



Climate Change Discussion Paper

Regional Official Plan Review

June, 2020



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1. Executive Summary

1.1 Introduction

The Regional Municipality of Halton is undertaking a Regional Official Plan Review (ROPR) in accordance with Provincial requirements established in Section 26 of the [Planning Act](#). The last comprehensive review of the Regional Official Plan (ROP) resulted in Regional Official Plan Amendments (ROPA) 37, 38, and 39, which implemented the policies of the Growth Plan for the Greater Golden Horseshoe 2006 and the Greenbelt Plan 2005, amongst other key policy initiatives. The ROPR is being undertaken in three phases and the Climate Change Discussion Paper is part of Phase 2.

Through this ROPR, specific theme areas and policies will be updated, enhanced and refined based on changing demographics, evolving land use trends and changes to a number of Provincial policy documents including the [Provincial Policy Statement](#) (PPS) 2020, [Greenbelt Plan](#) 2017, [A Place to Grow: A Growth Plan for the Greater Golden Horseshoe 2019](#) (Growth Plan) and the [Niagara Escarpment Plan](#) (NEP) 2017. The ROPR also provides an opportunity for a comprehensive assessment of the effectiveness of current ROP policies and implementation through a Municipal Comprehensive Review (MCR) process.

1.2 Halton Region and Climate Change

Climate change is a long-term change in the average weather patterns that define Earth's local, regional and global climates. It is mostly driven by human activities, particularly fossil fuel burning, which increases heat-trapping Greenhouse Gas (GHG) levels in Earth's atmosphere. Trapped GHGs contribute to the rapid rise of Earth's average temperature, otherwise known as Global Warming.

Around the Earth, Global Warming is uneven as some areas are warming faster than others are. According to "Canada's Changing Climate Report 2019" (CCCR), Canada's accelerated warming rate is currently double the global warming rate, which is resulting in more frequent and severe weather events such as heat waves, extreme rain events, flooding, droughts, and soil moisture deficits.

Halton is not immune to the global warming phenomenon or to climate change. The Region has already witnessed many severe weather events such as flash floods, ice storms and droughts. These events have and will continue to pose serious risks to our infrastructure and resources and threaten our communities' health, safety and prosperity.

In 2019, Halton Region strengthened its commitment to addressing climate change by declaring a climate emergency. The Region is working on multiple fronts to respond to climate change and reduce GHG emissions. One of these fronts is through land use policy. Land use policies are instrumental in directing and shaping growth in the Region (forecasted to reach one million people by 2041) in a way that reduces emissions,

ensures the conservation and wise use of resources and increases resilience to climate change impacts.

1.3 Climate Change Response Through the ROPR

Through the ROPR, Halton Region is reviewing its ROP policies for consistency with and conformity to Provincial policies and plans in addressing climate change. The review offers a great opportunity to build on the sustainability vision of the current ROP in the following policy areas:

- Growth Management: In order to strengthen the Region's ability to grow in a compact manner, and promote complete and resilient communities, a climate change lens must be applied on growth management to ensure the Region's growth does not translate into higher GHG emissions.
- Transportation: Aligning growth and transportation planning at the early stages by assigning growth in a way that supports transit and the implementation of complete streets will allow the Region to put greater emphasis on increasing its mode share towards transit and active transportation and reducing auto-dependence.
- Energy and Utilities: Explore ways to enhance and strengthen energy conservation policies and introduce policies related to renewables.
- Agriculture: Emphasize the importance of the protection of agricultural lands as a resource and the agriculture practice for the Region's food and economic resilience.
- Natural Heritage and Environmental quality: Protect the Natural Heritage System (NHS) as a valuable carbon sink and improve policies related to water, air and hazardous lands protection.

Through this Discussion Paper, the Region is seeking to generate broad public and stakeholder discussions on the opportunities to address climate change through land use policies in the Halton ROP. Regional staff will consider all input when drafting policies in the next phase (Phase 3) of the ROPR.

The Climate Change Discussion Paper is one of five discussion papers being made available to support public input for the Regional Official Plan Review.

How to get Involved:

Please visit halton.ca/ropr to learn more and provide feedback.

The Regional Official Plan Review page contains more information to support participation as well as a questionnaire on the policy themes being considered by Regional Council.

Comments can also be submitted to ropr@halton.ca.

2. Introduction

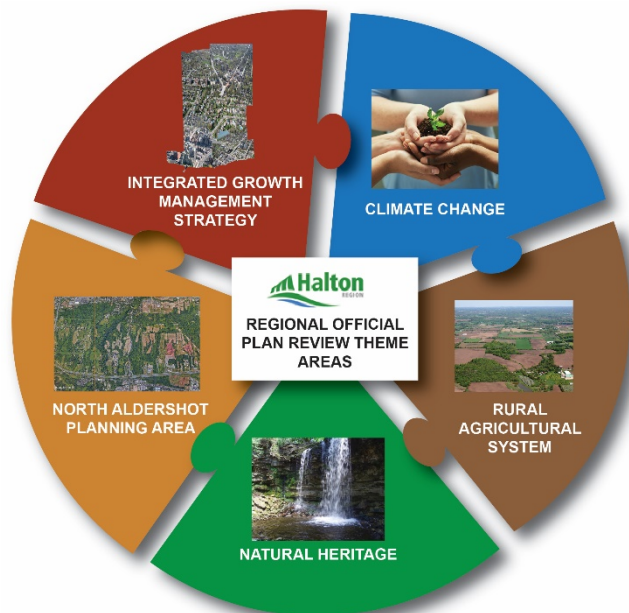
2.1 Regional Official Plan Review (ROPR)

The Regional Municipality of Halton is undertaking a Regional Official Plan Review (ROPR) in accordance with Provincial requirements established in Section 26 of the [Planning Act](#). The last comprehensive review of the Regional Official Plan (ROP) resulted in Regional Official Plan Amendments (ROPA) 37, 38, and 39, which implemented the policies of the Growth Plan for the Greater Golden Horseshoe 2006 and the Greenbelt Plan 2005, amongst other key policy documents.

The ROPR will ensure consistency with the [Provincial Policy Statement](#) (PPS), 2020, as well as conformity to [A Place to Grow: The Growth Plan for the Greater Golden Horseshoe \(2019\)](#), the [Greenbelt Plan](#) (2017) and the [Niagara Escarpment Plan](#) (2017). These plans and policies include new directions for land use planning to identify actions that will reduce greenhouse gas emissions and address climate change.

The ROPR, which commenced in 2014, is a three-phase process: Phase 1 was completed in October 2016 through the endorsement of “Phase One: Directions Report” which outlined the tasks and deliverables to be undertaken during the next two phases of the ROPR. Phase 2, currently underway, is focused on the production of five public discussion papers (including the present one), based on background research and analysis that will identify potential policy options to address the ROPR key theme areas as identified in Figure 1. Phase 3 will consist of proposed policy directions, draft official plan policies, and the adoption of an official plan amendment to implement the new directions.

Figure 1: ROPR Phase 2 key theme areas addressed through research, analysis and discussion papers.



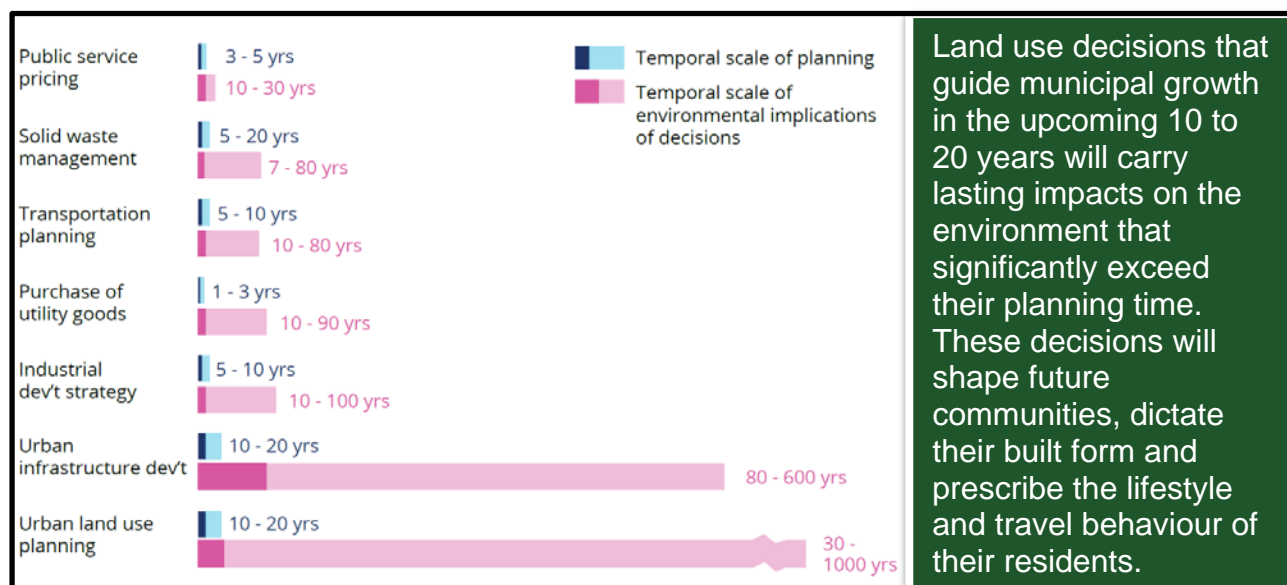
2.2 Climate Change Discussion Paper

This Climate Change Discussion Paper for the ROPR provides background information and poses discussion questions to the public in order to identify opportunities for land use policy enhancements to address climate change in the ROP. Obtaining public feedback at this stage of the ROPR is instrumental in order to align future policy recommendations with the public's vision and priorities in responding to climate change.

Addressing climate change through the ROPR is important given the significant impact land use policies have on the environment. It has been shown that land use planning decisions have lasting impacts on the environment by creating a “lock-in” effect whereby past decisions have a lingering impact that limits future options and drives costs thereof (Figure 2). This is particularly important since land use policies shape communities, determine population densities and address connectivity to goods and services; these factors influence lifestyles and travel behaviors for decades to follow.

For instance, land use planning policies that lead to the development of disconnected and spatially expansive communities increase car-reliance and result in an energy and emission trajectory that is costly and difficult to change. By comparison, land use planning policies that support compact, mixed use, and pedestrian-oriented design promote lifestyles that conserve energy use and decrease transportation emissions. In fact, studies have shown that, in compact communities, transportation emission levels per household are lower by 24% to 50% compared to conventional suburban neighbourhoods¹. This is particularly important in Halton given that 39% of emissions are from transportation sources².

Figure 2: The temporal environmental implications of municipal decisions³



¹ Ontario's Five Year Climate Action Plan 2016-2020. (p 31)

² Environmental Commissioner of Ontario 2018 Greenhouse Gas Progress Report (p40)

³ The Atmospheric Fund, Carbon Emissions Inventory for the GTHA, 2019 Edition (p15)

2.3 Relationship with other ROPR Components

The Climate Change Discussion Paper connects to all ROPR key theme areas in order to provide a lens through which each area is examined. This climate change lens will also inform the selection of policy and growth options with minimal climate change related impacts. This is how a climate change lens connects to each policy areas:

Integrated Growth Management Strategy (IGMS) – The application of a climate change lens to the IGMS, which guides the process of integrating Growth Plan 2019 policies, mapping and growth forecasts to the year 2041 into the ROP and ultimately in Local Official Plans, is an important step to ensure growth does not translate into higher GHG emissions from buildings and transportation. The climate change lens will help guide the IGMS work in deciding where growth takes place, how it is shaped, and how it can promote long-term resilience in Halton.

