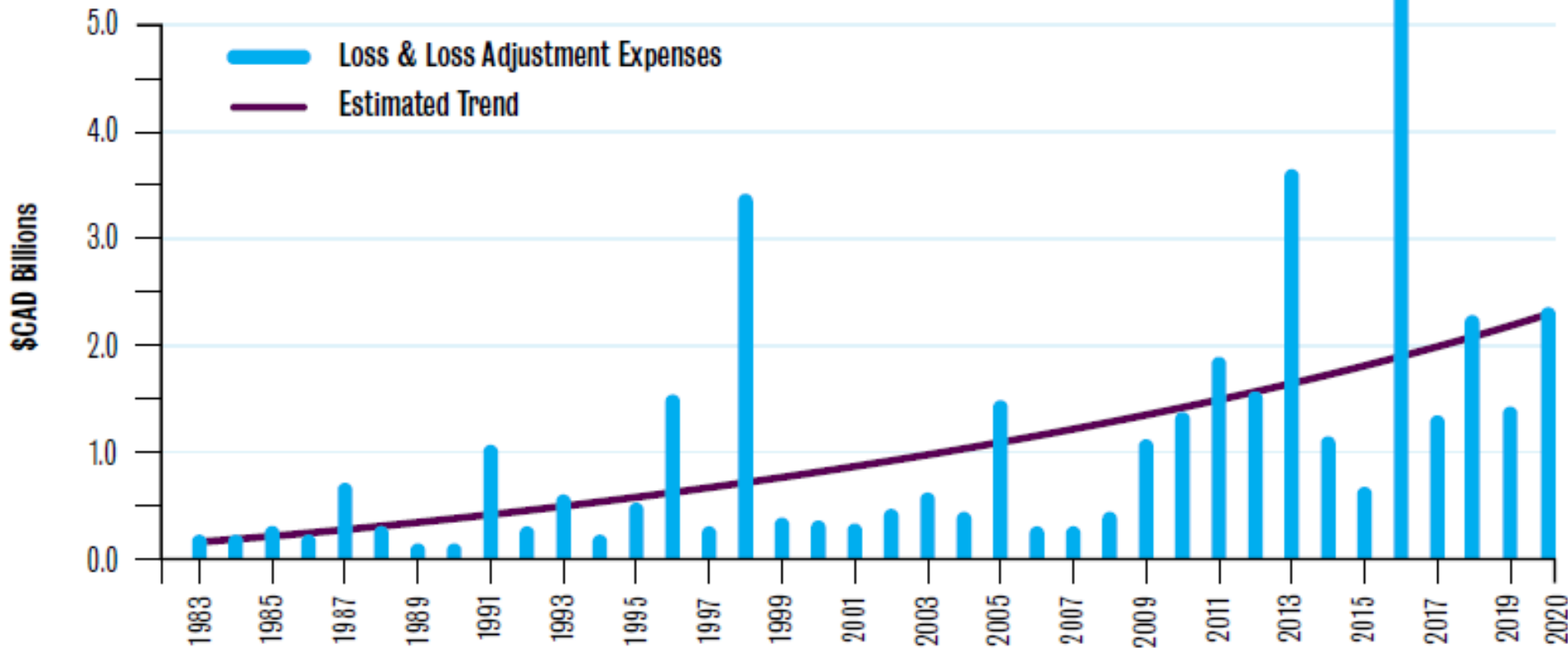
Burlington, Ontario

Warmer, Wetter and Wilder   Extreme Heat   High Winds   Rainfall   Lake Ontario   Freezing Rain   Extreme Cold   Vector-Borne Diseases   Credits and Acknowledgements

Our climate is changing. It is becoming warmer, wetter and wilder. No one is immune to the impacts of climate change.

The City of Burlington is developing its first Climate Adaptation Plan to help us better prepare for our changing climate. A **Climate Projections Report** was produced in January 2021 presenting Burlington's baseline data with future projections under lower and higher emission scenarios. About 40 climate variables are highlighted under the categories of temperature, hot weather, cold weather, precipitation, agriculture, extreme weather and Lake Ontario.

# Insured Catastrophic Losses in Canada



**Figure 1:** Catastrophic insured loss payments, Canada, 1983 – 2020. Total losses are normalized for inflation (\$2020 CAN) and per-capita wealth accumulation, as of November 2020. Source: CatIQ, PCS, IBC Facts Book.

*“The industry average premium for homeowner insurance has risen by 20 to 25% over the past five years in Canada. More than half of this increase is directly attributable to water damage and other extreme weather events. The remainder is due to the increase in insured values.”*

Patrick Barbeau, Senior Vice-president, Claims at Intact Insurance, March 2019.





# Mental Health & Time off Work Impacts of Flooding

## Higher worry and stress

- Within 30 days of flooded 47% of households vs. 11% of non-flooded households
- Three years after flood: 48% of households vs. 3% of non-flooded households
- Time off work following a basement flood = 7 days



## Stormwater Mgmt

Flood vulnerability & prioritization mitigation study  
B. plumbing fee reimbursem't prgm  
HR's enhanced basement flooding prevention subsidy  
Home flood protection prgm  
Creek erosion & maintenance ops  
Comprehensive & interim creek inspection prgm  
B. SW mgmt. design standards (2020)



## Emergency Preparedness

Hazard Identification and Risk Assessment  
Emergency management & continuity management program and bylaw  
Burlington Ready Committee Advisory Group  
Halton Region



## Heat

HR heat alert days  
B. working in hot weather corporate health & safety standard  
Extended outdoor pool hours  
Cooling centres



