



Integrated Sustainability Master Plan  
2024-2030



Sustainable   
**Innisfil**

*Working towards a better future.*



# Version History

Version	Date	Description
1.0	October 9, 2024	Council Approved

The Town of Innisfil is committed to public transparency and open communication. In this spirit, the Integrated Sustainability Master Plan is accessible through the Town of Innisfil website. If an alternative format is required, please contact [communications@innisfil.ca](mailto:communications@innisfil.ca)

# Land Acknowledgement

The Town of Innisfil acknowledges that Innisfil is situated on Treaty land that is steeped in rich Indigenous history. The Town also acknowledges that this land is the Traditional Territories of the First Peoples of Turtle Island. It is shared between the Anishinaabe peoples of Beausoleil First Nation, Chippewas of Rama First Nation, and Chippewas of Georgina Island First Nation and we thank them for generations of stewardship.

This meeting place is still the home to many Indigenous people and (as settlers) we are grateful to have the opportunity to work on this land.

The Town acknowledges the forced sacrifices that are the foundation of Canadian society today. We are dedicated to honouring Indigenous history and culture and committed to moving forward in the spirit of reconciliation and respect with all First Nation, Metis, and Inuit peoples.

## How to Use This Document

### **For Innisfil Town Council:**

A guide on actions, progress, and future investments for Sustainable Innisfil.

### **For Staff:**

A checklist and guide for actions to be developed and implemented through 2030.

### **For the Community:**

As information on what the Town of Innisfil is doing to address climate change and sustainability in Innisfil.

### **For Stakeholders:**

As information on possible collaborations with the Town of Innisfil.

# Message from the Mayor

Innisfil is a growing community. As we continue to welcome new residents, businesses, and visitors to our town, we must ensure that we protect our way of life and the beauty of the natural heritage around us. On behalf of the Innisfil Town Council, I am very pleased to share our first-ever Integrated Sustainability Master Plan which will guide the Town of Innisfil until 2030 and lay the foundation for actions beyond.

The Town recently introduced a new strategic plan to guide us as we grow, sustain, connect, and serve our residents. In this plan, we embrace the principles of sustainability as we actively protect, maintain, and enhance the environment as we know it—valuable, yet sometimes fragile. To that end, you will see that our Integrated Sustainability Master Plan provides the Town with a path to make Innisfil a more sustainable community, in particular as it relates to advancing climate change mitigation and adaptation. Choosing to lead by example, the Town is committing to corporate carbon emissions goals and adaptation actions that support Council's Climate Emergency Declaration on February 9, 2022.

I know that I speak for all Members of Council and Town staff when I say this is only the first step. Let's keep working together to make our town as beautiful, safe, and healthy in the future as it is today.

**Lynn Dollin**

Mayor of Innisfil



# Executive Summary

The Town of Innisfil's Integrated Sustainability Master Plan (ISMP) offers a strategic blueprint in advancing climate mitigation, building climate resilience, improving operational sustainability, and enhancing environmental stewardship. The ISMP establishes a vision, objectives, and actions to be pursued until 2030.

In 2023, the Intergovernmental Panel on Climate Change (IPCC) released its Climate Change 2023: Synthesis Report which has projected global temperatures to rise by approximately 1.5 to 2.0 degrees Celsius and atmospheric carbon dioxide (CO<sub>2</sub>) concentrations to surpass 410 parts per million (PPM) by 2025. Recognizing the immediacy, intensity, and pervasiveness of the climate crisis, the Town of Innisfil declared a climate emergency in 2022, underscoring the importance of our role in both reducing our impact on global warming and bracing ourselves for the effects of climate change that are already underway. The declaration also called for the development of this Plan.

This comprehensive strategy addresses corporate-level mitigation and adaptation measures by aligning with national initiatives, such as Canada's federal Net-Zero targets, the Pan-Canadian Framework on Clean Growth and Climate Change, and Canada's National Adaptation Strategy. While emphasizing mitigation and adaptation, the plan also incorporates holistic, good-sense actions that address operational sustainability and overall environmental stewardship.

The Town's ISMP is guided by six (6) objectives:

1. Reductions in corporate emissions and energy use
2. Adapt to the impacts of climate change
3. Support and enhance placemaking
4. Enhance natural assets and resources
5. Support sustainable economic prosperity
6. Reductions in corporate waste

The plan establishes a committed and accountable approach to implementation and monitoring, ensuring progress is tracked throughout each milestone. Through collaborative partnerships and data-driven decision-making, Innisfil is poised to realize its sustainability vision and forge a vibrant, climate-resilient community for generations to come.





# Sustainable Innisfil

## Building a sustainable, climate-resilient and low-carbon community

### Summary of the Town's Top Moves:



#### To reduce corporate emissions by 38%<sup>1</sup> by 2030

- Alternative fuels feasibility study implementation
- Vehicle and equipment conversions
- Charging infrastructure installations
- Facilities and energy management
- Technology and infrastructure upgrades
- Renewable energy integration



#### To adapt to the impacts of climate change in Innisfil

- Low Impact Development and climate resilient public infrastructure integrations
- Policy, land-use designation, and zoning updates for vulnerable areas
- Community climate education, Earth Day celebrations, and citizen engagement
- Staff training exercises and enhanced emergency preparedness
- Key Performance Indicators development and continuous climate risk monitoring



#### To reduce waste

- Eliminate Town single-use plastic usage
- Conduct a corporate waste audit



#### To support and enhance placemaking

- Develop green standards for new developments in Innisfil
- Expansion of active transportation routes
- Support the attraction of green businesses



#### To enhance natural assets and resources

- Increase urban tree cover by 30%
- Increase community and pollinator gardens



#### To support sustainable economic prosperity

- Costing analyses of low-carbon options for infrastructure projects
- Sustainable procurement criteria and carbon management integration

<sup>1</sup> Per capita emissions

## Financial Summary

The Integrated Sustainability Master Plan outlines a strategic approach to advancing climate mitigation, adaptation, and environmental sustainability. The financial implications of this plan have been carefully considered to balance immediate fiscal responsibility with long-term savings and economic benefits.

### **Municipal budget implications:**

- The recommendations in this plan are categorized into three implementation periods. The amounts below are current approximations of new expenditures for implementation during these periods:  
Short term: ~ \$2 million  
Medium term: ~ \$375,000  
Long term: ~ \$3-5 million
- Several actions and projects recommended in this Plan should be aligned with approved sustainability capital project budgets, currently totalling \$174,000.
- Appropriate lead departments should also make allotments and considerations in their respective budgets for actions and projects identified in this Plan.
- The recommendations in this Plan should be aligned with the projects and initiatives derived from the Town's other master plans and condition assessments.
- Several actions are recommended as improvements or complements to existing operational processes, plans and procedures, thereby not requiring any additional financial investments.

### **Grants:**

- Provincial and federal grants aligned with Canada's net-zero targets and adaptation initiatives, wherever feasible, will be pursued.

### **Reinvestment:**

- Savings from energy efficiency retrofits and investments should be rerouted into capital projects to fund future initiatives.

# Definitions

**Adaptive capacity:** The general ability of institutions, systems, and individuals to cope with the consequences of a climate impact.

**Baseline:** The starting year for energy or emissions inventoring and projections.

**Building retrofit:** Changes to the structure or systems of an existing building to achieve energy and water consumption reductions.

**Business-as-usual:** A scenario illustrating energy-use and greenhouse gas (GHG) emissions if no additional plans, policies, programs, and projects are implemented.

**Carbon budget:** The allowable amount of carbon dioxide (CO<sub>2</sub>) emissions that can be released into the atmosphere while still limiting global warming.

**Carbon cost:** The financial or economic value assigned to the emission of one metric ton of carbon dioxide (CO<sub>2</sub>) or its equivalent.

**Carbon dioxide equivalent (CO<sub>2</sub>e):** A measure for describing the global warming potential of a greenhouse gas using the equivalent amount of carbon dioxide (CO<sub>2</sub>) as a reference.

**Circular economy:** A process that aims to create a closed-loop system in which products, materials, and resources are continuously reused, refurbished, remanufactured, and recycled.

**Climate emergency:** A declaration of emergency made by governments and scientists to acknowledge humanity is in a climate crisis.

**Co-benefits:** Strategies that aim for win-win options and have multiple benefits,

and which often build the most momentum and support.

**Economies of scale:** The cost advantages that a business or organization can achieve as it increases its level of production or output.

**Embodied carbon:** The total emissions generated from the extraction of raw materials, manufacturing, transportation, construction, use, maintenance, disposal, and recycling for an item or system.

**Emissions intensity:** The level of GHG emissions per unit of economic activity, usually measured at the national level as GDP.

**ENVISION:** A certification framework that encourages changes in the planning, design, and delivery of sustainable, resilient, and equitable civil infrastructure

**Grid intensity:** The environmental impact associated with the generation of electricity on a power grid.

**Net-zero:** The state in which the balance between the amount of greenhouse gases emitted into the atmosphere and the amount removed or offset is equal.

**Pathway:** A plausible and structured trajectory of future GHGs, concentrations, and associated climate outcomes (often referred to as a climate scenario).

**Resilience:** The capacity of a system, community or society exposed to hazards to adapt.

**Risk:** The combination of an event, its likelihood, and its consequences – risk equals the probability of climate hazard multiplied by the consequence of that event.



**Sensitivity:** The extent to which a system is affected, either adversely or beneficially, by a climate impact.

**Sequestration:** The process of capturing and storing carbon dioxide (CO<sub>2</sub>) from the atmosphere, typically in natural ecosystems like forests or through technological means such as carbon capture and storage.

**Triple-bottom line:** An approach where companies commit to focusing on social,

environmental, and economic priorities equally.

**Vulnerability:** The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change.

**Zero-carbon ready:** Buildings, infrastructure, or systems that are designed and constructed to achieve carbon neutrality or net-zero carbon emissions over their operational lifespans.

## Acronyms

**BARC: Building Adaptive and Resilient Communities;** a five-milestone tool developed by the International Council for Sustainability (ICLEI) to help municipalities adapt to climate change

**CDSB: Community Development Standards Branch**

**ECDM: Energy Conservation and Demand Management**

**FCM: Federation of Canadian Municipalities**

**GHG: Greenhouse gas**

**ICE: Internal combustion engine**

**ICLEI: Local Governments for Sustainability;** an international non-governmental organization that promotes sustainable development

**IESO: Independent Electricity System Operator**

**I&I: Inflow & Infiltration**

**KPI: Key Performance Indicators;** critical (key) quantifiable indicators of progress toward an intended result

**LEED: Leadership in Energy and Environmental Design;** it is a green building certification program used worldwide

**LID: Low Impact Development**

**OSEP: Operational Sustainability and Environmental Preservation**

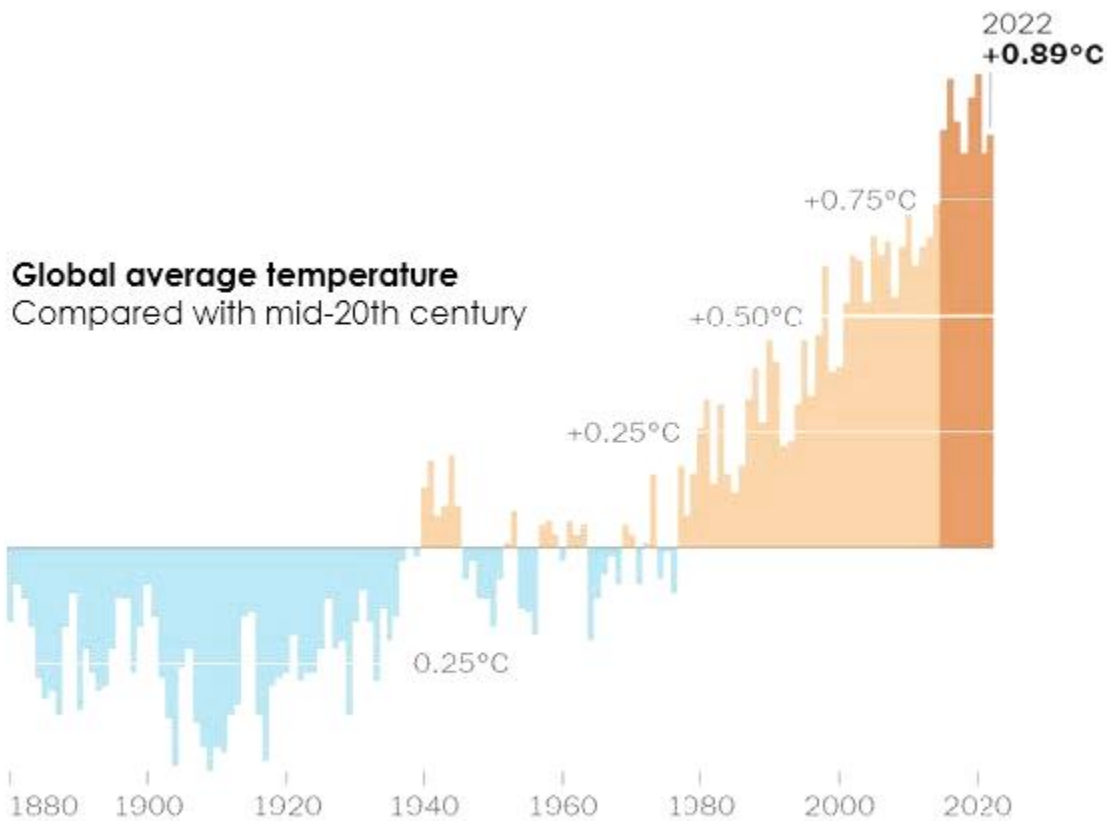
**PCP: Partners for Climate Protection;** a network of 400+ municipalities taking climate action in Canada, supported by the FCM and ICLEI

**PIEVC: Public Infrastructure Engineering Vulnerability Committee;** the protocol developed by this committee, co-funded by Natural Resources Canada and Engineers Canada, assesses the vulnerability of public infrastructure to climate change impacts

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# The Context for Action



Source: NASA Goddard Institute for Space Studies

Figure 1 Data by the NASA Goddard Institute for Space Studies, 2022; Graphic by The Learning Network, 2023

Innisfil, although considered a smaller community on the global scale, is not immune to the impacts of climate change. The residents, businesses, and lifestyles of our community are both susceptible and contributors to the environmental challenges faced by the broader Great Lakes region and Southern Ontario. Additionally, with rapid population growth, proximity to the Greater Toronto Area (GTA), a growing economy, a regional urgency for climate mitigation, and the increasing cost of carbon emissions, the need for Innisfil to do its part has come front and center. It is critical, for Innisfil to take decisive measures to address climate change in our community.

The Town of Innisfil's Strategic Plan, Official Plan, and other leading policies emphasize sustainability and climate mitigation and adaptation as key points of focus for our community, today and in the future. These policy tools, along with the Climate Emergency Declaration issued by Innisfil Town Council in 2022, have paved the way for the ISMP to drive effective corporate-level and community climate actions.

This first ISMP focuses on reducing the Town's corporate emissions, abating risks from current and future climate impacts, improving operational sustainability and preserving the local environment. This plan involves setting carefully planned goals, targets, and actions to guide us towards 2030.

## **Innisfil's Climate Emergency Declaration**

**In 2022, Council declared a Climate Emergency highlighting that Canada is already experiencing the impacts of climate change, which are expected to intensify due to human activities. Climate change poses lasting risks for our community, economy, and natural environment. Many municipalities across Canada have declared climate emergencies, acknowledging the emerging climate crisis. The declaration included the development of Innisfil's Integrated Sustainability Master Plan to set goals and develop actions that reduce carbon emissions, adapt to current and future climate impacts, and improve sustainability across the Town.**

# Climate Change in Innisfil

To develop a proper understanding of the actual risks from climate change in Innisfil, a thorough examination of historical and future climate and weather information was performed. Using data from Environment and Climate Change Canada, the Lake Simcoe Region Conservation Authority, and the Simcoe-Muskoka District Health Unit, specific climate projections and impacts for the Town of Innisfil were analyzed.



**Average annual temperatures will increase 30% by 2050**



**The frost-free season will decrease 16% by 2050**



**Average annual precipitation, especially in the spring, will increase 10% by 2050**



**Open water days for Lake Simcoe are projected to increase 18% by 2100, thereby decreasing lake ice**



**The intensity of 1-in-2 and 1-in-100-year storms are expected to increase 18%, and so are days with heavy rain**



**Air quality is expected to decrease, and pollen and moulds will increase**

A complete list of climate projections and impacts can be viewed in Appendix ii.

These climactic shifts will impact infrastructure, services, amenities, and associated resources in Innisfil. Consequently, communities and stakeholders must not only reduce emissions, but also prepare for and adapt to existing climate impacts.

# Strategies to Address Climate Change



**Mitigation strategies aim to reduce GHG emissions and address the root causes of climate change.** Strategies include promoting sustainable transportation, adopting clean energy sources, and improving energy efficiency.



**Adaptation strategies acknowledge the current and future impacts of climate change and focus on minimizing potential damages.**

Strategies include performing risk assessments on existing infrastructure, implementing flood protection measures, managing health risks, and improving disaster preparedness.

Certain actions can serve a dual purpose by supporting both mitigation and adaptation, like improving water conservation, increasing tree cover, and encouraging agricultural diversification. These strategies remove GHGs from the atmosphere and improve resilience.

## Ecology and Environment

Innisfil faces various ecological and environmental challenges beyond those posed by climate change. Urbanization, water quality issues, and threats to biodiversity are prominent amongst them. Protecting and preserving vulnerable ecosystems like Lake Simcoe, wetlands, and woodlands is essential for maintaining biodiversity and so is supporting vital ecosystem services like flood control, pollination, air purification, and carbon storage. These services play a crucial role in enhancing the quality of life for the residents of Innisfil.

## Operational Sustainability

In addition to addressing climate change and ecological and environmental preservation, the overarching concept of sustainability plays a crucial role in this Plan. Sustainability, in the broadest sense, involves the ability to maintain or support a process continuously over time, without compromising the ability of future generations to do so as well.

Corporate (or operational) sustainability strategies often adopt the triple-bottom line approach or the 3Ps: people, profits, and planet. Each element is interconnected – the economy relies on society, which in turn depends on the environment.

Climate actions are a part of a wider range of sustainable practices. Supporting fair-trade organizations, reducing waste, and monitoring carbon emissions, are all examples of sustainability and 3P efforts that can be implemented by a municipality.



