
TO: GENERAL COMMITTEE

SUBJECT: CLIMATE CHANGE ADAPTATION STRATEGY

WARD: ALL WARDS

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RECOMMENDED MOTION

1. That the Climate Change Adaptation Strategy as identified in Staff Report ENG003-17 be approved to guide future planning and development within the City of Barrie.

PURPOSE & BACKGROUND

2. Today, the impact of climate change is being felt in communities across the country. The City recognizes that climate change will impact both the community and City Operations. In 2016, the City initiated development of a Climate Change Adaptation Strategy.
3. The purpose of this Staff Report is to obtain Council endorsement of the Climate Change Adaptation Strategy. Through the endorsement, Council is solidifying its commitment to Climate Change Adaptation Planning.
4. The Climate Change Adaptation Strategy has been developed following ICLE-Canada's (Local Governments for Sustainability) Building Adaptive and Resilient Communities (BARC) Five Milestone framework. This methodology moves participating local governments through a series of progressive steps where each milestone builds off the findings of the one before. The City used the BARC methodology as it is an established and validated national program focused on resilience and adaptation. It offers a comprehensive way to respond to the impacts of climate change, develop and implement an adaptation plan, and protect the people, property, and prosperity of the community.
5. With Council endorsement of the Adaptation Strategy the City will have successfully completed Milestones 1-Initiate, 2-Research and 3-Plan of the Five Milestone framework.
6. The Climate Change Adaptation Strategy can be viewed at (<http://www.barrie.ca/Living/Environment/Pages/Climate-Change.aspx>). In addition, the presentation to Council will be posted for reference at the same location.

ANALYSIS

7. The City of Barrie has already taken several measures to become more sustainable in the face of climate change. In 2001, the City of Barrie committed to the Partners for Climate Protection Program, a network of more than 126 Canadian municipal governments who have committed to reducing greenhouse gases and acting on climate change. In 2006, the City developed a Greenhouse Gas Inventory and Community Energy Plan, which outlines the historical impact of Barrie's operations on greenhouse gas emissions, and how the City intends to take action by setting greenhouse gas reduction targets. Further efforts were made towards sustainable energy and greenhouse gas reductions in October 2012, when Council adopted the Energy Management Plan (2012-2017). Responding to climate change is a two-part approach. While reducing greenhouse gas emissions is important to address the root causes of climate change, adaptation is also important in addressing the symptoms.
8. In 2016, the City retained ICLEI Canada to complete Milestones 1-3 of the BARC framework and develop the Climate Change Adaptation Strategy. The planning process was complimented by extensive cross-departmental and community engagement. This ensured that impacts and actions identified were a priority both to the City as well as the community as a whole.
9. The Climate Change Adaptation Strategy identifies potential impacts of climate change in Barrie, and the risk they pose to our various service sectors and community. The impacts of climate change will be cumulative and synergistic. They will affect physical, social, economic and ecological systems.
10. To address the broad spectrum of impacts a series of overarching goals were developed to guide the action planning process. The goals identified include:
 - a) Maintain Public Health and Safety;
 - b) Minimize Risks to Buildings and Properties;
 - c) Strengthen Infrastructure Resilience;
 - d) Help Local Businesses and the Tourism Industry Adapt to Changing Conditions;
 - e) Protect Biodiversity and Enhance Ecosystem Functions;
 - f) Minimize Disruption to Corporate Services; and
 - g) Build Community Resilience.
11. The Climate Change Adaptation Strategy identifies fifty-nine (59) priority actions to undertake to reduce risk and vulnerability, associated with the anticipated and expected impacts of climate change. See Appendix A.
12. Engaging the Barrie community was an important part of developing the Climate Change Adaptation Strategy. A stakeholder advisory group was formed to provide an on-going forum for advice, feedback, and guidance to staff at key points during the planning process. In addition, broader community feedback was solicited through a series of "pop-up" events in the summer/fall of 2016, and a public open house in December. In addition, community members were able to provide feedback through an online survey located on the project webpage.
13. In order to ensure that the actions outlined in the strategy are implemented in line with the vision for the City of Barrie, a series of guiding principles for implementation were developed. These guiding principles will be integrated into the implementation planning process.