Rural and Agriculture – A functioning agricultural system as well as NHS protection and enhancement are an important part of responding to climate change in terms of both adaptation and mitigation. The addition of policies that promote sustainable farm practices and stewardship activities (e.g. on-farm diversified and agriculture-related uses) contribute to the overall viability of farm operations and, therefore, the long-term ability to adapt to and mitigate climate change threats.

Natural Heritage System- NHS protection and enhancement is an important part of responding to climate change in terms of both adaptation and mitigation. The NHS provides for more resilient environments and can allow opportunities to reduce impacts of flooding and other risks associated with extreme weather events. NHS protection and enhancement can also play an important role in acting as a carbon sink to reduce greenhouse gas emissions.

North Aldershot Special Policy Area - The review of North Aldershot and the update to its policy framework would need to consider a climate change lens in the areas of Integrated Growth Management and Natural Heritage System and agricultural and rural land protection. The climate change lens would direct growth towards compact and mixed-use communities with transit-supportive densities, and away from natural heritage and agricultural lands. A compact form of growth helps protect the Regional Natural Heritage and Agricultural Systems from fragmentation due to development encroachment and maintains their vitality. Strong and continuous Regional Natural Heritage and Agricultural Systems provide valuable ecosystem services like clean air and water and carbon sequestration. These Systems also support the Region's resilience and capacity to respond to extreme weather events.

3. Defining Climate Change

3.1 Climate Change

There are many definitions of climate change. For the purposes of this paper, the definition provided in the United Nations Framework Convention on Climate Change is used. It defines climate change as a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods⁴. These changes to the global atmospheric composition are largely the result of emitted green house gas (GHG) emissions and are reflected in changes in weather patterns and conditions that impact people's everyday lives.

3.1.1 GHG Emissions

One of the most climate-impactful human activities is the emission of GHGs that trap heat in the Earth's atmosphere just as the glass of a greenhouse keeps warm air inside. Human activity increases the amount of GHGs in the atmosphere. When more heat is trapped, the temperature of the planet increases⁵.

There are multiple GHGs emitted daily including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and refrigerants⁶. CO₂ is the most important of these gases as it is trapped in the atmosphere for a very long time thus absorbing and emitting a great amount of heat and further accelerating global warming.

According to the 2018 Greenhouse Gas Progress Report produced by the Environmental Commissioner of Ontario, in 2016 transportation was the largest contributor to Ontario's GHG emissions (35%), followed by industry (30%) and buildings (21%)⁷. Halton's emission levels were different in that emissions from transportation and buildings contributed almost 90% of the overall GHG emissions as per a study conducted by the Atmospheric Fund (50% emitted by buildings and 39% by transportation) (Figure 3).

Given the forecasted rapid population growth for the Greater Toronto and Hamilton Area (GTHA), emissions are anticipated to continue to rise substantially in the absence of control measures. Within this context, Halton Region is projected to have its emission levels increase by over 80% by the year 2050 if no meaningful GHG emissions control measures are introduced⁸.

⁴ The United Nations Framework Convention on Climate Change (UNFCCC), 2011

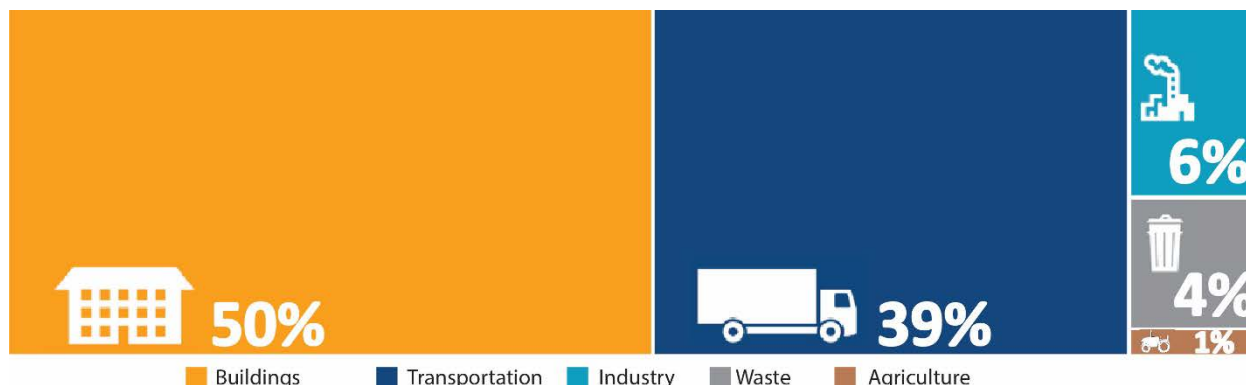
⁵ Government of Canada, Progress towards Canada's greenhouse gas emissions reduction target.

⁶ Environmental Commissioner of Ontario 2018 Greenhouse Gas Progress Report (p21)

⁷ Environmental Commissioner of Ontario 2018 Greenhouse Gas Progress Report (p40)

⁸ The Atmospheric Fund, Keeping Track: 2015 Carbon Emissions in the Greater Toronto and Hamilton Area July 2018 (p29)

Figure 3: Carbon Emissions by Sector in Halton Region, 2017⁹



3.1.2 Trends

GHG emissions are the leading cause of the most prominent aspect of climate change known as global warming. Global warming is the increase in combined surface air and sea surface temperatures averaged over the globe and over a 30-year period. This global increase reached 1°C above pre-industrial levels (1850-1900) in the year 2017¹⁰.

Global Warming is an uneven phenomenon. The increase in temperature is greater in certain regions than it is in others. In fact, the “Canada’s Changing Climate Report 2019” (CCCR) highlights Canada’s accelerated warming rate which is currently double the global warming rate. The CCCR also corroborates the Environmental Commissioner of Ontario’s 2018 findings, which shows that Ontario is warming faster than the global average¹¹.

The CCCR underscores the fact that while both human activities and natural variations in the climate have contributed to observed warming, human contributions are dominant. In fact, through modelling, and with high confidence, the CCCR shows that reduced GHG emissions would considerably slow Canada’s warming compared to scenarios in which GHG emissions increase or remain static. In these latter scenarios, extreme and severe weather conditions are very likely to increase in frequency and magnitude. These conditions include heat waves, extreme rain events, urban floods, droughts, and soil moisture deficits.

The average temperature in Ontario has risen by 1.5°C since 1948, and the ten warmest years on record have already occurred since 1998. This trend is expected to continue in the absence of meaningful interventions.

(2018 Greenhouse Gas Progress Report. Environmental Commissioner of Ontario)

⁹ The Atmospheric Fund, Carbon Emissions Inventory for the GTHA, 2019 Edition (p15)

¹⁰ IPCC: 2018 Global Warming of 1.5°C. IPCC. 2018. (p51).

¹¹ Environmental Commissioner of Ontario 2018 Greenhouse Gas Progress Report (p24)

3.1.3 Impacts

Halton is not immune to global warming. Models presented through the Ontario Climate Change and Health Modelling Study (2018) predict that the following severe weather events will significantly increase in occurrences and frequency by the year 2050: heat waves (a heat wave being defined as 3 consecutive days exceeding 32°C), pollution, vector-borne diseases and extreme precipitation causing floods¹².

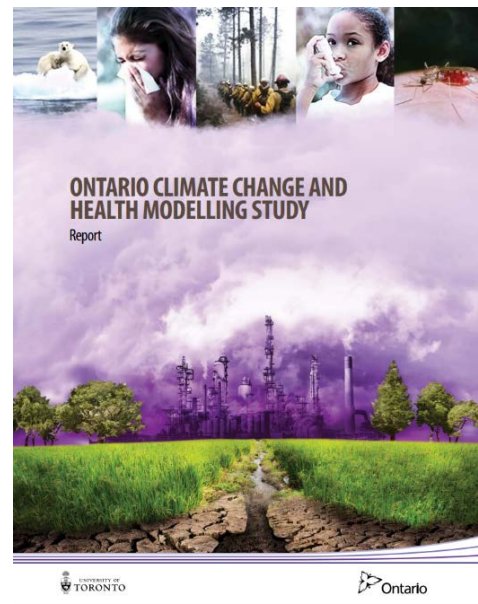
Here is a brief overview of some of the most impactful current and anticipated changes caused by global warming:

a- Weather Changes and Public Health Impacts

Halton Region is seeing an increase in the frequency and severity of localized weather hazards, which represent weather events potentially harmful to individuals and property, such as extended heat waves, heavy rainfalls, wind and ice storms. Although some of these weather events are cyclical in nature such as storms with a 1% or less chance of occurring in a given year¹³, data has shown that they are becoming more frequent and more severe as the planet becomes warmer.

While the most visible impact of these severe weather events tends to be the trail of destruction and damage they leave behind, there has been an increased awareness of the growing emotional and mental health toll inflicted on individuals by severe weather events. For instance, in the aftermath of the 2014 Burlington flood (Figure 5), a great number of affected residents indicated that their stress and anxiety levels were much higher than before, with many experiencing breathing and sleeping difficulties directly attributed to their flood experience¹⁴.

Figure 4: Cover of Ontario Climate and Health Modeling Study, 2018



¹² Ontario Climate Change and Health Modeling Study. William Gough, Vidya Anderson, Kris Herod. 2016 (p. 7).

¹³ G.J. Van Oldenborgh et al. Attribution of extreme rainfall from Hurricane Harvey, Environ. Res. Lett. 12 (2017)

¹⁴ After the Flood, a study by the Intact Centre on Climate Change in collaboration with University of Waterloo Intact and Manulife Financial (June 2018), P05.

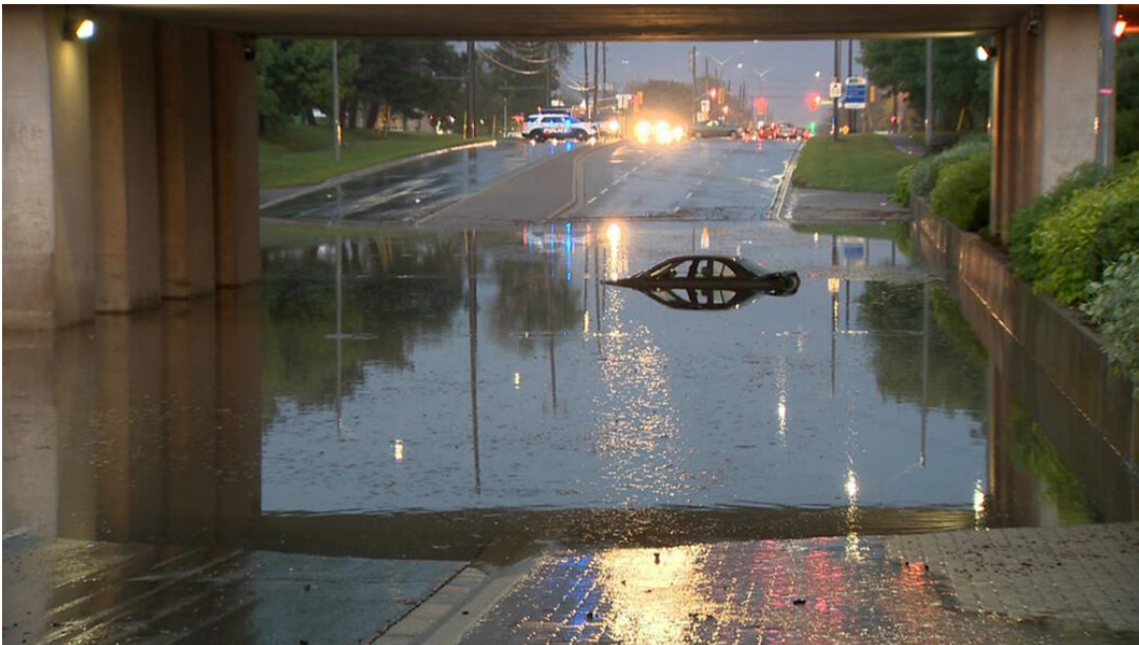
Figure 5: August 2014 Burlington, ON Flood (Source: Robert Deeks)



b- Pressures on the Built Environment and Infrastructure

Severe weather conditions such as windstorms and flash floods caused and/or amplified by climate change are increasingly putting pressure on the built environment and existing municipal infrastructure. Such extreme weather events have tested the drainage capacity and resilience of stormwater infrastructure. For instance, the Burlington flood of 2014, which resulted in the equivalent of nearly two months of rain in approximately eight hours, overwhelmed the stormwater management network, impacting many roads and highways and more than 3000 homes¹⁵ (Figure 6).

