

# Climate Action Resource Guide

*From Local to Global*

MAY 15, 2023



## About Halton Environmental Network

[Halton Environmental Network \(HEN\)](#) propels climate action and environmental sustainability in Halton by educating and building awareness in the Halton community. As a grassroots organization which has been supporting the Halton community since 2004, HEN is recognized for its successful community programs including Greening Sacred Spaces Halton-Peel, Halton Food, Halton Green Screens, Generation Green, and OakvilleReady. HEN also serves as the backbone agency of the [Halton Climate Collective \(HCC\)](#).

HEN advances education about environmental issues with a focus on climate change, providing strategies and opportunities for mitigation and adaptation, educational programs, events, workshops, research, and training for the Halton community. HEN ensures that climate remains at the top of the agenda at all levels of government and with Halton's diverse community stakeholders.



## About Halton Region

The Regional Municipality of Halton serves more than 624,000 residents in the City of Burlington, the Town of Halton Hills, the Town of Milton, and the Town of Oakville. Halton Region is committed to meeting the needs of its residents through the delivery of cost-effective, quality programs and services, including water and wastewater; Regional roads and planning; paramedic services; waste management; public health; social assistance; children's and seniors' services; housing services; heritage programs; emergency management and economic development.

As part of Halton's Strategic Business Plan, we are committed to protecting the natural environment and advancing initiatives to mitigate and adapt to the effects of climate change in Halton. There has been significant work over the past several years from all departments to respond to the impacts of climate change and to reduce our emissions. We all have a role to play, and we are building on ways to work together to do our part. We are participating in the Partners for Climate Protection (PCP) Program. The PCP Program is a national network of over 500 + municipalities who are taking action against climate change to reduce local greenhouse gas emissions. As part of this work, we have engaged with HEN to support the community component. The Region worked with HEN to develop this guide to further educate and inform individuals on climate actions.

This work supports the development of a Halton Community Climate Plan to advance Halton Region's participation in the Partners for Climate Protection program.

Halton Environmental Network (HEN) is supporting the development of a Community Climate Plan for Halton Region.

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# INTRODUCTION

## Climate Change and the Halton Community

Over the last 50 years, climate has increasingly become a central issue in many communities with the effects progressively being felt in urban areas the world over. In Halton region, we have experienced first-hand the results of warmer, wetter, and wilder weather. In August 2014, 'The Burlington Flood' saw 191 mm of rain descend over a period of ~8 hours, resulting in road closures, infrastructure damage and the flooding of over 3,000 homes—amounting to \$90M in insurance claims (IBC, 2014). Between 2014 and 2018, the GTA experienced close to 60 heat alert days and over 100 extreme cold warnings. In 2018, high winds reaching gusts of 120km/hr took down powerlines and a fallen tree took the life of a Milton resident (Hayes, 2018). The intensity and frequency of these events has shifted, which calls for greater commitment to action within the Halton community.

In September 2019, the Region of Halton announced its commitment to propelling climate action by declaring a climate emergency, joining the declarations made by the City of Burlington, Town of Halton Hills, Town of Oakville, and Town of Milton. In addition, climate emergency declarations have been made by the Halton District School Board and the Halton Catholic District School Board.

To advance climate action beyond individual corporate endeavours, the Region entered into a Memorandum of Understanding (MOU) with the Halton Environmental Network (HEN) to propel community-focused climate action and increase our collective impact on climate change mitigation and adaptation, through the development of the Halton Community Climate Plan. This collaboration also includes the confirmation of the community GHG emission reduction targets already established by the local municipalities in Halton. The achievement of these endeavours will help advance the Region's work with the Partners for Climate Protection (PCP) program for the Halton community.

# INTRODUCTION

## The Partners for Climate Protection (PCP) Program

The [PCP program](#), supported by the [Federation of Canadian Municipalities \(FCM\)](#) and [ICLEI-Local Governments for Sustainability](#), is a network of Canadian municipalities committed to taking action on climate change.

The PCP program guides municipalities through a milestone framework to take action on climate change through the reduction of GHGe. The milestones are shown below.

*Figure 1: PCP Milestone Framework and Progress for the Halton Community*



Source: [Program - Partners for Climate Protection \(pcp-ppc.ca\)](#)

# INTRODUCTION

Halton Environmental Network (HEN) worked with Halton Region to develop a community baseline greenhouse gas emissions (GHGe) inventory using 2019 as the baseline year. The community Milestone 1 was achieved in January 2022, while the Region has also achieved its first corporate milestone.

Next steps focus on achieving the following two milestones: setting an emissions reduction target and developing the Halton Community Climate Plan. However, we wish to take a different approach to Milestone 2. All local municipalities in Halton - Burlington, Halton Hills, Milton and Oakville - are participating in the PCP Program and are at different stages of achieving their milestones. As such, we wish to elevate the work that has already been done by the local municipalities and use their community GHG reduction targets. Using the already established targets would also be clearer for community to understand the work and see alignment across the different levels of government.

## Climate Action Guide

The focus of this report is to increase the awareness of climate actions available to the Halton community by highlighting best practices from a local to global scale. By showcasing what other municipalities, organizations, and communities are doing, the Halton community gains insight into what actions could be included in the Halton Community Climate Plan. Additionally, this report highlights work done by the local municipalities in Halton. Building upon and elevating the work already done by the locals will bolster alignment, develop deeper partnerships, and create authentic climate action across the Region.

All of the information presented in the report covers four main areas of focus:

- Buildings,
- Transportation,
- Engagement and Outreach,
- Environment and Sustainability

HEN has already surveyed the Halton community on climate actions and will utilize the findings of the survey to broadly consult with the Halton community through public engagement. This work will culminate in the confirmation of the local community GHG emission reduction targets and the development of the Halton Community Climate Plan. This work will also allow HEN to further propel meaningful climate action work within the Halton community.



# INTRODUCTION

## Background Research

Comprehensive research was compiled by Halton Environmental Network (HEN) over a four-month period through a desktop review of over 730 sources and interviews with Halton Climate Collective (HCC) members. This research looked at important climate work by municipalities locally, across Ontario, across Canada, internationally, and local organizations. The categories of buildings, transportation, engagement and outreach, environment and sustainability that the research focused on were selected based on:

- The most common categories across the body of research
- Cross-referencing with categories in other climate action plans
- A focus on community actions, where the community has the ability to act and influence

## Selection Criteria for Climate Actions

The following selection criteria were used to benchmark climate actions in local, national and global climate work.

**Innovative** - Actions that are creative and visionary

**Impactful** - Actions that make or have the ability to make a positive contribution to climate work

**Measurable** - Actions that can or will be expected to make change that can be quantified

These criteria were drawn from key references including Partners for Climate Protection (PCP) Compliant Climate Change Plans and Halton Region's 2010 Best Sustainability Practices. In these examples, selection criteria were chosen by municipal staff, community and municipal staff, or another body such as an advisory committee.

The selection criteria of innovative, impactful and measurable serves as a starting point to bring the actions forward that would seem to have the best potential for success in Halton. These will need to be verified by the community through the coming public consultation. There can be the potential to build out the selection criteria moving through the development of the Community Climate Action Plan.

## Review Process

To ensure the best possible product for the Halton Community, the Region provided draft versions of the Climate Action Resource Guide to different internal and external stakeholders for feedback. Internally, departments such as the Indigenous Relations, Health, Legislative and Planning Services, Communications, and the Equity, Diversity and Inclusion (EDI) team provided feedback that was reviewed and incorporated. Externally, the Resource Guide was provided to the climate teams of our local municipalities to ensure that the information provided in this guide best represented their climate efforts.

# INTRODUCTION

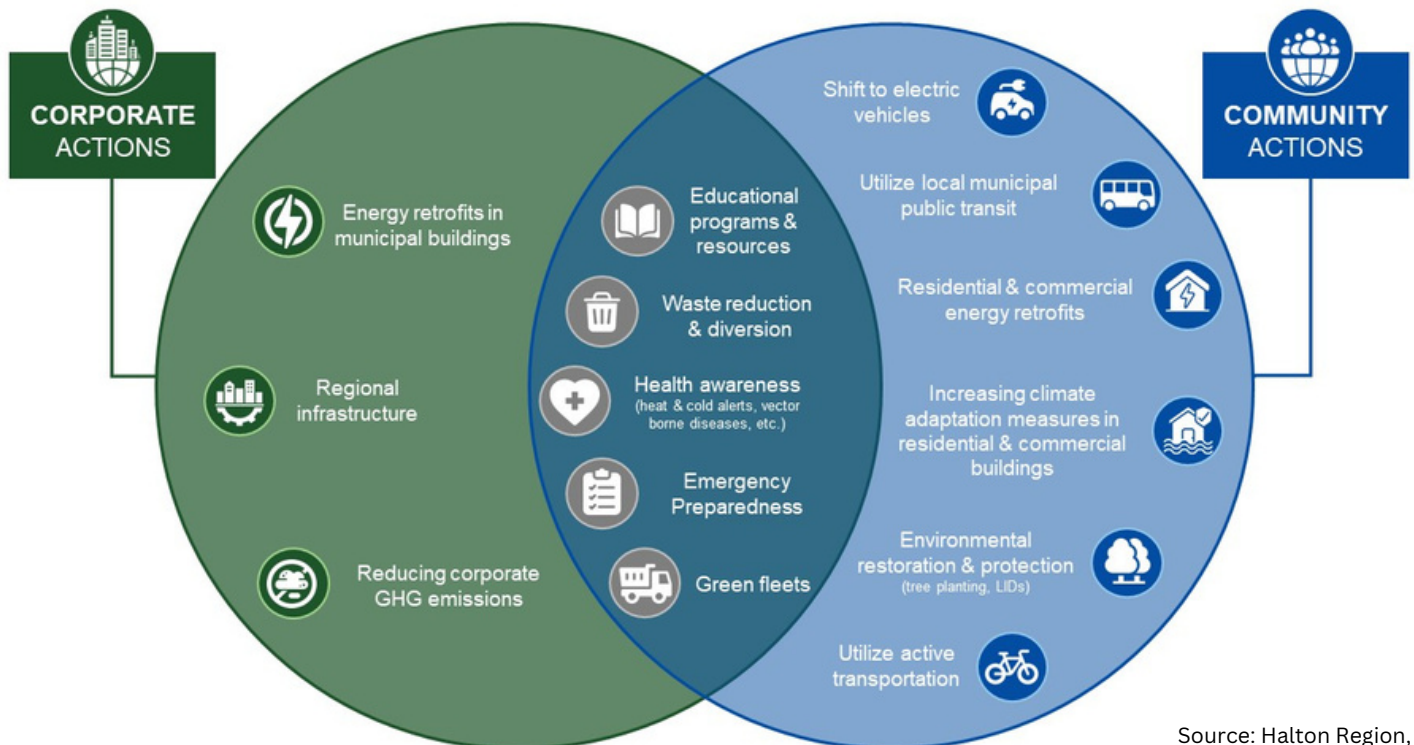
## Climate Actions

Climate change risks and impacts are related to the rate of warming. According to the Intergovernmental Panel on Climate Change (IPCC), limiting global warming to 1.5°C (IPCC, 2022) will reduce the impact of climate-related risks on health, livelihoods, sustainable food systems, water supply, economic growth, and natural systems. Cross-sector and community wide climate actions will be required to meet this target.

The local municipalities in Halton have considerable expertise and experience in the climate change area and have pursued many initiatives including declaring climate change emergencies, community climate action plans and community energy plans. Local municipalities have also set corporate and community GHGe reduction targets. As shown below in Figure 2, climate actions can be categorized into corporate and community climate actions. Corporate climate actions relate to municipal operations and entities (municipal facilities and fleet). Community climate actions address emissions from buildings, transportation, and waste in the community.

The overlap between corporate and community climate actions indicates those actions where policies and infrastructure change may be required to support community climate actions. Examples of such actions include, implementing building standards and regulations, expansion and improvement of public transit, infrastructure improvements, and changes in waste management.

**Figure 2: Halton Region's Corporate Climate Actions and Halton's Community Climate Actions**



Source: Halton Region, 2023

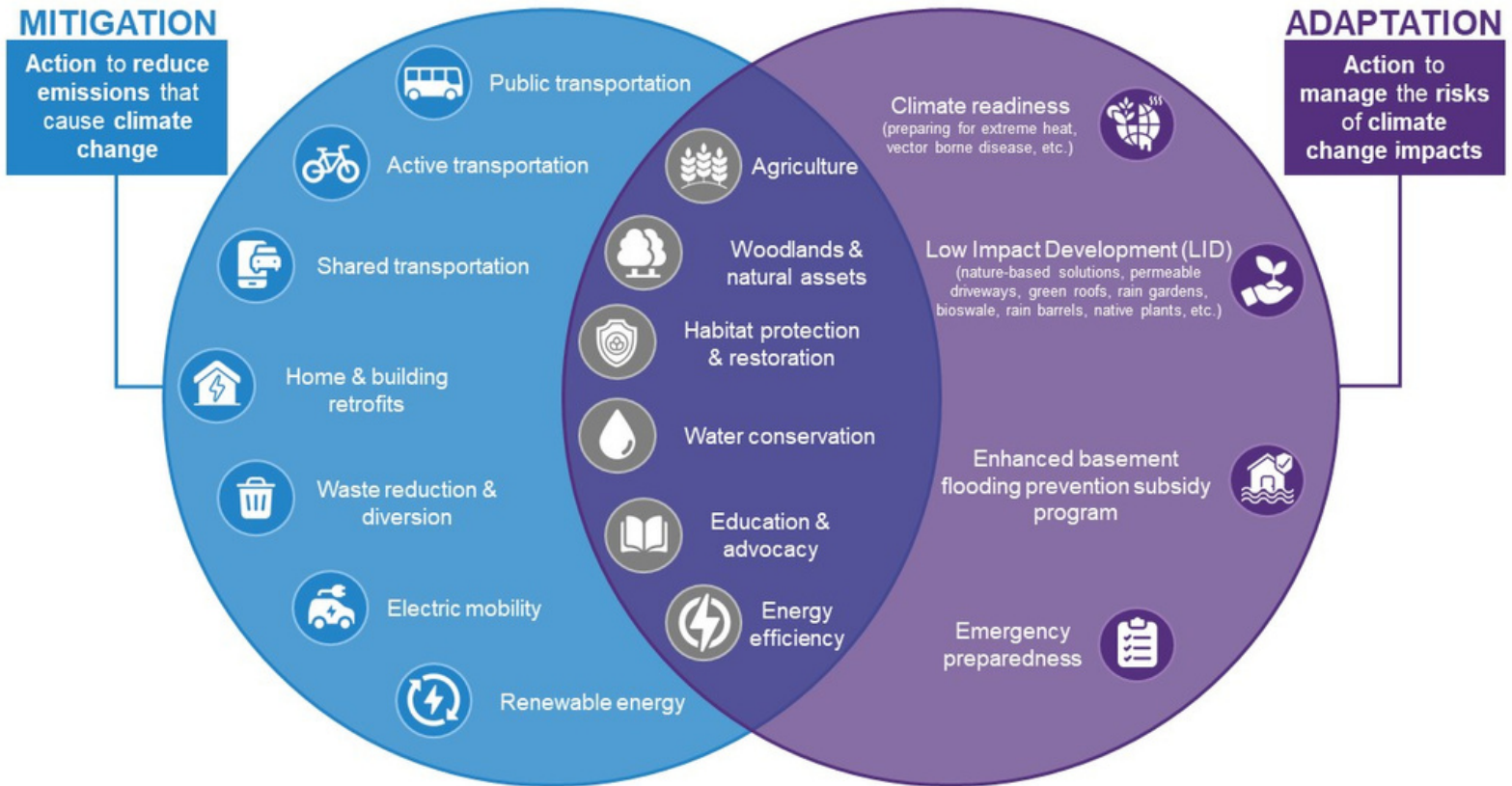
\* Community actions involve everyone and some examples include: Indigenous communities, Agricultural communities, Residents, Businesses, Youth, Nonprofits, and Charitable and Service Organizations.

