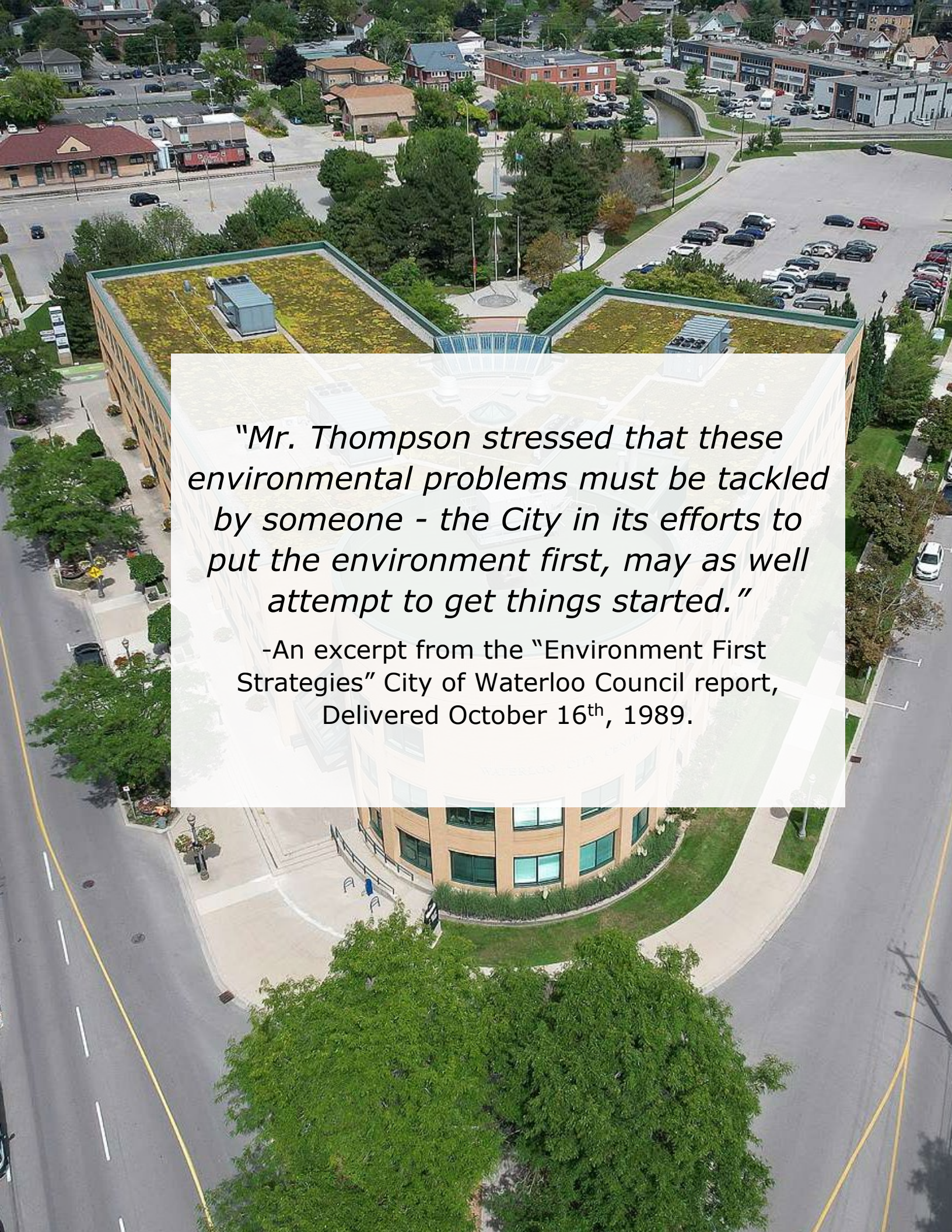




City of Waterloo

Corporate Climate Action Plan

2024-2029

An aerial photograph of a city street corner. In the foreground, a large, multi-story building with a green roof is visible. The roof is covered in green vegetation and has two large HVAC units. The building is situated on a corner with a curved sidewalk and a large tree in front of it. To the right of the building is a parking lot filled with cars. In the background, there are more buildings, a river, and a bridge. The overall scene is a mix of urban development and green space.

"Mr. Thompson stressed that these environmental problems must be tackled by someone - the City in its efforts to put the environment first, may as well attempt to get things started."

-An excerpt from the "Environment First Strategies" City of Waterloo Council report, Delivered October 16th, 1989.



The City of Waterloo is committed to climate action and to making transformational changes to create a sustainable and healthy city.

We are already experiencing a changing climate in Waterloo: more frequent and extreme weather events (severe rain, ice, and windstorms) and heat waves with record-setting temperatures. The devastating forest fires that threatened other communities across Canada this year impacted the air-quality in our city. These changes are affecting our community, our infrastructure, our economy and our natural environment.

Climate change is here, and it affects us all. We are past the point of sounding the alarm bell. Real, urgent action is needed to make meaningful change.

Waterloo's Corporate Climate Action Plan outlines the many ways we have been and will continue to reduce our corporate greenhouse gas emissions. This work integrates sustainability and climate change into everything we do.

The Corporate Climate Action Plan is just one of the ways we are making Waterloo a healthier, greener, more sustainable city. Waterloo has already taken a meaningful action to address the climate crisis by:

- Declaring a climate emergency
- Adopting ambitious greenhouse gas emissions reduction targets of 50% by 2030 and net-zero by 2050
- Prioritizing Environmental Sustainability and Climate Action in our strategic plan
- The creation and adoption of the City of Waterloo Green Building Policy
- Ongoing electrification of facilities and fleet
- Creating a Sustainability Advisory Committee to advise council on the implementation and promotion of the city's sustainability program

The Corporate Climate Action Plan will help the City meet the environmental sustainability objectives in our Strategic Plan. We want to be a leader in environmental sustainability practices and climate action, making transformational changes related to City operations and services. Through this plan, we are embedding environmental sustainability into our decision-making process, ensuring we consider greenhouse gas mitigation and adaptation goals as we evaluate our operations.

