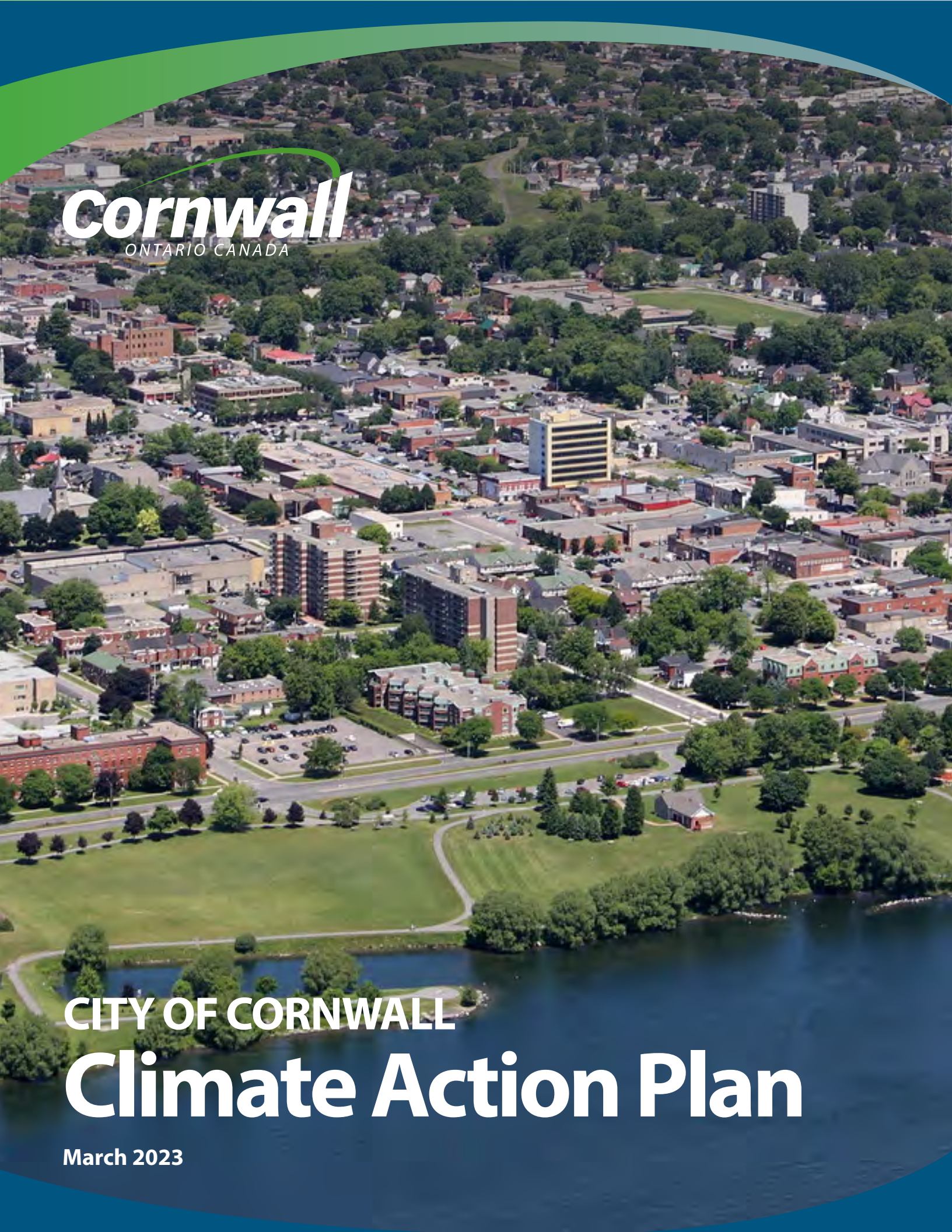


CITY OF CORNWALL
Climate Action Plan

March 2023

Land Acknowledgement

The City of Cornwall acknowledges the traditional territory of the Haudenosaunee peoples, the Mohawks of Akwesasne, the original keepers of this land. As settlers, we are grateful for the opportunity to live here, and we thank all the generations of people who have taken care of this land for thousands of years.

Acknowledgements

This plan represents the input and participation from a broad variety of community participants and City staff representatives from every department. Thank you to all participants for taking the time to contribute your expertise and knowledge to this initiative. The plan development process was supported by Pinna Sustainability Inc. In addition, the City is thankful to local energy utility providers who supported the plan development through the provision of data on community energy use.

Executive Summary

This Climate Action Plan is the City of Cornwall's response to the climate crisis, providing a path toward a low-carbon future for the community and for the City's operations. Following the commitment established in *Cornwall's Climate Emergency Declaration*, this plan outlines a strategy to achieve the ambitious target of 40-45% greenhouse gas (GHG) reduction (below 2005 levels) by 2030 and to become a net-zero city by 2050. This target reflects Canada's commitment to the Paris Agreement awnd the global effort to limit global average temperature from rising above 2°C and pursue efforts to limit the increase to 1.5°C. Meeting this goal is critical to avoid more catastrophic impacts of climate change.

This plan focuses on reducing greenhouse gas emissions in Cornwall in five action areas: **Efficient and Carbon Neutral Buildings, Active and Zero-Emission Mobility and Transportation, Waste Transformed, Enhanced Nature-Based Solutions** and **Municipal Leadership**. For each action area, this plan identifies a set of goals, actions and milestones with the ultimate aim to fulfill Cornwall's climate action vision and transform the city into a sustainable, low-carbon community. A summary of the goals and milestones is shown in the table on the next page.

Recognizing that achieving a net-zero city will involve significant investments in our buildings, transportation and waste systems, this plan highlights the substantial co-benefits of these actions, including becoming more resilient to the changing climate and extreme weather events, improving air quality, supporting local economic development, and supporting ecosystems and biodiversity. Investing in the actions in this plan will help the City optimize its resources toward initiatives that reduce emissions, build resilience, and meet many other community objectives in tandem.

Transitioning to a low-carbon community is an immense effort that is not isolated to the local municipality, but includes every resident, business and organization in the community as an essential piece to achieving the future we want for our city. Action from all other levels of government will also prove vital to achieving our goals. For this reason, this plan includes advocacy and the development of partnerships as part of the action plan to support this necessary collaborative approach to ensure we continue to live in a healthy, prosperous and resilient community.

FIVE ACTION AREAS IN CORNWALL'S CLIMATE ACTION PLAN

Efficient and Carbon Neutral Buildings

Active and Zero-Emission Mobility and Transportation

Waste Transformed

Enhanced Nature-Based Solutions

Municipal Leadership

ACTION AREA	GOALS	MILESTONES
 **1. Efficient and carbon-neutral buildings**	a) In collaboration with residential, commercial and industrial property owners, increase energy efficiency and decarbonize all buildings in Cornwall.	• By 2030, 30% of buildings use zero-emission heating as their primary source, reaching over 95% by 2050. • As of 2030, 100% of new buildings meet the national net-zero energy standard. • At least 80% of all new public housing developments use heat pumps starting in 2023, increasing to 100% as soon as feasible. • By 2030, 50% of existing public housing buildings operated by the City are retrofitted with energy efficiency measures and heat pumps.
 **2. Active and zero-emission mobility and transportation**	a) Provide a convenient, safe and comfortable public transit service that is supported by robust and low-emission infrastructure. b) Transportation infrastructure in Cornwall encourages and enables residents to walk and roll safely and conveniently, and make transportation choices that are healthier for themselves and their community. c) New urban development is compact and is designed to encourage walking, cycling, taking transit, and using zero-emission vehicles.	• Increase transit annual ridership from 16 trips per person (2016) to 20 trips per person by 2026 (~1 million riders), and to 30 trips per person by 2050. • Convert the transit fleet to 50% electric or hybrid buses by 2035, and 100% electric buses by 2040. • Increase percent of residents who commute by walking or biking by 3% by 2036. • Accelerate uptake of zero-emission light-duty vehicles to 40% of vehicles in Cornwall by 2030 and 100% by 2050. • Install 30+ new EV charging stations by 2026. • Adopt EV-ready parking requirements for new multi-unit residential and non-residential buildings by 2026.
 **3. Waste transformed**	a) All residents and businesses have access to programs that support waste reduction and allow them to divert organic waste. b) Waste is transformed into a beneficial resource that captures energy and other benefits while minimizing emissions.	• Increase residential and commercial organic waste diversion rate to 50% by 2025, 60% by 2030 and 80% by 2050. • Develop a Biosolids, Organics and Septage Master Plan (BOSMP) by 2023. • Landfill gas capture system efficiency is improved and opportunities for gas use as energy are explored.
 **4. Enhanced nature-based solutions**	a) Tree canopy coverage is increased to reduce demand for air conditioning, and to provide residents access to shaded public spaces that increase resilience to higher summer temperatures. b) Green spaces and wetlands are restored, enhanced and protected to increase carbon sequestration, and the value of these ecosystems is understood and appreciated by the public.	• Complete a tree inventory database in 2024. • Plant at least 600 trees in municipal spaces every year through 2030. • Increase carbon sequestration in natural areas.
 **5. Municipal leadership**	a) New municipally-led developments and retrofits are energy efficient and low emission, with the goal that all municipal facilities achieve net-zero emissions by 2050. b) The municipal fleet transitions to zero-emission vehicles and equipment as early as feasible, with the goal to have a zero-emission light-duty fleet by 2030 and a fully electric fleet by 2040.	• Reduce emissions from municipal operations by 45% by 2030 from 2005, and achieve net zero emissions from operations by 2050. • By 2025, all new municipal facilities designed after 2024 are net-zero energy ready. • By 2030, the City's light-duty fleet are all zero-emission vehicles.

Table of Contents

List of Figures

List of Tables

1

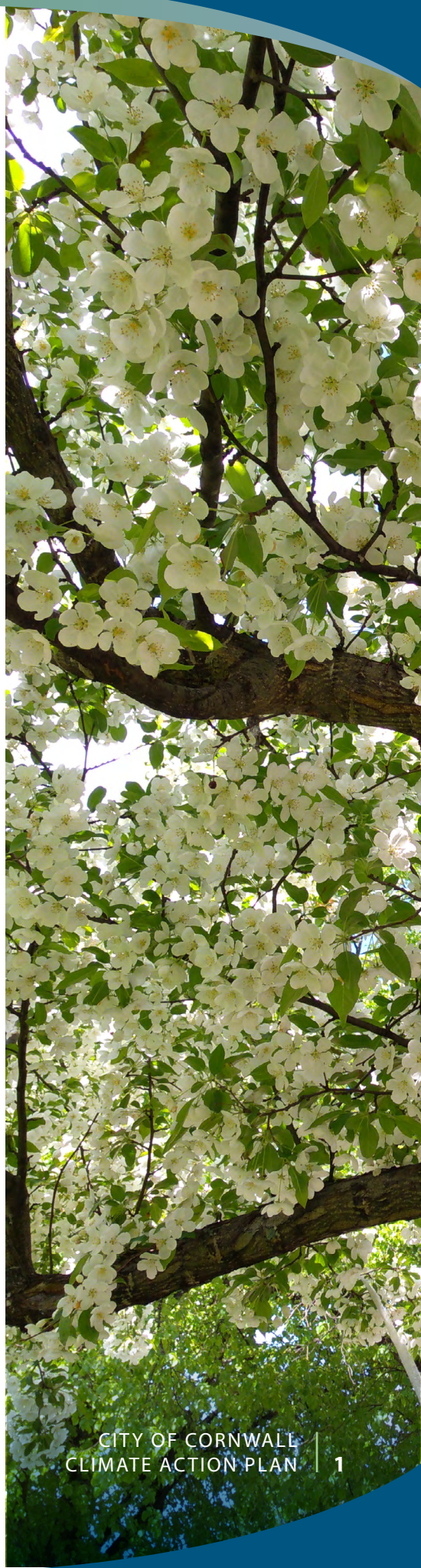
Introduction

A global problem with local consequences

Climate change is a global challenge with local impacts that are becoming increasingly frequent and severe. Extreme weather events like rainstorms, floods, droughts, heat waves, tornadoes and windstorms are becoming more common in Ontario, threatening residents' health and safety, the environment, and the economy in the City of Cornwall. To avoid the more catastrophic impacts of climate change that are anticipated if global warming exceeds 1.5°C above pre-industrial levels, the Intergovernmental Panel on Climate Change has identified an urgent need to rapidly decarbonize and reduce greenhouse gas (GHG) emissions.[1] Currently, Canada is not on track to meeting these emissions reduction targets at the national, provincial, or local levels.