Figure 6: Heavy rain over the City of Burlington, Ontario, 2014¹⁶



¹⁵ The City of Burlington, Flood Recovery: <https://www.burlington.ca/en/services-for-you/Flood-Recovery.asp>

¹⁶ City of Burlington. <https://www.burlington.ca/en/services-for-you/Remembering-the-Flood-Five-Years-Later.asp#>

c- Threats to the Natural Environment

Natural environments provide habitat for wildlife including species-at-risk. They are instrumental in maintaining ecosystem services like clean air and water, as well as ensuring urban resilience to extreme weather events. In addition, these environments play an integral role in the global carbon cycle by sequestering carbon dioxide in both terrestrial and aquatic environments.

GHG emission-driven warming is globally destabilizing these environments by accelerating the depletion of freshwaters, the degradation of soils and the loss of terrestrial and aquatic biodiversity. It is also contributing to the spread of invasive species and pest outbreaks. In Halton, and during the 2013 severe ice storm, major damage was sustained to the Region's tree canopy. The Town of Halton Hills was at the centre of the storm that deposited over 30 mm of ice over the Town's trees and caused unprecedented and long lasting destruction to this major resource.

Figure 7: View of Scotsdale Farm, Halton Hills, with trees broken under the weight of the ice (source: Halton Hills Public Library).



d- Agricultural Impacts

As climate change is expected to generate stronger and more frequent hazardous weather events such as intense rain and ice storms, there is a growing concern over impacts on crop production and agricultural businesses. This is particularly significant for Halton Region which has some of Ontario's most productive agricultural lands¹⁷.

Climate change has already impacted seasonal weather predictability, making it increasingly difficult for farmers to plan for planting and harvesting. Further, higher temperatures and flash floods are causing erosion, depleting soil, and increasingly limiting successful crops.

In 2012, Halton Region experienced a very warm March that prompted apple trees out of dormancy into early bloom, only to be hit by freezing temperatures in April. These conditions caused a massive crop failure with the loss of 80% of the yield according to Ontario Apple Growers¹⁸. Conditions such as these resulted and continue to result in substantial increases in crop insurance premiums.

e- Economic Impacts

Damages caused by extreme weather conditions have resulted in record-setting economic costs. The Insurance Bureau of Canada estimated weather-related insurance

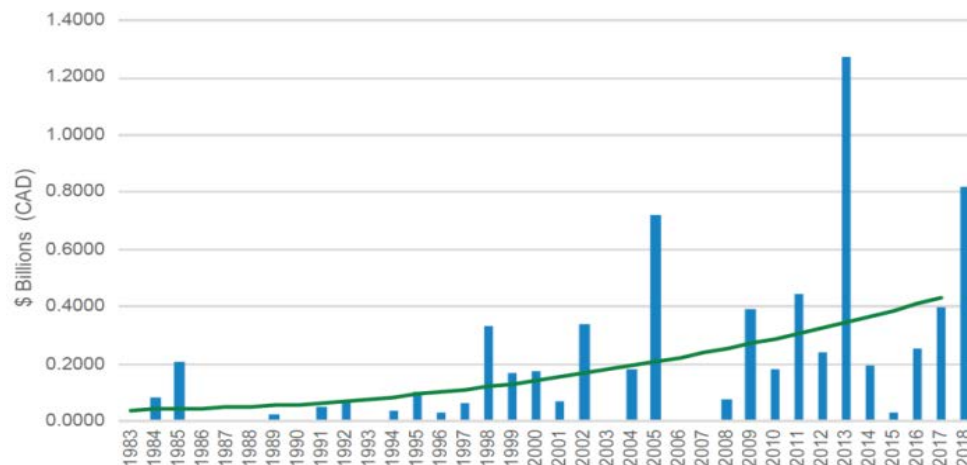
¹⁷ 2016 Census of Agriculture Data, 29% of Halton's total area was farmed.

¹⁸ Preparing for a Change in our Climate, a Report by the Town's Advisory Committee. Halton Hills 2013

damages for 2018 to be at \$1.4 billion¹⁹. In addition, according to environmental lawyer Dianne Saxe, for every \$1 billion dollars the insurance industry pays, there is another \$3 billion in costs to the public sector²⁰.

In Ontario, flash floods, wind and ice storms have financially impacted governments and individuals with exorbitant expenses. In 2013, the cost of Toronto's floods totaled \$940 million, while the 2014 Burlington floods left the municipality and its residents with \$90 million in insured damages²¹. These costs can be even higher if we take into account the fact that many people were not covered at all or only had partial coverage for overland flooding. Further, while these costs are concerning, the upward trend they seem to follow is further alarming since it clearly shows that these costs will continue to rise with time (Figure 8).

Figure 8: Record of losses greater than \$25 million due to catastrophic events in Ontario between 1983 to 2018²².



Given the rising trend of climate change related financial impacts, institutions have begun to look more closely at the hidden costs of extreme weather events, including impacts on the workforce in the aftermath of severe weather events. For instance, following the 2014 Burlington flood, a survey revealed that 56% of affected households with at least one working member took time off work for an average of 10 days per flooded household. This was ten times higher than the Ontario average for non-flooded households²³. Such interruptions have implications broadly on local businesses and economies.

Discussion Question 1:

Have you felt the impacts of climate change on your community? What impacts are of most concern to you in the next 20 years?

¹⁹ Insurance Business Canada, IBC: August Storm Caused Over \$80 million in Insured damage in Toronto. September 10, 2018.

²⁰ Climate Disruption in the Boardroom, The Canadian Bar Association, CBA National, Doug Beazley (Feb 2020)

²¹ Climate Action in Ontario: What's Next? 2018 GHGs Progress Report, Environmental Commissioner of Ontario (p29)

²² Ibid

²³ After the Flood, a study the Intact Centre on Climate Change in collaboration with University of Waterloo Intact and Manulife Financial (June 2018).

3.2 Response

3.2.1 Regional Efforts to Address Climate Change

Halton Region has a long history of efforts to reduce GHG emissions, adapt to climate change and environmental sustainability. These efforts are rooted in many of its existing plans and strategies. Local Regional Municipalities have also significantly addressed climate change through multiple plans, initiatives and programs as outlined in Appendix 2.

Halton's Strategic Business Plan 2019 – 2022 lists environmental sustainability and climate change as one of its five themes and highlights the importance of responding to climate change and reducing the Region's carbon footprint.

Building on the Region's strong climate change and sustainability awareness, Halton Regional Council passed a resolution to declare a climate change emergency during its September 11, 2019 meeting. The resolution aimed to underscore the Region's commitment to protecting and improving the resilience of its communities, environment and economy. The resolution followed similar ones declared by each of the Region's four municipal Councils as detailed in Appendix 2.

Additionally, the Regional climate change resolution directed staff to report on progress in many areas including the approach to managing growth and development to address climate considerations through the ROP.

Figure 9: Halton Region Strategic Business Plan 2019-2022



3.2.2 The Regional Official Plan - Responding to Climate Change

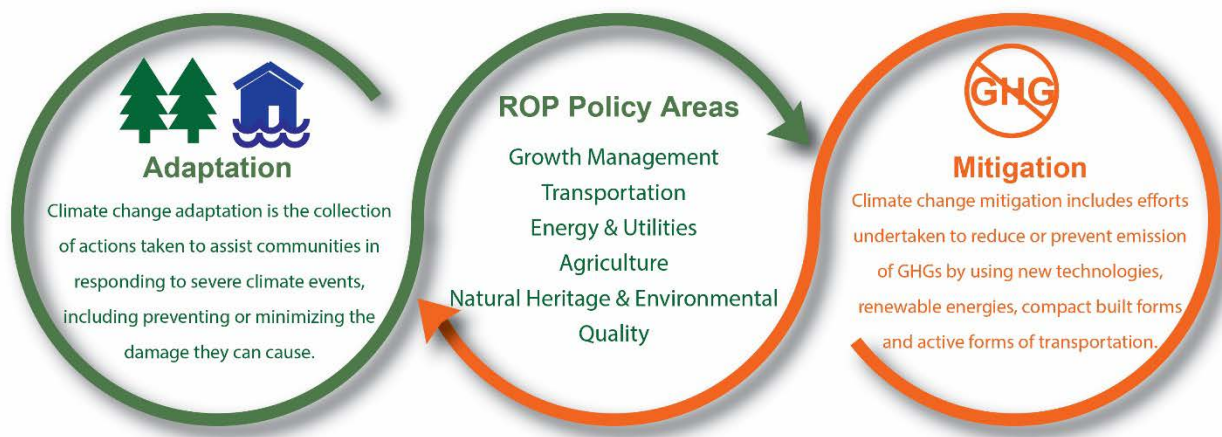
The ROP is a statutory document that is required by the Provincial legislation and that sets out the Region's land use and growth strategies. It is prepared with input from the public and helps to ensure future planning and development will meet the specific needs and priorities of its communities. Through its sustainable land use approach, the current ROP policies implicitly respond to climate change risks and threats. They do so by directing growth towards complete communities and away from natural heritage and agricultural lands.

The ROPR builds on this sustainability approach by integrating a climate change lens to explicitly and meaningfully address climate change by targeting the most impactful policy areas within the ROP from a GHG emission reduction standpoint. To this end, the ROPR's approach to responding to climate change will include both mitigative and adaptive policy directions, as defined in Figure 10. These directions will not be included as a ROP dedicated section, rather, they will be applied to existing ROP policy areas and themes as listed in the centre of Figure 10.

One of the guiding principles of the Growth Plan is to integrate climate change considerations into planning and managing growth such as planning for more resilient communities and infrastructure – that are adaptive to the impacts of a changing climate – and moving towards environmentally sustainable communities by incorporating approaches to reduce greenhouse gas emissions.