By acting today to reduce our emissions and adopt sustainable practices, we can mitigate the impacts of City operations on climate change and work towards preserving a stable environment.

We are planning for the long term, prioritizing sustainability now to create a future-ready Waterloo for tomorrow.

Sincerely,

Mayor Dorothy McCabe

PLAN ACKNOWLEDGEMENTS

This plan would not have been possible without the participation, enthusiasm, and passion of City of Waterloo residents, community partners, and staff. We would like to thank the following groups for their time and input.

AUTHORS

- Ena Ristic, Senior Sustainability officer
- Sandy Little, Director of Strategic Initiatives

COMMITTEES OF COUNCIL

- Sustainability Advisory Committee (SAC)

CORPORATE AND COMMUNITY PARTNERS

- Climatization (Climate Action Waterloo Region)
- Uptown Waterloo Business Improvement Area (Uptown Waterloo BIA)
- Waterloo Region Community Energy (WRCE)

CITY OF WATERLOO STAFF

- | | |
|---|---|
| • Building Standards | • Human Resources |
| • Community Outreach and Programming Services | • Information Management and Technology Services |
| • Corporate Communications | • Legal Services |
| • City Utilities | • Legislative Services |
| • Economic Development | • Municipal Enforcement Services |
| • Engineering Services | • Parks, Forestry, and Cemetery Services |
| • Environment Sustainability Team (EST) | • Planning |
| • Facility Design and Management Services | • Reconciliation, Equity, Accessibility, Diversity, and Inclusion |
| • Finance (including Asset Management) | • Recreation Services |
| • Fire Rescue Services | • Transportation Services |
| • Fleet and Procurement | • Waterloo Public Library |

TABLE OF CONTENTS

Plan Acknowledgements	4
Table of Contents	5
Executive Summary	6
Land Acknowledgement	8
Introduction	9
What is a Corporate Climate Action Plan?	9
Where does this plan fit?	9
What are the goals?	9
What is the technical scope of this plan?	10
Why do municipalities matter?	11
What are the risks of inaction?	11
GHG Emissions Inventory	13
What is a greenhouse gas?	13
What is a greenhouse gas emissions inventory?	13
What is the difference between a corporate and community inventory?	13
Corporate greenhouse gas emissions inventory	14
Community greenhouse gas emissions inventory	14
Plan Management	15
Actions	16
Buildings and facilities	17
Other actions	19
Next Steps	28
Beyond this Plan	28
Appendix A: Action Implementation	29
Appendix B: Glossary	43

EXECUTIVE SUMMARY

CORPORATE CLIMATE ACTION PLAN BACKGROUND

A Corporate Climate Action Plan (“CorCAP”) is a plan to reduce **corporate greenhouse gas (GHG)** emissions and integrate sustainability and climate change into all applicable City processes and procedures. The plan is a mechanism to reduce the City of Waterloo’s corporate greenhouse gas emissions by 50% by 2030 and **net-zero** by 2050 relative to 2010 levels. This plan complements existing City and Regional adaptation and mitigation climate change plans ([Corporate Climate Adaptation Plan](#), [TransformWR](#), [Community Climate Adaptation Plan for Waterloo Region](#), [Community Energy Investment Strategy](#)) to ensure a fulsome approach to climate action.

SCOPE OF THE PLAN

The plan will include considerations of all scope 1 (direct from source) and scope 2 (indirect from source) emissions from City-owned buildings and facilities, fleet and equipment, and staff activities. Scope 3 (indirect from supply chain) emissions will be considered in various capacities. Solid waste production and business travel will be directly considered. Commuting, **embodied carbon** for corporate assets, and land use change and approvals will require more research or data-collection. Supply chain materials and upstream transportation are areas where the City may be unable to take immediate action; however, the plan will work to ensure that the City is prepared to act in the future when conditions such as available technologies, economic landscapes, and legislative requirements have matured. The plan considers actions that impact measurable corporate assets, immeasurable corporate assets, supporting projects, and community-impacting municipal actions.

CORPORATE INVENTORY

The City currently emits approximately 5,391 tonnes of CO₂e per year (using 2021 figures). The majority of currently measured corporate greenhouse gas emissions (70%) stem from the City’s buildings and facilities. Fleet and equipment emit 22%, solid waste emits 6%, and collectively streetlights, travel, and wastewater facilities emit 2%.

ACTIONS

The plan features 61 actions divided into short, medium, and long-term timelines. The actions are varied in scope, level of effort, and influence. Each action contains a description, recommended division involvement, and qualitative estimations of potential greenhouse gas reduction impacts. The actions were determined through research of best practices, significant staff engagement, engagement with community partners, and feedback from the Sustainability Advisory Committee. The focus on the creation of the actions was that they be grounded in the realities of the City, implementable within staff’s work, and transformational in scope.

We are fortunate to have close ties with our community partners (CAWR, WRCE), energy partners (Enbridge, Enova Power, GRE), and post-secondaries, and know it is important to acknowledge that even within a corporate context, continued collaboration with these community organizations will be needed to move us all forward collectively towards our sustainability goals.

PLAN MANAGEMENT AND MONITORING

The overall direction and implementation of the plan will be managed by the **Strategic Initiatives Division (SI)** and overseen by the **Environmental Sustainability Team (EST)**. The Strategic Initiatives

Division and the Environmental Sustainability Team will work with divisions across the City to facilitate the selection of project leads and the implementation of the actions in the plan. An update on the progress of the plan will be provided every year as part of the annual Sustainability and Climate Change Update Report to Council.

FINANCIAL

This plan will be funded, in part, by the Corporate Climate Action Plan Implementation project (ref #143), with action items also funded by capital and operating initiatives across many divisions and included in the 2024-2026 capital and operating budgets. Increased capital investment, along with leveraging debt and grant opportunities, will be required to achieve GHG reduction targets.

NEXT STEPS

This plan will initially span a five-year period and be reviewed and updated in 2029. This plan will be part of an ongoing series of actions, strategies, and plans throughout the City implemented to reach the goal of net-zero by 2050.

