

# TABLE OF CONTENTS

---

- Acknowledgments ..... 3
- Introduction ..... 4
  - What Causes Climate Change?..... 4
  - Climate Change is Affecting Everyone, Everywhere..... 4
  - What Can Be Done to Address the Changing Climate?..... 9
  - Addressing Climate Change in Muskoka ..... 10
  - Planning for Climate Change in Muskoka ..... 10
  - District of Muskoka Taking Action ..... 12
  - The Muskoka Corporate Climate Change Action Plan (MCCAP)..... 13
- MCCAP: Proposed Goals and Actions ..... 16
  - Natural Environment ..... 16
  - Governance ..... 19
  - Economy ..... 21
  - Infrastructure ..... 23
  - Community..... 27
- Implementing the Muskoka Climate Change Action Plan..... 30
  - Implementation Champions ..... 31
  - Monitoring and Evaluation..... 31
  - RISE Visions and Values ..... 32
  - Implementation Chart..... 33
  - Next Steps ..... 34
- Conclusions..... 34
- Appendix 1: Implementation Charts ..... 35
  - Natural Environment ..... 35
  - Governance ..... 43
  - Economy ..... 49
  - Infrastructure ..... 55
  - Community..... 65

Appendix 2: Climate Drivers and Vulnerability Assessment .....	73
Risk Assessment .....	73
Glossary .....	75
Acronyms .....	76

# ACKNOWLEDGMENTS

---

The preparation of this plan was carried out with assistance of many District staff and departments, particularly the Muskoka Corporate Climate Change Action Plan Setting Committee. The District would also like to thank all those who contributed to this initiative with a special thank you to the Federation of Canadian Municipalities, Municipalities for Climate Innovation Program for providing financial assistance to support the development of this plan, and to the District Council for their leadership in directing climate action in Muskoka.

MCCAP Steering Committee members:

Christy Doyle – Director, Environmental and Watershed Programs

Kevin Boyle – Climate Change Initiatives Coordinator

Marcus Firman – Director, Water and Wastewater Services

Mark Misko – Director, Engineering and Transportation of Road

Jeff Yeo – Director, Facilities and Support Services

Sam Soja – Planner

Cassie Weston – W&WW Operations Administrator

Breeanna Long – EPW Administrative Assistant

Roxanne Carlton – Finance Clerk 3

Sarah Tolton – Dietary Manager, the Pines

Danielle Morgan – Manager, Housing Development

Mel Heatlie – Program Communication Specialist

Jacque Evans – Muskoka Transportation Network Coordinator

Graham Good – Manager, Geomatics Services

Stu Paul – GIS Project Coordinator

Stu McKinnon – Deputy Chief, Paramedic Services & Emergency Planning

Melissa Halford – Manager, Planning Services – Gravenhurst

© 2020, **District Municipality of Muskoka**. All Rights Reserved. The preparation of this plan was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

# INTRODUCTION

---

Muskoka's climate is changing. As a result, the Muskoka of tomorrow will be drastically different than the Muskoka of the past. Climate change is expected to bring significant changes to Muskoka's weather patterns, ecosystems, and infrastructure. It is necessary to prepare for these changes by taking action to increase the resiliency of The District Municipality of Muskoka's (the District) assets and programs. It is equally important to reduce, eliminate or sequester (where possible) greenhouse gas (GHG) emissions associated with District activities, infrastructure and projects that can further contribute to climate heating.

The District's "Muskoka Climate Change Action Plan" (MCCAP) is the result of extensive collaboration between all District departments and builds on existing District initiatives to address climate change. Based on the climatic changes anticipated in Muskoka, this report identifies goals and actions to help the District adapt to the changing climate (adaptation) as well as lessen the severity of anticipated climatic changes by modifying how the District operates and provides services (mitigation).

## WHAT CAUSES CLIMATE CHANGE?

Climate change is caused by greenhouse gases (GHG), which include carbon dioxide, methane, nitrous oxide, sulfur oxide and chlorofluorocarbons. The quantity of these gases emitted into the atmosphere from anthropogenic (human-caused) activities has significantly increased over the past century. As concentrations of GHGs increase, they act like a blanket around the earth, trapping solar energy and thereby gradually increasing the temperature of the atmosphere.

## CLIMATE CHANGE IS AFFECTING EVERYONE, EVERYWHERE

Climate change is truly a global phenomenon, though climate change impacts are not spread evenly across the globe. Temperatures increase at different rates in different areas with warming generally higher over continents than the oceans. The strongest warming is generally occurring in the Arctic during the winter season, and the mid-latitude regions during the summer season. Due to the latitude of most of Canada, if climate warming can be limited to 1.5°C, the hottest days will actually be up to 3°C warmer. If Canada experiences an increase of 2°C of climate heating, Canadian summers will actually be 4°C warmer. Estimates indicate that about more than 61 million people, or almost twice the population of Canada, will be exposed to severe drought if the world warms by 2°C compared to 1.5°C and climate predictions suggest that this warming may occur by the year 2100.

## Global Significance

- The 2018 Intergovernmental Panel on Climate Change (IPCC) report stipulates that limiting global warming to 1.5°C is instrumental to reduce the impacts of climate change<sup>1</sup>;
- According to the IPCC report, doing this will have benefits for ecosystems, human health and well-being, and will also assist in achieving the United Nations Sustainable Development Goals such as reducing hunger, and increasing access to clean water and sanitization;
- The IPCC report predicts that if temperature increases can't be limited to 1.5°C and reach a global average temperature increase of 2°C, >99% of coral reefs will be lost globally<sup>1</sup>;
- Increases in global temperature are anticipated to increase the wildfire risk which decrease associated air quality impacting human and animal health. For example, wild fire smoke from Washington and Oregon reduced Vancouver's air quality to one of the worst in the world<sup>2</sup> in summer of 2020;
- Limiting average global warming to 1.5°C vs 2°C would mean global sea level rise would be 10cm lower by 2100.

## Canadian Significance

- The major sources of GHG emissions in Canada that contribute to climate heating are the oil and gas and transportation sectors that account for 52% of total emissions. Buildings, agriculture, heavy industry, electricity and waste/others accounted for between 6% and 13% of total GHG emissions in Canada<sup>3</sup>.
- In 2019, Environment Canada (EC) reported that the average temperature in Canada is increasing by almost twice the global average rate, and the average temperature in Northern Canada is increasing by three times the global average rate<sup>4</sup>;

---

<sup>1</sup> IPCC, 'Global Warming of 1.5°C, 2018, available at:

<https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>

<sup>2</sup> CBC, 2020, available at: <https://www.cbc.ca/news/canada/british-columbia/smoke-from-distant-fires-in-u-s-poses-very-high-risk-for-air-quality-in-b-c-1.5722132>

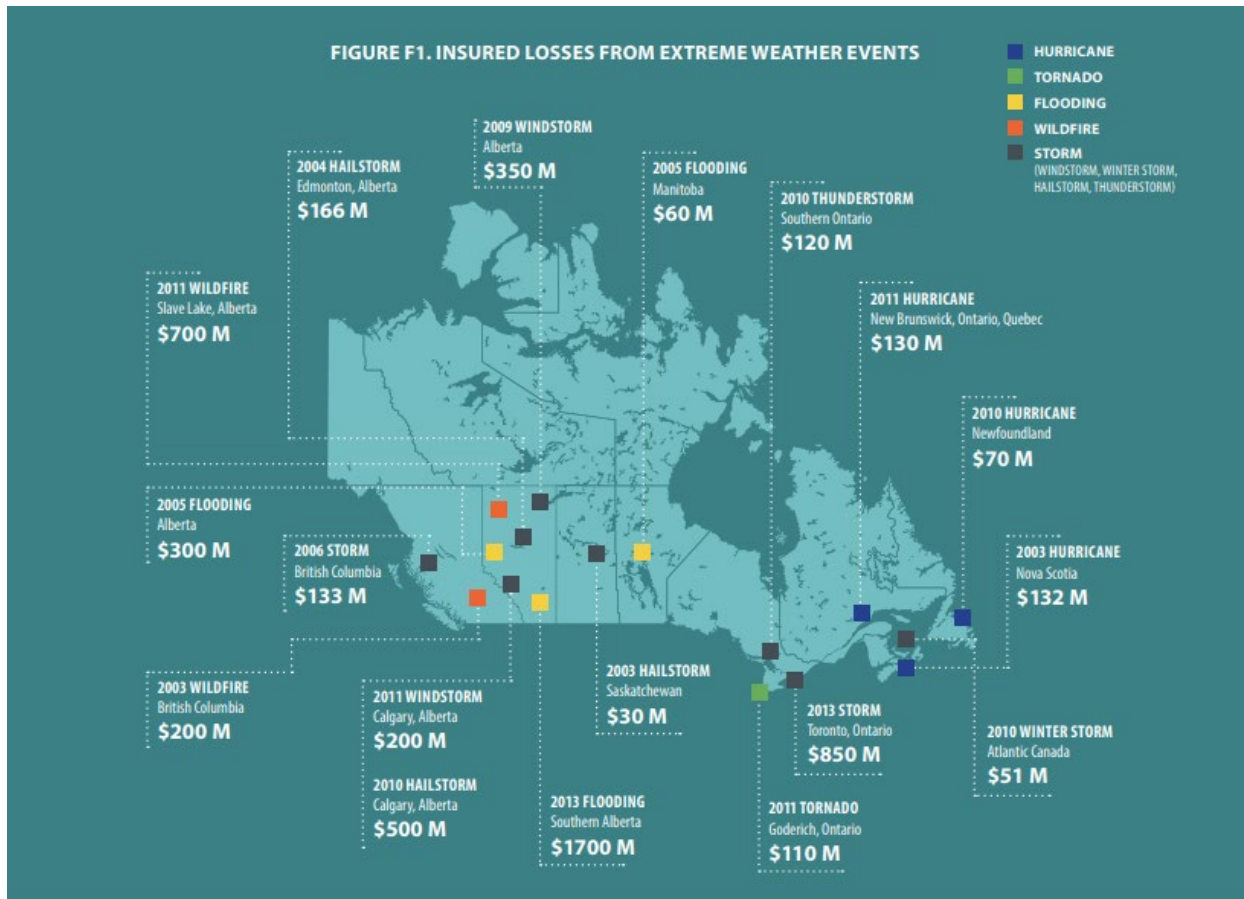
<sup>3</sup> Environment Canada, GHG Emissions, 2020, available at:

<https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html>

<sup>4</sup> Canada's Changing Climate Report, Environment Canada, 2019, available at

<https://changingclimate.ca/CCCR2019/>

- According to the EC report, current trends in climate change will lead to more frequent and intense weather extremes, with increasing flood, wildfire and other impacts across Canada;



Source: Warren, F.J. and Lemmen, D.S. 2014. Synthesis; in Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation, (ed.) F.J. Warren and D.S. Lemmen; Government of Canada, Ottawa, ON.  
<sup>44</sup> Canadian Meteorological and Oceanographic Society. 2016. Canada's Top Weather Stories for 2018.  
<sup>45</sup> Reported Canadian Meteorological and Oceanographic Society. 2016. From, Environment and Climate Change Canada. 2017. Climate Data and Scenarios for Canada: Synthesis of Recent Observation and Modelling Results. Chapter 3.3: Extremes.

51

*Figure 1: Insurance impacts from Severe Weather in Canada*

- The number of natural disaster events in Canada has increased significantly over the last 50 years (see Figure 2);
- Municipalities across Canada already struggle with maintaining public infrastructure with one-third of municipal infrastructure in fair, poor or very poor condition<sup>5</sup>;

<sup>5</sup> Canadian Infrastructure Report Card, 2016, available at:

[http://canadianinfrastructure.ca/downloads/Canadian\\_Infrastructure\\_Report\\_2016.pdf](http://canadianinfrastructure.ca/downloads/Canadian_Infrastructure_Report_2016.pdf)

- Since 2013, severe weather damage claims in Canada have averaged \$2.1 billion dollars a year<sup>6</sup>;
- The Catastrophe Indices and Quantification Inc. assess Canadian natural and human-made catastrophes and predict the average damage to increase from \$2.1 billion to \$5 billion a year over the next 10 years<sup>7</sup>;
- The Insurance Bureau of Canada estimates that for every insurance dollar paid for damaged homes and businesses, Canadian governments pay out \$3 dollars to repair public infrastructure damaged by severe weather<sup>8</sup>;
- Some studies have concluded that for every dollar invested in adaptation measures, \$6 is saved in future damages<sup>8</sup>;

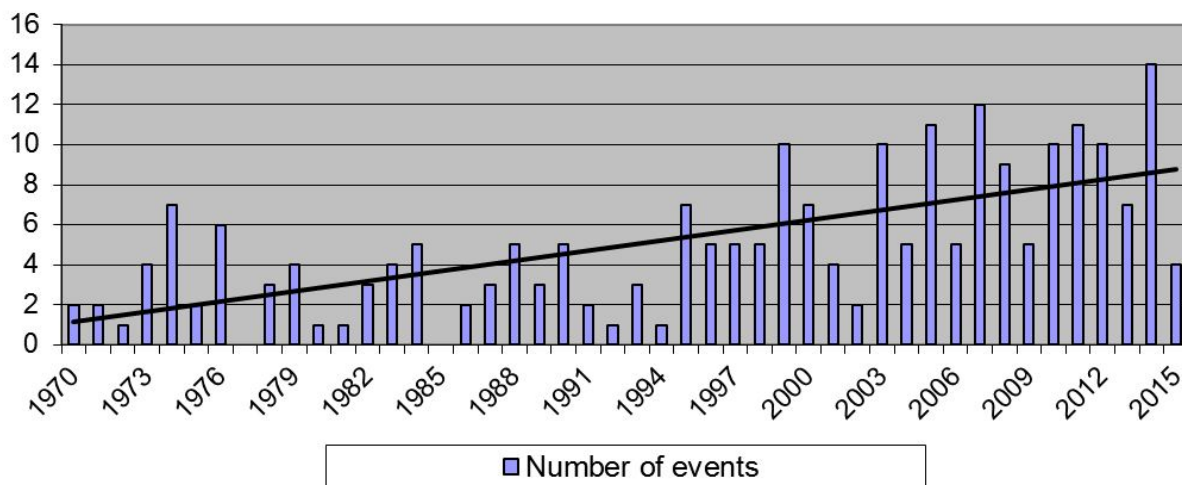


Figure 2: The number of disaster events in Canada is increasing<sup>9</sup>

### Provincial Significance

Statistics out of the Province of Ontario’s “A Made in Ontario Environmental Plan” (2018) indicate that insurance claims have been increasing steadily over the last 30 years due to increases in extreme weather events.