# INTRODUCTION

## Mitigation and Adaptation

The Halton Community Climate Plan will include both mitigation and adaptation measures. In climate change, mitigation refers to efforts and actions that will aid in the reduction of greenhouse gas emissions. These actions often relate to energy use, transportation, waste, and buildings. Adaptation on the other hand refers to actions that moderate and manage the impacts of climate change. These actions not only protect us from various risks climate change may bring but provide opportunistic benefits in some instances. It is quite common to see mitigation and adaptation placed in separate plans however, we believe they go hand in hand and will ensure that our plan will benefit the Halton community for years to come. Some examples of potential mitigation and adaptation actions can be seen below in Figure 3.

**Figure 3: Mitigation and Adaptation Actions for the Halton Community**



Source: Halton Region, 2023

# DISCLAIMER

This document is not meant to showcase the entirety of completed or ongoing work from the City of Burlington, the Town of Halton Hills, the Town of Milton, or the Town Oakville. It is meant to showcase a glimpse of the work in relation to the themes and subthemes discussed in this document. Links to the environmental websites for each of the local municipalities can be found below where individuals can find more information on what their cities are doing. Additionally, as this document will showcase work being done by cities across Canada and internationally, it should be noted that different cities have different jurisdictions, responsibilities, and regulations.



The City of Burlington is committed to reducing our impact on the environment and building a low carbon and climate resilient community.

[City of Burlington: Environment](#)



The Town of Halton Hills is focusing on corporate and community-wide actions to reduce or remove greenhouse gas (GHG) emissions through mitigation and adaptation measures.

[Town of Halton Hills: Climate Change](#)



The Town of Oakville strives to work with residents, businesses, institutions and nonprofit organizations to develop programs, policies, master plans and services that integrate the environment, economic, social and cultural values to make Oakville the most livable town in Canada.

[Town of Oakville: Environment](#)



The Town of Milton is working toward reducing its impact on the environment. Milton has been involved and completed a number of projects to improve the energy efficiency in our facilities and within our community.

[Town of Milton: Environment and Sustainability](#)

The purpose of this document is to act as an informational tool. It is meant to inform the Halton community of climate actions. To ensure accuracy, clarity and best representation of organizations and their actions we have taken wording directly from their websites. Links to the organization's websites can be found with the descriptions in the document.

# GHG EMISSION INVENTORY

## Halton Community Greenhouse Gas (GHG) Inventory

A GHG emissions inventory tracks GHG emissions generated from municipal and community sources for a given year. Community GHG emissions inventories track the GHG emissions released from the following sectors: buildings (residential, commercial and industrial), transportation, waste and agriculture.

A baseline year is selected for inventories as a reference year for comparison for future inventories and to set GHG reduction targets. The inventory in Table 1 was created following the Partners for Climate Protection (PCP) protocol, which is based on the Global Protocol for Community Scale Emissions.

In 2022, a GHG inventory for the Halton Community was completed using the year 2019 as its baseline. The inventory was determined by Halton Region in partnership with the Halton Environmental Network (HEN), University of Toronto, Clean Air Partnership (CAP) and the Atmospheric Fund (TAF). The full breakdown of the inventory can be found in Halton Region's *2019 Community Greenhouse Gas Emissions Inventory*.

**Table 1. Halton Community Emissions by Sector**

SECTOR	CO <sub>2</sub> E produced (Tonnes)	%
RESIDENTIAL	827,322	22
COMMERCIAL	446,659	12
INDUSTRIAL	733,918	19
TRANSPORTATION	1,696,243	44
WASTE	121,286	3
AFOLU	9,071	0.2
<b>TOTAL</b>	<b>3,834,498</b>	<b>100</b>

\*AFOLU: Agriculture, Forestry and Other Land Uses

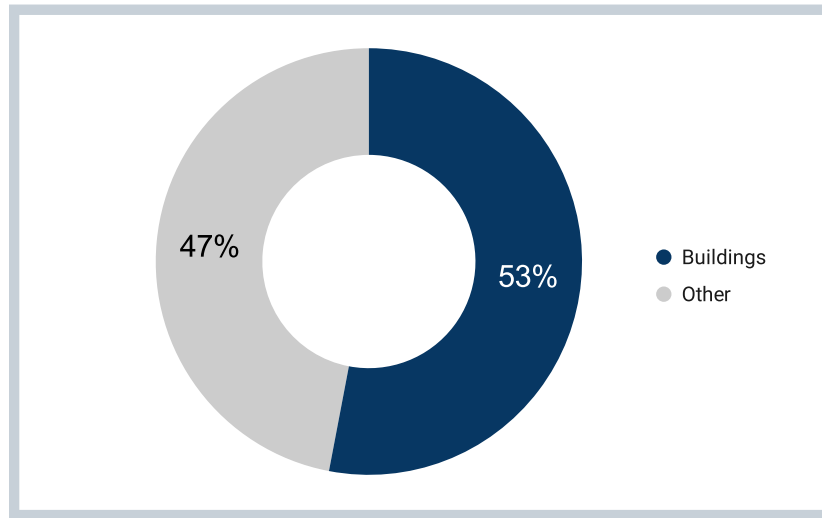


# BUILDINGS

The demand for more buildings and developments will only increase in the future, with Halton's population projected to grow to 1,100,000 by 2051 (Government of Ontario, 2020) and with the Provincial Government committing to building 1.5 million homes over the next ten years. During this period, it is critical to address GHG emissions from both new developments and existing building stock.

According to Halton's community GHG inventory, over 50% of all emissions in Halton come from energy being used to heat, cool and power buildings, with natural gas accounting for the majority of these emissions. 22% of the total emissions come from residential buildings and 31% of emissions are from commercial and industrial buildings.

**Figure 4: 2019 GHG emissions from Buildings in Halton**



## Co-Benefits of Climate Actions:

Energy Efficiency	Cost Savings	Improvements to Air Quality
Energy Security	Emission Reductions	Health Benefits



# BUILDINGS

## Regulations and Standards for New Developments

The establishment of policies and development standards to support low carbon and sustainable construction will ensure that all new buildings are designed to be energy efficient and sustainable from their commencement. In 2022, Canada released its new national model building code. These model codes act as a framework that provinces can use to form their own building codes (Efficiency Canada, 2022). Canada's new model follows a tier system in which subsequent tiers highlight better building performance with the highest tier in the new model being the net-zero energy ready (NZER) standard (Efficiency Canada, 2022). Tools such as Efficiency Canada's [The Municipal Guide to Net-Zero Energy Ready Building Codes](#) can help municipalities apply and adapt these building codes at a municipal level. Climate actions such as the ones listed below can help increase the uptake and commitment to these regulations and standards by the public as well.

### Examples of Climate Actions:

- Work with building owners, developers and operators to achieve green building certifications and rating system requirements
- Educate the public and developers on Green Development Standards (GDS)
- Support the implementation of by-laws and city policies for net-zero constructions
- Setting carbon pollution limits for developments

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- **Burlington** – In December 2021, Burlington Council approved the updated [Sustainable Building and Development Guidelines](#). These guidelines will be used to encourage sustainable design approaches to new developments. At the same meeting, Council approved a staff direction to prepare a green roof bylaw in 2023. In 2019, City Council endorsed the [Corporate Energy and Emissions Management Plan: 2019-2024](#). Targets are identified for 2024 as well as a path to be a net carbon neutral corporation by 2040. [Annual updates](#) are presented to Council.
- **Halton Hills** – The [Green Development Standards \(GDS\)v3](#) are measures that ensure the sustainability of new developments. The measures are associated with a point system; all applicants must score 20 points to meet development requirements. The measures are organized into the following categories: energy and water, ecology, resiliency, transportation, and innovation. The [2020-2025 Corporate Energy Plan \(CEP\)](#) reaffirms the Town's commitment to energy management and efficiency and will provide a roadmap for reducing energy consumption, utility costs, and greenhouse gas emissions.
- **Milton** – The Town's [Corporation Energy Plan](#) provides an overview of energy use and how energy will be managed at facilities, also included examples of facilities that have been designed in accordance with LEED-certified standards.
- **Oakville** – Through the Town's [Sustainable Design Guidelines](#), new town buildings over 500 m<sup>2</sup> in area are required to be designed and built to meet LEED Silver certification. The purpose of the town's Sustainable Design Guidelines is to guide sustainable construction for Town of Oakville's new buildings as well as maintenance and repair of town-owned facilities and to assist with the town's greenhouse gas (GHG) emission reduction goals, reduce the use of non-renewable resources, improve energy efficiency and implement a life-cycle costing process. Additionally, the Town's [2020 Conservation Demand Management Plan](#) reaffirms the Town's vision to be the most livable town in Canada and commitment to the Oakville community.



# BUILDINGS

## Regulations and Standards for New Developments

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Toronto, ON](#) – The Toronto Green Standard outlines sustainable design requirements for private and city-owned developments. The standard consists of 4 tiers; tier 1 is mandatory and required in the planning approval process. In 2022, the standard was updated to the Toronto Green Standard Version 4 which includes three new performance tiers, focusing on carbon reductions and green infrastructure.
- [Vancouver, ON](#) – Vancouver plans to transition to zero-emissions buildings by 2030; all new constructions will be required to abide. The Vancouver Building By-law has been amended in January 2022 to require zero-emissions equipment for all new low-rise residential buildings.

### Strategies and Programs Implemented by Other Organisations:

- [Halton Environmental Network \(HEN\)](#)- In June 2021, HEN hosted an educational [webinar on Green Development Standards](#), with experts from the Clean Air Partnership, The Town of Halton Hills, and The Atmospheric Fund, to help the community better understand the sustainability of new construction and how they relate to Halton.





# BUILDINGS

## Energy Retrofits

In addition to reducing emissions of future developments by implementing building regulations, standards, and requirements, it is also important to reduce emissions of current buildings by installing energy efficient retrofits. These energy retrofits will improve energy consumption across a household and provide a number of additional benefits including reductions in energy costs, increases in energy efficiency, reductions in maintenance costs, and reduce GHG emissions. Some examples of energy retrofits include adding insulation, upgrading windows, utilizing renewable energy systems, and installing air source heat pumps. The climate actions below showcase methods to increase the uptake of these retrofits by residents and building owners.

### Examples of Climate Actions:

- Promote programs that help support the implementation of home energy retrofits
- Promote incentives (i.e., Local Improvement Charges) and conduct marketing campaigns on grants and rebates that support energy retrofits
- Educate and promote energy retrofits to building owners and operators, and homeowners

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- **[Burlington](#)** – The City worked with the Centre for Climate Change Management at Mohawk College to conduct a feasibility study for a Home Energy Efficiency Retrofit (HERO) program. The study's results recommend a program which makes available loans of up to \$10,000 to cover the costs of the installation of air source heat pumps and leak sealing. Funding to staff this one-year pilot was approved by City Council in Feb. 2023. In late 2021, Burlington was approved for funding through the Federation of Canadian Municipalities – Green Municipal Fund to carry out [four deep energy retrofit studies](#) at Appleby Ice Centre, Brant Hills Community Centre and Fire Stations 2 and 7. These studies will provide a road map to transition these four buildings to low or zero carbon buildings and will be the first major step to upgrading our existing buildings.
- **[Halton Hills](#)** – The Town has run a pilot home retrofit program; the Town provided 0% interest loans to 9 homeowners to complete home energy improvements. Additionally, in 2020 the Town had Internat Energy Solutions Canada (IESC) complete a [low carbon design brief and feasibility study](#) that analyzed high-performance building retrofits options to make the Town Hall a Zero Carbon Building (ZCB).
- **[Milton](#)** - The Town has completed various facility energy retrofits, including LED conversions and building envelope upgrades.
- **[Oakville](#)** - The Town of Oakville has partnered with Oakville Enterprises Corporation to investigate the business case and options for a third party company to deliver a potential program for home energy retrofits. These retrofits will help to help achieve the targets of the Community Energy Strategy (CES), which was developed through the efforts of the Community Energy Task Force. Future Energy Oakville, a non-profit organization supported by the Town of Oakville, helps coordinate implementation and provide oversight of the CES.

# BUILDINGS

## Energy Retrofits

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Durham Region, ON](#) – Durham has started the Durham Greener Homes program, a retrofit accelerator program which is a partnership between the local municipalities, utility companies, financial institutions and skilled trades. Through this program, homeowners can access a home energy coach, who will advise the homeowner through the retrofit project.
- [Halifax, NS](#) - Halifax offers the Solar City program, which was the first PACE program in Canada. This program offers homeowners access to solar energy options, through low interest financing to cover the cost of the project.
- [Seattle, USA](#) – The HomeWise program provides free energy efficiency improvements to income eligible households, including energy audits, insulation, and air sealing. Since 2014, 4800 homes have received upgrades through this program.
- [Toronto, ON](#) - The City of Toronto offers low interest loan programs for the installation of energy retrofits. Through the Home Energy Loan Program homeowners can get a low-interest loan of up to \$125,000 to cover the cost of home energy improvements. A similar program, the Energy Retrofit Loan Program is available for all other buildings in Toronto.

### Strategies and Programs Implemented by Other Organisations:

- [Halton Environmental Network \(HEN\)](#)- In 2021, HEN conducted a [Deep Home Energy Retrofits Feasibility Study](#). The study explores the concept of a social purpose organization in helping to advance deep home energy retrofits in the Halton community.
- [Green Communities Canada](#) - Deliver EnerGuide home energy evaluations and facilitate the process to apply for home energy grants and rebates. This program is delivered through partner organisations, Green Venture in the Halton, Hamilton and Niagara regions, and Reep Green Solutions serves the Waterloo and surrounding areas.
- [ClimateActionWR](#) - A community collaboration led by Reep Green Solutions and Sustainable Waterloo Region focused on climate change mitigation and have developed strategies including [TransformWR](#) (Waterloo Region's community climate action plan) and led initiatives such as the completion of 2000 home energy retrofits.
- [Enbridge Gas](#) - Enbridge Gas and the Canada's Greener Homes Grant have partnered to produce the Home Efficiency Rebate Plus program which will provide rebates towards eligible retrofits such as home insulation, windows and doors, heat pumps and renewable energy systems.



# BUILDINGS

## Building Performance Monitoring and Reporting

In Ontario, the [Ontario Energy and Water Reporting and Benchmarking \(EWRB\)](#) program already requires owners of large commercial, industrial and multi-unit residential buildings to report their building's energy and water consumption data to the Ministry of Energy, Northern Development and Mines. Smaller commercial and industrial buildings along with residential properties should partake in measures to report and monitor building performance even if they are not required to. By using measures to report and monitor building performance, the energy consumption of buildings can be tracked, allowing for opportunities to be identified where energy can be used more efficiently, resulting in a reduction in emissions and cost. The climate actions listed below can help increase the uptake of building monitoring and reporting.

### Examples of Climate Actions:

- Establish an annual reporting system for energy consumption in commercial and industrial buildings
- Partner with building owners and local organizations to educate about the national energy benchmarking initiative
- Establish yearly emission and energy reduction targets for residential, commercial and industrial buildings.

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Burlington](#) - Burlington has installed various energy management systems in its facilities, including a real time utility submetering system in nine of its buildings.
- [Halton Hills](#) - The Town monitors electricity and natural gas consumption at Town facilities on a monthly basis with EnergyCAP energy monitoring software.
- [Milton](#) - The Town of Milton has installed various energy management systems in its facilities to monitor and control energy usage.
- [Oakville](#) - In collaboration with Seneca College, 10 Town facility managers participated in an Energy Reporting and Coaching Pilot program, managers received monthly energy performance data reports on their facilities to help them identify operational anomalies. The Town also monitors energy consumption and emissions at Town facilities.