1.2.1 Guiding Principles A Place to Grow, 2019

Figure 10: Adaptation and mitigation through the ROP



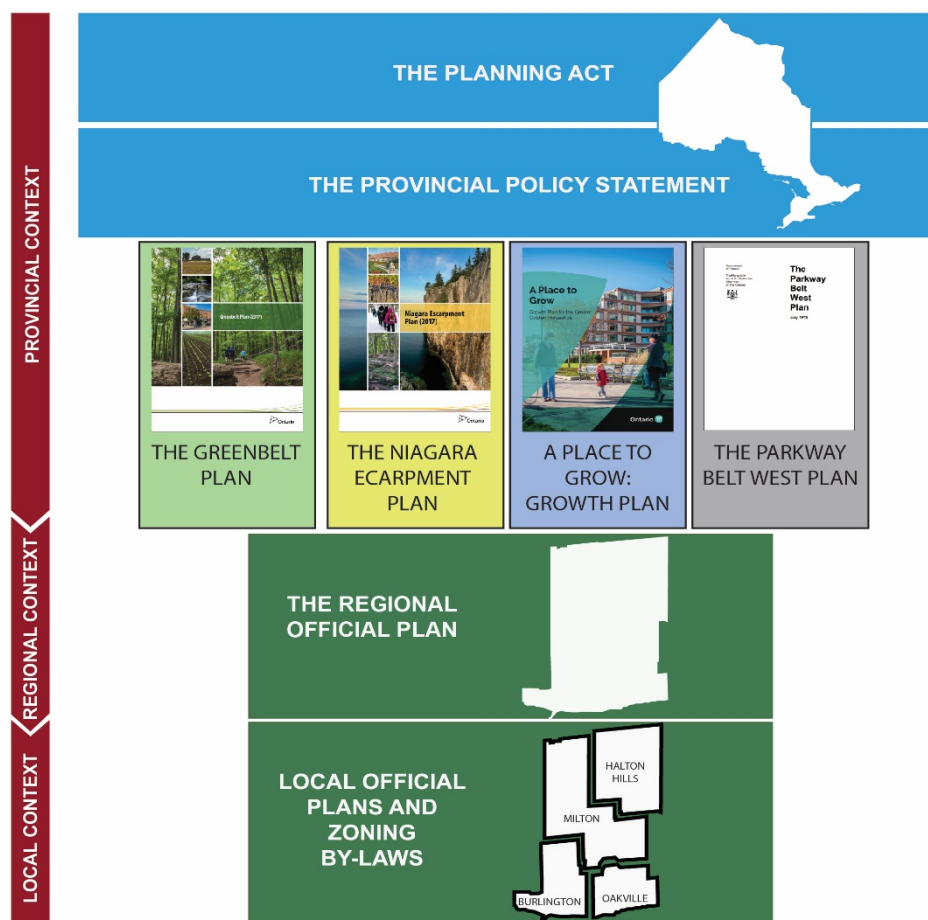
4. Climate Change through the ROPR

4.1 Ontario's Land Use Planning Framework

Halton is undertaking the ROPR in accordance with the Provincial requirements established in section 26 of the Planning Act. The ROPR will ensure that ROP will reflect the current provisions of the Planning Act, as well as Provincial policies and plans such as the [Provincial Policy Statement](#) (2020), [A Place to Grow: The Growth Plan for the Greater Golden Horseshoe](#) (2019), the [Greenbelt Plan](#) (2017) and the [Niagara Escarpment Plan](#) (2017). In particular, the ROPR will ensure that the climate change provisions of these documents are implemented.

The updated ROP will help inform Halton's local municipalities in updating their official plans and conforming to Provincial and Regional policies. This policy-led framework is represented in Figure 11.

Figure 11: Ontario's Land Use Planning Framework as Applicable to Halton Region.



4.1.1 The Planning Act

The *Planning Act* provides the statutory authority for land use planning in Ontario and provides the basis for municipalities to prepare their Official Plans and for privately-initiated planning applications such as applications for approval of a plan of subdivision. Section 2 of the *Planning Act* requires planning authorities to have regard to “the mitigation of greenhouse gas emissions and adaptation to a changing climate”²⁴, among other matters of provincial interest, in carrying out responsibilities under the Planning Act.

The *Planning Act* also requires, official plans to “contain policies that identify goals, objectives and actions to mitigate greenhouse gas emissions and to provide for adaptation to changing climate, including through increasing resiliency” (Part 3 Subsection 16(14))”²⁵.

4.1.2 The Provincial Policy Statement 2020

The Provincial Policy Statement, 2020 (PPS, 2020), issued under Section 3 of the Planning Act, which came into effect May 1, 2020, provides policy direction on matters of Provincial interests related to land use planning and development. It supports the financial well-being of the Province and municipalities over the long term and minimizes the undesirable effect of development on air, water and other resources. Subsections 1.1.1 (h) and (i) of the PPS, 2020 call for healthy, livable and safe communities that are sustained by, among other things, promoting development and land use patterns that conserve biodiversity and preparing for the regional and local impacts of a changing climate.

Furthermore, the PPS, 2020 directs planning authorities to support energy conservation and efficiency, improved air quality, reduced GHG emissions and preparing for the impacts of a changing climate by promoting compact form and a structure of nodes and corridors (Subsection 1.8.1(a)).

4.1.3 A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019)

The Growth Plan (2019) guides municipalities within the Greater Golden Horseshoe area through the process of planning to accommodate forecasted growth within “complete communities”.

With respect to climate change, the policies of the Growth Plan (2019) aim to “integrate climate change considerations into planning and managing growth such as planning for more resilient communities and infrastructure – that are adaptive to the impacts of a changing climate – and moving towards environmentally sustainable communities, by incorporating approaches to reduce greenhouse gas emissions” (section 1.2.1).

²⁴ The Planning Act 1990, Part I, Section 2

²⁵ The Planning Act 1990, Part III Section 16 (14)

4.1.4 The Greenbelt and the Niagara Escarpment Plans

Both the Greenbelt and the Niagara Escarpment plans were updated in 2017. The Greenbelt Plan (2017) provides a “permanent protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south central Ontario will be organized” (section 1.2.1). Similarly, the Niagara Escarpment Plan (2017) aims to provide for the “maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment”²⁶.

Building resilience to address and mitigate the effects of climate change is fundamental to the Greenbelt and the Niagara Escarpment plans. Both plans help protect and enhance areas that contain important cultural heritage resources and natural habitats that provide essential ecosystem services, including water storage, water and air filtration, biodiversity, support of pollinators, carbon storage and resilience to climate change. Furthermore, both plans contain policies aimed at reducing GHG emission levels in permitted developments through the use of green infrastructure and appropriate low impact and compatible development.

4.1.5 Regional Official Plan

Halton’s current Official Plan provides the broad policy framework to inform land use decisions related to growth, development, environmental protection and resource management in Halton Region. Embedded within the Regional Official Plan are direct and indirect policies that address climate change including promoting compact development, supporting energy and water conservation, improving air quality, facilitating energy conservation, and reducing GHG emission levels. As the current ROP is being updated through the ROPR, this process provides an opportunity to enhance the existing policy framework in accordance with Provincial policies and provide direction to Halton’s local municipalities in updating their Official Plans and Zoning By-laws to address climate change.

4.1.6 Local Municipal Official Plans and By-Laws

Halton’s local municipalities (the City of Burlington and the Towns of Halton Hills, Milton and Oakville) have Official Plans that have been developed to address local requirements while aligning with the ROP and Provincial policies. Local Official Plans provide more specific policy direction to address matters related to growth, development, land use, built form and community design. Each Local Official plan contains climate change related policies through the application of site-specific land use designations, built forms and transportation networks. The ROPR provides an opportunity to provide further direction to local municipalities to address climate change considerations when updating local policies.

²⁶Niagara Escarpment Plan 2017 (p07)

4.1.7 Conservation Authorities (CA)

In Ontario, conservation authorities (CAs) are public sector organizations that provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario.

Halton Region has longstanding collaborative relationships with Conservation Halton, Credit Valley Conservation Authority and Grand River Conservation Authority. The relationship with the Halton area CAs is defined and outlined in a Memorandum of Understanding (MOU) that is updated periodically to address roles and responsibilities relating to many matters including climate change mitigation and adaptation²⁷. The ROPR provides an opportunity to consider input from our CA partners in strengthening land use policies to address climate change.

4.2 Opportunities to Enhance ROP Climate Change Policies

Based on a policy review of the ROP, there are opportunities, through the ROPR, to strengthen a number of land use policy areas and themes to better respond to climate change. These policy areas are derived directly from the ROP, align with those policy areas identified in the [ROPR Phase One Directions Report](#) and have a direct impact on GHG emission management. These policy areas have also been identified as necessary in order to address Provincial consistency and conformity requirements and they are:

- Growth Management
- Transportation
- Energy and utilities
- Agriculture
- Natural Heritage and Environmental Quality

Discussion Question 2:

How do you think the Regional Official Plan can help Halton respond to climate change? What mitigation and adaptation actions would you like to see embedded in the ROP?

²⁷ Memorandum of Understanding Between the Regional Municipality of Halton, City of Burlington, Town of Halton Hills, Town of Milton, Town of Oakville, Halton Region Conservation Authority, Credit Valley Conservation Authority, And Grand River Conservation Authority for an Integrated Halton Area Planning System. May 30, 2018 (p11)

4.2.1 Growth Management

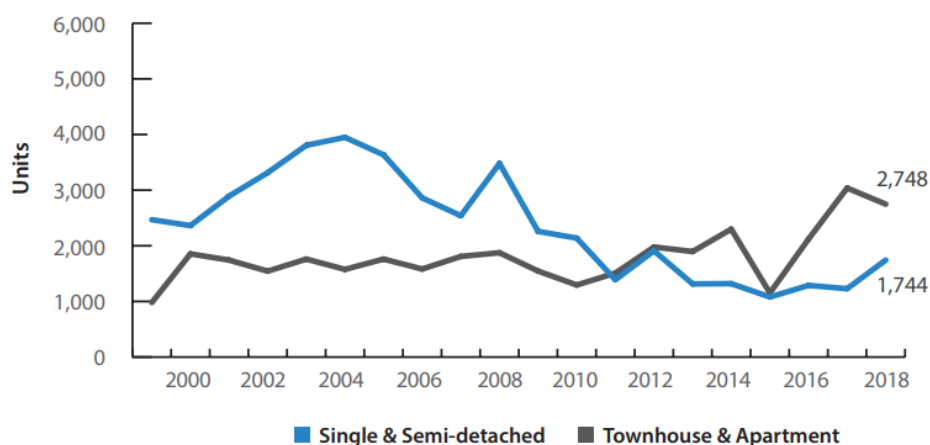
Sustainability has been a goal of the Region since the Halton Urban Structure Plan in the 1990s and the Sustainable Halton growth management process through the mid-2000s. The current ROP reflects the importance that the Region has placed on sustainability over the years, including climate change. The policies of the ROP direct growth away from agricultural and natural heritage lands towards intensification areas such as Urban Growth Centres (UGC), Major Transit Station Areas (MTSA) and Intensification Corridors. The ROP also identifies and protects vital employment areas that are in close proximity to major transportation corridors to reduce traffic and improve access. Further, the ROP sets density targets for new Greenfield development to reduce sprawl.

In addition to directing growth towards intensification areas, growth management policies that resulted from Sustainable Halton aimed to change the trend of building low density, spatially expansive and automobile-dependent communities by implementing a housing mix target of at least 50% of new housing to be higher density in the form of townhouses or apartment buildings. These policies effectively helped to increase the range and mix of higher density housing completions and sales as shown in Figure 13.

Figure 12: Conceptual illustrations of future development in the North Oakville Secondary Plan area, which was part of the Region's last round of comprehensive growth planning. Images: Brook McIlroy Inc.



Figure 13: Number of completions, starts and under construction units, Halton Region 1998-2018²⁸



Source: CMHC Starts and Completions Survey 1998-2018

²⁸ State of Housing Report 2018 (p08)

Both intensification and housing mix policy directions have contributed to the development of more compact communities that are transit-oriented, pedestrian-friendly and well-connected to schools, jobs, and services. These policies have addressed climate change by protecting valuable natural heritage and agricultural lands and establishing a policy framework for building complete communities.

Building on the complete communities approach and through the application of a climate change lens, the ROPR aims to enhance the current sustainability framework in the ROP to include explicit land use policies that address climate change.

Within the Urban Area, the focus should continue to be on complete communities and compact urban form while protecting the Natural Heritage System. Newer Greenfield development, if needed, should be planned for in a way that significantly reduces future GHG emissions. These objectives are achieved by putting a greater emphasis on coordinating growth with transit and through stronger policy directions supporting efficient energy and resource use.