Local governments stepping up

As our collective deadline for rapid emissions reductions looms, local governments are responding to increasing public demand with novel decarbonization initiatives that recognize the important role of municipalities in advancing climate action. Cornwall residents have expressed a clear interest in seeing the City take a more active role in the global fight against climate change. In a 2021 survey, 72% of respondents said that the City should do "more" to address climate change, with over 70% expressing specific support for the development of a municipal climate action plan.[2] On December 13, 2021, Cornwall joined over 500+ municipalities across the globe in declaring a climate emergency.



1 See IPCC. (2018). *Global Warming of 1.5°C*. Retrieved January 16, 2023, from https://www.ipcc.ch/sr15/.

2 Survey respondents were mostly residents living within the municipality of Cornwall (71%), but also includes residents of Eastern Ontario (26%).

Cornwall's climate commitment

The City of Cornwall's *Climate Emergency Declaration* established specific commitments and areas of climate action for the City, including the following commitments that support the development of this plan:

- Adopting the national greenhouse gas reduction target (40-45 percent below 2005 levels by 2030);
- Joining the Partners for Climate Protection (PCP) program by passing the additional Council Resolution and committing to its 5-step framework;
- Developing a Community Climate Action Plan that can realistically achieve the City's greenhouse gas emission reduction targets.

In addition to this declaration, the City also identified "*Being leaders in sustainability and climate change impact*" as one of five priorities in the 2019-2022 Strategic Plan.

Cornwall's climate action plan

To advance the areas of climate action identified in this declaration, the City initiated the development of this Climate Action Plan (CAP) in the Summer of 2022. While this plan focuses on understanding and reducing Cornwall's community greenhouse gas emissions, the City is also investigating the potential to pursue a climate change adaptation plan to assess climate change impacts on the City, its citizens and its ecosystems, and develop a strategic response to enhance resilience (see *Figure 1*). Recognizing there will be areas of overlap between these two plans, this Climate Action Plan highlights where there are co-benefits for climate change adaptation when reducing emissions. This will help the City optimize its resources toward initiatives that reduce emissions and build resilience in tandem. Investing in these actions now, also means reducing or avoiding the costs of not acting. Many capital investments being made now will need to transition off of fossil fuels before the end of their lifespan—now is the time to ensure these investments endure.

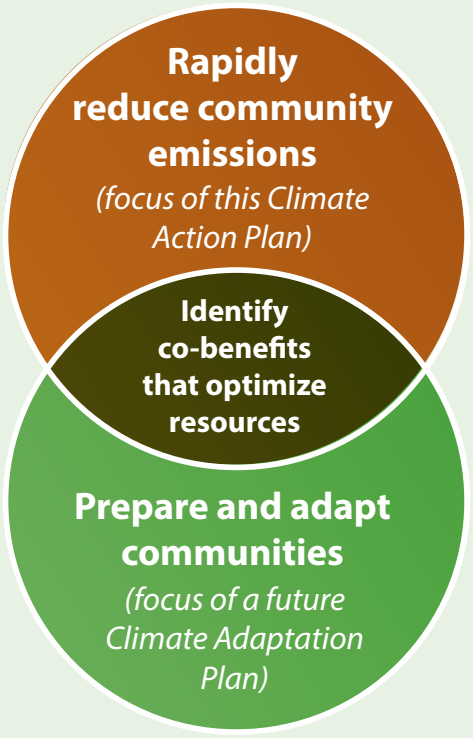


Figure 1. Relationship between this Climate Action Plan and future adaptation planning

Action needed from all levels of government

Transitioning to a low-carbon community is an immense effort that is not isolated to the local municipality, but includes every resident, business and organization in the community as an essential piece to achieving the future we want for our city. Action from all other levels of government will also prove vital to achieving our goals. This plan includes advocacy and the development of partnerships as part of the action plan to support this necessary collaborative approach to ensure we continue to live in a healthy, prosperous and resilient community.

Social, economic and environmental co-benefits

Meeting the national targets means rapidly changing how most buildings are heated, how people and goods move around, how waste is managed, and more. The task at hand is enormous, but it is increasingly viable with technology and government policies and programs that support the change. Meeting this challenge is also essential in order to avoid more catastrophic impacts of climate change and extreme weather events, which have enormous impacts on the local economy, residents' health and well-being, and ecosystems. Fortunately, many of the changes needed come with co-benefits:

- Investing in building retrofits makes them more affordable to heat and cool, more comfortable, more resilient to weather extremes, and provides jobs for local contractors and suppliers;
- Switching to efficient electric heat pumps provides an efficient way of cooling during increasing temperatures and improves indoor air quality;
- Building more compact new developments provides a wider variety of housing options, and opportunities for improved access to amenities;
- Shifting transportation toward more active modes (walking, biking and public transit) leads to healthier lifestyles and more affordable options for getting around;
- Using electric vehicles improves local air quality;
- Diverting and repurposing our waste can provide great quality compost and a potential new source of clean energy.

Investing in climate action also means investing in improved social, economic and environmental well-being in the community.

Advancing equity

As the City and the community identify and implement actions to decarbonize and reach the targets, it is necessary to acknowledge inequities in our current state and to advance actions in a way that is fair and accessible to all members of the community. Investments in climate action are also an opportunity to engage, prioritize and elevate individuals and groups that have been traditionally underserved. This may include shifting mobility and transportation planning to be more inclusive of all abilities, planning programs that address energy poverty, and prioritizing green spaces and naturalization in urban neighbourhoods that currently lack shading and areas of respite.

Over a thousand Cornwall residents took the City's climate survey in 2021. A significant majority said that the City should do more to address climate change, and supported the development of a Climate Action Plan for Cornwall.

How this plan was developed

This Climate Action Plan was developed over an eight-month period through research, analysis, and a series of workshops with City staff and community representatives (see *Figure 2* for a summary of the process). The City is fortunate to have numerous engaged community representatives that took the time to provide meaningful input into the process. Through these engagements, the City developed an overarching vision and goals to guide Cornwall's climate action efforts over the years ahead. To reach these targets, the plan identifies five areas for climate action, specific actions to advance each area, and milestones to assess the City's progress along the way.

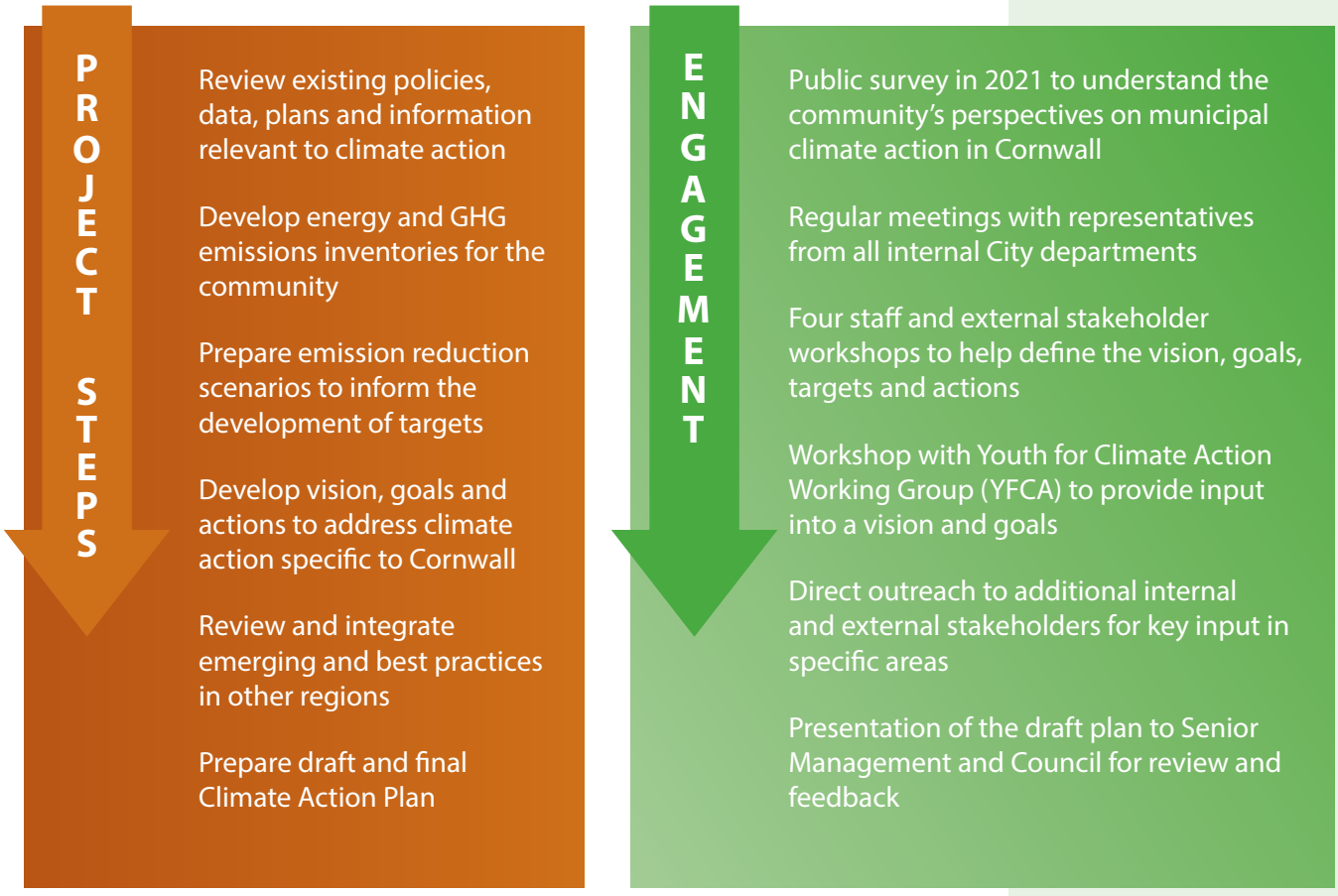


Figure 2. Climate Action Plan process and engagement

2

Vision, Targets and Goals for Community Climate Action

As one of the largest cities in Eastern Ontario, Cornwall is uniquely situated along the St Lawrence River at the convergence of the Ontario, Quebec and New York State borders. The city also shares its southern border with the Mohawk Nation of Akwesasne. With a population of approximately 48,000, Cornwall maintains a small-town feel, while also providing an urban centre with facilities and services for residents of the city and the surrounding communities.

Cornwall's location positions it to support a variety of industries with a shifting focus from primarily manufacturing to include logistics, distribution and call centres, and retail, including hosting the largest supply chain management distribution centre in Canada.

The projected impacts of climate change threaten many of the things currently taken for granted, including how we build and manage resilient infrastructure, how we keep residents healthy and safe, how we maintain functioning ecosystems, and where we get our food, both in the face of more extreme weather events and in light of gradual changes that lead to chronic stresses. Taking action to limit the impacts of climate change is imperative to minimize these impacts and maintain community well-being.

2.1
Climate Action Vision

In order to create and sustain a lasting sense of community and organizational commitment to climate action, it is important to provide an overarching vision that inspires and motivates people to do their part. The climate action vision at right describes a future that the City of Cornwall and its residents can aspire towards as they take local action to prepare for and respond to the global climate crisis.

This vision statement is based on input from City staff across departments, community representatives, and members of Cornwall's Youth for Climate Action Working Group (YFCA). The key messages from these conversations were clear: Cornwall's climate action vision needs to balance the city's goal of sustainability and low-carbon development with an approach that centers on realistic, practical, and collaborative action. Youth members also emphasized that the plan should empower residents to take more effective individual action to address the climate crisis.

Cornwall is already investing in becoming a sustainable city. Developing and implementing this municipal Climate Action Plan provides specific steps that move the community further along the path towards achieving this vision, shifting from "becoming" to "being" sustainable and resilient. Beyond demonstrating sustainability leadership, many of the actions outlined in this plan will enable and support community members to be sustainability leaders, and support them to take personal action to reduce their environmental footprint—for themselves, and for future generations.

Participants in the Youth for Climate Action Working Group.