<sup>6</sup> IBC, 2019, available at: <http://www.ibc.ca/on/resources/media-centre/media-releases/severe-weather-caused-1-3-billion-in-insured-damage-in-2019>

<sup>7</sup> Institute for Catastrophic Loss Reduction, 2019, available at: <https://www.cia-ica.ca/docs/default-source/2019/erm-gre3e.pdf>

<sup>8</sup> IBC, 2018, available at: <http://www.ibc.ca/on/resources/media-centre/media-releases/severe-weather-causes-190-million-in-insured-damage-in-2018>

<sup>9</sup> CBC News, 2019, <https://www.cbc.ca/news/canada/sudbury/ontario-forest-fire-costs-2018-1.5154015>

As a component of its Environmental Plan, the Province committed to conducting a risk assessment of climate change impacts, and in Summer 2020, launched Ontario's first climate change impact assessment initiative to assess vulnerabilities to Ontario's natural environment, economies and communities. This is the first assessment of its kind in Canada and is important as a 2018 collaborative report from Auditor Generals in Canada noted that most provincial governments had not fully assessed climate change risks and had not developed detailed adaptation plans<sup>10</sup>.

This assessment is being administered by the Ministry of Environment, Conservation and Parks (MECP) with the guidance of Ontario's Climate Risk Institute (CRI) and will use the best available science to better understand where and how climate change is likely to affect communities, critical infrastructure, economies and the natural environment across Ontario, while helping to strengthen the Province's resilience to the impacts of climate change.

As a part of its work, the CRI will be reviewing a variety of information such as climate data, land use patterns and socio-economic projections. The assessment and engagement component of this plan will solicit input from Indigenous Communities, municipalities, the economic sector and the general public will be conducted over the next two years and it is anticipated that the final results will be released in 2022.

Once complete, this assessment and any other forthcoming provincial climate-related initiatives are anticipated to be considered, and hopefully incorporated when possible, in forthcoming District climate initiatives.

### Local Significance

- In 2018, the Parry Sound "33" fire consumed over 11,362 hectares and burned from mid-July to the end of October.
  - Fighting forest fires in Ontario cost \$212 million in 2018, significantly surpassing the base budget of \$70 million;
- Muskoka's lakes have seen an increase in confirmed blue-green algal blooms;
- Over the past decade, there have been three major flood events in Muskoka (2013, 2016, 2019);
- In 2019, flooding in Muskoka was the highest in Muskoka's recorded history at three of the four major water flow stations;

---

<sup>10</sup> Collaborative Auditor General Report on Climate Change Action in Canada, 2018, <https://www.auditor.on.ca/en/content/downloads/Perspectives%20on%20Climate%20Change%20Action%20in%20Canada%20English.pdf>



- The 2019 floods caused the District, the Towns of Huntsville and Bracebridge and the Township of Muskoka Lakes to declare a state of emergency;
- The 2019 flooding was so significant across Ontario, that it resulted in the Province appointing a Special Advisor on Flooding to initiate an independent review and consultation of those flood events;
  - The report indicates that with climate change, flooding is anticipated to become more frequent and severe and that adding “impacts of a changing climate” should be included in the Provincial Policy Statement to bring attention to the issue;
  - The report also recommends updating or conducting new flood plain mapping to prevent development in higher risk areas; and
- Much of Muskoka’s existing municipal infrastructure, such as roads, bridges, buildings, drinking water and wastewater systems, and stormwater management systems, were not constructed to withstand the climate that Muskoka is expected have by mid-century.

## WHAT CAN BE DONE TO ADDRESS THE CHANGING CLIMATE?

Adaptation and mitigation are the two primary approaches to addressing climate change.

**1) *Adapting to Climate Change:*** To protect our families, our economies, and the environment in which we live with the impacts of climate change, we must adapt to climate change by altering our behaviours, our systems and – in some cases – our ways of life. We can undertake actions and activities specifically designed to reduce, minimize or eliminate the adverse effects of a changing climate.

Successful adaptation plans ensure that policies, programs, and infrastructure are in place so that communities, businesses and governments can be resilient to the climatic changes that are occurring.

**2) *Mitigating Against Climate Change:*** We can avoid and reduce emissions of heat-trapping GHGs into the atmosphere to prevent the planet from warming to more extreme temperatures. Successful mitigation plans include actions and activities designed to reduce, eliminate or sequester GHG emissions that contribute to climate change.

Mitigation plans can help decrease emissions of GHG through reducing or eliminating emissions associated with operations, vehicles, buildings, or through

activities that sequester carbon from the atmosphere; for example, through tree-planting, utilizing carbon sequestering building materials, or preserving greenspace.

## ADDRESSING CLIMATE CHANGE IN MUSKOKA

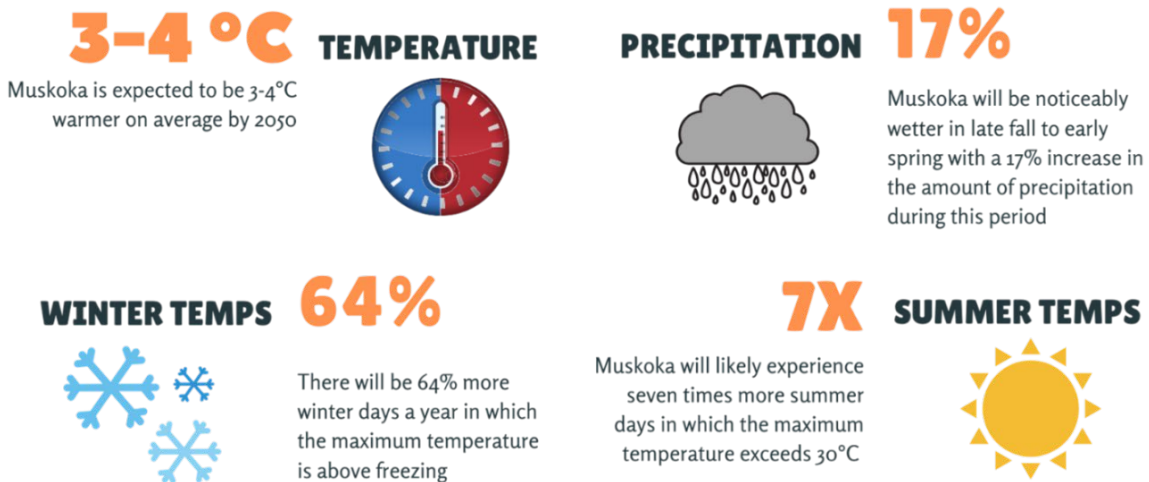
Two notable reports have been released in the last few years that outline what Muskoka's climate will likely look like in the future. These predictions were used to create a plan that reduces GHG emissions and strengthens the adaptive capacity of District programs, infrastructure and services.

- The Muskoka Watershed Council's (MWC) '[Planning for Climate Change in Muskoka](#)' (2016) report outlines the anticipated climatic changes for Muskoka by mid-century and identifies the associated impacts of the changing climate on the District's lakes, waterways, built infrastructure and human activities; and
- The Simcoe Muskoka District Health Unit's (SMDHU) '[A Changing Climate: Assessing Health Impacts and Vulnerabilities due to Climate Change in Simcoe Muskoka](#)' (2017) report identifies the health impacts of climate change in Simcoe Muskoka and includes the results of the SMDHU's climate change and health vulnerability assessment.

## PLANNING FOR CLIMATE CHANGE IN MUSKOKA

Using data generated by the Intergovernmental Panel on Climate Change (IPCC CMIP5 Project), MWC predicts that significant climatic changes will occur in Muskoka by mid-century, including:

- A 17% increase in late fall and early spring precipitation;
- A 3-4°C increase in average temperature;
- More frequent and severe weather events;
- An increase in the prevalence of invasive species;
- A significant reduction in winter lake ice;
- 64% more winter days where the maximum temperature is above freezing; and
- A 7x increase in extreme heat days.



*Figure 3: Climatic changes expected to occur in Muskoka by mid-century*

In direct response to a recommendation put forward by MWC, District Council established a Climate Change Initiatives Coordinator position in 2018, with the primary and initial direction for this role to develop the MCCAP for District’s consideration.

SMDHU’s report on the health impacts and vulnerabilities due to climate change in Simcoe Muskoka predicts the following direct impacts:

- Increase in air pollution and temperature;
- Food insecurity due to changing environments;
- Increased range and transmission of infectious disease;
- Reduced access to safe water; and
- Increases in injuries related to extreme weather events.

And some noted indirect impacts include:

- Psycho-social impacts; and
- Population displacement.

The report identifies climate change as a priority to public health and notes that while people across Simcoe-Muskoka will feel the effects of climate change, the effect will be greater for vulnerable populations, with factors like health status, age, gender, and access to resources playing a major role in how much impact a changing climate will have on individual health.

The District provides services to vulnerable populations and manages both long-term care facilities and social housing facilities. Based on information contained in the

SMDHU report, the District can anticipate, prepare for and, where possible, mitigate some of the major health-related challenges associated with the changing climate.

## DISTRICT OF MUSKOKA TAKING ACTION

Over the past several years, the District of Muskoka has recognized the importance of adapting and mitigating for climate change and has undertaken several crucial initiatives. In addition to establishing its Climate Change portfolio, other key and related District initiatives include:

- Updating the Muskoka Official Plan (2019) to include several sets of policies that call for action on climate change (i.e. C3 and D20);
- Undertaking flood plain mapping for high-risk, vulnerable areas across the region to ensure appropriate emergency responses, planning processes and infrastructure decisions. The initiative included a sensitivity-to-climate change analysis with predicted increase in flows (10-20%) to account for anticipated increases in precipitation due to climate change as noted in MWC's "Planning for Climate Change in Muskoka" report;
- Council Resolution unanimously passed to join the Federation Municipalities Partners for Climate Protection program, that includes a targets to reduce GHG emission associated with District operations;
- Initiating a Corporate Energy Management Plan (2019) which will help increase energy efficiency and decrease emissions associated with District buildings;
- Developing a 5-Year Transportation Needs Assessment and Growth and Sustainability Plan (2020) which, in part, will look to improve public transit in the east-west corridor in Muskoka and reduce single occupancy vehicle trips and associated emissions;
- Establishing Strategic Priorities (2016) that provide direction to enhance the District's knowledge and understanding of our natural environment in order to mitigate the effects of climate change on the resiliency and biodiversity of our watershed and to reduce our environmental footprint;
- Continuing its support for the Muskoka Watershed Council;
- Initiating a Community GHG Baseline Inventory and Reduction Plan (2020 - ongoing) which will develop a GHG baseline inventory, and bring together a diverse representation of Muskokans to establish GHG reduction targets and strategies; and
- Developing a Corporate GHG Baseline Inventory and Reduction Plan (2020 – ongoing) to establish a GHG Baseline inventory for the District's operations and buildings and use the MCCAP Steering Committee to propose GHG reduction targets and strategies.

## Community and Corporate Climate Change Action Plans

In 2020 the District launched both the 'Community GHG Baseline Inventory and Reduction plan' and a the 'Corporate GHG Baseline GHG Inventory and Reduction Plan.

**Corporate Climate Change Action Plans:** The MCCAP and the Corporate GHG Baseline Inventory and Reduction Plan both relate to services and infrastructure that the District has direct control over (District fleet, roads, buildings, service delivery etc.).

**Community Climate Change Action Plan:** The Community GHG Baseline Inventory and Reduction Plan' relates to GHG emissions from the general public, industry, and commercial businesses in Muskoka that are outside of the Districts control, and account for approximately 98% of GHG emissions in Muskoka. This plan will be developed with full consultation of a cross-section of Muskoka residents from all areas of society, and will aim to help businesses, households, and individuals reduce their GHG emissions.

## THE MUSKOKA CORPORATE CLIMATE CHANGE ACTION PLAN (MCCAP)

The MCCAP is a roadmap for the District itself to consider in its ongoing response to climate change. More specifically, the MCCAP proposes coordinated, interdepartmental actions on climate adaptation to inform planning and infrastructure decisions for District Council's consideration.

The purpose of the MCCAP is to provide the District with a proposed course of action towards achieving its climate change goals and responsibilities as stated in its Strategic Priorities and the Muskoka Official Plan.

Over the past few years, many other smaller and rural municipalities across Ontario and Canada have adopted climate change adaptation or mitigation plans including; the Township of Georgian Bay/Severn/Oro-Medonte/Midland/Tiny/Tay/Penetanguishene; Barrie; Thunder Bay; and Durham Region. Also, all 36 of Ontario's Conservation Authorities (CA) all have specific climate-related plans, though the District of Muskoka is not located within the jurisdiction of a CA.

### The Development of the MCCAP

The MCCAP is the result of an interdepartmental, collaborative effort led by a MCCAP Steering Committee comprised of representatives from most District departments.

At the initiation of this project, the MCCAP Steering Committee developed and approved a Terms of Reference (TOR) to outline the District's goals, strategic direction and priority action areas to help guide the plan. The TOR are as follows:

- **Goal:** To make the District a leader in the climate change field and to make the District more resilient to, and decrease the District's impacts on, climate change through the creation and implementation of a MCCAP.
- **Strategic Direction:** Prepare the District to adapt to climate change challenges and mitigate our effect on, and addition to, a changing climate.
- **Priority Action:**
  - Conduct a climate change vulnerability assessment of the District's built, natural, economic and social assets and infrastructure.
  - Identify any immediate climate change mitigation and adaptation actions for the District.
  - Develop the corporation's District Municipality of Muskoka Climate Change Action Plan.
  - Investigate and seek funding opportunities for climate change mitigation and adaptation work.

In 2019, the MCCAP Steering Committee participated in a climate vulnerability assessment led by the Ontario Centre for Climate Impacts and Adaptation Resources (now known as the Climate Risk Institute (CRI) to evaluate the impacts associated with anticipated climatic changes in Muskoka and, more specifically, at the District. The results of the assessment helped inform the goals and actions in MCCAP.

Subsequently, in 2020, the CRI was chosen by the Province to lead its two-year climate risk assessment.

Through its review of existing and/or emerging climate change and adaptation measures, the MCCAP Steering Committee has identified proposed actions needed to ensure Muskoka will be a climate-resilient municipality, with emphasis on potential actions and responsibilities to be undertaken by the District and, if desired, the Area Municipalities.

The District will continue to identify and pursue external resources and funding support to undertake municipal climate-related initiatives (e.g., through various grants offered by the Federal and Provincial governments, the Federation of Canadian Municipalities' Climate Innovation Program, etc.).