# BUILDINGS

## Building Performance Monitoring and Reporting

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Boulder, USA](#) - The Building Performance Ordinance requires commercial and industrial buildings to report energy use and implement energy efficiency measures. The requirements of the ordinance are; annual rating and reporting of energy use, energy assessments, retro-commissioning every 10 years and a one-time lighting upgrade.
- [Copenhagen, Denmark](#) - Energy Leap is a flagship partnership launched with major building owners and HOFOR - Copenhagen's utility company. Partners are offered two meters to monitor energy and water consumption in their buildings. The consumption data is monitored and interpreted by a team of experts, who offer advice on improving performance and energy saving measures.
- [York Region, ON](#) – York Region Mayor's Energy Challenge, in partnership with ClimateWise is to build awareness with commercial building owners to understand their energy performance and encourage them to report their energy use through the Energy and Water Reporting & Benchmarking Program.

### Strategies and Programs Implemented by Other Organisations:

- [Greening Sacred Spaces](#) - The Energy Benchmarking program is offered through Greening Sacred Spaces. This program helps faith-based Municipalities measure their building's energy consumption and help identify opportunities to become more energy efficient.
- [Halton Catholic District School Board](#) - Televisions were installed in central locations at schools to display an Energy Dashboard, presenting a variety of information including real-time energy consumption, eco-related tips, trivia, and recycling and composting statistics.



# BUILDINGS

## Use of Renewable or Low Carbon Sources of Energy

Natural gas, which is used to heat buildings, is the largest contributor to total emissions in Halton. Shifting from carbon intensive fuel sources to renewable or low carbon sources of energy (solar, wind, nuclear, and hydro) will lead to a reduction in emissions. Climate actions such as the ones listed below can help remove some of the barriers and myths to uptake and inform the community on the many other benefits that low carbon sources of energy can provide.

### Examples of Climate Actions:

- Encourage owners, developers and builders to explore on-site renewable energy sources
- Educate the public and building owners on district energy, heating and cooling systems
- Educate and promote incentives that support renewable energy installations

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - The Region partnered with Oakville Hydro on the Landfill Gas Collection and Utilization Project, where the gas released from the decomposition of waste from the landfill is being used to produce electricity.
- [Burlington](#) - The City has partnered with the W Booth School of Engineering Practice and Technology program at McMaster University to conduct a study on adopting a renewable energy program in Burlington. Additionally, Burlington is in the process of replacing [Skyway Arena with a new Skyway Community Center](#). The new center includes geothermal as well as the use of recovered heat from the refrigeration plant to heat portions of the facility. It has also been designed so that its roof is capable of supporting solar panels in the future. A [solar photovoltaic \(PV\) study](#) has been completed to assess the feasibility of installing these systems at various City sites.
- [Halton Hills](#) - [Halton Hills GDSv3](#) encourages the use of renewable energy, one of the measures from the GDSv3 is to 'utilize low emission mechanical systems, and/or install onsite renewables'.
- [Milton](#) - In the Town of Milton all Town buildings constructed since 2010 have been built to varying LEED standards. A number of the Town's buildings have solar panels in varying sizes. Additionally, the Town has electric ice resurfacers in two locations and ice is made through solar power. Geo-thermal heating and cooling installations have also been incorporated in two locations as well. A goal of [Milton's 2022 Climate Change Workplan](#) is to investigate the feasibility of a renewable energy system at Mattamy National Cycling Centre.
- [Oakville](#) - In 2020, council approved the [Community Energy Strategy](#) (CES), which was developed by the [Oakville Energy Taskforce](#). The CES has a strategic objective to implement district energy in high growth areas, with a 2041 target of serving 70% of existing property and 80% of new property with district heating in these high growth areas. The Town has initiated a district energy feasibility study to explore opportunities for district energy in the Hospital District. Additionally, [Oakville's Trafalgar Community Center](#) was built to LEED standards and includes rooftop solar panels and geo-thermal heating and cooling.



# BUILDINGS

## Use of Renewable or Low Carbon Sources of Energy

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Boulder, USA](#) – The city offers incentives and rebates for solar installations. Through the Solar Grant Program, residents in affordable housing and non-profits may be eligible to receive a grant to install rooftop solar systems.
- [Markham, ON](#) - The City owns Markham District Energy, it is the only municipally owned district energy utility in Canada to have two systems operating within the same municipality. One system serves the downtown core, and the other system serves Markham Stouffville Hospital and the surrounding area.
- [Montreal, QC](#) – Montreal has planned to phase out the use of heating oil in buildings by 2030. Commercial and industrial buildings will have until 2025 and residential buildings by 2030.
- [Toronto, ON](#) – Through Toronto's net zero strategy, [TransformTO](#), the City has planned by 2030, 25 % of commercial and industrial floor area is connected to low carbon thermal energy sources. Toronto already has district energy systems in place including a Deep Lake Water Cooling System that uses water from Lake Ontario to provide cooling to over 80 buildings.

### Strategies and Programs Implemented by Other Organisations:

- [REScoop.eu](#) - REScoop.eu is the European federation of citizen energy cooperatives, a network of 1.900 cooperatives operating across Europe representing over 1,25 million citizens who are active in the energy transition. REScoop.eu was legally set up in 2013 as a Belgian not-for-profit association. REScoops are energy cooperatives, a business model where citizens jointly own and participate in renewable energy or energy efficiency projects.
- [Sheridan College](#) - Sheridan College's Trafalgar Campus began the construction of a new district heating and cooling system. This system will replace the inefficient and outdated boiler plants that provide heating to the buildings on campus.
- [North Oak Condos at Oakvillage](#) - Utilizes a low-carbon community energy system that benefits from energy sharing between buildings and leverages the proven benefits of geexchange heating and cooling.
- [Halton District School Board \(HDSB\)](#) - The HDSB has strategy to use renewable energy by installing solar panels on all school rooftops with three schools currently having solar panels.

# BUILDINGS

## Green Building Examples in the Halton Community

The following are best examples of green building developments within the Halton community.

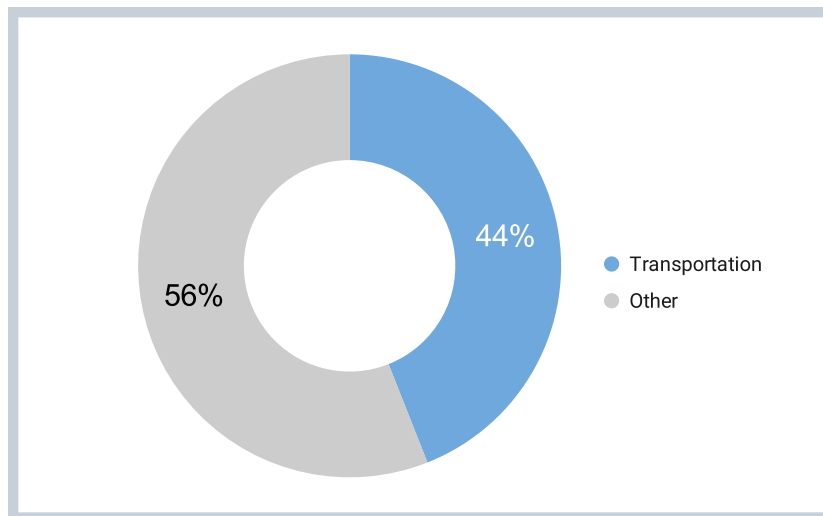
- [Skyway Community Centre, Burlington](#) - The new Skyway community centre, which is scheduled to open in 2024, will be built in accordance with the City's net-zero goals. There will be no gas use at the facility, the mechanical system for this facility will use geothermal energy as well as recovered heat from the refrigeration plant to heat areas of the facility. The roof structure will be constructed to support solar panels.
- [Royal Botanical Gardens \(RBG\), Burlington](#) - The Peter and Camilla Daglish Atrium at RBG is a LEED Gold-Certified building and has various sustainable features, including 2.5 km of in-floor heating which absorbs heat and releases it during the winter, as well as rainwater harvesting system intended to be used for flushing toilets
- [Mountain Equipment Company \(MEC\) Building, Burlington](#) - The MEC Building located on Brant Street is a LEED Gold-Certified building. Sustainable features include a PV system - a cooling system which makes ice at night and cools the building during the day. The structure of the building is also designed to be easily disassembled and repurposed.
- [Halton Hills Public Library - Acton Branch, Halton Hills](#) - The Acton Branch of Halton Hills Public library is a LEED Gold-Certified building. Sustainable features at the library include geothermal heat pumps.
- [Bronte West Condos, Milton](#) - The Bronte West Condominiums in Milton were designed as 'net positive' buildings that produces. Green features of the building uses include energy from photovoltaic (PV) system on the roof and a geothermal system for heating and cooling, and clean water and grey water harvesting.
- [Church of the Incarnation, Oakville](#) - The Church of the Incarnation updated its 20-year-old HVAC system to a new geothermal system. Other green upgrades included a transition to LED lights, completion of a green audit, as well as an installation of rain and pollinator gardens.
- [North Oak Tower, Oakville](#) - The North Oak Towers located at Dundas Street and Trafalgar Road, developed by Minto Group, will have the first geo-exchange system in the GTA, reducing fossil fuel use for space heating and cooling by up to 95%.
- [Oakville Trafalgar Community Center](#) Is built to LEED standards and close to Net Zero due to the addition of high-efficiency systems combined with renewable energy technologies like rooftop solar panels, geo-thermal heating and cooling.

# TRANSPORTATION

Halton's Community greenhouse gas emissions (GHGe) inventory indicated that the transportation sector accounted for 44% of total GHG emissions. Of these emissions gasoline vehicles accounted for 83% and diesel vehicles for 17% of the emissions.

Transportation is essential for Halton resident's everyday lives, making these trips more sustainable will help reduce emissions and improve lives. This change in sustainable transportation is being shown at higher levels as well, such as the Federal mandate that 100% of car and passenger truck sales be zero-emission by 2035 (Transport Canada, 2021).

**Figure 5: 2019 GHG emissions from transportation in Halton**



## Co-Benefits of Climate Actions:

Cost Savings

Improvements to Air Quality

Reduced Traffic Congestion

Health Benefits (Mental & Physical)



# TRANSPORTATION

## Active Transportation

Upgrading and expanding walking and cycling infrastructure can motivate communities to choose active modes of transportation as an alternative to using their own vehicle. This improved infrastructure will also allow communities to bike or walk between transit stops when using public transit. Not only will this reduce emissions, but it will also provide health benefits for the people of the community and connect the community in new ways.

### Examples of Climate Actions:

- Expand walking and cycling infrastructure
- Host community events that encourage residents to use active transportation
- Educate the public about the individual and community benefits of active transportation

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Every Metre Counts](#) - With representatives from the school boards and all municipalities in Halton, Every Metre Counts supports and promotes active school travel in Halton.
- [Burlington](#) - The Bicycle-friendly Community continues to undertake projects to improve cycling infrastructure including the completion of the [Plains Road protected bikeway](#) in 2023. The City's innovative [Integrated Mobility Plan](#) which focuses on how best to move people versus vehicles will be presented to City Council by the end of 2023 and will be informed by the updated [Burlington Cycling Plan](#) and the [Burlington Rural Active Transportation Plan](#). Burlington Transit buses also include [bike racks](#) to enable multiple modes of transportation for trips. Pedestrian crossovers have also been added downtown.
- [Halton Hills](#) – The Halton Hills Bike it Committee runs an annual Bike Swap, where residents are given an opportunity to donate their used bikes. The Town is also adding to its [active transportation infrastructure](#) with the addition of new bike lanes, bike signals, and signed bike routes.
- [Milton](#) - A key component of Milton's strategy for growth is creating walkable neighbourhoods with public transit hubs that are pedestrian and cyclist friendly. The Town of Milton also took part in Bike Month; the Town offered the community a series of free webinars on bike safety and bike maintenance. Buses offer bike racks to enable multiple modes of transportation for trips.
- [Oakville](#) - Oakville has completed a number of projects to improve the infrastructure for active transportation, including separated bike lanes along Speers Road. The Town also received funding from the Investing in Canada Infrastructure Program in 2021, to be used to expand the active transportation network including the construction of 20 pedestrian crossovers. Buses offer bike racks to enable multiple modes of transportation for trips.

# TRANSPORTATION

## Active Transportation

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Amsterdam, The Netherlands](#) - Amsterdam is implementing number of measures to improve and accommodate for the growing number of cyclists. These include, improved cycling paths, bicycle parking, and creating well-connected cycling route.
- [Copenhagen, Denmark](#) - In Copenhagen, biking accounts for 49% of all trips made for school or work. Many infrastructure designs, including well-connected bike infrastructure such as bike bridges and bike highways, have contributed to the widespread adoption of cycling.
- [Markham, ON](#) - In 2019, the Markham Active School Travel Pilot Program was launched in partnership with the school boards, York Region and funding through Ontario Active School Travel, a program of Green Communities Canada. Through this program, a number of improvements were made to improve active transportation around 9 elementary schools in Markham.
- [Region of Waterloo, ON](#) – The Protected Bike Lane Projects were implemented in Kitchener and Waterloo with the goal of creating a separated cycling network. These projects include educating people on the new network, as well as educating other transportation users on how to safely interact with the new network.
- [Region of York, ON](#) – Through the Pedestrian and Cycling Municipal Partnerships Program the Region contributes up to 50% cost of a project which promotes active transportation trough walking and cycling infrastructure projects.

### Strategies and Programs Implemented by Other Organisations:

- [Halton Climate Collective - Generation Green 2021-2022](#) focused on Active Transportation. Generation Green is a youth program with the goal of engaging Halton students in climate action leadership and supporting them in their commitment to greenhouse gas emission reductions. Students reduced 26.2t of CO<sub>2</sub> by completing 79 projects focused on increasing Active Transportation in their communities. Overall, 120 students from Grades 7 to Grade 12 participated in the program. In April 2022, A Project Showcase was held to recognize award winners with special guest speakers including Tim Burrows (EV Society), Oakville E-bikes, Chris Clapham (Town of Oakville), Sarah Westerhof (York University), Sheridan Bike Club, and Emily Farrar (Positive Zero Transport Future, University of Toronto).

# TRANSPORTATION

## Active Transportation

- [Sheridan College](#) - Sheridan College's Bike Hub supports cyclists in the Sheridan community. The Bike Hub offers a do-it-yourself bike repair space, a bike rental programme, and a mentorship programme for new cyclists.
- [Safe Streets Halton](#) - The mission of Safe Streets Halton is to eliminate traffic deaths and improve the quality of life in Halton region by enabling residents to safely and comfortably use sustainable and active modes of transportation.

# TRANSPORTATION

## Public Transport

Improvements and expansion of the public transit network will encourage residents to choose public transit more often over their own personal vehicle. Additionally, the emissions released by transit vehicles can be reduced by decarbonizing the fleet and switching to electric buses and trains.

### Examples of Climate Actions:

- Add and expand public transport infrastructure
- Improve public transport infrastructure, services and operations
- Decarbonize public transit fleet by switching to electric buses and trains
- Support the implementation of programs that make public transit more accessible and affordable

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - Low-income residents in Halton can apply for the Subsidized Passes for Low Income Transit (SPLIT) program, which provides a partial subsidy for local travel expenses.
- [Burlington](#) - Burlington offers free transit for kids under 12 travelling with an adult, for youth between 13 and 19 on weekends and evenings and for adults aged 65 or older on weekdays between 9 a.m. and 2:30 p.m. In Feb. 2023, Burlington Transit offered 1,000 free PRESTO cards for kids under 12 allowing older kids to travel on their own for free by tapping their own PRESTO card. Burlington Transit staff have been working with the Canadian Urban Transit Research and Innovation Consortium (CUTRIC) to model Burlington Transit's route network and identify the [potential opportunity for electrification of its fleet](#). Staff will report back in 2023 with a Zero-Emission Bus Fleet Implementation and Rollout Plan with the goal of launching a small pilot of four electric buses in 2024, pending budget approval.
- [Halton Hills](#) - Halton Hills in partnership with Milton Transit provides municipal bus services along the Steeles Ave corridor from Milton GO Station to Lisgar GO Station in Mississauga. Additionally, the Town retained WSP in 2019 to complete a [Transit Service Strategy](#) to determine the feasibility of introducing expanded transit service in Halton Hills.
- [Milton](#) - To support sustainability initiatives, climate change goals and Greenhouse Gas (GHG) emission impacts in 2023, Milton will pilot Battery Electric Bus (BEB) technology through the implementation of a mid-life, diesel-to-electric conversion of a 12 metre conventional bus. The pilot will explore BEB implications to maintenance costs, fuel costs and utility usage over the life of the bus. In 2022, Milton Transit partnered with Metrolinx on a study to move towards electric buses.
- [Oakville](#) - Through funding from the Investing in Canada Infrastructure Plan, Oakville Transit will replace 57 diesel buses with zero-emission battery-electric buses.