> ***Cornwall is a sustainable and resilient city that takes collaborative and practical action to support low-carbon lifestyles and enhance community wellbeing.***
>
> *—Cornwall climate action vision*

2.2
Emission Reduction Targets

The City of Cornwall's declaration of a Climate Action Emergency showed the urgency of climate change mitigation and a call to rapidly reduce the community's emissions. Cornwall's long-term targets are aligned with the national greenhouse gas reduction targets as follows:

- Reduce GHG emissions 40-45% below 2005 levels by 2030
- Achieve net-zero GHG emissions in the community by 2050

These targets align with the international and Canada's targets to limit global warming to 1.5°C this century; the targets are more ambitious than the current provincial targets. To meet the 2030 targets, Cornwall needs to reduce annual levels of GHG emissions by at least 75,000 tonnes of CO_2equivalent emissions in 2030 relative to 2005 levels. The actions in this plan provide the steps toward achieving these targets.

2.2.1
Current sources of community emissions

What is measured in this plan?

This plan includes emissions generated within the community as a whole in relation to buildings, transportation, solid waste and wastewater. A community-wide greenhouse gas emission inventory provides an estimate of the greenhouse gas emissions arising from the activities within the community boundaries, and includes emissions generated by the local government itself (also called "corporate emissions"). The community-wide emission inventory was developed using the guidelines from the Partners for Climate Protection (PCP) program, of which Cornwall is a member.

What are the key sources of emissions?

In 2021, total GHG emissions for the community of Cornwall were approximately 242,000 tonnes of CO_2e.[3] *Figure 3* shows the community's GHG emissions by sector and fuel type. Buildings make up 47% of all community emissions, while transportation accounts for an estimated 46%, and the remaining emissions result from the breakdown of waste deposited in the landfill and flaring of methane gas at the wastewater treatment plant (WWTP).

Images from City of Cornwall's Eco Day in 2022.

3 Carbon dioxide equivalent is a measure used to compare the emissions from various greenhouse gases based on their global warming potential. This index, defined by the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, expresses the warming effect of a certain amount of a greenhouse gas over a set period of time (usually 100 years) in comparison to CO_2. For example, the global warming potential for methane over 100 years is 21. This means that emissions of one million metric tons of methane is equivalent to emissions of 21 million metric tons of carbon dioxide.

Buildings. Nearly all emissions from buildings result from using natural gas for heating and hot water, with electricity amounting to a very small fraction of the total. This is because the electricity used in Cornwall comes from hydroelectricity and has very low emissions associated with it. Propane and heating oil are not major sources of energy in the city boundaries, as most properties are on the natural gas grid. Propane is estimated to contribute less than 1% of total emissions.

Transportation. Vehicles in the community primarily use gasoline and diesel as fuel sources, with the majority of emissions coming from passenger light-duty vehicles (38%) and the remaining from heavy-duty vehicles (8%). Based on Statistics Canada Census, Cornwall has much shorter average commuting distances than the Ontario average which reduces the average daily travel. However, the majority of that travel is by vehicle (about 86%), while the remaining commuters use public transit (5%) and active transport like walking and biking (9%).

Solid waste and wastewater. Organic waste that is put into the landfill and generated at the WWTP decays over time and releases methane—a powerful GHG. The City's landfill and WWTP have systems that capture methane gas, then flare the methane to convert it to CO_2—a much less potent GHG—resulting in significantly lower emissions than would otherwise be released from both facilities.

Urban green spaces and natural areas. These areas are not currently quantified as part of the community emissions baseline, however, preservation and expansion of these can be important carbon sinks over the longer term.

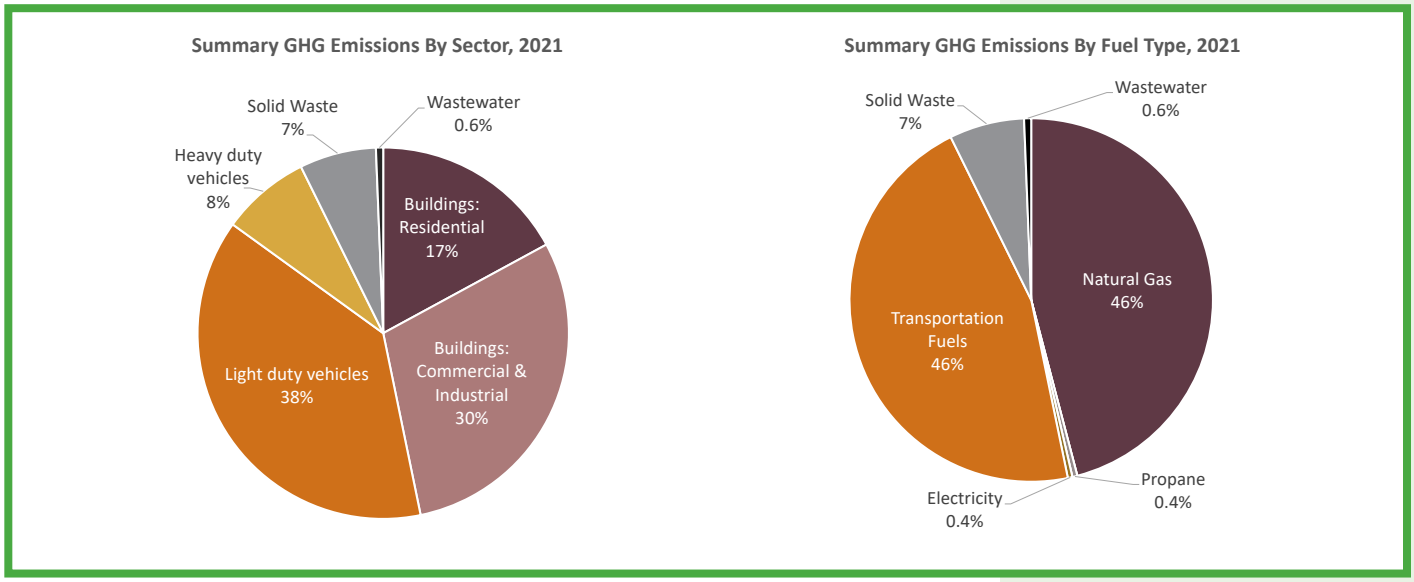


Figure 3. Summary of GHG emissions by sector and fuel type, 2021

Municipal operations. The City of Cornwall's corporate emissions result from providing community services (including fire services, roadworks, planning, building permitting, waste management, water and sewer management, recreation services, parks, and more). These emissions are a small sub-component of the total community emissions described above, but they are directly in the municipality's purview to manage. An inventory prepared in 2022, by the Clean Air Partnership, identified total corporate emissions for the City of Cornwall in 2021 as 5,576 tonnes of CO_2equivalent. This is about 2% of the estimated community greenhouse gas emissions. *Figure 4* provides a breakdown of these emissions.

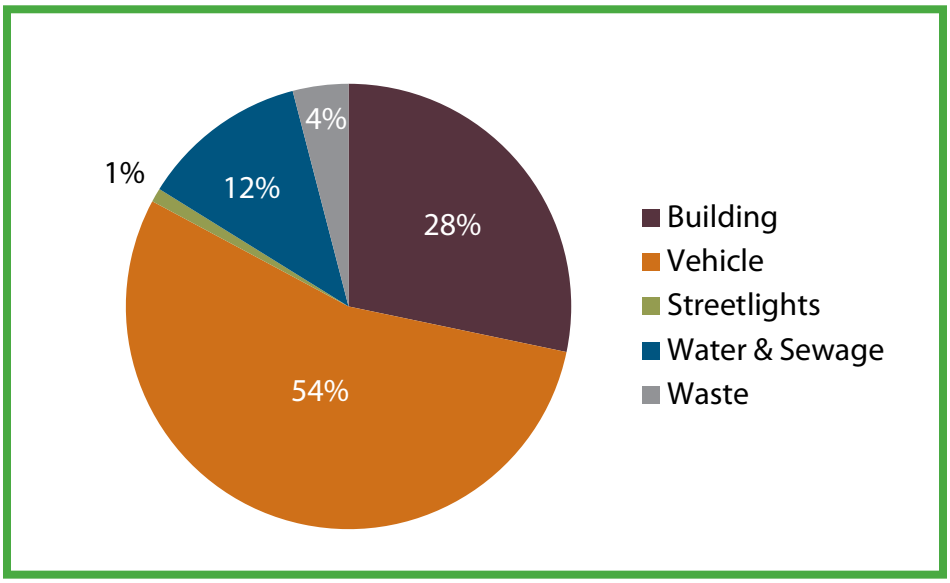


Figure 4. City of Cornwall corporate GHG emissions sources, 2021

2.2.2 Emissions reduction scenarios

What are the opportunities to meet the targets set in the climate emergency declaration? Emission reduction scenarios were developed for Cornwall to examine a range of trajectories that emissions may follow over time, depending on the level of ambition that occurs. *Figure 5* shows the result of three key scenarios:

1. **Minimal climate action scenario:** a trend of emissions growing approximately in tandem with projected population growth.
2. **Business-as-planned scenario:** a trend of emissions if currently planned federal and provincial policies are implemented, but no further action is taken. Emissions drop by about 7% by 2030 and 30% by 2050.

3. **Climate emergency scenario:** a pathway toward reaching Cornwall's climate action targets that assumes additional action is taken at all levels of government (Municipal, Provincial, Federal government), and by residents and businesses, as supported by the government action.
4. **Carbon sequestration scenario:** additional action to support and expand natural carbon sinks in the community, in addition to the climate emergency scenario, will help to achieve an overall goal of a net-zero community by 2050.

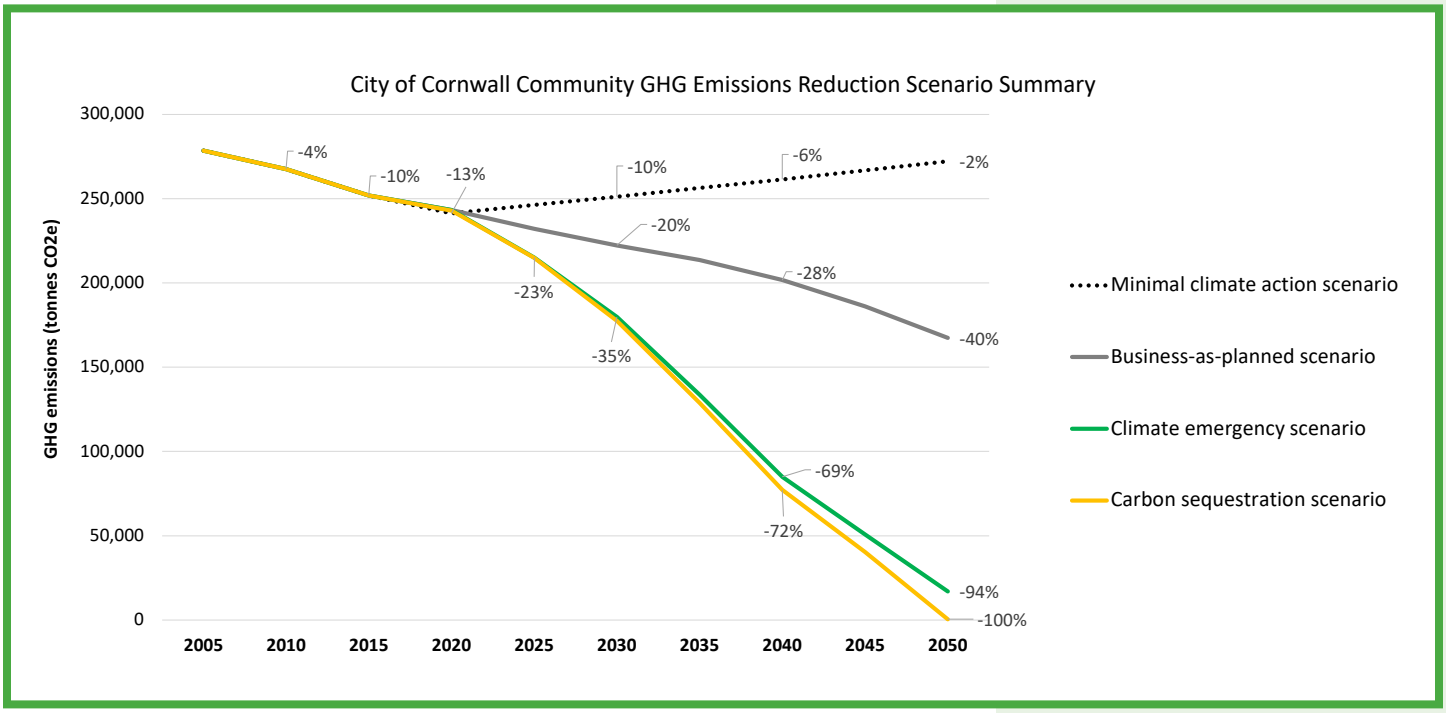


Figure 5. City of Cornwall Community GHG Emissions Reduction Scenario Summary

Climate Emergency Scenario: A Pathway to Our Targets

Figure 6 shows Cornwall's climate emergency scenario, representing one pathway toward reaching the climate emergency targets. This pathway projects that significant emission reductions will result from a combination of action by all levels of government, residents, businesses and community organizations. The most significant reductions are projected to include: replacing natural gas heating with electric heat pumps, building and renovating to high energy efficiency standards, transitioning the vehicle fleet to zero-emission vehicles (primarily electric for light-duty vehicles), increasing the use of transit, walking and cycling, capturing and diverting organic waste from the landfill, and making the best use of methane gas captured at the landfill and the WWTP.