External advisors, including members of Muskoka Watershed Council, senior staff from the Federation of Canadian Municipalities, staff from the CRI and representatives from the SMDHU Climate Change Exchange have also provided guidance in the development of this plan.

The District's Strategic Priorities (2016) provide direction for District programs and policies. These priorities have been incorporated directly into the MCCAP because they have helped to manage the legacy of a healthy Muskoka and are designed to sustain a functioning natural environment that recognizes the need for a vibrant economy together with a caring community conscience that supports those in need.

The District's Strategic Priorities are categorized into five themes including:

- Natural Environment
- Governance
- Economy
- Infrastructure
- Community

To align with the Strategic Priorities, these same categories are selected as the MCCAP's themes to organize all proposed climate goals.

For each MCCAP theme, several new and/or existing climate change adaptation and mitigation goals have been identified and each goal has an action, or actions, that have been designed to achieve the goal. Where possible, indicators or milestones will be included to ensure the actions are measurable and can be evaluated.

A total of 84 actions were identified for the District to consider for implementation to address the goals of the MCCAP. These actions were identified through consultation with the MCCAP Steering Committee and senior leadership.

# MCCAP: PROPOSED GOALS AND ACTIONS

---

## NATURAL ENVIRONMENT

Muskoka benefits from having a predominantly intact natural environment in contrast to Ontario's more fragmented and urbanized areas located south of the Canadian shield. From a bird's eye view, approximately 94% of Muskoka is under natural cover, including forests, wetlands, lakes, barrens and rivers. While development and roads do fragment Muskoka's natural areas, the abundance of natural areas that remain supports Muskoka with a number of valuable ecosystem services and provides a buffer for the impending impacts of climate change. The high percentage of naturally covered area in Muskoka, including wetlands, helps mitigate flood risks and provides natural filtration of water moving throughout Muskoka's watershed. The Canadian shield's associated shallow soils have limited capacity to store water, but even the loss of this limited capacity can increase flood risk, reduce water quality, and decrease economic opportunities associated with tourism, second homes, and recreation in Muskoka.

Ecosystems can become more vulnerable as extreme weather events increase and invasive species become more pervasive with a warmer climate. The impacts from climate change are experienced year-round and require both short-term and long-term solutions. The health of the terrestrial and aquatic environments in Muskoka is vital to the quality of life of its residents. The District will continue to strategize and implement steps to enhance climate resiliency through the natural environment across the region.

**Natural Environment Goal - NE 1:** Apply a "Climate Change Lens" to maximize resiliency of ecosystems and communities, manage the risks associated with climate change, and provide ecosystem services for future generations.

Actions to support NE 1:

- **NE 1.1** Develop and implement green and sustainable development standards and encourage Area Municipalities to as well (D20.4 and D20.5 of the MOP).
- **NE 1.2** Encourage all new District of Muskoka municipal buildings and projects to satisfy green and sustainable development standards. (D20.4 and D20.5 of MOP).
- **NE 1.3** Promote sustainable development and healthy communities by considering the impacts of climate change during the review and approval of development applications. (D20.4 to D20.6 of MOP).
- **NE 1.4** Adopt a set of climate change resiliency and mitigation performance measures to guide and monitor development. (D20.7.a. of MOP).



- **NE 1.5** Adopt and use performance checklists to implement performance measures and consistently and transparently evaluate adherence of development to these measures. (D20.7.b. of MOP).
- **NE 1.6** Develop and implement performance checklists to assist with creating sustainable communities and encourage Area Municipalities to do as well. (D20.7.f. of MOP).

**Natural Environment Goal - NE 2:** Promote the planting of native vegetation to reduce erosion and the impacts of flooding, as well as enhance local biodiversity.

Actions to support NE 2:

- **NE 2.1** Support the Muskoka Watershed Council to implement stewardship programs like Love Your Lake and The Natural Edge.
- **NE 2.2** Support community organizations (i.e. lake associations, neighborhood groups) in native species planting initiatives.
- **NE 2.3** Develop policies requiring the use of native vegetation on all District-owned properties.
- **NE 2.4** Partner with the Muskoka Watershed Council and other NGO's on new initiatives to increase the public's awareness of the importance of native vegetation and natural shorelines.
- **NE 2.5** Assess the Muskoka Watershed Advisory Group's 'Interim Advice and Recommendations to Address Priority Environmental Issues in the Muskoka River Watershed' for actions that would assist in climate change adaptation, mitigation, or increase sustainability and action where appropriate.

**Natural Environment Goal - NE 3:** Prevent the establishment of invasive species.

Actions to support NE 3:

- **NE 3.1** Track the occurrence of invasive species on District-owned properties and along District roadways.
- **NE 3.2** Fund and implement removal programs for invasive species on District-owned properties and along District roadways.
- **NE 3.3** Submit reports of invasive species occurrences to a province-wide database through EDDMapS Ontario.
- **NE 3.4** Partner with the Muskoka Watershed Council and other NGOs on initiatives to raise the public's awareness about invasive species.
- **NE 3.5** Require Invasive Species Management Plans for all District projects outlining procedures to minimize the spread of invasive species and proper disposal of contaminated soils and materials.

**Natural Environment Goal - NE 4:** Reduce road salt use while maintaining public safety.

Actions to support NE 4:

- **NE 4.1** Map areas sensitive to chloride and implement a strategy to reduce salt application in these areas.
- **NE 4.2** Continue EPW trials that investigate the efficacy and cost effectiveness of alternatives to traditional de-icing materials, with the goal of reducing the amount of road salt used.
- **NE 4.3** Support the implementation of programs to reduce salt used by the District, businesses and residents.
- **NE 4.4** Work with the Area Municipalities and the Ministry of Transportation (MTO) to quantify the amount of salt applied to Muskoka's roads and facilitate record keeping to examine the effectiveness of salt-reduction initiatives.

**Natural Environment Goal - NE 5:** Protect locally, regionally and provincially significant areas and features and preserve them to maintain the long-term integrity and the special character of the Muskoka environment.

Actions to support NE 5:

- **NE 5.1** Develop a Natural Heritage Strategy to identify locally, regionally and provincially significant areas and features and incorporate protection for these priority areas in Official Plan Policy.
- **NE 5.2** Quantify the value of Muskoka's natural assets for consideration in decision-making and land-use planning. Their value in climate change adaptation and mitigation should be stated.
- **NE 5.3** Identify priority areas for rehabilitation and renaturalization that strengthens Muskoka's ability to adapt to a changing climate.

**Natural Environment Goal - NE 6:** Quantify and mitigate the impacts of climate change on our water resources.

Actions to support NE 6:

- **NE 6.1** Implement the Lake System Health Water Quality Monitoring program to collect data on Muskoka's lakes, including the collection of data that provides an indication of Muskoka's changing climate (i.e. water temperature profiles) where possible.

- **NE 6.2** Support the Muskoka Watershed Council's algae monitoring program, which collects baseline data on algae abundance and trends in order to establish changing conditions as a result of climate change.
- **NE 6.3** Implement policies to guide development around Muskoka's water resources taking current and future climate impacts into account.
- **NE 6.4** Partner with all levels of government, NGOs and the community to support relevant research opportunities to identify current and future ecosystem changes and potential mitigation and/or adaptation programs.
- **NE 6.5** Support the development of an Integrated Watershed Management (IWM) plan for the Muskoka River Watershed and Black-Severn River Watershed.
- **NE 6.6** Implement water conservation measures in all District-owned buildings to mitigate the impacts of drought.
- **NE 6.7** Partner with Area Municipalities to improve septic tracking and re-inspection in Muskoka.

**Natural Environment Goal - NE 7:** Develop, fund and support programs to protect and conserve Muskoka's water resources.

Actions to support NE 7:

- **NE 7.1** Pursue grant opportunities for the District and partners to maintain current programs and develop new innovative ways of protecting Muskoka's water resources.

## GOVERNANCE

Periodic review and revision of District policies are necessary to maintain effective and responsive governance in the face of climate change. Since climate change is going to impact the livelihoods and lifestyles of Muskoka residents, strategic planning and implementation is required to ensure the optimal delivery of programs, policies, plans and services. Adapting current practices and policies to increase climate resiliency can create a vibrant future for the region. The District will endeavor to make sustainable changes where possible.

**Governance Goal - GA 1:** Revise District programs to reduce GHG emissions and make them more resilient to climatic changes by implementing best practices and technology.

Actions to support GA 1:

- **GA 1.1** Work with MWC and other organizations to support industry and all levels of government in promoting and developing low carbon and resilient standards, policies, and programs.
- **GA 1.2** Identify and pursue available funding mechanisms and partnerships to support actions.
- **GA 1.3** Develop a Corporate waste reduction strategy
  - Investigate opportunities to increase residential diversion rates.
  - Investigate opportunities for partnerships to encourage and increase the diversion of organics from IC&I waste (Business, schools, industry etc.).
  - Expand, where possible, the District's diversion programs.
  - Assess policies and approvals to allow flexibility to accept organics from IC&I sources when and where possible.
  - Investigate opportunities to partner with other municipalities and funding opportunities for development of advanced organics processing technology with the potential for renewable natural gas capture.
  - Create an education and marketing campaign on the importance of diversion programs in Muskoka.

**Governance Goal - GA 2:** Develop a sustainable asset management plan that takes climate change impacts into account while maintaining a high level of service.

Actions to support GA 2:

- **GA 2.1** Incorporate the findings of the Muskoka Climate Change Action Plan into the new asset management system and review periodically.

**Governance Goal - GA 3:** Review and revise the District's policies and plans to account for climate change. Ensure future District activities incorporate climate change considerations and mitigation measures whenever possible.

Actions to support GA 3:

- **GA 3.1** Provide feedback (where applicable) on climate-related legislation proposed by Province, Federal and Area Municipal Governments.
- **GA 3.2** Adopt new legal and/or policy tools, including by-laws, that require the implementation of climate resilience measures (e.g., green roof by-law) in new buildings, or to reduce the embodied carbon in new construction.
- **GA 3.3** Embed climate change considerations in staff reports and purchasing processes, similar to the existing 'financial implications' section, or added to the existing Strategic Priorities graphic.

- **GA 3.4** Review and amend key policy documents (such as the Muskoka Official Plan) on a regular basis to ensure new climate change considerations are incorporated.

**Governance Goal - GA 4:** Conduct an analysis of the District and Area Municipalities response to extreme weather events and other regional emergencies and use lessons learned to help refine response.

Actions to support GA 4:

- **GA 4.1** Conduct an analysis of the District and Area Municipal responses to the COVID-19 crisis and use lessons learned to support climate-friendly approaches to District activities.
- **GA 4.2** Encourage opportunities to work remotely where service levels are being met.
- **GA 4.3** Investigate other municipalities' best-practices to achieve a new 'Greener' normal.

**Governance Goal - GA 5:** Monitor the implementation of adaptation and mitigation actions and goals in order to make continuous operational improvements. Review and update the MCCAP on a recurring basis (~5 years).

Actions to support GA 5:

- **GA 5.1** Report annually to the District's Community and Planning Services Committee on the implementation of the MCCAP and grant opportunities available to support District climate change initiatives.
- **GA 5.2** Develop a standardized checklist to ensure progress and monitoring is consistent.
- **GA 5.3** Adhere to legislative and program requirements while continually advocating for consistent, equitable and sustainable funding for Muskoka.

## ECONOMY

Climate change can impact businesses and the different industries and sectors supporting Muskoka's economy by increasing risk from disruption by severe weather events, invasive species, flooding or wildfire. Collaborating with local businesses and the tourism sector to identify potential risks and burdens from climate change is a priority of the District. Tourism and recreation generate a significant amount of revenue

in Muskoka, with tourists and second home owner spending over \$500 million annually in Muskoka<sup>11</sup> and supports a large portion of Muskoka's employment sector.

Including climate-resilient actions in commercial, recreational, and other economic development opportunities enhances a municipality's ability to combat associated risks. The District will collaborate with Area Municipalities, partners, and businesses to adapt to a changing climate through innovation and economic growth.

**Economy Goal - EA 1:** Enhance the sustainability of the Muskoka Airport.

Actions to support EA 1:

- **EA 1.1** Develop a sustainability plan for the Muskoka Airport that identifies opportunities to reduce energy consumption, waste, GHG emissions associated with airport activities, protect ground water resources, and improve resiliency to climatic changes.

**Economy Goal - EA 2:** Increase the resiliency of the local economy to climate change impacts and help them take advantage of any opportunities related to climatic changes in Muskoka.

Actions to support EA 2:

- **EA 2.1** Incorporate climate change education and outreach into District programs that support business or commercial interests.
- **EA 2.2** Partner with Area Municipalities to help local businesses adapt to climate change and decrease their GHG emissions.
- **EA 2.3** Encourage the building sector to minimize GHG emissions associated with construction operations and materials.

**Economy Goal - EA 3:** Build on Muskoka's reputation as an internationally recognized tourism destination to become a leader and innovator in the fight against climate change.

Actions to support EA 3:

- **EA 3.1** Encourage developers to include low carbon energy systems in new developments and/or the use of carbon sequestration material in new buildings.

---

<sup>11</sup> District of Muskoka Economic Development and Community Profile, 2019, <https://www.muskoka.on.ca/en/work-and-invest/resources/2019-11-01-Economic-Development-Profile-FINAL-.pdf>

Consider financial tools and tying fees to embodied carbon or sustainability in new builds.

- **EA 3.2** Support incorporation of climate-smart business models and programs in the tourism industry.

**Economy Goal - EA 4:** Collaborate with Area Municipalities and other organizations to support and promote economic development opportunities that enhance the natural environment, have low-impact on climate change, and recognize the character of Muskoka's communities.

Actions to support EA 4:

- **EA 4.1** Consider establishing a 'Green Economy/Recovery Task Force' (or task an existing committee/group) comprised of representatives from Area Municipalities, businesses, the tourism sector, Business Improvement Areas (BIA), and community organizations like the Muskoka Watershed Council (MWC), Muskoka Steamship & Discovery Centre (MSDC), Climate Action Muskoka (CAM), and others, to explore ways to foster and support eco-tourism and environmentally friendly economic opportunities.
- **EA 4.2** Expand the Corridor 11 Bus service within Muskoka, providing additional, environmentally friendly travel options for residents and tourists alike.
- **EA 4.3** Launch an east-west transportation program, building on the previous Muskoka Extended Transit Service, to help move residents east and west throughout the District and into the larger towns, providing a more environmentally friendly travel option.

**Economy Goal - EA 5:** Establish a climate change reserve fund or increase contributions to the environmental reserve fund to assist in the pursuit of grants for ambitious projects to increase resiliency and mitigate District GHG emissions.

