



SUBJECT: Climate Resilient Burlington: A plan for adapting to our warmer, wetter and wilder weather

TO: Environment, Infrastructure & Community Services Cttee.

FROM: Environment and Energy

Report Number: EICS-12-22

Wards Affected: All

File Numbers: 210-09

Date to Committee: July 7, 2022

Date to Council: July 12, 2022

Recommendation:

Approve environment, infrastructure and community services department report EICS-12-22 regarding Climate Resilient Burlington: A plan for adapting to our warmer, wetter and wilder weather as presented in Appendix A.

PURPOSE:

Vision to Focus Alignment:

- Increase economic prosperity and community responsive city growth
- Improve integrated city mobility
- Support sustainable infrastructure and a resilient environment
- Building more citizen engagement, community health and culture
- Deliver customer centric services with a focus on efficiency and technology transformation

The purpose of this report is to present Climate Resilient Burlington: A Plan for Adapting to Our Warmer, Wetter and Wilder Weather for approval. As noted in more detail in [EICS-02-22](#), while directly aligned with Focus Area 3, specifically “Develop Burlington’s Climate Change Adaptation Plan,” this report identifies risks and vulnerabilities associated with our warmer, wetter and wilder weather and as such will have impacts on all focus areas.

Background and Discussion:

Climate Resilient Burlington (CRB): A Plan for Adapting to Our Warmer, Wetter and Wilder Weather was previously presented as a draft to the Environment, Infrastructure and Community Services Committee on May 5 ([EICS-02-22](#)) and made available for review on the Get Involved Burlington [CRB project page](#) between Apr. 22 and May 8 through six surveys. The purpose of the surveys was to collect feedback on:

- City of Burlington Actions – 32 actions were presented within five themes (one survey per theme)
- Citizen Action Checklists and potential future Community Climate Resilience Education Program (one survey)

A total of 94 surveys were completed ranging from 12 to 20 respondents per survey. Although the intent was to solicit feedback through the surveys, an additional 25 comments were also received on the online copy of the CRB plan.

The feedback was compiled in one document and staff responses were provided for each comment (Appendix B). Comments were generally positive and resulted in only a few minor modifications to the draft CRB plan presented in May. Many comments raised were either addressed in another section of the CRB plan or related to climate mitigation (greenhouse gas reductions) and reflected within the [Climate Action Plan](#).

Comments incorporated into the final CRB plan include:

- Removing the phrase “current emissions are tracking close to the RCP8.5 pathway.” A thorough explanation is provided in Appendix B.
- Modifying the map on page 2
- Adding another example “invasive species that survive our warmer winters” to the list of sample impacts noted on page 5
- Providing further direction in the Citizen Action Checklist regarding whether or not to stake new trees

Climate Resilient Burlington Plan

Climate Resilient Burlington (CRB): A Plan for Adapting to Our Warmer, Wetter and Wilder Weather (Appendix A) is Burlington’s first climate adaptation plan. However, due to extreme weather events experienced locally such as the 2014 flood, the City, Halton Region, Conservation Halton, homeowners and others have already taken, are currently taking, or plan to take measures to address some climate related risks, especially those associated with flooding. Such initiatives are identified in the CRB plan and were considered during the [Vulnerability and Risk Assessment](#) process (EICS-02-22).

The CRB plan identifies actions to manage the highest projected local risks of warmer, wetter and wilder weather. While CRB considered [Burlington’s climate projections](#) to the

years 2051-2080 under a high emissions scenario, the plan outlines actions to focus on for the next 10 years to build resilience and prepare for a changing climate. Implementing these actions will continue to shift the City from reactive to proactive measures with the goal of less damaging impacts to our infrastructure, services, environment, economy, and the health and well-being of the community.

CRB 10 Year Action Plan

The action plan component of the CRB is broken down as follows:

- Five themes aligned with [Canada's National Adaptation Strategy](#), currently out for public consultation through letstalkadaptation.ca and expected to be finalized later this year. The intentional alignment supports potential future monitoring and reporting requirements.
- Within each theme are one to three action groups. Each action group includes a goal and one or more indicators and targets for a total of 10 goals, 13 indicators and 13 targets.
- There are 32 actions in the plan. Each action includes:
 - Action type (assessment, partnership, plan, policy, procedure, program or project)
 - Timeline (ongoing, 1-2 years, 3-5 years, or 5-10 years)
 - Estimated additional cost to implement (low, medium or high)
 - Lead and supporting City department(s)
 - Community connections
 - Related initiatives

Below is a high-level summary by theme including the action group(s), goal(s) and actions.