Some of these actions may require higher capital investments up front relative to the business-as-usual investments, though many of these will pay back through savings in operational costs within their lifespan. When preparing

business cases going forward, it will be important to ensure the lifecycle costs are fully considered, in addition to future carbon liabilities and the costs of not shifting to low and zero emission energy sources.

These actions are anticipated to result in substantial reductions in GHG emissions, but some emissions may remain past 2050. In particular, waste deposited into the landfill will continue to produce GHG emissions for decades, and not all of these emissions can be captured effectively. Furthermore, although most buildings may transition to electric heating overtime, there may be some high energy intensity applications that take longer to transition. Therefore, in addition to emission reduction actions, it will be important for the community to identify opportunities to restore natural areas that sequester additional carbon, resulting in a net-zero emissions community. The development of a database and a strategy for carbon sequestration is an action identified in this plan that will further define how this can be achieved.

Actions identified in this plan demonstrate how the City can play an important and active role in supporting these key initiatives, but the City cannot achieve these outcomes alone. Significant support from the provincial and federal governments, as well as active participation from the community and businesses, will be necessary to achieve our targets.

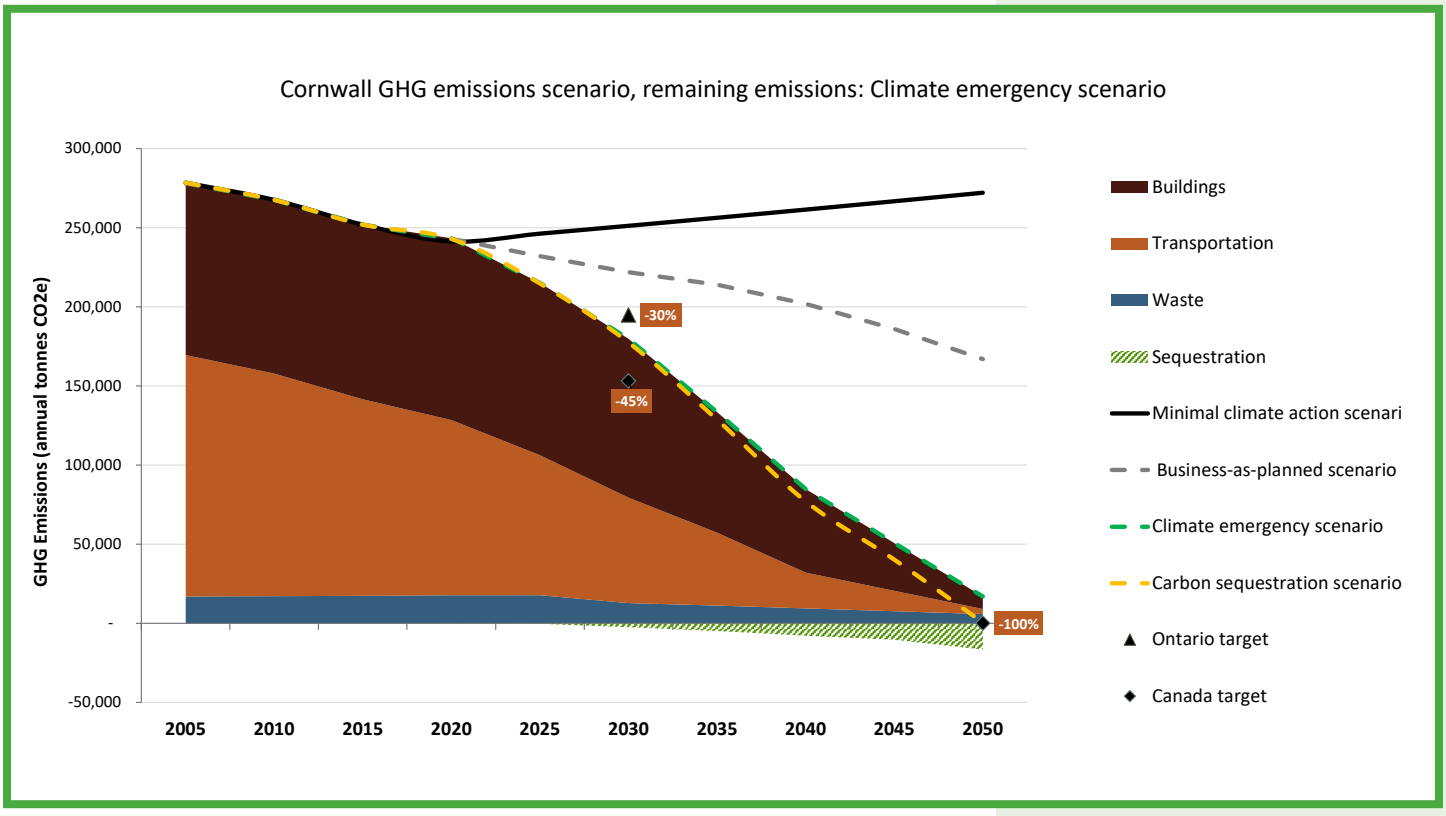


Figure 6. City of Cornwall Climate Emergency GHG Emissions Scenario

2.3
Climate Action Goals

Sector-specific climate action goals make Cornwall's climate action vision tangible and real, and describe the practical change that will be required to achieve community emissions reduction targets. The following table details climate action goals to guide the efforts of City staff, community members, and partner organizations:

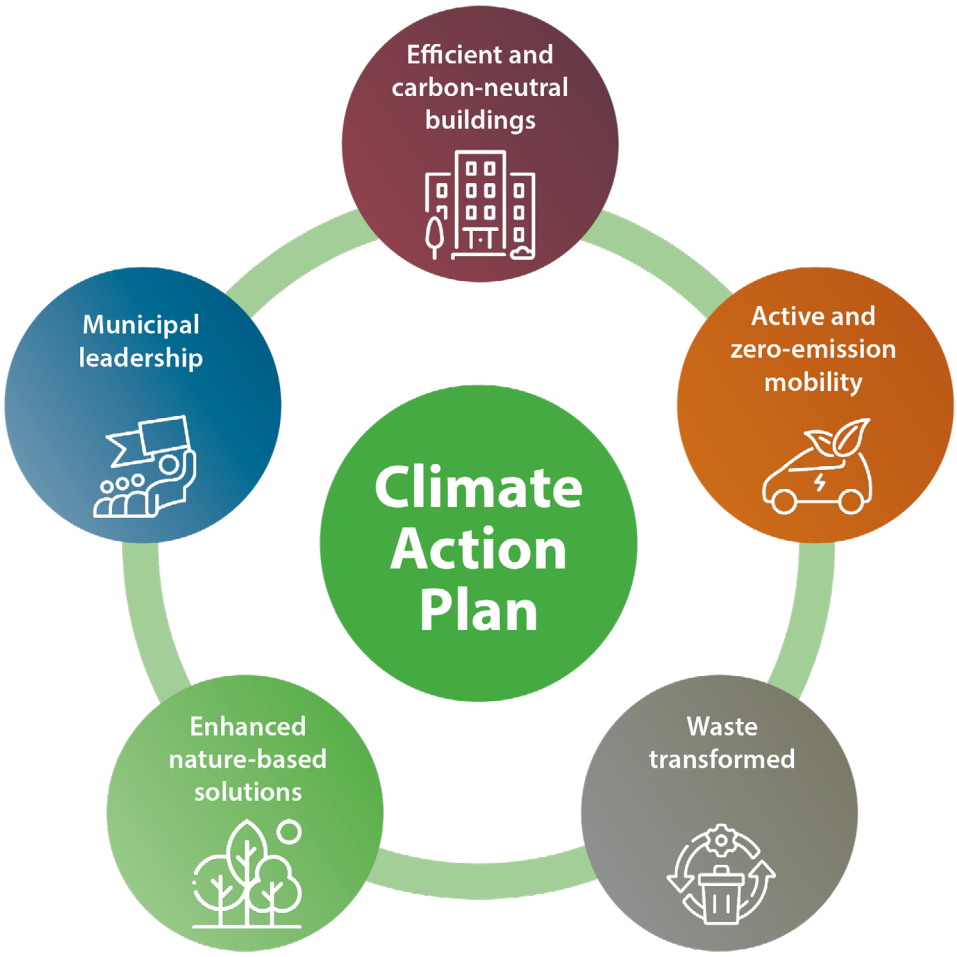
CLIMATE ACTION GOALS	
 **1. Efficient and carbon-neutral buildings**	1.1 In collaboration with residential, commercial and industrial property owners, increase energy efficiency and decarbonize all buildings in Cornwall.
 **2. Active and zero-emission mobility and transportation**	2.1 Provide a convenient, safe and comfortable public transit service that is supported by robust and low-emission infrastructure. 2.2 Transportation infrastructure in Cornwall encourages and enables residents to walk and roll safely and conveniently, and make transportation choices that are healthier for themselves and their community. 2.3 New urban development is compact and is designed to encourage walking, cycling, taking transit, and using zero-emission vehicles.
 **3. Waste transformed**	3.1 All residents and businesses have access to programs that support waste reduction and allow them to divert organic waste. 3.2 Waste is transformed into a beneficial resource that captures energy and other benefits while minimizing emissions.
 **4. Enhanced nature-based solutions**	4.1 Tree canopy coverage is increased to reduce demand for air conditioning, and to provide residents access to shaded public spaces that increase resilience to higher summer temperatures. 4.2 Green spaces and wetlands are restored, enhanced and protected to increase carbon sequestration, and the value of these ecosystems is understood and appreciated by the public.
 **5. Municipal leadership**	5.1 New municipally-led developments and retrofits are energy efficient and low emission, with the goal that all municipal facilities achieve net-zero emissions by 2050. 5.2 The municipal fleet transitions to zero-emission vehicles and equipment as early as feasible, with the goal to have a zero-emission light-duty fleet by 2030 and a fully electric fleet by 2040.

Table 1. Climate Action Goals

3

Action Plan

To achieve Cornwall's climate action vision and goals, a detailed action plan has been developed to articulate strategic pathways and specific activities and tactics. These actions are grouped into five action areas: efficient and carbon-neutral buildings, active and zero-emission mobility and transportation, waste transformed, nature-based solutions, and municipal leadership. For each action area, specific actions have been identified to advance emissions reduction efforts, and milestones have been identified to measure progress over time.



Actions to reduce GHG emissions

Actions in this plan focus on what role the City can play to support the community to reach the climate action vision, goals and targets. The City's role varies widely, depending on the level of influence the City plays in different action areas. With its own assets, the City can make direct investments, for example in electric vehicles and very energy efficient facilities. For broader activities taking place across Cornwall, the City can influence changes through indirect actions, for example, updating policies, plans or bylaws, developing education or incentive programs, installing infrastructure, or engaging in partnerships and advocacy with other levels of government.

Actions identified in this plan were selected and refined through research into the climate action efforts of comparable and leading municipalities, and multiple rounds of engagement with City staff and community representatives with the purpose of identifying the optimal role for the City in this rapid transition. In addition to identifying actions, several milestones were defined to help the City track progress in each action area.

What will be required to put the actions in place?

Preliminary implementation costs and resource requirements have been considered for each action to assist with understanding the approximate level of effort that will be needed by the City to implement each action. Estimates include both the initial activity (e.g., conducting a feasibility study), and a broad estimate for the level of investment that may follow from those initial activities (e.g., undertaking construction or implementing a new program) up to the 2030 timeframe. Some actions may lead to additional investment post-2030, but those are not included. More detailed estimates will be developed as actions are prioritized for implementation through capital and operational budgeting processes (see *Section 6: Implementation*).

Estimates of the scale of investment and staff time to implement each action use the ranges shown in Table 2.

Cornwall youth take part in the Great Little Cleanup of 2022.

