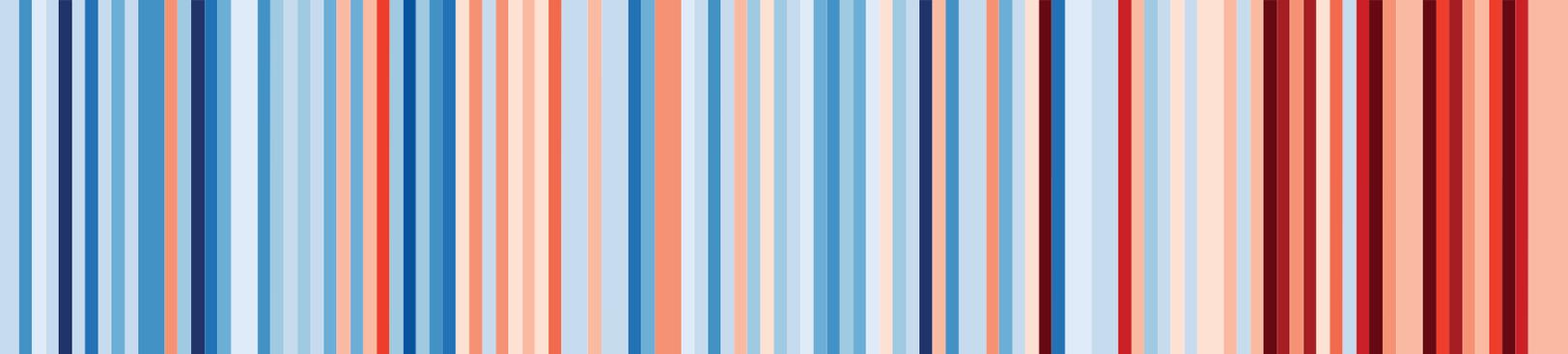




CLIMATE CHANGE MASTER PLAN

LEAD **INFLUENCE** TRANSFORM

2020 – 2030



Warming Stripes for Canada from 1901–2018.
Annual average temperatures for Canada from
1901–2018 using data from Berkeley Earth.*

Change Beyond Climate

Climate change is the defining challenge of our time. Now is the time municipalities can **Lead** through action to **Influence** the change needed to **Transform**. This will be critical to ensure communities remain equitable, healthy, prosperous, and secure places to live and work in the future.

In 2017, Regional Council unanimously endorsed a Climate Change Statement of Commitment directing the Region of Peel to develop a climate change master plan.

Building on this commitment, the Region of Peel will be a leader in the community to reduce greenhouse gas (GHG) emissions and to ensure its services, operations, and infrastructure are resilient to the impacts of climate change. These combined efforts will enable the Region's vision of building a Community for Life, where everyone enjoys a sense of belonging and has access to the services and opportunities they need to thrive throughout each stage of their lives.

The Region is experiencing the impacts of climate change. Anticipated future impacts, including severe heat waves, threats to the water supply, extreme storms, and adverse health effects, could disrupt society and the economy.

The signing of the Paris Agreement in December 2015 marked the moment when the global community committed to climate action to keep warming well below 2°Celsius (°C), and to strive to limit warming to 1.5°C above preindustrial levels. These targets require transformational change, which hinges on every community putting its resources, innovation, and leadership into play.

Municipalities around the world are stepping forward with strategies that identify ambitious targets to reduce or eliminate GHG emissions and protect their populations from the impacts of climate change. With the Climate Change Master Plan (CCMP), the Region will join their ranks by demonstrating leadership in its own operations (**Lead**), while supporting community climate action (**Influence**). The first three years will be defined the Pacesetter projects, pilots to inform the broader roll-out of net zero energy and net zero carbon buildings.

The Region will prioritize resources, policies, and initiatives that facilitate this transformation. The Region recognizes the urgency of this challenge and will take bold action.