TERRITORIAL ACKNOWLEDGEMENT

In the spirit of truth-seeking, respect, and Reconciliation, the City recognizes that members of staff and the community are settlers who benefit from the lands cared for by the Indigenous Peoples from the very beginning. Waterloo is situated on the land traditionally cared for by the Haudenosaunee, Anishnaabe and Neutral Peoples. We acknowledge the enduring presence and deep traditional knowledge and philosophies of the Indigenous People with whom we share this land today. Acknowledgment of the traditional lands of Indigenous Peoples is only a starting point in the City's journey toward Reconciliation.

One of the core goals in creating this plan was to ensure it would help further a sustainable future for the City. When thinking of how to define the somewhat-abstract notion of "sustainability", we often like to borrow from the definition of the Seventh Generation Principle from the Great Law of the Haudenosaunee Confederacy: **In every deliberation, we must consider the impact of our decisions on the next seven generations.**

Seven generations ago the City of Waterloo was still the Village of Waterloo located on Block 2 of the Haldimand Tract. The counted population was less than 1,600 mostly German residents living in a concentrated core area.

Six generations ago Waterloo Park was created and opened for the first time because of a growing number of residents transitioning from rural to urban living.

Five generations ago people from the Town of Waterloo would fight and serve in the First World War.

Four generations ago Canada gained full political independence from Britain because of the Statute of Westminster.

Three generations ago Indigenous Peoples of Canada gained the right to vote federally without losing their "Indian Status".

Two generations ago construction began on Waterloo City Centre, where the government of the City is centered today.

One generation ago the first legally recognized same-sex marriages were performed in Ontario.

Today, the City of Waterloo is virtually unrecognizable from the small Germanic farming town built around a Mennonite Grist Mill. It is called home by over 151,440 thousand people including 31,340 students from across the globe (based on 2016 and 2021 census data). It plays host to one of the largest tech sectors in Canada, three world-class post-secondary institutions, and a booming insurance sector.

Despite all this progress, it is important to recognize that the echoes of decisions made all those generations ago still impact our City today. The layout of our City, the events, our ability to enjoy Waterloo Park and other greenspaces, our ability to call this land home, the landscape we have lost and gained, and much more were all founded by those who could not have imagined what their choices would mean for the future.

We have no idea what the future will look like in seven generations, and we have no idea what impacts our decisions today may have, so it is important that we try our best to make good ones.

INTRODUCTION

WHAT IS A CORPORATE CLIMATE ACTION PLAN?

This City of Waterloo Corporate Climate Action Plan (“CorCAP”) is a plan to reduce corporate greenhouse gas emissions AND integrate sustainability and climate change into all applicable City processes and procedures. The plan is holistic and focuses on four different areas of action:

- 1) **Measurable Impact Projects.** These are activities that have environmental effects that can be clearly measured, tracked, and reported. Examples include on-site energy generation, fleet transition to electric vehicles, district energy heating systems, and conducting waste audits.
- 2) **Immeasurable Impact Projects.** These are activities that have environmental impacts that cannot be clearly measured, tracked, or reported. Examples include education (internal and external), advocacy, and deploying a “Climate Lens”.
- 3) **Supporting Projects.** These are activities which have no environmental effects, but rather support the development or implementation of measurable or immeasurable impact projects. Examples include funding, partnerships, and reporting.
- 4) **Community-Impacting Municipal Actions.** These are activities which impact tools that the municipality uses to encourage community actions. Examples include policies, by-laws, and community grants.

WHERE DOES THIS PLAN FIT?

This Corporate Climate Action Plan is designed to integrate with and complement the City’s existing climate action plans. This includes the regional community climate [mitigation](#) plan [TransformWR](#), the [Corporate Climate Change Adaptation Plan](#), the corporate [Energy Conservation Demand Management Plan](#), the [Community Energy Investment Strategy](#), and the [2023-2026 Strategic Plan](#). The plan has also taken into consideration existing and future business and comprehensive planning throughout the corporation.

While this is a corporate plan, it is important to recognize that a municipality’s unique role as a governing organization means that actions which are undertaken internally will inherently impact the community. Staff knowledge, policies, culture, direction, goals, and attitudes influence the ways the City is governed and the services we provide to the community. This plan acknowledges that many of its corporate facing actions will also have positive benefits for the community, in-line with our community goals.

WHAT ARE THE GOALS?

This plan is a mechanism to help the corporation achieve the goal of 50% greenhouse gas emissions reductions by 2030 as compared to 2010 levels, and net-zero by 2050. The goal is to position the City to be a leader in transformational climate action and to create a cultural, regulatory, and intellectual environment where greenhouse gas emissions considerations become part of the norm in all that we do.

WHAT IS THE TECHNICAL SCOPE OF THIS PLAN?

The technical scope of this plan describes which scope of greenhouse gas emissions will be included or excluded from consideration. A greenhouse gas emissions scope encompasses all the greenhouse gas emissions (GHG) that will be included or excluded from an analysis or plan and are defined by national and international standards. It is important to define this as the scope of a municipality can be far-reaching and go beyond its ability to influence change. To ensure consistency in measurement of emissions, and avoid double counting, the GHG protocol is the most common framework used around the world to scope and measure emissions, which are classified in the following ways:

Scope 1 emissions are direct GHG emissions from sources that are owned or operated by the corporation. Examples include combustion processes from boilers in buildings and facilities, vehicles, and furnaces.

Scope 2 emissions are indirect GHG emissions from the generation of purchased electricity consumed by the corporation. An example would include power utilized by City facilities, for instance, interior lighting for an office space, from an offsite production facility.

Scope 3 emissions result from the activities of the corporation and its staff, but which are not from sources directly owned or operated by the company. Examples include purchased goods and services, business travel, and employee commuting.

All scope 1 and 2 emissions (as defined by the [GHG Protocol](#)) are being considered within this CorCAP. scope 3 emissions will be considered on a sliding scale. The aim is to respect the current resource capabilities of the City as well as the cultural, technical, and operational landscape in which it operates, while also striving to prepare staff and our partners for a more ambitious future. The below graphic highlights which scope 3 emissions will be directly considered in this plan, which ones require more research and data collection, and which actions cannot be currently completed, but can be prepared for in the future. Scope 3 emissions were sorted based on the current or anticipated availability of data or sphere of influence within the City within the next five years, as well as the economic, technological, and social landscape in which the City operates.