TIMEFRAME		INVESTMENT		STAFF RESOURCES	
SHORT	Years 1 and 2	**$**	$0-150,000	◆	Less than 10% of one FTE^
MEDIUM	Years 3 and 4	**$$**	$150,000-$1,000,000	◆◆	10-25% of one FTE
LONG	Year 5+	**$$$**	$1,000,000-$5,000,000	◆◆◆	25-75% of one FTE
		$$$$	$5,000,000+	◆◆◆◆	One+ employees dedicated

Table 2. Investment and staff time estimate range for implementing each action.
Table note: ^An FTE means one full time employee's role.

Co-benefits of taking climate action

The action plan tables also highlight the substantial economic, environmental and social co-benefits for each action that goes above and beyond simply reducing greenhouse gas emissions. Examples of co-benefits include increasing resilience to the changing climate and extreme weather events, improving air quality, supporting local economic development, and supporting ecosystems and biodiversity. Investing in the actions in this plan will help the City optimize its resources toward initiatives that reduce emissions, build resilience, and meet many other community objectives in tandem.

City of Cornwall staff and residents take part in various community environmental programs.

3.1

Efficient and Carbon Neutral Buildings

Goal

In collaboration with residential, commercial and industrial property owners, increase energy efficiency and decarbonize all buildings in Cornwall.

Overview

Transitioning to energy-efficient buildings that use renewable and low-carbon energy sources is a decisive step toward greenhouse gas reductions. Currently, buildings account for about 50% of community emissions, with almost all of these emissions resulting from using natural gas for heating and hot water. Replacing natural gas furnaces, hot water heaters, and boilers with electric heat pumps are the biggest opportunity to reduce emissions from buildings. This, paired with energy efficiency improvements, can also be a cost-effective option in many cases (see *text box,* right).

Residents and businesses in the region are beginning to make the shift away from natural gas, but there remain significant barriers. These include a lack of information about the costs and benefits, limited number of trades that will install heat pumps, lack of capital to pay for higher upfront costs, delays in the supply chain and availability of units, sufficient electrical service capacity, and more. For very high-intensity boiler applications (for example, heating a pool in a recreation centre), the conversion to electric heating may not yet be cost-effective, so alternative options may need to be considered such as purchasing renewable natural gas, or heat exchange where feasible.

By removing barriers and providing incentives, the City can help make adopting energy-efficient technologies more achievable. By developing information and supporting services, the City facilitates the energy transition for residents. By expanding the capability of local contractors to provide solutions for building owners, the City increases the affordability and effectiveness of energy upgrades.

Recent provincial legislation called the *More Homes Built Faster Act (Bill 23)*, which has the goal to expedite home building, may reduce municipal authority to adopt bylaws for sustainable building standards.[4]

HEAT PUMPS ARE EFFECTIVE IN COLD CLIMATES

Modern cold climate heat pump systems with built-in backup resistance heaters are capable of efficiently providing all of the heat required to keep a home comfortable even in Ontario's climate. Cold climate heat pumps are often rated to provide full heating down to -20°C to -30°C, but performance will vary by system and installation.[5]

4 Amendments have been suggested by The Atmospheric Fund, with several organizations supporting these suggestions, that would maintain authority for municipalities to adopt and enforce sustainable building standards.

5 See Ontario Clean Air Alliance Research. (2022). *An Analysis of the Financial and Climate Benefits of Electrifying Ontario's Gas-Heated Homes by Installing Air-Source Heat Pumps*. Retrieved January 16, 2023, from https://www.cleanairalliance.org/wp-content/uploads/2022/08/Heat-Pump-Report-gas-heated-2022-8.5x11-aug-02-v_01.pdf.

Current municipal actions and resources

- The City is integrating energy efficiency measures and heat pumps into new public housing projects. A current project in development to house 77 people will meet higher energy efficiency standards, will have heat pumps in each unit, will include being solar panel ready, and will have Solarwall Technology on the south side of the building.
- City building inspectors work with building owners and contractors to ensure energy efficiency standards in the building code are being met.
- Other municipal actions to improve efficiency and reduce emissions in buildings have focused on city-owned facilities—see *Municipal Leadership* (page 35) for a summary of these actions.

Federal and provincial leadership

Federal and provincial climate legislation, funding, and strategies that influence Cornwall's efforts to advance in this action area include the following:

- **Net-zero energy-ready building codes:** The federal government's Pan-Canadian Framework on Clean Growth and Climate Change calls for the development and adoption of "increasingly stringent model building codes, starting in 2020, with the goal that provinces and territories adopt a 'net-zero energy ready' model building code by 2030."[6]
- **Energy pathways in National Building Code:** New compliance pathways with four energy performance tiers were introduced to provide a framework for achieving higher levels of energy efficiency in new buildings in the 2020 edition.[7]
- **New National Alterations Code:** Natural Resources Canada is currently developing an "Alterations Code" that will provide clear code requirements for alterations to existing buildings, triggered by property owners undertaking renovations. The first version of this code is expected by 2025, and will focus on increasing the energy efficiency of existing buildings.

6 See *Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy*. (2016). Retrieved January 16, 2023, from https://publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf.

7 See *Canada's national energy code.* (n.d.). https://www.nrcan.gc.ca/energy-efficiency/buildings/new-buildings/canadas-national-energy-code/20675.

- **Canada Greener Homes Grant:** In Ontario, this grant is co-delivered by Natural Resources Canada and Enbridge Gas in Ontario under the Home Efficiency Rebate Plus (HER+) program. It provides grants of up to $600 for pre- and post-retrofit EnerGuide evaluations, and grants from $125 to $10,600 for home insulation, windows and doors, heat pumps, and renewable energy systems. Ontario homeowners can be considered for both the provincial grant program, HER+, and the federal grant initiative, Canada Greener Homes Grant.[8]

Milestones and Actions

The following list of milestones marks reference points in this action area to be assessed in future evaluation efforts. The actions detail specific steps along this pathway that demonstrate progress towards milestones, and the Climate Action Plan's broader emissions reduction targets.

MILESTONES
By 2030, 30% of buildings use zero-emission heating as their primary source, reaching over 95% by 2050.
As of 2030, 100% of new buildings meet the national net-zero energy standard.
At least 80% of all new public housing developments use heat pumps starting in 2023, increasing to 100% as soon as feasible.
By 2030, 50% of existing public housing buildings operated by the City are retrofitted with energy efficiency measures and heat pumps.

Table 3. Efficient and Carbon Neutral Buidings Milestones

Heat pumps have been installed in every unit in this City of Cornwall affordable housing development.

8 *See Greener Homes Grant - Ontario*. (n.d.). https://www.nrcan.gc.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-grant/greener-homes-grant-ontario/24835.

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
1.1 Supporting solar energy. Currently Cornwall Electric does not allow solar panels to be connected to the grid due to technical issues. Engage with Cornwall Electric and the Ontario Energy Board to address significant barriers to the installation of solar panels, including enabling net metering, and the lack of financial incentives for energy efficiency and low-carbon retrofits available elsewhere in Ontario.	Short	Advocacy and collaboration	$	◆◆	Economic: supports clean energy transistion and green jobs Economic: savings to property owners
1.2 Energy upgrade portal and support service. Develop and implement a service to support property owners with energy audits, efficiency upgrades, and heat pump installation, and provide information on the City's website. Review and incorporate lessons from other municipal programs currently in place (e.g., Kingston) to inform program development.	Short to long	Plan and implement program: energy program	$$	◆◆	Economic: savings to property owners Environment: program could include water conservation Social: improves preparedness for extreme heat events; improve access to information
1.3 Home energy loan program. Conduct a feasibility study to investigate the potential to implement a home energy loan program, building from the experience of other Ontario municipalities (e.g., *Better Homes Kingston, Retrofit Halton Hills*). Based on findings, develop a program plan that provides access to low-interest or zero-interest financing to undertake home energy upgrades. Seek federal grant funding to support the initiative.	Short to long	Research, plan and implement: loan program for ~100 homes	$$	◆◆	Social: supports equity
1.4 Geo-exchange heating opportunities. Review and update the Subdivision Manual to incorporate a requirement for, or evaluation of, geo-exchange heating opportunities with new subdivisions.	Medium	Plan and implement: policy	$	◆◆	Economic: savings to property owners Social: improves preparedness for extreme heat events

Table 4. Efficient and Carbon Neutral Buildings Actions and Co-Benefits

Table continued next page

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
1.5 Decarbonizing Cornwall Housing. Continue to install heat pumps and energy-saving technologies in all new public housing construction and major retrofits.	Short to long	Plan and implement: building upgrades	$$$	◆	Social: supports equity Social: improves preparedness for extreme heat events
1.6 Local capacity for zero-emission buildings. Host seminars and provide information to local contractors, builders and City staff about energy-efficient and low-emission building techniques and materials, including opportunities for using materials with low embodied carbon. Partner with other municipalities to share resources and obtain provincial resources.	Short to medium	Engagement and communication	$	◆	Economic: supports clean energy transition and green jobs Social: improve access to information
1.7 District heating system. Engage with Cornwall Electric, the provincial government, relevant crown corporations, and/or other stakeholders to explore the feasibility to renew the district heating system with low-emission energy sources, and to expand to other municipal facilities.	Short	Advocacy and collaboration	$	◆	Economic: optimizes resources; fosters innovation and supports clean energy transition
1.8 Electrical grid capacity. Engage with Cornwall Electric to obtain information about the electrical grid capacity and potential constraints across the community. Use this to inform phased upgrades to municipal facilities, EV infrastructure, and the home energy and heat pump program. This may involve ongoing discussions as demand and capacity evolve.	Short and ongoing	Advocacy and collaboration	$	◆	Economic: supports clean energy transition and green jobs

Table continued next page

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
1.9 Building efficiency requirements. Identify and implement opportunities to require higher levels of building efficiency. First, add a reference to this climate action plan into the Community Improvement Program (CIP) with criteria for higher efficiency and heat pumps. Second, review the opportunity to adopt sustainable building standards above building code (as adopted by several Ontario municipalities). Third, advocate to the Province to enable municipalities to require new buildings to meet higher tiers of energy efficiency as a step toward the 2030 net-zero-energy-ready performance level. This is available in the new National Energy Code of Canada for Buildings and has been adopted by British Columbia, Quebec, and Newfoundland and Labrador, but not yet by Ontario. In addition, advocate for the advancement of code to address embodied carbon – ensuring that new buildings minimize the carbon intensity of the materials selected.	Short	Plan and implement policy Advocacy and collaboration	$	◆	Economic: supports clean energy transition and green jobs

3.2

Active and Zero-Emission Mobility and Transportation

Goals

- Provide a convenient, safe and comfortable public transit service that is supported by robust and low-emission infrastructure.
- Transportation infrastructure in Cornwall encourages and enables residents to walk and roll safely and conveniently, and make transportation choices that are healthier for themselves and their community.
- New urban development is compact and is designed to encourage walking, cycling, taking transit, and using zero-emission vehicles.

Overview

Encouraging and enabling residents to travel by electric vehicle, bus, bicycle, and on foot is a critical role for municipal governments in shifting travel behaviour towards zero-emission alternatives. Light-duty vehicles currently account for about 39% of the community's emissions, and heavy-duty vehicles account for another 6%.

Adjusting and investing in City transit services to improve alignment with residents' mobility needs and travel schedules makes transit a practical travel option for more residents. More inclusive planning and targeted investments in active transportation infrastructure make biking and walking safer and more accessible, reducing traffic congestion and supporting residents' health and wellness.

When governments and utility providers work together to improve EV charging infrastructure, EVs become a more desirable option for residents and businesses—particularly as they become more available and affordable. Facilitating discussions among businesses, utilities, and the provincial government can help advance collaboration toward the adoption of zero-emission heavy-duty vehicles that transport goods throughout the region and province.

Planning the city to ensure new developments provide a variety of housing options that are complete, walkable, and transit-oriented, helps to meet the City's vision in the Official Plan while reducing emissions.

> ***"Cornwall has an animated, pedestrian-friendly downtown and its safe neighbourhoods are livable, accessible, reflect the strategic development and redevelopment that has taken place, and are well connected to each other and to community amenities.***
>
> *—Quote from the City's Official Plan Vision*

Current municipal actions and resources

The City of Cornwall has a transit service that is actively evolving to increase ridership and decrease fleet emissions and has made other important investments to build a baseline of active transportation and EV charging infrastructure. Specific financial, material and human resources directed toward these efforts include:

- Integrating an increasing number of hybrid buses, with plans to electrify the fleet.
- Partnerships with major local employers that increase ridership by providing targeted transit service support.
- A comprehensive network of recreational paths that spans roughly 40 kilometres along the St. Lawrence River and throughout the city.
- Promoting intensification to a minimum target of 20% of new development through infill and intensification, which allows for residents to walk, bike and take transit for more trips.
- Incorporating electric light-duty vehicles into the municipal fleet, with a goal to have 100% be electric by 2030—see *Municipal Leadership* section (page 35) for more.