- a) Sustainable: wherever possible, actions should enhance mitigation efforts, and should not be maladaptive or unsustainable.
 - b) Effective: Actions which are effective for a wide range of plausible future scenarios should be prioritized.
 - c) Integrated: Wherever possible, implemented actions should contribute to other goals and/or programs in the community.
 - d) Inclusive: Implementing actions should involve multiple city government departments, stakeholders, and community partners.
 - e) Iterative: The implementation of actions should be informed, adjusted, or refined as new information becomes available or circumstances change.
14. The focus of 2017/2018 is to work towards Milestones 4-Implement and 5-Monitor and Review by developing an implementation plan and beginning implementation of some quick win actions. The Implementation Plan will outline the details of how the City is going to achieve the actions outlined in the strategy, identify community partners, and determine how we will report back on the implementation of the adaptation plan. Collaboration and partnerships will be key to the successful implementation of the adaptation actions.

ENVIRONMENTAL MATTERS

15. Many of the anticipated and expected impacts of climate change will affect the natural environment ranging from flooding, erosion, spread of invasive species, water quality deterioration, tree damage, environmental destruction, beach closures, stress on native flora and fauna. The Climate Change Adaptation Strategy acknowledges the intrinsic value of ecosystems and their contribution to the quality of life in Barrie; and contains a goal focused on protecting biodiversity and enhancing ecosystem functions.
16. In addition, many of the actions outlined under the remaining goals also support protecting the environment including but not limited to:
- a) Obtaining blue flag certification for all Barrie beaches;
 - b) Enhancing shade canopy;
 - c) Promoting lot level stormwater controls;
 - d) Increasing natural and forested areas, increase the use of low impact development technologies; and
 - e) Updating policy and standards regularly to reflect new green technologies.

ALTERNATIVES

17. There is one Alternative available for consideration by General Committee.

Alternative #1

General Committee could choose to not adopt the Climate Change Adaptation Strategy.

This Alternative is not recommended as there is a need to formally prepare for the vulnerability and risks associated with climate change from both a community and municipal perspective.

FINANCIAL

18. Being proactive and integrating climate change considerations into the decision making framework to address both the anticipated and expected impacts can save money; and protect the well-being of the Barrie community. In general, anticipatory adaptation to climate change will incur lower long-term costs and be more effective than reactive responses. Taking practical steps to adapt now using the best information available will enable the reduction of future risk while realizing some near term benefits.
19. Integrating climate change considerations into the capital planning process is critical to minimizing risks, understanding lifecycle requirements, off-setting costly emergency repairs and response, infrastructure upgrades, and to build resiliency.

LINKAGE TO 2014-2018 STRATEGIC PLAN

20. The recommendation(s) included in this Staff Report support the following goals identified in the 2014-2018 Strategic Plan:
 - Vibrant Business Environment**
 - Responsible Spending**
 - Well Planned Transportation**
 - Inclusive Community**
21. Adopting the Climate Change Adaptation Strategy supports Council' Strategic Plan for the City. As our climate continues to change it becomes increasingly apparent that there is a need to pro-actively adapt and integrate climate change considerations into the decision making process. There is a high probability of risk occurring to City of Barrie services and the community given the extreme weather that has caused flooding and erosion issues within the City. The vision, goals and actions outlined in the Climate Change Adaptation Strategy identify the steps and opportunities the City needs to act on to remain a vibrant, healthy and sustainable waterfront community.

Appendix "A"



CROSS CUTTING ACTIONS

Cross cutting actions are actions that are applicable across a variety of Goals. For this Strategy, these actions primarily refer to integrating climate change considerations into existing plans, policies, and frameworks. Factoring climate change into Barrie's programs, plans, and policies is one of the most important ways the City can contribute to adaptation, while also supporting the planning and decision making processes.