# The Cost of Inaction

<b>Carbon Emissions in 2018</b> <b>3035</b> <b>Tonnes of CO2e</b>	<b>Annual Carbon Cost</b> <b>\$ 91,050</b>	<b>Carbon Cost in 2030</b> <b>\$ 515,950</b>
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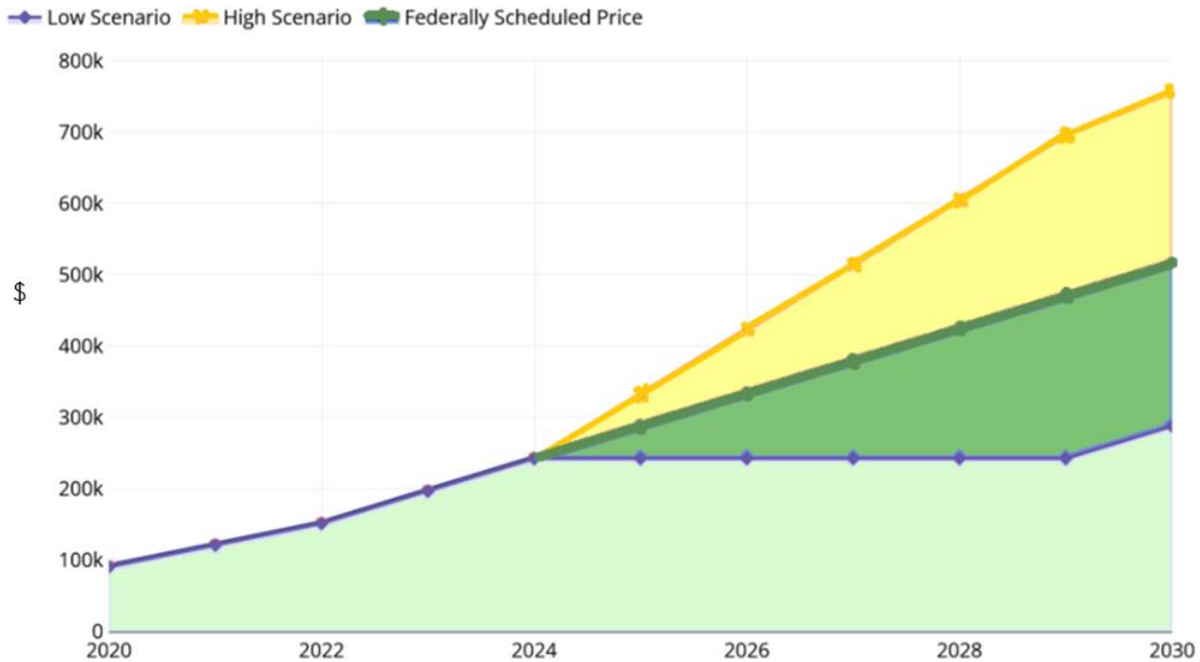


Figure 2 Carbon costs modeled based on the Town of Innisfil's 2018 baseline emissions data, highlighting the significant potential expense based on the low grid scenario

Sustainability initiatives require reallocating resources and modifying current strategies, which might seem cost-prohibitive and complex at first. Yet, what are the consequences of maintaining the status quo? What are the implications of continuing a business-as-usual approach?

1. The cost of inaction is greater than the cost of climate action



**According to 2011 estimates by the National Round Table on the Environment and the Economy, climate change could cost Canada \$21 to \$43 billion per year by 2050.**

In recent years, we have witnessed Canadians facing significant financial burdens due to severe weather events, resulting in billions of dollars in insured losses.

## 2. The carbon tax



**According to the current Canadian Federal Pollution Pricing Schedule, carbon costs are expected to increase significantly to \$170 per tonne CO<sub>2</sub>e by 2030**

In Canada, emissions are regulated by a carbon tax which can vary based on the province where the emissions are generated. Nearly every industry and business face financial responsibilities associated with emission production. To understand the cost of carbon and/or a carbon tax to the Town of Innisfil, staff performed a carbon cost analysis to assess the long-term carbon costs for emissions under a business-as-usual scenario (refer to Figure 2).

**The carbon tax cost for the Town of Innisfil under a BAU scenario from 2020 to 2030 = \$ 3,217,100**

Carbon taxes are applied to all the Town's currently consumed electricity and fuel. By taking into consideration the long-term carbon costs of emission-producing assets, such as buildings, vehicles, and equipment, we gain a clearer understanding of the financial motivations for decarbonization. Redirecting these funds towards community necessities, services, and greening initiatives may offer more beneficial outcomes.

## 3. Adaptation saves money



**The Canadian Climate Institute estimates that investing \$1 in adaptation measures can result in total benefits ranging from \$13 to \$15.**

For example, implementing climate-resilient building codes in Canada, an adaptive action, is estimated to have a benefit-cost ratio of 12:1—equivalent to a 1,100% return on investment.

## 4. The Social Cost of Carbon



**The social cost of carbon is approximately \$266 per tonne of CO<sub>2</sub> emitted in 2024 and \$394 per tonne of CO<sub>2</sub> by 2050** (*Social cost of greenhouse gas emissions, Canada.ca, 2023*)

The social cost of carbon represents the incremental damages expected from increases in greenhouse gas (GHG) emissions. This metric estimates the damages from climate change like changes in net agricultural productivity, health effects, flood-related property damage, energy system disruption, and the value of ecosystem services. As climate change damages rely on cumulative emissions, the social cost increases over time as GHGs accumulate in the atmosphere.

**We pay multi-fold for every bit of GHG produced.**

# An Integrated Sustainability Master Plan

The Town has embraced the overarching principle of the 3Ps to guarantee a lasting commitment to climate resilience, environmental stewardship, and operational sustainability, and create this Integrated Sustainability Master Plan. By adopting best practices, seeking win-win solutions, and tackling issues beyond just those related to climate change, we can address the larger scope of sustainable and environmental issues. Staff have included Operational Sustainability and Environmental Preservation (OSEP) practices to achieve this.

Noteworthy in this first version of the ISMP are the corporate-level emissions reduction actions, which only address emissions associated with the Town's fleet, facilities, streetlights, and solid waste generation in Town projects. A framework for developing a Community Energy Plan, following the adoption of the ISMP, has been included in Appendix vi. This initiative aims to continue the momentum on climate mitigation efforts in Innisfil.

**The ISMP categorizes actions into Mitigation and Adaptation sections.**

**OSEP actions are found in both sections, as many complement and align with climate change strategies.**



**The ISMP is aligned with the following United Nations Sustainable Development Goals (SDGs):**

#11: Make cities and human settlements more inclusive, safe, resilient, and sustainable.

#12: Ensure sustainable consumption and production patterns.

#13: Take urgent action to combat climate change and its impacts.

# Vision

## Sustainable Innisfil

Building a sustainable, climate-resilient and low-carbon community

## Objectives

1. Reduce corporate emissions and energy use
2. Adapt to the impacts of climate change
3. Support and enhance place-making
4. Enhance natural assets and resources
5. Support sustainable economic prosperity
6. Reduce corporate waste

## Our Approach

The ISMP was created through a comprehensive multi-step approach that allowed us to establish baselines, develop universally applicable actions, and help through the future implementation and monitoring of the ISMP. These steps were categorized into five milestones:

### **Milestone 1: Establishing a Baseline**

Mapping past and current energy use and emissions, assessing future climate risks, and identifying past and ongoing sustainability actions.

### **Milestone 2: Setting a Direction**

Setting energy and emissions reduction targets, identifying top climate-related risks, and overall sustainability goals.

### **Milestone 3: Action Planning**

Developing actions, creating related tools and programs, assessing costs, creating an implementation and reporting schedule, and drafting the ISMP.

### **Milestone 4: Adoption and Implementation**

Finalizing the ISMP and presenting to Council for adoption.

### **Milestone 5: Monitor and Review**

Implementing the action items, reporting progress, and continuously reviewing and improving actions.

This approach was inspired by the Partners for Climate Protection and International Council for Local Environmental Initiatives (ICLEI) Building Adaptive and Resilient Communities (BARC) five-milestone process.

# Road to Our Sustainability Goals

The ISMP introduces a roadmap for Innisfil, outlining corporate mitigation and adaptation goals that also encompass OSEP initiatives across short, mid, and long-term horizons. Detailed actions have been developed up to 2030 in this version of the Plan (exceptions are some mitigation actions, which go beyond 2030).



Figure 3 Timeline for adaptation actions and mitigation goals for the Town of Innisfil (2024-2030)

Emission reductions resulting from planned actions through 2030 have been modelled for 2030, 2040, and 2050 (2050 being a significant milestone for Canada's Federal Net-Zero target (Environment and Climate Change Canada, 2021)); however, actions have not been developed for years beyond 2030 in this version of the ISMP.

## Guiding Principles

The Plan's guiding principles will help direct and inform decisions on the design and progress of ISMP actions. Equally vital to the vision, objectives, and goals outlined in this Plan are the values that guide them. Our Guiding Principles are:

1. Align with the Town of Innisfil's Strategic Plan
2. Prioritize the community and Town staff's health, safety, and equity
3. Use the latest data to deliver effective solutions
4. Build community awareness and education



# Mitigation



Integrated Sustainability Master Plan  
2024-2030



# Mitigation

Mitigation is a climate change reduction strategy that primarily focuses on reducing emissions and energy consumption of key assets and processes. It serves as a proactive approach to limit the impact of global warming. Actions are implemented to prevent future emissions, reduce existing emissions, and potentially capture GHGs already released into the atmosphere from previous emissions.

Innisfil's initial emission reduction goals aim to lower total corporate emissions by 15% (compared to 2018 levels) by 2030, with a further target of 20% by 2050. This equates to per capita emission reductions of 38% (by 2030) and 66% (by 2050)<sup>2</sup>. The actions identified provide a starting point for the Town to establish more ambitious targets in future versions of the ISMP. This progressive approach will help maintain momentum as the Town builds upon its own successes.

These corporate actions were developed with the help of tools such as the Partners for Climate Protection (PCP) Milestone Framework, a program established by the Federation of Canadian Municipalities (FCM) and ICLEI. The program consists of five milestones:

1. Creating an inventory
2. Setting a target
3. Developing a plan
4. Implementing the plan
5. Monitoring the impact

The next sections expand on the work performed under each of the Milestones.

## Community or Corporate Energy Planning?

Mitigation actions can fall into two categories: Corporate (centered on internal energy management within the municipality) or Community-wide (focuses on various sectors across the community and engaging multiple stakeholders). This document focuses on corporate strategies as Council and staff aim to demonstrate leadership in the community by addressing internal carbon consumption first and using the experience and knowledge to shape a future Community Energy Plan.

Furthermore, Community Energy Planning is a deliberate step outlined in the ISMP. For more details on the Community Energy Plan development framework, please refer to Appendix vi.

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<sup>2</sup> Per capita emissions are corporate emissions distributed over the population in a specific year.

# Milestone 1: Creating A Baseline Emissions Inventory

The first step in creating mitigation strategies involves understanding the Town's historical energy consumption and emissions output. This evaluation is achieved through the development of an emissions inventory.

Emissions arise from utilizing fossil fuels for various purposes such as lighting, heating, cooling, and ventilating structures, as well as powering municipal operations, transportation, wastewater treatment, and the breakdown of organic waste in landfills.



**Innisfil's Corporate emissions inventory has been developed with 2018 as the baseline year.**

The inventory serves as a tool to:

## **Establish a starting point**

Selecting a baseline year and creating an emissions inventory is crucial for monitoring reductions in GHGs expressed as a CO<sub>2</sub> equivalent (CO<sub>2</sub>e).

## **Take action**

Identifying GHG sources is crucial in developing actions (Milestone 3) and executing them (Milestone 4).

## **Reduce costs**

By monitoring energy expenses and tracking investment opportunities in energy efficiency, financial savings can be achieved. Effective management relies on concrete data — what can be quantified can be effectively managed.

## **Engage in carbon offsetting**

Maintaining a verifiable GHG emissions inventory facilitates participation in carbon offset and trading initiatives.

Corporate emissions have been categorized into five inventory sectors according to on how and where energy is utilized by Town activities:

1. Fleet
2. Buildings
3. Streetlights and,
4. Solid Waste

The 2018 Corporate Energy and Emissions Inventory results, including information on fuel types, energy intensity, and per capita emissions, are summarized in Figure 4 and Figure 5. For a detailed breakdown by tonnage and composition, refer to Appendix iii.

**Greenhouse Gas Emissions Overview:**

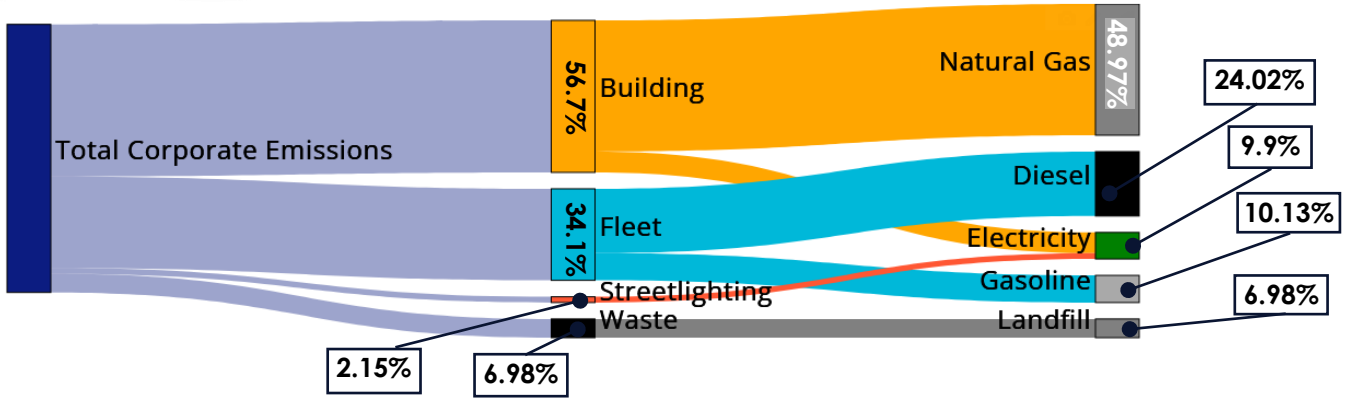


Figure 4 Total corporate greenhouse gas emissions overview per energy sector and energy source.

**Inventory Energy Overview:**

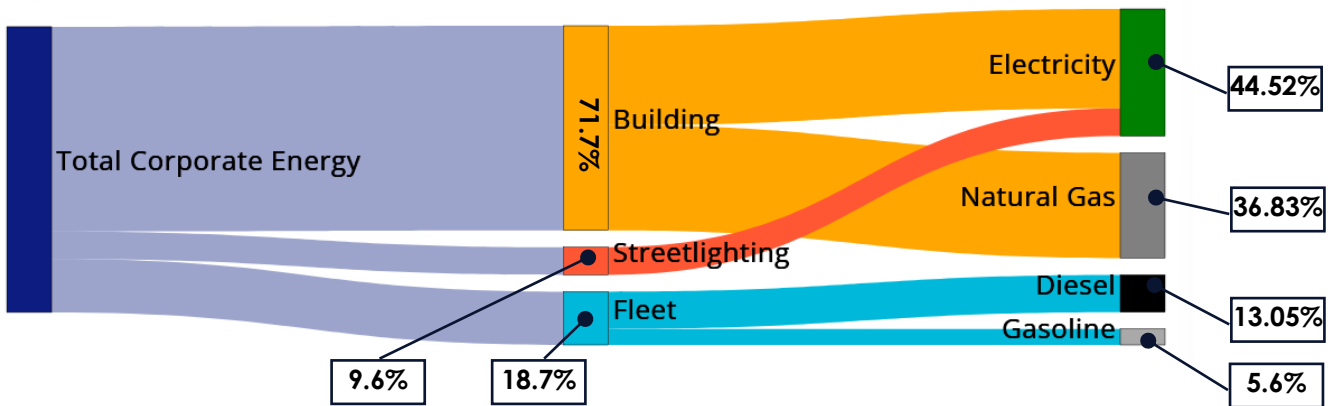


Figure 5 Total corporate inventory energy use overview per energy sector and energy source.

## Forecasts

After establishing a baseline, an emissions forecast analysis was conducted to identify business-as-usual (BAU) scenarios for Innisfil's corporate energy and emissions profile in both the short and long run. This analysis includes population dynamics along with projected changes in energy supply and demand.



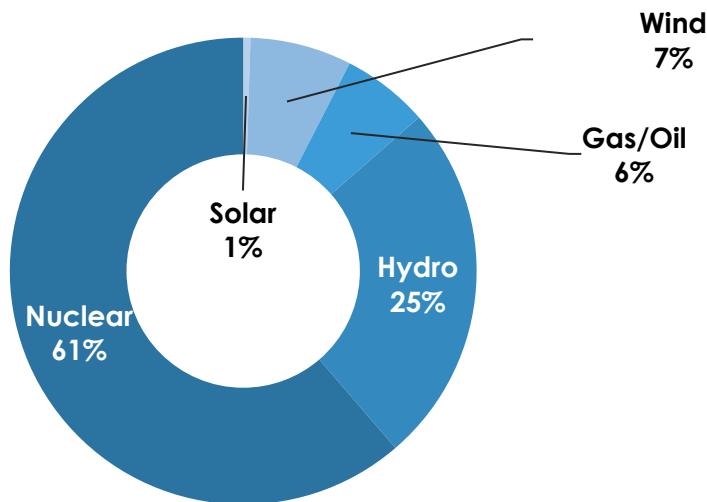
**An emissions forecast refers to a projection or estimation of future GHG emissions over a specified period.**

### Population Growth

The Town of Innisfil is expected to experience significant population growth from 2018 to 2050, which will also increase corporate emissions, as municipal corporate operations expand to maintain service levels relative to the population. Utilizing the population estimates from the 2022 draft Municipal Comprehensive Review for the County of Simcoe, a 2.65% population growth rate has been factored into BAU calculations.

### Ontario's Electricity Supply Mixture

**Ontario's electricity supply mix, 2018**



*Figure 6 Ontario's 2018 Electricity Fuel Supply Mix.*

Emissions forecasts depend significantly on changes to Ontario's electricity grid, which is adjusting to meet increasing growth demands. The emissions from electricity are dependent on the fuels that help generate it. Reports by the Independent Electricity Systems Operator (IESO) suggest that electricity emissions are expected to rise in the future. This is due to the installation of more natural gas generation (which has a high emissions intensity) across the province to meet increased peak demands and to

replace the generation provided by nuclear facilities scheduled for decommissioning (*Environment and Climate Change Canada, 2022*).

From the Town’s viewpoint, predicting the most plausible grid scenario is challenging due to the ever-changing political landscape affecting grid futures. It is anticipated that the future grid condition will fall between a high emissions scenario (with natural gas boosting grid capacity) and a low emissions scenario (phasing out fossil fuels entirely), a topic currently under Federal discussion (*Environment and Climate Change Canada, 2022*).

In 2018, electricity contributed around 300 tonnes of GHGs, representing 9.9% of the Town’s total corporate emissions, which will increase due to a rise in demand, consumption, and the possibility of more natural gas in the overall electricity grid.

BAU forecasts were calculated for two scenarios, high-grid emissions and low-grid emissions, factoring the population growth rate of 2.65% and Ontario grid impact parameters. Results can be found in Figure 7<sup>3</sup>.