# TRANSPORTATION

## Public Transport

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Cardiff, Wales](#) - The City plans to expand their Metro network, introduce new Bus Rapid Transit services, and make bus travel cheaper.
- [Durham Region](#) - Through the E-Mission Zero Project Durham Region Transit is adopting a number of initiatives to reduce its transit emissions, including electric bus pilot projects.
- [Toronto, ON](#) - The City's TTC Green Bus program has a target of converting 50% of its bus fleet to zero emission by 2032. Currently, the TTC has one of the largest fleets of electric buses in North America.
- [Region of Waterloo, ON](#) - ION light rail is Waterloo Region's light rail transit system. Running a service between Conestoga station in Waterloo and Fairway station in Kitchener, with a total of 19 stations. The proposed stage 2 of ION will connect Kitchener and Cambridge.
- [Region of York, ON](#) - Piloting the Transit Assistance Program, to help make public transit more affordable for eligible residents. Participants will be eligible for a 50% discount on regular Adult single ride York Region Transit fares using a PRESTO card.

### Strategies and Programs Implemented by Other Organisations:

- [Union Pearson Express](#) - Is a train service which connects Toronto Pearson International Airport and Union Station.
- [Terminal Link](#) - Terminal Link is a free train at Pearson Airport that connects Terminals 1 and 3

# TRANSPORTATION

## Shift to Electric Mobility

The installation of more electric vehicle (EV) charging stations will strengthen the local EV infrastructure and normalise the use of electric vehicles; encouraging residents and corporations to make the switch from fossil fuel consumption to cleaner fuels (KPMG International, 2022a, 2022b; Smith et al., 2021). Not only will this reduce carbon emissions and improve air quality, but it will also reduce noise, improve vehicle fuel efficiency and reduce vehicle maintenance costs. Increasing the uptake of EVs in communities is important and climate actions such as the ones below can help remove the barriers and myths that stand in the way of this.

### Examples of Climate Actions:

- Educate the public and businesses on the benefits of switching to EVs
- Educate and promote other electric mobility options, such as e-scooters and e-bikes
- Promote incentives that support switching to EVs and other electric mobility options
- Support policies to ensure responsible implementation of EV charging stations
- Switch the municipal fleets to EV

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- **Burlington** - Burlington has the most [EV charging stations](#) per capita in the GTHA, including 54 Level 2 EV charging ports on City property at the end of 2022. In 2023, an additional 22 ports will be publicly accessible including a Level 3 charging station with two ports. The City also partnered with BurlingtonGreen to create an [Electric Mobility Strategy](#), which defines actions to support increased adoption of electric mobility in the community. An updated Green Fleet Strategy for the City's fleet vehicles will be presented to City Council in 2023.
- **Halton Hills** - The Town has installed EV chargers at various public parking lots and Town facilities to encourage the uptake of EVs.
- **Milton** - The Town of Milton installed EV charging stations at the Mattamy National Cycling Centre as part of being a LEED Certified Gold building. Currently, the Town operates two electric ice resurfacers with a third scheduled for 2023. In 2023, the Town is undertaking a comprehensive Fleet Strategy which will include a comprehensive review of operations and opportunities to transition vehicles hybrid and electric technology. The Ministerial Zoning Order for the Milton Education Village (Phase 1) and the Town's Zoning By-Law Amendment for the Downtown Milton Major Transit Station Area introduced zoning regulations to require the installation of EV charging infrastructure as part of new residential and non-residential developments.
- **Oakville** - Through funding from The Government of Canada's Zero Emission Vehicle Infrastructure Program, Oakville was able to expand its electric charging network by installing 16 additional charging stations, bringing the total number of EV charging stations to 23.

# TRANSPORTATION

## Shift to Electric Mobility

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Region of Durham, ON](#) - Durham Region has partnered with Oshawa Power and Elexicon Energy on the E-Mission Electric Vehicle Initiative, a zero-emission vehicle education and awareness initiative partially funded by Natural Resources Canada. Residents can learn about EV ownership and test drive EVs at participating dealerships.
- [Nottingham, UK](#) - Through the Electric Van Experience, businesses in Nottingham can test drive a range of electric vans. Through this program the City loans an electric van and charging point for up to 30 days.
- [Region of Peel, ON](#) - The [Peel Zero Emissions Vehicle Strategy](#) was developed through the Peel Climate Change Partnership. The aim of the strategy to increase uptake of EVs within the community over the next 5 years.
- [Seattle, USA](#) - By 2030, the City plans to provide access to charging stations for households without off-street parking, pursue grant funding and partnerships in support of expanding EV charging infrastructure, and explore ways to convert the city's waste into alternative fuels, such as liquid natural gas from anaerobic digesters.

### Strategies and Programs Implemented by Other Organisations:

- [Plug'n Drive](#) - Burlington and Halton Hills have worked with Plug N Drive to host EV showcases and EV test drive events for the community.
- [EV Society](#) - A not-for-profit organisation comprised of EV owners and enthusiasts; help promote awareness about EVs. The EV society also run a webinar series, Canada Talks Electric Cars

# TRANSPORTATION

## Shared Transportation Options

The shared use of vehicles or other modes of transportation will enable residents to reduce carbon emissions that would otherwise be emitted by every individual vehicle. Forms of car-sharing, or carpooling, will prevent the extensive use of multiple vehicles for one trip, while implementing a bikeshare, or scooter-share, system will promote the use of active transportation even further. Introducing smartphone apps to organize and optimize these mobility options will motivate users even more.

### Examples of Climate Actions:

- Support the implementation of bike-share and e-scooter programs
- Support programs which promote car pooling
- Promote on demand transit services

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Burlington](#) - Handi-Van, is a door-to-door service offered by Burlington Transit to people with disabilities.
- [Halton Hills](#) - The Town provides the ActiVan service for Halton Hills residents, who are seniors aged 65 and older, and persons with disabilities.
- [Milton](#) - The Milton Transit ONDemand service, offers on-demand shared transportation services, connecting passengers to transfer location to continue their journey on the fixed bus route.
- [Oakville](#) - Has begun electrifying their Care-A-Van (specialised) service fleet, with 15 electric buses expected by the end of the year.



# TRANSPORTATION

## Shared Transportation Options

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Cambridge, ON](#) - VRTUCAR provides car sharing services throughout the City, and the City is hoping to launch a bike share and e-scooter share program with the Region of Waterloo by 2023. The program is proposing a system with about 800 bikes and 400 e-scooters to start.
- [Ottawa, ON](#) - The City's transportation committee has recently approved a third year of the e-scooter pilot project, with approximately 127,000 riders taking nearly half a million trips over the past two years.

### Strategies and Programs Implemented by Other Organisations:

- [Hamilton Bike Share Inc](#) - Operates the City of Hamilton's bike share system, with more than 800 smart bikes across over 25 square kilometres of Hamilton. Downloading the SoBi smartphone app allows users to locate the nearest bike and pay the fare directly from their smartphone.
- [Niagara Airbus](#) - A door-to-door shared shuttle bus service from and to the Toronto International Airport and the Niagara Region.

# ENGAGEMENT & OUTREACH

Behavioural and lifestyle changes can result in a 40-70% reduction of GHG emissions by 2050 (IPCC, 2022) however, it is essential to have shift in policies and infrastructure to enable this change. Increased engagement and outreach will increase climate knowledge and empower the community to be aware of the opportunities to reduce GHG emissions and adapt to climate change. This also enables the community to influence decision making related to climate policies.

Impacts of climate change will not affect everyone equally; Indigenous communities and other vulnerable communities will be more impacted. It will be vital to ensure that these communities are supported and that their experiences are integrated when developing climate actions.

## Co-Benefits of Climate Actions:

Equity, Diversity & Inclusion (EDI)

Integration of Indigenous Knowledge

Educated Population

Better Decision Making

# ENGAGEMENT & OUTREACH

## Community Events and Programs

Community driven programs, events and environmental stewardship initiatives can help promote environmental awareness and propel climate actions within the community. To help support these initiatives, partnerships with local businesses, ENGOs (Environmental Non-Government Organization) and volunteer groups is essential. Climate actions that help support and promote these community events and programs will increase the uptake and education in the community, leading to much deeper and powerful climate work.

### Examples of Climate Actions:

- Support and organize events and programs which promote and advance climate actions, (community-driven events, EV events, repair cafes, planting events, waste diversions, community gardens)
- Support and organize community volunteer opportunities which promote climate actions
- Awards recognising community members and businesses for their work on environmental stewardship projects

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Burlington](#) - The City of Burlington, worked with BurlingtonGreen and Burlington Hydro on Action for Climate Earth Day event, which featured a free tree giveaway and a month-long opportunity to test drive EVs. Burlington also supports five [community gardens](#). The City also hosts an annual Food for Feedback event where staff set up displays and seek feedback from residents on projects, initiatives and programs and in return residents are provided with free food.
- [Halton Hills](#) - The Town hosted a Go Green event, which promote uptake of EVs and other local climate solutions.
- [Milton](#) - For Earth Day 2022, the Town organized a two-week community clean-up, residents were encouraged to participate, and clean-up kits were provided by the Town. Additionally, the Town partners with local schools and Conservation Halton annually on a number of tree planting initiatives as well as a community planting days.
- [Oakville](#) - Through Oakville's Urban Forest Health Monitoring program residents can volunteer as a forest health ambassador and monitor neighbourhood street trees for invasive insects and diseases. The Town hosts Earth Week celebrations designed to educate and activate the community to take climate action and in collaboration with community partners organizes a town-wide community clean-up.

# ENGAGEMENT & OUTREACH

## Community Events and Programs

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Mississauga, ON](#) - The City's Parks, Forestry and Environment Division partnered with Ecosource, to manage the community garden network, connecting residents in Mississauga neighbourhoods with gardening spaces. The City currently has nine community gardens in city parks.
- [Niagara Falls, ON](#) - The City runs various community clean up events throughout the year, including Earth Day clean ups, and annual clean sweep events, where local volunteers clear litter and debris from local parks, trails and walkways.
- [Nottingham, England](#) - Launched the Green Rewards Program, which is an online platform and an app, where residents can earn 'Green Points' for any sustainable action they are taking, these points can be redeemed for prizes including discounts at participating stores.
- [Woolwich, ON](#) - Through the Woolwich CARES Business Leadership Award the Township recognizes businesses which have undertaken an independent environmental project that benefits the residents of Woolwich.

### Strategies and Programs Implemented by Other Organisations:

- [Halton District School Board](#) - The Student Sustainability Leadership Award recognises students' environmental leadership, which can be demonstrated through actions taken at school or in the community.
- [Conservation Halton \(CH\)](#) - Conservation Halton run a variety of environmental outreach programs, including Green Thumbs, a program where students can learn about plants and soil.
- [Credit Valley Conservation \(CVC\)](#) - The [Hungry Hollow Sustainable Neighbourhood Action Plan \(SNAP\)](#), was developed through collaboration between CVC, Town of Halton Hills and local residents. The plan outlines actions such as community engagement, natural areas stewardship and sustainable home landscaping programming.
- [BurlingtonGreen](#) - BurlingtonGreen is a community-driven, non-partisan, registered charity that has hosted 12 annual city-wide [Community Clean Up events](#) with 121,000 participants to date; provided event greening services at 79 local festivals and events; created a [Shop Local Buy Green](#) directory and in 2021 launched [Zero Waste Days](#) diverting 6.5 tonnes of electronics waste so far.

# ENGAGEMENT & OUTREACH

## Community Events and Programs

- [Bay Area Climate Change Council \(BACCC\)](#) - BACCC harnesses the power of the community to fight climate change and their strength lies in collaboration and the diverse expertise of our member organizations. BACCC has a guide that residents can use to discover opportunities to raise their voice for climate action and lower their personal climate impact.
- [Grandmothers Act To Save The Planet \(GASP\)](#) - GASP is a grass-roots non-partisan community group committed to climate action and advocacy. GASP achieves its goals by participating in rallies, writing letters, and attending Council meetings. Some examples include GASP taking to the streets with students and our grandchildren on Student Strikes in Toronto, Hamilton, Burlington, Oakville and Halton Hills.
- [Field and Stream Team Rescue](#) - Field and Stream Team Rescue has been keeping our greenspaces, streams and creeks cleaned and healthy for over 20 years by performing activities such as clean ups, tree planting, and stream rehabilitation. Field and Stream Rescue Team welcomes volunteers to assist in all of our projects.
- [Oakvillegreen](#) - Oakvillegreen is a non-partisan environmental charity that has been helping protect and restore nature through community education and local action since 2000. They work closely with thousands of local volunteers to protect and restore the ecological functions of local lands and waters, creating a more resilient and healthy community. They believe that through local, collaborative action, we can make a difference.
- [Halton Hills Climate Action](#) - Founded by Jane Fogal, Janet Duval and Chantal Garneau in May 2019, Halton Hills Climate Action has hosted more than 20 rallies attracting hundreds of people in Halton Hills. They have pressed politicians at three levels of government to get serious about climate action, and now coordinate plans with climate action leaders in Burlington, Oakville, Milton and beyond.
- [Sustainable Milton](#) - Sustainable Milton's vision is to create a sustainable and resilient Milton by supporting and promoting activities that enhance our environment and help reduce the impacts of climate change by using actions, education, and advocacy. Emphasizing community participation, collaboration, and empowerment is also important to them as well.

# ENGAGEMENT & OUTREACH

## Educational Programs and Resources

Providing resources and programs on climate change and environmental sustainability will allow the community to develop a better understanding of climate change and increase their capacity to respond to the opportunities to become a low carbon, resilient community. There are many options to this, and some examples can be seen below listed in the climate actions.

### Examples of Climate Actions:

- Develop educational resources on environmental sustainability and climate change
- Deliver webinars and workshops for the public on actions that can be taken to tackle climate change
- Educate the public on existing climate actions and initiatives

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - Halton Region and Conservation Halton co-hosted the Halton Children's Water Festival which provides curriculum-linked education about all aspects of water through inquiry and investigation.
- [Burlington](#) - The Take Action Burlington blog provides updates on climate actions and environmental work happening in the City as well as promotes actions that can be taken by the community. The City developed a [Climate Impacts story map](#) to help educate the public on some of the impacts the community has already faced due to extreme weather which is anticipated to become more common with climate change.
- [Halton Hills](#) - Halton Hills Public Library along with Credit Valley Conservation held a lecture series on Invasive Insects and Tree Health: Ongoing Issues and Emerging Threats.
- [Oakville](#) – The Town has developed [Oakville Climate Change Primer](#), an online document which provides local information for residents on climate change and how to protect against the impacts of climate change. The Town delivers annual community presentations on projected climatic changes and their impacts on the corporation and the community.

# ENGAGEMENT & OUTREACH

## Educational Programs and Resources

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Copenhagen, Denmark](#) - Educating the youth on climate change is a part of Copenhagen's 2025 vision. The Climate Ambassador training program is offered to students in the 7th grade, which provides training for students about climate change and equips students to be effective communicators on climate change and a sustainable future.
- [Durham Region, ON](#) – The Region of Durham offers the Climate Change Webinar series for residents to outline actions that can be taken by residents and homeowners to tackle the impacts of climate change. Topics that have been addressed in the webinars include home 'flood preparedness' and 'protecting you and your home'.
- [Glasgow, Scotland](#) - Glasgow City Council has partnered with the environmental charity Keep Scotland Beautiful, to deliver an accredited carbon literacy training program. This program will be mandatory for all senior officials with the city's agencies.

