

CALEDON'S OFFICIAL

PLAN UPDATE & CLIMATE CHANGE

OFFICIAL PLAN DISCUSSION PAPER

TOWN OF CALEDON

TOWN OF CALEDON
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INTRODUCTION — CLIMATE CHANGE IN CALEDON

The Town of Caledon is creating a new Official Plan – a road map for the next 30+ years. One of the Official Plan's five focus areas is Climate Change. How we design our communities is linked to the amount of emissions we generate and our ability to cope with climate change (resilience).

PURPOSE

The purpose of this paper is to identify policy best practices and opportunities for Caledon to incorporate climate change into the core of its Official Plan. This paper paints a picture of what Caledon could look like if developed using a climate change lens. It also outlines the benefits of climate-oriented development in a concise and approachable format.

WHY DO WE NEED LOCAL CLIMATE ACTION?

We already know our climate is changing. Globally, average temperatures are rising. This is leading to negative impacts on health, the environment and the economy. In Caledon, we've seen an increase in rainstorms that result in flooding and extreme heat events. We know that climate change is caused by greenhouse gases (GHGs) being emitted into our atmosphere.

The rise in GHGs is due to human activities. Burning fossil fuels to produce energy results in emissions. Daily commuting, heating our homes and buildings, and the amount of waste we generate all produce emissions.

In Caledon, more than half of our emissions come from transportation. Transportation includes personal travel around town and commuting to and from work. It also includes commercial vehicles and trucks. The main source of GHGs from transportation is from vehicles powered using fossil fuels, such as gasoline.

Table 1. Extreme weather events in Caledon.

DATE	EVENT	DESCRIPTION
October 1954	Hurricane Hazel	Resulted in flooding in urban areas of Caledon East and Bolton.
December 2013	Ice storm	Power outages (~14,000 homes).
March 2016	Ice storm	Power outages, forcing many local businesses to close.
August 2016	Rain event	Flooding and infrastructure damage in Alton.
October 2017	Wind storm	Power outages (~2,200 homes).
June 2017	Extreme precipitation	Flooding and dam failure on Main Credit River.
March 2019	Warmer Temperatures	Ice jam (ice accumulation that impeded the flow of water) along the Humber and Credit Rivers, resulting in flooding in the areas of Bolton and Inglewood.

The next biggest source of Caledon's emissions comes from the energy used to heat and cool our homes and buildings. Heating and cooling use energy and produce GHGs. Many of our homes use natural gas, which produces a large amount of emissions compared to other fuel sources.



The electricity consumed in buildings also produces GHGs. Right now, Ontario's electricity grid is relatively clean. However, electricity emissions are anticipated to rise by 300% as more natural gas plants are brought online in Ontario. The remaining sources of Caledon's GHGs come from agriculture, waste and industry.

WHAT WILL OUR COMMUNITY LOOK LIKE WITHOUT ACTION?

Without any further action, emissions are expected to increase by 119% by 2050 in Caledon[1]. That's more than double current levels. The Town of Caledon needs to be a global citizen in addressing climate change. Thinking globally can be achieved by acting locally. This means introducing ambitious climate change solutions within the Town to reduce emissions and prepare for changes to our climate. Taking action at the local level would support global efforts to avoid worsening impacts to our climate. This would ensure that the Town and its citizens are taking its fair share of action to mitigate the effects of climate change.



If no further action is taken globally, by the end of the century, Caledon will continue to experience:

- **Higher temperatures overall, with more freeze-thaw cycles;**
- **More extreme heat days (over 35°C) and fewer cold days (below 0°C);**
- **A longer growing season with drier summers;**
- **More precipitation in winter, spring and fall;**
- **More intense precipitation falling in shorter periods; and,**
- **More instances of extreme weather and storms.**

These local climate changes will have negative impacts on our infrastructure, natural environment and agriculture. Climate change will also impact our health and economic wellbeing. Higher amounts of rain and snow will put pressure on our stormwater systems.

1 According to the Region of Peel's draft Official Plan Update, the population forecast has increased from the assumptions built into the model that determined the estimated emissions increase in a business-as-usual scenario. The Model estimated 200,000 population by 2050. The Region of Peel's draft policies highlight a population of 300,000 for the Town by 2050. It is expected that an even higher emissions growth trajectory will occur, in a business-as-usual scenario, if no further action is taken.

Roads and bridges will require maintenance to counteract more frequent freeze-thaw cycles. Higher temperatures will lead to more algae blooms – impacting our drinking water.

Temperature changes will make it difficult for native species to thrive. It will also make it easier for invasive species to move in. Despite a longer growing season, farmers will struggle with unpredictable weather conditions and soil erosion. Our economy will be burdened with costs from storm damage. We will also see a loss of agricultural productivity and increased municipal servicing costs. Extreme heat, poor air and water quality will have negative impacts on our health. This is especially true amongst the most vulnerable in our community.

CLIMATE MITIGATION AND ADAPTATION

To avoid the worst effects of climate change, we must take action locally. Action must include both mitigation and adaptation. Mitigation looks to reduce the amount of GHGs being emitted. Climate mitigation includes managing our use of energy and using more green sources of energy. Examples include renewable energy or converting our heating systems from natural gas to electricity.