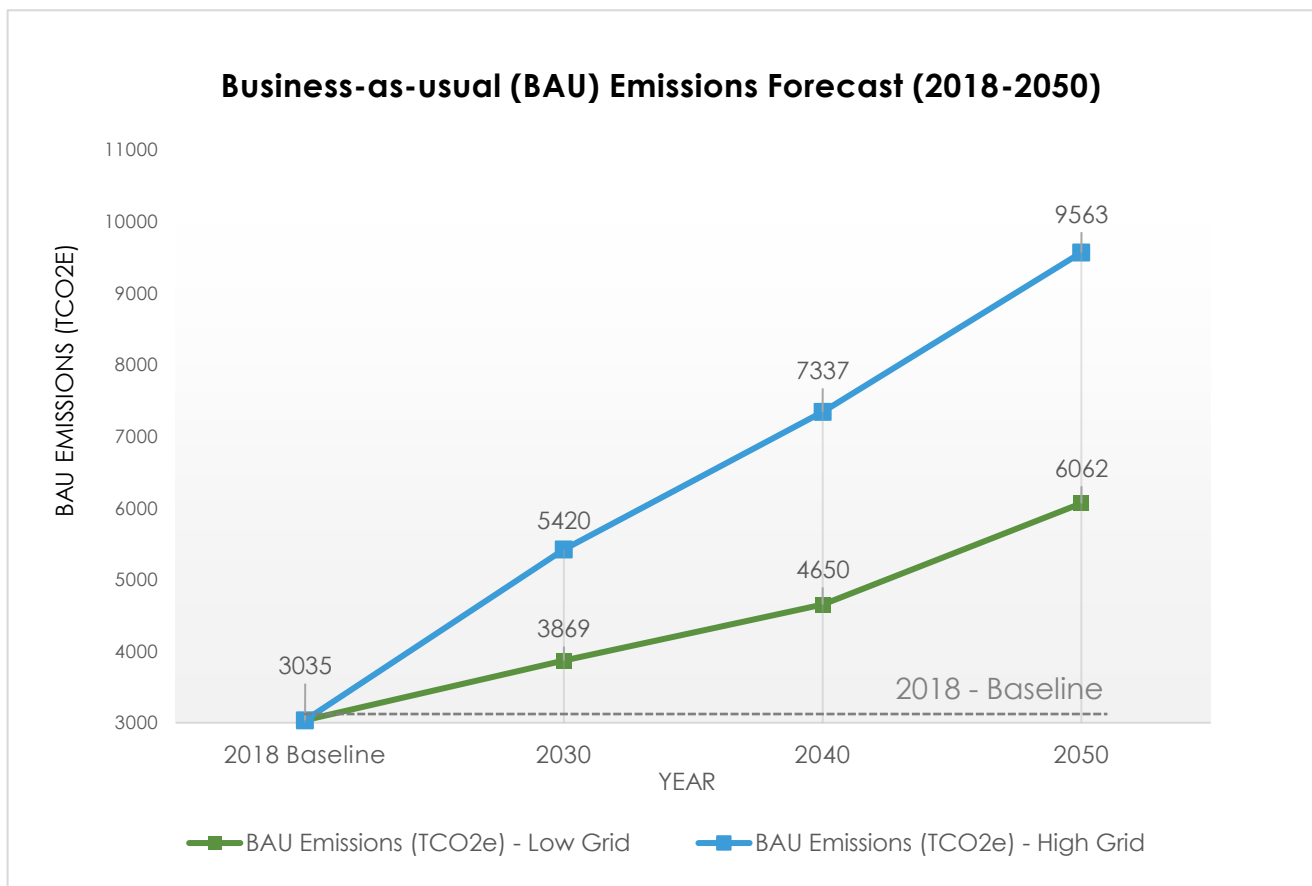


Figure 7 Business-as-usual emissions forecast (2018-2050) for the Town of Innisfil comparing a high-emissions and a low-emissions scenario

Given the substantial population growth projections for Innisfil, it is essential to recognize that achieving emission reductions is more challenging compared to

<sup>3</sup> Climate Neutral software was used for the analysis.

communities with slower growth rates. The analysis of the two scenarios demonstrates that a small reduction in total corporate emissions will require a significant reduction on a per-capita basis.

A full methodology report can be made available upon request.



**The PCP Program approved the inventory and forecasting analysis results leading to the Town being rewarded a Milestone 1 completion badge.**

## Milestone 2: Set Emissions Reductions Target

Following the completion of Milestone 1, the next step involved establishing emission reduction targets, based on baseline data, factors influencing energy usage and emissions, and BAU scenarios. A GHG emissions reduction target serves as a guide for emission reduction efforts.



**The emissions reduction target serves as the foundation for a municipality's emission reduction objectives, offering a benchmark to measure progress.**

Specific targets for reducing corporate emissions vary widely across Canada. There are essentially two approaches to setting these targets: science -based, and evidence-based.



### **SCIENCE-BASED TARGETS**

These align with the latest climate science recommendations to meet the goals of the Paris Climate Agreement.



### **EVIDENCE-BASED TARGETS**

These consider a range of evidence, like scientific research, economic feasibility, resource availability, and overall practicability.

The ISMP has used this approach to set targets.

Many municipalities have aligned their corporate targets to factors like population growth, resource availability, community carbon footprint, and monitoring capabilities. The targets in the ISMP combine available data to the factors above and scientific recommendations, financial feasibility, and overall tangibility to address climate change comprehensively beyond specific temperature thresholds.

Using the evidence-based method, the following emission reduction targets have been established for the Town:



Table 1 Corporate emission reduction targets for 2030, 2040, and 2050 for the Town of Innisfil

Year	Total Corporate Reduction Targets (from 2018 baseline)	Per Capita Reduction Targets (from 2018 baseline) <sup>4</sup>
2030	15%	38%
2040	17%	54%
2050	20%	66%

A 15% Total Corporate Reduction Target for 2030 is established. This projects a 17% reduction by 2040 and a 20% reduction by 2050, accounting for the increase in emissions due to population growth. This equates to a 38% Per Capita Reduction Target by 2030, 54% by 2040, and 66% by 2050. The targets would remain the same regardless of Ontario electricity grid changes (i.e. high and low grid scenarios, (Figure 7 Business-as-usual emissions forecast (2018-2050) for the Town of Innisfil comparing a high-emissions and a low-emissions scenario). The success of these targets is dependent on the execution of planned initiatives by 2030.

These emission reduction targets are progressive, reflecting a strong commitment to meaningful climate action. This being Innisfil's first ISMP, the targets have been designed to push the limits of current capabilities based on available data, preliminary energy audits, and the initial performance of pilot projects. They represent a dynamic starting point, laying the groundwork for continuous improvement and innovation.

As new data and insights from planned initiatives are gathered, Staff is prepared to revisit and push these targets in the planned 2030 update to the ISMP, aligning with future opportunities and advancements in policy and technology. This approach allows us to build strong momentum, engage stakeholders effectively, and ensure that the Town's efforts are both credible and impactful over the long term.

## Why not Net-Zero?

Aiming for a “Net-Zero” goal is a common target across many organizations in Canada. However, it may raise questions as to why the ISMP’s targets do not aim for this ambitious goal despite the urgent call for action.

The current targets have been established after careful evaluation of factors such as data availability, technological capabilities, policy-based support, and available resources and are designed to yield tangible and impactful outcomes. Pending results from planned initiatives, the Town aims to refresh goal posts in 2030, ensuring alignment with evolving sustainability benchmarks and organizational capacities.

<sup>4</sup> A Per Capita Reduction Target is the Total Corporate Reduction Target divided by the population.

## Milestone 3: Developing a Plan

The next step in the process was to develop strategies and tangible actions to help the Town reach its emissions reduction targets in municipal operations, assets, and services.

Corporate mitigation actions are categorized into four main areas, aligned with the baseline emissions inventory and the PCP approach, along with an additional fifth category titled “Corporate”. This includes actions requiring senior leadership involvement or collaboration across multiple departments.



**FLEET:** Vehicles used by Town departments as well as Innisfil Transit.



**SOLID WASTE:**

Waste collected from all Town-owned buildings.



**BUILDINGS:** Town facilities such as Operations, Fire and Police Stations, Arenas, and Libraries.



**CORPORATE:** Actions that are multi-departmental in scope and/or outline larger policy directives



**STREETLIGHTS:** Streetlights, and within community spaces such as parks, and Town Square.

In the subsequent sections, detailed descriptions of the five categories along with the proposed mitigation actions are provided. Wherever feasible, the potential emissions savings percentage (PES%) from each action has been quantified. This information serves to assess the effectiveness of the proposed measures. For actions where PES data is currently unavailable, 'NA' has been used to indicate that. These numbers will be calculated as data becomes available.

For a comprehensive breakdown of action implementation, including tools, timelines, estimated costs, and lead department information, please refer to Appendix iv of this document. Additionally, action process flows for relevant actions are in Appendix vii.

## Fleet



**The 2018 Town of Innisfil GHG inventory shows that the Town's Fleet is the second highest contributor of GHGs at 34.1%.**

At the time of writing this report, the Town's fleet includes over 200 units powered by gas or diesel fuel and, utilized by departments such as Operations, Fire and Community Development Standards Branch. The Operations department includes Facilities, Parks and Open Spaces, and Roads, providing a wide variety of services such as road maintenance, snow removal, street sweeping, grass cutting, and indoor and outdoor recreation opportunities. Included in the fleet inventory are:

- 57 Light and Medium Duty Vehicles (LDV/MDVs) including pickup trucks, SUVs, and vans
- 20 Heavy Duty Vehicles (HDVs), including dump trucks, street sweepers and firetrucks.
- 45 Off-Road Vehicles and/or equipment (ORVs) which include backhoes, graders, loaders, tractors, ice resurfacers, and other recreation and turf equipment.

With such a wide array of units and functions, that are constantly evolving, opportunities have arisen to introduce emissions reduction strategies. The Town's Fleet Management Policy provided the policy directive for these strategies. The actions below lead fleet sector emission reductions until 2030:

*Table 2 Planned mitigation actions for the Town of Innisfil fleet*

ID	Mitigation Action	PES (2030) <sup>5</sup>
F1	Complete and implement recommendations from an Alternative Fuels Feasibility Study	10%
F2	Conversion of LDV to electric/hybrid - <i>Class 100 Vehicles</i>	11% (by 2035) <sup>6</sup>
F3	Conversion of equipment - <i>Class 400, 500, 600, &amp; 900</i>	NA
F4	Electrification of small engine equipment - <i>Class 700 Units</i>	NA
F5	Conduct charging Infrastructure usage and installation planning	NA
F6	Monitor and increase fleet efficiencies by focusing on idling times, fuel use, etc.	3%

<sup>5</sup> Indicated PES is for the total fleet from the baseline

<sup>6</sup> 95% reduction from 2018 LDV carbon emissions, which translates to approx. 28% reduction in total fleet carbon emissions from 2018 performance

F7	Promote energy efficient driving behaviors	NA
F8	Conduct route planning and optimization	NA
F9	Conduct training for mechanics on EV components	NA
F10	KPI development for performance monitoring	NA
F11	Include propane/natural gas small engine equipment in future emission inventories	NA

Although Innisfil Transit was included in the emissions inventory, there are currently no planned mitigation actions due to third-party operation and management. The Town has limited influence over the company policies in this regard.

## Buildings



**The 2018 Town of Innisfil GHG inventory shows that Town buildings are the highest emitters of GHGs at 56.7%.**

### Existing Buildings:

The Town's 2018 building inventory consists of 25 facilities ranging from administrative offices, libraries, and community centres to fire halls. Buildings can be large sources of emissions through their HVAC systems, sporting and recreational amenities, and lighting infrastructure, to name a few. Retrofitting these buildings and equipment offers substantial opportunities for emissions reductions.

Key sources for baseline data and policy guidelines were the Town's Energy Conservation and Demand Management Plan and the 2024 Facilities Master Plan. The Ontario Ministry of Energy provided detailed energy performance data, including provincial averages for over 10,000 municipal buildings in Ontario, through the Broader Public Sector Emissions and Energy Dataset. This data was instrumental in identifying the following actions and their associated emissions savings:

*Table 3 Planned mitigation actions for the Town of Innisfil existing buildings*

ID	Mitigation Action	PES
B1	Conduct a Facilities Sustainability Study in identified buildings to examine energy consumption of systems and develop energy-efficient retrofits and solutions	Approximately 36% by 2030 Based on the benchmark model of retrofitting existing buildings
B2	Develop a Facilities Sustainability Policy	
B3	Continue to incorporate Building Automation Systems in new buildings as required	

<b>B4</b>	Complete lighting conversion to LEDs across existing buildings	<i>to the 2018 Ontario average performance</i>
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Completion of B1 will inform the level of emission reductions by offering detailed analyses of emission sinks, energy maps, retrofit solutions, effective monitoring solutions, and Net-Zero pathways for suitable buildings. The data from these audits will further refine sector-specific and overall Town emission reduction targets in future versions of the ISMP.

**High Efficiency New Buildings:**

Beyond 2024, new Town building projects should target Net-Zero<sup>7</sup>, Passive House, or equivalent building efficiency performance standards. Retrofits should also aim for Net-Zero standards.

*Table 4 Planned mitigation actions for Town of Innisfil new buildings*

ID	Mitigation Action	PES
<b>B5</b>	Aim for Net-Zero or equivalent building efficiency performance standards for new buildings post Q4-2024	40% by 2030 50% by 2040 75% by 2050 <i>Improvement over overall Town building performance in 2018</i>
<b>B6</b>	Develop a Sustainable Capital Builds Policy and update other Town policies to address low carbon materials and embodied carbon during infrastructure builds	NA

When constructing new buildings, it is crucial to prioritize achieving high energy efficiency levels to manage the future emissions levels of a growing community. By establishing minimum energy efficiency performance for new buildings, the Town can ensure that growth aligns with emissions targets.

Various technologies can be combined to reduce emissions in buildings, such as high-performance glazing, heat pump systems for HVAC, advanced building envelopes, and on-site renewable energy generation. Each construction will have unique specifications and requirements that inform the appropriate technologies needed to achieve the desired outcome.

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<sup>7</sup> "Net-zero" targets in buildings can refer to either "net-zero energy" or "net-zero carbon." Net-zero energy buildings balance building energy efficiency, consumption, and energy production on an annual basis. Net-zero carbon buildings produce net-zero carbon emissions on an annual basis.

## Streetlights



**The 2018 Town of Innisfil GHG inventory shows that streetlights emit 2.14% of the total emissions.**

In 2020, after the baseline year, the Town successfully completed a retrofit program to upgrade all streetlights to LEDs. The program was carried out through a group purchase program with Local Authority Service, facilitated by the Association of Ontario Municipalities. This will be reflected in the 2020 emissions inventory as a part of the ongoing emissions monitoring process.<sup>8</sup>

Table 5 Planned mitigation actions for Town of Innisfil streetlights

ID	Mitigation Action	PES
S1	New lights and lighting installations will be LED, or the better performing latest technology, wherever applicable	5% by 2030

## Waste



**The 2018 Town of Innisfil GHG inventory shows that solid waste and recycling produced at the Town emit 6.98% of total emissions.**

Emissions from solid waste result from methane released during the decomposition of organic material in landfills. Although Innisfil does not directly manage landfills, the waste generated and collected from Town projects and operations that end up in a landfill has been accounted for. The most effective ways to reduce emissions are to reduce waste production and divert waste from landfills through reusing, composting, and recycling.

Table 6 Planned mitigation actions for Town of Innisfil waste

ID	Mitigation Action	PES
W1	Conduct a Corporate Waste Audit to understand waste and recycling rates currently occurring in Town facilities	NA
W2	Develop a Single-Use Plastic Elimination Policy	5% by 2030 10% by 2040
W3	Conduct education on waste reduction at the corporate level	15% by 2050

<sup>8</sup> The only lights that weren't retrofitted were the baseball and soccer pitch lights as the cost and timing for this were not feasible.

## Corporate Actions



**Senior leadership is instrumental in solidifying commitment to the Town’s climate mitigation efforts.**

Steering Group, under the direction of Town Council, have the authority to establish the direction for overarching policies, regulations, and initiatives that promote sustainable practices, reduce emissions, and enhance resilience.

These decisions influence the entire organization and establish a foundation for a culture of change, making effective municipal leadership a cornerstone of climate mitigation initiatives. While each department has specific targets and tasks assigned to project leaders, these corporate actions address multi-departmental actions and/or outline policy directions that will help guide large-scope energy and emissions reducing efforts.

*Table 7 Planned mitigation corporate actions for the Town of Innisfil*

ID	Mitigation Action
CA1	Investigate energy security development through locally expanding renewable sources of energy supply in the Town
CA2	Consider the development of District Energy Systems for existing and new Town builds
CA3	Establish KPIs and metrics to develop a monitoring a reporting system for the mitigation actions in the ISMP
CA4	Develop a roadmap and strategy for a Community Energy Plan
CA5	Explore purchase of carbon offsets to offset emissions
CA6	Conduct a costing analysis of various low carbon options of Town infrastructure and assets to forecast and budget for capital projects and balance fiscal responsibility and funding of projects
CA7	Review of Town assets through an asset management lens, to contrast and compare GHG retrofit solutions against ‘conventional’ asset management replacement costs and timelines
CA8	Track carbon taxes paid on all fuel and electricity purchases
CA9	Integrate sustainable procurement language within official purchasing documentation and include life cycle costing into purchasing decisions, where possible and practical
CA10	Develop a scoring matrix to score bidders on their sustainability practices, where applicable and practical





## Water and Wastewater

**It should be noted that Water and Wastewater emissions, energy usage and associated mitigation actions have been intentionally excluded from the Town’s inventory and this Plan. This is due to these services being provided by a separate entity, InnServices, which is outside the jurisdiction and reporting scope of the Town.**

The water and wastewater sector of InnServices emitted almost 400 tonnes of GHGs in 2018, majority of which were from electricity used for buildings, pumping equipment, treatment structures and natural gas used in buildings and treatment infrastructure.