Complete Communities: Places such as mixed-use neighbourhoods or other areas within cities, towns, and settlement areas that offer and support opportunities for people of all ages and abilities to conveniently access most of the necessities for daily living, including an appropriate mix of jobs, local stores, and services, a full range of housing, transportation options and public service facilities. Complete communities are age-friendly and may take different shapes and forms appropriate to their contexts

A Place to Grow, 2019

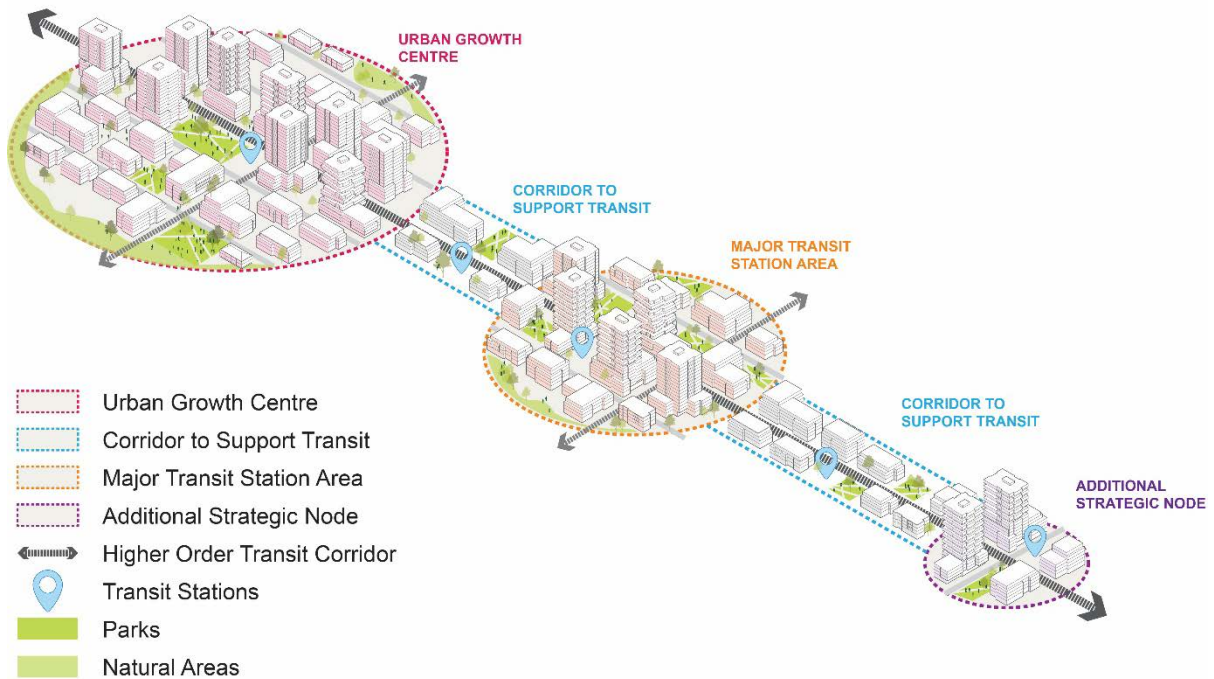
The application of a climate change lens to the IGMS component of the ROPR, which guides the process of integrating Growth Plan (2019) policies, mapping and growth forecasts to the year 2041 into the ROP and ultimately in Local Official Plans, is an important step to ensure growth does not result in higher GHG emissions from buildings and transportation. The climate change lens will help guide the IGMS work in deciding where growth takes place, how it is shaped, and how it can promote long-term resilience in Halton. In order to address climate change, the IGMS work will address the following priorities:

Where Should Halton Grow:

Focusing higher densities in strategic growth areas that are planned to be transit-supportive, walkable, and well-serviced will reduce the need to drive private automobiles and decrease GHG emissions.

The IGMS Regional Urban Structure Discussion Paper explores the hierarchy of growth nodes such as Urban Growth Centres, MTSA's and corridors, as shown in Figure 14, and discusses their role in accommodating the Region's forecasted growth while supporting transit, connectivity and walkability to reduce GHG emissions.

Figure 14: Conceptual Hierarchy of Nodes and Corridors.



The IGMS Regional Urban Structure Discussion Paper also examines the potential need to expand the current Urban Boundary to include new Greenfield areas to accommodate growth to the year 2041. If required, locations for these new Greenfield communities will consider connectivity to existing communities within the Urban Area, as well as their impact on natural heritage and agricultural lands. If the IGMS work for the ROPR determines that new Greenfield areas are required to accommodate growth to 2041, it is important to establish a policy framework that guides the future development of these new Greenfield communities in a manner that significantly reduces their GHG emissions.

How Should Halton Grow:

The recent review of the [Regional Comprehensive Housing Strategy 2014-2024](#) reinforced the policy of the Region to ensure an adequate mix and variety of housing to meet the needs of all residents and support complete and healthy communities.

There are opportunities to increase the mix and variety of housing in the Region, especially in growth nodes such as MTSAs and intensification corridors, where higher density forms of development may be permitted. A greater variety of housing can also support transit growth and ridership and more compact patterns of development that can foster walkability and reduce auto-dependence.

In addition to helping to reduce auto-dependence, a healthy variety of housing, especially higher density housing forms, where appropriate, can significantly reduce the Region's GHG emissions from buildings. This is largely due to the fact that higher density, multi-unit housing tends to be more energy efficient than single-detached housing. In fact, single-family, detached households have been shown to consume up to twice the energy for cooling and heating required by comparable households living in multi-family units²⁹.

Figure 15: Comprehensive Housing Strategy 2014-2024 - Five-year Review



Discussion Question 3:

Should more be done through Regional Official Plan policies to specifically tie growth management to climate change? If so, what should be done?

²⁹ Ryerson City Building Institute 2020. Density Done Right (p32)

How should Halton Build

Buildings designed and built according to sustainable development practices, standards and guidelines have significantly lower energy consumption and emission rates than conventionally designed and built buildings. As a result, many municipalities, including Halton's local municipalities, have adopted policies and standards that mandate and enforce sustainable building practices. Through the ROPR there is an opportunity to enhance sustainable development policies and criteria in the ROP with a stronger emphasis on climate change. These policies and criteria will help to reinforce existing Local municipal policies and programs and emphasize the Region's resolve to enhance policies to respond to climate change. These policies and criteria may include:

- Requiring sustainable development practices that promote energy and water conservation, better air quality, efficient waste management, active and public transportation and an enhanced natural environment.
- Requiring transit-supportive design for all development to ensure accessibility and promote active transportation.
- Enforcing or incentivizing adherence to local green development standards and sustainable development guidelines for all new development, particularly in major growth areas where development and redevelopment may occur.

Figure 16: Acton Library Branch – LEED Gold Certified.



Local Municipal Green Development Standards:

The Town of Halton Hill's Green Development Standards program encourages the inclusion of a range of measures to reduce the environmental impact of new developments. Structured as a LEED-like (LEED: Leadership in Energy and Environmental Design) point-based system with a menu of options, the program includes several items related to energy efficiency and others that focus on climate resiliency – such as low impact design (LID) storm water management.

4.2.2 Transportation

The current ROP provides strong policy direction to support an efficient transportation network that, among other objectives, minimizes the impact on the environment and promotes energy efficiency. The Region has also undertaken multiple transportation studies to help shape its network and support growth, such as the Transportation and Active Transportation Master Plans, the Mobility Management Strategy (MMS) and, recently, the Defining Major Transit Requirements (DMTR) study.

Both the MMS and DMTR helped establish and refine a Regional higher order transit network that can connect the Region's Urban Growth Centres, MTSAs and other strategic growth nodes while providing a base to permit the future integration of local transit services.

Building on the MMS and recommendations from the DMTR, the IGMS Regional Urban Structure Discussion Paper examines how future growth could be directed to support the Regional higher order network to promote transit use.

The IGMS Regional Urban Structure Paper also examines opportunities to link transportation and growth management in order to enable complete streets to be implemented in growth areas. Complete streets, in addition to transit-supportive mixed-use communities, will encourage people to choose alternative forms of transportation other than driving. This is particularly important given that almost 90% of trips made on an average weekday in Halton are automobile trips³⁰, which further contributes to the Region's GHG emissions.

Upper- and single-tier municipalities will develop policies in their official plans to identify actions that will reduce greenhouse gas emissions and address climate change adaptation goals, aligned with other provincial plans and policies for environmental protection, that will include:

- a) supporting the achievement of complete communities as well as the minimum intensification and density targets in this Plan;
- b) reducing dependence on the automobile and supporting existing and planned transit and active transportation

4.2.10 Climate Change A Place to Grow (2019)

Discussion Question 4:

What do you think the Region should do to help you reduce your GHG emissions? For example, if you typically commute by car to work or school every day, what would make you consider taking transit, biking, walking?

³⁰ Source: Transportation Tomorrow Survey, 2011

4.2.3 Energy and Utilities

In 2018, the Province of Ontario introduced the *Green Energy Repeal Act, 2018* which, in addition to repealing the *Green Energy Act, 2009*, introduced changes to the *Planning Act* to restore municipal planning authority related to the siting of renewable energy generation facilities, and restrict appeals on municipal refusals and non-decisions. These recent legislative changes gave municipalities the authority to implement policies for energy conservation, renewable energy and energy distribution in accordance with the PPS, 2020 and the Growth Plan, 2019.

In parallel with provincial policy changes, local municipalities in Halton have been working to develop energy plans that can help conserve energy at domestic and delivery end use levels as well as lower GHG emissions. This is particularly important as municipalities can have a major influence on the key long-cycle drivers of energy use and infrastructure requirements for energy distribution. Decisions on housing densities, for example, will influence future building energy requirements, transportation options, and the energy required to deliver water, waste water and waste collection services.

In addition, coordinating energy planning with growth management promotes the optimization of energy infrastructure and provides the density and economies of scale required to support distributed energy resources and alternative energy systems in complete communities.

The ROPR provides a great opportunity to enhance ROP policies in order to:

- Promote the integration of energy planning and energy efficient design in the development of complete communities.

A renewable energy source is an energy source that is renewed by natural processes and includes wind, water, biomass, biogas, biofuel, solar energy, geothermal energy and tidal forces.

PPS, 2020

Municipalities will develop and implement official plan policies and other strategies in support of the following conservation objectives:

b) energy conservation for existing buildings and planned developments, including municipally owned facilities, including through:

i. identification of opportunities for conservation, energy efficiency and demand management, as well as district energy generation, renewable energy systems and alternative energy systems and distribution through community, municipal, and regional energy planning processes, and in the development of conservation and demand management plans;

ii. land use patterns and urban design standards that support energy efficiency and demand reductions, and opportunities for alternative energy systems, including district energy systems; and

iii. other conservation, energy efficiency and demand management techniques to use energy wisely as well as reduce consumption;

4.2.9 A Culture of Conservation

- Support opportunities to incorporate distributed energy resources and alternative energy systems in new developments (i.e. 5th and 6th generation district heating and cooling networks).
- Promote district energy, solar energy, and energy efficiency in new development (such as secondary plans) in collaboration with the local municipalities.

Discussion Question 5:

Do you think the Region should encourage and support local renewable energy sources? If so, what should be considered?

4.2.4 Agriculture

The current ROP includes an Agricultural System which aims to maintain a permanently secure, economically viable agricultural industry and to preserve the open-space character and landscape of Halton's non-urbanized areas. The Agricultural System plays an important role in mitigating climate change impacts given the carbon sequestration function of soils and the increasing use of sustainable farm practices such as no-tilling, precision agriculture, windbreaks and cover crops.