Adaptation looks to prepare for changes in climate. Climate adaptation may include preserving greenspace to lessen flooding impacts from extreme rainfall events or planting more trees to reduce local temperatures. Both mitigation and adaptation are important concepts to be included in our new Official Plan.

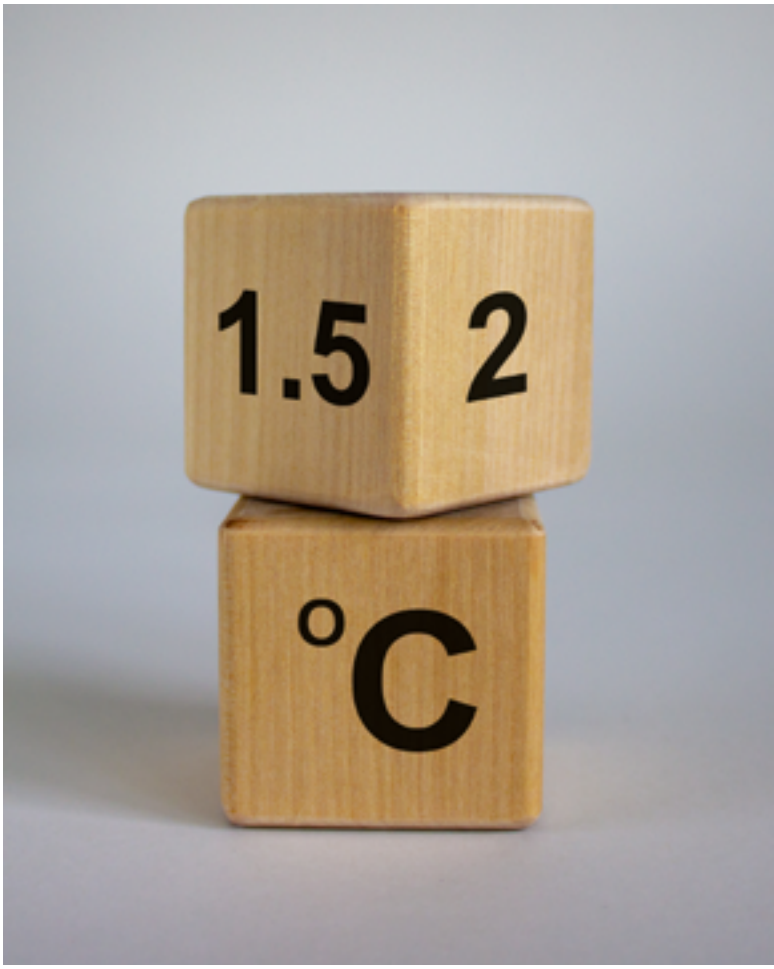


WHAT DOES SCIENCE TELL US?

Recent scientific reports tell us that we must limit the global temperature rise to 1.5°C. Limiting the temperature rise is crucial to avoid "rapid, far-reaching and unprecedented changes in all aspects of society"[2]. A certain amount of climate change is already "locked-in", even if all emissions stopped today. We will still experience changes to our climate and weather patterns in the future.

Recognizing the need for action at the local level, Town Council declared a climate change emergency in January 2020. Caledon Council also endorsed a net-zero emissions reduction target by 2050 and an interim target of 36% reduction by 2030. The Town developed a community-wide climate mitigation and adaptation plan, Resilient Caledon, to meet our climate emissions reduction targets and better prepare for a changing climate.

Cities and towns like Caledon have direct or indirect control over half of the country's emissions[3]. We must radically rethink the design of our communities to align with our climate objectives. The development of a new Official Plan is our chance to do so. We must implement climate-oriented policies and allocate sufficient resources to address climate change.



2 IPCC, 2018. Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Retrieved from: https://www.ipcc.ch/sr15/download/

3 Federation of Canadian Municipalities, 2009. Act Locally: The Municipal Role in Fighting Climate Change. Retrieved from: https://fcm.ca/en/resources/act-locally-the-municipal-role-in-fighting-climate-change

PLANNING FOR OUR FUTURE

HOW DOES THE OFFICIAL PLAN IMPACT CLIMATE CHANGE?

The Town of Caledon is creating a new Official Plan – a road map for the next 30+ years. An Official Plan is an overarching policy document that acts as a road map for developing our community. This includes where we locate housing, build roads and trails, locate employment, offer community facilities, and much more. Official Plans are necessary to promote smart land-use decisions. They work to ensure compatibility between different land uses (e.g., residential, industrial, agricultural) and the protection of our environment. Official Plans also help us prepare for a growing community by providing parks, transit options, schools and recreation spaces. Our new Official Plan will embrace Caledon's community charm while ensuring we're prepared for the future.

One of the Official Plan's five focus areas is Climate Change. **How we design our communities is linked to the amount of emissions we generate and our ability to cope with climate change (resilience).**

More than half of our current emissions come from transportation. Traditional planning and development often locate homes, workplaces and shopping centres in separate areas of the community. This type of development is sometimes referred to as "sprawl". Sprawl makes it more difficult to walk or cycle and makes us more reliant on vehicles to reach key destinations such as the grocery store, school, or community centres. Traditional development takes up more greenspace and reduces our ability to adapt to climate change.