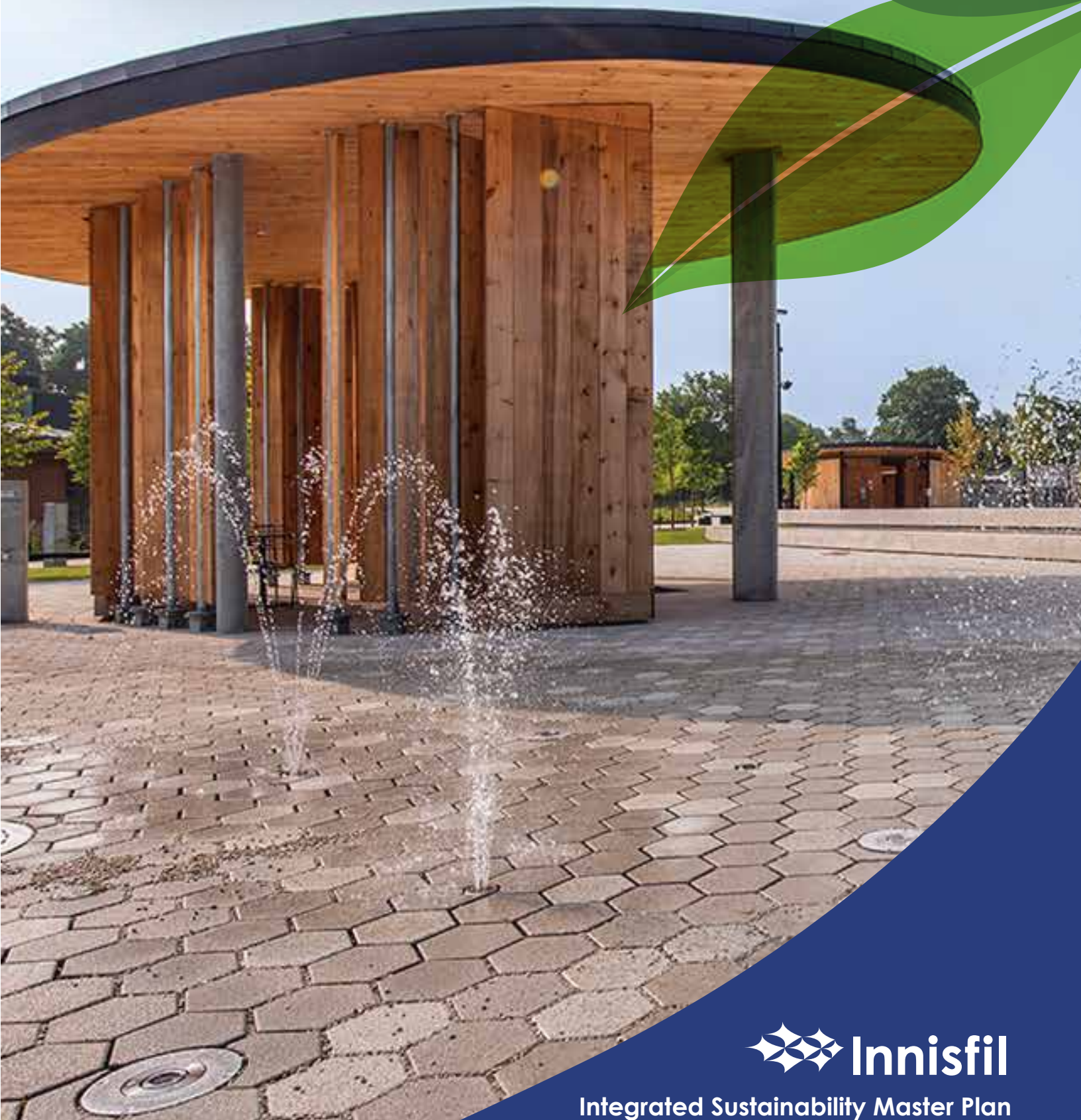
In 2014, InnServices published *Our Water, Our Future (OWOF)*, a water conservation strategy document, outlining their targets for water conservation and wastewater reductions. It outlines potential benefits, like water savings, reduced wastewater flows, reduced size and lifespans of septic systems, and improved local environment. The implementation of the OWOF plan is anticipated to reduce emissions due to the combined impact of conservation and treatment efficiency improvements.

In addition to the OWOF plan implementation, InnServices could autonomously advance their sustainability efforts further by:

*Table 8 Suggested mitigation corporate actions for InnServices*

<b>Suggested Action for InnServices:</b>	<b>Potential Emissions Savings:</b>
Budgeting for baseline building energy and water efficiency audits, to develop detailed baseline consumption information for water and wastewater facilities and infrastructure, and improve energy consumption	5% by 2030 8% by 2040 20% by 2050
Completing ongoing inflow and infiltration studies in Cookstown and Alcona, and use the results to develop inflow & infiltration reduction goals	2% by 2030 5% by 2040 5% by 2050
Enhancing water conservation education and outreach programs to improve water conservation best practices	5% by 2030 10% by 2040 20% by 2050

# Adaptation



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**Integrated Sustainability Master Plan  
2024-2030**

# Adaptation

Adaptation involves preparing for and responding to the predicted impacts of climate change. While mitigation actions address the reduction and prevention of GHG emissions, adaptation efforts aim to manage the impacts of climate change that have occurred or are anticipated because of the extent of global warming that has already happened.

The Town will be implementing measures to reduce vulnerability to extreme weather events, protect critical infrastructure, preserve natural resources, and enhance community resilience. The Town's adaptation efforts aim to safeguard Innisfil residents, the local environment, and economic stability from the impacts of climate change, while fostering a sustainable and resilient community for the future.

Climate change adaptation in Innisfil requires proactive strategies and actions to address local impacts, guided by the ICLEI-BARC framework. This framework follows five progressive milestones that build upon each other, similar to the PCP framework:

1. Initiate
2. Research
3. Action Planning
4. Adoption and Implementation
5. Monitoring and Review

There are some climate vulnerabilities and risks that require changes to the broader socio-economic systems. Adaptation in some areas requires transformational changes in how we make decisions, work together, build communities, interact with nature, and look out for one another.

# Milestones 1 and 2: Initiate and Research

The climate adaptation journey starts with conducting an impact assessment, followed by a vulnerability and risk assessment. These processes help identify and prioritize the greatest challenges to Town infrastructure, assets, service capabilities, programs, personnel, and the community at large.

## Impact Assessments

The first step was to conduct an impact assessment. This process uses climate data and projections to assess potential threats and impacts to a range of systems (physical, natural, operational, and social). It is a starting point in understanding how the municipal system will be affected by the predicted climactic changes for the region and strategizing responses across Town departments accordingly.



**Impact statements are concise statements detailing projected threats relevant to the area and the anticipated impacts on built, natural, social, and economic systems.**

Appendix ii lists the climate projections, associated impacts, and specific impact statements for priority climate scenarios predicted for Innisfil, that were used as the basis for adaptation actions.

## Vulnerability and Risk Assessments

Climate-related impact statements lead to the next steps of the adaptation process of conducting vulnerability and risk assessments.



**Vulnerability is evaluated based on two factors– the sensitivity of the community or Town department/sector to a specific climate change impact, and its adaptive capacity.**

The impact statements were scored on their sensitivity and adaptive capacity levels to provide an idea of the level of readiness of the relevant Town department/sector in tackling said impact. This completed the vulnerability assessment stage and led to the risk assessment stage.



**Risk is assessed by considering the likelihood of a climate impact occurring, and its potential negative impacts.**

The risk assessment process was used to further analyze and prioritize which impacts are most relevant in a climate-adjusted future.

Together, these assessments helped measure the readiness of various assets, service areas, operations, policies, and staff to potential impacts from various climate threats. This approach also helped prepare a priority list of the most exposed Town sectors and design adaptation actions, as well as good-sense, holistic sustainability practices. This priority list can be found in Appendix ii.



# Milestone 3: Action Planning

Using the priority climate impacts identified in the Climate Projections and Impacts section in Appendix ii, as well as the results of the Vulnerability and Risk Assessments in Milestone 2, staff developed a range of actions to address significant adaptation challenges in Innisfil.

The actions, presented subsequently under this Milestone, were developed with the expertise of all Town departments, focusing on the highest priorities and areas of vulnerability. The integration of ongoing and future projects, plans, and policies were taken into consideration to help guide the implementation of these actions.

These actions are grouped into the following six categories. Detailed descriptions of each action are provided in Appendix v and the corresponding action process flows, that will help guide the development of actions that require new plans or by-laws, in Appendix vii.



**TOWN INFRASTRUCTURE AND ASSET RESILIENCE**



**ENGAGEMENT AND INNOVATION**



**NATURAL ASSET AND LAND-USE PLANNING**



**EMERGENCY PREPAREDNESS**



**CORPORATE GOVERNANCE**



**MONITORING**

## Town Infrastructure and Asset Resilience



**Planning for and building resilience for key infrastructure and Town assets against climate impacts is essential.**

The Town builds, manages, and maintains a large variety of municipal roads, bridges, drains, culverts, parks, and other grey assets that the community relies on, to ensure:

- Public safety
- Continuity of services
- Economic stability
- Safeguarded transportation
- Environmental sustainability

**Below are the Town's Top 11 moves to improve and ensure infrastructure and asset resilience to expected climate impacts:**

*Table 8 Planned adaptation actions for Town of Innisfil Infrastructure and Asset Resilience*

ID	Adaptation Action
A1	Increase roads budgets to deal with increasing need for asphalt patches, asphalt mix design, and different cement grades (both operational and design and construction)
A2	Integrate Low-Impact Development (LID) features like bioswales, infiltration galleries, holding tanks, and permeable paving in relevant infrastructure projects to reduce flooding and erosion
A3	Greater use of drought, heat, and/or flood resistant native plants in Town landscaping and LID infrastructures to align with Conservation Authority recommendations
A4	Update the Salt Management Strategy to include eco-friendly salting options
A5	Complete the Federal Climate Lens Assessment for any future public infrastructure projects over \$10 million at the planning and design phases
A6	Integrate the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Green Protocol (a process to assess infrastructure component responses to the nature, severity, and probability of future climate changes and events) into the decision flow process of new and existing infrastructure builds and upgrades. This would include personnel training (see Appendix ix for PIEVC resources)
A7	Investigate third-party certifications (e.g., LEED, ENVISION, etc.) for Town infrastructure to demonstrate the Town's commitment to sustainability to residents, employees, and relevant stakeholders

<b>A8</b>	Accelerate improvement of current routes and the development of new active transportation routes (sidewalks, bike lanes, etc.). This would include planning for and adding signage, staffing, line painting, pavement markings, and patchwork
<b>A9</b>	Investigate the development of impervious fees and/or stormwater surcharges at the private property level
<b>A10</b>	Develop a LID Policy to encourage LIDs on private property
<b>A11</b>	Develop a flood mitigation program

## Natural Assets and Land-Use Planning



**Land-use planning and the preservation of natural spaces are essential for climate adaptation.**

Innisfil is rich in both natural assets and built landforms. Sustainable land-use planning and the conservation of natural spaces guide the growth and development of the community in a way that minimizes climate risks, enhances resilience, preserves ecosystems, provides economic benefits, and promotes sustainable living.

**Below are the Town’s Top 10 moves to conserve and enhance the natural assets operated by the Town and make sustainable land-use planning decisions:**

*Table 9 Planned adaptation actions for Town of Innisfil Natural Assets and Land-Use Planning*

<b>ID</b>	<b>Adaptation Action</b>
<b>NP1</b>	Develop a buffer policy for public/private lands draining into Lake Simcoe
<b>NP2</b>	Increase tree and shade cover up to 30% (e.g., canopies) in public/high-density spaces and watercourses (natural buffers)
<b>NP3</b>	Develop programs to increase resident access to trees and encourage private tree planting
<b>NP4</b>	Develop new pollinator/rain gardens in community spaces and other Town areas



<b>NP5</b>	Develop a Natural Asset Inventory and Management Strategy Roadmap to integrate all Town-owned/operated natural assets into a current asset inventory
<b>NP6</b>	Update and implement invasive species programs for various invasive species threats in the region (e.g., emerald ash borer, Michigan fungi, phragmites)
<b>NP7</b>	Develop a Sustainability Matrix/Green Development Standards for Site Plan Applications/Community Planning Permits System to encourage environmentally, socially, and economically sustainable design across developments in Innisfil
<b>NP8</b>	Update policies, land-use designations, and zoning for areas vulnerable to flooding, heat island effects, and other climate-related risks (e.g., wetlands and woodlands)
<b>NP9</b>	Develop new development guidelines to withstand extreme weather (e.g., hotspots, flooding)
<b>NP10</b>	Integrate dark sky lighting provisions in planning and capital policies

## Corporate Governance



**Municipal corporate governance plays a pivotal role in climate change adaptation.**

By shaping the Town's policies, strategies, actions, and overall culture through a top-down approach, climate-related challenges can be effectively managed.

**Below are the Town's Top 8 moves to shape corporate-level policies, strategies, and actions to address climate-related challenges:**

Table 10 Planned adaptation actions for Town of Innisfil Corporate Governance

ID	Adaptation Action
C1	Complete a Cost of Doing Nothing Assessment to examine the costs related to climate change across Town sectors and develop viable business case scenarios for adaptation
C2	Appoint dedicated Staff to oversee, coordinate and implement the ISMP
C3	Establish an ISMP Advisory Group to provide advice, facilitate ongoing communication and guide the effective and equitable implementation of the ISMP
C4	Update various corporate-level policies (e.g., Official Plan, Town of Innisfil Sustainability Policy, Communications Strategy) to encompass sustainability and climate change considerations
C5	Include weather appropriate considerations like shift flexibility, personal protective equipment, water breaks etc. for outdoor personnel in relevant policies
C6	Investigate and review current insurance coverage (for current and future climate risks) to Town property annually and update the Risk Management Policy / Risk Register to incorporate climate change risks
C7	Integrate sustainability/ climate action considerations sections into the Council Report template
C8	Prepare and train staff, wherever relevant, to ensure the successful implementation of the ISMP

## Engagement and Innovation



**Engagement and innovation are crucial in effectively combating climate change in municipalities.**

To effectively educate, inform, involve, and learn from internal staff through institutional and community engagement, through the following approaches:

- Community ownership
- Collective commitment to sustainable practices
- Fostering inclusion of diversity
- Transforming traditional practices

**Below are the Town's Top 5 moves to boost public participation, engagement, and awareness of climate change impacts and actions:**

*Table 11 Planned adaptation actions for Town of Innisfil engagement and innovation*

ID	Adaptation Action
I1	Develop a Community Sustainability Guide to help guide and educate residents on sustainability actions and resources in Innisfil
I2	Support the attraction of green businesses that align with Innisfil's key sectors (e.g., adding resources and/or personnel to the Innisfil Business Mentors program), while also supporting existing businesses in developing sustainable practices
I3	Involve citizens in collecting local data to support the Town in decision-making through engagement activities, where needed
I4	Develop sustainability recommendations for vendors and event organizers through event guidelines
I5	Commemorate Earth Day annually with an Earth Day community event

**Emergency Preparedness**



**Municipal emergency preparedness is essential for the preservation of staff safety and business continuity**

**Below are the Town's Top 4 moves to ensure readiness in responding to climate impacts:**

*Table 12 Planned adaptation actions for emergency preparedness at the Town of Innisfil*

ID	Adaptation Action
E1	Have more Emergency Operations Centre (EOC) training exercises and play through scenarios for emergency situations
E2	Build in a contingency (e.g. a Climate Disaster Fund) for high-impact climate events through proactive budgeting
E3	Deliver enhanced first aid training to staff (beyond police and fire)
E4	Install cooling measures in high-traffic public areas for hot days and events (e.g. water coolers for residents and pets, misters, shade structures)

## Monitoring



**Monitoring actions within the plan are crucial for tracking progress, evaluating effectiveness, and fostering accountability.**

Regularly monitoring implemented actions allows staff to assess whether desired outcomes are achieved, identify areas for improvement, and make informed decisions based on data-driven insights.

**Below are the Town's Top 3 moves to ensure proper monitoring and implementation of adaptation actions:**

*Table 13 Planned adaptation monitoring actions for the Town of Innisfil*

ID	Adaptation Action
M1	Map priority areas for tree planting to reduce heat island effects and flooding, and sequester carbon, in consultation with relevant stakeholders (e.g., Conservation Authorities, SMDHU)
M2	Develop KPIs/performance metrics to monitor and review the progress of each ISMP recommended action, for reporting, reviewing, and updating
M3	Conduct mapping, modelling, and monitoring to assess areas at risk from storms, high wind, and other severe climate change impacts

## Drivers and Constraints

As the Town embarks on the ISMP, staff can expect to encounter various catalysts propelling action forward, alongside barriers constraining progress. By recognizing these influences upfront, staff can strategize effectively and allocate resources to overcome climate-related challenges.

### Drivers



**Drivers are influences that propel implementation efforts forward. Drivers often stem from evaluating the co-benefits and opportunities of the actions, creating further momentum.**

Examples include:

- Availability of funding and data
- Support from political leadership
- Economies of scale and cost-effectiveness
- Community support
- Upper-tier government policies
- Fear of inaction
- Co-benefits

### Constraints



**Constraints are limitations that may hinder staff from implementing actions. Acknowledging these limitations when developing and reporting on actions is essential for establishing timelines and allocating responsibilities.**

Examples include:

- Limited availability of information
- Cost considerations
- Staff capacity constraints
- Political will or lack thereof
- Negative impacts on other actions
- Provincial or territorial legislative compliance

### Co-Benefits



**Co-benefits analysis focuses on creating win-win solutions that address multiple issues simultaneously. Well-planned actions can result in numerous positive outcomes, beyond climate-related benefits, such as creating jobs, reducing inequality, and improving public health.**

Sustainability initiatives have often been perceived to conflict with municipal priorities, such as economic growth or reducing inequality. Designing policies that address sustainability and other Town priorities can garner support and approval from local stakeholders and decision-makers.

The Co-Benefits Assessment Tool in Appendix viii is recommended to Staff for evaluating the co-benefits of ISMP actions at the pre-implementation and reporting stages.

## Milestone 4: Adoption and Implementation

In the fourth milestone, efforts will focus on gaining Council support for the adoption of the ISMP, securing necessary implementation tools, coordinating staff efforts, and generating stakeholder support for various actions.

The Sustainability staff under the Department of Growth will lead and monitor the implementation of the Plan, with the coordinated efforts of all relevant staff and stakeholders. The ISMP Implementation Tools will propel each action in Appendix iv and Appendix v. Additionally, lead departments should also develop appropriate mechanisms to facilitate the planning and execution of relevant actions, including:

### **Key Performance Indicators (KPIs)**

KPIs and clear metrics will allow staff, elected officials, and stakeholders to monitor progress, identify areas for improvement, make informed decisions, and ensure accountability.

### **Training**

Continuous training of staff, elected officials, and community stakeholders in new standards, codes of practice, emerging technologies, etc., is essential for maintaining competence and adaptability.

### **Financing**

Evaluation of actions to integrate into new and existing projects and expenses, potential savings, life cycle costs, alternative funding sources, and costs of inaction are all necessary considerations.

### **Pilots**

Implementing small-scale initiatives, wherever necessary, enables the evaluation of strengths, weaknesses, costs, and outcomes before broader implementation.

### **Communication**

Keeping Council, municipal staff, and various partners informed about the progress of the ISMP is essential. This involves updating on progress and any changes in priorities, policy, and training needs.