## Health

HR Health Dept  
Community Health - West Nile Virus and Lyme Disease



## Plans

Urban Forest Master Plan  
Official Plan  
Sustainable Building and Development Guidelines  
Asset Management and Financial Strategy  
Municipal Natural Assets Initiative  
Cootes to Escarpment Plan  
Parks, Recreation and Cultural Assets Master Plan  
Integrated Mobility Plan

# What are we doing?

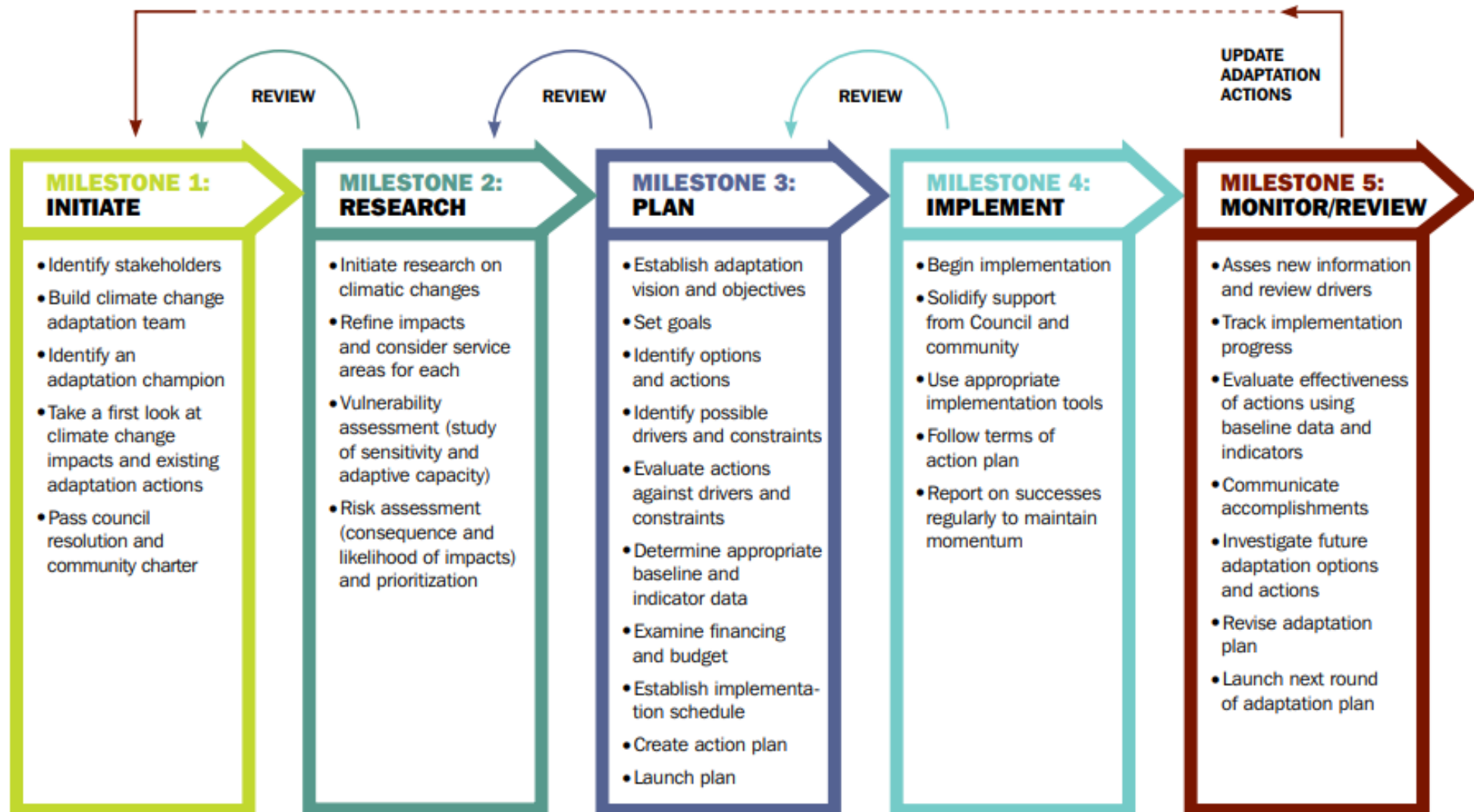


# Process

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# ICLEI Building Adaptive Resilient Communities (BARC)



Q1	Q2	Q3	Q4	Q1/Q2	Q2/Q3
<ul style="list-style-type: none"> <li>• EICS Mar 4 Report</li> <li>• Staff team first meets</li> <li>• RFP issued</li> </ul>	<ul style="list-style-type: none"> <li>• GIB page launched</li> <li>• Consultant retained</li> <li>• Community stakeholder team first meets</li> <li>• Climate impact statements</li> <li>• Vulnerability assessments</li> </ul>	<ul style="list-style-type: none"> <li>• Review results</li> <li>• Ongoing engagement activities</li> <li>• Risk assessments</li> </ul>	<ul style="list-style-type: none"> <li>• Risk assessments cont.</li> <li>• Review results</li> <li>• Ongoing engagement activities</li> <li>• Prioritize list of climate impacts based on results</li> <li>• Retain consultant to develop plan (pending funds)</li> </ul>	<ul style="list-style-type: none"> <li>• Draft plan</li> <li>• Report to Council</li> <li>• Ongoing engagement activities</li> </ul>	<ul style="list-style-type: none"> <li>• Final plan</li> <li>• Report to Council</li> </ul>

## Timeline (2021-2022)



# What's next?

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# Next steps

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Meet with staff team

Reach out to community stakeholder committee members

Get Involved Burlington page

RFP for stakeholder and community engagement





Thank you

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