The Climate Is Changing

Canada is warming at twice the rate of the rest of the world and the impacts are already being felt across the country and in every sector. In 2019, the Bank of Canada identified climate change as a risk to the economy and financial system, both as a physical risk from disruptive weather events and as a transition risk from adapting to a lower carbon economy.

Peel has experienced a number of significant weather-related events

Peel has experienced a number of significant weather-related events over the last decade, including (amongst others) a record-breaking rainfall in July 2013 that resulted in widespread flooding, and an ice storm in December 2013 that resulted in severe tree damage and power outages for several days. These events resulted in negative health impacts, damage to property, disruption in critical infrastructure systems, business and service interruptions, and limited mobility and access to services.

In Peel, these types of impacts are projected to increase in variability, frequency, and intensity. The most significant climate impacts to Peel will be from higher average temperatures, increases in heat waves, increases in rainfall, and more extreme weather events. This is expected to negatively impact the following areas;

 <p>Increased health impacts and reduced staff productivity</p>	 <p>Growing demands on public health, paramedic, and emergency management services</p>
 <p>Increased energy use and vulnerability of the electricity supply</p>	 <p>Rising financial costs and liabilities</p>
 <p>Increased pressure on operations and maintenance</p>	 <p>Increased impacts to natural systems</p>

1. Bush, E. and Lemmen, D.S., editors (2019): Canada's Changing Climate Report; Government of Canada, Ottawa, ON. p. 444
 2. Bank of Canada (2019). Financial System Review – 2019. Retrieved from: bankofcanada.ca/2019/05/financial-system-review-2019/#continue
 3. Region of Peel. (2016). Climate Trends and Future Projections in the Region of Peel.
 4. Region of Peel. (2019). Region of Peel Corporate Climate Change Risk Assessment Results Report.
 * Source: showyourstripes.info

Stepping Up to the Challenge

The Region’s responsibility to address climate change is based on the imperative to reduce GHG emissions and the ability to maintain the delivery of services in the face of current and projected climatic changes. This is consistent with how *the Municipal Act* empowers local government as leaders in the community, tasked with accountability and transparent decision making that has the well-being of the municipality at its core, including respecting and responding to the threat of climate change.

As much as climate change presents risks, there are also opportunities

As much as climate change presents risks, there are also inherent opportunities. Actions which reduce GHG emissions and increase resilience can also result in co-benefits. These include:

 Creating vibrant walkable cityscapes through sustainable urban design	 Improving public health outcomes, particularly among vulnerable populations
 Improving mental health outcomes	 Reducing regional operating and capital costs, and avoiding future costs from economic losses
 Spurring the local economy, generating jobs and attracting top talent	 Protecting the local environment, cleaning the air, and water

To fully realize many of these co-benefits, and ensure future investments are on-track to meet longer-term and deeper carbon reduction targets, experts in the energy sector are in agreement that diversification in energy sources (renewables, biofuel and, for now, natural gas) and decentralized energy systems (also known as district energy or community energy) are part of the required response to stay on track with the global agreement to meet the 1.5°C threshold.

In support of the continuous delivery of critical services to the Peel community and for future generations the CCMP focuses on reducing GHG emissions and preparing for the impacts of climate change in its corporate operations over the next decade, and ensuring future-ready conditions that can leverage and access energy diversity and system transitions over time. These operations encompass a range of services in the areas of health, affordable housing, water, waste, and wastewater, amongst others.

These services are delivered through Peel’s assets worth \$27.8B (with \$9B new assets planned out to 2041), including one million m² of building floor space, corporate and police fleets, roads, water and wastewater treatment plants, sewer lines, and other associated infrastructure.

CCMP Outcomes

Build Capacity: Climate change is considered in all decision-making through organization-wide climate literacy, planning, and accountability.

Reduce GHG emissions: Corporate greenhouse gas emissions are reduced by 45% by 2030, relative to 2010 levels.

Be Prepared: A safe, secure, and connected community is provided by ensuring Regional services and assets are more resilient to extreme weather events and future climate conditions.