**The Sustainability Catalyst under the Department of Growth will lead and monitor the implementation of the Plan, with the coordinated efforts of all relevant staff and stakeholders.**

# Milestone 5: Monitoring and Review

The fifth milestone, "Monitoring and Review", marks the final phase in the ISMP, serving as a comprehensive evaluation of progress and outcomes.

Implementation of the ISMP is a complex and dynamic process, which requires a cycle of activities. Continuous monitoring, review, and reporting offer valuable insights into the effectiveness of actions, guiding the future development of the ISMP.

Below is a breakdown of key components within this milestone:

## Monitor

### Monitoring and Evaluation Framework

Developing a robust monitoring and evaluation framework is essential for continuous assessment and improvement.

### Tracking Results

This involves tracking results by quantifying the impact of actions, evaluating progress, and measuring the resulting reductions in emissions.

### Inventory Updates

Periodic updates to the emissions inventory are essential for monitoring progress towards corporate emissions reduction targets. The latest emissions data for years post-2018 will be incorporated into the current inventory and be used to improve targets.

### Stakeholder Engagement

Throughout this milestone, active engagement with stakeholders and decision-makers remains paramount. Collaboration ensures that monitoring and verification efforts are inclusive and aligned with established targets and objectives. By sharing achievements, the community can celebrate milestones reached and rally support for ongoing initiatives.

## Review

### Problem Identification and Solution Development

Through internal reviews, the focus shifts towards identifying challenges encountered during the implementation process. This involves analyzing the effectiveness of planned actions, understanding barriers faced, and initiating discussions to develop viable solutions to address these issues in current or future versions of the ISMP.

### Assessment of Goals

Staff will assess the success of the initial goals and objectives set. This will involve a detailed examination to determine the extent to which targets have been met and any deviations that may have been encountered during the process.



# Report

## Reporting to Council and FCM

Sustainability staff will provide annual status updates to Council. Additionally, emissions and action updates will be provided to the FCM PCP program as a part of membership requirements. Reporting serves to inform stakeholders of progress, garner support for future initiatives, and contribute to the collective knowledge base of the broader community.

A key part of the process is the intentional review of successes, challenges, and lessons learned at each step to better inform and enhance future activities. Moreover, the adaptation process is continuous - once the fifth milestone is achieved, actions and targets should be updated and restarted for ongoing progress.

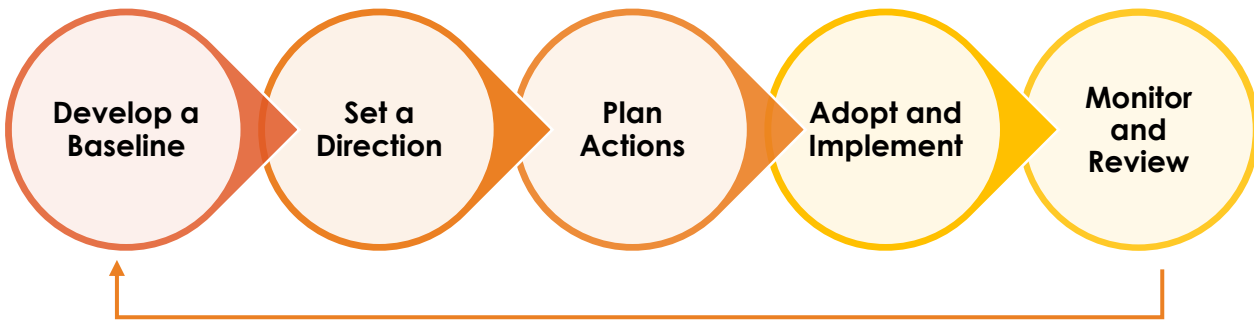


Figure 8 The five-milestone framework is a continuous process that restarts upon the completion of the “Monitor and Review” step.

# Conclusion

The Integrated Sustainability Master Plan for the Town of Innisfil represents a comprehensive and forward-thinking approach to addressing the complex challenges facing the municipality. This first iteration of this document is to establish a solid foundation for Town-wide sustainability initiatives in the coming decades. By incorporating environmental, social, and economic considerations, the Plan offers a guide to develop a community that is more resilient and sustainable.

Through innovative strategies, stakeholder engagement, and ongoing monitoring and evaluation, the Town is ready to enhance Innisfil's quality of life, protect its natural resources, and adapt to the impacts of climate change. Continued commitment and collaboration are imperative for the implementation of this master plan which will contribute to a more vibrant and prosperous future for all residents of Innisfil.

Questions about this Plan or the Town's other sustainability initiatives? Visit us at [innisfil.ca/sustainability](https://innisfil.ca/sustainability) to learn more and stay up to date.

**The next update to the ISMP will occur in 2030, with revised emission targets and updated sustainability actions.**

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[Town of Innisfil: Strategic Plan 2023](#)



Integrated Sustainability Master Plan  
2024-2030  
Appendices



Sustainable   
**Innisfil**

*Working towards a better future.*



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## Appendix i – FAQ

Scientific consensus emphasizes that human activities are causing unprecedented changes in the Earth's climate, posing significant risks to human health, security, and economic growth (IPCC, 2023). With a global temperature rise of 1.1°C (2° F) as of 2023, changes to the climate are occurring worldwide that are unparalleled over centuries to millennia. These changes, include rising sea levels, more extreme weather events, and rapid biodiversity loss, are changing life as we know it. In Ontario, climate change manifests as more frequent and severe weather occurrences, like heavy rain, disappearing lake ice, intense windstorms, prolonged heat waves, and milder winters. Climate risks are now being factored into policy, legislation, and economic decisions by governments, businesses, and markets.

Below are some commonly asked sustainability and climate change-related questions and observations:



### **What is the difference between weather and climate?**

"Weather" refers to the day-to-day state of the atmosphere such as the combination of temperature, humidity, rainfall, wind etc. "Climate" describes the weather of a place averaged over a period of time, often 30 years.



### **Is it climate change or global warming?**

The terms "global warming" and "climate change" are sometimes used interchangeably, but global warming is just one of the ways in which climate is affected by rising concentrations of GHGs. "Global warming" describes the recent rise in the global average temperature near the earth's surface, which is caused mostly by increasing concentrations of greenhouse gases in the atmosphere from human activities such as burning fossil fuels for energy.



### **The climate has always changed. Why act now?**

The earth does go through natural cycles of warming and cooling caused by factors such as changes in the sun or volcanic activity. Most of the warming since 1950 has been caused by human emissions of GHGs that come from a variety of activities, including burning fossil fuels. The most recent National Climate Assessment found that global efforts to reduce GHG emissions could avoid billions of dollars in damages related to water shortages, wildfires, agricultural losses, flooding, and other impacts.



### **Is the carbon price equal to the social cost of carbon?**

No. Carbon pollution pricing and the social cost of carbon are distinct. The SCC is an estimate of the *global* damages associated with one tonne of carbon emitted – it is a metric and not a policy. In contrast, a carbon price is a *domestic* GHG mitigation policy that incents people and businesses to reduce emissions.





**Is net-zero achievable?**

Research indicates that climate models have indicated that Paris Climate Agreement goals can no longer be met with GHG reductions alone and require removal of emissions from the atmosphere as well. Most organizations are currently focused on efficiency gains and emissions reductions, highlighting any remaining emissions as a gap that may need to be addressed using or other strategies as they emerge.



**How does the town of Innisfil include community feedback into the plan?**

The Town will endeavour to provide opportunities for community engagement as actions in the ISMP are developed. The Town will provide information on the corporate website to facilitate transparency in the process.

## Appendix ii – Climate Projections and Impacts in Innisfil<sup>1</sup>

While predicting daily weather changes is challenging, climate projections offer valuable insights into long-term averages. Studying climate projections and impacts helps us:

- Establish a baseline,
- Compare and understand the differences in future climate from historical experiences,
- Understand the extent of the anticipated change,
- Prioritize short-term versus long-term changes, and
- Gain insight into expected changes from natural, geological, and cyclical processes versus changes exacerbated by human activities.

The table below shows future climate trends for the Town of Innisfil, which is vital information used to anticipate related consequences and plan responses.

Category	Past Average (1976-2005)	Climate Predictions (2021-2050)	Climate Predictions (2051-2080)	Trend	Impact Highlights
Mean Hottest Day °C	33.1	35.5	38.0	Increase	High temperatures and increases in extreme heat events are expected in Simcoe-Muskoka, affecting: <ul style="list-style-type: none"> <li>• Plant and animal lifespans and biodiversity</li> <li>• Building, vehicular, and transportation efficiencies</li> <li>• Energy use and consumption in buildings</li> </ul>
Mean Annual Temperature °C	6.8	8.9	11.1	Increase	
Mean Summer Temperature °C	19.0	21.1	23.3	Increase	

<sup>1</sup> Climate projections data were acquired from Climate Atlas, Climate Data, Environment and Climate Change Canada, the Lake Simcoe Region Conservation Authority and the Simcoe-Muskoka District Health Unit websites.

<b>Number of Heat Waves</b>	1.5	2.6	6.3	<b>Increase</b>	<ul style="list-style-type: none"> <li>• Supply chain efficiencies</li> <li>• Food production and drought risk</li> <li>• UV exposure</li> <li>• Thunderstorms and risks of flash flooding, lightning, hail, and tornadoes</li> <li>• Heat-related illnesses, food-borne illnesses</li> <li>• Outdoor work and mass gatherings</li> </ul>
<b>Length of Heat Waves (days)</b>	3.1	5.1	7.4	<b>Increase</b>	
<b>Mean Winter Temperature °C</b>	-6.2	-3.8	5.0	<b>Increase</b>	<p>While average winter temperatures are projected to be milder, there is still the risk for extreme cold snaps to occur due to changing jet streams, affecting:</p> <ul style="list-style-type: none"> <li>• Community health and safety (due to lack of acclimatization)</li> <li>• Plant and animal habitation ranges and lifespans</li> <li>• Limitations or opportunities for outdoor activities</li> <li>• Building and vehicle operability</li> <li>• Energy use demands and patterns</li> <li>• Water/wastewater and drainage infrastructure efficiencies</li> </ul>
<b>Coldest Day °C</b>	-28	-24.1	-19.8	<b>Increase</b>	
<b>Ice Days (below 0°C)</b>	67.3	49.1	32.5	<b>Decrease</b>	
<b>Freeze-Thaw Cycles</b>	70.7	64.8	57.5	<b>Decrease</b>	Freeze-thaw cycles may increase in January and February, thereby having major impacts on infrastructure. This will also determine the frequency of freezing rain events, sleet, and ice storms.
<b>Frost-Free Season (days)</b>	152.2	177.0	200.0	<b>Increase</b>	Changes in the length and timing of the frost-free season will not only affect growing seasons, life cycles of disease vectors, pollen, and invasive species, but also our social, psychological, and

					physical experience of the changing seasons.
<b>Mean Annual Precipitation (mm)</b>	858.0	913.0	939.0	<b>Increase</b>	<p>Precipitation patterns are critical for many important issues, including:</p> <ul style="list-style-type: none"> <li>• Water availability</li> <li>• Crop production</li> <li>• Utility-infrastructure efficiency</li> <li>• Snow accumulation</li> <li>• Seasonal and flash-flooding</li> <li>• Short- and long-term drought risk</li> </ul>
<b>Mean Spring Precipitation (mm)</b>	197.0	217.0	231.0	<b>Increase</b>	
<b>Mean Summer Precipitation (mm)</b>	226.0	229.0	225.0	<b>Decrease</b>	
<b>Mean Winter Precipitation (mm)</b>	208.0	229.0	246.0	<b>Increase</b>	<p>Summer precipitation levels are expected to decrease, leading to potential drought during these warmer, drier months, but with higher chances of isolated storm events. Winter storms will become more prevalent, with increases in precipitation in the form of snow or rain. The potential increase of lake effect snow within the area due to warmer temperatures and waterways with reduced ice cover could impact the amount of snow accumulation and flooding risk.</p>
<b>Heavy Precipitation Days (Minimum 20 mm)</b>	5.4	6.3	7.2	<b>Increase</b>	<p>In urban areas of Innisfil, heavy rainfall can overwhelm storm drains and ditches and cause flash flooding. They can also cause problems in rural areas by drowning crops, eroding topsoil, and damaging roads. Shoreline areas are susceptible to higher wind action and shoreline erosion. Heavy snowfall events can disrupt ground transportation, and</p>

					thaw periods can lead to increased overland flooding.
<b>Storm Events</b>	By 2100, the one-day maximum precipitation could increase by 15.3%. The intensity of the one-in-two and one-in-100-year storm events is expected to increase to 18% more intense.			<b>Increase</b>	Flooding events occur most frequently during the peak thunderstorm season of the summer; can cause massive erosion, undermine roads and bridges, cause sewer backups, and flooding roadways; and may disrupt power supplies.
<b>Lake Levels</b>	Water levels, especially in the summer and fall, are vulnerable to change as precipitation and evaporation rates become more variable			<b>Uncertain</b>	Owing to the complexity of the Great Lakes and Lake Simcoe watershed systems, long-term predictions have been hard to make.
<b>Lake Ice</b>	Open water days are projected to increase from 257 days in the baseline period (1971-2000) to 304 days by 2100, thereby decreasing lake ice			<b>Decrease</b>	Ice record data indicates that the period of ice cover on Lake Simcoe has been decreasing and, in recent years, open water has even remained throughout the winter. This will affect lake ecosystems, precipitation patterns, water/wastewater infrastructure, and associated recreational activities.
<b>Streamflow</b>	Both low-flow and flooding conditions are expected to increase			<b>Increase</b>	
<b>Algae</b>	Blue-green algae are expected to increase			<b>Increase</b>	This will affect water quality, water intake infrastructure, recreational activities, tourism, and Lake Simcoe ecosystems.

<b>Groundwater Recharge</b>	Spring recharge rates will likely decrease, impacting the rest of the hydrologic cycle. Groundwater recharge in the summer may decrease due to higher temperatures	<b>Variable</b>	This will affect well monitoring, aquifers, land development, infrastructure projects etc.
<b>Natural Heritage</b>	In the Lake Simcoe watershed, 90% of the swamps, 84% of the marshes, 50% of the fens, and 100% of the bogs are vulnerable to drying up by 2100.	<b>Decrease</b>	Wetlands within the watershed provide flood protection services valued at \$169 million, which is very likely to reduce as wetlands become degraded or lost.
<b>Air Quality</b>	Levels of ozone are expected to increase. Pollens and moulds within the environment will also increase.	<b>Decrease</b>	Ground-level ozone is a main air pollutant, and short and long-term exposure to high levels of ozone has been linked to asthma and asthma-like symptoms. Increases in aeroallergens are expected due to increased productivity of plants and prolonged growing periods.
<b>Invasive Species</b>	The potential spreading of new or existing invasive species will increase (including disease vectors like ticks, viruses, etc.)	<b>Decrease</b>	Phragmites, emerald ash-borer, back-legged ticks, and West Nile virus are some invasives and disease vectors that will be of particular concern in Innisfil.

## Climate Scenarios and Impacts

Below are impact statements for three priority climate scenarios anticipated for Innisfil, based on the Climate Projections listed above. Impact statements were developed for all the Town departments and sectors.

The impact statements are sorted into four categories under each scenario:

- Physical: Impacts to physical man-made infrastructure and assets
- Natural: Impacts to natural areas, assets and the natural environment
- Operational: Impacts to Town operations, servicing capabilities and staff
- Social: Impacts to community well-being and way of life

**Scenario 1:** Increased heat in urban areas/ built areas; increased heat impacts to residents, visitors, Town staff during hotter summers

Physical	Natural	Operational	Social
Increased chances of heat-related damage to road infrastructure (buckling, cracking) leading to service discontinuations, repairs, and fleet issues.	Reduced resilience of natural assets (wetlands, wooded areas, lake shoreline, streams, meadows, etc.) leading to increased need for conservation.	Less daytime construction activities and more nighttime construction activities, longer building seasons leading to quicker project turn arounds.	Increased criminal activity in vulnerable areas/ populated areas.
Greater number of heat islands in Town centres and residential areas due to grey public and private infrastructure.	Increased watering needs for planters, parks, community gardens, and boulevard trees due to greater heat and reduced ground water.	More contingency plans needed for outdoor community events and popular shopping areas.	Increasing Town population putting stress on available resources.
Play equipment, splash pads, and other community amenities will get hot.	Fewer pollinators and greater loss of native species due to loss of habitat.	Increased heat exposure for outdoor and frontline workers (building inspectors, by-law officers, parks, operations, frontline staff, etc.) resulting in potential for health and safety risks to employees.	Lower community health from heat and poorer air quality.



Increased need to provide and maintain cooling stations and cooling systems within municipal buildings for municipal staff and residents.		Increased inquiry volume from regular/seasonal residents requiring more staff time and resources.	
		Increases in overall operating budget for the Town in addressing the impacts of these weather events.	

**Scenario 2:** More frequent and/or severe extreme weather events (e.g., windstorms, thunderstorms, tornadoes)

Physical	Natural	Operational	Social
Increased need for bad weather detection.	Higher <i>Escherichia coli</i> ( <i>E. coli</i> ) counts leading to more beach closures.	Increased power outages leading to internal communication and program delivery disruptions.	Lower community resilience from communication disruptions.
Increased need for tree removal and clean-up post-precipitation events.	Destruction of Town's natural assets (wetlands, wooded areas, parks, meadows, gardens, shoreline, etc.).	Increased need for emergency plans that provide residents with displacement information and responses from frontline staff (evacuations, shelter-in-place).	A greater number of property owners being displaced from their homes.
Increased need for water/damp proofing of public and private buildings.	Lakeshore flooding might increase standing water in ditches, etc. (has potential to become unmanageable).	More damage to Town property and private property, causing increased insurance costs and damage claims against the Town.	Need for more emergency preparedness and related education, resources, and communications, etc.
Increased pressure on sump systems		Increased financial resources (Town	Increased need for community

and residential site-level infrastructure.		reserves, higher property taxes, government grants) in addressing impacts from weather events.	resilience programs (Neighbours Helping Neighbours, food security, etc.).
Higher pressures and volumes of permits for repairs, rebuilds, remediation of buildings.		Increased need for greater staff hours of service (e.g. inquiry volumes, staffing resources, and response times).	
Overwhelming the stormwater management facilities and infrastructure (ponds, creek/streams, lakeshore, and sewer).		Increased cost of procuring materials, goods, and services due to supply chain disruptions.	
Increased need for updated flooding risk and stormwater management strategies.		Flooding/rains leading to sports field closures, less outdoor programming, and/or rescheduled programming.	
More severe damage to roads, sidewalks, and other infrastructure.		Increased safety and health risks to staff.	
Additional wear and tear on the fleet.			