### Strategies and Programs Implemented by Other Organisations:

- [Halton Climate Collective \(HCC\)](#) - [HCCReads](#) aims to engage the residents of Halton in reading, listening to, and asking about climate change, while learning how the community can act to protect our planet. The books discussed were Project Drawdown edited by Paul Hawken (2019), Right to be Cold by Sheila Watt-Cloutier (2020) and Saving Us by Dr. Katharine Hayhoe (2021). Each program included discussions with the public. In 2020 and 2021, the discussions were broadcasted to the community.
- [Conservation Halton \(CH\)](#) - Conservation Halton runs the Green Space: Newcomer Youth Climate Forum in partnership with RBC Tech for Nature. The program helps youth aged 14-29 learn more about climate change and gain practical skills to help their community to fight climate change.
- [Burlington Public Library \(BPL\)](#) - The BPL provides a [number of lists of books](#) to educate individuals on topics related to the environment and nature such as climate change, earth day, and biodiversity. Additionally, the BPL hosts a [seed library](#) every year in which residents can borrow seeds to grow your own healthy food and contribute to a sustainable community with the Burlington Public Library card.
- [Halton Hills Public Library](#) - The Halton Hills Public Library works closely with the Town of Halton Hills Office of Sustainability to create a green atmosphere by conserving water and energy, reducing carbon emissions and improving air quality in our buildings. Individuals can sign up for a tour of these LEED certified buildings.

# ENGAGEMENT & OUTREACH

## Educational Programs and Resources

- [Milton Public Library \(MPL\)](#) - The Milton Public Library has hosted numerous educational events over the years related to the environment. In 2021, the MPL [announced a series of lectures](#) and events under the “Speak for the Bees” banner. “Speak for the Bees” is both a play on The Lorax’s cautionary tale from Dr. Seuss, and a nod to MPL’s new brand identity. Other [past events](#) include Species at Risk with Conservation Halton and some Young Eco Warrior initiatives.
- [Oakville Public Library](#) - The [OPL Seed Library](#) is an educational project that provides customers with the opportunity to “borrow” and grow their own plants, harvest their own food, and participate in a community-wide sharing initiative free of charge. Customers are encouraged to plant the seeds in their personal gardens, nurture the plants as they grow, and, once mature, harvest the seeds to return to the library. The OPL also has a [growing guide](#) detailing how to grow the various plants and a list of gardening book on their website.
- [Royal Botanical Gardens \(RBG\)](#) - RBG offers [courses and workshops](#) in Burlington & Hamilton for families, kids and adults in the areas of gardening, nature, botanical arts and wellness. The RBG also have a number of camps, school programs, and youth programs. Additionally, RBG is dedicated to connecting people to plant through their [seed library](#). They provide seeds that you borrow, grow, and then return.
- [Halton Hills Nature](#) - Halton Hills Nature is a new organization looking to connect nature lovers and protectors across Halton Hills. They host the [Halton Hills Eco Film Fest](#) in which they screen exceptional environmental documentaries from January to May each year. Featuring films on climate change, healthy living, water preservation, earth care and biological diversity.
- [Country Heritage Park \(CHP\)](#) - CHP provides a unique link, creating a rural-urban bridge that connects schools, families, and residents throughout Ontario with food and farming. A curriculum-based educational programme for Kindergarten to Grade 8 students and summer camps are core components of CHP’s educational focus.
- [Protect Our Water and Environmental Resources \(POWER\)](#) - POWER’s goal is to educate and inspire individuals, governments, and organizations to make choices that support the integrity of all life and to ensure that the life supporting systems remain intact for generations to come.



# ENGAGEMENT & OUTREACH

## Grants & Funding Support for Environmental Initiatives

Providing grant and funding opportunities will help support and promote change in communities and homes that will benefit the environment and residents. Financing climate actions is often the biggest hurdle for residents, by providing supports and educating the community on available funding and grant resources, the biggest barrier for community can be removed and more uptake of various climate actions will be seen.

### Examples of Climate Actions:

- Develop and implement grants and funding support for community-driven initiatives which advance climate actions within the community
- Educate the community on existing incentives and funding support available to advance climate actions

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - The Halton Region Community Investment Fund (HRCIF) provides funding for non-profit human service programs and initiatives that enhance the health, safety and well-being of Halton residents. Environmental organizations that have received HRCIF funding for their programs include, BurligtonGreen, Halton Environmental Network (HEN) and Oakvillegreen.
- [Halton Hills](#) – The Climate Change Investment Fund provides up to \$ 2000 in funding to support community-based projects relating to adaptation and mitigation of climate change.
- [Burlington](#) - The Neighbourhood Community Matching Fund provides up to \$ 10,000 in funding support for community led projects which improve, build and strengthen Burlington. Approved projects have previously included funding for community gardens.
- [Milton](#) - The Milton Community Fund is available for not-for-profit organizations which improve the quality of life in the community. Previous recipients of this fund include Sustainable Milton.

# ENGAGEMENT & OUTREACH

## Grants & Funding Support for Environmental Initiatives

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Caledon, ON](#) - The Town offers the Community Green Fund, which provides up to \$ 5000 in funding for local not-for-profits or volunteer organizations with a project that will enhance and preserve the local environment. They also offer the School Green Fund which provides up to \$2000 in funding for Public and Catholic schools to complete an environmental project.
- [Vancouver, BC](#) – The Greenest City grant program offers grants for community driven initiatives that help advance Vancouver's Climate Emergency Action Plan, projects must address climate change and equity. Small neighbourhood grants of up to \$ 500 are also available for residents.
- [Region of Waterloo, ON](#) – The Community Environmental Fund provides financial support to community environmental stewardship and sustainability projects, with grant amounts ranging \$5000 - \$20,000.

### Strategies and Programs Implemented by Other Organisations:

- [Oakville Community Foundation](#) - The Oakville Community Foundation has funded a number of environmental projects and programs, including HENs Green drive Oakville Feasibility Study
- [The Atmospheric Fund \(TAF\)](#) - Fund a range of projects and approaches that can generate large-scale carbon reduction in the GTHA. The Town of Halton Hills received funding from TAF and worked with HEN to deliver workshops to increase awareness of the Town's updated Green Development Standards. The City of Burlington also received funding to install EV chargers from TAF.
- [TD Friends of the Environment Foundation \(TD FEF\)](#) - Offer the TD FEF grant, eligible projects include schoolyard greening, park revitalization, community gardens, park programming and citizen science initiatives.
- [Sustainable Canadian Agricultural Partnership \(Sustainable CAP\)](#) - Running from April 1, 2023, to March 31, 2028, the Sustainable CAP is a new \$3.5-billion, 5-year agreement between the federal, provincial and territorial governments to strengthen the competitiveness, innovation, and resiliency of the agriculture, agri-food and agri-based products sector.

# ENGAGEMENT & OUTREACH

## Climate Justice, Equity, and Inclusion

Actively engaging with Indigenous and other communities in climate change education and outreach programming is an important means of improving equity in climate mitigation and adaptation outcomes. It is widely known that the effects of climate change are disproportionate within the community. Globally, we see that populations that have contributed the least to sources of climate change are often those that are experiencing the most harmful impacts such as hurricanes, sea level rise and droughts. Locally, we are already burdened by systemic inequities, vulnerable geographies, environmental injustices, and a lack of access to resources and technology, are often the same voices who are excluded from processes aiming to improve community resilience (Sutherland et al., 2021).

Ensuring equitable engagement through active community consultation in climate planning, community-based education, and targeted support programs will help to mitigate these impacts and increase community resilience.

### Examples of Climate Actions:

- Ensure Indigenous and other impacted communities are represented and engaged when developing and implementing programs
- Develop climate resiliency networks
- Integrate Indigenous knowledge in climate actions
- Educate the community on climate action programs and financial support available for impacted communities

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Burlington](#) - Burlington offers free space for community neighbourhood groups looking to enhance community connections through free activities, programs and events with Burlington residents.
- [Halton Hills](#) – Halton Hill's [Low-Carbon Transition Strategy \(LCTS\)](#) includes equity considerations for under-employed and low-income residents. The town will make LCTS-related jobs accessible to underemployed residents, and tailor energy-retrofit programs to be financially accessible to low-income households.
- [Milton](#) - Through funding from the Government of Canada's Healthy Communities Initiative, an Indigenous Garden was planted at Milton Public Library's Beaty Branch, with an aim to highlight Indigenous knowledge about the land, plants and medicine.
- [Oakville](#) - [OakvilleReady](#) is a climate resiliency collective that establishes extreme weather resilience hubs around Oakville and builds community stakeholder networks to increase individual and community adaptive and supportive capacity in the face of climate change impacts.

# ENGAGEMENT & OUTREACH

## Climate Justice, Equity, and Inclusion

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Boulder, USA](#) – The City of Boulder provides training and outreach that engage BIPOC communities in urban forestry opportunities, which not only educate about the importance of urban forests but also provide employment
- [Hamilton, ON](#) – The City of Hamilton collaborated with the Indigenous community on shoreline protection and monitoring to incorporate Traditional Ecological Knowledge in their approach and to recognize and learn more about the cultural and natural significance of the land.
- [Toronto, ON](#) – Toronto has a number of funding supports for Toronto's most vulnerable and isolated residents. This includes the [Climate Action Fund](#), which supports community-led projects and activities that aim to reduce emissions through education, with a focus on engaging vulnerable, isolated, and/or low-income. Toronto is also developing an [Indigenous Climate Actions Grant Program](#).

### Strategies and Programs Implemented by Other Organisations:

- [Halton Climate Collective \(HCC\)](#)- [Generation Green](#) launched in 2019 with an "un"-conference on November 25, 2019, held at Sheridan College. Students are given the opportunity to hear from an outstanding lineup of community experts, leaders, and engagers, who will educate and inspire youth through a keynote talk, panel discussion, and various workshops. In 2020-2021, Generation Green's theme was [Taking Action for Climate Justice](#). Overall 163 students from Grades 7 to Grade 12 participated in the program and the students completed 124 projects focused on climate action and climate justice.
- [BurlingtonGreen](#) - BurlingtonGreen has advocated for environmental justice for more than 145 important local issues. They also established the award-winning [BurlingtonGreen Youth Network](#) engaging more than 14,000 children and youth, to help grow the next generation of eco-leaders in Burlington.
- [Conservation Halton \(CH\)](#) - Conservation Halton launched the [Green Space: Newcomer Youth Climate Forum](#) in 2021 in partnership with RBC Tech for Nature. The program helps youth aged 14-29 learn more about climate change, gain practical skills to help their community to fight climate change, and make new friends.

# ENGAGEMENT & OUTREACH

## Indigenous Knowledge

Indigenous people have deep intergenerational knowledge of meaningful climate solutions, formed through their connections with ecosystems, water, organisms, and land (Climate Atlas, 2022). These climate solutions are not uniform, as Indigenous knowledge is not identical across Turtle Island (Climate Atlas, 2022). Ensuring a cohesive integration of Indigenous Knowledge is vital to advancing impactful climate solutions. Resources like the [Climate Atlas](#) take this into account by working with Indigenous Knowledge holders to provide personal perspectives to climate change. The Climate Atlas contains Indigenous-focused data, knowledge, and resources developed by, with, and for Métis, First Nations, and Inuit communities.

### Examples of Climate Actions:

- [Climate Atlas](#) uses resources developed with Indigenous Knowledge holders and other experts to provide personal perspectives to the impacts of climate change.
- The [Land Needs Guardians](#) protect, restore and monitor our environment. Currently, there are around 120 Indigenous Guardians programs that are managing lands, waters and resources across the country.
- [Kayanase](#) is an ecological restoration and native plant and seed business that utilizes traditional knowledge and scientific approaches to advance biodiversity.
- [Six Nations Future](#) was launched to manage the economic self-sufficiency of Six Nations people without compromising their values. Central to their mission is the management of their growing investments in large scale solar and wind projects in and around their territory. From a roof top solar plant on Nation owned business park to a massive 77 turbine wind farm on the Niagara escarpment, Six Nations has become a national clean energy leader, in both the Indigenous and non-Indigenous sectors.

### Initiatives Implemented by Indigenous Peoples:

- [First Nations Climate Emergency Declaration](#) – At the Annual General Assembly of First Nations in 2019, the Chiefs in Assembly declared a climate emergency. The declaration, titled "Yeendoo Diinehdoo Ji' heezrit Nits'oo Ts'o' Nan He' aa," translates directly to "After Our Time, How Will the World Be," saying the traditional way of life in Old Crow is under threat from the climate crisis.
- [Ogimaa R. Stacey Laforme](#) - His book *In Living in the Tall Grass: Poems of Reconciliation* gives a history of his people through stories and poetry to let Canadians see through the eyes of Indigenous people. In it, he hits hard on matters of residential schools, the environment, suicide among Indigenous youth, domestic abuse, and so on, but also writes poems of love and hope. Ogimaa Laforme's universal message is, "We should not have to change to fit into society, the world should adapt to embrace our uniqueness.
- [Sheila Watt-Cloutier](#) – Is an Inuk leader, climate change champion, politician, Indigenous rights activist and writer. Sheila Watt – Cloutier is recognized around the world for her environmental and climate change awareness. Her book *The Right to be Cold: One Woman's Story of Protecting Her Culture, the Arctic and the Whole Planet* is a celebrated work of non-fiction that was nominated for a number of awards.

# ENGAGEMENT & OUTREACH

## Indigenous Knowledge

### Initiatives Implemented by Indigenous Peoples on Turtle Island

- [Grandmothers Voice](#) - An Indigenous Women-Lead organization unifying Indigenous voices while welcoming all people from the four directions. The universal wisdom of Grandmothers Voices has been the heart and healing of communities since creation.
- [Cambium Indigenous Professional Services \(CIPS\)](#) – CIPS is an Indigenous owned and operated organization that works on projects that primarily affect Indigenous clients and associated organizations. CIPS provides a number of services including First Nation Climate Change Evaluation and Adaptation services, First Nation Energy Planning, and First Nation Food Security and Sustainability.
- [Generation Power](#) – Developed by the Indigenous Clean Energy Social Enterprise (ICE), Generation Power encourages Indigenous youth to explore careers in clean energy and looks to advance a sustainable and equitable energy future.
- [Indigenous Led Natural Climate Solutions](#) – The Natural Smart Climate Solutions Fund from the Federal Government was meant to reduce GHG emissions through restoration, conservation and enhanced land management. \$36.9 million in this fund was set aside for Indigenous-led Natural Climate Solutions, to provide targeted support to Indigenous Nations, communities and organizations to engage as leaders in natural climate solutions.

### Initiatives Implemented by Other Organizations:

- [National Climate Gathering: Preserving our Earth, Land and Water for Future Generation](#) – The Climate Gathering hosted by the Assembly of First Nations brought together First Nations experts, Elders, youths, women, Knowledge Keepers, leadership and professionals to discuss and explore climate change and its solutions.
- [Power to the People](#) – Power to the People is a television documentary series that delves into how Indigenous people and their values and knowledge are guiding us to a sustainable clean energy future.
- [Indigenous Climate Hub](#) – The Indigenous Climate Hub acts as an online platform where individuals can share, learn and connect about climate change.
- [Halton Region](#) – The Region has taken steps to advance Reconciliation and Indigenous Relationship building. This work focuses on enhancing cultural competency and knowledge with Regional staff about the Indigenous narrative, history and heritage as well as education on Indigenous groups and organizations around Halton. It also emphasizes the importance of building and fostering reciprocal relationships with First Nations, Métis and Inuit People and Communities around Halton and Urban Indigenous leaders in the community.