Integrating climate change across the corporation provides a more sustainable, effective, and efficient uses of resources. Rather than designing and managing climate policies separately from ongoing activities, integrating actions allows adaptation to be looked at holistically.

CROSS CUTTING ACTIONS

- CC.1 Incorporate climate change into the City's Official Plan.
- CC.2 Integrate climate change considerations into Barrie's existing plans and policies (e.g. Multi-Modal Transportation Plan, Transportation Master Plan, Emergency Management Plan, etc.)
- CC.3 Develop education initiatives to lead and encourage awareness of climate change for Barrie residents, businesses, and City staff. When possible, integrate these initiatives into existing programs and communications.





GOAL 1: MAINTAIN PUBLIC HEALTH AND SAFETY

Climate change comes with great public health and safety concerns. Over the coming decades, Barrie will experience more severe and potentially threatening weather and climate phenomena such as extreme heat, extreme cold, and freezing rain events. As well, impacts due to vector-borne diseases (e.g. West Nile and Lyme disease) are expected to increase in the future and have direct

implications for the health and safety of residents. Everyone will be affected by climate change, but vulnerable communities in Barrie including children, the elderly, and homeless, those with special existing health conditions may be particularly affected. In the face of a changing climate, the City of Barrie is committed to maintaining the health, safety, and wellness of the whole community.

GOAL 1 ACTIONS

- 1.1 Improve communications to the public regarding road conditions and safety during extreme weather events.
- 1.2 Continue working towards blue flag certifications for all Barrie beaches.
- 1.3 Communicate beach closures or swimming advisories to the public.
- 1.4 Support the continued implementation of Barrie's Geese Management Program.
- 1.5 Require adherence to the Threshold Limit Values (TLVs) for Heat Stress and Heat Strain recommended by the Ministry of Labour (via safety talks, education and training of staff) to reduce heat stress and maintain productivity.
- 1.6 Partner with Simcoe Muskoka District Health Unit to address climate change considerations in food-security communications and programming.
- 1.7 Consider impacts and risks of increased disease vectors in design of stormwater infrastructure (e.g. avoiding ponding/standing water).





GOAL 2: MINIMIZE RISKS TO BUILDINGS AND PROPERTIES

In recent years, the City of Barrie has experienced increased incidences of basement flooding, cracked building foundations, and damaged landscapes. The impacts have come as a result of changing climate conditions, which have manifested as more frequent extreme weather events, overland flooding, and changes to freeze thaw cycles. These changing

conditions will affect the ways in which buildings and landscapes are designed, constructed, managed, and maintained. The City of Barrie is dedicated to minimizing risks from climate change to buildings and properties in order to protect public health and safety, and reduce costs incurred by property owners.

GOAL 2 ACTIONS

- 2.1 Support the promotion and marketing of Barrie's Sanitary Sewer Inflow Reduction Rebate (SSIRR) program to improve uptake of storm water best management practices.
- 2.2 Develop an education and incentive program to promote lot level storm water controls (e.g. rain barrels, rain gardens, down spout disconnections, etc.).
- 2.3 Evaluate and recommend opportunities for increased storm water management during park redesign and in new parks to reduce flooding risk.
- 2.4 Promote higher building standards which reflect newest climate projections by updating by-laws, development guidelines, and zoning regulations.





GOAL 3: STRENGTHEN INFRASTRUCTURE RESILIENCE

Recent climate events have offered insight into what continued changes might mean for Barrie's infrastructure: increased intensity of rainfall, runoff, and erosion leading to wash-outs on roads, shoulders, and bridges; more frequent freeze-thaw cycles, soil instability, and ground movement causing damage to roads, sidewalks, and underground infrastructure; and more extreme weather events leading to direct physical damage to infrastructure.