Actions to support EA 5:

- **EA 5.1** Identify financial implications and incorporate climate mitigation and adaptation goals into existing short and long term financial projections for the District. A dedicated reserve fund or an increase in contributions to the environmental reserve fund could help support the pursuit of grants that require contributions from the District.

## INFRASTRUCTURE

Increases in the frequency and intensity of extreme weather events due to climate change will impact built infrastructure across the District. Climate events such as

flooding, increased freeze-thaw cycles, and greater precipitation levels all put stress on existing infrastructure.

Through continued collaboration with Area Municipalities and stakeholders, the District will continue to connect and service communities by enhancing the resiliency of its transportation networks, waste management, and water and wastewater systems. Updated designs and specifications that take these concerns into consideration will evolve as reaction moves from acknowledgement to implementation. Outlined below is a series of proposed goals to increase the District's adaptive capacity and to mitigate its GHG emissions.

**Infrastructure Goal- IN 1:** Increase the District's ability to help the community prepare for and respond to extreme weather events and emergency situations.

Actions to support IN.1:

- **IN 1.1** Evaluate the data presented in the flood plain mapping project to determine impacts on different areas in Muskoka.
- **IN 1.2** From the flood plain mapping assessment, investigate potential flood mitigation opportunities.
- **IN 1.3** Encourage the Province to update the Muskoka River Water Management Plan (MRWMP) to ensure that up-to-date climate information is incorporated.
- **IN 1.4** Consider establishing a municipal "extreme weather reserve fund" to assist community members, organizations, and businesses recover from serious weather events.
  - Determine best delivery model for this program.
- **IN 1.5** Strategically locate infrastructure and public service facilities, generally within or immediately adjacent to settlement areas, to support the effective and efficient delivery of emergency services. (D18 b of MOP).
- **IN 1.6** Encourage public road access to new lots and development, or as an alternative, access over a private condominium road to ensure the provision of emergency access (K5 of MOP).

**Infrastructure Goal - IN 2:** Evaluate District buildings and infrastructure for vulnerability to climate change impacts.

Actions to support IN 2:

- **IN 2.1** Complete an inventory of all buildings that includes an assessment of climate risks and incorporate this inventory into asset management plans.
- **IN 2.2** Evaluate District facilities for vulnerability to extreme heat days.



- **IN 2.3** Review newly developed Intensity-Duration-Frequency (IDF) curves from Ministry of Transportation Ontario (MTO) and other jurisdictions in Ontario and assess their applicability for Muskoka infrastructure.

**Infrastructure Goal - IN 3:** Examine the potential increase in capital expenses and expenditures from damage related to an increase in more frequent and severe weather events.

Actions to support IN 3:

- **IN 3.1** Determine the metrics required to monitor and track costs of response to emergency events like flooding and compare to historical costs to the District and Area Municipalities.
- **IN 3.2** Explore the use of green infrastructure to manage stormwater on publicly and privately owned properties (e.g., permeable paving, blue roofs). Consider a change to development and engineering design standards, where feasible, that would increase resiliency to flooding.
- **IN 3.3** Assess service delivery programs for vulnerabilities to climate-related emergencies and develop contingency plans to mitigate the impacts.
- **IN 3.4** Partner with Area Municipalities and other relevant organizations to coordinate responses to climate-related emergencies.
- **IN 3.5** Target and prioritize publicly funded new construction developments that apply climate change construction principles.

**Infrastructure Goal - IN 4:** Reduce the GHG associated with the operation of District buildings, infrastructure, and fleet vehicles.

Actions to support IN 4:

- **IN 4.1** Complete a corporate GHG baseline inventory for all District emissions.
- **IN 4.2** Use the results of the corporate and community GHG emissions inventory to explore opportunities to enhance resilience and reduce greenhouse gas emissions (e.g., heat pump retrofits).
- **IN 4.3** When building new municipally-owned buildings, ensure they are low carbon structures, energy efficient and near net-zero when feasible.
- **IN 4.4** Pursue retrofits of municipally-owned buildings to reduce natural gas and electricity consumption, and where feasible consider options that increase efficiency and reduce emissions. Review previous Operational Energy Audit for outstanding actions and assess feasibility of implementation. Review actions and recommendations and determine the cost/energy saving associated with the actions.

- Through asset management plan, continue to pursue energy reduction and conservation benefits through lifecycle replacements.
- When refreshing, maintaining, replacing equipment/buildings evaluate proposals for climate change mitigation and adaptation options.
- **IN 4.5** Identify opportunities for renewable energy generation, including renewable natural gas, and storage at District-owned facilities to supply the needs of District-owned assets.
- **IN 4.6** Based on the results of the corporate and community GHG emissions inventory, target a reduction of GHG emissions associated with District buildings by 50% by 2030. Achieve net-zero GHG emissions from buildings by 2050.
- **IN 4.7** Develop a green fleet policy to assess electrification or alternate fuel opportunities for all District vehicles and equipment, monitor technological changes to assess the best fit to fulfil District services while reducing emissions, and regularly review vehicle allocation, route optimization, and right-sizing fleet for efficiencies.
- **IN 4.8** Evaluate infrastructure readiness for electric vehicle charging infrastructure in corporate and municipal parking facilities to accommodate the electrification of the corporate fleets. Pursue funding opportunities to reduce implementation costs.
- **IN 4.9** Target GHG emissions from fleet vehicles of 50% by 2030 based on the results of the Corporate GHG emissions and develop a plan to be net-zero by 2050.
- **IN 4.10** Reduce fleet use by encouraging remote/virtual meeting opportunities.
- **IN 4.11** Investigate options for the use of electric or hybrid vehicles for the District's Community Transportation programs.

**Infrastructure Goal - IN 5:** Integrate climate change impacts and GHG emission reductions into the design, construction and maintenance of District assets (roads, buildings, bridges, sanitary sewer and potable water infrastructure, etc.).

Actions to support IN 5:

- **IN 5.1** Incorporate climate friendly, resilient, and cost-effective options in Engineering and Public Works (EPW) procurement specifications.
- **IN 5.2** Pursue innovative low or zero emissions pilot and partnership opportunities (e.g., hydrogen or electric bus pilots, water & wastewater public private partnerships (P3s), District heating).
- **IN 5.3** Update the District's engineering and development standards to ensure that the design of District assets accounts for the impacts of climate change. Including but not limited to reducing GHG emissions associated with material and construction (related to C4 vi of MOP).
- **IN 5.4** Investigate funding mechanisms and options to increase efficiency and move towards a low carbon housing stock.

## Infrastructure Goal - IN 6: Improve the management of stormwater.

Actions to support IN 6:

- **IN 6.1** Review the state of stormwater management in Muskoka, including recommendations in the District's 2009 Stormwater Management Plan and address outstanding actions.
- **IN 6.2** Review local stormwater management plans and when possible partner for pilot opportunities. Continue to partner with Area Municipalities to maximize efficiencies from planning road construction cooperatively when both Governments are present.

## COMMUNITY

An increase in extreme heat and cold days, extreme weather events, and the spread of vector-borne diseases will lead to a corresponding increase in threats to human health and safety. The tourism sector is a major employer in Muskoka and responsible for bringing over \$500 million dollars annually to the region. While there may be some increases in opportunities for summer seasonal businesses related to a longer season, negative impacts like increases in algal blooms, drought and wildfire risk due to climate change can also present challenges. Also, winter businesses that rely on ice over the lakes, or snow on the trails will continue to see their season shorten.

The District will continue to collaborate with partners, stakeholders and community members and those that are more vulnerable to climate change such as children, elderly, people with pre-existing health conditions, etc., and continue to promote an inclusive and healthy community by working to mitigate and adapt to the impacts of a changing climate. The District will continue to meet the needs of its communities while addressing the impacts of climate change.

## Community Goal - CA 1: Facilitate the development of a Muskoka-wide Community Climate Change Action Plan.

Actions to support CA 1:

- **CA 1.1** Conduct a corporate and community greenhouse gas inventory for Muskoka.
- **CA 1.2** Partner with the community to develop GHG reduction targets, a list of actions to reduce Muskoka GHG emissions.
- **CA 1.3** Partner with the community to develop a list of actions to adapt to climate change.

- CA 1.4 Seek funding to assist the community in implementing actions to reduce GHG emissions and adapt to climate change.
- CA 1.5 Post information about climate change related initiatives on the Engage Muskoka site and related spatial data on the Muskoka Web Map and Muskoka Open Data site.
- CA 1.6 Develop and implement a marketing campaign encouraging residents to utilize public transportation services when possible as an opportunity to help mitigate climate change. Launch in concert with the east-west public transportation corridor that is planned for Muskoka.
- CA 1.7 Support grass roots organizations looking to achieve progressive responsible change to reduce GHG emissions in Muskoka.
- CA 1.8 Encourage Area Municipalities to develop their Climate Change Action Plans, and provide support and assistance.

**Community Goal - CA 2:** Through communication and outreach educate staff and the community on climate change impacts and opportunities in Muskoka.

Actions to support CA 2:

- CA 2.1 Continue to support the Muskoka Watershed Council, Georgian Bay Biosphere Reserve (GBBR) and other organizations in its outreach efforts and stewardship programs.
- CA 2.2 Continue to partner with the Muskoka Steamship & Discovery Centre on its watershed and sustainability programs.
- CA 2.3 Develop curriculum-based education materials for local schools related to specific climatic impacts in the area and deliver to area schools.
- CA 2.4 Encourage and raise awareness about local food production in Muskoka.
- CA 2.5 Promote local and historical ecology facts as they relate to climate change. Investigate the potential for a pilot project that highlights changes that we anticipate in Muskoka due to climate change.
- CA 2.6 Incorporate climate change education and outreach into all District programs where appropriate.
- CA 2.7 Develop an education program for homeowners and renters on climate and emergency preparedness.

**Community Goal - CA 3:** Partner with MWC and other community groups and organizations on climate change and environmental protection programs and outreach.

Actions to support CA 3:

- CA 3.1 Provide support for the MWC Algae Monitoring Program.

- CA 3.2 Encourage and support the development of a Watershed Management Plan as proposed by the MWC.
- CA 3.3 Partner with community and advocacy groups for the resumption of the Ontario Northland train service to Muskoka.
- CA 3.4 Continue to partner with the Muskoka Watershed Council to implement stewardship programs like Love Your Lake and The Natural Edge. Explore opportunities to expand the reach of these programs.
- CA 3.5 Review the Muskoka Watershed Advisory Group's (MWAG) report and assess recommendations and proposed projects in the report on protecting the Muskoka River Watershed.

**Community Goal - CA 4:** Assist the community to respond and recover from damage and loss due to extreme weather events.

Actions to support the CA 4:

- CA 4.1 Review the flood plain mapping data to assess the potential impacts of a 2019 magnitude or greater effect would have on Muskoka.
- CA 4.2 Encourage the area municipalities to use 511 to report flooded or otherwise blocked roads. Establish a Muskoka-wide database of road closures or access issues due to severe weather events or flooding. Hold meeting with area municipalities Roads Directors and Emergency services to discuss the importance of displaying all road closures in Muskoka in real-time at a single portal, and the benefit of having a record of road closures. Determine willingness to participate in this initiative. Develop a strategy to ensure each municipality can access and update the service.
- CA 4.3 Work with partners to lobby Provincial and Federal governments to provide financial support for recovery efforts.
- CA 4.4 Seek grants and partnership opportunities with funders from all levels of Government and the private and philanthropy sector.

**Community Goal - CA 5:** Partner with the SMDHU and other stakeholders to assess and mitigate the health impacts associated with climate change on Muskoka residents.

Actions to support CA 5:

- CA 5.1 Actively participate in the SMDHU 'Climate Change Exchange'.
- CA 5.2 Develop response plans for climate-related risks (e.g., heat) and partner with appropriate levels of Government (Area Municipalities, Provincial and Federal Governments) to ensure suitable warning systems and response procedures are in place during extreme weather events.

# IMPLEMENTING THE MUSKOKA CLIMATE CHANGE ACTION PLAN

---

Implementation of the MCCAP will require collaborative short-term action with a continued comprehensive long-term focus. Timeframes for implementation of each of the goals and actions will differ. Several of the actions are already underway (such as the GHG Baseline Inventory and Reduction Plans); certain proposed actions may commence or become fully implemented in the short-term (<1 years), while others may be considered for medium (1-3 years) or long terms (3+ years).

The municipal government world is a rapidly changing environment. Shifts in federal and/or provincial politics can drastically alter the priorities and available funding for municipalities. Large-scale crises, such as extreme weather events or the COVID-19 pandemic, can rapidly alter how governments of all levels respond and commit resources to programs. These changes present challenges for municipal governments to implement plans, but can also provide opportunities.

The implementation of the MCCAP is intended to be flexible while focusing resources and efforts to fulfil the District's Strategic Priorities and meaningfully and effectively addressing the changing climate. In addition, the MCCAP aims to ensure continuity, where feasible, with existing climate plans and strategies at all levels of government.

The goals and actions outlined in this report are to be used as a guide or reference for future planning. Some of the actions outlined in this document are already underway, or do not have specific budget requirements attached to them. However, some actions require budget consideration and may be incorporated, where possible, into Council decision-making, budget forecasting, and program planning. There are also projects outlined that would require significant investment from other levels of government to be fiscally possible. Detailed implementation information for each action, such as the roles, responsibilities of supporting departments, and tentative timelines, are available in appendix XX. Preliminary estimates of potential budget impacts are being identified, but some ambitious actions will rely on significant funding from Provincial or Federal sources and are difficult to cost currently.

With the MCCAP as a base, the Climate Change Initiatives Coordinator and the MCCAP Steering Committee will continue to identify, coordinate and assist in the implementation of approved actions. Where possible, actions outlined in this report will be incorporated into District policy and department workflows. For example, some design and development policies can be revised, where appropriate, to ensure goods

and services are chosen that will reduce GHG emissions or increase the District's resiliency to climate change.

The overall implementation of the MCCAP is proposed to be flexible to accommodate changes in District staffing complements, budgets, and grant awards. Changes in Federal or Provincial governments and their priorities can impact the pace at which the plan is implemented. The District will seek funding to achieve the goals and accelerate the implementation of the MCCAP where possible.

## IMPLEMENTATION CHAMPIONS

To assist with implementation this plan proposes that a staff Steering Committee continue to serve as an "MCCAP Implementation Committee" to assist the District, particularly through its Climate Change Initiatives Coordinator, advance the various goals and actions. Each department will be tasked with assessing the actions assigned to them, with guidance and support from the Steering Committee when required, and developing a plan for implementation. Individual departments will be able to best determine the resourcing (i.e., budget, time, staff capacity) required to complete the action. The MCCAP Implementation Committee with support from senior leadership will provide assistance where possible on the actions and can ensure that progress is being made on the goals and actions.