# ENGAGEMENT & OUTREACH

## Health

*"Climate change is already impacting health in a myriad of ways, including by leading to death and illness from increasingly frequent extreme weather events, such as heatwaves, storms and floods, the disruption of food systems, increases in zoonoses and food-, water- and vector-borne diseases, and mental health issues. Furthermore, climate change is undermining many of the social determinants for good health, such as livelihoods, equality and access to health care and social support structures. "*

*- [Climate Change and Health, World Health Organization, October 30, 2021](#)*

*Climate change is affecting health, and will continue to affect health in the future. People in Canada face a wide range of risks that vary from region to region because of Canada's large land mass. Climate change poses direct and indirect health risks. Direct health risks result from climate-related exposures, often associated with hazards such as floods, storms, air pollution events, and extreme heat events, commonly called "heat waves". Indirect health risks are related to environmental and social factors that influence how climate change affects individuals and communities.*

*- [Risks to health from climate change, Government of Canada, November 7, 2022](#)*

### Examples of Climate Actions:

- Educate the public on the risks associated with extreme heat and cold temperatures
- Promote Regional health resources (webpages) that provide up to date information such as health risks (cold, smog, and heat warnings)
- Surveillance of emerging vector-borne diseases
- [Beach water quality monitoring](#)

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- **Halton Region** - Halton Region works with its communities to keep the environment safe. The [Region's Outdoor Air Quality website](#) provides information on [heat](#) and [cold](#) warnings, specifically the risks and how to take precautions to prevent health issues in extreme heat. Community members can [sign up](#) to receive heat, smog, and cold warnings from the Region. The Region's [Disease and Infection webpage](#) provides information on important vector borne diseases such as [Lyme disease](#) and [West Nile Virus](#).

# ENGAGEMENT & OUTREACH

## Emergency Management

Halton region is vulnerable to a variety of natural, human-caused, and technological hazards. The top risks for the Region include freezing rain/ice storms, high winds, tornadoes, urban flooding, power outages, hazardous spills, extreme temperatures, adverse water quality, and thunderstorms/lightning. In an emergency, Halton Region, its local municipalities and first responders will be working to ensure the safety of residents, the environment and property. Emergencies can happen at any time and being prepared can help protect you, your household and the community.

### Examples of Climate Actions:

- Educate the public on potential risks associated with extreme weather events
- Inform the community on climate adaptation measures that could support community resiliency, such as emergency preparedness kits

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region – Halton Region Emergency Program and Plan](#) as well as the emergency plans of each local municipality detail the roles and responsibilities of response parties including Council members, employees, and first responders when responding to an emergency. Emergency plans are designed to facilitate a timely and effective response to and recovery from those hazards to which Halton and its local municipalities are particularly vulnerable. The emergency plans are reviewed annually to reflect the changes in the community, and tested regularly to ensure employees and first responders know how to use the plans. Larger plan updates are incorporated as needed following post incident reviews, after drills/exercises, or as needed to ensure changes in the community are properly reflected. The Region's emergency management webpages provide information to residents on what to do [during an emergency](#), [how to prepare for an emergency](#) and [what risks the Halton community may face](#).
- [Oakville](#) - The OakvilleReady program established neighbourhood extreme weather resiliency hubs. These Hubs are located in faith-based organizations across Oakville, serving as engagement and care anchors. Currently, eight OakvilleReady hubs are operating across the city of Oakville. The goal of OakvilleReady is to establish a network of care across Oakville, to increase personal resiliency, expand community capacity, and strengthen residents' understanding around how we can work together to support each other during extreme weather events.



# ENVIRONMENT & SUSTAINABILITY

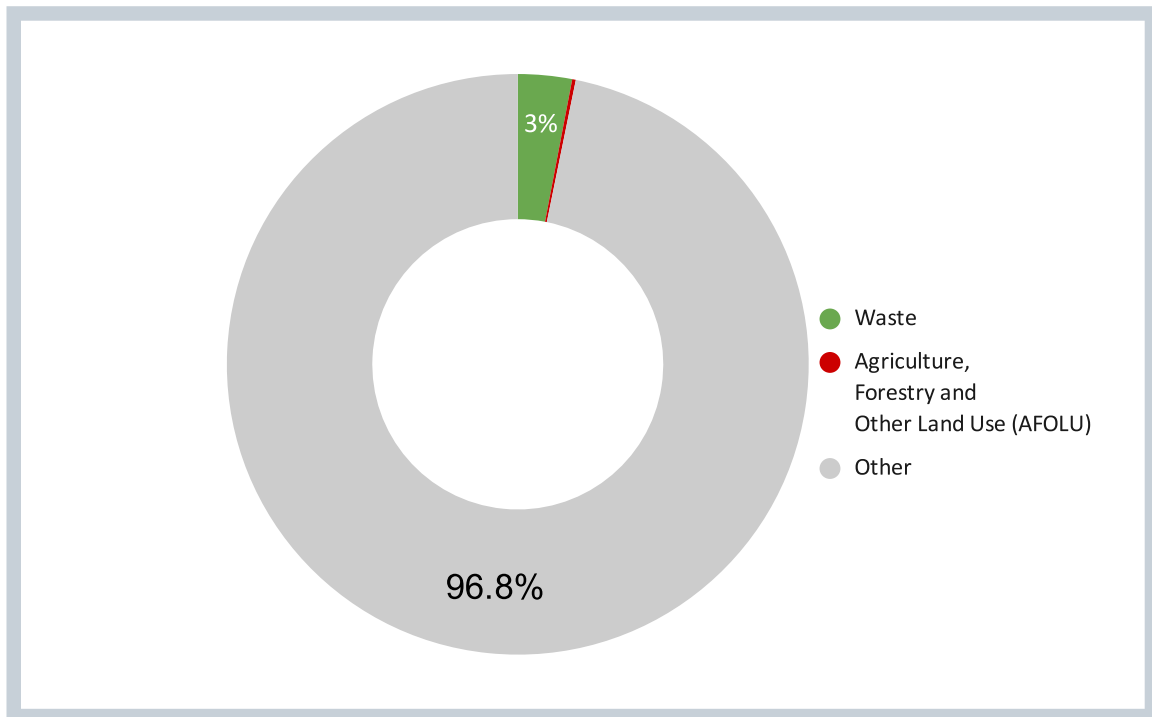
Climate change has already caused and will continue to cause more frequent and intense weather events that will have adverse impacts on natural systems for the foreseeable future. Halton region has a variety of natural areas, including woodlands, wetlands, streams, creeks, valley lands and meadows. These natural assets serve to protect our community from the extremes of these weather events through their ecosystem services. Natural assets, unlike some other commodities, appreciate in financial value as the systems mature and improve their service value (Mollame & Drescher, 2021; Molnar et al., 2018). Allowing them to increase their capacity to absorb flood waters, sequester more carbon, reduce urban heat, and improve biodiversity. Protecting and restoring these natural areas will improve the region's resiliency by absorbing and thereby reducing the impact of climate extremes.

Beyond this buffer against the impacts of climate change, these natural systems provide a myriad of co-benefits such as enhancing biodiversity and public health, improving air quality, access to greenspace, mental health, food safety and security, lowering risk of cardiovascular and infectious disease, and reducing pressure on built infrastructure (Akenji et al., 2021; Berry et al, 2022). However environmental protection and sustainability is not just improving parks and wetlands, it is also about stormwater management, low impact development and reducing and diverting waste. A significant reduction in our community emissions can be realised through lifestyle changes. Changes in how we travel through our community and our individual consumption patterns: what we eat, and how we power and heat our homes can have a significant impact on our emissions.

In Halton, waste generation and disposal into landfill accounts for 3 % of total GHG emissions. Waste reduction and diversion programs can be an opportunity for the community to reduce their waste emissions and will increase sustainability within the community.

# ENVIRONMENT & SUSTAINABILITY

Figure 6: 2019 GHG emissions from Waste and AFOLU in Halton



## Co-Benefits of Climate Actions:

Improvement to Air Quality

Ecosystem Services

Public Health (Mental & Physical)

Biodiversity

# ENVIRONMENT & SUSTAINABILITY

## Agriculture

Agricultural systems play an important role in mitigating climate change impacts given the carbon sequestration ability of soils and the increasing use of sustainable farm practices such as but not limited to no tilling, precision agriculture, windbreaks and cover crops. In Ontario, the Golden Horseshoe is one of the largest food and beverage clusters in North America, with fertile soils, favorable climate and over 200 different types of crops. In Halton specifically, the Rural and Agricultural System is comprised of rural and prime agricultural lands as well as businesses important to the viability of the agricultural sector. Halton's rural countryside is defined by outstanding soils and a thriving natural environment that includes access to fresh water and a benevolent climate. Halton's agricultural sector is home to a wide range of farming types including horse farms, plant nurseries, hay producers, oilseeds operations, livestock operations, fruit and vegetable growers, and many others, and is nurtured by a community of active farmers. Farmers play a critical role in stewardship, often investing to ensure soil quality, natural biodiversity, wildlife habitat, and healthy forests/wetlands which offer multiple benefits. As climate change continues to progress, protection of the agricultural land base is vital, but it is also important to focus on farm viability to ensure that the sector can thrive and evolve over the long term.

### Examples of Climate Actions:

- Inform the public on the co benefits and use of regenerative agriculture practices such as no till agriculture that help increase soil health
- Educate the public on the importance of soil sequestration to climate change and that good soil stewardship increases the water holding capacity of soils which contributes to resiliency during extreme weather events
- Promote sustainable practices that will address climate change threats and increase food resilience
- Educate current and future consumers about the importance of locally sourced food and farming products and promote the Region's [Simply Local program](#), which looks to increase the consumption and production of local food
- Encourage and support innovation to enhance the competitiveness and sustainability of Halton's food and farming sector
- Protect the agricultural land base from fragmentation by directing growth to designated nodes and corridors and within compact built form in the urban area

# ENVIRONMENT & SUSTAINABILITY

## Agriculture

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- **Halton Region** - The [Halton Agricultural Advisory Committee](#) advises and assists the Region's work to maintain a permanently secure, economically viable agriculture industry and preserve the character and landscape of Halton's rural areas. Additionally, two members of the agricultural community in Halton are part of the Natural Heritage Advisory Committee as it was noted that the Agricultural System and Natural Heritage System complement one another. Halton Region has also developed a [Rural and Agricultural Strategy](#) that identifies how Halton Region can positively influence the economic climate in Halton's rural and agricultural areas, so that these areas continue to thrive. The Region has played an important role in supporting the agricultural community, primarily through agricultural strategies and the Regional Official Plan (ROP) which helped support a Rural and Agricultural System that nurtured economic growth, secured access to food and helped ensure environmental sustainability. To build on those goals, Halton Region consulted on how best to implement changes in Provincial direction through the [Rural and Agricultural System Discussion Paper](#). Additionally, each year Halton Region hosts Environmental Farm Plan (EFP) workshops for the farming community.
- **Burlington** - The Burlington Agricultural and Rural Affairs Advisory Committee advises and assists in the implementation of the City of Burlington's agricultural and rural goals, objectives and policies, and raises community awareness and understanding of agricultural and rural issues as they relate to the City.
- **Halton Hills** - Halton Hills' horticulture, greenhouse, floriculture and nursery firms are the largest agricultural employers in the Town and account for 13% of the Halton Region's farming operations. The Town has four times as many nurseries and tree production farms as the national average, and local greenhouse production efficiency continues to increase through automation and improved climate control systems. Halton Hills has a vibrant food and farming cluster that serves a thriving hub of food processing businesses creating wide a range of healthy and safe products.
- **Milton** - Milton is home to two of the largest food distributors in Canada, [Sysco](#) and [Gordon Food Service](#) along with a number of smaller distributors.

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- **City of Guelph** - Guelph has the largest concentration of Agri-Innovation research and technology expertise, and related infrastructure in Canada.
- **Wellington County** - The County of Wellington and the City of Guelph are working together on the federally-funded Our Food Future project, which envisions a climate-smart Circular Food Economy for the region. In 2020, the Smart Cities Office worked with a group of six Masters of Environment and Sustainability (MES) students in the Centre for Environment and Sustainability (CES) programme at Western University. The student team surveyed farmers and produced a report on some of the climate friendly, or regenerative, farming practices in the County. Findings from this report will help the County align both the Our Food Future work and the County's Climate Change Mitigation Plan.

# ENVIRONMENT & SUSTAINABILITY

## Agriculture

### Strategies and Programs Implemented by Other Organisations:

- [ALUS](#) - ALUS is a charitable organization with an innovative community-developed and farmer-delivered program that produces, enhances and maintains ecosystem services on agricultural lands. ALUS helps farmers and ranchers build nature-based solutions on their land to sustain agriculture and biodiversity for the benefit of communities and future generations.
- [Canada - Ontario Environmental Farm Plan \(EFP\)](#) - Canada-Ontario EFP is often referred to as a voluntary, self-administered education and risk assessment tool. EFP's are voluntarily prepared by farm families to increase their environmental awareness in up to 23 different areas on their farm. Through the EFP process, farmers highlight their farm's environmental strengths, identify areas of environmental concern and set realistic action plans with timetables to improve environmental conditions. Environmental cost-share programs are available to assist in implementing projects. The program has become the basis for and companion exercise for many other programs as it forms a more complete understanding of the potential linkages to larger environmental considerations around any farm.
- [Country Heritage Park \(CHP\)](#) - CHP provides a unique link, creating a rural-urban bridge that connects schools, families, and residents throughout Ontario with food and farming. A curriculum-based educational programme for Kindergarten to Grade 8 students and summer camps are core components of CHP's educational focus. In addition to its work on agricultural and rural education, CHP has advanced work towards establishing a food hub and is working with not-for-profit food organizations. It also has a commercial kitchen available.
- [Farmers for Climate Solutions](#) - A National Coalition of farmer led and farmer supporting organizations who believe that agriculture must be part of the solution to climate change. They work to advance agricultural policies and programming that support farmers to reduce emissions and build resilience in the face of climate change.
- [Halton Region Federation of Agriculture \(HRFA\)](#) - The Halton Region Federation of Agriculture is one of 51 county and regional federations supported by [OFA](#) across the province. Halton Region Federation of Agriculture represents the voice of agriculture in the local community and advocates on behalf of farm families in Halton region on local agricultural issues.
- [Halton Soil and Crop Improvement Association \(HSCIA\)](#) - HSCIA is a volunteer organization representing farmers in Halton region. They facilitate responsible economic management of soil, water, air and crops through development and communication of innovative farming practices.
- [Ontario Federation of Agriculture \(OFA\)](#) - OFA is the largest general farm organization in Ontario, proudly representing 38,000 farm family members across the province. OFA works to represent and champion the diverse interests of Ontario's agri-food sector and rural communities. This includes government relations, farm policy development, research, lobby efforts, community representation, media relations and more.

# ENVIRONMENT & SUSTAINABILITY

## Agriculture

- [Ontario Soil and Crop Improvement Association \(OSCIA\)](#) - OSCIA is a grassroots, not-for-profit farm organization. In addition to research and educational initiatives across the province, OSCIA is also recognized and respected as leaders in the delivery of educational workshops and incentive programs to the Ontario farm community. OSCIA recently administered the [Ontario On-Farm Climate Action Fund](#) that offers cost-sharing opportunities to farmers that implement best management practices related to climate change by reducing GHG emissions and supporting increase carbon sequestration.
- [Ridgetown Campus](#) - Part of the University of Guelph, the Ridgetown Campus looks to advance society through agri-food research and science-based learning. The campus is home to a number of programs including Associate Diploma's in agriculture, horticulture, or environmental management.
- [Sustainable Canadian Agricultural Partnership \(Sustainable CAP\)](#) - Running from April 1, 2023, to March 31, 2028, the Sustainable CAP is a new \$3.5-billion, 5-year agreement between the federal, provincial and territorial governments to strengthen the competitiveness, innovation, and resiliency of the agriculture, agri-food and agri-based products sector. It should be noted that up to date EFP is mandatory for applying to this fund.
- [University of Guelph](#) - The Ontario Agricultural College (OAC) of the University of Guelph is internationally renowned for its research, teaching and knowledge extension in the broad areas of food, agriculture, communities and the environment.
- [Vineland Research and Innovation Centre](#) - Vineland is recognized as Canada's leader in horticulture research and innovation. They look to improve the economic viability, sustainability and competitiveness of horticulture in Canada.
- [Weston Family Foundation](#) - The Weston Family Foundation invests in innovation and learning to deliver measurable impacts to the well-being of Canadians. They provide funding for initiatives such as the [Weston Family Soil Health Initiative](#) aims to increase the number of agricultural producers using beneficial management practices that are scientifically proven to help increase soil organic matter on farmland.