Invest: Innovative and sustainable approaches are used to finance action on climate change.

Monitor and Report: Progress on addressing Regionally-funded climate change work is consistently reported, available, and widely understood.

Progress on these outcomes will be measured by the Region's Climate Change Resiliency scorecard which assesses key factors of a climate resilient community.



Build Capacity

Outcome: Climate change is considered in all decision-making through organization-wide climate literacy, planning, and accountability.

The emphasis on transformational change requires the promotion of governance processes that encourage learning, questioning norms, leading by example, and engagement, in addition to adjusting technical and infrastructure specifications.

Table 1.1
Build Capacity Actions

	Actions	Output
1	Develop service area climate change operational plans	Operational plans will be collaboratively developed to guide the implementation of the CCMP and provide clarity on responsibilities, timelines, and resource requirements.
2	Provide tools that enable integration of climate change priorities into decision making	A set of future scenarios will be developed to support decision-making. A guide will be prepared that incorporates the integration of climate change into business plans, and into standards and guidelines.
3	Communicate the need for and benefits of climate action	The Region will develop and implement an engagement strategy for key audiences, further informing discussions and actions on climate change.
4	Stimulate innovative approaches to address climate change	The Region will communicate and incentivize evidence based best practices.



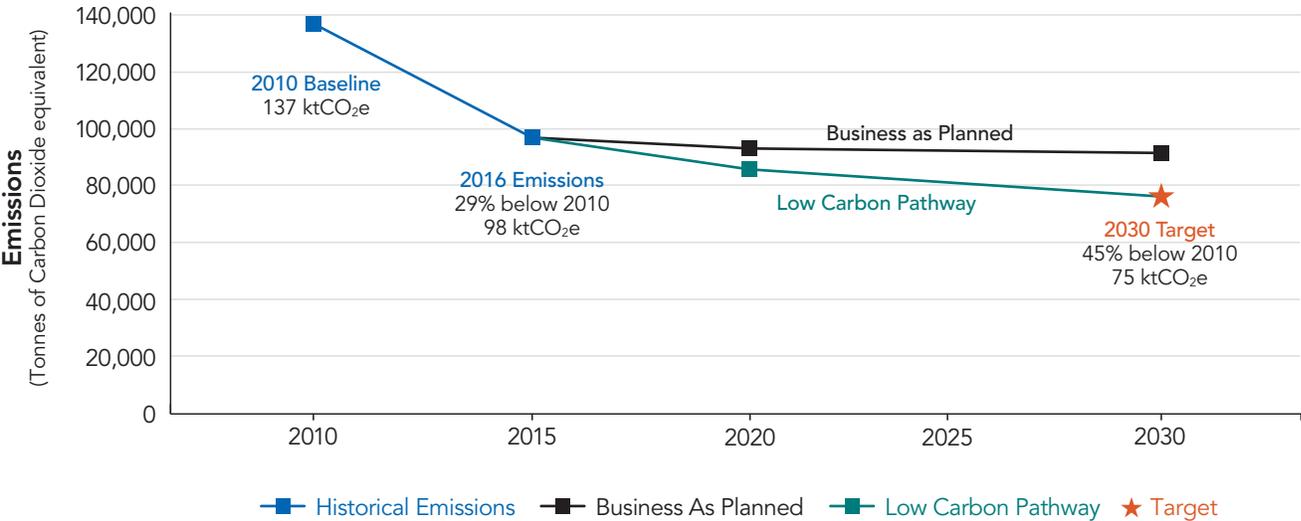
Reduce GHG emissions

Outcome: Corporate greenhouse gas emissions are reduced by 45% by 2030, relative to 2010 levels.

The Region of Peel has established a science-based target and will apply bold solutions to reduce GHG emissions from its buildings, fleet, and processes. The Region will also explore how to leverage this momentum and enable longer-term energy system transformation across the Region.