## MONITORING AND EVALUATION

Progress towards implementation of the MCCAP will be monitored and evaluated through:

- Annual progress reports to District Council commencing around Earth Week 2021;
- Quarterly MCCAP Steering Committee meetings to review and various champion corporate goals and actions; and
- Comprehensive review and update of the MCCAP every five years to ensure the best available climate science and related innovations are continually incorporated and the goals and actions remain up-to-date, relevant, and focused.

To effectively implement goals and actions detailed in the MCCAP, the following approaches will be used:

### Use the best science

By using the most recent local, national and international climate data available the District can plan and prepare for the changing climate effectively and with as much accuracy as possible.

### Partner with others

The District will continue to partner with the Area Municipalities, and various other governmental and non-governmental agencies including but not limited to MWC, AMs, SMDHU, the MSDC, CRI, GBBR, TLDSB, FCM, etc.

### Identify co-benefits

Both mitigation and adaptation components have been included into the MCCAP. The District can assess adaptation actions and ensure that, when possible, GHG emissions associated with the adaptation project are minimized.

### Deliver high quality service levels

This plan can help the District to ensure the delivery of high-quality levels of programs that address climate change on services and service levels.

### Communicate Effectively

This plan will build awareness in Muskoka through outreach and programs intended to increase citizens' adaptive capacity and decrease contributions to climate change. While this plan is intended as a corporate climate action plan, community outreach efforts through educational programming, and presentations have also been included to engage the public.

### Innovate and Collaborate

The District is committed to not only using the best practices currently in place in other municipalities, but to also develop innovative, "Made-in-Muskoka" solutions to mitigate climate change effects in Muskoka.

## RISE VISIONS AND VALUES

This plan will follow the District's Corporate Vision and Values Project called RISE. RISE stands for:

**Respect and Integrity:** Goals to improve how we as staff work with each other every day...and how to make our work experience as employees the best they can be.

**Innovation and Leadership:** Goals to make us more innovative in how we do our work... and develop personal leadership skills across the organization at all staff levels.

**Synergy:** Goals to work more closely together and collaborate across the many different departments and divisions at the District ...and ways we can improve how we communicate internally and get to know each other better.



**Experiences:** Goals to improve customer service...and enhance how services are delivered to our customers and clients.

The MCCAP was developed to ensure these staff driven corporate values are incorporated into, and at the center of, all actions and programs.

The Implementation Chart in pages 35 to 75 outlines the cost, time considerations and staff resources needed to complete each action. The following notes explain how the implementation chart is organized.

**Goal:** Describes the high-level goal that the action is meant to achieve.

**Action:** Provides detailed information about the action.

**Timeline:** The amount of time the action is anticipated to take.

- Immediate: Underway, ongoing or starting within a year
- Short: <1 year
- Medium: 1- 3 years
- Long: >3 years

**Cost:** The anticipated cost and/or staff effort associated with the action. Some actions will have specific budgets associated with them, while others are yet to be determined. Staff has estimated the impacts using the following metrics:

- \$ - Low cost (<\$50k)
- \$\$ - Medium cost (\$50-\$250k)
- \$\$\$ - High cost (\$250k -\$1 million)
- \$\$\$\$ - Major initiative (>\$1 million)

**Status:** Where in implementation the action is (proposed, underway, complete).

**Responsibility:** Identifies the lead and supporting department(s) that will help develop/assess/implement the action.

**Additional Stakeholders:** Identifies other parties (Area Municipalities, non-profits, consultants, general public etc.) that may have resources and expertise to help support or promote the action.

## NEXT STEPS

The next step in the corporate GHG reduction project is to work with the consultant to submit the results to FCM's PCP tool for assessment and award of completion for Milestone 1 of the PCP program (anticipated for Season/Year). Once this is achieved, the MCCAP Steering committee will work with the consultant to develop corporate GHG emission reduction targets.

With these GHG emission reduction targets in mind, the committee will work with the consultant to develop detailed GHG reduction strategies, focussing on cost-effective GHG reduction and electrical efficiency projects.

## CONCLUSIONS

---

The impacts of climate change are already being felt in Muskoka. Both, global and local scientific predictions demonstrate that the effects from increases in average temperatures will become increasingly evident in the near future. Climate change will alter Muskoka's communities, the local economy, and the beautiful but delicate environment that Muskoka's residents and visitors cherish.

With this MCCAP, and with its work on other climate initiatives the District Municipality of Muskoka is in a position to systematically prepare for the predicted impacts of climate change while also working towards significant reductions in local GHG emissions.

The preparation of the goals and related actions presented in the MCCAP provide the District with an ambitious but clear path forward. Through focused implementation and a steadfast commitment to continually monitor progress and update the actions when required, the MCCAP as a major component of the Muskoka Climate Strategy, will ensure the District takes the necessary steps to achieve resiliency to climate change.

# APPENDIX 1: IMPLEMENTATION CHARTS

---

## NATURAL ENVIRONMENT

### Strategic Priority

*Continue the stewardship of our natural environment - especially water and natural areas - so that they are protected for the values they provide including support for resilient, diverse ecosystems and a vibrant economy.*

Muskoka benefits from having a mostly intact natural environment, unlike the majority of Ontario south of the Canadian Shield. From a bird's eye view, approximately 94% of Muskoka is under natural cover, including forests, wetlands, lakes, barrens and rivers. While development and roads fragment Muskoka's natural areas, the abundance of natural areas that remain supports Muskoka with a number of valuable ecosystem services and provides a buffer for the impending impacts of climate change.

However, climate change is predicted to have a number of adverse effects on the natural environment. Many ecosystems become more vulnerable as extreme weather events increase and invasive species pose more risk. The impacts from climate change are experienced year-round and require both short-term and long-term solutions. The health of the terrestrial and aquatic environments in Muskoka is vital to the quality of life of its residents. The District will continue to strategize and implement steps to enhance climate resiliency through the natural environment across the region.

### Goals

**NE 1** Apply a "Climate Change Lens" to maximize resiliency of ecosystems and communities, manage the risks associated with climate change, and provide ecosystem services for future generations.

**NE 2** Promote the planting of native vegetation to reduce erosion and the impacts of flooding, as well as enhance local biodiversity.

**NE 3** Prevent the establishment of invasive species.

NE 4 Reduce road salt use while maintaining public safety.

NE 5 Protect locally, regionally and provincially significant areas and features to maintain the long-term integrity and the special character of the Muskoka environment.

NE 6 Quantify and mitigate the impacts of climate change on our water resources.

NE 7 Develop, fund and support programs to protect and conserve Muskoka's water resources.

### Actions

NE 1. Apply a “Climate Change Lens” to maximize resiliency of ecosystems and communities, manage the risks associated with climate change, and provide ecosystem services for future generations.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
NE 1.1	Develop and implement green and sustainable development standards and encourage Area Municipalities to as well (D20.4 and D20.5 of the MOP).	Planned	\$	Proposed	CPS (Planning)		Local AMs, Development Community
NE 1.2	Encourage all new District of Muskoka municipal buildings and projects to satisfy green and sustainable development standards. (D20.4 and D20.5 of MOP).	Long	\$	Proposed	CPS (Planning)		Local AMs, Development Community
NE 1.3	Promote sustainable development and healthy communities by considering the impacts of climate change during the review and approval of development applications. (D20.4 to D20.6 of MOP)	Medium	\$	Proposed	CPS (Planning)		Development Community

NE 1.4	Adopt a set of climate change resiliency and mitigation performance measures to guide and monitor development. (D20.7.a. of MOP)	Medium	\$	Proposed	CPS (Planning)		Development Community
NE 1.5	Adopt and use performance checklists to implement performance measures and consistently and transparently evaluate adherence of development to these measures. (D20.7.b. of MOP)	Medium	\$	Proposed	CPS (Planning)		Development Community
NE 1.6	Encourage Area Municipalities to use performance checklists to assist with creating healthy and complete, sustainable communities. (D20.7.f. of MOP)	Medium	\$	Proposed	CPS (Planning)		Local AMs. Development Community

NE 2. Promote the planting of native vegetation to reduce erosion and the impacts of flooding, as well as enhance local biodiversity.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
NE 2.1	Support the Muskoka Watershed Council to implement stewardship programs like Love Your Lake and The Natural Edge.	Recurring	\$	Ongoing	CPS (Watershed)	MWC	
NE 2.2	Support community organizations (i.e. Lake Associations, neighbourhood groups) in native species planting initiatives.	Recurring	\$	Ongoing	CPS (Watershed)	Lake and Community Associations	
NE 2.3	Develop policies requiring the use of native vegetation on all District-owned properties.	Short	\$	Proposed	FCS (Facilities Services)	CPS (Watershed)	MWC

NE 2.4	Partner with the Muskoka Watershed Council and other NGOs on new initiatives to increase the public's awareness of the importance of native vegetation and shoreline buffers.	Recurring	\$	Ongoing	CPS (Watershed)		MWC, Local NGOs
NE 2.5	Assess the Muskoka Watershed Advisory Group's 'Interim Advice and Recommendations to Address Priority Environmental Issues in the Muskoka River Watershed' for actions that would assist in climate change adaptation, mitigation, or increase sustainability and action where appropriate.	Short	\$- \$\$\$	Proposed	CPS, EPW	AMs	MWC, MWAG

NE 3. Prevent the establishment of invasive species.					Adaptation	○
					Mitigation	○
Action	Timeline	Cost	Status	Responsibility		Additional Stakeholders
				Lead	Support	
NE 3.1	Track the occurrence of invasive species on District-owned properties and along District roadways.	Recurring	\$	Ongoing	EPW	MWC
NE 3.2	Fund and implement removal programs for invasive species on District-owned properties and along District roadways. Partner with the Muskoka Watershed Council and other NGOs on initiatives to raise the public's awareness about invasive species.	Recurring	\$\$	Ongoing	EPW	AMs
NE 3.3	Submit reports of invasive species occurrences to a province-wide database through EDDMapS Ontario.	Recurring	\$	Proposed	EPW	

NE 3.4	Partner with the Muskoka Watershed Council and other NGOs on initiatives to raise the public's awareness about invasive species.	Recurring	\$	Ongoing	EPW	CPS (Watershed)	MWC, Local NGOs
NE 3.5	Require Invasive Species Management Plans for all District projects outlining procedures to minimize the spread of invasive species and proper disposal of contaminated soils and materials.	Recurring	\$\$	Ongoing	EPW	CPS (Facilities Services)	

NE 4. Reduce road salt use while maintaining public safety.					Adaptation	○	
					Mitigation	○	
Action	Timeline	Cost	Status	Responsibility		Additional Stakeholders	
				Lead	Support		
NE 4.1	Map areas sensitive to chloride and implement a strategy to reduce salt application in these areas.	Medium	\$	Proposed	EPW (Roads & Transportation)	CPS (GIS)	
NE 4.2	Continue EPW trials that investigate the efficacy and cost effectiveness of alternatives to traditional de-icing materials, with the goal of reducing the amount of road salt used.	Short	\$\$	Ongoing	EPW (Roads & Transportation)		AMs
NE 4.3	Support the implementation of the programs to reduce salt used by the District, businesses and residents. <ul style="list-style-type: none"> <li>Create multi-media outreach programs</li> </ul>	Recurring	\$	Ongoing	EPW (Roads & Transportation)	CPS (Watershed)	MWC
NE 4.4	Work with the Area Municipalities and the Ministry of Transportation (MTO) to quantify the amount of salt applied to Muskoka's roads and facilitate record keeping to examine the effectiveness of salt-reduction initiatives.	Short	\$	Proposed	EPW (Roads & Transportation)		AMs, MTO

NE 5. Protect locally, regionally and provincially significant areas and features to maintain the long-term integrity and the special character of the Muskoka environment.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
NE 5.1	Develop a Natural Heritage Strategy to identify locally, regionally and provincially significant areas and features and incorporate protection for these priority areas in Official Plan Policy.	Medium	\$\$	Proposed	CPS (Planning)	CPS (Watershed)	MWC
NE 5.2	Quantify the value of Muskoka's natural assets for consideration in decision-making and land-use planning. Their value in climate change adaptation and mitigation should be stated. <ul style="list-style-type: none"> <li>Explore funding opportunities resulting from recommendations and projects in the MWAG report.</li> </ul>	Medium	\$\$	Proposed	CPS (Planning)	CPS (Watershed)	MWC
NE 5.3	Identify priority areas for rehabilitation and renaturalization that strengthens Muskoka's ability to adapt to a changing climate. Support programs like the Friends of Muskoka Watershed 'Ash Program' when possible.	Medium	\$\$	Proposed	CPS (Planning)	CPS (Watershed)	MWC



NE 6. Quantify and mitigate the impacts of climate change on our water resources.					Adaptation	Mitigation	○	○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders	
					Lead	Support		
NE 6.1	Implement the Lake System Health Water Quality Monitoring program to collect data on Muskoka's lakes, incorporating the collection of data that provides an indication of Muskoka's changing climate (i.e. water temperature profiles) where possible.	Recurring	\$	Ongoing	CPS (Watershed)		MECP	
NE 6.2	Partner with the Muskoka Watershed Council to implement a volunteer algae monitoring program to collect baseline data on algae abundance and trends in order to establish changing conditions as a result of climate change.	Recurring	\$	Ongoing	CPS (Watershed)		MWC, Lake Associations	
NE 6.3	Implement policies to guide development around Muskoka's water resources taking current and future climate impacts into account.	Long	\$	Proposed	CPS (Planning)	CPS (Watershed)	MWC	
NE 6.4	Partner with all levels of government, NGOs and the community to support relevant research opportunities to identify current and future ecosystem changes and potential mitigation and/or adaptation programs.	Medium	\$	Proposed	CPS (Watershed)		MWC, Local NGOs, MECP, MNRF, Universities	
NE 6.5	Support MWC efforts to develop an IWM plan for the Muskoka Watershed.	Medium	\$ - \$\$	Ongoing	MWC	DMM	AM MNRF Neighbouring Municipalities MECP Lake Associations	

NE 6.6	Implement water conservation measures in all District-owned buildings to mitigate the impacts of drought.	Medium	TBD	Ongoing	Finance		
NE 6.7	Partner with AMs to improve septic tracking and re-inspection in Muskoka.	Medium	TBD	Ongoing	EPW		

NE 7. Develop, fund and support programs to protect and conserve Muskoka's water resources.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
NE 7.1	Pursue grant opportunities for the District and partners to maintain current programs and develop new innovative ways of protecting Muskoka's water resources.	Med	\$	Ongoing	CPS (Watershed)	EPW (W&WW)	

# GOVERNANCE

## Strategic Priority

*Provide responsive and efficient government by demonstrating leadership in transparency, excellence, accountability, fiscal responsibility, good governance, community engagement, and continuous improvement in our program and service delivery.*

As climate change persists and presents new risks, modification and updating of District policy is necessary to maintain effective and responsive governance. Since climate change is going to impact the livelihoods and lifestyles of Muskoka residents, strategic planning and implementation is required to ensure the continued delivery of optimal programs, policies, plans and service delivery. The adaptation of current practices and policies to increase climate resiliency can create a vibrant future for the region. The District will work to make sustainable changes where necessary in a feasible manner.