# ENVIRONMENT & SUSTAINABILITY

## Natural Assets

Halton is well known for its biologically diverse Natural Heritage System (NHS) of natural heritage features and areas (e.g. woodlands, wetlands, valleylands) that act as a carbon sink and provide habitat for diverse plants and animals. These natural assets unlike some other commodities, appreciate in financial value as the systems mature and improve their service value (Mollame & Drescher, 2021; Molnar et al., 2018). They also provide a number of benefits including improvements to mental health and physical health, stronger ability to mitigate climate change through carbon sequestration, and a resilient system that responds to severe weather events such as floods. The majority of natural assets in the Region are held by private ownership and these owners such as farmers have been great stewards to the lands. Halton's natural areas are considered our heritage and the heritage of future generations and appropriate actions must be taken to protect them from harm.

## Examples of Climate Actions:

- Mitigate climate change and extreme weather impacts on key natural heritage and key hydrologic features and areas
- Encouraging joint partnerships with local municipalities and conservation authorities to find opportunities to enhance, protect and restore natural areas
- Develop natural assets inventories
- Develop land securement initiatives. Such initiatives will aid in the protection of key natural heritage features, functions and attributes using a range of tools, including but not limited to planning policy; stewardship; monitoring; and land acquisition.
- Develop initiatives which restore under-utilized urban areas to natural areas

## Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) – Halton Region has been at the forefront of natural area planning since the 1980s, well before the Province made it mandatory for municipalities to do so. Preserving natural heritage remains a key component of Halton's Planning Vision, which stems from the Region's fundamental value in land use planning: landscape permanence. Although not part of the Region's NHS, the [Cootes to Escarpment EcoPark System](#) is another initiative that looks to enhance ecological connectivity from the Western edge of Lake Ontario to the Niagara Escarpment. It recently received \$3.5 million in funding from the Federal Government and is a partnership amongst nine agencies operating under a voluntary collaboration in accordance with a Memorandum of Understanding.
- [Burlington](#) - The City of Burlington recognizes that a strong, healthy urban forest provides many benefits to its residents and have included natural assets for the first time in its Asset Management Plan via urban forestry. The City's [Official Plan](#) also highlights the importance of the City's Natural Heritage System (NHS) and its associated objectives to plan and manage the City's natural heritage features and areas.
- [Halton Hills](#) - As part of a project with the Credit Valley Foundation and the Greenbelt Foundation, Halton Hills has created an inventory of natural assets in the town (streams, woodlands, wetlands, meadows, etc.) and the ecosystem services they provide, which is used to guide how these natural assets should be managed and maintained.
- [Oakville](#) – The Town of Oakville's Natural Heritage System (NHS) ensures the preservation of land which maintains a wide diversity of species and landscapes within an urban context. The NHS is home to a number of terrestrial (woodlots, open fields) and aquatic systems (watercourses, valleys). Part of the NHS is the Glenorchy Conservation Area which is which functions as a network of habitat features, such as wetlands, woodlands, grasslands, meadows, creeks and streams, which are connected instead of being fragmented by homes, businesses, and roads. [Glenorchy is currently being restored by Conservation Halton](#) to ensure the area will be stronger, more resilient and better able to provide valuable services to the community.

# ENVIRONMENT & SUSTAINABILITY

## Natural Assets

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [York Region](#) - York Region's Greening Strategy creates and maintains healthy natural environments that foster sustainable communities now and for the future. It outlines programs and activities such as tree planting, stewardship, education and conserving natural lands with a focus on partnering with local organizations and residents through the following action areas such as environmental land protection/preservation and community stewardship and education.
- [District of West Vancouver](#) - The District of West Vancouver is one of the first Canadian municipalities to estimate the value of our natural assets in terms of the services they provide annually and into the future. This is the first step toward integrating natural assets into the District's financial and asset management plans. The District's forests, waterways, foreshore and parks provide services worth as much as \$3.2 billion.
- [Calgary](#) - Calgary understands that there is an opportunity to integrate natural infrastructure into our traditional infrastructure and asset management frameworks. The City of Calgary is undertaking its own study to develop a Natural Infrastructure Valuation Toolkit. Natural infrastructure provides spaces for people to enjoy recreation activities but also helps mitigate risk.

### Strategies and Programs Implemented by Other Organisations:

- [Municipal Natural Assets Initiative \(MNAI\)](#) - Conservation Halton with partners including the City of Hamilton, Royal Botanical Gardens, Greenbelt Foundation, and City of Burlington; worked on the 3-year MNAI Grindstone Creek Watershed project – the first of its kind in Ontario. Natural assets were inventoried, assessed for condition, function, risk, and modeled under different climate change (flooding) scenarios to understand potential impacts to forests and wetlands. Findings reveal the natural assets provide immense service value through stormwater management (over \$2 billion in capital costs of equivalent engineered infrastructure assets) and co-benefits (\$34 million annually) to the region.
- [Municipal Natural Assets Initiative \(MNAI\)](#) - As an original Municipal Natural Assets Initiative (MNAI) pilot, the Town of Oakville assessed stormwater services provided by a ~240 metre stream section that demonstrated: stormwater services were provided equivalent to an engineered asset at a cost of \$1.24-\$1.44 million to replace. The value increases in intensified development scenarios because the stream can adapt to changes in climate and development pressures.
- [Credit Valley Conservation \(CVC\)](#) - Hungry Hollow Sustainable Neighbourhood Action Plan (SNAP) is a plan developed with your community to make Hungry Hollow ravine and the Delrex neighbourhood more sustainable and ready for a changing climate. In collaboration between the community, CVC, and the Town of Halton Hills the plan outlines a number of actions including the stewardship of natural areas.
- [Durham Environmental Advisory Committee \(DEAC\)](#) - DEAC's *Natural Areas as Neighbours Guide* was designed to help residents and visitors understand, appreciate and care for the natural heritage areas in Durham Region.



# ENVIRONMENT & SUSTAINABILITY

## Natural Assets

- [Green Communities Canada \(GCC\)](#) - GCC's [Our Living Cities Canada program](#) is advancing green infrastructure (GI) in cities and towns across the country. 'Green infrastructure' includes natural assets that are both naturally-occurring and introduced (e.g. wetlands, forests, parks, and soils), as well as enhanced and engineered assets that use natural materials and processes (e.g. rain gardens, street trees, green roofs, permeable pavements) to provide a number of services to help make urban areas work more like natural systems.
- [Conservation Halton \(CH\)](#)- Conservation Halton partnered with environmental engineering companies, Aquafor Beech and Rubidium Environmental, the City of Burlington, and the community members of Brighton Beach to design and implement two bioswales. Bioswales are shallow landscaped depressions that are meant to capture, infiltrate, and redirect stormwater. They are a form of green infrastructure that helps slow water runoff, provide cleansing and infiltration, and create habitat for pollinators, birds, and local wildlife.

# ENVIRONMENT & SUSTAINABILITY

## Forestry

Trees provide a variety of benefits to communities by improving air quality, reducing energy use, and dampening stormwater flow. Additionally, trees remove carbon from the atmosphere and store it within their tissues. As trees age and grow, the more carbon they sequester. Effective management of the tree canopy in Halton along with ambitious canopy cover targets can help to further increase the benefits provided by trees and improve the quality of our environment. Tree planting is very important however, a balanced approach is required to ensure that proper care of the trees occur.

### Examples of Climate Actions:

- Set canopy cover targets or tree planting targets
- Develop local tree inventories
- Promote tree planting incentives and programs

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - The Woodlands Stewardship Program provides resources and funding to support private landowners manage forested areas on their properties.
- [Burlington](#) - The City of Burlington has a canopy target of 35% by 2041. The City has offered different programs to increase Burlington's tree canopy over the years. For example, in 2021, the City accepted applications for residents to receive a free tree to be planted on the right-of-way in front of their house (the right tree for the right location). In 2022, the City held two free tree giveaways with 200 trees in the spring and 500 trees in the fall. Burlington's urban forest canopy is projected to provide over [\\$8.6 million](#) in additional annual services for carbon sequestration, pollution removal, and runoff avoided and a value of [\\$78.1 million](#) in carbon stored.
- [Halton Hills](#) - The Town runs an annual tree sale, trees that are native to the area are available for residents to purchase. In 2022, 1200 trees were purchased through this program.
- [Milton](#) - As a result of programs done in partnership with Conservation Halton and Sustainable Milton. and other community initiatives, between 20,000 and 25,000 trees have been planted in Milton since 2015.
- [Oakville](#) - The City of Oakville's Resident Partnership Program in Street Tree Replacement, lets residents apply to have a tree planted in their yard that would have otherwise been planted on municipal land in front of their home. Residents are given \$300 to plant a tree themselves in an approved location.

# ENVIRONMENT & SUSTAINABILITY

## Forestry

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Mississauga, ON](#) - In 2018, the City of Mississauga began their "One Million Trees" program with the goal of planting one million trees by 2032. Currently, they have planted almost 500 000 trees and are set to achieve this goal.
- [Gothenburg, Sweden](#) - The City of Gothenburg, intentionally leaves tree litter and undergrowth in forested areas to allow forests to regenerate naturally.
- [Toronto, ON](#) - The City of Toronto provides several grants and incentives for urban forestry initiatives including the Community Planting and Stewardship Grant, and the Greening Partnership Grant. The city runs a community-led tree giveaway program to engage residents and increase canopy cover on private property.

### Strategies and Programs Implemented by Other Organisations:

- [Oakvillegreen](#) - Run tree planting events in the spring and fall and have planted more than 35,500 trees since the year 2000.
- [Conservation Halton](#) - Offers various funding opportunities to landowner's located within Conservation Halton watershed, who are interested in planting trees on their property,
- [Credit Valley Conservation](#) - Offer tree and shrub planting services to rural landowners, funding is available up to the full cost of planning and planting. CVC also offer Sustainable Forest Management Services.
- [Trees for Halton Hills](#) - Promote tree planting in Halton Hills, with a goal of planting 65,000 trees in five years.
- [BurlingtonGreen](#) - Since 2017, BurlingtonGreen has planted 71,600 trees and shrubs.

# ENVIRONMENT & SUSTAINABILITY

## Habitat Restoration and Protection

Climate change will increase the frequency of extreme weather events, as well as accelerate the introduction of invasive species. Both of these will cause serious harms to species in our local ecosystems and habitats through the destruction of the homes and competition for resources and area. Unfortunately, this may lead to permanent losses in biodiversity. Protecting and restoring our natural ecosystems using climate actions such as the ones listed below will help increase resiliency to impacts of climate change, as well as help maintain the native biodiversity of the ecosystems.

### Examples of Climate Actions:

- Develop and implement shoreline protection projects
- Restore wetlands and other sensitive ecological regions
- Monitor and map invasive species
- Promote the protection of sensitive ecological regions
- Enhance biodiversity and ecological functions

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- **Halton Region** - Prior to December 2022, Halton Region placed significant emphasis on the protection and enhancement of Halton's Natural Heritage System (NHS) through each successive Halton Regional Official Plan. The goal of the NHS was to increase the certainty that the biological diversity and ecological functions within Halton will be preserved and enhanced for the future through initiatives that restore habitats, secure greenlands and their linkages and promote and protect the natural environment. Additionally, the Region has previously released [A Biodiversity Strategy for the Halton Regional Forests \(2014 - 2024\)](#) which was intended to contribute to a more comprehensive program targeting long-term maintenance and enhancement of biodiversity in Halton's Natural Heritage System through responsible land stewardship with many partners including the public, non-governmental organizations, and other government agencies. Additionally, at fall fairs the Region distributed pollinator seed packets to encourage pollinator habitats. The Region's [Environmental Health webpage](#) provides information on invasive species and pests along with measures individuals can take to prevent their spread.
- **Burlington** - Every year since 2012, the City of Burlington closes King Road to ensure the safe passage of the endangered Jefferson salamanders during their breeding migration period. The closures have made a measurable positive impact on the population of the Jefferson salamander. Additionally, the City provides information on different insects and diseases that can have devastating effects on the health of urban forests on their website.
- **Halton Hills** - The Town of Halton Hills' invasive species page provides information to residents on the Spongy Moth, Giant Hogweed, and Emerald Ash Borer. This includes material on the species, how residents may protect themselves, resources from other organizations and what the Town is doing to control the infestations.
- **Milton** - The Town of Milton partnered with Conservation Halton to restore Sixteen Mile Creek at Drumquinn Park. The objectives of this project are to restore the natural functions of the creek, improve the quality of fish habitat, and increase biodiversity in the floodplain.
- **Oakville** - The Town of Oakville provides residents with information on tree diseases, pests and invasive plants that represent a continued challenge to our street, park, and woodland trees. Information on what residents can do to help protect their trees along with what the Town is doing can be found on their website.

# ENVIRONMENT & SUSTAINABILITY

## Habitat Restoration and Protection

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Brampton, ON](#) - In 2018, Brampton implemented their Don't Mow, Let It Grow Initiative. This initiative identifies public areas covered by grass and converts them to naturalized areas such as meadows and pollinator gardens. Like many cities in Canada, Brampton has joined the Bee City program which creates and maintains pollinator habitats and increases awareness about the importance of pollinators.
- [Hamilton, ON](#) - The City of Hamilton's Flamborough Centre Park Restoration Project, which commenced in 2020, will convert two hectares of recreational parkland in Hamilton into wetlands and marshes. Hamilton is also a part of the Bee City program.
- [York Region](#) - The Regionally owned boulevard on Bayview Avenue south of Bethesda Sideroad was transformed into a pollinating bee and butterfly meadow as part of the Project Pollinator pilot project. This project will be expanded to other municipalities in the Region.

### Strategies and Programs Implemented by Other Organisations:

- [Conservation Halton \(CH\)](#) - Conservation Halton is currently in the process of developing an Invasive Species Strategy that will focus on species such as the Dog Strangling Vine, Zebra Mussels, and the Emerald Ash Borer. Conservation Halton is also undertaking a number of [restoration projects](#) to provide habitat for wildlife species, improve the natural functions of our environments and make our watershed more resilient to climate change.
- [Blooming Boulevards](#) - Through Blooming Boulevards, Mississauga residents can apply through Blooming Boulevards to have a pollinator garden installed on their boulevard, with the City's permit fee waived and plants provided.
- [Grand River Conservation Authority](#) - Through the Grand River Cover Crop Program incentives of up to \$1,500 are available for farmers to plant cover crops.
- [BurlingtonGreen](#) - BurlingtonGreen secured funds to directly improve the health of the local environment through the leadership of six major habitat restoration projects at the Burlington beach which strengthened local biodiversity and the stabilization of the dune environment by planting 26,000 native plants, shrubs and trees at the beach; facilitated hands-on programming for children and youth including nature walks, litter art crafts and recycling relays and coordinated clean ups along the shoreline for 12 years.

# ENVIRONMENT & SUSTAINABILITY

## Stormwater Management and Low Impact Developments

Climate change will increase the amount and frequency of extreme rain events, with a higher risk of flooding which can cause widespread damage and have negative financial, and health implications. Improving stormwater management and adapting our urban areas to handle these increased precipitation levels is crucial to mitigate some of the most adverse effects of climate change. Sustainable approaches will be needed to be used to adapt to these events. Low impact developments (LID) are an approach to manage stormwater runoff, using techniques that increase the infiltration of stormwater. There are many additional benefits of LID's including increased biodiversity by creating a habitat for native birds and pollinators and reducing the heat island effect. Climate actions such as the ones listed below can help increase the use of LIDS and other sustainable approaches to stormwater management.