Recognizing that climate change will put additional stress on Barrie's critical green and grey infrastructure, the City is committed to strengthening the resilience of its infrastructure systems to climate change and other non-climatic factors (e.g. land-use changes, population growth, aging infrastructure) to prevent disruptions of essential services and ensure the safety of the community.

GOAL 3 ACTIONS

- 3.1 Increase staff and/or resources to repair potholes.
- 3.2 Increase natural and forested areas within sub-watersheds with high surcharge and runoff.
- 3.3 Increase low impact development technologies throughout the City and update engineering policy and standards accordingly.
- 3.4 Explore possibilities of incorporating storm water management measures along existing developed watercourses to reduce system surcharge and overflow where required.
- 3.5 Develop and implement a plan to regularly update the design Intensity Duration Frequency (IDF) curve to reflect the geographic areas of the municipality.
- 3.6 Update the inflow and infiltration reduction program as required.
- 3.7 Develop and implement a comprehensive maintenance and inspection program and manual for storm water works.
- 3.8 Enforce the site alteration by-law including erosion and siltation requirements.
- 3.9 Conduct storm water drainage area inspections to identify areas of potential risk for debris blockage and dams.
- 3.10 Develop an inspection policy for high risk infrastructure to identify any damage from events.
- 3.11 Investigate and apply methods of incorporating climate change considerations into infrastructure (grey, green, and urban forests) asset management.
- 3.12 Develop a policy for regularly updating infrastructure design and retrofit standards repairs to reflect new climate change projections and green infrastructure technologies.
- 3.13 Investigate and explore opportunities to collect and recycle water and storm water for further use in future buildings and developments.
- 3.14 Update engineering policy and standards to consider new and emerging green technologies to manage storm water in new developments.
- 3.15 Explore the possibility of a storm water utility in Barrie to manage and operate storm water infrastructure.
- 3.16 Upsize storm water infrastructure as part of renewal (where possible).





GOAL 4: HELP LOCAL BUSINESSES AND THE TOURISM INDUSTRY ADAPT TO CHANGING CONDITIONS

Climate change can pose significant risks to businesses, not only for their operations, but also to their suppliers, employees, customers, and people living in the areas in which they operate. The City of Barrie will help local businesses and the tourism industry in adapting to climate changes in order to ensure their

continuity of operations, improve their ability to reduce and manage risk, and build and maintain a positive and proactive reputation within the community.

GOAL 4 ACTIONS

- 4.1 Improve communications to local businesses on their role in the maintenance of sidewalks and appropriate application rates or best management practices (outlined in the Smart About Salt Program) during freezing rain or snow events.
- 4.2 Assess new opportunities for different forms of business and tourism as a result of a changing climate.
- 4.3 Provide guidance to local business on how to maintain business continuity (e.g. supply chain) during extreme weather events.
- 4.4 Establish a local best practice network (e.g. business continuity, green business practices, adaptation measures) for businesses to build resiliency.





GOAL 5: PROTECT BIODIVERSITY AND ENHANCE ECOSYSTEM FUNCTIONS

Climate change affects ecosystems directly by creating favorable climatic conditions for the spread of invasive species, causing environmental damage due to extreme weather events, while simultaneously interacting with other human stressors. The increase in rainfall intensity leading to overburdened stormwater ponds, or the increased frequency of winter

events requiring the use of de-icing substances are a few of the many examples where added stress will have cascading effects on water quality and ecosystem functions. Acknowledging the intrinsic value of ecosystems and their contributions to the quality of life in Barrie, the City will take steps to further protect and enhance ecosystems functions and services.