On the other hand, compact, mixed-use neighbourhoods allow us to drive less. Amenities are more likely to be within walking or cycling distance. Density also makes public services like transit more feasible.

Protecting natural areas from development helps to sequester carbon and improve resilience. Our Official Plan can also include provisions for renewable energy and policies to support the overall health and wellbeing of our residents and the natural environment.

WHAT IS A CLIMATE CHANGE LENS AND WHY DO WE NEED ONE?

The Official Plan will guide our community for at least the next 30 years. To meet our climate targets in 2050, we must consider climate action within the Official Plan. Where and how we decide to build will become "locked-in" for the foreseeable future. We don't often move roads and buildings after they're constructed – underscoring the need to "get it right" now. We need to incorporate a **climate change lens** into our planning exercise. As a growing community, we have a unique chance to include climate action as a core element of how we grow.

A "climate change lens" looks to include GHG mitigation and adaption requirements into all decision-making. At the municipal level, this might include strategic documents, plans and policies. It also applies to capital projects and development applications. Using a climate change lens within our Official Plan sets the stage for climate-based decision-making for years to come.

Examples of how we might include a climate change lens within the Official Plan include:

- **Requiring all major decisions made by the Town to consider and minimize climate change impacts (mitigation and adaptation);**
- **Embedding our net-zero emissions reduction target as an overarching strategic goal of the plan;**
- **Including a commitment to update emissions targets as needed, in line with the scientific community;**
- **Outlining what climate change means to the Town and committing to leadership in climate action;**
- **Including target-based policies related to climate action;**
- **Including stronger language in climate-related policies;**
- **Committing to include climate mitigation and adaptation in the Town's other plans.**

LONDON'S CLIMATE EMERGENCY SCREENING TOOL[4]

As part of its Climate Emergency Declaration, the City of London, Ontario, has developed a Climate Emergency Screening Tool (CEST). The tool aims to incorporate a climate change lens into decision-making at the municipal level. The tool is not meant to be a "stop/go" decision-making tool. Rather, it requires the consideration of climate change alongside other criteria like cost or safety. The tool considers both mitigation and adaptation and identifies ways to reduce the climate impacts of a specific project. Screening criteria include generation of emissions, the removal of trees, impacts on stormwater and the urban heat island effect, among others. The tool also helps to identify where additional investigation is required. CEST is already being used to inform and influence major transportation projects. Going forward, it will be used to review proposed major City projects and master plans.

4 City of London, 2020. Strategic Priorities and Policy Committee Report. Retrieved from: https://pub-london.escribemeetings.com/FileStream.ashx?DocumentId=74016

WHAT DOES PLANNING A CLIMATE-FRIENDLY COMMUNITY LOOK LIKE?

Creating a healthy, sustainable and climate-friendly community requires careful planning. The decisions we make today will have a lasting impact on our Town for decades to come. With that in mind, our new Official Plan will look to:

- **Encourage sustainable growth – using a climate change lens for new development;**
- **Support zero-emissions travel and a community-oriented transportation system;**
- **Reduce the amount of emissions from new and existing homes and buildings;**
- **Enhance and protect our natural environment and greenspaces;**
- **Support renewable energy and the transition to a low carbon energy system;**
- **Enhance, protect and sustain our agricultural system;**
- **Develop future-proof & resilient communities in the face of climate change;**
- **Promote a climate-friendly and resilient economy.**

15-MINUTE NEIGHBOURHOOD

One way to think about a climate-friendly community is to picture a 15-minute neighbourhood. Imagine living in a neighbourhood where all your basic necessities are accessible within a 15-minute walk of your home. This includes where you get your groceries, where you work, where your children go to school, where you exercise – nothing is more than a 15-minute walk away. Parks, transit stops, and shopping destinations are all close by. Making 15-minute neighbourhoods a reality requires careful planning – including mixed land uses and intensification.



CHARTING OUR PATH FORWARD

GROWTH AND NEW DEVELOPMENT

Caledon's population is predicted to more than double in size over the next two decades. We need to plan for smart growth that meets the needs of residents without undue harm to the environment.

Our Future Community Under Traditional Planning

Under a traditional planning scenario, Caledon continues to build out in low-density neighbourhoods. This scenario would support the development of mostly single-family homes on large lots. While single-family homes are often desirable, they can cost more to heat and cool than multi-unit houses. Under this scenario, homes would take up more space, compromising our natural and agricultural areas. Municipal servicing costs are also higher in low-density neighbourhoods. Sprawling subdivisions typically lack easy access to employment and shopping areas.

Long distances between destinations and a lack of sidewalks and bike lanes make residents more reliant on personal vehicles.

Our Future Community with a Climate Change Lens

A community developed using a climate change lens allows residents to work, play and shop where they live. Residents will have a reduced need to drive long distances as key amenities will be located nearby. Infrastructure exists to support walking, cycling and rolling. Since key destinations are located closer together, public transit is efficient, more affordable and reliable. Providing services to residents is more efficient and less costly. Compact development has more protected natural areas, greenspace and agricultural lands. A mix of housing types – including townhouses, apartments and condos – aims to provide affordable options for all residents.