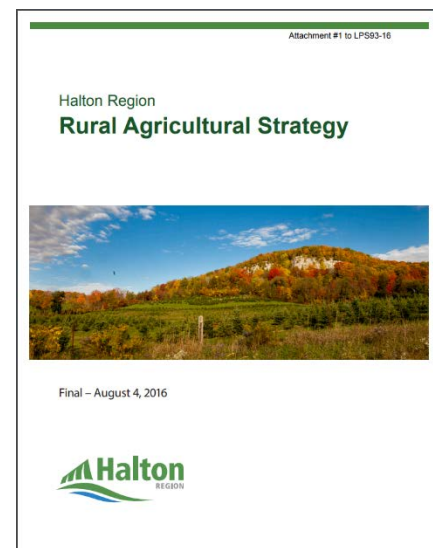
A portion of the Agricultural System overlaps with the Natural Heritage System in the rural countryside outside of Halton's urban areas. The ROP recognizes that within these areas agricultural operations and natural heritage protection can co-exist, thus offering an opportunity to promote environmentally progressive stewardship practices that do not inhibit agricultural production.

Sustainable farm practices and stewardship activities may be promoted by developing land use policies that are supportive of agriculture-related and on-farm diversified uses. These uses are commercial or industrial uses that are directly related to a farm operation. The diversification of agricultural operations will provide better access to revenue streams that allow farmers to invest in more viable practices and promote agricultural and food resilience in response to climate change threats.

Figure 17: Agricultural Lands.
Source: Halton Region Strategic Plan 2019-2022



Figure 18: Halton Region Rural Agricultural Strategy



The Regional Rural Agricultural Strategy proposed new approaches and programs to promote sustainable forms of agriculture which will implicitly address climate change concerns (e.g. Farm-Based Anaerobic Digestion & Biogas Management).

As part of the ROPR Agricultural and Rural Systems review, policy updates to the Region's Agricultural System policies are being considered. This review would benefit from policy recommendations that can support agricultural resiliency in response to climate change which may include:

- Protecting the agricultural land base from fragmentation by directing growth to designated nodes and corridors and within compact built form in the urban area.
- Promoting agriculture-related and on-farm diversified uses to better support the agricultural industry.
- Strengthening existing ROP direction and/or RAS implementation actions that encourage sustainable and environmentally progressive farm practices.

Discussion Question 6:

Can you provide examples of opportunities to address climate change as it relates to agriculture that you would like to see in Halton?

4.2.5 Natural Heritage and Environmental Quality

A major goal of the current ROP is to protect and maintain a high-quality natural environment that will sustain life, maintain health, and enhance the quality of life for present residents and future generations. However, Halton's Natural Heritage System (NHS) and its environmental quality are under pressure from threats both caused or amplified by climate change. These threats can impact the Region's ability to meet and maintain one of its Strategic Plan outcomes and measures to maintain 50% of the region within the NHS³¹.

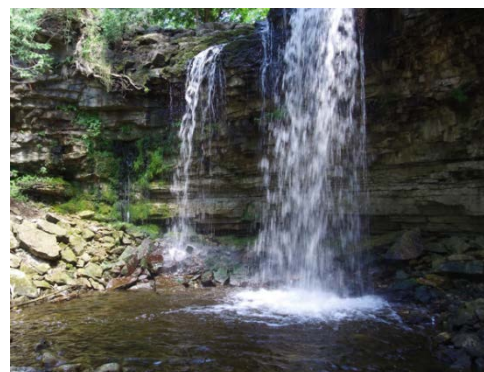
Regional Natural Heritage System

Halton is well known for its biologically diverse Natural Heritage System (NHS) of natural heritage features and areas (e.g. forests, wetlands, valleylands) that can act as a carbon sink.

Halton Region has been at the forefront of natural heritage planning since the 1980s, and protecting and enhancing the NHS remains a fundamental value of Halton's Planning Vision in the ROP.

The 1980 ROP introduced Environmentally Significant Areas which protected about 13.4% of Halton. The ROP policies targeted the protection of

Figure 19: Hilton Falls – Conservation Halton

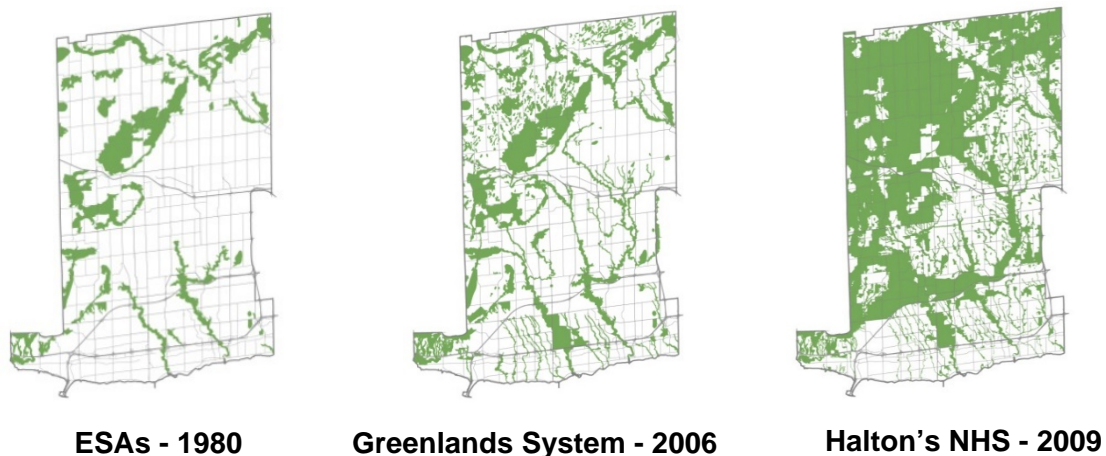


³¹ Halton's Regional Strategic Action Plan 2019-2022, p(22)

individual sensitive features and areas, which was considered a feature-based approach to environmental protection. The 2006 ROP built on this strong foundation by introducing comprehensive protection of the natural heritage features and areas that were identified in the 1997 Provincial Policy Statement. These protected areas, called the Greenlands System, covered about 21.9% of the Region. However, despite its name, the Greenlands System was essentially still a feature-based approach to natural heritage protection.

Halton's current NHS (ROPA 38), adopts a true "systems approach" that includes the protection of 'non-features' such as linkages and enhancement areas. This systems approach in the ROP now protects about 50.6% of the Region, giving Halton an even stronger ability to mitigate climate change through carbon sequestration and a resilient system that responds to severe weather events such as floods.

Figure 20: The Evolution of Natural Heritage Protection in Halton Region



As part of the ROPR, the NHS policies and mapping in the current ROP are under review to address Provincial conformity requirements and to identify ways to further protect and enhance the Region's NHS. The ROPR NHS Discussion Paper presents technical mapping and policy analysis that will examine natural hazards, water resource and source water protection. Part of this analysis considers some flood mitigation and remediation practices such as water storage and wetland preservation in flood-prone areas. Given the increasing threat of potential damage to NHS due to more frequent and severe weather events, ROP policies should be enhanced to address climate change by:

- Strengthening the ROP natural heritage system policy framework to incorporate climate change considerations and refine mapping of the natural heritage system.
- Building on the existing research and literature to require studies such as subwatershed studies and plans to 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 and restore Halton's NHS to help mitigate against climate change through the Region's Natural Heritage Strategy.

According to the PPS, 2020, planning authorities are required to consider the potential impacts of climate change in increasing risks associated with natural hazards (e.g. fires and floods).

Discussion Question 7:

How can ROP policies be enhanced to address climate change impacts on natural hazards?

Air Quality

The current ROP addresses issues related to air quality as they relate to climate change by supporting urban forms that will reduce long distance trip-making and the reliance on automobiles and through the promotion of active transportation and the use of public transit (ROP, Section 142 and 143).

Current ROP policies also require the provision of facilities for active transportation, where appropriate, and tree planting and landscaping initiatives to improve air quality.

Enhancement of ROP policies related to air quality should include more explicit policies promoting compact built forms and nodes and corridors that maximise active transportation and the use of transit to align with the PPS, 2020.

Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns which:

- a) promote compact form and a structure of nodes and corridors;
- b) promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;

1.8 Energy Conservation, Air Quality and Climate Change

PPS, 2020

Discussion Question 8:

Are there additional measures the ROP should include to improve air quality?

Water

Through the ROPR Natural Heritage Discussion Paper, and to satisfy new requirements of the PPS, 2020, the Greenbelt Plan (2017) and the Growth Plan (2019), a water resources system must be identified in the ROP which includes incorporating new terms, mapping and policies. In addition to the scope of this review, consideration of the vulnerability of water resources and infrastructure to climate change are important. The Region should explore ways that are consistent with the protection of the NHS that will help mitigate against climate change events and protect water resources using low impact development and green infrastructure approaches to stormwater management.

Planning authorities shall protect, improve or restore the quality and quantity of water by:

...

c) evaluating and preparing for the impacts of a changing climate to water resource systems at the watershed level;

...

2.2 Water PPS, 2020

5. Next Steps

The overall goal of the climate change component of the ROPR is to ensure Provincial policy conformity by identifying opportunities to address climate change concerns as they relate to land use matters in the ROP.

This Discussion Paper summarizes the key findings of background research and analysis and identifies the principal areas where the ROPR could address climate change and outlines potential policy considerations for the ROP.

The Discussion Paper will form the basis for consultation with municipalities, conservation authorities, and the public as part of the ROPR. Following public consultation, a policy directions report will be brought forward to Council to guide policy drafting work for climate change in the ROP as part of Phase 3 of the ROPR.

6. Acronym Glossary

CA	Conservation Authority
CCCR	Canada's Changing Climate Report
CH ₄	Methane
CO ₂	Carbon Dioxide
DMTR	Defining Major Transit Requirements
GHG	Greenhouse Gas
ICLEI	International Council for Local Environmental Initiatives
ICSS	Integrated Community Sustainability Strategy
IGMS	Integrated Growth Management Strategy
IPCC	Intergovernmental Panel on Climate Change
LID	Low Impact Design
LEED	Leadership in Energy and Environmental Design
MMS	Mobility Management Strategy
MOU	Memorandum of Understanding
MTSA	Major Transit Station Area
N ₂ O	Nitrous Oxide
NEP	Niagara Escarpment Plan
NHS	Natural Heritage System
PCP	Partners for Climate Protection
PPS	Provincial Policy Statement
RAS	Regional Rural Agricultural Strategy
ROP	Regional Official Plan
ROPA	Regional Official Plan Amendment
ROPR	Regional Official Plan Review
UN	United Nations
TPC	Transit Priority Corridor

7. Glossary of Terms

Agricultural system: The system mapped and issued by the Province in accordance with this Plan, comprised of a group of inter-connected elements that collectively create a viable, thriving agricultural sector. It has two components: 1. an agricultural land base comprised of prime agricultural areas, including specialty crop areas, and rural lands that together create a continuous productive land base for agriculture; 2.) An agri-food network which includes infrastructure, services, and assets important to the viability of the agri-food sector. (Greenbelt Plan 2017)

A system comprised of a group of inter-connected elements that collectively create a viable, thriving agricultural sector. It has two components:

- a. An agricultural land base comprised of prime agricultural areas, including specialty crop areas, and rural lands that together create a continuous productive land base for agriculture; and
- b. An agri-food network which includes infrastructures, services, and assets important to the viability of the agri-food sector. (PPS 2020)

Carbon Footprint: Amount of carbon emitted by an activity or organization.

Carbon Sequestration: Carbon sequestration is an important ecosystem service provided by protected areas. Vegetation (trees, shrubs, and grasslands) through the process of photosynthesis, absorb carbon dioxide from the atmosphere, and store it in the form of organic carbon in various plant and root biomass over a period of time (generally their respective life period).

Climate Change: change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (The United Nations Framework Convention on Climate Change, 2011)

Greenhouse Gas (GHG): Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorbs and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. (based on definition by Intergovernmental Panel on Climate Change)

Global Warming: Recent rise in the average global temperature caused by increased concentrations of greenhouse gases trapped in the atmosphere, which are largely caused by burning fossil fuels to produce energy and human activities (adopted from Ontario's Climate Change Strategy, 2015)

Integrated Growth Management Strategy (IGMS): A strategy in preparation by Halton Region during its current municipal comprehensive review (MCR) to establish a vision

and implementation plan to guide growth and development in Halton and its local municipalities to 2041.