GOAL 5 ACTIONS

- 5.1 Collect data on the urban canopy to develop baseline information and direction for a future Urban Forest Management Plan.
- 5.2 Develop municipal by-laws, standards, and permitting processes to advocate/enhance green space, green roofs, and tree canopy on private and public properties.
- 5.3 Develop an Urban Forest Management Plan with specific greening strategies for areas of the City where tree canopy/greenspace is low.
- 5.4 Support the identification and mapping of invasive species as part of the Urban Forest Strategy.
- 5.5 Develop partnerships and funding strategies to control non-native invasive species.
- 5.6 Increase education and communication to public about invasive species (e.g. dog strangling vine, garlic mustard, round goby, zebra mussels, and quagga mussels).
- 5.7 Promote the planting of native vegetation along lakes, creeks and ravines to reduce erosion risk, maintenance needs, and enhance local biodiversity.
- 5.8 Support the implementation of the Smart About Salt program to reduce salt used by the City, businesses and residents.





GOAL 6: MINIMIZE DISRUPTION TO COMMUNITY SERVICES

The more frequent occurrence of extreme weather has the potential to hinder people's routines and day-to-day activities, while posing safety-related risks to those driving or utilizing outdoor recreational spaces such as waterfront and community park pathways. Recognizing that the ability of the City to efficiently deliver services to the residents

will be under pressure due to changing climatic conditions, the City of Barrie will take measures to ensure that the needs of the community are met, and any disruption to core services are minimized.

GOAL 6 ACTIONS

- 6.1 Develop a communication tool (e.g. an app) which tells residents the plowing/sanding/salting status of roads in order to better plan routes for driving in hazardous conditions.
- 6.2 Mandate the use of snow tires on all City vehicles during winter months.
- 6.3 Encourage the pre-treatment of roads (using brine or alternatives) to reduce the amount of salt used during freezing rain/snow events.
- 6.4 Continue to implement winter control measures (snow removal and de-icing) on waterfront park and community park pathways and parking lots.
- 6.5 Ensure communication plans are in place between departments (e.g. Environmental operations, Roads, Parks, and Fleeer, Facilities) to provide efficient clean-up after an extreme weather event.
- 6.6 Develop strategies to reduce wind pressure (e.g. tree planting, pedestrian sheltering, etc.) especially around the marina and on north/south roads.
- 6.7 Increase preventative maintenance and inspection of trees on public property (e.g. tree pruning, removal of diseased/hazardous trees, proactive planting) in order to reduce damage caused by extreme weather events to the urban forest.
- 6.8 Expand Barrie's Road Weather Information System (RWIS), and use of road pucks to monitor road conditions to enhance winter maintenance actions.
- 6.9 Develop teleworking and other alternative work arrangements (e.g. Stay-at-home days/shifted/flex) that eliminate commuting during extreme weather events and hazardous road conditions.





GOAL 7: BUILD COMMUNITY RESILIENCE

Climate change poses a variety of risks to the community, ranging from flooding, to extreme heat and cold, to habitat loss, and property damage. To ensure that the City of Barrie is able to withstand and recover from the impacts of climate change it is important to build and maintain the community's resilience. Building

community resilience in the context of this Strategy refers to actions that can be taken by the City to support residents and citizens in order to improve local adaptive capacity and reduce risks.

GOAL 7 ACTIONS

- 7.1 Develop outreach programs to teach residents what they can do to reduce snowmelt flooding on their property (e.g. removing snow from around their foundations, clearing debris from catch basins, etc.)
- 7.2 Conduct education and outreach to developers to encourage the use of Low Impact Development technologies.
- 7.3 Encourage residents to plant gardens with native species that provide habitat and enhance local biodiversity.
- 7.4 Encourage natural and constructed shade and cooling structures on public and private property.
- 7.5 Support ongoing community initiatives that address extreme heat and cold such as Barrie's Out of the Cold Program.
- 7.6 Create naturalized and edible landscapes on City land using existing resources.
- 7.7 Develop communications campaign with messaging to residents on lot-level resiliency actions (e.g. green roofs, shade structures, rain gardens, etc.).
- 7.8 Continue with active tree planting and preservation, community partnerships, and naturalization programs as outlined in the Urban Forest Strategy.