Table 2. What Are the Benefits of Climate-Oriented Growth and New Development?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Reduced heating and cooling needs, and energy comes from low carbon sources, such as electricity • Reduced need for single-occupancy vehicles and electric vehicle charging infrastructure provided or ready for installation • Increased use of transit, walking, cycling and rolling	• Reduced pressure on municipal infrastructure • Natural stormwater management • Enhanced greenspace and tree canopy	• Sustaining the local food system • Providing more equitable housing options • Reduced social isolation and community connectedness • Preservation of natural areas act as a carbon sink • Enhancing the local economy by keeping energy dollars local

How Do We Get There?

- **Encourage mixed-use development;**
- **Limit settlement boundaries and encourage intensification;**
- **Support the Resilient Caledon targets for improved urban form;**
- **Encourage construction of secondary suites;**
- **Encourage brownfield remediation and development;**
- **Encourage the use of planning tools for renewable energy areas and policies that enable district energy systems.**



DENSITY AS A TOOL FOR BUILDING STRONGER, MORE RESILIENT COMMUNITIES

Density can be a scary word. It can raise concerns about what might be lost. On the contrary, it can support and protect what we value most in our communities and bring in more services and employment opportunities. Compact communities can benefit human health, the natural environment, and cultural vibrancy.

Density is about enabling more community members to live in our neighbourhoods. It can be achieved through a mix of low-rise, condos and townhouse buildings that complement existing single-family homes. Taller buildings will be considered in strategic growth areas, like near the new GO Station. With more people and the resources and skills they bring, we can attract and support more local businesses and jobs. This enhances culture and social bonds and can build resiliency to natural disasters and emergencies. Density also saves municipal resources from being spread thin across sprawling subdivisions. In turn, this allows funds for other public amenities to be created and sustained. Things like better public transit, cultural venues, parks, and recreational centres.

The resulting mixed-use neighbourhoods enable residents to work, shop and play where they live. By reducing the need to drive, we decrease emissions and improve air quality. It can also reduce the amount of greenspace and agricultural land that is used for development. Most importantly, mixed-used neighbourhoods can offer a diversity of housing options. This allows students, seniors, and young families to live in the same community and supports friends and family across generations and income levels to live closer together.

THE CITY OF OTTAWA PRIORITIZES EXISTING NEIGHBOURHOODS FOR FUTURE HOMES[5]



The City of Ottawa is preparing for its population to increase by 400,000 residents by 2046. In building housing for this new population, the City has concluded that development will occur in existing neighbourhoods. This type of development – known as infill – will be much cheaper and enable better services for residents than creating new suburbs on undeveloped lands.

A study found that building low-density homes on undeveloped land would cost $465 per person each year, above what the City currently receives in property taxes and water bills. On the other hand, infill development provides the City with a surplus of $606 per person each year. This allows for additional funding to support broader community programs instead of resulting in the need to increase taxes.

Converting undeveloped lands into new neighbourhoods carries significant costs in building new roads, water pipes, sidewalks, and transit. Greenfield development can also remove soil suitable for agriculture, which limits local food security. On the other hand, building compact communities creates energy efficiencies from existing infrastructure. It enables municipalities to deliver services cheaper and improve service quality. As a result, the City of Ottawa's new Official Plan aims to house over half of its expected population growth through infill development.

5 CBC, 2021. Suburban expansion costs increase to $465 per person per year in Ottawa. Retrieved from: https://www.cbc.ca/news/canada/ottawa/urban-expansion-costs-menard-memo-1.6193429#:~:text=Suburban%20expansion%20costs%20increase%20to%20%24465%20per%20person%20per%20year%20in%20Ottawa,-Infill%20development%20is

TRAVEL AND TRANSPORTATION SYSTEMS

Transportation is the largest source of emissions in our community. About 95% of yearly trips in Caledon are made using a personal vehicle. We need to plan and advocate for an efficient transportation system. We also need to switch to low or zero-emissions vehicles and design the road network to support alternatives to driving.



Our Future Community Under Traditional Planning

Under traditional planning, we will continue to build car-centric neighbourhoods. Residents will need to travel large distances to access basic amenities like grocery stores. Residents are forced to commute long distances to work. In this scenario, there are few attractive alternatives to driving. Key destinations are too far apart to justify a transit system. Active transportation (walking, cycling, rolling) is not a comfortable option for most residents.

Our Future Community with a Climate Change Lens

Developing with a climate change lens will locate places to work, live and play nearby. It will be easier to use transit or active transportation to complete daily activities. Streets are designed for all road users. We will retrofit existing neighbourhoods where feasible with active transportation planning in mind. Safety features have been built into the streetscape design. Residents feel safe walking their children to school or riding their bikes to work. Streets include trees and benches, making walking and cycling more enjoyable for commuting and recreational trips. Caledon's extensive network of trails is accessible for all residents and draws tourists to our community.

Electric vehicle chargers are accessible across the community. Residents are connected with the wider Greater Toronto Area through the Caledon GO Station. Areas with higher density are well-positioned to support innovative programs such as micro-transit, carshare or carpool programs and alternative forms of short-distance transportation such as e-bikes and e-scooters.