Using detailed modeling, the Region has developed a Low Carbon Pathway (LCP) model that achieves the target of a 45% reduction in GHG emissions below 2010 levels by 2030⁴. The Low Carbon Pathway is an accelerated option when compared to a “Business as Planned” (BAP) trajectory which would represent only a 30% reduction below 2010 with growth and the implementation of current plans (See Figure 1.2).

Figure 1.2
The Low Carbon Pathway to the Region’s 2030 GHG Emissions Target



⁴ The CCMP is focused on the period from 2020 to 2030, but also considers the implications of current actions out until 2050 in order to account for the duration of the impact of long-lasting investments.

The LCP is an ambitious but practical approach that addresses GHG emissions from the delivery of services to the community. It focuses on the heating and cooling of buildings, renewable energy generation, emissions from wastewater treatment, green fleet, and mode shifting for commuting, amongst other considerations (See Figure 1.3 for breakdown of emissions).

Figure 1.3
GHG Emissions from Delivery of Services

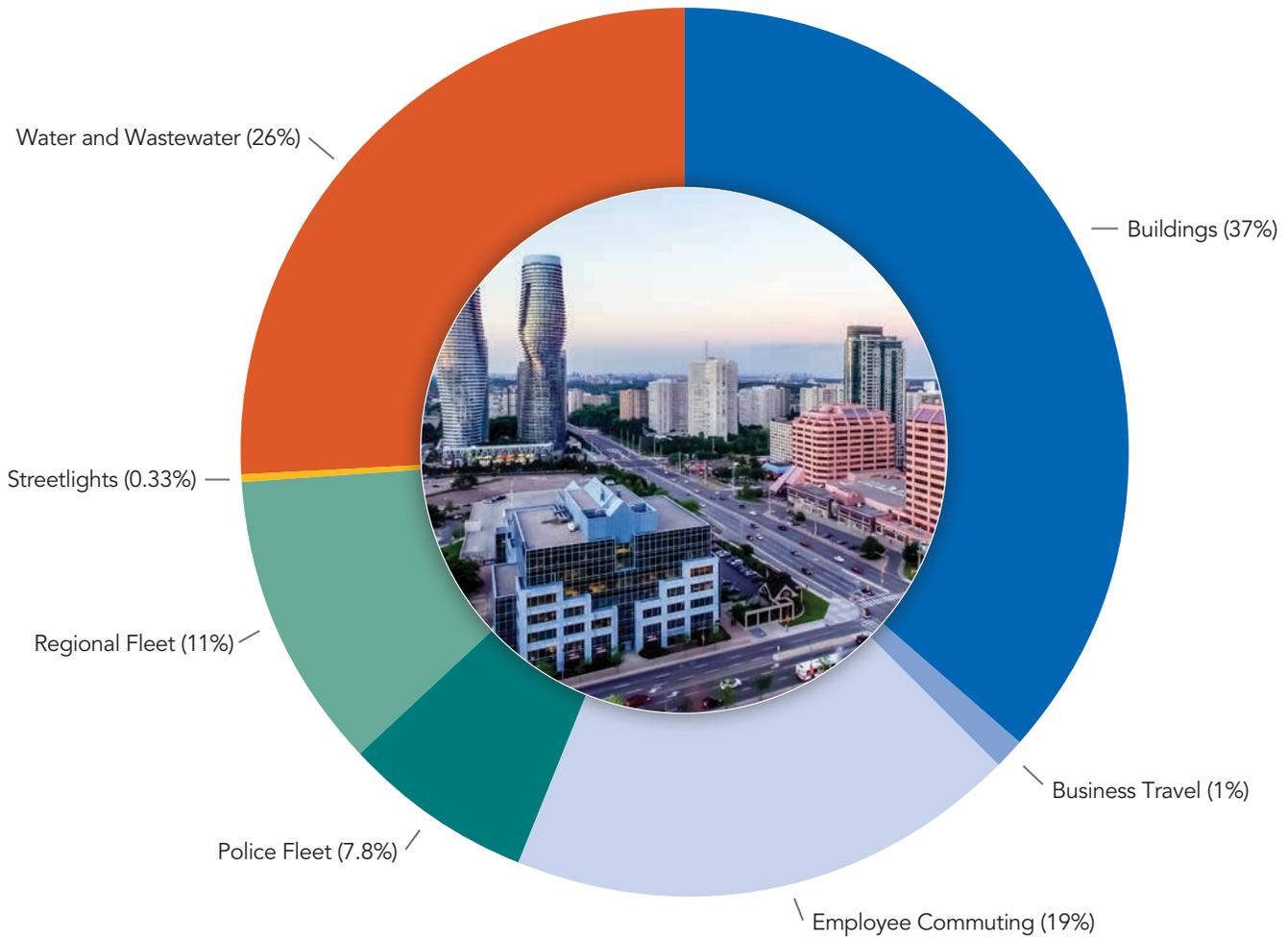


Table 1.2
Reduce GHG Actions

	Actions	Output
5	Undertake deep retrofits for existing buildings	Pursue deep retrofits of existing buildings, leveraging state of good repair work, and prioritizing energy intensive buildings.
6	Ensure new buildings have high energy performance	Construct new buildings to achieve a net-zero emissions standard.
7	Generate low carbon energy	Install solar PV and geexchange systems, where feasible, as buildings are constructed or retrofitted.
8	Enable alignment of Regional actions with transition toward diversified and decentralized energy systems	Convene and coordinate appropriate partners to develop a strategy for diversified and decentralized energy management at the regional scale and implement where feasible.
9	Support sustainable transportation for commuting	Promote actions of the Sustainable Transportation Strategy to support mode shifting and encourage teleworking.
10	Green the fleet	Continue to implement the Green Fleet Strategy.
11	Maximize energy efficiency and energy recovery in water and wastewater systems	Optimize the treatment and transmission of water supply. Implement the actions of the Wastewater Energy Security Strategy where feasible.



Be Prepared

Outcome: A safe, secure, and connected community is provided by ensuring Regional services and assets are more resilient to extreme weather events and future climate conditions.