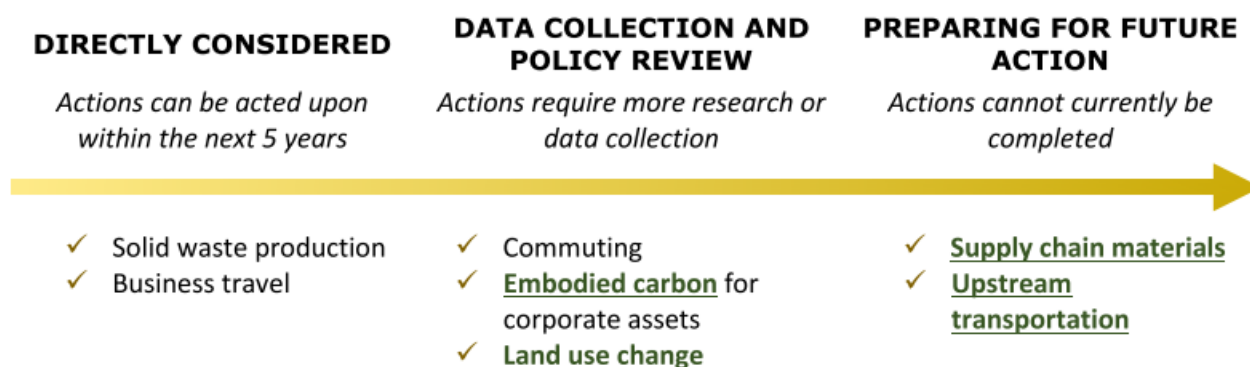


Figure 1 Break down of the considerations of scope 3 greenhouse gas emission in the Corporate Climate Action Plan

The unique role of municipalities as an interface with the community means that often actions which are corporate-focused may have intended or unintended impacts to the larger community. Several actions in this plan will also have positive impacts to the community of Waterloo.

WHY DO MUNICIPALITIES MATTER?

Municipalities are a critical component of reaching the planet's greenhouse gas mitigation targets, although they cannot do this alone.

- Municipalities have direct or indirect control of 44-50% of greenhouse gas emissions in Canada.
- Municipalities are responsible for their own direct and indirect corporate emissions.
- Municipalities own approximately 60% of public infrastructure in Canada.
- Municipalities (local municipalities and education) only receive approximately 10% of total taxes paid to all levels of government. Within Waterloo, the City receives 3%, the Region of Waterloo receives 6%, and education receives 1%.
- Municipalities have a role to protect their citizen's health, social, and economic well-being.
- Municipalities know their local context the best and are closest to the voices of residents.

The City of Waterloo is a key player in the fight against climate change and must take action accordingly in response to the items within our direct control or influence.

WHAT ARE THE RISKS OF INACTION?

The broader impacts and risks of inaction on climate change have been known for decades. This includes increasing temperatures, more severe storm events, more extreme changes in precipitation (flooding or drought) and decreased predictability of weather systems. These impacts can further cascade to affect local and global food systems, infrastructure, social systems, economic systems, and health systems. The most vulnerable are also the most likely to be negatively impacted and have the least number of resources to increase their own resilience.

One of the largest difficulties, however, of tying the consequences of climate action, or inaction, to those risks is that emissions are a global problem, while action is often done on a local scale. One municipality may take aggressive action to lower its emissions but still be significantly impacted by climate change, while another may take on a business-as-usual approach and face very few consequences.

It is therefore important to highlight the risks of inaction for a municipality that are grounded in factors other than the direct impacts of climate change:

1) Financial

- There is a risk of losing access to early adopter grants and funding from various levels of government.
- Locking-in carbon-dependent infrastructure and technology may result in additional higher costs in the future.
- Losing on opportunities for economic development and talent attraction
- Sudden increases in costs if carbon prices increase.

2) Social

- Delaying the combined efforts of partner municipalities through lack of action.
- Lowering the quality of life for residents.
- Furthering the severity of climate-related impacts on those less advantaged.

3) Reputational

- Eroding trust within the community and losing social capital.
- Failing to meet strategic priorities.
- Failing to create an environmentally progressive community.

GHG EMISSIONS INVENTORY

WHAT IS A GREENHOUSE GAS?

Greenhouse gases are gases in the earth's atmosphere that trap heat. These gases are an essential part of maintaining the earth's temperature, without them, the average temperature would be -18 degrees Celsius. When GHGs exceed certain levels, the atmosphere retains more heat. This imbalance can cause climate change by destabilizing weather systems and causing increasing temperatures, changing precipitation patterns, more intense storm events, and more unpredictable weather. The six most common GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO_x), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), and ozone in the lower atmosphere.

WHAT IS A GREENHOUSE GAS EMISSIONS INVENTORY?

A greenhouse gas inventory is the analysis and accounting of all greenhouse gas emissions emitted within a certain scope. These analyses use several different information sources including fuel usage, electricity use data, waste weight, and mileage, and nationally determined emissions factors.

WHAT IS THE DIFFERENCE BETWEEN A CORPORATE AND COMMUNITY INVENTORY?

A **corporate** GHG inventory accounts for all emissions created by the corporation of the City of Waterloo. This includes all City-owned buildings, fleet, staff activity (such as driving and flying), and equipment. The corporation of the City of Waterloo conducts a corporate GHG inventory every year.

A **community** GHG inventory accounts for all emissions created by the larger community of Waterloo. This includes all transportation, homes, businesses, waste, and agriculture within the City of Waterloo. The City is part of a larger collaborative with all the area municipalities known as ClimateActionWR. One of the initiatives that ClimateActionWR leads is the measurement of community emissions every five years and reports on it as a region. Community emissions make up most of the emissions within the geographic boundary of the City of Waterloo.