Table 3. What Are the Benefits of Climate-Oriented Travel and Transportation Systems?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Promote low carbon vehicles like electric vehicles (EV) • Increased use of transit, walking, cycling and rolling • Reduced usage of single-occupancy vehicles and increased transit, micro-transit or carshare programs	• Decreased reliance on external (fossil) fuel sources • Backup power through EV battery storage	• Reduced risks of respiratory illness from less exposure to traffic-related air pollution • Reduced risk of serious health conditions, such as heart disease, diabetes (type II) and chronic obstructive pulmonary disease, from increased physical activity (e.g., walking) • Noise reduction from vehicle engines, reducing mental health stresses • Improvements to mental health from increased social interactions when walking, cycling, or taking transit, and as a result of regular physical activity • Increased use of active and transit transportation modes can reduce traffic congestion

How Do We Get There?

- **Requirements for transit-supported development and policy to advocate for expanded transit systems;**
- **Development of a safe, robust, well-connected active transportation network;**
- **Complete Streets Policy and design guidelines to support connectivity and continuity of on-road and off-road transportation networks in a way that prioritizes travel by all modes;**
- **Minimum bicycle parking space requirements;**
- **Site plan control requirements to improve pedestrian connectivity at a site;**
- **Require electric vehicle charging infrastructure in new and existing developments;**
- **Prioritize transit and active transportation in all transportation network updates and expansion;**
- **Minimum parking requirements in appropriate areas to encourage transit use;**
- **Incorporation of Transportation Master Plan mode share targets;**
- **Focus on mixed-use and employment in GO Transit hub area;**
- **Policies that enable and encourage carshare or carpool programs.**

NEW & EXISTING HOMES AND BUILDINGS

After transportation, the next biggest source of emissions is our homes and commercial and industrial buildings. Heating and cooling our homes and buildings uses energy that produces emissions. Making our new and existing homes as efficient as possible is a key step in climate action.



Our Future Community Under Traditional Planning

Homes and buildings continue to use traditional forms of energy – like natural gas – which has a large carbon footprint. Older buildings have poor insulation, making them more expensive to heat and cool. Ageing equipment like furnaces and boilers will require maintenance and replacements. For the most part, our buildings are not prepared for extreme weather events, resulting in future damage costs.

Our Future Community with a Climate Change Lens

Existing homes, institutions and commercial buildings are retrofitted to be net-zero. We use low-carbon and innovative forms of net-zero emissions to heat and cool our homes – like solar panels and heat pumps. Buildings have added insulation and cost less to keep occupants comfortable. Property values increase, and workspaces experience higher productivity. Green infrastructure – like rain gardens and planting trees – helps absorb water during heavy storms and provides cooling during heat events.



New Town buildings conform to a Green Building Standard, with net-zero and resiliency measures built in. New buildings also include electric vehicle (EV) chargers to support EV adoption. Low-carbon backup power is available at Town facilities in case of emergencies.

Table 4. What Are the Benefits of Efficient Homes and Buildings?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Reduced heating and cooling needs • Switching to renewable energy	• Ability to store energy for future emergencies • Natural stormwater management • Mitigation of urban heat island effect	• Cost savings from energy retrofits • Local economic benefits from building retrofits and renewable energy sources

How Do We Get There?



- **Implement a Green Development Standard that encourage new net-zero energy, resilient buildings and communities, including support for renewable energy generation, district energy and electric vehicle infrastructure;**
- **Update Community Improvement Plans to strengthen energy and water efficiency programs for commercial buildings;**
- **Town-wide Local Improvement Charge by-law and program to support the retrofit of existing homes;**
- **Introduce policy for residential developments to be highly efficient and net-zero ready;**
- **Carbon neutral corporate buildings, infrastructure and operations;**
- **Secondary plans that support alternative low carbon energy systems to heat and cool homes and buildings;**
- **Policies that encourage and allow for green roofs and rooftop solar photovoltaics.**

RENEWABLE AND LOW-CARBON ENERGY

In 2016, community-wide energy costs in Caledon totalled about $315 million. The Town currently sees most of its energy dollars leave the community. Virtually all energy consumed within Caledon is imported. Developing clean energy locally will create jobs and stimulate Caledon's economy.

Our Future Community Under Traditional Planning

Caledon remains reliant on fossil fuels to heat and power our homes, buildings and vehicles. Dependence on fossil fuels means we rely on external supply chains that produce a lot of emissions and are subject to changing energy costs. The economic benefits of fossil fuel mining and refining are not seen locally. Our energy dollars leave the community and benefit those in other jurisdictions. During extreme weather events, our community lacks access to local and sustainable backup power.

Our Future Community with a Climate Change Lens

Caledon becomes less dependent on fossil fuels in favour of low-carbon electricity. Natural gas furnaces are swapped out for heat pumps. Communities that do not have natural gas services use low-carbon heating sources. All new rooftops are equipped with solar panels. Energy costs are reduced, and residents and businesses can produce their own energy. Smart grids and microgrids will help us to incorporate renewable sources and use energy more efficiently. Excess energy generated can be stored locally, providing backup power during extreme weather events.

Compact developments can better utilize district energy systems. In a district energy system (DES), nearby buildings share heating, cooling and hot water. Sharing energy increases efficiency and results in cost and emissions savings. Generating renewable and low-carbon energy in Caledon means that more of our energy dollars stay local. The installation and maintenance of new energy technologies bring new industries and job opportunities.