Theme 1: Resilient Built and Natural Infrastructure

Group 1: Infrastructure Design and Life Cycle Management

- Goal: Manage infrastructure to prepare for future climate conditions and carbon neutral goals.
- Actions in this group relate to expanding and including natural asset data in Burlington's Asset Management Plan (AMP); integrating future climate impacts in Burlington's AMP; and reviewing and if necessary updating design standards for City infrastructure.

Group 2: Flood Management

- Goal: Enhance resilience of infrastructure exposed to high flood risk.
- Actions in this group relate to developing a lake shoreline flood management strategy augmenting existing plans to incorporate future climate impacts to protect City assets; enhancing creek flood protection plans; enhancing

emergency preparedness plans and communication of flood risk; and enhancing coordination with partner agencies and governments to manage flood risks.

Group 3: Service Disruption

- Goal: Invest in proactive measures to prepare for increased extreme events to avoid post-storm reactive costs.
- Actions in this group relate to post storm assessment tracking to inform recovery and future adaptation efforts; enhancing risk assessment protocol for trees in areas with above-ground powerlines, near major roads, fire stations, etc.; investing in backup power for City infrastructure; developing wind risk and vulnerability mapping; assessing snow management plan with a climate lens; and assessing the impacts of projected climate conditions on all recreation services.

Theme 2: Thriving Natural Environment

Group 1: Tree Management

- Goal: Reduce damage to trees while increasing the value of the services they provide.
- Actions in this group relate to investing in full tree life cycle management to improve tree survival outcomes; incorporating a climate lens in the Urban Forest Master Plan and supporting its implementation.

Group 2: Natural Area Management

- Goal: Value, conserve and enhance the multiple services that natural areas provide.
- Actions in this group relate to investing in green infrastructure and establishing a city-wide biodiversity plan.

Theme 3: Health and Well-Being

Group 1: Extreme Heat and Health

- Goal: Provide City services to support the community during extreme heat events.
- Actions in this group relate to programs supporting vulnerable populations during extreme heat events such as through access to public space cooling, water play, hydration, shade, feasibility of maximum indoor temperature thresholds, etc. which could be informed through an urban heat island assessment.

Theme 4: Disaster Resilience

Group 1: Community Capacity Building

- Goal: Build capacity in the community to prepare for and respond to more extreme events and long-term climate stresses.
- Actions in this group relate to enhancing emergency notification and communications; developing a community climate resilience education program; and enhancing funding and supports for community and neighbourhood social resilience programs.

Group 2: Citizen and Business Support Programs

- Goal: Encourage climate adaptation actions from citizens and businesses.
- Actions in this group relate to promoting and augmenting existing programs for home and business climate resilience retrofits and enhancing existing policies, programs and education for private stormwater management practices.

Theme 5: Strong and Resilient Economy

Group 1: Agriculture

- Goal: Support agricultural community in preparing for climate change.
- Actions in this group relate to pursuing the development of a Burlington Agricultural Action Plan and expanding opportunities to support local food production.

Group 2: Local Economy

- Goal: Support and develop resilient local supply chains to help withstand impacts associated with extreme climate events outside of Burlington.
- Actions in this group relate to assessing the feasibility of sourcing local and developing a business innovation ecosystem to test local products.

Monitoring and Reporting

An initial list of 13 indicators and targets, vetted through the City staff and community stakeholder teams, will track the plan's progress. Staff are flexible to add, remove or modify indicators in the future as necessary. Any changes will be included in the annual update report on the CRB plan to City Council.

Annual CRB plan updates also align with annual reporting requirements through the City's participation in the Global Covenant of Mayors for Climate and Energy ([GCoM](#)). Burlington received its [commitment badge](#) in 2020 and in 2021 its climate mitigation badges for assessment, goal and plan through the approval of the Climate Action Plan.

Staff hope to receive the climate adaptation assessment, goal and plan badges in 2022, pending the approval of the CRB plan by City Council. Staff will also continue to [report progress](#) through the Carbon Disclosure Project (CDP), a non-profit charity providing a global disclosure reporting platform for investors, companies, and governments, which also aligns with the GCoM reporting requirements.

Strategy/process

Burlington City Council declared a [climate emergency](#) in April 2019 “for the purposes of deepening our commitment to protecting our economy, environment and community from climate change” and to “apply a climate lens to the plans and actions of the City of Burlington including the Council strategic workplan and future budgets.”