## Goals

**GS 1** Revise District programs to reduce GHG emissions and make them more resilient to climatic changes by implementing best practices and technology.

**GS 2** Develop a sustainable asset management plan that takes climate change impacts into account while maintaining a high level of service.

**GS 3** Review and revise the District's policies and plans to ensure climate change has been fully accounted for. Ensure future documents and projects incorporate climate change considerations and mitigation measures.

**GS 4** Conduct an analysis of the District and Area Municipal responses to the COVID-19 crisis and use lessons learned to help refine responses to extreme weather events and emergencies; explore options to continue working from home to help reduce GHG emissions associated with driving to work, and the decreased wear and use other District infrastructure. Continue to invest in opportunities to work remotely to ensure business continuity during extreme weather events or other emergencies.

**GS 5** Monitor the implementation of adaptation and mitigation actions and goals in order to make continuous operational improvements. Review and update the plan on a recurring basis (~5 years).

**Actions**

<b>GA 1.</b> Revise District programs to reduce GHG emissions and make them more resilient to climatic changes by implementing best practices and technology.					Adaptation	○	
					Mitigation	○	
<b>Action</b>		<b>Timeline</b>	<b>Cost</b>	<b>Status</b>	<b>Responsibility</b>		<b>Additional Stakeholders</b>
					<b>Lead</b>	<b>Support</b>	
GA 1.1	<p>Work with MWC and other organizations to support industry and all levels of government in promoting and developing low carbon and resilient standards, policies, and programs.</p> <ul style="list-style-type: none"> <li>Assess the Provincial Climate Change Risk assessment results when available and incorporate actions into appropriate policies where feasible.</li> </ul>	Short - Med	\$-\$\$	Ongoing	CPS (CC), CPS (Planning),	MWC, CAM, MSDC, TLDSB, Lake Head University, DESC	Province
GA 1.2	Identify and pursue available funding mechanisms and partnerships to support actions.	Short - Med	\$\$	Ongoing	MWC, CPS (CC),	CAM, MSDC, TLDSB, Lakehead University, DESC	
GA 1.3	<p>Develop a Corporate waste reduction strategy</p> <ul style="list-style-type: none"> <li>Investigate opportunities a strategy to increase residential diversions rates.</li> <li>Investigate opportunities for partnerships to encourage and increase the diversion organics of IC&amp;I waste (Business, schools, industry etc.).</li> </ul>	Med - Long	\$ - \$\$\$	Ongoing	EPW (Waste), CPS (CC),	General Public	

	<ul style="list-style-type: none"> <li>• Expand, where possible, the District's diversion programs.</li> <li>• Assess policies and approvals to allow flexibility to accept organics from IC&amp;I sources when and where possible.</li> <li>• Investigate opportunities to partner with other municipalities and funding opportunities for development of advanced organics processing technology with the potential for renewable natural gas capture.</li> <li>• Create an education and marketing campaign on the importance of diversion programs in Muskoka.</li> </ul>						
--	---	--	--	--	--	--	--

<b>GA 2.</b> Develop a sustainable asset management plan that takes climate change impacts into account and maintains the high level of service.					Adaptation		○
					Mitigation		○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
	GA 2.1 Incorporate the findings of the Muskoka Climate Change Action Plan into the new asset management system and review periodically.	Med	\$\$	RFP Awarded	Lead IT, Finance, CIU, CPS (CC), EPW	Support	

GA 3. Review and revise the District's policies and plans to account for climate change. Ensure future District documents and projects incorporate climate change considerations and mitigation measures whenever possible.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
GA 3.1	Provide feedback (where applicable) on climate-related legislation proposed by Federal, Provincial, and Area Municipal Governments.	Recurring	\$	Ongoing	CPS Planning, EPW, Health, Finance,	CPS (CC), MWC, AMs	
GA 3.2	Identify opportunities to introduce new legal and/or policy tools, including by-laws, to require implementation of climate resilience measures (e.g., green roof by-law) in new buildings, or that reduce the embodied carbon in new construction.	Recurring	\$\$	Ongoing	CPS Planning, EPW, Health, Finance,	CPS (CC), MWC, AMs	CAM
GA 3.3	Embed climate change considerations in staff reports and purchasing processes. <ul style="list-style-type: none"> <li>Investigate options to achieve this. Can be similar to the 'financial implications', or added in with the Strategic Prioritize checklist.</li> </ul>	Short	-	Ongoing	All DMM Departments, Council	DSLTT	
GA 3.4	Review and amend key policy documents (such as the Muskoka Official Plan) on a regular basis to ensure new climate change considerations are incorporated. <ul style="list-style-type: none"> <li>Amend key policy documents when new climate related reports are released (new flood plain mapping, green fleet policy, waste management projects, IWM etc.).</li> </ul>	Med	\$	Ongoing	All DMM Depts, CPS (CC)	DSLTT	

GA 4. Conduct an analysis of the District and Area Municipalities response to extreme weather events and other regional emergencies and use lessons learned to help refine response.					Adaptation Mitigation		○ ○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
GA 4.1	<p>Conduct an analysis of the District and Area Municipal responses to the COVID-19 crisis and use lessons learned to support climate-friendly approaches to District activities.</p> <ul style="list-style-type: none"> <li>Explore grant opportunities associated with the economic recovery from the crisis and where possible target grants that have clean tech, climate change and/or green economy.</li> </ul>	Med	\$	Ongoing	Finance, CIU, CPS (CC), Facilities, Health Team	DSLIT	AMs
GA 4.2	Encourage opportunities to work remotely where service levels are being met.	Med	\$\$	Ongoing	CPS (CC), Facilities, Finance, EPW	AMs	
GA 4.3	<p>Investigate other municipalities best-practises to achieve a new 'Greener' normal.</p> <ul style="list-style-type: none"> <li>Explore opportunities to partner with 'green-economy' organizations like Green economy North etc.</li> </ul>	Short	\$	Ongoing			

GA 5. Monitor the implementation of adaptation and mitigation actions and goals in order to make continuous operational improvements. Review and update the plan on a recurring basis (~5 years).					Adaptation Mitigation		○ ○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	

GA 5.1	Report quarterly to committee on the progress of implementation and an assessment of potential grants of project opportunities.	Long	\$	Ongoing	Finance, CIU, CPS (CC), Facilities, Health Team	DSLTT	AMs
GA 5.2	Develop a standardized checklist to ensure progress and monitoring is consistent.	Med	\$	Ongoing	CPS (CC), facilities, Finance, EPW	AMs	
GA 5.3	Adhere to legislative and program requirements while continually advocating for consistent, equitable and sustainable funding for Muskoka.	Med	\$	Ongoing	EPW, CPS, Facilities, Finance		



## ECONOMY

### Strategic Priority

*Drive a vibrant regional economy by collaborating with others to identify and take advantage of opportunities to create a positive business environment.*

Climate change can impact businesses and the different industries and sectors supporting Muskoka's economy by increasing risk from disruption by severe weather events, invasive species, flooding or wildfire. Collaborating with local businesses and the tourism sector to support the navigation of potential risks and burdens from climate change is a priority of the District. Recreational activities and tourism generate a significant amount of revenue in Muskoka every year, with tourists and second home owner spending over \$500 million annually in Muskoka<sup>12</sup>. This economic input is a key driver in Muskoka's employment sector.

Expanding initiatives to be inclusive of climate-resilient actions to commercial, recreational, and other economic development opportunities enhances municipal ability to combat associated risks. The District will continue to collaborate with area municipalities, partners, and businesses to adapt to a changing climate through innovation and economic growth.

### Goals

**EA 1** Enhance the sustainability of the Muskoka Airport.

**EA 2** Increase the resiliency of the local economy to climate change and other emergency impacts and help businesses, community groups, and citizens take advantage of any opportunities related to climatic changes in Muskoka.

---

<sup>12</sup> District of Muskoka Economic Development and Community Profile, 2019, <https://www.muskoka.on.ca/en/work-and-invest/resources/2019-11-01-Economic-Development-Profile-FINAL-.pdf>

**EA 3** Build on Muskoka's reputation as an internationally recognized tourism destination that is a leader and innovator in the fight against climate change - Make Muskoka the greenest region in the province.

**EA 4** Collaborate with Area Municipalities and other groups to support and promote tourist, commercial, recreational and other economic development which enhances the natural environment, has low-impact on climate change and recognizes the character of all of Muskoka's communities.

**EA 5** Establish a climate change reserve fund or increase contributions to the environmental reserve fund to assist in the pursuit of grants for ambitious projects that increase resiliency and mitigate District GHG emissions.

**Actions**

<b>EA 1.</b> Enhance the sustainability of the Muskoka Airport.					Adaptation	○	
					Mitigation	○	
<b>Action</b>		<b>Timeline</b>	<b>Cost</b>	<b>Status</b>	<b>Responsibility</b>		<b>Additional Stakeholders</b>
					<b>Lead</b>	<b>Support</b>	
EA 1.1	Develop a Sustainability Plan for the Muskoka Airport. Explore opportunities to reduce energy consumption, waste, GHG emissions associated with airport activities, protect ground water resources, and improve resiliency to climatic changes.	Med	\$\$	Ongoing	Airport Team, CPS (CC)	Airport Board, DSLT	Explorers Edge, Finance

<b>EA 2.</b> Increase the resiliency of the local economy to climate change impacts and help them take advantage of any opportunities related to climatic changes in Muskoka.					Adaptation	○	
					Mitigation	○	
<b>Action</b>		<b>Timeline</b>	<b>Cost</b>	<b>Status</b>	<b>Responsibility</b>		<b>Additional Stakeholders</b>
					<b>Lead</b>	<b>Support</b>	

EA 2.1	Incorporate climate change education and outreach into District programs that deal with business or commercial interests.	Med	\$	Ongoing	Finance, Explorers Edge, CPS (CC)	AMs	
EA 2.2	Partner with Area Municipalities to help local businesses adapt to climate change and decrease their GHG emissions. <ul style="list-style-type: none"> <li>• Include a section in the climate change web resources platform dedicated to local businesses.</li> <li>• Advertise and promote energy efficiency programs as the become available.</li> </ul>	Med	\$	Ongoing	CPS (CC), Comms	AMs	
EA 2.3	Encourage the development community to minimize carbon footprints associated with construction operations and materials. <ul style="list-style-type: none"> <li>• Use results of the new development standards and checklists to encourage climate responsible development.</li> </ul>	Med	\$	Ongoing	CPS (Planning), EPW	AMs, local businesses	

<b>EA 3.</b> Build on Muskoka's reputation as an internationally recognized tourism destination that is a leader and innovator in the fight against climate change.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
EA 3.1	Encourage developers to include low carbon energy systems in new developments and/or the use of carbon sequestration material in new buildings. Consider reviewing development charges and tying the fees to embodied carbon or sustainability in new builds. Review the Duro-Drummond use of development charges based on embodied carbon and assess applicability for Muskoka.	Med	\$	Ongoing	CPS (Planning)	AMs	
EA 3.2	Support incorporation of climate-smart business models and programs in the tourism industry. <ul style="list-style-type: none"> <li>Where possible encourage Explorers' Edge to advertise or encourage environmentally friendly tourism options.</li> </ul>	Med	\$	Ongoing	CPS (CC), Comms, Finance, Explorer's Edge.	AMs, MWC, CAM,	

<b>EA 4.</b> Collaborate with Area Municipalities and other organizations to support and promote economic development opportunities that enhance the natural environment, have low-impact on climate change, and recognize the character of Muskoka's communities.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
EA 4.1	Consider establishing a 'Green Economy/Recovery Task Force' (or task an existing committee/group) comprised of representatives from Area Municipalities, businesses, the tourism sector, Business Improvement Areas (BIA), and community	Short - Med	\$	Ongoing	Finance, CPS (CC), MWC	AMs, CAM, MSDC	General Public

	organizations like the Muskoka Watershed Council (MWC), Muskoka Steamship & Discovery Centre (MSDC), Climate Action Muskoka (CAM), and others, to explore ways to foster and support eco-tourism and environmentally friendly economic opportunities.						
EA 4.2	Expand the Corridor 11 Bus service within Muskoka, providing additional, environmentally friendly travel options for residents and tourists alike.	Short	\$	Ongoing	CPS (Planning – Transportation)	AMs	Service Operators
EA 4.3	Launch an east-west transportation program, building on the previous Muskoka Extended Transit Service, to help move residents east and west throughout the District and into the larger towns, providing a more environmentally friendly travel option	Short	\$\$	Ongoing	CPS (Planning - Transportation)	AMs	

<b>EA 5.</b> Establish a climate change reserve fund or increase contributions to the environmental reserve fund to assist in the pursuit of grants for ambitious project to increase resiliency and mitigate District GHG emissions.					Adaptation	○	
					Mitigation	○	
Action	Timeline	Cost	Status	Responsibility		Additional Stakeholders	
				Lead	Support		
EA 5.1	Identify financial implications and incorporate climate mitigation and adaptation goals into existing short and long term financial projections for the District. Fund could help support the pursuit of grants that require contributions for the Municipal Government. <ul style="list-style-type: none"> <li>Explore funding opportunities for this fund like % of revenue from renewable projects,</li> </ul>	Short - Med	\$\$	Ongoing	Finance, EPW, CPS (CC)	DSLTT, Council	AMs

	or cost savings from energy efficiency upgrades.						
--	--	--	--	--	--	--	--

## INFRASTRUCTURE

### Strategic Priority

*In a fiscally responsible manner, provide safe and reliable public infrastructure systems to connect and support all communities across Muskoka.*

Increases in the frequency and intensity of extreme weather events due to climate change will impact built infrastructure across the District. Climate events such as flooding, more numerous freeze-thaw cycles, and greater precipitation levels all put stress on existing infrastructure.