Federal and provincial leadership

Federal and provincial climate legislation, funding, and strategies that influence Cornwall's efforts to advance in this action area include the following:

- **Light-duty zero-emission vehicle sales targets:** The federal government set a mandatory target for all light-duty vehicle and passenger truck sales to be zero-emission by 2035, with interim requirements for 20% of sales by 2026 and 60% of sales by 2030.[9]
- **Light-duty zero-emission vehicle incentives:** Transport Canada provides purchase and lease incentives of up to $5,000 to individuals and businesses purchasing eligible zero-emission vehicles.

PLANNING FOR A 15-MINUTE AND ACCESSIBLE COMMUNITY

A "15-minute city," originally described by Carlos Moreno when building a plan for Paris, is a place where residents have access to the services and amenities they need within a 15-minute walk or short bike ride. This includes essentials like schools, healthcare, grocery stores, pharmacies, parks, workspaces and more. Communities around the world have begun to embrace this concept, and many strategies are emerging about how to achieve this in different contexts. Key strategies include focused active transportation planning and infrastructure, providing expanded public dining and socializing spaces, incorporating complete communities into new development plans, and more. It is also important to consider how to provide access to these services and amenities for all residents in an equitable manner that addresses social inequities.

9 See *Canada's Zero-Emission Vehicle (ZEV) sales targets.* (n.d.). Transport Canada. https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/canada-s-zero-emission-vehicle-zev-sales-targets.

- **Medium and heavy-duty vehicle incentives:** Transport Canada's Medium- and Heavy-Duty Zero-Emission Vehicles Program provides purchase incentives worth ~50% of the price difference between an electric vehicle and a traditional vehicle up to $200,000.[10]
- **Federal zero-emission vehicle infrastructure program:** Transport Canada is funding the installation of electric vehicle charging stations across Canada, with a goal to support the deployment of 33,500 EV chargers and 10 hydrogen fueling stations.

Milestones and Actions

The following list of milestones marks reference points in this action area to be assessed in future evaluation efforts. The actions detail specific steps in this action area that demonstrate progress towards milestones, and the Climate Action Plan's broader emissions reduction targets.

MILESTONES
Increase transit annual ridership from 16 trips per person (2016) to 20 trips per person by 2026 (~1 million riders), and to 30 trips per person by 2050.
Increase percent of residents who commute by walking or biking by 3% by 2036.
Convert the transit fleet to 50% electric or hybrid buses by 2035, and 100% electric buses by 2040.
Accelerate uptake of zero-emission light-duty vehicles to 40% of vehicles in Cornwall by 2030 and 100% by 2050.
Install 30+ new EV charging stations by 2026.
Adopt EV-ready parking requirements for new multi-unit residential and non-residential buildings by 2026.

Table 5. Active and Zero Emission Mobility and Transportation Milestones

10 See Transport Canada. (2022, July 11). *Minister of Transport announces new Incentives for Medium- and Heavy-Duty Zero-Emission Vehicles Program*. Canada.ca. https://www.canada.ca/en/transport-canada/news/2022/07/minister-of-transport-announces-new-incentives-for-medium--and-heavy-duty-zero-emission-vehicles-program.html.

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
2.1 Active Transportation Plan. Review and replace the *Bicycle and Pedestrian Master Plan* with an Active Transportation Plan to strategically expand and enhance active transportation infrastructure, and incorporate available best practices and updated design guidelines. Consider opportunities to work towards being a 15-minute city, where residents can reach all necessary amenities within 15 minutes by foot, bike or public transit. Consider engaging in a safe routes to school program to reduce vehicle traffic at school drop-offs.	Medium	Plan and implement (e.g., install infrastructure): ACT	$$$$	◆◆	Social: equitable access to amenities and services; opportunity to improve access for people with disabilities
2.2 Transit partnerships. Investigate and develop opportunities for strategic transit service partnerships with municipal and county counterparts. Additional investment to implement services may be required depending on partnerships developed.	Medium	Advocacy and collaboration	$	◆◆	Environmental: promotes regional connectivity Social: reduces congestion
2.3 Transit Master Plan. Review and update the *Transit Master Plan* to include transit service improvements such as: alignment with land use planning and new development, effective promotion and marketing of transit services, and preparing a fleet electrification plan with funding options.	Short to long	Plan and implement: TMP	$$$	◆◆◆	Social: affordable mobility options; shaded bus stops support resilience; opportunity to improve access for people with disabilities
2.4 Electric vehicles. Support and enable acceleration of personal electric vehicle use by • Supporting, facilitating the installation of additional EV charging stations in publicly accessible parking areas • Developing and adopting a bylaw (via zoning or parking bylaw) to require level 2 electric vehicle charging stations in new residential and commercial developments. • Engaging with Cornwall Electric about rate structures that support electric vehicle charging.	Short to medium	Plan and implement: EV charging stations Policy development Advocacy and collaboration	$$	◆◆	Economic: supports clean energy transition, fosters innovation and green industries

Table 6. Active and Zero Emission Mobility and Transportation Actions and Co-Benefits

Table continued next page

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
2.5 Downtown parking plan. Investigate options for a downtown parking plan and utilization strategy, beginning with an updated analysis of parking supply and demand data. Increasingly cities are recognizing the link between parking management and demand for driving vehicles. Parking policies can help shift demand, and can seek opportunities to reallocate space toward other public uses such as parklets, outdoor eating areas, farmers markets and more.	Short to medium	Research	$	◆	Economic: incentivizes alternatives to vehicle use Social: reduces congestion; provides more opportunity for public spaces that build community
2.6 Climate lens in Official Plan. Review and update policies to incorporate a climate lens considering GHG reductions into the next Official Plan update (or prepare an amendment in the nearer-term), including planning for higher density and infill development in the downtown core areas and policies to support a 15-minute community. This will involve additional engagement and research about opportunities to change development patterns and supporting mobility to align with the climate emergency vision, goals and targets.	Short to long	Policy development	$	◆◆	Environmental: reduces need of cars Social: reduces congestion, improves community livability and vitality
2.7 Climate lens in development application process. Incorporate climate change mitigation considerations into development application reviews, including transit- and active-oriented development, parking reserves and cash in lieu, and support applications that enhance complete community attributes.	Medium	Policy development	$	◆◆	Economic: fosters innovation Social: improves community livability and vitality

Table continued next page

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
2.8 Subdivision Manual. Review and update the *Subdivision Manual* after completion of the *Active Transportation Plan*, ensuring future subdivisions provide access to amenities through walking, cycling and transit, supporting a 15-minute city.	Medium	Policy development	$	◆◆	Social: enhances human health and well-being, improves community livability and vitality
2.9 Heavy-duty electric vehicles. Engage with local businesses, Cornwall Electric and possibly the province to investigate ways to facilitate the uptake of medium and heavy-duty zero-emission vehicles locally. Share results of piloting medium and heavy-duty vehicles in the City fleet (see *Municipal Leadership*, page 35).	Long	Advocacy and collaboration	$	◆◆	Economic: fosters innovation and green, clean industries, and supports clean energy transition Environmental: improves air quality
2.10 Inter-community rail service. Continue to advocate for maintaining and expanding inter-community rail service (e.g., VIA rail), increasing public transit options.	Short	Advocacy and collaboration	$	◆	Environmental: reduces air pollution Social: reduces congestion; promotes regional connectivity

3.3

Waste Transformed

Goals

- All residents and businesses have access to programs that support waste reduction and allow them to divert organic waste.
- Waste is transformed into a beneficial resource that captures energy and other benefits while minimizing emissions.

Overview

Diverting organic waste from landfill enables municipal governments to reduce or eliminate the production of methane, a potent greenhouse gas. By implementing an organic waste collection system, the municipality provides an easy and convenient way that encourages residents to compost their organic waste, thus reducing the amount that goes into landfills. Exploring options to capture value from the waste stream in the form of landfill and WWTP methane gas capture, biogas digesters or waste heat recovery systems continue to close the loop on waste and provide benefits to the community by using the energy from waste to power infrastructure.

Current municipal actions and resources

The City of Cornwall has planned an organic waste collection system and is actively working on feasibility studies to support this program, improve the landfill gas capture system, and explore options for energy production from the waste stream. Specific plans include:

- Implementation of curbside organic waste collection starting in 2025.
- In the process of engaging consultants for the development of a Biosolids, Organics and Septage Master Plan.

Federal and provincial leadership

Federal and provincial climate legislation, funding, and strategies that influence Cornwall's efforts to advance in this action area include the following:

- **Strategy for a Waste-Free Ontario: Building the Circular Economy:** The provincial government set goals to achieve zero waste in Ontario and zero greenhouse gas emissions from the waste sector, with targets of a 50% diversion rate by 2030 and 80% by 2050.

Milestones and Actions

The following list of milestones marks reference points in this action area to be assessed in future evaluation efforts. The actions detail specific steps in this action area that demonstrate progress towards milestones, and the Climate Action Plan's broader emissions reduction targets.

MILESTONES
Increase residential and commercial organic waste diversion rate to 50% by 2025, 60% by 2030 and 80% by 2050.
Develop a Biosolids, Organics and Septage Master Plan (BOSMP) by 2023.
Landfill gas capture system efficiency is improved and opportunities for gas use as energy are explored.

Table 7. Waste Transformed Milestones

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
3.1 Green waste collection program. Implement residential and commercial organic waste collection, including purchase and distribution of green bins, providing waste collection services, and managing green waste.	Short and ongoing	Implement: organic collection program	$$$	◆◆◆◆	Economic: reduces waste/optimizes resources, promotes a circular economy, and may be a source of energy or biofuels Environmental: production of compost
3.2 Biosolids, Organics and Septage Master Plan (BOSMP). Develop a BOSMP, including feasibility studies, goals and targets for organic waste collection and energy production from organics and the wastewater treatment plant.	Short	Planning: BOSMP	$	◆◆	Economic: foster innovation, supports clean energy transition, promotes a circular economy, and optimizes resources Environmental: improves air quality Social: enhances local autonomy
3.3 Methane gas capture and energy production. Continue to upgrade the landfill gas capture system and evaluate the potential for energy production from captured gas.	Long	Research	$	◆◆	Economic: foster innovation, supports clean energy transition, promotes a circular economy, and optimizes resources

Table 8. Waste Transformed Actions and Co-Benefits

3.4

Enhanced Nature-Based Solutions

Goals

- Tree canopy coverage is increased to improve air quality, buffer winds, lower flood risk, and reduce demand for air conditioning while also providing residents access to shaded public spaces that increase resilience to higher summer temperatures.
- Green spaces and wetlands are restored, enhanced and protected to increase carbon sequestration, and the importance of these ecosystems is understood and valued by the City and the public.

Overview

Investment in the natural environment reduces GHG in the atmosphere, improves the well-being of residents, and protects the community. Expanding the urban tree canopy increases carbon storage and sequestration while also providing other benefits such as cooling benefits, stormwater management, improved air quality and shade. Consolidating the information on the city's natural assets into inventories not only enables a better understanding of the carbon sequestration potential, but also allows for targeted tree canopy expansion in areas most impacted by heat. Planting trees, in conjunction with the restoration of riparian areas and naturalization of stormwater systems, increase resilience to climate change by helping the management of stormwater and protecting water bodies. Vegetation and associated soils increase the amount of rainwater interception and groundwater recharge, thus lowering flood risk from intense rainstorms. As the city continues to grow, guidelines for tree preservation in new developments will ensure the long-term benefits of these actions.

There are currently limitations on the City's ability to require or foster tree protection on private property. Lot drainage plans and Species at risk legislation inadvertently incentivize lot clearing. Also, recent provincial legislation called the *More Homes Built Faster Act (Bill 23)*, which has the goal to expedite home building, may reduce municipal authority to retain trees on private property at the time of development.