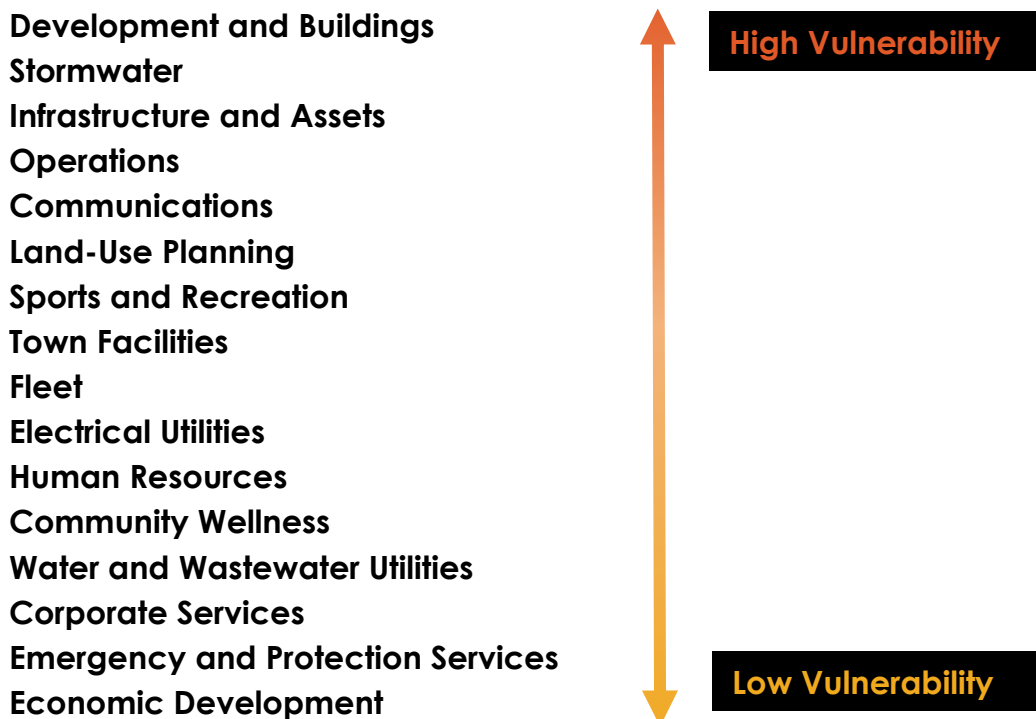
**Scenario 3:** Climate impacts to Lake Simcoe and overall ecosystem health (Impact statements have not been sorted into categories due to high overlap in themes)

- Increased salting during wintertime, leading to more salt in Lake Simcoe during thaw and spring-melt
- Lake Simcoe's shorelines, aquatic habitats, natural heritage areas are under high risk from degradation and habitat loss
- Shorter ice season leading to a decline in winter-time fishery tourism
- More phosphorus run-off from farm fields into Lake Simcoe during precipitation events

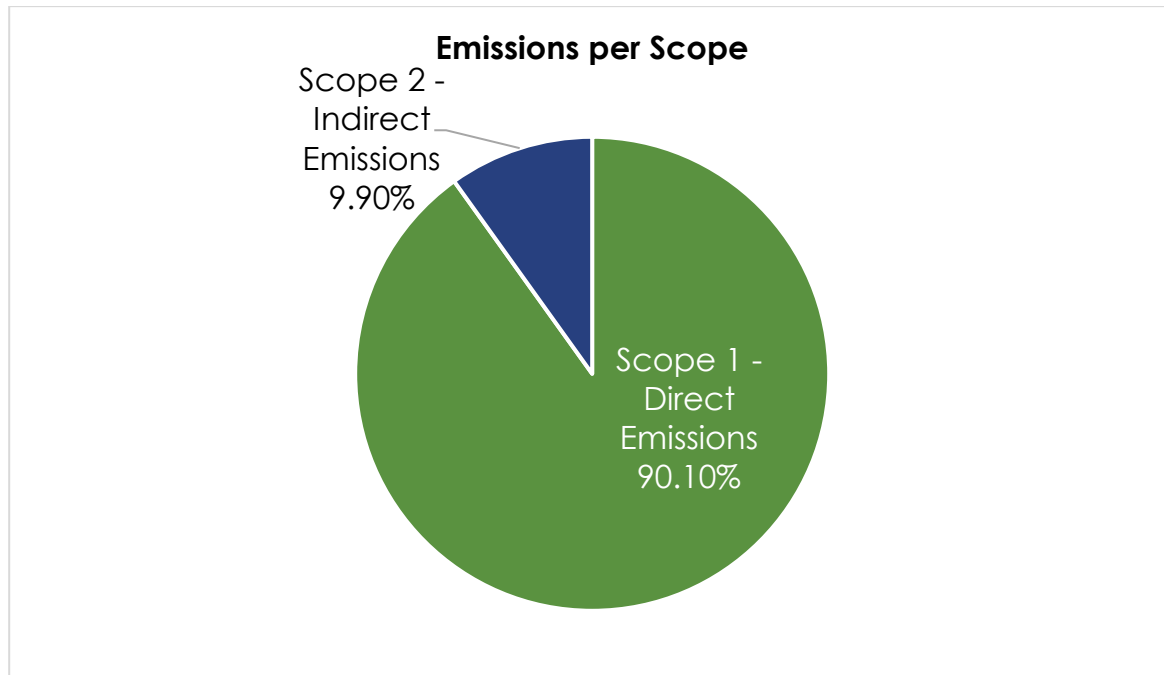
- Higher E. coli counts in the summer leading to more beach closures
- Increased demand on staff resources and time to mitigate Lake-related issues
- More rain events combined with high lake levels will cause flooding due to storm systems not being able to outlet to the lake
- Low summertime water levels, leading to impacts on marinas, boating, and summer tourism.
- Increased health and safety risk to Town staff
- Increase in water-table level will result in less infiltration in areas around Lake Simcoe resulting in more flooding
- Possible risk of algae blooms
- Increased standing water could lead to increases in mosquito-borne diseases.
- More flooding will likely increase the risk of more damage to Town property and private property, meaning increased insurance costs and more damage claims against the Town
- Increased demands on Lake Simcoe from development and changes in land use

### **Vulnerability by Town function and service areas**

The vulnerability assessment process was performed to determine a vulnerability grading for various Town functions and service areas. Service areas with high sensitivity and low adaptive capacity are highly vulnerable, low sensitivity and high adaptive capacity have low vulnerability, and those with both high sensitivity and high adaptive capacity have a medium vulnerability. Based on the collective responses from Town departments, Town function areas have been sorted from highest to lowest perceived levels of vulnerability:



# Appendix iii - Inventory



## Scope Considerations

Scope	Emissions	Percentage	Energy	Percentage
Scope 1 - Direct Emissions	2734.42 TCO <sub>2</sub> e	90.1%	45284.69 GJ	55.48%
Scope 2 - Indirect Emissions	300.41 TCO <sub>2</sub> e	9.9 %	36340.52 GJ	44.52%

## Baseline Inventory Results Tables

### Emissions per Sector

Sector	Emissions (TCO <sub>2</sub> e)	Emissions per Capita (kg/person)	Percentage
Buildings	1,721	48	56.71%
Fleet	1,036	29	34.14%
Streetlighting	65	1.85	2.15%
Waste	211	5.99	6.98%
<b>Total</b>	<b>3035</b>	<b>85.81</b>	<b>100.00%</b>

## Temperature Weighted Results

Parameter	Value
Building Natural Gas Emissions per HDD	0.3291 TCO <sub>2</sub> e
Building Electricity Emissions per CDD	0.9110 TCO <sub>2</sub> e

## Electrical Emissions Proportions

Parameter	Value
Building Electricity Proportion	13.65 %

## Energy per Sector

Sector	Energy (GJ)	Energy per Capita (GJ/person)	Percentage
Buildings	58,491	1.65	71.66%
Fleet	15,224	0.43	18.65%
Streetlighting	7,909	0.22	9.69%
<b>Total</b>	<b>81,625</b>	<b>2.31</b>	<b>100.00%</b>

## Energy Per Source

Energy Source	Energy (GJ)	Percentage
Electricity	36341	44.52%
Natural Gas	30060	36.83%
District Energy	0	0.00%
Gasoline	4571	5.6%
Diesel	10654	13.05%

## Activity Results Table

Inventory Elements	Activity	Emissions	Energy
Building Natural Gas	782,614 m <sup>3</sup>	1,486 TCO <sub>2e</sub>	30,060 GJ
Building Electricity	7,897,550 kWh	235 TCO <sub>2e</sub>	28,431 GJ
Building District Energy	0 GJ	0 TCO <sub>2e</sub>	0 GJ
Fleet Gasoline	133,652 L	307 TCO <sub>2e</sub>	4,570 GJ
Fleet Diesel	267,678 L	728 TCO <sub>2e</sub>	10,653 GJ
Streetlighting Electricity	2,197,039 kWh	65 TCO <sub>2e</sub>	7,909 GJ
Landfill Waste	155.85 T	211 TCO <sub>2e</sub>	Waste sent to landfill does not produce energy.

## Inventory Analysis Settings

### Emissions & Energy Coefficients

Source	Emissions Coefficient	Energy Coefficient
Natural Gas	0.001899 TCO <sub>2e</sub> /m <sup>3</sup>	0.03841 GJ/m <sup>3</sup>
Electricity	0.00002976 TCO <sub>2e</sub> /kWh	0.0036 GJ/kWh

District Energy	0.05 TCO <sub>2e</sub> /GJ	1 GJ/GJ
Gasoline	0.0023 TCO <sub>2e</sub> /L	0.0342 GJ/L
Diesel	0.002723 TCO <sub>2e</sub> /L	0.0398 GJ/L
Waste	1.36 TCO <sub>2e</sub> /T	Waste sent to landfill does not produce energy.

#### Data Sources

<b>Inventory Component</b>	<b>Data Source / Comments</b>
Natural Gas	Enbridge
Electricity	HydroOne
Gasoline	Fleet
Diesel	Fleet
Waste	Facilities

## Appendix iv – Mitigation Actions and Implementation Tools

### Legend

Timeline (Start):            **Ongoing/2024**    **Short-term: 2025/2026**    **Med-term: 2027/2028**    **Long-term: 2029/2030**

Approximate Costs:        **\$:** 0 – 25K    **\$\$:** 25K – 100K    **\$\$\$:** >100K    **N/A:** Absorbed into planned operating/capital costs



### Mitigation Actions: Fleet

ID	Mitigation Action	Lead	Description	Timeline	Approx . Cost
F1	Complete and implement recommendations from an Alternative Fuels Feasibility Study	• Fleet	<ul style="list-style-type: none"> <li>• 2024 - A Feasibility Study is underway to guide the adoption of alternative fuels for our remaining vehicles and equipment, including Heavy Duty Vehicles.</li> <li>• All non-Light Duty Vehicles (LDV) will be participating in alternative fuels by 2030 (e.g. EV, biodiesel, ethanol, hydrogen).</li> </ul>	Ongoing/2024	\$\$
F2	Conversion of LDV to electric/hybrid <i>Class 100 Vehicles</i>	• Fleet	<ul style="list-style-type: none"> <li>• Q2 2023 – Light Duty Electrification Plan and Lifecycle Costing Study to determine if there was sufficient evidence and a business case to be made for vehicle electrification, completed.</li> <li>• As a result of that analysis staff have developed a timeline for electrification of SUVs and half-ton pick-up trucks.</li> <li>• Q4 2024, an EV truck and PHEV SUV will be purchased as pilot vehicles and to gather</li> </ul>	Short-term	\$\$\$



			true performance data prior to full roll out of electrification.		
<b>F3</b>	Conversion of equipment <i>Class 400, 500, 600, &amp; 900</i>	• Fleet	<ul style="list-style-type: none"> <li>• Two electric Zambonis currently in service.</li> <li>• Off-road and turf vehicles not currently available, but we continue to look for opportunities to convert.</li> <li>• The Feasibility Study will help to determine the best course of action for future alternative fuel adoption in these units (i.e., conversion to hydrogen or biodiesel).</li> </ul>	Ongoing/ 2024	\$\$\$
<b>F4</b>	Electrification of small engine equipment <i>Class 700 Units</i>	<ul style="list-style-type: none"> <li>• Parks</li> <li>• Roads</li> </ul>	<ul style="list-style-type: none"> <li>• Started conversion with sample electric trimmers, weed eater, and blower.</li> </ul>	Ongoing/ 2024	\$\$
<b>F5</b>	Conduct charging infrastructure usage and installation planning	• Fleet	<ul style="list-style-type: none"> <li>• 2019 – There are currently four charging stations dedicated to Town Fleet vehicles, two at Town Hall and two at the Operations Building.</li> <li>• Full electrification of our Light Duty Vehicles would require a minimum of seven additional charging stations dedicated to Fleet vehicles. The correct mix of DC fast chargers and Level 2 chargers are currently being investigated.</li> <li>• 2024 – Capital Project is scheduled to add DC Fast Charging stations for the Operations Building and Town Hall.</li> </ul>	Ongoing/ 2024	\$\$\$
<b>F6</b>	Monitor and increase fleet operational efficiencies by focusing on idling times, fuel use etc.	• Fleet	<ul style="list-style-type: none"> <li>• 2023 - Telematics installation commenced (GeoTab) to monitor fuel use, idling times, fleet utilization, etc.</li> </ul>	Ongoing/ 2024	\$\$

<b>F7</b>	Promote energy efficient driving behaviours	<ul style="list-style-type: none"> <li>• Fleet</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Department managers have been engaged to collaboratively work on staff-focused approaches to promoting energy efficient driving behaviours.</li> </ul>	Short-term	N/A
<b>F8</b>	Conduct route planning and optimization	<ul style="list-style-type: none"> <li>• Fleet</li> </ul>	<ul style="list-style-type: none"> <li>• The collection and review of usage data through telematics has commenced, which will be used to inform optimization efforts.</li> </ul>	Short-term	N/A
<b>F9</b>	Conduct training for mechanics on EV components	<ul style="list-style-type: none"> <li>• Fleet</li> </ul>	<ul style="list-style-type: none"> <li>• Q1 2024 - One mechanic trained in safely diagnosing and repairing electric and hybrid vehicles.</li> </ul>	Short-term	\$\$
<b>F10</b>	Key Performance Indicators (KPIs) development for performance monitoring	<ul style="list-style-type: none"> <li>• Fleet</li> </ul>	<ul style="list-style-type: none"> <li>• Beginning in 2024, KPIs will be developed to provide managers with meaningful comparisons of their fuel consumption and emissions data.</li> <li>• Completed through Telematics in quarterly reports to managers.</li> </ul>	Ongoing/ 2024	N/A
<b>F11</b>	Include propane/natural gas small engine equipment in future emission inventories	<ul style="list-style-type: none"> <li>• Fleet</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• The Town currently uses a mix of fossil fuel, electricity, propane, and natural gas, to power several small engine units, heavy equipment, and on/off-road vehicles. Fossil fuel use tracking has been in place for some time. However, alternative fuel use is not as well understood.</li> </ul>	Short-term	\$



## Mitigation Actions: Buildings

ID	Mitigation Action	Lead	Description	Timeline	Approx. Cost
B1	Conduct a Facilities Sustainability Study (FSS) in identified buildings to examine energy consumption of systems and develop energy-efficient retrofits and solutions	<ul style="list-style-type: none"> <li>Facilities</li> <li>Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Conduct energy and emissions performance audits on facilities and facility systems.</li> </ul>	Ongoing/2024	\$\$
B2	Develop a Facilities Sustainability Policy	<ul style="list-style-type: none"> <li>Capital Engineering</li> <li>Facilities</li> <li>Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>As put forth in the Facilities Master Plan, a Facilities Sustainability Policy will detail sustainability actions for existing (derived from FSSs) and future buildings.</li> </ul>	Ongoing/2024	N/A
B3	Continue to incorporate Building Automation Systems in new buildings as required	<ul style="list-style-type: none"> <li>Facilities</li> <li>Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of energy and emissions performance through the installation of Building Automation systems.</li> </ul>	Ongoing/2024	N/A
B4	Complete lighting conversion to LEDs across existing buildings	<ul style="list-style-type: none"> <li>Facilities</li> </ul>	<ul style="list-style-type: none"> <li>This action will be integrated into the 2024 Energy Conservation and Demand Management Plan update.</li> </ul>	Ongoing/2024	N/A
B5	Aim for Net-Zero or equivalent building efficiency performance standards for new buildings post Q4 -2024	<ul style="list-style-type: none"> <li>Capital Engineering</li> <li>Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Include in Facilities Sustainability Policy and Engineering Standard Updates, and then incorporate through capital projects for new builds for Town facilities.</li> </ul>	Short-term	\$\$\$

<b>B6</b>	Develop a Sustainable Capital Builds Policy and update other Town policies to address low carbon materials and embodied carbon during infrastructure builds	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Development Engineering</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Update Town Standards to include low-embodied carbon requirements, where appropriate</li> <li>• Include specifications in the Engineering Standards Update</li> <li>• Include in the Sustainability Matrix (NP7)</li> </ul>	Med-term	\$
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## Mitigation Actions: Streetlights

ID	Mitigation Action	Lead	Description	Timeline	Approx. Cost
<b>S1</b>	New lights and lighting installations will be LED, or the better performing latest technology, wherever applicable	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Ensuring all new lighting in parks, streets, and parking lots are LED, or better performing technology</li> </ul>	Ongoing/ 2024	N/A

## Mitigation Actions: Waste

ID	Mitigation Action	Lead	Description	Timeline	Approx. Cost
<b>W1</b>	Conduct a Corporate Waste Audit to understand waste generation and recycling rates currently occurring in Town facilities	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• CAO's Office</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Short-term	\$

<b>W2</b>	Develop a Single-Use Plastic Elimination Policy	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• CAO's Office</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a corporate single-use plastic elimination policy.</li> </ul>	Short-term	N/A
<b>W3</b>	Conduct education on waste reduction at the corporate level	Sustainability	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Short-term	N/A



## Mitigation Actions: Corporate

ID	Mitigation Action	Lead	Description	Timeline	Approx. Cost
<b>CA1</b>	Investigate energy security development through locally expanding renewable sources of energy supply in the Town	<ul style="list-style-type: none"> <li>• Senior Leadership</li> <li>• Planning</li> </ul>	<ul style="list-style-type: none"> <li>• This should be developed through partnership with InnPower &amp; InnTerprises. Policy changes will have to be made.</li> <li>• Similar to cell tower siting policy, a Renewable Energy Siting Protocol would need to be developed to determine Town support for renewable energy projects such as wind and solar.</li> </ul>	TBD	\$\$
<b>CA2</b>	Consider the development of District Energy Systems for existing and new Town builds	<ul style="list-style-type: none"> <li>• Growth</li> </ul>	<ul style="list-style-type: none"> <li>• Anywhere a secondary plan is required, a district energy system needs to be considered.</li> <li>• Wording can be included in the Official Plan Review and Town Campus Master Plan.</li> </ul>	Short-term	N/A
<b>CA3</b>	Establish KPIs and metrics to develop a monitoring and reporting system for the mitigation actions in the ISMP	<ul style="list-style-type: none"> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a new ISMP KPI/metrics document.</li> </ul>	Short-term	N/A