The City has shown leadership on climate mitigation (reducing greenhouse gas emissions) by adopting the [Corporate Energy and Emissions Plan: 2019-2024](#) and the community [Climate Action Plan](#) and associated carbon neutral goals of [2040 for emissions from City operations](#) and [2050 for community emissions](#). Climate mitigation though is only one half of the climate change story. Climate Resilient Burlington (CRB): A Plan for Adapting to Our Warmer, Wetter and Wilder Weather (Appendix A) addresses the other half of the climate change equation: climate adaptation.

There were many steps involved in developing Burlington’s CRB plan including:

- Researching and presenting the [Climate Projections for Burlington](#) in March 2021 through [EICS-03-21](#) report;
- Creating a [Climate Impacts Story Map](#) to highlight Burlington’s climate projections in a user friendly format;
- Developing climate impact statements with staff and community stakeholder input;
- Assessing sensitivity, lack of coping capacity and vulnerability; and assessing consequences, likelihood and risk which fed into the Vulnerability Risk Assessment presented in [EICS-02-22](#);
- Determining priorities for action planning through a series of workshops; and
- Presenting the draft CRB plan ([EICS-02-22](#)) on May 5, 2022.

Options Considered

Not adapting is not an option. While the City is currently implementing both the [Corporate Energy and Emissions Plan](#) and the community [Climate Action Plan](#), those plans only address one half of the climate change issue. The other half is adaptation. While we need to continue to work on reducing our greenhouse gas emissions, we must also recognize that we are already locked into a changing climate. As such we need to simultaneously prepare for warmer, wetter and wilder weather.

When David Phillips, Senior Climatologist from Environment and Climate Change Canada presented "[Weather and Climate: It's Not What Our Grandparents Knew](#)" he stated that "climate change is not about slushy winters and earlier springs. It's about greater extremes and greater variability. Those are going to beat us up when our climate changes even more dramatically than now. If recent years have taught us anything is to expect the unexpected!"

Financial Matters:

Total Financial Impact

Climate Resilient Burlington was completed within the Council approved budget.

Source of Funding

\$60,000 was from the Tax Rate Stabilization Reserve Fund, approved in the 2020 operating budget. The rest was diverted from funds dedicated for the home energy retrofit project (EICS-03-21) due to the successful FCM application for that project.

Other Resource Impacts

The CRB plan involved significant time to develop, due to the bottom up approach to ensure buy-in throughout the process. While Sustainability staff will be reporting back annually on progress, the actions within the plan involve multiple lead and supporting City departments and service areas. Where additional funding is required to implement actions, requests will be brought forward through the budget process both within service areas and as separate business cases and capital initiatives. In addition, to keep up with the changing climate science and associated risks and vulnerabilities, the City will revisit and renew the CRB plan every five years, pending budget approval.

Cost of climate change

As noted in detail in [EICS-02-22](#), it is [more economical](#) at the local level to be proactive and invest in climate adaptation than to respond to disasters. Severe weather has already impacted the City such as the Aug. 4, 2014 flood when over 3,000 homes were flooded with \$90 million in insured claims. As a result, an additional \$20.4 million was added to the capital budget for stormwater management updates. Since 2014, the City has also offered the [Plumbing Permit Fee Grant Program](#) at a cost of over \$393,000. This program, which waives building permit fees associated with reducing the risk of basement flooding, also supports Halton Region's [Enhanced Basement Flooding Prevention Subsidy Program](#) which has provided [\\$2.95 million](#) in subsidies since 2016. In addition, the City budgets for and delivers several initiatives to support climate

resiliency including forestry services; cooling centres; outdoor pools, splash pads and water refilling stations; emergency relief centres; back-up power for facilities; etc.

Wind storms have also impacted the City requiring resources for post storm cleanups, including the May 21, 2022 storm where 22,000 Burlington Hydro customers lost power.

[Weather related insurance claims](#) have grown exponentially with the Insurance Bureau of Canada reporting that in [2021](#) severe weather caused \$2.1 billion in insured damage and global losses from natural disasters reached \$355 billion. In addition to insured losses, there are also [uninsured losses](#) incurred by government, businesses and individuals. It has been reported that for every \$1 of insured losses, there are \$3 to \$4 of uninsured losses.

In December 2021, the Financial Accountability Office of Ontario released a [report](#) on public buildings in Ontario estimating a cost increase of 8.2–14.5% over current costs to maintain assets in a state of good repair under future climate conditions.