### Examples of Climate Actions:

- Support the implementation of stormwater credit programs.
- Promote the implementation of LID best practices (rain gardens, Bioswales, infiltration trenches, permeable pavements and rainwater harvesting)
- Include LID best practices in stormwater management plans, and development guidelines
- Work with local organizations on initiatives to implement LID practices

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - The Enhanced Basement Flooding Prevention Subsidy Program provides financial assistance to Halton residents, undertaking home improvements that can reduce the risk of flooding. Improvements include downspout disconnection, sump pump installation.
- [Burlington](#) - In 2020, the City of Burlington approved an updated [Stormwater Management Design Guidelines](#), to be used in the design of storm drainage infrastructure within the City. Since the 2014 flood, Burlington has offered a Plumbing Permit Fee grant program to provide residents with financial support for improvements to their homes or businesses to reduce risk of basement flooding. Between 2014 and 2021, \$393,492 in permit fees were refunded with an additional \$80,000 approved for 2022-2023.
- [Halton Hills](#) - Halton Hills is developing a Stormwater Management Master Plan, to update and improve stormwater management infrastructure that will be adapted to handle the impacts of climate change.
- [Milton](#) - Catch basins have been created across the Town of Milton which capture stormwater and route it through storm sewers to stormwater management ponds. Various parks in Milton have a number of low impact design features, swales infiltration galleries and rain gardens to manage storm water. Pilot projects have been installed to harvest rainwater to operate irrigation and building grey water systems.
- [Oakville](#) - The Town of Oakville installed permeable pavements at the Oakville Transit Facility, resulting in a 50 % reduction in stormwater runoff.

# ENVIRONMENT & SUSTAINABILITY

## Stormwater Management and Low Impact Developments

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Cardiff, Wales](#) - The Greener Grangetown Project was designed to reduce the volume of stormwater entering the sewer network, this was achieved through the installation of 108 rain gardens, diverting an average of 40,000m<sup>3</sup> of stormwater from the sewer system.
- [Ottawa](#)- The Rain Ready Ottawa pilot program supports residents to take action on their property to reduce impacts of stormwater runoff, through home assessments, rebates and e-learning programs
- [Kitchener, ON](#) - The City of Kitchener offers stormwater credits to residents for reducing the amount of stormwater entering their property. These credits can be used by residents as payments toward their stormwater utilities fees
- [Region of Peel, ON](#)- Through a pilot project, The Region reconstructed the storm drainage system on Mississauga Road through the installation of a bioswale in the middle of the road made up of native plants and granular material. This project was funded through FCM's Municipalities for Climate Innovation Program

### Strategies and Programs Implemented by Other Organisations:

- [Halton Environmental Network \(HEN\)](#) - HEN has worked on [Depave Paradise](#) projects at schools and faith-based communities, where asphalt is removed, and gardens are created for better water infiltration. HEN has also conducted a feasibility study, [Green Drive Oakville](#). This study explores the feasibility of advancing a social purpose organization to support Oakville homeowners with the installation of permeable driveways and electric vehicle chargers.
- [Conservation Halton](#) - Have worked on a number of stormwater management and LID projects. The [Brighton Beach Bioswale Project](#) the aim was to reduce the contaminant and sediment load entering Lake Ontario, through the installation of 2 bioswales. Conservation Halton also offer landowners financial assistance to support LID projects through the Rainwater Conservation Fund.
- [Halton District School Board](#) - The Irma Coulson Public School, Milton, and Halton District School Board partnered with Evergreen on the [Climate Ready School Project](#), to transform the school grounds into an outdoor learning hub, as well as incorporate sustainable features to mitigate the effects of climate change.
- [Oakvillegreen](#) - Oakvillegreen's blended (online and practical component) DIY Rain Garden Workshop Series goes step by step through the whole process of installing a rain garden. The current course runs from November 2022 until May 2023. Additionally, Oakvillegreen has been set the challenge of creating [TEN rain gardens by September 2023](#).

## Stormwater Management and Low Impact Developments

- [Intact Centre for Climate Adaptation](#) - Burlington was chosen to pilot the Home Flood Protection Program in August 2017, three years after the Burlington flood. The City of Burlington continues to offer residents subsidies to participate in the program to have a trained assessor complete a 50-point visual assessment of potential sources of water entry in the home and discuss preventative maintenance.



# ENVIRONMENT & SUSTAINABILITY

## Waste Reduction and Diversion

Waste management through collection, treatment and storage, is a significant source of GHG emissions. In Halton, waste management is within Halton Region's mandate, but other community organizations can influence waste management by increasing education on waste diversion and reduction.

Decreasing the amount of waste requiring management through reduction and diversion efforts will reduce emissions. Additional benefits include lowering costs for individuals and businesses through the more effective use of the resources that we consume. Diversion efforts such as recycling, repurposing and upcycling are vital for reducing emissions and working towards a net-zero community. Climate actions such as the ones listed below can increase the use of waste diversion and reduction initiatives.

### Examples of Climate Actions:

- Educate the public and businesses about the social and environmental benefits of recycling and reducing waste
- Encourage the use of recycled materials in construction and infrastructure projects
- Promote programs which promote food waste reduction and the use of composting
- Promote programs and events which encourage reusing, repurposing and repairing items (repair cafes)

### Examples of Some Strategies and Programs Implemented by Halton Municipalities:

- [Halton Region](#) - The Region developed the [Solid-Waste Management Strategy](#), to enhance the current waste management system in the community. The Halton Waste Management Site also run a free compost giveaway in the spring and fall.
- [Burlington](#) - The City developed the 'Thirsty? Try the Tap' campaign to promote tap water usage and reduce the sale of bottled water at City facilities. The City also removed individual bins from workstations and installed central two and three stream waste stations. Underground waste and recycling bins are also at many City parks.
- [Halton Hills](#) - As part of Earth Week activities, the Town encouraged residents to participate in a '22-Minute Makeover and Community Clean-up.
- [Milton](#) - The Town of Milton uses recycled asphalt pavement and other recycled material in many of their roads, trails, and road shouldering in rural areas. Recycled asphalt pavement is also used in the town's Mattamy National Cycling Centre.
- [Oakville](#) - The Town has taken various steps to improve waste reduction and diversion in its facilities, including removing the majority of single use plastics and providing outdoor waste diversion bins at main entrances and exits.

# ENVIRONMENT & SUSTAINABILITY

## Waste Reduction and Diversion

### Strategies and Programs Implemented by Municipalities in Ontario, Across Canada, and Internationally

- [Region of Durham, ON](#) - The Region runs environment days, where residents can drop off items including, clothing and textiles, electronic waste and household hazardous waste for reuse, recycling and safe disposal.
- [City of Guelph, ON](#) - Twice a year the City runs a community wide re-use event the Goods Exchange Weekend, where residents can place unwanted household items on their curb for others in the community to take for free.
- [Montreal, QC](#) - By 2025, the City of Montreal plans to ban the disposal of unsold products and waste in the textile industry and to facilitate the recycling of textiles by adding donation boxes around the city. The city has also committed to reducing food waste by 50% by 2025.
- [Victoria, BC](#) - Victoria has recently introduced the Demolition Waste and Deconstruction by-law. Under this by-law, Applicants for demolition permits pay a refundable fee. This fee is refunded once the permit holder has salvaged the required amount of wood for reuse during demolition.
- [York Region](#) - To support York Region's [SM4RT Living Plan](#) (integrated waste management plan), the Region has created a Circular Economy Roadmap, as well as a number of supporting initiatives, such as the Circular Economy Initiatives Fund, which provides up to \$25,000 in funding to non-profit organisations for projects that reduce residential waste and advance the circular economy.

### Strategies and Programs Implemented by Other Organisations:

- [Burlington Repair Cafe](#) - A completely volunteer run operation, Burlington Repair Cafe opens once a month at different locations in the city offering to fix broken or damaged household items.
- [Halton Environmental Network \(HEN\)](#) - The [Make Every Bite Count](#) study was conducted in 2019-2020, the aim of the study was to help understand the Carbon "Foodprint" of household food waste in Oakville and to guide future initiatives to reduce environmental impacts. Additionally, HEN continues to go waste diversion at local events in the summer.
- [Sheridan College](#) - Since 2014, Sheridan has held numerous Repair Cafe events where anyone can come learn and get help fixing their broken household items.
- [Guelph Tool Library](#) - The Guelph Tool Library has organized a series of waste reduction and diversion events within the Guelph community, such as Re-purpose Fest in 2021, which was a community wide recycling event.
- [The Kind Matter Company](#) - An eco-friendly store located in Milton, offering items which support a low-waste lifestyle and offer a product refill delivery service in Halton.

# ENVIRONMENT & SUSTAINABILITY

## Waste Reduction and Diversion

- [Ecofillosophy](#) - Located in Oakville, Ecofillosophy is a low-waste boutique and refillery offering products for those interested in living a sustainable lifestyle. EcoFillosophy will be closing its brick-and-mortar shop in March 2023, and will be reinventing themselves as a local delivery service.
- [BurlingtonGreen](#) - BurlingtonGreen hosted 12 annual city-wide [Community Clean Up events](#) with 121,000 participants to date and in 2021 launched [Zero Waste Days](#) diverting 6.5 tonnes of electronics waste so far.
- [Food for Life](#) - Food for Life, a volunteer-powered, grassroots-driven organization rescues and distributes food that would have been wasted. They rescued and distributed over 4 million pounds of food in 2019. This good quality, fresh food which had a retail value of over \$10 million would have otherwise gone to landfill. Over 5.7 million kgs of greenhouse gases were diverted. They are the largest food rescue organization in Halton and Hamilton.
- [The Oakville Community Centre For Peace, Ecology and Human Rights | \(OCCPEHR\)](#) - For 32 years the OCCPEHR has been hosting Earth Day Clean Ups in Oakville. The Clean Up in 2022 was their most successful Clean Up ever. The high level of involvement illustrates the passion Oakville residents have for the town's greenspaces including its parks, trails, ravines, woodlots, creeks and lakefront.

# NEXT STEPS

The body of work represented in this report builds on the completion of the Partners for Climate Protection (PCP) Community Greenhouse Gas Emissions (GHGe) Inventory (Milestone 1) that has been completed, and the foundational research on climate actions. A separate companion report draws together information on GHGe reduction targets of municipalities locally, across Ontario, across Canada, and internationally.

This work will inform the next steps: valued and essential public consultation needed to understand the community's awareness of climate change, confirmation of GHGe reduction targets, and willingness to take action to address the broadly acknowledged climate emergency. Public engagement will involve two components: broad facilitated outreach with community stakeholders and a complementary survey.

The culmination of these efforts will be the confirmation of GHGe reduction targets (PCP Milestone 2) and the development of the Halton Community Climate Plan with appropriate climate actions to help achieve reduction targets as set in PCP Milestone 2.

# GLOSSARY OF TERMS

**Active Transportation** - Using human power to move from one place to the other, such as walking, biking, skateboarding, rollerblading, jogging, running, non-mechanized wheel chairing, snowshoeing, and cross-country skiing.

**Adaptation** - Preparation and adjustment in natural or human systems to reduce the negative impacts of a changing climate, which moderates harm or takes advantage of beneficial opportunities.

**Carbon Sequestration** - The process by which trees and plants absorb carbon dioxide, release the oxygen, and store the carbon.

**Climate Change** - The long-term changes in current climatic conditions, including temperature, wind patterns, and/or precipitation.

**Circular Economy** - Circular economy retains and recovers as much value as possible from resources by reusing, repairing, refurbishing, remanufacturing, repurposing, or recycling products and materials.

**Co-benefits** - The potential benefits associated with climate actions that are not directly related to climate change mitigation and adaptation.

**Cover Crops** - an enhanced cropland management activity that helps prevent greenhouse gas emissions and increases carbon sequestration

**District Energy** - Low-carbon thermal energy networks that distribute thermal energy to multiple buildings in a specific area or neighbourhood. Often these systems or networks contain a heating and cooling centre as well as a connected thermal network of pipes.

**Electric Vehicle (EV)** - Contain a battery instead of a gasoline tank, and have an electric motor instead of an internal combustion engine.

**Energy Retrofits** - Upgrading energy consuming systems in buildings, such as replacing lighting fixtures, ventilation systems, windows and doors, and adding insulation.

**Geoexchange System** - Consists of a ground source heat pump connected to a series of buried pipes

# GLOSSARY OF TERMS

**Green Development Standards** - voluntary or mandatory measures created by municipalities to encourage environmentally, socially, and economically sustainable design

**Greenhouse Gas (GHG)** - The atmospheric gases responsible for causing climate change. The major GHGs are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Less prevalent, but very powerful GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>).

**GHG Inventory** - An estimate of GHG emissions (GHGe) within a defined boundary in a given year. Sources of GHGe can include transportation, residential and commercial energy, wastewater treatment, and the decomposition of solid waste.

**Ground Source Heat Pump** - Utilizes the natural difference between the above-ground air temperature and the subsurface soil temperature to move heat for a variety of uses, including space heating, air conditioning, and water heating.

**Habitat Protection and Restoration** - The process of conserving, protecting and restoring habitats from ecosystem degradation and so the ecosystem's natural activities and processes resemble those of the original environment.

**Heat Island** - High temperature regions associated with urban areas. Replacement of open land and vegetation with urban structures leads to increases in the absorption of solar energy, creating higher temperatures in the region.

**Heat Pump** - Installed on the outside of a home, a heat pump is part of the heating and cooling system and is capable of providing cooling and heat. During colder months, heat is transferred from the outside into homes while in warmer months, heat is extracted from inside homes.

**Halton Climate Collective** - Halton Climate Collective members are Halton Environmental Network, City of Burlington, Town of Halton Hills, Town of Milton, Town of Oakville, Halton Region, Conservation Halton, Halton District School Board, Halton Catholic District School Board, Sheridan College, and University of Waterloo. HEN is the backbone agency, facilitating the HCC's inception, facilitating collaboration and implementing initiatives with HCC member support.

**Low-Carbon Energy Sources** - Energy generation methods that produce lower amounts of carbon emissions. Such as solar, wind, nuclear, and hydro.

**Low Impact Development (LID)** - An approach to land development that looks to manage stormwater by mimicking the natural movement of water. Some examples of methods include rainwater harvesting, green roofs, bio retention/rain gardens, and permeable pavements

# GLOSSARY OF TERMS

**LEED Certification** - A green building certification program and the globally recognized standard for the design, construction, and operation of high-performance green buildings and neighborhoods. To Achieve LEED certification earning a minimum number of credits is required, the levels of certification generally follow these thresholds: Certified: 40–49 points, Silver: 50–59 points, Gold: 60–79 points, and Platinum: 80+ points.

**Mitigation** - Relates to strategies and programs that aim to reduce greenhouse gas emissions and the impact that humans have on the environment.

**Municipal Natural Asset Initiative (MNAI)** - MNAI is an organization that provides scientific, economic and municipal expertise to support and guide local governments in identifying, valuing and accounting for natural assets in their financial planning and asset management programs and developing leading-edge, sustainable and climate-resilient infrastructure.

**Net-zero** - Any emissions released into the atmosphere are balanced by removal of emissions out of the atmosphere.

**No Till Farming/Agriculture** - No till farming refers to the practice of keeping the soil structure intact instead of turning the soil (tilling) before planting a new set of crops. The use of this practice helps restore and maintain soil health.

**Property Assessed Clean Energy (PACE) Model** - Mechanism for financing renewable energy improvement or energy efficiency measures on private property. In the PACE model, the upfront cost for the project is provided as a loan that is tied to the property instead of the homeowner.

**Photovoltaic (PV) System** - System composed of solar panels, an inverter, as well as other electrical and mechanical hardware that use energy from the Sun to generate electricity.

**Regenerative Agriculture** - A method of farming that focuses on soil health. Some examples include methods that minimize the ploughing of land, rotating crops, and using animal manure and compost.

**Renewable Energy** - Sources of energy that replenish naturally such as solar, wind, geothermal, hydro, and biomass.

**Resilience** - The capacity to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment.

# GLOSSARY OF TERMS

**Sustainability** - A dynamic process that guarantees the persistence of natural and human systems in an equitable manner.

**Sustainable Food Systems** - A sustainable food system is a collaborative network that integrates several components in order to enhance a community's environmental, economic and social well-being. It is built on principles that further the ecological, social, and economic values of a community and region.

**Waste Diversion** - Diverting waste away from incineration and landfills, through recycling, repurposing, reducing and composting waste.



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