CORPORATE GREENHOUSE GAS EMISSIONS INVENTORY

The City of Waterloo's Corporate GHG emissions total 5,391 tonnes of carbon dioxide equivalent as of the year 2021. The largest source of these emissions are buildings and facilities, which make up approximately 70% of total corporate emissions. Fleet and equipment, such as City fleet and parks maintenance equipment, comprise approximately 22%, followed by solid waste at 6%, and then streetlights, travel, and wastewater buildings which together comprise roughly 2% of emissions.¹

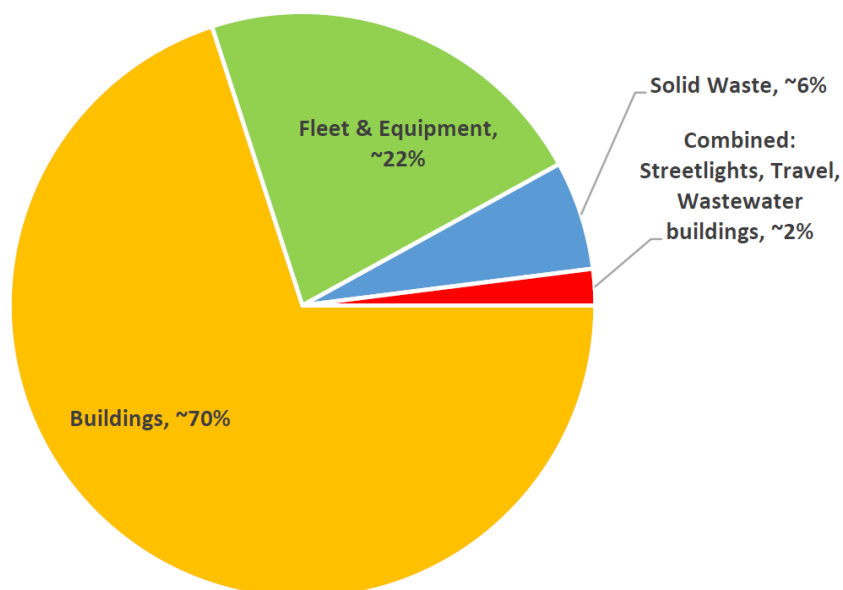


Figure 2 City of Waterloo Corporate Greenhouse Gas Emissions (2019)

COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

All eight municipalities within the Region of Waterloo calculate their community emissions together as part of the regional mitigation initiative TransformWR. The community of the region of Waterloo emitted 3.8 million tonnes of CO₂e in 2020². Approximately half of emissions from the community are a result of transportation, followed by 45% from our homes and workplaces. The remainder is from agricultural activities in the region and waste.

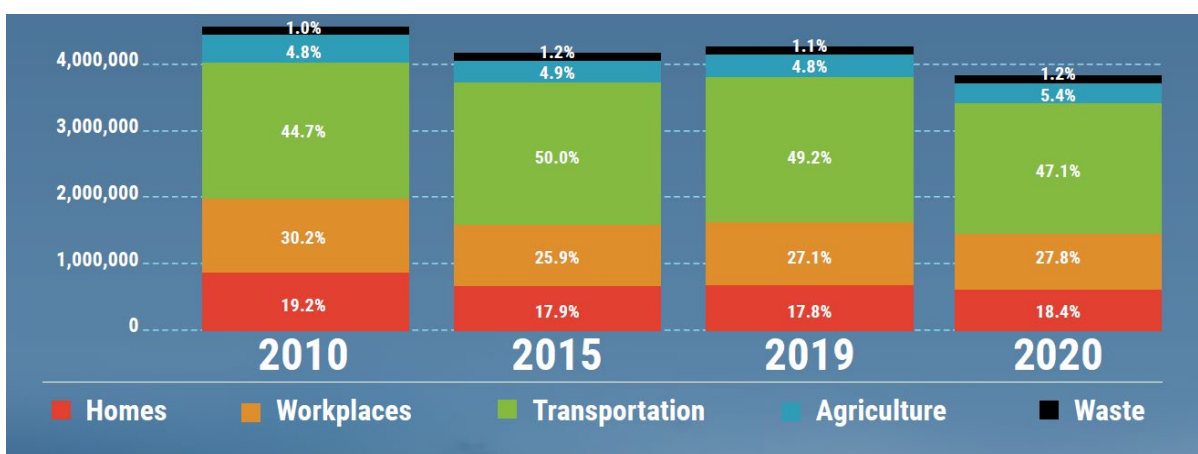


Figure 3 Region of Waterloo Community Greenhouse Gas Emissions 2010-2020 (Our Progress, Our Path: 2023)

¹ Staff Report. COM2021-027 Corporate Greenhouse Gas and Energy Roadmap-Phase1. (2021).

² ClimateActionWR. Our Progress, Our Path 2020. (2023).

PLAN MANAGEMENT

The management and monitoring of this plan will be the responsibility of the Strategic Initiatives Division, under the guidance of the Environmental Sustainability Team (EST) and Council where appropriate. Individual actions will be the responsibility of all departments and divisions across the organization. The nature of this plan necessitates a flexible and organization-wide system of management to integrate the emission reduction actions in both a top-down and bottom-up approach. This approach allows for flexibility, better allocation of resources, and better integration of staff knowledge throughout the entire organization.

The Strategic Initiatives Division is a division of the City of Waterloo within the Office of the CAO. This division houses the coordination of the Sustainability and Climate Change portfolio for the Corporation and Community of the City of Waterloo. They will be responsible for:

- The overall high-level management of the plan
- Monitoring high-level plan progress
- Supporting divisions when needed
- Reporting the progress of the plan to Council
- Bringing forward actions to EST for direction and approval

The Environmental Sustainability Team is a team consisting of leadership and staff representatives from various divisions across the City. The purpose of this team is to streamline City personnel across divisions with environmental sustainability responsibilities into a team that provides a centralized focus on helping to implement sustainability and climate change plans. They will be responsible for:

- Approving the direction of the plan
- Recommending staff resources
- Guiding the direction of the plan

Staff are the individuals within the organization who will be responsible for managing individual actions, or elements of individual actions. They are responsible for:

- Completing individual actions.
- Reporting back the progress to the Strategic Initiatives Division.
- Requesting funding as part of the City's budget process and authoring staff reports as required.