The ability of the broader community to thrive is linked to the ability of the Region to maintain and operate assets and the vital services they provide through possible climate change disruption. The actions in this chapter will ensure the Region’s infrastructure assets and the services they provide, especially to those who are most vulnerable, are more resilient to extreme weather events and future climate conditions.

The Region faces an array of impacts from climate change, and will apply an integrated and systematic approach that:

- Increases readiness to respond to extreme events and climate-related health issues, especially those most vulnerable to climate impacts;
- Proactively protects and strengthens the Region’s existing infrastructure assets to maintain of service delivery to the community;
- Reduces the impacts of heat and flooding through green infrastructure; and
- Plans and builds assets and service delivery for a future climate and population projections.

Table 1.3
Be Prepared Actions

	Actions	Output
12	Better prepare to respond to, and raise awareness of, increased climate change-related emergencies and health impacts	The Region will enhance alliances with emergency management (EM) partners and integrate climate into EM planning and operations.
13	Identify and manage risks to infrastructure assets	The Region will undertake a climate risk and vulnerability analysis of Regionally-owned assets, integrate climate in the asset management planning process, apply climate design and performance criteria to new and state of good repair (SOGR) infrastructure work, and make climate risk and vulnerability-related information and plans for resilience available to the public.
14	Protect and increase green infrastructure throughout Peel	The Region will collaborate with local municipalities to expand GI across Peel. The Region will inventory, protect, and maintain existing natural assets, while expanding GI in areas with the greatest need.
15	Enhance standards, guidelines, and planning activities that pursue resilient urban design and development	The Region will develop and apply a resilience lens to new infrastructure. Working with Conservation Authorities and Local Municipalities maintain data on hazards, vulnerabilities, and risks, and further integrate climate hazards considerations into land use planning policy and processes.