Resilience: The ability to recover from difficulties and return to original state or form.

Employment Area: Areas designated in an official plan for clusters of business and economic activities including, but not limited to, manufacturing, warehousing, offices, and associated retail and ancillary facilities (PPS, 2020)

Greenfield (Designated Greenfield Area): Lands within settlement areas (not including rural settlements) but outside of delineated built-up areas that have been designated in an official plan for development and are required to accommodate forecasted growth to the horizon of this Plan. Designated greenfield areas do not include excess lands. (Growth Plan, 2019)

Intensification Corridors: Areas identified along major roads, arterials or higher order transit corridors that have the potential to provide a focus for higher density mixed-use development consistent with planned transit service levels (Halton Regional Official Plan, June 2018 Office Consolidation)

Major Transit Station Areas (MTSA): The area including and around any existing or planned higher order transit station or stop within a settlement area; or the area including and around a major bus depot in an urban core. Major transit station areas generally are defined as area within an approximate 500 to 800 metre radius of a transit station, representing about a 10-minute walk (Growth Plan, 2019)

Municipal comprehensive review: A new official plan, or an official plan amendment, initiated by and upper- or single-tier municipality under section 26 of the Planning Act that comprehensively applies the policies and schedules of A Place to Grow: Growth Plan for the Greater Golden Horseshoe. (Growth Plan, 2019)

Natural Heritage System (NHS): A system made of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. The system can include key natural heritage features, key hydrologic features, federal and provincial parks and conservation reserves, other natural heritage features and areas, lands that have been restored or have the potential to be restored to a natural state, associated areas that support hydrologic functions, and working landscapes that enable ecological functions to continue (Based on PPS, 2020 and modified for the Growth Plan, 2019)

Urban Growth Centres (UGC): Existing or emerging downtown areas shown in Schedule 4 of the Growth Plan, 2019 and as further identified by the Minister on April 2, 2008 (Growth Plan, 2019)

8. Appendices

Appendix 1: Climate Change Discussion Section

We welcome your feedback on the content of this Discussion Paper. Below is a summary of questions posed throughout the Discussion Paper. Please take a moment to answer these questions and provide your valuable insight into these issues:

1. Have you felt the impacts of climate change on your community? What impacts are of most concern to you in the next 20 years?

2. How do you think the Regional Official Plan can help Halton respond to climate change? What mitigation and adaptation actions would you like to see embedded in the ROP?

3. Halton's population is forecast to grow to one million people and accommodate 470,000 jobs by 2041.

What do you think about policies to plan for climate change through more compact urban form and complete communities? In your opinion, are we growing in the right direction?

4. What do you think the Region should do to help you reduce your GHG emissions? For example, if you typically commute by car to work or school every day, what would make you consider taking transit, biking, walking?

5. Do you think the Region should encourage and support local renewable energy sources? If so, what should be considered?

6. Can you provide examples of opportunities to address climate change as it relates to agriculture that you would like to see in Halton?

7. According to the PPS, 2020, planning authorities are required to consider the potential impacts of climate change in increasing risks associated with natural hazards (e.g. fires and floods).

How can ROP policies be enhanced to address climate change impacts on natural hazards?

8. Are there additional measures the ROP should include to improve air quality?

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Appendix 2: Climate Change Action Framework

Global Climate Change Action

One of the most highly acclaimed global climate change policies is the United Nations (UN) led Paris Agreement. The Paris Agreement was adopted in December 2015 in order to bring the 195 signing nations to a commitment to lower their GHG emissions. As of April 2018, 175 parties had ratified the Paris Agreement and 10 developing countries had submitted their first iteration of their national adaptation plans for responding to climate change³².

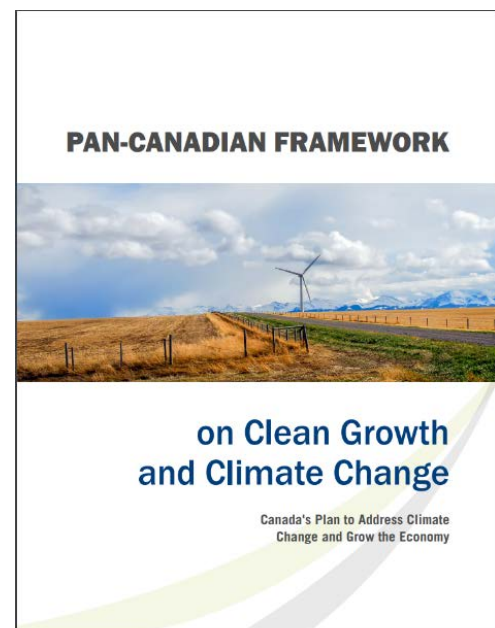
The legally binding agreement set as targets limiting global temperature increases to 2 degrees Celsius above pre-industrial levels, and establishing local GHG emission reduction targets referred to as “Intended Nationally Determined Contributions, INDCs”³³. Through the Paris agreement, Canada, as a signing member, has agreed to reduce its GHG emissions to 30% below the 2005 levels by the year 2030.

Parallel to the Paris Agreement, the UN developed 17 sustainable development goals that are a call for action by all countries to promote prosperity while protecting the planet. Goal 13 aims at taking urgent actions to combat climate change and its impacts, through affordable, scalable solutions that are now available to enable countries to move to cleaner, more resilient economies.

National Climate Change Action

The Pan-Canadian Framework on Clean Growth and Climate Change

The Pan-Canadian Framework on Clean Growth and Climate Change outlines Federal commitments to grow the economy while reducing emissions and building resilience. The framework allows Canada as a signing member of the Paris agreement, to meet its commitment to reduce GHG emissions to 30% below the 2005 levels by the year 2030. The framework also builds on the leadership of each of the provinces and territories to design policies and programs to meet emission-reductions targets, supported by federal investments in infrastructure, specific emission-reduction opportunities and clean technologies.



Cover of the Pan-Canadian Framework for Clean Growth and Climate Change 2016

³² European Commission (2015). Paris Agreement. <https://www.un.org/sustainabledevelopment/climate-change-2/>

³³ United nations Climate Change, The Paris Agreement. <https://unfccc.int/process/the-paris-agreement/what-is-the-paris-agreement>

Summary of areas of focus and actions within the Pan-Canadian Framework.³⁴



Pricing carbon pollution:

- Implement a pricing system by 2018.
- Establish an approach to review, assess and report on the effectiveness of the pricing system by 2022 to conform the path forward.



Taking action in each sector of the economy:

- Modernise industry sectors and improve their energy efficiency.
- Increase renewable and non-emitting energy sources.
- Retrofit existing buildings and promote energy efficient buildings.
- Use cleaner fuels and reduce reliance on diesel.



Adapting and building resilience against climate change:

- Provide authoritative climate information.
- Build regional adaptation capacity and expertise.
- Develop climate-resilient standards and infrastructure.
- Promote and protect community resilience and health.



Supporting clean technologies, innovation and job creation:

- Set ambitious targets to reduce GHG emission level.
- Support early-stage technologies, research and development.
- Strengthen support for skills development and business leadership.

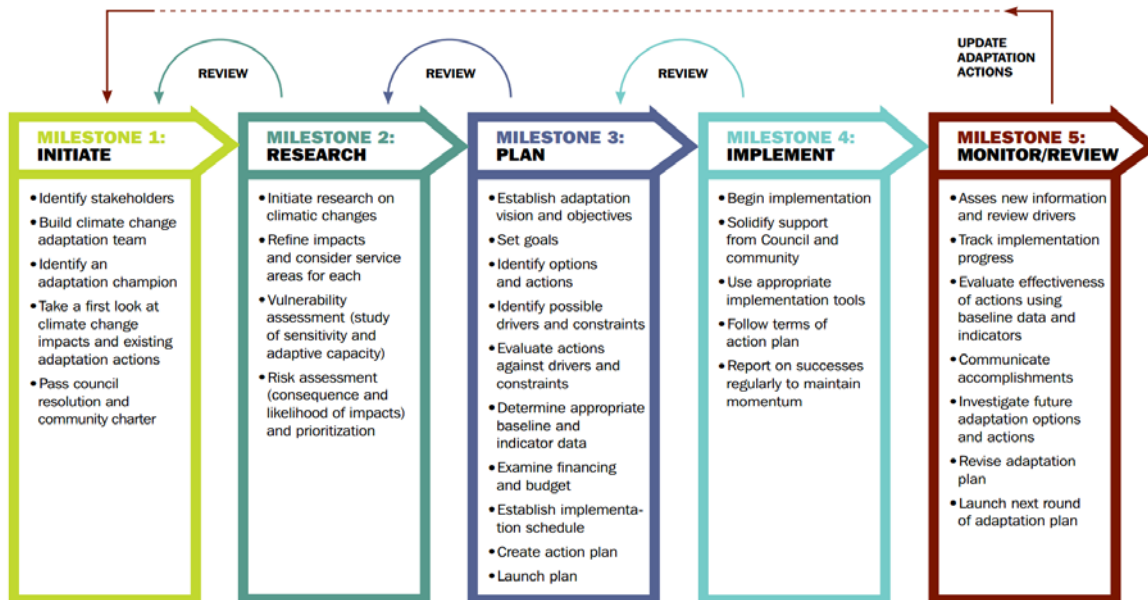
The International Council for Local Environmental Initiatives (ICLEI)

Parallel to the Pan-Canadian Framework, ICLEI Climate Adaptation Framework was put in place by an association of cities and local governments dedicated to sustainable development. ICLEI includes many Canadian cities and government agencies. ICLEI's methodology relies on a five-milestone approach to adaptation planning (see figure below), which moves participating local governments through a series of progressive steps. While each milestone builds off of the findings of the one before, the methodology as a whole creates an opportunity to re-evaluate and review findings and decisions³⁵.

³⁴ Government of Canada. (2016). Pan-Canadian Framework on Clean Growth and Climate Change

³⁵ ICLEI, Local Governments for Sustainability. Climate Change, Changing Communities: Guide Workbook for Municipal Climate Adaptation(06)

ICLEI adaptation methodology milestones³⁶



The Partners for Climate Protection (PCP)

In addition to the frameworks listed above, municipal governments that are committed to reduce their GHG emissions, including the Town of Oakville and the City of Burlington, have formed a partnership with the Federation of Canadian Municipalities and ICLEI known as the Partners for Climate Protection (PCP). The PCP mandate is to guide municipalities to develop GHG emission inventories, set GHG emission reduction targets, develop and carry out local climate action plans, and monitor results. These targets are achieved through the PCP's Five-Milestone Mitigation Planning Framework as described in the figure below.

³⁶ ICLEI, Local Governments for Sustainability. Climate Change, Changing Communities: Guide Workbook for Municipal Climate Adaptation P(08)

PCP five milestones framework to guide mitigation planning³⁷



Provincial – Ontario Climate Change Response

Preserving and Protecting our Environment for Future Generations: A Made-in-Ontario Environment Plan

The Made-in-Ontario Environment Plan represents a move away from carbon pricing policies established by an earlier Provincial government and the Government of Canada as it considers environmental policy more broadly. In this Plan, climate change resilience is conceived as a discrete theme among others including Protecting our Air, Lakes and Rivers, Reducing Litter and Waste in Our Communities and Keeping Our Land and Soil Clean and working towards reducing emissions by 30% below the 2005 level by 2030. The Climate Change theme acknowledges previous successes such as terminating coal-fired electricity generation to substantially reduce greenhouse gas emissions in Canada.