ACTIONS

The development of this plan placed high importance on the actions *being realistic, practical, and grounded* in the knowledge and daily realities of staff at the City of Waterloo. It considered how to best acknowledge and leverage current and future resources to help meet our mitigation goals as a City. The development of this plan also considered factors outside of the corporation that may influence actions, such as the availability and cost of current technologies, the development of future technologies, and provincial and federal direction and support.

Many of these actions were designed to integrate with existing work that is being done or planned within the City, while others are completely new ideas designed to push the organization to be more sustainable. Several of the actions are interconnected and can be done simultaneously with other planned work.

Each action below is accompanied by a brief description. A full list of the actions including suggested prioritization and team members can be found in Appendix A. The actions are divided into short-term (2 years), medium-term (3-4 years), and long-term (>5 years). The timeline of each action reflects the estimated completion date, not the estimated start date. Actions were characterized into certain time periods due to estimates of length of the project, staff availability and resources, budget allocation timelines, priority, and interaction with other plans. Each action has also been assigned a “relative impact” value of *low, moderate, or high* to indicate the qualitative estimation of how much that action may reduce the City’s greenhouse gas emissions. Some actions which are likely to have higher impacts on community emissions rather than corporate emissions will be marked with an *N/A* (not applicable).

Ultimately, it must be acknowledged that each individual action in this plan is not enough to meet the City’s targets. The strength of these actions is through collaboration, along with existing work, and the constant push for a changing, more sustainable world from staff, Council, residents, communities, and all levels of government. These actions are just a portion of the work that must be done to mitigate greenhouse gas emissions, but they will help foster the momentum and conditions to push this work forward into the future.

BUILDINGS AND FACILITIES

Buildings and facilities account for approximately 70% of the City's currently measured GHG emissions. The City owns and operates 58 electrically or natural gas served buildings throughout the City. These include libraries, offices, fire stations, and recreation facilities. The City of Waterloo has several ambitious and ongoing projects to reduce the greenhouse gas emissions from its buildings and facilities. This work is being led by the Facility Design and Management Services Division (FDMS). The mechanisms already in place to reduce greenhouse gas emissions from City buildings include:

- 1) **Energy Conservation Demand Management Plan** is developed by the City every five years as part of Ontario regulation 25/23. This plan includes a summary of the City's annual energy consumption and greenhouse gas emissions for its operations, and a description of previous, current, and proposed measures for conservation and otherwise reducing the amount of energy consumed by the City's operations.
- 2) **Broader Public Sector Annual Energy Reporting** under Ontario Regulation 25/23 requires the City to submit annually all energy use for City owned and operated buildings.
- 3) **Annual reporting** of corporate greenhouse gas emissions through the City's partnership with the [Impact Network through Sustainable Waterloo Region](#).
- 4) **The City of Waterloo Green Building Policy (A-033)** which commits to reducing corporate building GHG emissions by 50% by 2030 and 80% by 2050 relative to 2010 levels³. This includes requiring that new construction or expansion is built as zero carbon, that a zero-carbon approach be used for major retrofit projects of existing buildings, and that GHG, energy, and financial metrics are included. Studies have been completed at the City which inform the Green Building Policy. This includes the Corporate Greenhouse Gas and Energy Roadmap-Phase 1 (CORP2022-013) which was a study created to map out pathways to achieve the 50% by 2030 and 80% by 2050 goal for corporate GHG reductions. At the time of the report, based on information from 2021, it calculated that the cost of reduction would be between \$36.5M and \$47.7M by 2050 or between \$1.3M and \$1.6M per year for 29 years. As part of the study the City worked with GHG and energy consultants to conduct feasibility assessments on five City buildings to show a sequence of GHG measures that reduce each building's GHG emissions by at least 80%. These five buildings were the Albert McCormick Community Centre, Fire Station 2, Waterloo City Centre, RIM Park, and the Waterloo Public Library (Main Branch). These buildings were selected because of their contribution to the City's building GHG emissions and their example classification that can be extrapolated out to 15 City buildings which make up 90% of the GHGs. The study found that each building could achieve a GHG emissions reduction of at least 80% relative to the current baseline through a series of building upgrades, systems upgrades, and renewable energy generation.

Implementing Green Building Policy measures will align with capital renewal requirements and projects. Low/no cost measures, or standalone GHG reduction measures not requiring a capital renewal project, will be implemented as identified as funding allows. The following five actions are proposed to reduce the greenhouse gas emissions from the City's buildings and facilities.

³ Note: the 2022 version of the Green Building Policy was released prior to the amendment of the City's 2050 goal of Net Zero. This has been accounted for in an action below.

BUILDINGS AND FACILITIES ACTIONS

- 1) **Continue to convert natural gas fuelled heating systems to electrically powered heating systems.** The electrification of natural gas heating systems is dependent on existing upgrade and renovation projects and the availability of established or new technology. This action generally provides an attractive return on GHG reductions per dollar investment (\$ spent per tonne of GHG emissions saved), is considered a high-impact measure, and high priority.

Relative impact: high

- 2) **Continue to implement the City of Waterloo's Green Building Policy.** This includes:

- requiring that new construction or expansion be built as zero carbon ready buildings (including having feasibility studies conducted prior to design and construction).
- Requiring a zero-carbon approach for major retrofit projects of existing buildings.
- Establishing GHG, energy, and financial metrics.

Relative impact: high

- 3) **Ensure that all new iterations of the City of Waterloo's Green Building Policy and any future corporate plans or greenhouse gas modeling align with the corporate 2050 net-zero target.** On October 16th, 2023, Council established a more ambitious corporate greenhouse gas mitigation target of net-zero by 2050. All work done after this date will reflect and incorporate the new targets.