Invest

Outcome: Innovative and sustainable approaches are used to finance action on climate change

Climate science has highlighted the urgency to mitigate and adapt to climate change now. The Region’s track record of prudent, forward-looking fiscal and budgetary policies could be threatened by future climate impacts and damages. These actions require significant investments that will generate returns. These investments present financial merits, and are critical to the future well-being of the Region and building a Community for Life.

The actions in the Low Carbon Pathway require incremental investments over the life of the Master Plan that result in savings later and are central to influencing broader transformation. These mitigation actions represent the majority of the estimated \$300–400 million capital expenditure needed to implement the action of the CCMP. The funding of this important work will be addressed through the Climate Finance Strategy. This work would be carried in alignment with the Region of Peel’s Long-term Financial Strategy.

Table 1.4
Invest Actions

Actions	Output
16 Complete a Climate Change Financing Strategy	The Climate Change Financing Strategy will develop the framework for how actions of the CCMP are budgeted into long term capital planning, with consideration given to innovative financing tools, including external funding.



5 Note that this representation of capital costs includes green infrastructure. However, because the financials for green infrastructure are calculated differently, it is not included in the Low Carbon Pathway financial results.

Monitor and Report

Outcome: Progress on addressing Regionally-funded climate change work is consistently reported, available, and widely understood.

Reporting, measurement, and evaluation processes are critical to understanding the impacts of climate change. This can enable a safe space for trying new approaches and informing risks. Therefore, the CCMP will report on elements from the Region’s performance in achieving climate change resiliency criteria and GHG reduction targets to climate risk exposure and project implementation.

Table 1.5
Reporting Actions

	Actions	Output
17	Report annually on Climate Change Master Plan Implementation	Provide status on progress toward climate change outcomes.
18	Develop a corporate climate change resiliency performance report	Report on how the Region is performing relative to the climate change resiliency scorecard.
19	Develop an annual climate-related financial disclosure report	A comprehensive report on the Region’s response to climate change will be published annually, using a format developed by the Task Force on Climate-Related Financial Disclosure.
20	Complete periodic scientific reviews	A review of climate science and its implications for the Region will be undertaken periodically by the Region.

Climate Change Resiliency Scorecard

- ✓ Public Support and Disaster Preparedness Increased
- ✓ Human Health Protected
- ✓ Commitment, Capacity and Partnerships Expanded
- ✓ Climate Risks and GHG’s Understood and Plan in Place
- ✓ Climate Related Risks and GHG’s Reduced
- ✓ Land Use Policy Implemented to Reduce GHG’s and Community Vulnerability
- ✓ Natural and Green Infrastructure Protected and Enhanced
- ✓ Investments Made and Financial Risks and Opportunities Disclosed



The Path Toward Transformation

The CCMP is a comprehensive ten-year strategy that contains many significant leadership opportunities that can influence positive change within the community. As part of the CCMP, the Region will:

- Be the first municipality in Canada to apply a carbon budget to its own operations;
- Undertake a deep retrofit program for existing buildings targeting near net zero emissions in alignment with anticipated transformations in the energy sector;
- Construct new buildings to target net zero emissions in alignment with anticipated transformations in the energy sector;
- Integrate climate resilience into asset management;
- Implement a green infrastructure program on existing and new assets; and
- Help pioneer climate risk and opportunity reporting by municipalities as specified by the Task Force on Climate-Related Financial Disclosures.

The CCMP creates a pathway that will be reviewed in 2023, while guiding investments that will deliver benefits beyond the life of the Plan. These benefits will include reduced GHG emissions and increased resilience to climate change and will also take many other forms, from enhancing the Region's reputation as a climate leader to improving the quality of the workplace. The CCMP will help the Region make the right investment decisions to create a healthy, safe, and connected community for current and future generations. It outlines a pathway for bold leadership and demonstrates the Region is a government that is future-oriented and accountable. All are necessary components for the Region to Transform in response to climate change.

Investments that will deliver benefits beyond the the life of the Plan



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