Through continued collaboration with area municipalities and stakeholders, the District will continue to connect and service communities by enhancing the resiliency of its transportation networks, waste management, and water and wastewater systems. Updated designs and specifications that take these concerns into consideration will evolve as reaction moves from acknowledgement to implementation. Outlined below is a series of proposed goals to increase the District's adaptive capacity and to mitigate its GHG emissions.

### Goals

**IN 1** Increase the District's ability to help the community prepare for and respond to extreme weather events and emergency situations.

**IN 2** Assess District buildings and infrastructure for vulnerability to climate change impacts.

**IN 3** Examine the potential increase in capital expenses and expenditures from damage related to an increase in more frequent and severe weather events.

**IN 4** Reduce the GHG associated with the operation of District buildings, infrastructure, and fleet vehicles.

**IN 5** Integrate climate change impacts and GHG reductions into affordable design, construction and maintenance of District assets (roads, buildings, bridges, sanitary sewer and potable water infrastructure, etc.).

**IN 6** Create a stormwater management plan.

**Actions**

<p><b>IN 1.</b> Increase the District’s ability to help the community prepare for and respond to extreme weather events and emergency situations.</p>					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status/Staff time	Responsibility		Additional Stakeholders
					Lead	Support	
IN 1.1	<p>Evaluate the data presented in the flood plain mapping project to evaluate impacts on different areas in Muskoka.</p> <ul style="list-style-type: none"> <li>Assess # of buildings impacted and their type.</li> <li>Assess # of structures that have basements.</li> <li>Quantify, where possible, damage to various areas.</li> </ul>	Short	\$	Ongoing	CPS (GIS)	Emergency Response group, EPW, AMs	General Public
IN 1.2	<p>From the flood plain mapping assessment, investigate potential flood mitigation opportunities.</p> <ul style="list-style-type: none"> <li>Review outcomes from the Muskoka Watershed Advisory Group and implement feasible actions.</li> <li>Depending on the results of the FPMP data assessment target higher risk areas for mitigation where possible.</li> <li>Work collaboratively with AMs to develop cohesive planning policies for Muskoka to deter building in flood prone areas.</li> <li>Develop technical guidance for structures that are permitted in the flood plain by their</li> </ul>	Med-Long	\$\$\$	Ongoing	CPS (Planners, GIS, Watershed), EPW, MNRF	Emergency Response group, EPW, AMs, MNRF,	General Public



	nature (boathouses, docks etc.) as directed in the Provincial flood assessment.						
IN 1.3	Encourage the Province to update the Muskoka River Water Management Plan (MRWMP) to ensure that up-to-date climate information is incorporated.	Short	\$	Ongoing	DSLTT	Emergency Response group, EPW, AMs	General Public
IN 1.4	Consider establishing a municipal “extreme weather reserve fund” to assist community members, organizations, and businesses recover from serious weather events. Determine the best delivery model for a program (grants, waived fees, etc.). <ul style="list-style-type: none"> <li>Determine best delivery method for funds (grants, waiving fees, etc.).</li> </ul>	Long	\$\$	Ongoing	Finance,	Emergency Response group, AMs	General Public
IN 1.5	Strategically locate infrastructure and public service facilities, generally within or immediately adjacent to settlement areas, to support the effective and efficient delivery of emergency services. (D18 b of MOP). <ul style="list-style-type: none"> <li>Tie-in with asset management plan to focus on end-of-life replacements.</li> <li>Consider locations for new builds as well.</li> </ul>	Med	\$\$	Ongoing	Facilities, CPS (CC), EPW	EMS	General Public
IN 1.6	Encourage public road access to new lots and development, or as an alternative, access over a private condominium road to ensure the provision of emergency access (K5 of MOP).	Med	\$	Ongoing	CPS (Planners, GIS)	AMs	General Public, Development community

IN 2. Evaluate District buildings and infrastructure for vulnerability to climate change impacts.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
IN 2.1	<p>Complete an inventory of all buildings that includes an assessment of climate risks and incorporate this inventory into asset management plans.</p> <ul style="list-style-type: none"> <li>Assess insurance claims at District facilities and identify trends or problems areas if found.</li> <li>Tie in with new asset management system when developed.</li> </ul>	Short	\$	Ongoing	Facilities, CPS (CC)	Finance, IT	General Public
IN 2.2	<p>Evaluate District facilities for vulnerability to extreme weather events days, including extreme heat days.</p> <ul style="list-style-type: none"> <li>Develop criteria for assessment of risk level.</li> <li>Work with SMDHU to prioritize vulnerable groups that are at increased risk to extreme heat.</li> </ul>	Med	\$	Ongoing	CPS (CC),	SMDHU	General Public
IN 2.3	<p>Review newly developed Intensity-Duration-Frequency (IDF) curves from Ministry of Transportation Ontario (MTO) and other jurisdictions in Ontario and assess their applicability for Muskoka infrastructure.</p> <ul style="list-style-type: none"> <li>Investigate best practises from other municipalities with similar geography and flooding problems.</li> <li>Review and report to Committee.</li> </ul>	Short	\$	Proposed	EPW (Roads)	CPS (CC)	MTO

IN 3. Examine the potential increase in capital expenses and expenditures from damage related to an increase in more frequent and severe weather events.					Adaptation Mitigation		○ ○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
IN 3.1	Determine the metrics required to monitor and track costs of response to emergency events like flooding and compare to historical costs to the District and Area Municipalities. <ul style="list-style-type: none"> <li>Use results in pursuit of funding opportunities.</li> </ul>	Low	\$	Proposed	EPW	CPS (GIS), Finance	
IN 3.2	Explore the use of green infrastructure to manage stormwater on publicly and privately owned properties (e.g., permeable paving, blue roofs). Consider change to development and engineering design standards, where feasible, that would increase resiliency to flooding.	Low	\$-\$\$	Ongoing	CPS (Watershed), EPW		
IN 3.3	Assess service delivery programs for vulnerabilities to climate-related emergencies and develop contingency plans to mitigate the impacts. <ul style="list-style-type: none"> <li>Develop a list of what programs under what conditions/events are not able to meet service requirements.</li> <li>Explore opportunities to ensure business continuity and service delivery during the events identified.</li> </ul>	Low	\$	Proposed	All		
IN 3.4	Partner with Area Municipalities and other relevant organizations to coordinate responses to climate-related emergencies.	Low	\$-\$\$	Ongoing	EMT, DSLT	EPW (Roads), AMs	

IN 3.5	Target and prioritize publicly funded new construction developments that apply climate change construction principles. <ul style="list-style-type: none"> <li>Assess programs like FCM's Community Efficiency Financing programs for applicability in Muskoka.</li> </ul>	Low	\$\$	Proposed	CPS (CC)	Finance	General Public
--------	---	-----	------	----------	----------	---------	----------------

IN 4. Reduce the GHG associated with the operation of District buildings, infrastructure, and fleet vehicles.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
IN 4.1	Complete a corporate GHG baseline inventory for all District emissions. <ul style="list-style-type: none"> <li>When complete, apply for completion of Milestone 1 of the FCM PCP program</li> </ul>	Short	\$\$	Budgeted/ Pending completion	EWP (W&WW), CPS (CC)	EPW (Waste), Facilities	
IN 4.2	Use the results of the Corporate GHG inventory to explore innovative pilot projects and opportunities to enhance resilience and reduce greenhouse gas emissions (e.g., heat pump retrofits).	Med - Long	\$\$	Budgeted/ Ongoing	Facilities	EPW , CPS (CC)	
IN 4.3	When building new municipally-owned buildings ensure they are low carbon structures that are more energy efficient and near net-zero when feasible.	Long	\$\$\$	Ongoing	EPW, Facilities, CPS (CC)		
IN 4.4	Pursue retrofits of municipally-owned buildings to reduce natural gas and electricity consumption, and where feasible consider options that increase efficiency and reduce emissions. Review previous Operational Energy Audit for outstanding actions and assess	Med - Long	\$\$\$	Ongoing	Facilities, EPW, CPS (CC)		

	<p>feasibility of implementation. Review actions and recommendations and assess the cost/energy saving associated with the actions.</p> <ul style="list-style-type: none"> <li>• Through asset management plan, continue to pursue energy reduction and conservation benefits through lifecycle replacements</li> <li>• When refreshing, maintaining, replacing equipment/buildings assess proposal for CC mitigation and Adaptation options.</li> <li>• Consider the embodied carbon in construction materials when planning retrofit work, with the aim of reducing the carbon intensity of the retrofit.</li> </ul>						
IN 4.5	<p>Identify opportunities for renewable energy generation, including renewable natural gas, and storage at District-owned facilities to supply the needs of District-owned assets.</p> <ul style="list-style-type: none"> <li>• Assess surplus or unused District land for solar projects.</li> <li>• Consider different approaches to financing projects like P3s.</li> </ul>	Med - Long	\$\$	Ongoing	Facilities,	EPW (W&WW), CPS (CC)	
IN 4.6	<p>Based on the results of the Corporate and GHG emissions inventory, develop GHG emissions reduction targets for District facilities.</p> <ul style="list-style-type: none"> <li>• Review the IPCC targets and assess viability of reducing emission associated with District buildings by 50% by 2030. Achieve net-zero GHG emissions from buildings by 2050.</li> </ul>	Med - Long	\$\$	Ongoing (budgeted)	EPW, Facilities, CPS (CC)	DSLTT	

IN 4.7	<p>Develop a green fleet policy to assess electrification or alternate fuel opportunities for all District fleets and equipment; and continue to monitor technology changes to assess the best fit to fulfill District services while reducing the climatic impacts and continue to assess vehicle allocation, route optimization, right-sizing fleet, and remote or virtual meeting options.</p> <ul style="list-style-type: none"> <li>Assess procurement schedule and target electric vehicle replacements for District fleet where feasible (i.e. District cars initially, trucks when appropriately available and affordable).</li> </ul>	Short – Med	\$\$	Ongoing (budgeted)	Facilities (Fleet Manager)	Finance (Procurement)	
IN 4.8	<p>Evaluate infrastructure readiness for electric vehicle charging infrastructure in corporate and municipal parking facilities to accommodate the electrification of the Corporate and transit fleets. Pursue funding opportunities to reduce cost.</p> <ul style="list-style-type: none"> <li>Reach out to Lakeland Power, Hydro One, and other utility providers and interested commercial business in the electric car charging market in Muskoka to discuss partnership opportunities to expand the charging network.</li> </ul>	Med – Long	\$\$	Ongoing	Facilities		
IN 4.9	<p>Based on the results of the Corporate and GHG emissions inventory, develop GHG emissions reduction targets for District fleet.</p> <ul style="list-style-type: none"> <li>Review the IPCC targets and assess viability of reducing emission associated with District buildings by 50% by 2030.</li> </ul>	Med - Long	\$\$	Ongoing (budgeted)	EPW, Facilities, CPS (CC)	DSLTT	

	Achieve net-zero GHG emissions from buildings by 2050.						
IN 4.10	Investigate options for the use of electric or hybrid vehicles for the District's Community Transportation vehicles or public transit contracts.	Short	\$\$-	Ongoing	CPS (Planning – Transportation)	Service providers	
IN 4.11	Reduce fleet use by encouraging remote/virtual meeting opportunities.	Short	\$	Ongoing	IT, Finance, DSLT	All where feasible	

IN 5. Integrate climate change impacts and GHG reductions into affordable design, construction and maintenance of District assets (roads, buildings, bridges, sanitary sewer and potable water infrastructure, etc.).					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
IN 5.1	Where feasible ensure Engineering and Public Works (EPW) procurement and design requirements reflect climate friendly, resilient, and cost-effective options.	Short - Medium	\$\$	Ongoing	Facilities	EPW, CPS (CC)	
IN 5.2	Pursue innovative low or zero emissions pilot and partnership opportunities (e.g., hydrogen or electric bus pilots, net-zero water & wastewater facility etc.)	Long	\$-\$\$\$	Ongoing	EPW, CPS (CC)	AMs, MWC, MSDC	
IN 5.3	Update the District's engineering and development standards where feasible to ensure the design of district assets considers and accounts for the impacts of climate change. Including but not limited to reducing GHG emissions associated with construction (related to C4 vi of MOP).	Med - Long	\$\$-	Ongoing	Facilities, EPW, CPS (CC)	EPW, CPS (CC)	

IN 5.4	Investigate funding mechanisms and options to increase efficiency and move towards a low carbon housing stock. <ul style="list-style-type: none"> <li>Detail list of potential funding opportunities to pursue.</li> </ul>	Short - Medium	\$\$	Ongoing	CPS (CC), Facilities		
--------	--	----------------	------	---------	----------------------	--	--

IN 6. Improve the management of storm water in Muskoka.					Adaptation		○
					Mitigation		○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
IN 6.1	Review the state of stormwater management in Muskoka, including recommendations in the District's 2009 Stormwater Management Plan and where appropriate address outstanding actions.	Med	\$	Ongoing	EPW (Roads), CPS (CC)		
IN 6.2	Review local stormwater management plans and when possible partner for pilot opportunities. Continue to partner with Area Municipalities to maximize efficiencies from planning road construction cooperatively when both Governments are present.	Med	\$	Ongoing	EPW (Roads), CPS (CC)	AMs	



## COMMUNITY

### Strategic Priority

*Ensure that all of Muskoka's communities are complete, safe, inclusive, accessible, supportive and foster healthy living.*

With the anticipated increase in extreme heat and cold days, extreme weather events, and the spread of vector-borne diseases, there will be a corresponding increase in threats to human health and safety. The tourism sector is a major employer in Muskoka and brings over \$500 million dollars annually to the region. While there may be some increases in opportunities for seasonal businesses related to a longer summer season, negative impacts like increases in algal blooms and drought due to climate change can also present challenges.

The District will continue to collaborate with partners, stakeholders and community members and those that are more vulnerable to climate change such as children, elderly, people with pre-existing health conditions, etc., and continue to promote an inclusive and healthy community by working to mitigate and adapt to the impacts of a changing climate. The District will continue to meet the needs of its communities while addressing the impacts of climate change.

### Goals

**CA 1** Facilitate the development of a Muskoka-wide Community Climate Change Action Plan.

**CA 2** Through communication and outreach educate staff and the community on climate change impacts and opportunities in Muskoka.

**CA 3** Partner with the MWC and other groups on climate change and environmental protection programs and outreach.

**CA 4** Assist the community to respond and recover from damage and loss due to extreme weather events.

**CA 5** Partner with the SMDHU and other stakeholders to assess and mitigate the health impacts associated with climate change on Muskoka residents.