Relative impact: high

- 4) **Continue to replace equipment at failure with GHG/energy efficient improved performance equipment.** These projects typically occur on an as-needed basis and

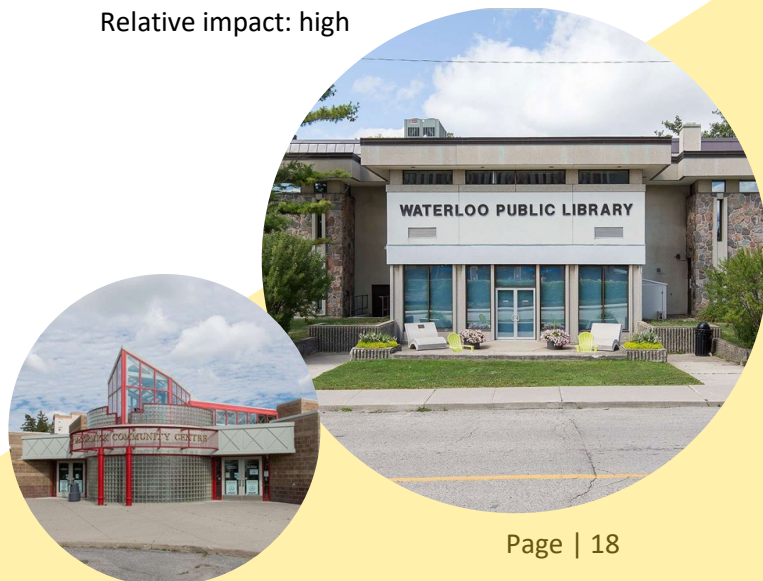
include examples such as installing higher efficiency pumps, motors, or fans when existing equipment fails.

Relative impact: high

- 5) **Continue to implement energy efficient systems when major building systems (e.g., roofing, cladding, windows, mechanical, electric controls) reach their end of life or require a major overhaul.** This includes conducting reviews for the following systems and equipment:

- Building envelope improvements including increased insulation and reduction of infiltration at the roof, exterior walls, doors, and glazing.
- Electrical and control systems improvements by replacing non-LED lighting with LED and optimizing controls to minimize GHG/energy consumption through appropriate scheduling set points and equipment programming.
- Mechanical system improvements through optimization and electrification.
- Feasibility of renewable energy installations including renewable energy and ground source heat pumps.

Relative impact: high



OTHER ACTIONS

Fleet and equipment, solid waste, streetlights, travel, wastewater, and business travel comprise the other 30% of corporate greenhouse gas emissions for the City of Waterloo. The proposed actions to mitigate these emissions as well as create the culture and expertise needed within the City to reach its long-term goals are proposed below. These include measurable impact project actions, immeasurable impact project actions, supporting project actions, and community-impacting actions.

SHORT-TERM ACTIONS (2 YEARS)

- 6) Implement a large-scale public awareness and education strategy focused on the sustainability and climate change work done by the City.** It has become increasingly evident through recent engagement opportunities led by the City that the wider community is not always aware of the work the City is leading related to sustainability and climate change. In addition to providing residents with information on the City's great work in this area, education should be used to help reduce public confusion and resistance around certain environmental initiatives. Examples include:

- a. The progress made on grass cutting (i.e., reduction in mowing in the last several decades). This is in-line with the City's [Parkland Strategy](#).
- b. Reasons the City may be cutting the grass less.
- c. The importance of meadows.

This could include collaborating with organizations such as the school boards to teach the next generation of residents the impact of everyone's actions on the planet, and how the municipality is dedicated to creating a sustainable and resilient community.

Relative impact: high

- 7) Formalize the internal decision-making process regarding available funding for corporate sustainability and climate change initiatives.** The City's response to sustainability and climate change is led by the Strategic

Initiatives Division however, the projects and impacts are spread out throughout the City. A process should be implemented to decide how funds are allocated and awareness of the funds to help facilitate projects throughout the City. The internal decision-making process would include reviews and recommendations from EST. It is recommended that this action be considered in tandem with asset management planning and reporting.

Relative impact: high

- 8) Advocate to the provincial and federal government for funding and legislative changes.** This includes changes to the National Building Code of Canada, the Ontario Building Code, and reporting requirements, as well as the need for significant increases in grant funding support for mitigation projects.

Relative impact: high

- 9) Create and distribute an internal educational list of potential mitigation actions that could benefit from sustainable funding streams or subject matter expertise.** This is to help educate staff on the potential their projects may have to consider climate change in their design and to access to funding streams that may not have been considered. The aim is to encourage projects to integrate climate change considerations early in their process.

Relative impact: high

10) Continue to build on the progress of the creation of the Climate Action Reserve Fund (CARF). Seek ways to increase funding for the CARF through future budget processes and to leverage federal and provincial opportunities.

Relative impact: high

11) Actively seek external funding for sustainability and climate change work. Significant external funding will be required for the City to achieve all its mitigation goals. The existing internal grant identification process should be leveraged to identify all new potential funding streams, identify the process under which they should be applied, and identify the opportunities and limitations of applying in tandem with other internal divisions and external groups as warranted.

Relative impact: high

12) Outline and report which scope 3 emissions will or will not be considered by the City of Waterloo. Scope 3 emissions often make up the largest source of a municipality's emissions. However, there is often significant difficulty associated with data acquisition as well as questions of where an organization's scope of influence ends. In addition, there is the possibility of 'double counting' emissions with another organization providing services. To this end, it is important that the City define exactly which Scope 3 emissions are considered within its realm of accountability, and which cannot feasibly be considered.

Relative impact: high

13) Continue to leverage debenture financing in support of increased climate action investment. The City's Debt Policy was updated on June 19, 2023, as approved by Council report CORP2023-018. As per the updated policy "Debt should be used primarily for strategic priorities including but not limited to, infrastructure renewal projects, climate action projects and or any other strategic initiative subject to the approval of Council". By focusing debt on strategic priorities, it will allow the City to advance important and urgent projects

along the capital-planning horizon that will help achieve over-arching community goals, such as achieving our GHG reduction targets.