Table 5. What Are the Benefits of Renewable and Low-Carbon Energy?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Switching to renewable energy • Using energy more efficiently	• Decreased reliance on external (fossil) fuel sources • Ability to store energy for future emergencies	• Energy dollars stay local • Attraction of new industries and employment • Lower energy costs

How Do We Get There?

- **Undertake a renewable energy study to understand the feasibility of different systems;**
- **Requirement for new growth areas to complete carbon-neutral energy plans as part of the secondary plan process;**
- **Supportive policy for the development of district energy projects that prioritize renewable and alternative energy systems;**
- **Require district energy-ready new development in areas identified for district energy;**
- **New development shall be encouraged to have dedicated rooftop solar technologies;**
- **Encourage the development of smart grids and microgrids;**
- **Explore opportunities to zone for renewable energy sources.**



NATURAL ENVIRONMENT AND GREENSPACES

Eighty percent of Caledon's area is made up of natural areas. Natural areas include wetlands, forests and animal habitats. Within the Official Plan, these areas and their connections are known as the Natural Heritage System. Natural areas play a key role in our community's climate resiliency.



Our Future Community Under Traditional Planning

Low-density development and sprawl compromise our natural systems. Natural areas are paved over to allow for the development of single-family homes with larger lots. Ecosystem services – which previously reduced flooding and the urban heat island effect – are lost. As such, our community is at greater risk of projected climate impacts. Access to natural areas for recreation is reduced.

Our Future Community with a Climate Change Lens

The Natural Heritage System is protected from encroaching development due to compact development. Remediation and monitoring programs are in place to ensure the long-term health of our natural areas. Ecosystem services provide added resilience against climate impacts. A well-connected park system is available and accessible for all residents. Ambitious targets are established to enhance, protect and expand the tree canopy. The urban heat island effect is reduced through a thriving urban tree canopy. Minimum greenspace targets are established and increased for new developments.

Table 6. What Are the Benefits of Protecting Our Natural Environment and Greenspaces?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Preservation of natural areas that act as a carbon sink • Enhanced and protected tree canopy	• Reduced pressure on municipal infrastructure • Natural stormwater management • Mitigation of urban heat island effect	• Enhancement of wildlife habitat and biodiversity • Cleaner air and water from the filtration of pollutants • Environmental education and tourism opportunities • Improved physical and mental health through recreational activities



How Do We Get There?

- **Monitor and manage the protection and health of natural systems;**
- **Policy to implement actions for improved air quality and reduced heat island effect;**
- **Protection and acquisition of lands within the Natural Heritage System;**
- **Protection of areas adjacent to Natural Heritage Features;**
- **Targets for Town-wide minimum forest cover and total protected area;**
- **Enhanced policies to protect trees in rural and urban areas;**
- **Parkland acquisition policy for developers to provide land, or cash-in-lieu for municipal parks.**

CALLOUT: WHAT ABOUT THE IMPACT OF AGGREGATE EXTRACTION?

Aggregate resources include gravel, sand, and other minerals. Local aggregate resources include loose sands and gravels, shale, sandstone and dolostone. These vital resources are used to build roads, infrastructure and homes. Lessening the climate impact of aggregate extraction can be achieved through reducing emissions in transportation and vehicle choice. Another opportunity could be to reduce the emissions created into the processing of aggregate. This can be achieved by increasing recycled aggregate content, for example.



The Province dictates aggregate management through the Aggregate Resources Act. However, we recognize that stronger policies are needed at the local and Regional levels of government. Caledon is currently working with the Region of Peel to update its aggregate resources policies. The update is a part of the Peel 2051 Official Plan Review (ROP Review) process. A key objective of the ROP Review is to update policies to protect Peel's communities and the environment from the possible harmful impacts of removing aggregate. Some of the solutions being discussed include:

- **Policy updates to ensure the protection of groundwater resources, cultural and natural heritage features;**
- **Strengthening requirements for community and environmental impact studies;**
- **Provisions for end-of-life mine rehabilitation (e.g., enhance carbon sequestration through expanding green infrastructure);**
- **Promoting aggregate recycling within operations to substitute for new mineral aggregate (e.g., reducing embodied carbon of materials).**

At the local level, the Town can introduce policies through Green Development Standards and Corporate Building Policies to encourage the reduction of the embodied carbon of building materials. This may include the reuse and recycling of construction and demolition waste.

The ROP Review also seeks to reduce emissions from aggregate operations, primarily from the transportation of goods. Finally, the Region is undertaking a study to understand the community impacts of aggregate transport. The study will inform policy updates in the ROP Review.

AGRICULTURAL SYSTEMS

The agricultural sector plays a key role in supporting the Town of Caledon's economy. Agriculture makes important contributions to our cultural heritage and environmental stewardship. With increasing rates of growth expected to occur in Caledon, protecting farmland is a key priority.



Our Future Community Under Traditional Planning

Like our natural areas, our agricultural system could be at risk, if traditional planning approaches are used. The majority of Caledon's prime farmland is within the Province's designated growth area. Developing farmland would have negative impacts on local food security and the agri-food sector. Residents would need to rely more heavily on food transported from outside of our community. As such, Caledon could be more vulnerable to climate-related disruptions in the food system.