<b>CA4</b>	Develop a roadmap and strategy for a Community Energy Plan	<ul style="list-style-type: none"> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Framework in Appendix vi- Community Energy Plan.</li> </ul>	Short-term	\$\$\$
<b>CA5</b>	Explore purchase of carbon offsets to offset emissions	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• Finance</li> </ul>	<ul style="list-style-type: none"> <li>• Explore various carbon offsetting programs to help offset corporate emissions where not already reduced by mitigation actions.</li> </ul>	Med-term	N/A
<b>CA6</b>	Conduct a costing analysis of various low-carbon options for Town infrastructure and assets, to forecast and budget for capital projects and balance fiscal responsibility and funding of projects	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Fleet</li> <li>• Facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Embed into RFPs of various sustainability studies</li> </ul>	Ongoing / 2024	N/A
<b>CA7</b>	Review of Town assets through an asset management lens, to contrast and compare GHG retrofit solutions against 'conventional' asset management replacement costs and timelines	<ul style="list-style-type: none"> <li>• Asset Management</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Med-term	N/A
<b>CA8</b>	Track carbon taxes paid on all fuel and electricity purchases	<ul style="list-style-type: none"> <li>• Finance</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Short-term	N/A
<b>CA9</b>	Integrate sustainable procurement language within official purchasing documentation and include life cycle costing into purchasing decisions, where possible and practical	<ul style="list-style-type: none"> <li>• Procurement</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Integrate into Purchasing Procedures, Bid Documents.</li> </ul>	Med-term	\$\$

<b>CA10</b>	Develop a scoring matrix to score bidders on their sustainability practices, where applicable and practical	<ul style="list-style-type: none"> <li>• Procurement</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Integrate into Purchasing Procedures, Bid Documents.</li> </ul>	Med-term	\$\$
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# Appendix v – Adaptation Actions

## Legend

Timeline (Start):            **Ongoing/2024**    **Short-term:** 2025/2026    **Med-term:** 2027/2028    **Long-term:** 2029/2030

Approximate Costs:        **\$:** 0 – 25K    **\$\$:** 25K – 100K    **\$\$\$:** >100K    **N/A:** Absorbed into planned operating/capital costs



## Adaptation Actions: Town Infrastructure & Asset Resilience

ID	Adaptation Action	Lead	Policy Tool	Description	Timeline	Approx . Costs
A1	Increase roads budgets to deal with increasing need for asphalt patches, asphalt mix design, and different cement grades (both operational and design and construction)	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Roads</li> </ul>	<ul style="list-style-type: none"> <li>• Study Update</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to incorporate in Roads Needs Studies (five-year frequency).</li> </ul>	Short-term	\$\$
A2	Integrate Low-Impact Development (LID) features like bioswales, infiltration galleries, holding tanks, and permeable paving in relevant infrastructure projects to reduce flooding and erosion	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Development Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Master Plan Update</li> <li>• Policy Update</li> <li>• New Policy</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to incorporate into Stormwater Management Master Plan Updates, Flooding Strategy, Stormwater Pond Cleanout/Retrofit Program updates and Development applications.</li> <li>• New LID Policy and Tracking Tool as a</li> </ul>	Long-term	-\$\$\$\$

				recommendation from the 2023 SWMP update. <ul style="list-style-type: none"> <li>Update Engineering Standards.</li> </ul>		
<b>A3</b>	Greater use of drought, heat, and/or flood resistant native plants in Town landscaping and LID infrastructure to align with Conservation Authority recommendations	<ul style="list-style-type: none"> <li>Capital Engineering</li> <li>Development Engineering</li> </ul>	<ul style="list-style-type: none"> <li>Standards Update</li> </ul>	<ul style="list-style-type: none"> <li>Include in update to Town Engineering Standards.</li> </ul>	Short-term	N/A
<b>A4</b>	Update the Salt Management Strategy to include eco-friendly salting options	<ul style="list-style-type: none"> <li>Roads</li> </ul>	<ul style="list-style-type: none"> <li>Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>Service level change.</li> <li>Cost implies salting materials as well.</li> </ul>	Short-term	\$\$\$
<b>A5</b>	Complete the Federal Climate Lens Assessment for any future public infrastructure projects over \$10 million at the planning and design phases	<ul style="list-style-type: none"> <li>Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>Policy updates to create framework for this. Following, specific capital projects within the 10-year capital plan would be identified, along with the certification requirements. These would be built into the scope, budget, and schedule.</li> </ul>	Med-term	\$

A6	Integrate the PIEVC / PIEVC Green Protocol into the decision flow process of new and existing infrastructure builds and upgrades. This would include personnel training.	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Development Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• New Master Plan</li> <li>• Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>• Include in the next Stormwater Management Master Plan Update and Flooding Strategy (five-year frequency).</li> <li>• This could be added to other relevant future master plan updates.</li> <li>• See Appendix ix for PIEVC resources</li> </ul>	Med-term	\$
A7	Investigate third-party certifications (e.g. LEED, Envision, etc.) for Town infrastructure to demonstrate the Town's commitment to sustainability to residents, employees, and relevant stakeholders	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporate in the new Facilities Sustainability Policy (B2) and Sustainable Capital Builds Policy (B6). Following that, specific capital projects within the 10-year capital plan would be identified, along with the certification requirements. These would be built into the scope, budget, and schedule.</li> </ul>	Short-term	\$
A8	Accelerate improvement of current routes and the development of new active transportation routes (sidewalks, bike lanes, etc.). This would include planning and adding signage, staffing, line painting,	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Plan Change</li> </ul>	<ul style="list-style-type: none"> <li>• Implement trails recommendations in the Transportation Master Plan and Land and Lake Plan.</li> </ul>	Med-term	\$\$

	pavement markings, and patchwork					
<b>A9</b>	Investigate the development of impervious fees/stormwater surcharges at the private property level	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• By-Law Change</li> <li>• Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>• Capital project to determine a stormwater user fee structure.</li> <li>• By-law and policy change to collect user fees to finance future stormwater costs.</li> </ul>	Short-term	\$\$\$
<b>A10</b>	Develop a LID Policy to encourage LIDs on private property	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• New Policy</li> </ul>	<ul style="list-style-type: none"> <li>• Stormwater Master Plan has given the primary directive for this.</li> </ul>	Med-term	\$\$
<b>A11</b>	Develop a flood mitigation program	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• New Policy</li> </ul>	<ul style="list-style-type: none"> <li>• Flooding Strategy and SWMP has developed a prioritized list of preliminary recommendations for locations.</li> </ul>	Short-term	\$\$\$



## Adaptation Actions: Natural Assets & Land-Use Planning

ID	Adaptation Action	Lead	Policy Tool	Description	Timeline	Approx. Cost
NP1	Develop a buffer policy for public/ private lands draining into Lake Simcoe	<ul style="list-style-type: none"> <li>• Operations</li> <li>• Capital Engineering</li> <li>• Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Master Plan Update</li> </ul>	<ul style="list-style-type: none"> <li>• Guided by Stormwater Master Plan and the Lake Simcoe Protection Plan.</li> <li>• Official Plan Review.</li> <li>• Integrate into Private Tree By-Law (NP2).</li> </ul>	Short-term	\$\$
NP2	Increase tree and shade cover up to 30% (e.g., canopies) in public/high-density spaces and watercourses (natural buffers)	<ul style="list-style-type: none"> <li>• Operations</li> <li>• Capital Engineering</li> <li>• Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Master Plan Update</li> <li>• New By-Law</li> <li>• Policy Update</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a Private Tree By-Law.</li> <li>• Develop an Urban Forest Strategy and Urban Tree Management Policy.</li> <li>• Integrate into Placemaking Destinations Master Plan.</li> <li>• Engineering Standards Update.</li> </ul>	Short-term	\$\$
NP3	Develop programs to increase resident access to trees and encourage private tree planting	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• Operations</li> </ul>	<ul style="list-style-type: none"> <li>• New Policy</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• New free trees policy will have to be established for a free tree program.</li> </ul>	Short-term	\$
NP4	Develop new pollinator/rain gardens in community spaces and other Town areas	<ul style="list-style-type: none"> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• New Master Plan</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Land and Lakes Plan.</li> <li>• Incorporate into parks/Town-owned community spaces improvements through capital projects.</li> </ul>	Short-term	\$\$

				<ul style="list-style-type: none"> <li>• Emulate the Circle Park Wetland model during stormwater builds, whenever possible, and include partners like Lakehead University in consultations.</li> </ul>		
<b>NP5</b>	Develop a Natural Asset Inventory and Management Strategy Roadmap to integrate all Town-owned/operated natural assets into current asset inventory	<ul style="list-style-type: none"> <li>• Asset Management</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Define natural assets and establish inventory.</li> </ul>	Med-term	N/A
<b>NP6</b>	Update and implement invasive species programs for various invasive species threats in the region (e.g., emerald ash borer, Michigan fungi, phragmites)	<ul style="list-style-type: none"> <li>• Operations</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Need dedicated staff to initiate and continue to run these programs, as they get bigger or as scope expands.</li> <li>• Include in the Urban Forest Strategy and Urban Tree Management Policy.</li> </ul>	Med-term	\$\$\$
<b>NP7</b>	Develop a Sustainability Matrix/Green Development Standards for Site Plan Applications/Community Planning Permits System to encourage environmentally, socially, and economically sustainable design across developments in Innisfil	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• By-Law Change</li> <li>• Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporate into the CPP By-Law.</li> <li>• This will also need to be reflected in the Official Plan and Site Plan Control.</li> <li>• By-Law Change.</li> </ul>	Short-term	\$\$

<b>NP8</b>	Update policies, land-use designations, and zoning for areas vulnerable to flooding, heat island effects, and other climate-related risks (e.g., wetlands and woodlands)	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• By-Law Change</li> <li>• Policy Change</li> <li>• Plan Update</li> </ul>	<ul style="list-style-type: none"> <li>• Official Plan Review - Build in policies for climate change.</li> <li>• Comprehensive Zoning By-Law Review - Update zoning by-law in conformity with OP for climate change.</li> <li>• Municipal Comprehensive Review - Include climate change risks in reviews.</li> <li>• Stormwater Management Master Plan and Flooding Strategy directed new capital project.</li> </ul>	Short-term	N/A
<b>NP9</b>	Develop new development guidelines to withstand extreme weather (e.g., hotspots, flooding)	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Development Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Standards Update</li> </ul>	<ul style="list-style-type: none"> <li>• Integrate into CPPS Placemaking and Sustainable Design Guidelines.</li> <li>• Integrate into Engineering Standards Update.</li> </ul>	Short-term	N/A
<b>NP10</b>	Integrate dark sky lighting provisions in planning and capital policies	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Plan Update</li> <li>• Policy Update</li> </ul>	<ul style="list-style-type: none"> <li>• Site Plan Control Guidelines.</li> <li>• Placemaking Destinations Master Plan.</li> <li>• Update CP.13.1.1.</li> </ul>	Short-term	N/A





## Adaptation Actions: Corporate Governance

ID	Adaptation Action	Lead	Policy Tool	Description	Timeline	Approx. Cost
C1	Complete a Cost of Doing Nothing Assessment to examine the costs related to climate change across Town sectors and develop viable business case scenarios for adaptation	<ul style="list-style-type: none"> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• New Study</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainability to lead this with support from Asset Management team.</li> </ul>	Short-term	N/A
C2	Appoint dedicated staff to oversee, coordinate, and implement the ISMP	<ul style="list-style-type: none"> <li>• Senior Leadership</li> <li>• Council</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Contracted staff allocation within approved budget. Consideration of full-time staff resources to be identified in future budget cycle.</li> </ul>	Short-term	\$\$
C3	Establish an ISMP Advisory Group to provide advice, facilitate ongoing communication and guide the effective and equitable implementation of the ISMP	<ul style="list-style-type: none"> <li>• Senior Leadership</li> <li>• People and Talent</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of an employee-led committee, terms of reference, etc.</li> </ul>	Short-term	\$
C4	Update various corporate-level policies (e.g., Official Plan, Town of Innisfil Sustainability Policy, Communications Strategy) to encompass sustainability and climate change considerations	<ul style="list-style-type: none"> <li>• All departments</li> </ul>	<ul style="list-style-type: none"> <li>• Policy Change</li> <li>• Plan Update</li> </ul>	<ul style="list-style-type: none"> <li>• Review policies and plans as and when updates are triggered.</li> </ul>	Short-term	N/A

<b>C5</b>	Include weather-appropriate considerations, like shift flexibility, personal protective equipment, water breaks etc., for outdoor personnel in relevant policies	<ul style="list-style-type: none"> <li>All departments</li> </ul>	<ul style="list-style-type: none"> <li>Other</li> </ul>	<ul style="list-style-type: none"> <li>Already ongoing for field staff across the Town, through service area leaders and People and Talent (P&amp;T) (Health and Safety engagement as needed). From a corporate policy/program lens, P&amp;T (Health and Safety) would be the lead.</li> </ul>	Short-term	\$
<b>C6</b>	Investigate and review current insurance coverage (for current and future climate risks) to Town property annually and update the Risk Management Policy/Risk Register to incorporate climate change risks	<ul style="list-style-type: none"> <li>Legal</li> </ul>	<ul style="list-style-type: none"> <li>Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>If necessary, increase or decrease insurance coverage by adjusting our insurance policies.</li> <li>Update the Town's Risk Management Policy.</li> </ul>	Short-term	N/A
<b>C7</b>	Integrate sustainability/climate action considerations sections into the Council Report template	<ul style="list-style-type: none"> <li>Sustainability</li> <li>Clerks</li> </ul>	<ul style="list-style-type: none"> <li>Other</li> </ul>	<ul style="list-style-type: none"> <li>Complete this action during the next Council Report Template update.</li> </ul>	Short-term	N/A
<b>C8</b>	Prepare and train staff, wherever relevant, to ensure the successful implementation of the ISMP	<ul style="list-style-type: none"> <li>All departments</li> </ul>	<ul style="list-style-type: none"> <li>Other</li> </ul>	<ul style="list-style-type: none"> <li>Train staff wherever relevant</li> </ul>	Ongoing / 2024	N/A



## Adaptation Actions: Engagement & Innovation

ID	Adaptation Action	Lead	Policy Tool	Description	Timeline	Approx. Cost
I1	Develop a Community Sustainability Guide to help guide and educate residents on sustainability actions and resources in Innisfil	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• Communications</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Med-term	\$
I2	Support the attraction of green businesses that align with Innisfil's key sectors (e.g., adding resources/personnel to the Innisfil Business Mentors program), while also supporting existing businesses in developing sustainable practices	<ul style="list-style-type: none"> <li>• Economic Development</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• DMZ All Access Workshop focused on Sustainability (will encompass key areas such as sustainable practices, grants available, green development/building).</li> <li>• Make changes to the Innisfil Business Mentors Program.</li> </ul>	Short-term	\$
I3	Involve citizens in collecting local data to support the Town in decision-making through engagement activities, where needed	<ul style="list-style-type: none"> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Short-term	\$

<b>14</b>	Develop sustainability recommendations for vendors and event organizers through event guidelines	<ul style="list-style-type: none"> <li>• Sports and Recreation</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Special Event Guidelines</li> </ul>	Short-term	N/A
<b>15</b>	Commemorate Earth Day annually with an Earth Day community event	<ul style="list-style-type: none"> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Short-term	\$



## Adaptation Actions: Emergency Preparedness

ID	Adaptation Action	Lead	Policy Tool	Description	Timeline	Approx. Cost
<b>E1</b>	Have more EOC training exercises and play through scenarios for emergency situations	<ul style="list-style-type: none"> <li>• Fire</li> </ul>	<ul style="list-style-type: none"> <li>• By-Law Change</li> </ul>	<ul style="list-style-type: none"> <li>• Fire Department to increase EOC training and exercises beyond minimum requirements of the Emergency Management and Civil Protection Act.</li> <li>• By-Law 091-23 and Regulation 380/01 to be used as references.</li> </ul>	Short-term	N/A
<b>E2</b>	Investigate a contingency (e.g. a Climate Disaster Fund) for high-impact climate events through proactive budgeting	<ul style="list-style-type: none"> <li>• Finance</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>	Med-term	N/A
<b>E3</b>	Deliver enhanced first aid training to staff (beyond police and fire)	<ul style="list-style-type: none"> <li>• People and Talent</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Consult relevant parties in determining additional staff (beyond legislative</li> </ul>	Med-term	\$

				requirements) to receive first aid training.		
E4	Install cooling measures in high traffic public areas for hot days and events (e.g. water coolers for residents and pets, misters, shade structures)	<ul style="list-style-type: none"> <li>• Capital Engineering</li> <li>• Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Master Plan update</li> </ul>	<ul style="list-style-type: none"> <li>• Updates to the Land and Lake Master Plan occur every five years, this could be added to future master plan updates.</li> </ul>	Med-term	N/A



## Adaptation Actions: Monitoring

ID	Adaptation Action	Lead	Policy Tool	Description	Timeline	Approx. Cost
M1	Map priority areas for tree planting to reduce heat island effects and flooding, and sequester carbon, in consultation with relevant stakeholders (e.g., Conservation Authorities, SMDHU)	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Operations</li> </ul>	<ul style="list-style-type: none"> <li>• By-Law Change</li> <li>• Policy Change</li> </ul>	<ul style="list-style-type: none"> <li>• Updates to Official Plan and Zoning By-law map schedules.</li> </ul>	Short-term	N/A
M2	Develop KPIs/performance metrics to monitor and review the progress of each ISMP recommended action, for reporting, reviewing, and updating	<ul style="list-style-type: none"> <li>• Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• New ISMP KPI/Metrics document.</li> </ul>	Short-term	N/A

<p><b>M3</b></p>	<p>Conduct mapping, modelling, and monitoring to assess areas at risk from storms, high wind, and other severe climate change impacts</p>	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• Capital Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Some mapping already completed through Flooding Strategy for flood risks.</li> <li>• Modelling for site-specific impacts can be done through PIEVC process during active capital projects and sent to GIS team to map.</li> </ul>	<p>Long-term</p>	<p>N/A</p>
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# Appendix vi – Community Energy Plan

The Community Energy and Emissions Plan is a long-term plan to meet Innisfil's future community energy needs while improving energy efficiency, reducing greenhouse gas (GHG) emissions, and fostering local sustainable and community-supported energy solutions. The plan includes every aspect of Innisfil's community-wide energy use and GHG emissions, from homes and transportation to industry and waste.