## Actions

CA 1. Facilitate the development of a Muskoka-wide Community Climate Change Action Plan.					Adaptation	Mitigation	○	○
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders	
					Lead	Support		
CA 1.1	Invite and partner with community organizations to conduct a community greenhouse gas inventory for Muskoka. <ul style="list-style-type: none"> <li>When complete, celebrate completion of Milestone 1 in FCM's PCP program.</li> </ul>	Short	\$	Budgeted /Ongoing	EPW (W&WW), CPS (CC)	Consultant, General Public	MWC, CAM	
CA 1.2	Partner with the community to develop a list of actions to reduce Muskoka GHG emissions.	Short	\$	Budgeted /Ongoing	EPW (W&WW), CPS (CC)	Consultant, General Public	MWC, CAM	
CA 1.3	Partner with the community to develop a list of actions to adapt to climate change.	Med	\$	Ongoing (FPMP)	EPW (W&WW), CPS (CC)	Consultant, General Public	MWC, CAM	
CA 1.4	Seek funding the assist the community in implementing actions to reduce GHG emissions and adapt to climate change.	Med-Long	\$	Ongoing	EPW (W&WW), CPS (CC)	Consultant, General Public	MWC, CAM	
CA 1.5	Post climate change related initiatives on the District website or Engage Muskoka site and related spatial data the Muskoka Web Map and Muskoka Open Data site. <ul style="list-style-type: none"> <li>Develop a public facing platform to inform the public of resources and information relating to climate change in Muskoka.</li> <li>List links and actions that can help the general public reduce their emission and/or</li> </ul>	Short - Med	\$	Ongoing	Comms, CPS (CC), CPS (GIS)			

	make them more resilient to climate change impacts.						
CA 1.6	Develop and implement a marketing campaign encouraging residents to utilize public transportation services when possible as an opportunity to help mitigate climate change. <ul style="list-style-type: none"> <li>Launch in concert with the east-west public transportation corridor that is planned for Muskoka.</li> </ul>	Short-Med	\$	Ongoing	CPS (Planning - Transportation), Comms	AMs, MWC, CAM, GBBR	General Public, Muskoka Businesses (BIAs)
CA 1.7	Support grass roots movement that are looking to achieve progressive responsible change to reduce GHG emissions in Muskoka.	Med	\$	Ongoing	CPS (CC), MWC	CAM, MWC, MSDC, TLDSB, GBBR, MC, etc.	General Public, Muskoka Businesses (BIAs)
CA 1.8	Encourage Area Municipalities with the development of their Climate Change Action Plans, and provide support and assistance.	Med - Long	\$\$	Ongoing	CPS (CC), MWC	CAM, MWC, MSDC, TLDSB, MC, etc.	General Public, Muskoka Businesses (BIAs)

CA 2. Through communication and outreach educate staff and the community on climate change impacts and opportunities in Muskoka.					Adaptation	○	
					Mitigation	○	
Action		Timeline	Cost	Status	Responsibility		Additional Stakeholders
					Lead	Support	
CA 2.1	Continue to support the Muskoka Watershed Council, Georgian Bay Biosphere Reserve (GBBR) and other organizations in its outreach efforts and stewardship programs	Short-Long	\$	Ongoing	CPS (Watershed)	CPS (CC), DSLT, MSDC, FMW	General Public
CA 2.2	Continue to partner with the Muskoka Steamship & Discovery Centre on its watershed and sustainability programs.	Medium	\$	Ongoing	CPS (Watershed, CC)		
CA 2.3	Develop curriculum-based education materials for local schools related to specific climatic impacts in the area and deliver to area schools.	Short	\$	Program 1 Complete	General Public, Muskoka Businesses (BIAs)	TLDSB, MWC	
CA 2.4	Encourage and raise awareness about local food production in Muskoka.	Short - Med	\$	Ongoing	CPS (CC), MWC, Food Coop, GBBR	MSDC, CAM	
CA 2.5	Promote local and historical ecology facts as they relate to climate change. Investigate the potential for a pilot project of that highlights changes that we anticipate in Muskoka due to climate change. <ul style="list-style-type: none"> <li>Investigate funding opportunities to support the pilot project.</li> <li>Partner with other organizations to deliver when possible (MWC, MSDC etc.)</li> </ul>	Short	\$	Ongoing	MWC, CPS (CC). MSDC	Local Businesses, AMs	General Public

CA 2.6	Incorporate climate change education and outreach into all District programs where appropriate. <ul style="list-style-type: none"> <li>Deliver climate change based programming to various district programs and partners (W.I.S.E., EarlyON, Rotary, TLDSB, etc.)</li> </ul>	Short - Med	\$	Ongoing	CPS (CC)	CPS Seniors – Kids & Community Transportation, MWC, MSDC, TLDSB	CAM, General Public
CA 2.7	Develop an education program for homeowners and renters on climate and emergency preparedness. <ul style="list-style-type: none"> <li>Launch on web platform chosen for climate change resource sharing.</li> </ul>	Short - Med	\$	Ongoing	CPS (CC), Comms		

<b>CA 3.</b> Partner with MWC and other community groups on climate change and environmental protection programs and outreach.					Adaptation	○	
					Mitigation	○	
Action	Timeline	Cost	Status	Responsibility		Additional Stakeholders	
				Lead	Support		
CA 3.1	Provide support for the MWC algal study.	Med	\$	Ongoing	CPS (Watershed)	CPS (Planning)	
CA 3.2	Encourage and support the development of a Watershed Management Plan as proposed by the MWC.	Med-Long	\$\$	Ongoing	DSL, CPS (Watershed)	CPS (Planning), Muskoka, Watershed Advisory Group)	General Public
CA 3.3	Partner with community and advocacy groups for the resumption of the Ontario Northland train service to Muskoka. <ul style="list-style-type: none"> <li>Develop a District position on the resumption of train services to Muskoka.</li> </ul>	Med-Long Term	\$	Ongoing	CPS (Transportation)	Economic Development, Community groups	Province

	<ul style="list-style-type: none"> <li>Advocate to local MP for increased clean transportation networks to Muskoka.</li> <li>Take advantage of increased local tourism opportunities relating to COVID likely to continue for several years.</li> </ul>						
CA 3.4	<p>Continue to partner with the Muskoka Watershed Council to implement stewardship programs.</p> <ul style="list-style-type: none"> <li>Explore opportunities to expand these programs reach.</li> </ul>	Recurring	\$	Ongoing	CPS (Water)	MWC, MSDC, MC, CAM, Lakehead University, etc.	General Public
CA 3.5	<p>Review the Muskoka Watershed Advisory Group's (MWAG) and assess recommendations and proposed projects in the MWAG report on protecting the Muskoka River Watershed.</p> <ul style="list-style-type: none"> <li>Determine implications/next steps for the District.</li> </ul>	Short-Med	\$- \$\$\$	Ongoing	CPS (Water), DSLT	AMs, MWAG, MWC	General Public

CA 4. Assist the community to respond and recover from damage and loss due to extreme weather events.					Adaptation	○	
					Mitigation	○	
Action	Timeline	Cost	Status	Responsibility		Additional Stakeholders	
				Lead	Support		
CA 4.1	<p>Review the flood plain mapping data to determine the potential impacts of a 2019 magnitude or greater effect would have on Muskoka.</p> <ul style="list-style-type: none"> <li>Assess the number of District roads flooded and compare to area captured by the FPMP.</li> <li>Identify areas of higher risk.</li> </ul>	Short - Med	\$-\$\$	Ongoing	CPS (GIS), CPS (CC),	EPW, AMs	General Public

	<ul style="list-style-type: none"> <li>Identify areas that have features that can slow the infiltration of water and protect them.</li> <li>Review FPMP against existing emergency plans/evacuation routes and determine if updates or changes are required.</li> </ul>						
CA 4.2	<p>Encourage AMs to use 511 to report flooded or otherwise blocked roads. Establish a Muskoka-wide database of road closures or access issues due to severe weather events or flooding.</p> <ul style="list-style-type: none"> <li>Hold meeting with AM Roads Directors and Emergency services to discuss the importance of displaying all road closures in Muskoka in real-time at a single portal, and the benefit of having a record of road closures.</li> <li>Determine willingness to participate in this initiative.</li> <li>Develop a strategy to ensure each municipality can access and update the service.</li> <li>Continue to support emergency management measures in Muskoka.</li> </ul>	Short - Med	\$	Ongoing	EPW	AMs, CPS (CC)	
CA 4.3	Work with partners to lobby provincial and federal governments to provide financial support for recovery efforts.	Recurring	\$	Ongoing	DSL/ Council	Province, Federal	
CA 4.4	Seek grants and partnership opportunities with funders from all levels of Government to expand flood plain mapping in Muskoka.	Recurring	\$ - \$\$\$	Ongoing	Facilities, CPS (CC)	MWC, MSDC, MC, CAM, etc.	General Public

	<ul style="list-style-type: none"> <li>Advocate for additional intakes into the NDMP. Assess eligibility for application to an Intake-6 if it proceeds as planned.</li> <li>Identify additional risk areas for FPMPs (i.e. LOB, stretches of the N. and S. Muskoka river etc.).</li> </ul>						
--	--	--	--	--	--	--	--

CA 5.. Partner with the SMDHU and other stakeholders to assess and mitigate the health impacts associated with climate change on Muskoka residents.					Adaptation	○	
					Mitigation	○	
Action	Timeline	Cost	Status	Responsibility		Additional Stakeholders	
				Lead	Support		
CA 5.1	Actively participate and support the SMDHU 'Climate Change Exchange'.	Medium	\$	Ongoing	CPS (CC)	SMDHU, MWC, MSDC, MC, CAM, etc.	General Public
CA 5.2	Develop response plans for climate-related risks (e.g., heat) and partner with appropriate levels of Government (Area Municipalities, Provincial and Federal Governments) to ensure suitable warning systems and response procedures are in place during extreme weather events. Partner with the SMDHU to identify the biggest risks to human health related to climate change.	Medium	\$\$	Ongoing	DMM	SMDHU, AMs, Province	General Public



## APPENDIX 2: CLIMATE DRIVERS AND VULNERABILITY ASSESSMENT

---

In collaboration with the Climate Risk Institute (CRI), the District hosted a workshop for the MCCAP Steering Committee to identify and assess risks associated with climate change. During the workshop, the MCCAP Steering Committee members were asked to identify and assess a number of climate change risks relating to the District's assets, operations and services.

During the workshop, the MCCAP Steering Committee had the opportunity to discuss the impacts of climate change on corporate operations, plans, and programs; to share observations on past or recent climate change impacts in their departments; and to hear about resources, tools and case studies related to municipal climate change risk assessment. The workshop included: a presentation and discussion of historical and projected climate trends identified by the MWC for the Muskoka region; facilitated discussions of the potential impacts of climate change on municipal operations, environment, and people; and information on approaches to assess climate risks and reduce vulnerability. Workshop participants engaged a risk identification exercise, outlining a number of different climate-related risks for the community and the District.

Participants reviewed climate change data and trends, as well as the list of identified climate risks. Participants were then provided with detailed ranking matrices so that they could identify the likelihood and potential consequence of each risk. These risks were then compiled in a risk register database for reference.

### RISK ASSESSMENT

Following the risk identification exercises, the Steering Committee participants reviewed the list of risks to determine the relative likelihood and consequence of the various risks.

Since the consequences of climate change could result in variety of impacts, workshop participants were asked to rank the likelihood of the risk, as well as the consequence in four key areas: people, economy and finances, environment and by individual department. These areas of consequence are described briefly here.

- **People.** Including department staff, contractors, or residents accessing or benefitting from assets or programs managed by each department). Includes access to services, as well as health and safety.
- **Economy and Finances.** Includes department and District operating budgets, repair costs, as well as financial impact to local residents or businesses.
- **Environment.** Includes risks to air quality, water, land (soil, shorelines, trees), and wildlife.

This exercise helped identify perception of risk to the various member of the Steering Committee and was used in development of the goals and actions contained within this report.

# GLOSSARY

---

Adaptation	The process of adjusting systems and infrastructure to climate change in order to improve climate-resiliency
Adaptive Capacity	The ability and capacity to adjust to potential damage, to take advantage of opportunities, or to respond to consequences
Anthropogenic	Originating in human activity
Baseline	A reference point for which change is measured
Climate	Average weather conditions over a period of time
Climate Change	A long-term change in climactic patterns
Climate Change Scenario	A plausible future climate that has been constructed by projections based on a Global Climate Model
Extreme Weather Event	An event that is rare at a particular place and time
Global Climate Models (GCM)	A complex computer model that captures the various processes linking solar energy input, atmosphere, land and oceans at a global scale to model local climates and project potential future climatic changes
Greenhouse Gas (GHG) Emissions	Gaseous compound emitted into the atmosphere that absorbs infrared radiation, holding heat in the atmosphere; most commonly CO <sub>2</sub>
Impact	Have a strong effect on something
Mitigation	Actions to decrease the emissions that cause climate change
Resilience	The ability to recover from or adjust to change
Weather	The state of the atmosphere at a particular place and time in regard to heat, wind, rain, etc.

## ACRONYMS

---

AMs	Area Municipalities
AMO	Association of Municipalities of Ontario (AMO)
CAM	Climate Action Muskoka
CO <sub>2</sub>	Carbon dioxide
CPS	Community and Planning Services
DESC	Dorset Environmental Science Centre
DMM	The District Municipality of Muskoka
DSLTT	District Senior Leadership Team
EPW	Engineering and Public Works
FMW	Friends of Muskoka Watershed
GBBR	Georgian Bay Biosphere Reserve
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
IT	Information Technology department
IWM	Integrated Watershed Management
FCM	Federation of Canadian Municipalities
FMW	Friends of Muskoka Watershed
LID	Low impact development
LiDAR	Light Detection and Ranging remote sensing method
MCCAP	Muskoka Climate Change Action Plan
MC	Muskoka Conservancy
MCIP	Municipalities for Climate Innovation Program
MECP	Ontario's Ministry of Environment, Conservation and Parks
MMAH	Ontario's Ministry of Municipal Affairs and Housing
MNRF	Ontario's Ministry of Natural Resources and Forestry
MSDC	Muskoka Steamship & Discovery Centre

MWAG	Muskoka Watershed Advisory Group
MWC	Muskoka Watershed Council
NDMP	National Disaster Mitigation Program
PCP	Partners for Climate Protection
PSC	Public Safety Canada
SMDHU	Simcoe Muskoka District Health Unit
TBD	To be determined
TLDSB	Trillium Lakelands District School Board
WePpm	parts per million