Our Future Community with a Climate Change Lens

Under a climate change lens, Caledon has a robust and protected agricultural system. Encroachment on farmland is reduced. There is enhanced local food security and a thriving agri-food sector. Local farms use innovative techniques like regenerative agriculture and renewable energy generation. As such, farms reduce reliance on fertilizers, enhance soil quality and become more resilient to changing weather patterns. Indoor and outdoor crop production allow for the diversification of the agricultural economy. Community gardens allow all residents to grow their food, increase access to healthy food, and the resiliency of our local food system.

Table 7. What Are the Benefits of Protecting Our Agricultural Systems?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Use of on-farm renewable energy • Protection of agricultural land, and promote practices that may act as a carbon sink	• Adapting farming practices to projected climate conditions • Introduction of innovative indoor farming practices resilient to unpredictable climate	• Sustaining the local food system • Supporting the local economy • Increased agri-tourism • Opportunities to enhance waste management through biogas digestion

How Do We Get There?

- **Support and encourage best practices in agriculture that minimize environmental and climate change impacts; support the protection of high-quality soil;**
- **Collaborate with partners to understand the opportunity and feasibility of carbon storage in soils;**
- **Encourage higher density development to reduce encroachment on farmland;**
- **Support long-term agricultural stability and effective land management;**
- **Encourage on-farm renewable and alternative energy projects;**
- **Work with partners to undertake an assessment of the adverse impacts of projected climate conditions on farming activities in Caledon and to establish recommendations to mitigate and resolve these;**
- **Food production, processing, distribution, storage and farmer's markets are supported throughout the Town;**
- **Supporting the diversification and resilience of the agricultural economy, including the importance of indoor and outdoor crop production.**

RESILIENT COMMUNITIES

The Town manages a complex infrastructure network, including roads, bridges, culverts, stormwater systems, and municipal buildings, which residents and businesses depend upon daily. Critical infrastructure needs to withstand the impacts of climate change in the near and long term.

Our Future Community Under Traditional Planning

Traditional planning will leave Caledon vulnerable to the negative impacts of climate change. Paving over greenspace will lead to more runoff and increased pressure on sewer systems. Traditional stormwater systems are not designed to handle the intensity of future weather events. Extreme weather events are more likely to cause flooding and costly repairs. Trees and natural areas, which provide cooling and stormwater management, have been lost due to the rapid build-out of sprawling neighbourhoods of single-family homes. Increased development on floodplains increases the vulnerability of residents.



Our Future Community with a Climate Change Lens

Under a climate change lens, climate risk is included in the Town's Asset Management Plan. Climate impacts are accounted for in the design of new or upgraded infrastructure. Emergency management planning includes climate change flooding maps and accounts for risks related to extreme heat. Green infrastructure is incorporated into new and existing neighbourhoods to improve resiliency.

Pursuing more compact development preserves greenspace and promotes the natural flow of water through the environment. When rain falls, it can travel slowly through the ground rather than directly into storm sewers. This more natural process alleviates the pressures on our stormwater systems. In this way, the use of green infrastructure – like rain gardens, bioswales or green roofs – helps to reduce flooding. Green infrastructure, along with a thriving urban forest, helps to reduce the urban heat island effect.

Table 8. What Are the Benefits of Resilient Communities?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Preservation of natural areas that act as a carbon sink	• Reduced pressure on municipal infrastructure • Improved stormwater management • Mitigation of urban heat island effect	• Reduced vulnerability of residents and businesses to climate impacts

How Do We Get There?

- **Develop a green roof and solar technology bylaw;**
- **Site plan control requirements for the inclusion of green infrastructure;**
- **Explore sustainable stormwater financing tools to support a robust stormwater system that incentivizes stormwater practices on private land;**
- **Restrict development and mitigate risks in hazardous and flood-prone areas;**
- **Forest Strategy identifying key areas for protection and restoration, as well as expected impacts from climate change;**
- **Explore the development of a Tree Protection Bylaw to protect existing trees and woodlands;**
- **Policies that require property owners to disconnect their downspout;**
- **Introduce policies that enhance tree canopy along sidewalks to reduce the urban heat island effect.**

RESILIENT ECONOMY

Taking local climate action is good for our economy. Economic opportunities exist in installing renewable energy, designing and constructing zero-carbon and resilient buildings, and retrofitting existing buildings. These investments could create 38,000 person-years of employment in Caledon from 2020-2050. That's over 1,100 jobs per year.



Our Future Community Under Traditional Planning

Caledon will miss out on the economic opportunities posed by climate action. Our community's reliance on outdated forms of energy will drive potential businesses to more innovative communities that align with their corporate climate change commitments. Residents will have to commute long distances to find suitable employment.

Our Future Community with a Climate Change Lens

Future employment lands attract a diverse array of companies. Employment lands are designed with energy efficiency and renewable sources in mind. Commercial and industrial buildings are held to minimum environmental sustainability objectives. Businesses are located close to where people live, creating high numbers of jobs per hectare. Residents use active transportation and transit to get to work. Caledon has become a hub of climate innovation, attracting like-minded industry and talent. High-quality job opportunities encourage young people to settle in Caledon post-graduation.