Climate Implications

In February 2022, the International Panel on Climate Change’s Working Group II released “[Climate Change 2022: Impacts, Adaptation and Vulnerability](#)” as part of the Sixth Assessment Report. They noted “climate change is affecting nature, people’s lives and infrastructure everywhere. Its dangerous and pervasive impacts are increasingly evident in every region of our world.”

In May 2022, the discussion paper “Preparing for Climate Change: [Canada’s National Adaptation Strategy](#)” was released for public comment. This document highlights the urgent need for climate adaptation action with people living in Canada already witnessing and experiencing climate impacts.

[Impacts](#) experienced in Burlington include:

- Damage to creek infrastructure due to erosion from extreme storms;
- Damage to roads and other infrastructure due to freeze-thaw patterns, extreme precipitation, intense heat, etc.;
- Impacts to transportation network and economy due to flooding and high wind events closing roads;
- Increasing demand for services such as splash pads and water fountains due to increased extreme heat events;
- Use of facilities as warming, cooling or evacuation centres;
- Flooded roads, parks, sports fields, paths and basements;
- Damaged or diseased trees due to ice storms, high wind events and drought;

- Health impacts from extreme heat and vectors such as infected blacklegged ticks which carry Lyme disease; and
- [Impacts to mental health](#) due to extreme events.

Preparing for Climate Change: [Canada's National Adaptation Strategy](#) also stated that “climate impacts are complex and touch upon almost all aspects of society: emergency services, food production, housing and infrastructure, ecosystems, human health, supply chains and national security...posing serious risks to the well-being and livelihood of people and communities. The impacts also build upon each other and lead to additional effects such as increased demand for emergency assistance, loss of biodiversity, reduced food and economic security, and increased demands on physical and mental health services. Climate change impacts worsen existing inequalities and vulnerabilities and multiply existing hazards – meaning some people living in Canada are more at risk or more exposed.”

As noted by David Phillips, Senior Climatologist at Environment and Climate Change Canada, at the [Oct. 27, 2021 public event](#), “no place in Canada will look the same in 40 years as it does today. We have moved from climate and its averages to weather and its extremes. Weather is changing faster than we can adapt to it and we cannot afford not to factor it in as it's affecting our cost of living, economic indicators, etc. Our motivation to do something about it should be based not on what we've seen but what we're going to see. We need to move from a culture of disaster recovery to one of risk preparedness.”

Engagement Matters:

City Staff and Community Stakeholder Teams

The plan was developed using a bottom up approach primarily with two teams comprised of City staff and community stakeholders which were formed in early 2021. Several meetings were held (four with staff and two with community) prior to hiring the consultant Associated Engineering and subconsultant All One Sky Foundation in June 2021. Between September 2021 and January 2022, 15 two to three-hour online workshops were hosted by the consultants for staff and community stakeholders. This approach, involving staff and community stakeholders throughout the process, helped ensure momentum, buy-in and ownership of the actions in this plan.

Community Engagement

Community members were encouraged to participate in the process by:

- Visiting the public facing project page at getinvolvedburlington.ca/crb.

- Listening and asking questions at the public project launch on Oct. 27, 2021 with keynote speaker David Phillips, Senior Climatologist, Environment and Climate Change Canada, who presented “[Weather and Climate: It’s Not What Our Grandparents Knew.](#)”
- Providing feedback during two surveying periods between Oct. 27 and Nov. 14, 2021 and Apr. 22 to May 8, 2022.
- Delegating to City Council when this project was on the agenda: March 2021 ([EICS-03-21](#)), May 2022 ([EICS-02-22](#)) and July 2022 (EICS-12-22).

There were also 13 blog posts published at [TakeActionBurlington.ca](#) since March 2021 which referenced the CRB plan.

For further information regarding the engagement process to develop Climate Resilient Burlington, refer to Appendix E of report [EICS-02-22](#) and [getinvolvedburlington.ca/crb](#).

Conclusion:

Recognizing that even if carbon neutrality is achieved today, greenhouse gases already emitted will remain in the atmosphere and continue to impact our climate for the foreseeable future. As such, it is imperative that we plan for the weather we are going to see and continue to transition from disaster response to risk preparedness if we want Burlington to remain a desirable, liveable, healthy and safe community.

Respectfully submitted,

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Appendices:

- A. Climate Resilient Burlington: A Plan for Adapting to Our Warmer, Wetter and Wilder Weather, July 2022
- B. Climate Resilient Burlington: Community Responses to Six Surveys Regarding the Draft Plan, May 2022

Report Approval:

All reports are reviewed and/or approved by Department Director, the Chief Financial Officer and the Executive Director of Legal Services & Corporation Counsel.