Based on this success, the Climate Change section of this plan focuses on potential actions to increase resilience through raising awareness around risks such as basement flooding. The plan also considers how the Building Code could better equip homes and buildings to withstand extreme weather as well as

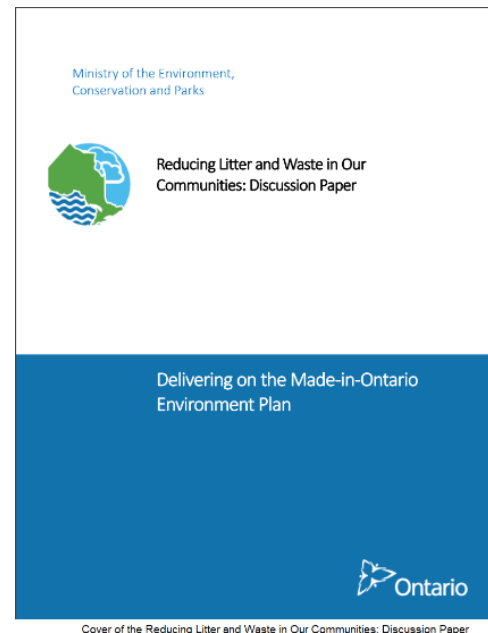


³⁷ Federation of Canadian Municipalities, Partners for Climate Protection. Milestone Framework.
<https://fcm.ca/en/programs/partners-climate-protection/milestone-framework>

how tax policies would be revised to support home owners in renovating to achieve these modernized Building Code provisions.

Reducing Litter and Waste in Our Communities: Discussion Paper – Delivering on the Made-in-Ontario Environment Plan

This Discussion Paper associated with the Provincial Made-In-Ontario Environment Plan focuses on a single theme introduced in the Plan: Reducing Litter and Waste in Our Communities and Keeping Our Land and Soil Clean. The Paper builds upon the direction to reduce food waste and divert organic waste from landfills. The discussion Paper indicates that reduction and diversion of food and organic waste can reduce climate change caused by methane emissions.



Regional Climate Change Response

Halton's Regional Corporate Sustainability Action Plan – 2014

The Corporate Sustainability Action Plan (CSAP) contains actions and targets and identifies implementation timelines over the life of the Plan³⁸. It includes examining ways to reduce the Region's corporate carbon footprint through sustainable practices and participating in energy conservation programs.

The Corporate sustainability plan coincided with the Region's participation with Partners for Climate Protection (PCP) through the submission of the Corporate Greenhouse Gas Emissions Inventory towards meeting milestone 1 of the PCP process.

Basement Flooding Mitigation Program

The Basement Flooding Mitigation Program intends to upgrade wastewater service lines and maintenance holes across Halton Region. These improvements will ensure that wastewater infrastructure is in a state of good repair and helps prevent sewer-backups that can lead to basement flooding.

The Basement Flooding Mitigation Program was initiated in response to a significant storm event in August 2014 that led to major flooding in the City of Burlington. Regional Council authorized actions intended to develop a comprehensive program that would assist homeowners most affected by basement flooding from sanitary sewer surcharging. The Program focuses on seven identified priority areas that have been most affected by basement flooding in the past, as well as areas affected by the August 2014 storm event. The Program also involves a comprehensive analysis of the entire

³⁸ Halton Region's Corporate Sustainability Action Plan, 2014 Report Card. Attachment to Staff Report LPS77-15

wastewater systems and recommends actions such as targeting downspout disconnections in the areas of Halton outside the seven priority areas, additional sewer optimization projects, and numerous subsidy enhancements.

LED Street Light Conversion Program

The LED Street Light Conversion Program was an initiative that ran from 2016 to 2020 to retrofit approximately 5000 Regional street lights with energy-efficient Light Emitting Diode (LED) technology. Municipalities across Ontario have been actively converting existing High Pressure Sodium lights to LED technology in order to achieve both cost and energy savings. Converting all of Halton Region's Regional street lights was expected to cost approximately \$2.6 million; however, energy cost savings and maintenance costs savings of the LED lights is expected to result in a return on investment within five or six years. Municipalities that have implemented street light conversion programs have realized energy savings of 45 to 60 percent.

Halton's Regional Strategic Action Plan 2019-2022

The Strategic Action Plan sets out directions for the Region to identify priority areas that matter most to the people who live and work in Halton. One of these priority areas is "Environmental Sustainability and Climate Change", which focuses on ensuring Halton Region is prepared to respond to weather related events and other emergencies³⁹.

The Plan outlines its actions to reduce the Region's carbon footprint, which include finalizing and updating important documents such as the Energy Management Strategy and Pumping Station Master Plan. It also aims to implement measures to reduce GHG emissions such as the advanced meter infrastructure to automate meter reading and advanced traffic management system that tackles idling.

Local Municipal Climate Change Response

The City of Burlington

The City of Burlington's efforts to curb climate change consequences has led to many initiatives including joining the Partners for Climate Protection (PCP) in 2002 and meeting all 5 of the PCP's milestones⁴⁰. The City provided its first GHG inventory in 2004 which helped to determine energy use and emissions for both corporate and community sources. It also established benchmarking data for 2003 to forecast energy use and emissions for the next 10 to 20 years for municipal operations and the community⁴¹.

³⁹ Halton's Regional Strategic Action Plan 2019-2022

⁴⁰ ICLEI Member Listing: <https://fcm.ca/home/programs/partners-for-climate-protection/members---partners-for-climate-protection-program/ontario.htm> (accessed Nov 30, 2018)

⁴¹ Partners for Climate Protection Program, Milestone 1: Inventory of Greenhouse Gas Emissions.

In 2013 and 2014, the City of Burlington created Energy Management Plans for both corporate⁴² and community⁴³ sources which helped the City create a long term road map for best practice energy management to deliver energy savings in an effective and flexible manner.

In 2016, the City of Burlington approved its long term strategic plan 2015-2040. Through this plan the City set out to accomplish multiple social, economic and environmental objectives including achieving a better environmental outcome that would help the City combat climate change⁴⁴.

Currently City of Burlington staff are reviewing and updating both the Corporate Energy Management Plan and the Community Energy Plan this year to provide guidance on how to reach the goals in the strategic plan for City operations to be net carbon neutral by 2040 and to work towards being a net carbon neutral community. The City is also a partner of the Bay Area Climate Change Council (BACCC) which, under the Centre of Climate Change Management at Mohawk College, has developed a three-year work plan to focus on community engagement, transportation and building efficiency and local food/agriculture.

On April 23rd, 2019 the City of Burlington's Council voted to support a declaration of Climate Change Emergency to increase the priority of the fight against climate change and apply a climate lens to plans and actions undertaken by the City of Burlington.

The Town of Halton Hills

The Town of Halton Hills joined the Partners for Climate Protection (PCP) in 2001. It has achieved the first three PCP milestones through the development of the Town's Mayor's Community Energy Plan (2015). The plan was intended to help the Town identify and implement actions to reduce GHG emissions from both corporate operations and community activities⁴⁵.

In 2013, Council for the Town of Halton Hills approved the Integrated Community Sustainability Strategy (ICSS) which outlines the community's vision for its economy, environment, social fabric and culture to 2060. The ICSS contains two goals that are directly related to climate change: to reduce greenhouse gas emissions for both the Town corporately and in the community, and to be prepared for climate change.

The first goal is being addressed through the continued implementation of the Mayor's Community Energy Plan. The corporate component of this plan was updated in 2019 and the community component is scheduled to be updated in 2020. These updates are intended to reflect Council's May 2019 Climate Emergency Declaration, which set a target to become a net-zero carbon community by 2030. The second goal is being addressed through the development of the Climate Change Adaptation Plan, initiated in 2017 and scheduled to be completed in 2020. The Adaptation Plan is intended to help

⁴² Corporate Energy Management Plan March 27, 2013

⁴³ Burlington Community Energy Plan January, 2014

⁴⁴ Burlington's Strategic Plan 2015-2040 (p05)

⁴⁵ Halton Hills Mayor's Community Energy Plan, 2015

the Town identify community risks and vulnerabilities to climate change, and develop actions to manage, minimize, or eliminate those risks⁴⁶.

The Town's Green Development Standards program encourages the inclusion of a range of measures to reduce the environmental impact of new developments. Structured as a LEED-like point-based system with a menu of options, the program includes several items related to energy efficiency and others that focused on climate resiliency – such as low impact design (LID) storm water management. The most recent iteration of the Standards was approved in 2014 and the program is being reviewed in 2020 to ensure that it continues to reflect best practices in green construction and accelerates the Town's ability to meet its climate mitigation, climate adaptation and community sustainability goals.

On May 6th, 2019 the Town of Halton Hills' Council voted to support a resolution to declare a Climate Change Emergency in response to the "Canada's Changing Climate 2019" report. Implementation of this resolution will require changes in how the Corporation conducts its business and a resetting of goals with respect to Engineering, Planning, Building, Recreation, Parks Libraries, Fire and Transportation Services⁴⁷.

The Town of Oakville

The Town of Oakville has been actively working on developing action plans to curb climate change since its first Environmental Strategic Plan in 2002. As part of its involvement in both PCP and ICLEI, the Town of Oakville has included climate change considerations in several master plans, reports and strategies used to guide growth in a sustainable manner.

Oakville joined the Partners for Climate Protection (PCP) in 2004, and has successfully met five of its corporate milestones and three of its community ones. The town created a GHG emission inventory in 2004, followed by a corporate energy plan in 2009. The Town was also a signatory member of ICLEI's Building Adaptive and Resilient Communities (BARC) program, joining in 2011 and achieving Milestone 5 in 2014 with Council endorsement of the Town's Climate Change Strategy. In 2017, the Town of Oakville became one of only six Canadian municipalities to complete three of four badges for International Covenant of Mayors program for Climate and Energy.

In 2020, the town with local community partners will adopt Oakville's Community Energy Plan. The plan creates a pathway for Oakville's residents, businesses, organizations and institutions to work together to reduce energy costs and GHG emissions while strengthening the local economy and building an affordable and resilient energy future.

Oakville Town Council unanimously declared a climate emergency on June 24, 2019 stressing the importance of supporting and requiring all corporate strategies and initiatives to be viewed with a climate change mitigation and adaptation lens.

Due to the extensive work done on the PCP, BARC and GCOM programs, Oakville was selected as one of twenty-five Canadian Showcase Cities. As a Showcase City, Town

⁴⁶ Halton Hills Climate Change Adaptation Plan – Terms of Reference January 13, 2017

⁴⁷ Town of Halton Hills report PLS-2019-0001

staff will work to align the Town's greenhouse gas inventories to that of the GCOM as well as update its climate change adaptation strategy within the next year with support from FCM and ICLEI.

The Town of Milton

The first Corporate Energy Plan for the Town of Milton was completed in 2013 and was called the Environment Conservation Demand Energy Management Plan (ECDEMP). This plan was completed to comply with the Green Energy Act 2009.

In August 2018, the Town of Milton received funding from the Federation of Canadian Municipalities for "Climate Innovation Programs". The funding allowed for the development of a Green Innovation Plan (GIP) in partnership with Milton Hydro and Union Gas.

During the same year, an opportunity was identified to look beyond the Town's energy consumption and demonstrate leadership in the community to combine the Corporate Energy Plan with a Community Energy Plan under the umbrella of the Milton 'Green Innovation Plan' (GIP). The GIP develops goals, targets and actions to reduce emissions for both the community and the town.

The GIP will aim to meet the targets set out by the Canada Climate Change Action Plan. The GIP was developed using FCM's Partners for Climate Protection (PCP) five step milestone framework, and supporting GHG inventory tools. The report used a triple bottom line approach for this initiative, including social responsibility and environmental considerations along with financial performance when considering immediate and future action plans and opportunities.

On July 22, 2019, the Town of Milton's Council passed a motion to declare a climate emergency and directed staff to consider all opportunities to include language in future policy planning work that acknowledges climate change.

Regional Official Plan Review