Current municipal actions and resources

The City of Cornwall is actively increasing urban canopy coverage by continuing to plant more trees and investing in a municipal inventory of natural assets. These actions include:

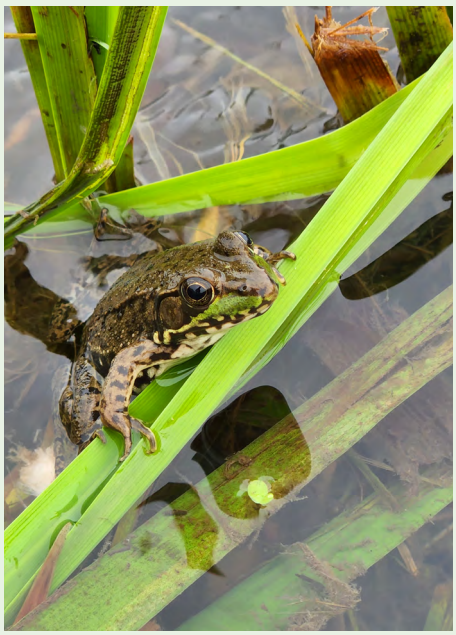
- Partnering with the Raisin Region Conservation Authority to estimate urban canopy coverage within the city (currently at approximately 32%).
- Planting trees in parks and municipal spaces.
- Developing a city tree inventory.

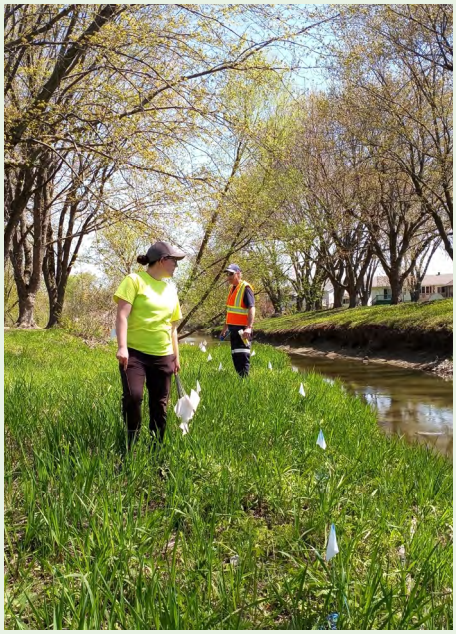
Federal and provincial leadership

Federal and provincial climate legislation, funding, and strategies that influence Cornwall's efforts to advance in this action area include the following:

- **2 Billion Trees Commitment:** the federal government is committed to partnering with governments and organizations to plant two billion trees over 10 years (2021-2031).
- **Natural Infrastructure Fund:** the $200 million Natural Infrastructure Fund supports projects that use natural or hybrid approaches to protect the natural environment, support healthy and resilient communities, and contribute to economic growth and jobs.
- **Municipal Act updates:** as of 2019, municipal governments are now required to adopt and maintain policies with respect to the protection and enhancement of the tree canopy and natural vegetation in the community (*Municipal Act* Section 270).

Riparian restoration project in the South Branch of the Raisin River





EXPLORING THE ROLE OF THE TREE CANOPY IN A HEALTHY AND EQUITABLE CITY

In an equitable city, everyone experiences the same level of beneficial environments. When all residents live within an environment complete with urban nature and a healthy tree canopy coverage, they are guaranteed countless benefits that nature can provide. Many of these benefits are well known, such as recreation, biodiversity, and carbon sequestration. But there are additional benefits for the city including lower energy use and emissions, jobs, community connectedness, pollution mitigation, and heat mitigation. As the climate warms, trees significantly relieve heat stress at the street level and within neighbourhood scales, particularly during heat waves and at hot times of the day. In Toronto, neighbourhoods with less than 5% tree cover make five times as many heat-related ambulance calls as those with more than 5% cover. Marginally increasing tree cover in neighbourhoods that have less than 5% coverage could reduce heat-related ambulance calls by 80%.[10]

Vulnerable populations may be especially susceptible to the impact of heat. For example, homeless people, young children, older people, and people with pre-existing health conditions such as respiratory or heart conditions, are physiologically more sensitive to the harmful impacts of heat waves. In Cornwall, there are an estimated 3,700 low-income individuals in unfavourable tree canopy cover areas, in addition to 1,800 visible minority individuals, 7,300 older adults, and 4,900 children living in the same unfavourable areas as of the time of this plan.[11] Adequate tree coverage throughout the City ensures that nature's benefits reach the entire population.

11 From Graham, D. A., Vanos, J. K., Kenny, N. A., & Brown, R. D. (2016). The relationship between neighbourhood tree canopy cover and heat-related ambulance calls during extreme heat events in Toronto, Canada. *Urban Forestry &Amp; Urban Greening, 20*, 180–186. https://doi.org/10.1016/j.ufug.2016.08.005.

12 From *HealthyPlan*. (n.d.). https://healthyplan.city/en.

Milestones and Actions

The following list of milestones marks reference points in this action area to be assessed in future evaluation efforts. The actions detail specific steps in this action area that demonstrate progress towards milestones, and the Climate Action Plan's broader emissions reduction targets.

MILESTONES
Complete a tree inventory database in 2024.
Plant at least 600 trees in municipal spaces every year through 2030.
Increase carbon sequestration in natural areas.

Table 9. Enhanced Nature Based Solutions Milestones

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
4.1 City tree inventory. Develop a database of the city's tree inventory and map desired locations to increase tree canopy, targeting areas of highest vulnerability to heat impacts, starting with the health unit analysis. Continue to plant at least 600 trees annually on public property.	Short	Implement: tree inventory and ongoing planting	$	◆◆	Economic: reduces risks to property values Environmental: enhances biodiversity, supports habitat creation, improves water retention and absorption, enhances pollutant capture, improves air quality, reduces extreme temperatures Social: enhances human health and well-being, improves community livability and vitality, advances equity and social inclusion
4.2 Assessment of natural carbon capture. Conduct an assessment of the annual carbon sequestration of Cornwall's current natural assets. Integrate findings into future land use and development planning to understand the impact of decisions on the communities' natural carbon reserves.	Medium	Research	$	◆	Economic: improves understanding of value of natural assets Environmental: increases carbon sequestration / storage Social: enhances human health and well-being
4.3 Restoration of riparian areas. Advocate for and support initiatives to restore riparian areas with local partners (e.g., Raisin Region Conservation Authority).	Short to long	Advocacy and partnerships	$	◆◆	Environmental: enhances biodiversity, supports habitat creation, improves water retention and absorption, improves water quality, enhances pollutant capture, improves air quality, reduces extreme temperatures, increases carbon sequestration / storage Social: enhances human health and well-being, improves community livability and vitality

Table 10. Enhanced Nature Based Solutions Actions and Co-Benefits

Table continued next page

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
4.4 Naturalization of stormwater systems. Explore options and invest in naturalizing stormwater systems, including the retrofit of existing ponds.	Short to long	Plan and implement: stormwater systems naturalization (~7 ponds)	$$$	◆◆	Economic: fosters innovation and green, clean industries, reduces costs for hard infrastructure Environmental: improves water retention and absorption, improves water quality, increases carbon sequestration / storage, supports habitat creation, enhances biodiversity, reduces extreme temperatures Social: enhances human health and well-being, improves community livability and vitality
4.5 Tree preservation on private property. Investigate and implement guidelines or a bylaw for tree protection in new developments to preserve Cornwall's existing urban forest, though there may be limitations on City authority. Also review opportunities for tree preservation through the subdivision manual, site plan agreements, and the use of natural wetlands as an option for lot drainage where appropriate.	Medium	Policy development	$$	◆	Environmental: reduces extreme temperatures, improves water retention and absorption, increases carbon sequestration / storage Social: improves community livability and vitality
4.6 Urban agriculture. Promote local food production to enhance Cornwall's self-sufficiency and expand the urban forest by planting fruit trees and shrubs, community gardens, and fostering an expansion of urban agriculture through community educational programs. Provide support for local farmers markets.	Short to long	Plan and implement: urban agriculture Advocacy and partnerships	$	◆◆	Economic: supports local farmers Environmental: enhances biodiversity, supports habitat creation, improves water retention and absorption, improves air quality, reduces extreme temperatures Social: improves community livability and vitality, enhances human health and well-being

3.5

Municipal Leadership

Goals

- New municipally-led developments and retrofits are energy efficient and low emission, with the goal that all municipal facilities achieve net-zero emissions by 2050.
- The municipal fleet transitions to zero-emission vehicles and equipment as early as feasible, with the goal to have a zero-emission light-duty fleet by 2030 and a fully electric fleet by 2040.

Overview

To be a climate action leader in the community, the City of Cornwall must demonstrate leadership within our organization. By finding ways to reduce the carbon footprint of day-to-day operations, we illuminate opportunities for staff and community members to take additional action in their own lives. By updating our decision-making process to better reflect the environmental impacts of municipal decisions, we encourage residents to be thoughtful about the impacts of the decisions they make in their own households or businesses. By investing in City assets that are more efficient and resilient, we demonstrate local leadership in building innovation that expands local markets for the materials, skills and services needed to reduce emissions across the built environment.

In some cases, supply chain availability or other constraints may limit the availability of products in the short term. In these cases, the City can seek opportunities to defer replacements where feasible to allow investment in low carbon options when they become available, rather than investing in a new asset that will continue emitting for its lifespan (or need to be replaced prematurely). Other public agencies, including the Cornwall Police Service, can also demonstrate leadership through the transition to zero-emission vehicles and buildings.

Current municipal actions and resources

The City of Cornwall has made significant progress in reducing greenhouse gas emissions and has mobilized important financial, material and human resources toward this effort. Some examples include:

- Declared a Climate Emergency and advanced development of this plan.
- Established the Environment and Climate Change Committee of Council.
- Established an internal working group with at least one representative from each City department.
- Created a full-time Sustainability Project Coordinator position in 2021 to support all City departments to integrate sustainability and climate change into day-to-day operations.

- Established the City's Youth for Climate Action Working Group.
- Expanded the City's asset management plans to include all City-owned capital assets, including fleet and buildings, and updated some of the plans in 2022.
- Integrating hybrid buses into the City's Transit fleet. Collaborating with CUTRIC to study options for zero-emission transit.
- Successfully piloted an electric vehicle in the City's fleet.
- Assessing and integrating sustainability principles for new buildings (such as LEED, Net-Zero Energy standards), such as the Benson Centre, Municipal Works Administration Building, and Fire Headquarters. For example, the City is planning to install a geo-exchange heating and cooling system for the Fire Headquarters and Municipal Works Administration Building.
- Continually evaluating opportunities to improve the energy efficiency of the City's buildings through future asset management plans. For example, the Cornwall Transit building recently had windows and heaters replaced, re-insulation, and LED lighting installed.

Milestones and Actions

The following list of milestones mark reference points in this action area to be assessed in future evaluation efforts. The actions detail specific steps in this action area that demonstrate progress towards milestones, and the Climate Action Plan's broader emissions reduction targets.

MILESTONES
Reduce emissions from municipal operations by 45% by 2030 from 2005, and achieve net zero emissions from operations by 2050.
By 2025, all new municipal facilities designed after 2024 are net-zero energy ready.
At the time of replacement, replace the City's light-duty fleet with zero-emission vehicles , where supply is available.