Table 9. What Are the Benefits of a Resilient Economy?

CLIMATE MITIGATION	CLIMATE ADAPTATION	CO-BENEFITS
• Using energy more efficiently • Reduced need for single-occupancy vehicles • Increased use of transit, walking, cycling and rolling	• Reduced pressure on municipal infrastructure • Natural stormwater management	• Attracting innovative businesses that help to enhance a low-carbon future • High-quality local jobs • Enhanced local economy

How Do We Get There?

- **Support Green Development Standards that encourage new net-zero energy, resilient buildings and communities, including support for renewable energy generation and electric vehicle infrastructure;**
- **Encourage eco-industrial and innovation district developments through secondary plans and an eco-zoning bylaw, which include carbon neutral objectives**



SUMMARY – A CLIMATE-FRIENDLY CALEDON

Now is our chance to decide what the future of our community will be. If we choose to grow our community using a climate change lens, in 2051, Caledon will be a place where:

CONNECTED & CONVENIENT

- We work, play and shop in our own neighbourhoods;
- We walk, roll or cycle to work instead of driving long distances;
- We use public transit to get to key destinations in Caledon, and across the GTA;
- We have access to electric vehicle chargers so that personal vehicle trips are fossil-fuel free.

HEALTHY & EQUITABLE

- We feel safe allowing our children and seniors to walk, roll and cycle;
- We provide affordable and accessible housing for current and future residents;
- We have local food security with a thriving agri-food sector;
- We have improved physical and mental health outcomes;
- We have improved air quality through reducing emissions from sources like cars.

GREEN & RESILIENT

- We benefit from ecosystem services like flood prevention;
- We have a thriving urban forest which provides shade and cooling;
- We have access to greenspace, fresh air and recreational opportunities;
- We have reliable back-up power for times of need;
- Our wildlife and natural spaces are thriving and protected;
- Our community is resilient and prepared for extreme weather.

EFFICIENT & INNOVATIVE

- We rely on renewable energy to power our homes and businesses;
- We use energy more efficiently and reduce our energy bills;
- We attract innovative, eco-friendly businesses;
- We retain and build local talent through sustainable employment.

GLOSSARY OF TERMS

TERM	DEFINITION
Active transportation	Using an individual's power to get from one place to another. This includes walking, biking, skateboarding, rollerblading, jogging and running, and wheel chairing.
Bioswales	Bioswales are shallow, typically vegetated, channels designed to capture and stormwater. They are effective at slowing runoff and cleansing water. They can also help recharge groundwater.
Carbon sequestration / Carbon sink	Carbon sequestration is the long-term removal of carbon dioxide from the atmosphere through storage. A carbon sink is anything that absorbs more carbon from the atmosphere than it releases. Examples of carbon sinks include a forest or an ocean.
Climate resilience	The ability to prepare for, respond to or recover from extreme weather and a changing climate. Improving climate resilience involves assessing climate impacts and taking steps to better cope with these risks.
Complete streets	Designing roads to prioritize travel by all modes and ensure the safety of people of all ages and abilities.
Embodied carbon	The amount of carbon emissions produced throughout the life of a product. This includes emissions generated during extraction, refining, processing, manufacturing, assembly, transport, use and disposal.
Energy retrofits	Upgrades to the energy-consuming systems of buildings. Retrofits may involve improving or replacing lighting fixtures, windows and doors, or adding insulation.
Greenhouse gas emissions	A greenhouse gas absorbs and radiates heat in the lower atmosphere. The main greenhouse gases are carbon dioxide (CO2), methane (CH4), chlorofluorocarbons (CFCs), and nitrous oxide (N2O). The most abundant greenhouse gas is CO2 – carbon dioxide.

TERM	DEFINITION
Green infrastructure	Includes a variety of water management practices, such as green roofs, bioswales, rain gardens, that capture, filter, and reduce stormwater. Green infrastructure reduces flooding and the polluted runoff that reaches sewers, streams, lakes, and oceans.
Infiltration	The process of water on the ground surface, from rainfall or irrigation, being absorbed by the soil.
Intensification	The development of an area at a higher density than currently exists.
Net-Zero Building	A zero-carbon building is a highly energy-efficient building that produces onsite, or procures, carbon-free renewable energy or high-quality carbon offsets to counterbalance the annual carbon emissions from building materials and operations.
Runoff	The flow of water across the ground. Occurs when excess water from rain, snowmelt, or other sources, can no longer soak into the soil.
Smart growth	Designing new communities to maximize active transportation and transit, green infrastructure, and health, ensuring new buildings are low carbon and climate-resilient.
Urban forest	All woodlands, groups of trees, individual trees and associated plants and animals in the urban environment.
Urban heat island	An urban area that is significantly warmer than its surrounding rural areas due to heat created from human activity and energy usage.
Urban sprawl	Expansion of urban areas with low-density housing spread out over large amounts of land. Long distances between homes, stores, and work increase dependence on personal vehicles.



TOWN OF CALEDON

CALEDON'S OFFICIAL PLAN UPDATE & CLIMATE CHANGE

TOWN OF CALEDON • DECEMBER 2021