**Framework:** The following is a framework for the development of a Community Energy Plan in Innisfil (Mitigation action CA4)

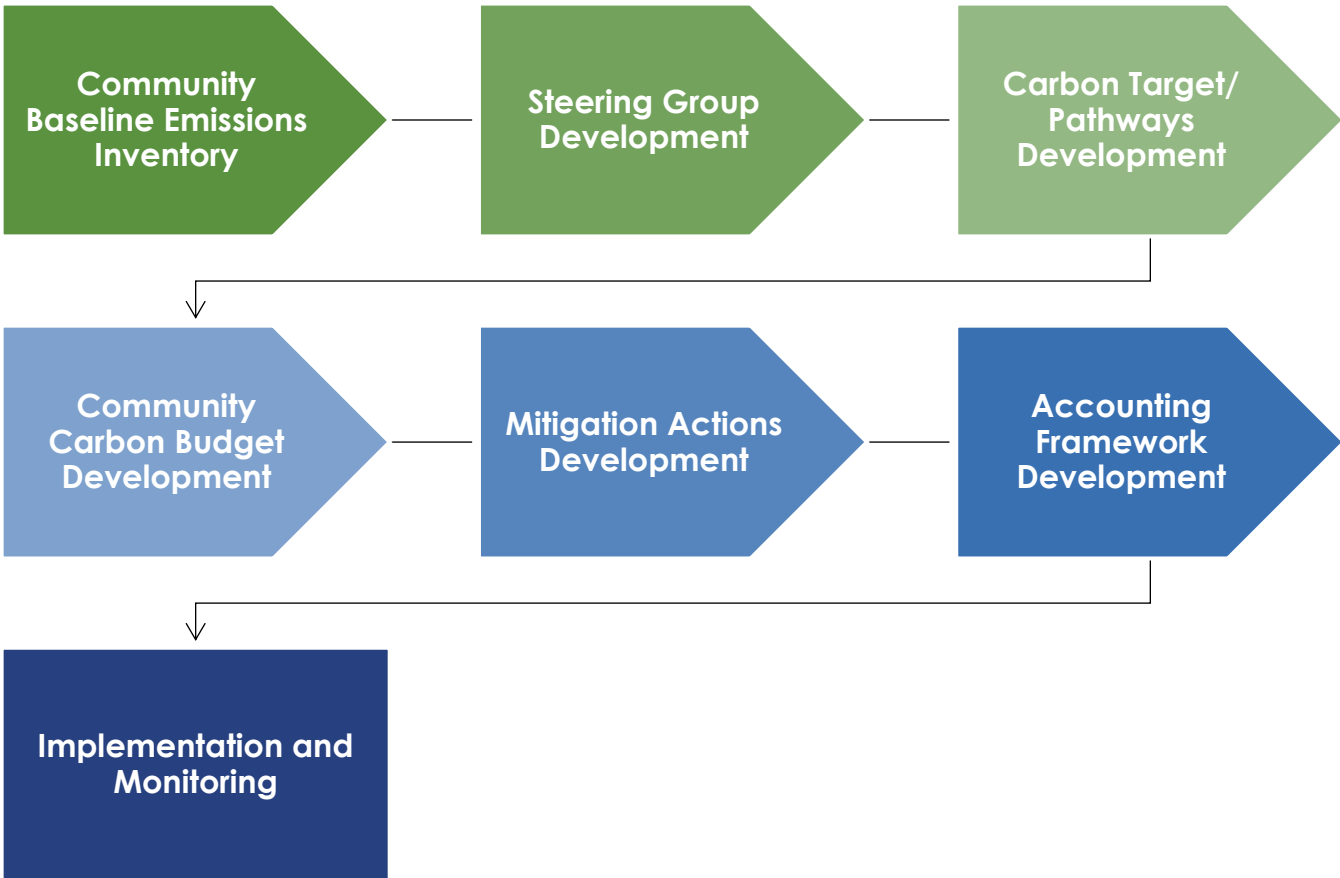


Figure 1 Community Energy and Emissions Plan framework



# Appendix vii – Action Process Flow

## 1. New Plan/ Policy

The action process flow below is applicable to all actions that trigger the creation of a new policy or plan. This is a framework for the basic steps involved in the process which may be customized based on the action.

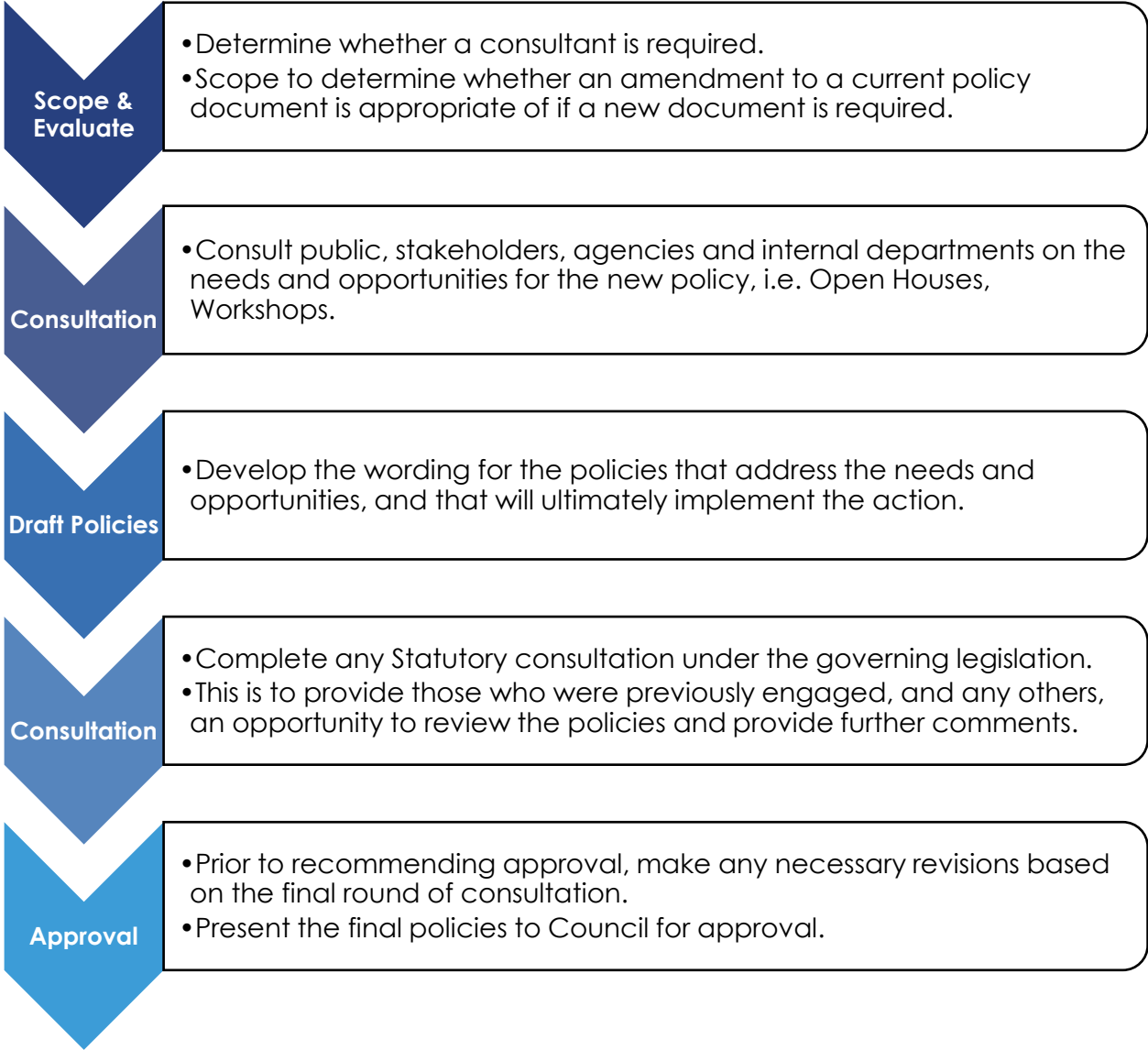


Figure 2 Action process flow for a new plan or policy

## 2. New By-Law/ Major By-Law Update

The action process flow below is applicable to all actions that trigger the creation of a new by-law or a major by-law update. This is a framework for the basic steps involved in the process which may be altered based on the specific needs of the corresponding action.

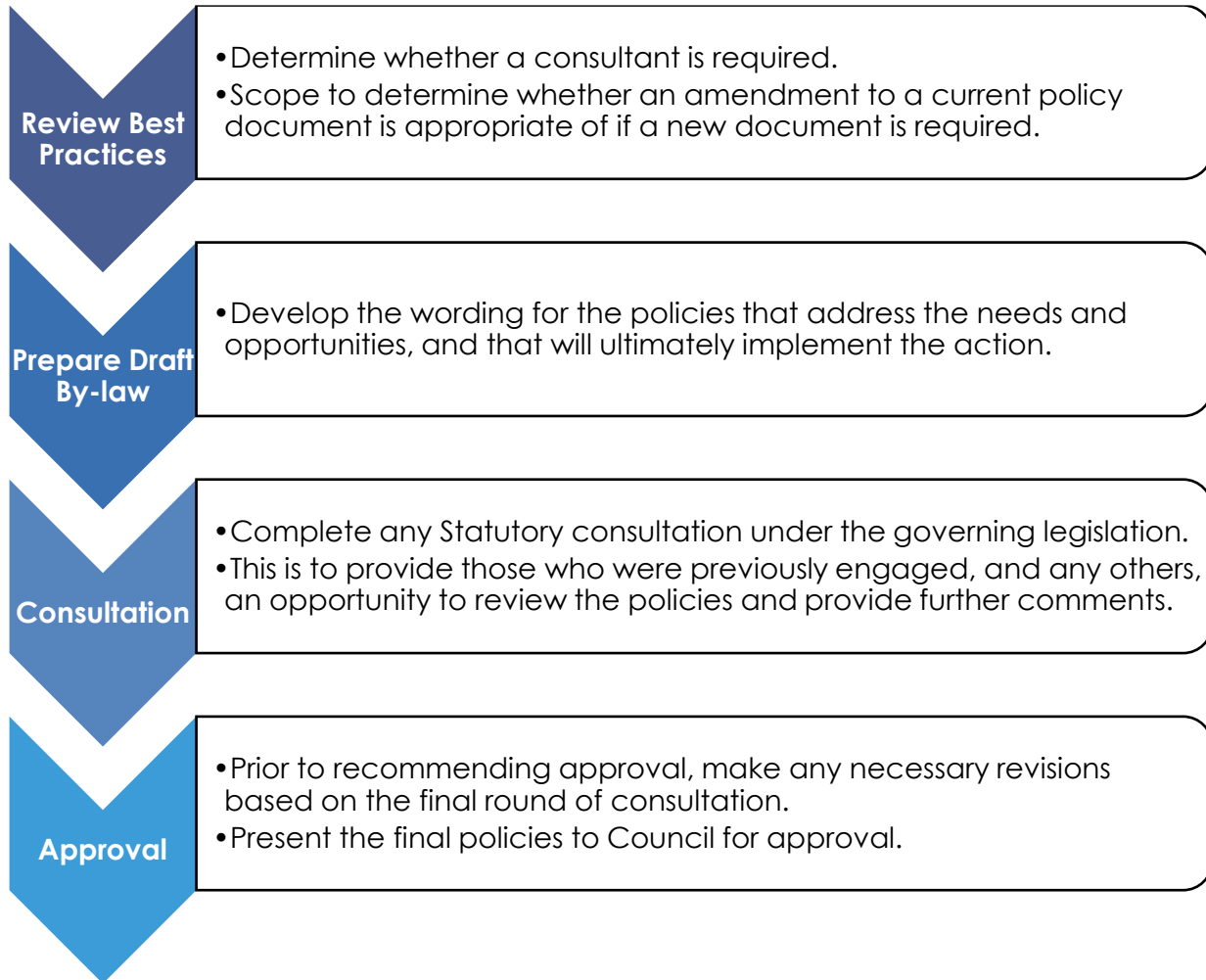


Figure 3 Action process flow for a new by-law or major by-law updates

# Appendix viii – Co-Benefits Assessment

A co-benefits assessment focuses on creating win-win solutions that address multiple issues simultaneously. Designing policies that address both sustainability and other Town priorities can garner support and approval from local stakeholders and decision-makers. Use the template below to assess the co-benefits of an ISMP action:

Co-benefits	ISMP Action		
	Example ISMP action	< State ISMP action >	< State ISMP action >
Carbon Sequestration			
Circular Economy Promotion	✓		
Disaster Risk Reduction/ Preparedness			
Economic Growth	✓		
Ecosystem/Biodiversity/ Green Space Preservation			
Enhanced Climate Change Adaptation/ Resilience			
Enhanced Energy Use/ Emissions Reductions			
Greener Economy	✓		
Improved Accessibility to Mobility Services			
Improved Air/ Water/ Soil Quality and Security			
Improved Public Health			
Improved Resources for Decision-Making			
Improved Sustainability Behaviours			
Increased Climate Education/Awareness	✓		
Increased Community Building			
Job Creation	✓		
Poverty Reduction	✓		
Resource Conservation			
Social Equity Promotion			
Waste Reduction			

# Appendix ix – Resources

Listed below are various resources for Staff use intended towards supporting the development and implementation of various actions.

Buildings		
Capacity Development for Community Building Retrofits in Canada	Clean Air Partnership	<a href="https://www.cleanairpartnership.org/projects/capacity-development-for-community-building-retrofits-in-canada/">https://www.cleanairpartnership.org/projects/capacity-development-for-community-building-retrofits-in-canada/</a>
Building Net Zero Emissions City Buildings: Corporate Real Estate Management's Net Zero Carbon Plan	City of Toronto	<a href="https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-168414.pdf">https://www.toronto.ca/legdocs/mmis/2021/ie/bgrd/backgroundfile-168414.pdf</a>
Climate Change Data		
Climate Action Atlas	Ontario Climate Action Database	<a href="https://www.cleanairpartnership.org/atlas/explore/">https://www.cleanairpartnership.org/atlas/explore/</a>
Canada's National Adaptation Strategy	Government of Canada	<a href="https://publications.gc.ca/collections/collection_2023/eccc/en4/En4-544-2023-eng.pdf">https://publications.gc.ca/collections/collection_2023/eccc/en4/En4-544-2023-eng.pdf</a>
Climate Lens Tools		
Municipal Climate Lens Tool	Clean Air Partnership	<a href="https://www.cleanairpartnership.org/projects/climatelens/">https://www.cleanairpartnership.org/projects/climatelens/</a>
The Climate Lens: General Guidance	Government of British Columbia	<a href="https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/climate_lens_general_guidance_version_122.pdf">https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/climate_lens_general_guidance_version_122.pdf</a>
Investing in Canada Infrastructure Program Climate Lens - General Guidance	Infrastructure Canada	<a href="https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html">https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html</a>
Climate Communications		
Climate-Ready Infographics	Intact Centre for Climate Adaptation	<a href="https://www.intactcentreclimateadaptation.ca/climate-ready-infographics/">https://www.intactcentreclimateadaptation.ca/climate-ready-infographics/</a>
Community Energy		
ReCharge Hamilton	City of Hamilton	<a href="https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=335400">https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=335400</a>
Engineering		

PIEVC Protocol and Resources	Institute for Catastrophic Loss Reduction, Climate Risk Institute	<a href="https://pievc.ca/protocol/">https://pievc.ca/protocol/</a>
PIEVC Green Protocol - Integrating Ecosystem-based Adaptation into Infrastructure Climate Risk Assessments	Institute for Catastrophic Loss Reduction, Climate Risk Institute	<a href="https://www.adaptationcommunity.net/wp-content/uploads/2022/11/2022giz-en-pievc-green-fur-druck.pdf">https://www.adaptationcommunity.net/wp-content/uploads/2022/11/2022giz-en-pievc-green-fur-druck.pdf</a>
Thermally Comfortable Playgrounds	Standards Council of Canada	<a href="https://www.scc.ca/en/about-scc/publications/general/thermally-comfortable-playgrounds">https://www.scc.ca/en/about-scc/publications/general/thermally-comfortable-playgrounds</a>
Future by Design: Standards for a Climate Resilient Canada	Standards Council of Canada	<a href="https://www.scc.ca/sites/default/files/SCC%20Infrastructure%20Report%20EN%20WEB%20FINAL.pdf">https://www.scc.ca/sites/default/files/SCC Infrastructure Report E N WEB FINAL.pdf</a>
Stormwater Charge	City of Mississauga	<a href="https://www.mississauga.ca/services-and-programs/home-and-yard/stormwater/stormwater-charge/">https://www.mississauga.ca/services-and-programs/home-and-yard/stormwater/stormwater-charge/</a>
<b>Fleet</b>		
EV Costing Study	Clean Air Partnership	<a href="https://www.cleanairpartnership.org/projects/ev-costing-study/">https://www.cleanairpartnership.org/projects/ev-costing-study/</a>
<b>Natural Assets</b>		
Tree Canopy Expansion Program	City of Brantford	<a href="https://www.brantford.ca/en/living-here/tree-canopy-expansion-program.aspx">https://www.brantford.ca/en/living-here/tree-canopy-expansion-program.aspx</a>
Nature is Infrastructure: How to Include Natural Assets in Asset Management Plans	Natural Assets Initiative	<a href="https://mnai.ca/media/2024/04/NAI-NAM-guidebook_for_local_gov-v102.pdf">https://mnai.ca/media/2024/04/NAI-NAM-guidebook_for_local_gov-v102.pdf</a>
<b>Planning</b>		
Creating Municipal Green Development Standards	Clean Air Partnership	<a href="https://www.cleanairpartnership.org/wp-content/uploads/2023/03/Final-CAP-Towards-Low-Carbon-Communities-2023-Update.pdf">https://www.cleanairpartnership.org/wp-content/uploads/2023/03/Final-CAP-Towards-Low-Carbon-Communities-2023-Update.pdf</a>
Sustainable Placemaking Guidelines	City of Pickering	<a href="https://www.pickering.ca/en/city-hall/sustainableplacemakingguidelines.aspx">https://www.pickering.ca/en/city-hall/sustainableplacemakingguidelines.aspx</a>
<b>Procurement</b>		

Procuring Sustainability: A Close Look at Green Practices in Municipal Procurement	Clean Air Partnership	<a href="https://www.cleanairpartnership.org/wp-content/uploads/2023/04/Green-Procurement-Report-3.pdf">https://www.cleanairpartnership.org/wp-content/uploads/2023/04/Green-Procurement-Report-3.pdf</a>
Database of Green Procurement Practices in Municipalities	Clean Air Partnership	<a href="https://www.cleanairpartnership.org/wp-content/uploads/2023/04/CAP-Dynamic-Database.xlsm">https://www.cleanairpartnership.org/wp-content/uploads/2023/04/CAP-Dynamic-Database.xlsm</a>
<b>Waste</b>		
Reduction of Single-use Items in City Facilities and Operations Policy	City of Mississauga	<a href="https://www.cleanairpartnership.org/wp-content/uploads/2023/04/CAP-Dynamic-Database.xlsm">https://www.cleanairpartnership.org/wp-content/uploads/2023/04/CAP-Dynamic-Database.xlsm</a>