Table 11. Municical Leadership Milestones

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
5.1 Climate lens in decision-making. Update procedural bylaws and council briefing practice to integrate a climate lens analysis into all reports to Council to ensure emissions implications of capital and operational decisions are integrated into political decision-making. Consider incorporating an internal carbon price mechanism set at the 2030 carbon price ($170 per tonne CO_2e).	Short	Policy development	$	◆◆	Economic: avoids community cost over time Social: improve access to information; transparent decisions
5.2 Dedicated staff time for funding applications. Critical to the early implementation and success of this plan will be identifying grant funding to support significant efforts set forward in this plan. Identify key staff to monitor and identify grant and funding opportunities for decarbonization initiatives.	Medium	Advocacy and collaboration	$	◆◆	Economic: supports green jobs
5.3 Facility decarbonization. Conduct facility decarbonization assessment of all municipal facilities, which includes an electrical capacity assessment to identify optimized opportunities to decarbonize facilities. Incorporate electrical capacity upgrade needs and decarbonization opportunities into the asset and financial planning. Undertake recommended, feasible facility decarbonization efforts in alignment with asset lifespan and upgrade timeframes.	Short to long	Plan and implement: facility decarbonization	$$$	◆◆◆◆	Economic: reduces operating costs Environmental: improves air quality Social: prepares facilities for future climate conditions

Table 12. Municipal Leadership Actions and Co-Benefits

Table continued next page

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
5.4 Climate in the Asset Management Plan. Climate in the Asset Management Plan . Incorporate findings from the Building Condition Assessments (currently planned) together with climate change considerations into the City's asset management plans. Include emission reduction targets and methods to account for rising risks and costs of using fossil fuels over the asset lifecycle such as carbon liabilities (rising carbon tax). For new facilities, consider how to reduce embodied carbon emissions and integrate into the plan.[13]	Medium	Policy development	$	◆ (Included in action 5.3)	Economic: savings to property owners Social: improves preparedness for extreme heat events
5.5 Fleet electrification. Transition light-duty fleet to electric vehicles and initiate transition of medium and heavy-duty vehicles (based on availability and service requirements). Pilot medium and heavy-duty electric vehicles with support from Federal incentives (see Footnote 9). For vehicles using fossil fuels, continue to minimize idling through policy, monitoring and enforcement.	Short	Plan and implement: fleet electrification	$$$	◆◆	> Economic: reduces operating costs Environmental: improves air quality
5.6 Remote work policy. Develop a Remote Work Policy that considers the potential to reduce emissions. Build from the experience in other municipalities (e.g., Muskoka's remote work pilot), and consider starting as a pilot project.	Short to medium	Policy development and pilot project	$	◆	Social: enhances health and well-being Environmental: reduces transportation air pollutant emissions
5.7 Sustainable commuting. Promote sustainable commuting habits for City employees by installing active transportation infrastructure in municipal buildings (e.g., bike racks), and developing programs that enable and incentivize transit ridership and active transportation choices.	Medium to long	Plan and implement: active transportation infrastructure and program	$	◆◆	Environmental: improves air quality Social: enhances health and well-being

Table continued next page

13 See discussion on embodied carbon emissions here https://www.cagbc.org/wp-content/uploads/2022/03/Embodied-carbon-white-paper-March-2022.pdf.

ACTION	TIMEFRAME	ACTION TYPE	INVESTMENT	STAFF	CO-BENEFITS
5.8 Climate action outreach. Conduct ongoing outreach and communications about the climate emergency with residents and businesses in the community, opportunities to take action, and progress toward emission reduction targets. Advocate to minimize idling in police vehicles, and encourage the shift to electric police vehicles as soon as feasible.	Short to Long	Advocacy and collaboration	$	◆◆	Social: improves access to information

4. Implementation Planning

The five climate action areas, supported by 10 goals and 38 actions identified in this Climate Action Plan, provide a path forward for the City of Cornwall to support the community in addressing the Climate Emergency Declaration by Council, including working towards achieving the GHG emission reduction targets for 2030 and 2050. These actions build on the initiatives already underway by the City and the provincial and federal governments.

4.1 Climate Action Plan ownership and accountability

The Climate Action Plan includes actions that span many City departments. This will involve a greater degree of coordination to ensure targets, goals and actions get integrated into various department priorities, budgets and work planning. The Plan will be led by the Environmental Sustainability team in the Department of Infrastructure and Municipal Works, but each team identified in the implementation plan is responsible for advancing their actions.

To support ongoing collaboration and coordinationwith a working group with representatives from all key departments involved in implementing the plan will continue to meet regularly. These representatives will also be responsible for reporting progress on a regular basis to the Environmental Sustainability team. In addition, the Climate Action Plan can be added as a standing item on senior management meetings to ensure alignment and accountability across City management. Sustainability progress will continue to be highlighted in the City's monthly Eco Update public e-newsletter.

4.2 Key elements of implementation

Implementing this plan will involve a combination of the following key elements:

- **Being strategic:** This Climate Action Plan is a roadmap toward a vision, targets and goals that provide a guiding document all City departments can reference and rally behind while providing enough guidance to move forward actions immediately. Many of the actions require more detailed assessments that will inform future phases of work and more detailed budgets.

- **Being opportunistic:** The City will need to monitor and take advantage of existing and emerging policies, funding programs, technologies, and resources to best leverage limited City resources. This may result in adapting the current plan to adjust timelines or update actions based on opportunities that arise.
- **Seeking equity:** Decarbonizing the community's activities will involve substantial investments over the coming decade, providing an important opportunity to support equitable outcomes. All programs and policies developed through this plan will consider how inequities can be addressed through new initiatives (e.g., by prioritizing new urban tree cover in areas with populations most vulnerable to heat).
- **Allocating resources:** The Plan can only be successfully implemented if sufficient resources are allocated, in combination with identifying external funding opportunities. An initial estimate of resource requirements to implement the identified actions are included in the estimated resource requirements in the next section. These initial estimates will need to be set out in greater detail at the time of budget approvals.

4.3
City resource requirements

An initial indication of the level of resources that will be needed to implement each action is provided in the tables in each action area earlier in the plan. Successful implementation will require dedicating time in staff work plans toward implementing priority actions, and increasing or re-allocating budgets to fulfill the actions. Key to the early success of the plan will be funding from provincial and federal agencies to support the higher initial investments in the identified areas. This will involve dedicated staff time to seek out and apply for funding opportunities (see Action 5.2).

Operationalizing the work plan will require further planning, consultation, and in some cases, external funding. Significant additional resources may be required to implement the findings of some actions (for example, a project to install energy production from landfill gas could result from feasibility studies undertaken in this plan, and would involve millions of dollars of investment and funding). Numerous action areas may be eligible to obtain substantial funding support from provincial or federal funds for community decarbonization. Detailed resourcing and budget estimates will be prepared for each initiative during the budgeting approval process,

together with identifying supporting funds.

4.4
Costs and benefits of climate action

The scientific community has warned us that there is just over a decade to fundamentally change the current emissions path to prevent global instability. This five-year plan is crucial to advancing the City's role in supporting the rapid decarbonization of activities in Cornwall. The more we reduce total emissions in the short term, the less intense climate impacts will be over time, and acting earlier is likely to be less costly than delaying action. As an example, Toronto's December 2013 ice storm cost their municipal government alone almost $107 million in unplanned costs not including the costs incurred by residents and businesses in terms of property damage and lost business.[14]

To become a low-carbon community, the City's role will include investing in actions that the municipality has direct control over (e.g., municipal buildings, transit, social housing), as well as investing in supporting actions for others to take. These supporting actions will also need investment from all levels of government, residents and businesses. Furthermore, many climate action measures involve spending differently rather than being a true additional cost for the community and municipality.

Studies made by a few Ontario cities (e.g., Toronto, Ottawa, Guelph, Burlington, Hamilton) have shown that undertaking community-wide climate change mitigation provides a net-economic benefit when compared to doing nothing, even when only considering the energy costs without quantifying other co-benefits.[15] For example, an average Toronto home that replaces an end-of-life gas furnace today will receive about $10,320 in lifetime total savings (capital plus energy) with a fully electrified home with heat pumps for space and water heating when compared to replacing it with a new gas furnace system (see *Footnote 4*). This case is strengthened when

14 City of London. (2022). *Climate Emergency Action Plan*. Retrieved January 18, 2023.

15 City of London. (n.d.). *Overview of Current and Potential Climate Action Costs and Funding Opportunities*. Retrieved January 18, 2023.

we incorporate the increasing carbon tax rates (currently on course to reach $170 per tonne of CO_2e by 2030).

Not all investments will show immediate paybacks in terms of energy costs alone, and in these cases, it is important to account for additional benefits of action, and to improve how we account for the costs of not taking action. An analysis in Ottawa's Energy Evolution: Ottawa's Community Energy Transition Strategy[16] shows that compared to a business-as-planned scenario, reducing emissions by 100% by 2050 would result in a $12.4 billion net savings in 2020 dollars over the 2020-2050 period due to saved energy costs, earned revenues from local energy generation, saved carbon fees and lower operation and maintenance costs (for electric technologies including vehicles).

When we consider that there is a cost associated with emissions, there is also a clear case for investing in emission reductions. Governments and decision-makers use the social cost of carbon as part of cost-benefit assessments. This value ranges, but has recently been evaluated at 185 USD per tonne CO_2e.[17] At this rate, the cost of emissions today in Cornwall is about $60 million dollars (CAD) every year. By investing in the actions in this plan, the City is playing its part to reduce this carbon liability toward zero by 2050.

Most actions to reduce GHG emissions also provide important co-benefits beyond direct payback including advancing key community priorities relating to health, equity, biodiversity, and economic development (indicated in each of the action tables in Section 3 under "Co-Benefits").

16 City of Ottawa. (2018). *An Analysis of the Financial and Climate Benefits of Electrifying Ontario's Gas-Heated Homes by Installing Air-Source Heat Pumps.* Retrieved January 18, 2023, from https://documents.ottawa.ca/sites/documents/files/energy_evolution_strategy_en.pdf

17 See Rennert, et. al. (2022). Comprehensive evidence implies a higher social cost of CO_2. Retrieved January 2023, from https://www.nature.com/articles/s41586-022-05224-9.

4.5

Monitoring and reporting

Tracking and reporting on progress will support the City's future decision to ensure the Climate Action Plan remains relevant and supports the desired outcomes. Public communication about progress will also be important to maintain support for the plan. Twenty milestones were outlined earlier in the action plan, and are summarized below to support this effort. These milestones are ambitious, seeking to align the City's focus and efforts with the Climate Emergency Declaration. Success of these milestones will require increased City budgets, and several will be subject to external funding, partnerships, and policies at other levels of government. Through this action plan, the City will endeavour to meet these milestones to support the path toward becoming a net-zero emission community.

ACTION AREA	MILESTONES	RESPONSIBLE	DATA SOURCES
Overall	Reduce emissions by 40-45% from 2005 levels by 2030.	Environmental Sustainability	Community GHG emission tracking tool
 **Buildings**	By 2030, 30% of buildings use zero-emission heating as their primary source, reaching over 95% by 2050.	Buildings	Number of corporate/community buildings using zero emission heating collected with building permitting
	As of 2030, 100% of new buildings meet the national net-zero energy standard.	Buildings	Number of new corporate/ community buildings meeting net-zero energy standard collected with building permitting
	At least 80% of all new public housing developments use heat pumps starting in 2023, increasing to 100% as soon as feasible.	Asset Management	Number of new public housing with heat pumps
	By 2030, 50% of existing public housing buildings operated by the City are retrofitted for energy efficiency measures and heat pumps.	Asset Management	Number of public housing energy retrofits
 **Transportation**	Increase transit annual ridership from 16 trips per person (2016) to 20 trips per person by 2026 (~1 million riders), and to 30 trips per person by 2050.	Cornwall Transit	Transit ridership
	Increase percent of residents who commute by walking or biking by 3% by 2036.	Planning	Percentage of residents commuting by walking or biking from Statistics Canada Census (every 5 years)
	Convert the transit fleet to 50% electric or hybrid buses by 2035, and 100% electric buses by 2040.	Cornwall Transit	Number of electric and hybrid transit vehicles

Table 13. Milestones Monitoring

Table continued next page

ACTION AREA	MILESTONES	RESPONSIBLE	DATA SOURCES
 **Transportation**	Accelerate uptake of zero-emission light-duty vehicles to 40% of vehicles in Cornwall by 2030 and 100% by 2050.	Environmental Sustainability	Number of community ZEVs – source TBD
	Install 30+ new EV charging stations by 2026.	Infrastructure and Municipal Works	Number of community ZEVs – source TBD
	Adopt EV-ready parking requirements for new multi-unit residential and non-residential buildings by 2026.	Planning	Parking policy and legislation
 **Waste**	Increase residential and commercial organic waste diversion rate to 50% by 2025, 60% by 2030 and 80% by 2050.	Waste Management	Organic waste collection
	Develop a Biosolids, Organics and Septage Master Plan (BOSMP) by 2023.	Waste Management	BOSMP
	Landfill gas capture system efficiency is improved and opportunities for methane gas use as energy are explored.	Waste Management	Landfill and WWTP gas capture
 **Environment**	Complete a tree inventory database in 2024.	Parks & Landscaping	Tree inventory database
	Plant at least 600 trees in municipal spaces every year through 2030.	Parks & Landscaping	Number of trees planted yearly
	Increase carbon sequestration in natural areas.	Infrastructure and Municipal Works	Carbon sequestration tool to be developed
 **Municipal Operations**	Reduce emissions from municipal operations by 45% by 2030 from 2005, and achieve net zero emissions from operations by 2050.	Environmental Sustainability	Corporate GHG emission tracking tool
	By 2025, all new municipal facilities designed after 2024 are net-zero energy ready.	Asset Management	Net-zero energy ready municipal facilities
	By 2030, the City's light-duty fleet are all zero-emission vehicles.	Fleet	Number of ZEVs in City's light-duty fleet