Relative impact: high

14) Create a GHG mitigation goal and roadmap for small equipment used for City operations and maintenance. Create an inventory of the current small equipment used during City operations and maintenance. This includes the use of the equipment and the designation of their power sources (i.e. electric or gas powered). Designate which pieces of equipment could be feasibly converted to electric based on their use and available technology. Create a proposed roadmap for the conversion of those pieces of equipment, including timeline, goal, and required budget. The roadmap should include considerations of externalities such as power supply, supply shortage, division responsibilities, and needs of staff.

Relative impact: moderate

15) Determine an internal decision-making structure for greenhouse gas reduction projects. This includes when and how the Strategic Initiatives Division should be included in project considerations, when EST should be included, and when other staff should be engaged. The criteria for these considerations should be determined at the onset of the action.

Relative impact: moderate

16) Increase employee knowledge on all the different ways they can safely commute to various City buildings. This includes cycling, walking, and public transit. This may be included as part of orientation or continuous training. Explore partnering with the existing TravelWise program to achieve this action.

Relative impact: moderate

17) Explore the potential of cross-departmental sharing of zero-emissions vehicles. The intent of this action is to avoid unnecessary purchasing of new vehicles, and to increase the

efficacy and use of existing vehicles. This may involve staff engagement and a smaller pilot program.

Relative impact: moderate

- 18) Right-size fleet.** Continue to implement processes, procedures, and cultural changes that ensure that the fleet being used is the most efficient and appropriate for each individual responsibility.

Relative impact: moderate

- 19) Improve fleet and equipment tracking.**

Continue to optimize fleet assets, reduce fuel consumption, and increase fleet efficiencies through the use of telematics tracking equipment.

Relative impact: moderate

- 20) Explore opportunities to reduce vehicle use during regular City operations.** Explore options to reduce or limit the number of times a staff member (or various staff members) must go to the same site. Sometimes, more than one trip can be prevented with advanced planning. The City may be able to cross-train staff to reduce the frequency for multiple visits. Introduce a no-idling policy (where applicable and safe) to staff using City vehicles. GPS should be considered as an avenue of tracking and optimizing routes and vehicle use.

Relative impact: low-moderate

- 21) Explore further opportunities to transition annual floral displays to perennials.** The flowers grown in the summer around the City are beautiful and increase the enjoyment of the City. However, these flowers are often annuals which require significant time and energy to grow, and which become waste at the end of the season. The City's horticultural team has already begun implementing more sustainable gardens throughout the City. It is encouraged that this action be continued and expanded. During this action, also consider the role of perennials for all the City's use cases, including hanging baskets, planters, and in-ground gardens.

Relative impact: low-moderate

- 22) For annual reporting purposes (e.g. the Sustainability and Climate Change Update Reports) ensure the distinction and inclusion of both greenhouse gas and energy reductions/increases for the City.** While greenhouse gas emissions are related to energy consumption, they are not the same thing. Presenting them as the same thing can omit important details about the City's progress towards decarbonisation and does not present a fulsome picture of mitigation efforts. Each year the City should present both the greenhouse gas emissions emitted and the energy used. This has been suggested to both properly show the City's progress independent of the province's energy grid, and to create a more consistent database for this information in the form of the update reports. It is suggested that this work be done in collaboration with other existing reporting processes, such as the annual Asset Management Report Cards.

Relative impact: low

- 23) Determine the feasibility of doing an assessment on GHG retrofits of wastewater pump stations.** GHG emissions from wastewater pump stations are often overlooked when examining corporate GHG emissions. Conduct a brief return on investment exercise on the emissions of a more efficient pump or determine the costs associated with future upgrades as the current wastewater pumps reach end of life.

Relative impact: low

24) Provide employee training for energy efficiency. As part of employee onboarding and continuous training, create a module on how employees can reduce energy demands at home and in their workplace.

Relative impact: low

25) Provide employee training for efficient driving. As part of employee onboarding and continuous training, create a module on how employees can drive efficiently at the workplace and at home to reduce fuel use.

Relative impact: low

26) Integrate Sustainability and climate change wording into job postings. Advertise the City as a sustainable place to work. Highlight specific sustainable programs such as the TravelWise membership.

Relative impact: low

27) Create 'green event' guides for all City hosted, endorsed, and sponsored events. This includes:

- a. Externally organized events. These are events self-organized by the public such as those hosted by neighbourhoods' groups or when residents book spaces on City properties (e.g. Waterloo Park).
- b. City of Waterloo organized internal events. These are events organized by City staff for City staff such as holiday events, BBQs, the staff symposium, etc.
- c. City of Waterloo organized external events. These are events planned by the City for the public, such as Lumen or community engagement sessions.
- d. Affiliate events. These are large events not organized by the City, but hosted within the community that may require prior City involvement such as Buskers or Oktoberfest.

These guides should include consideration of food waste, transportation, garbage creation, and messaging.

Relative impact: low

28) Embed sustainability and climate change as part of departmental and divisional staff meetings. Ensure that sustainability and climate change are components of City staff meetings, akin to safety moments. Emphasize this importance near notable dates, such as Earth Day.

Relative impact: low

29) Continue to review the potential of limiting grass mowing in areas that could be replaced with perennial gardens, meadows, or naturalized. Continue to review the areas where the City cuts grass and determine if there are any areas that are being programmed right now that may benefit from a different form of management. This is to reduce the amount of mowing (and by extension emissions from mowing) needed.

Relative impact: low

30) Create division-use accounts for the ION, GRT, Neuron, and any other widely available modes of active or public transportation. To encourage staff to use cars less during work hours, provide each division with accounts/access cards to readily available public transit. Create a system of management and accountability for this program. Investigate the ways this can be linked with the existing TravelWise program.

Relative impact: low



31) Define City policy on consideration of sequestration sources in possible carbon accounting and possible future carbon budgeting activities. The City of Waterloo has a large source of carbon sequestration potential in the form of our publicly and privately owned trees, water bodies, and other plant life. The addition or removal of these sources may impact the carbon emissions of the City. It is recommended that the City develop a policy or methodology on if and how these carbon sinks should be considered towards our climate change goals. This decision may impact future tree preservation or development decisions.

Relative impact: N/A

32) Implement sustainability and climate change considerations into all applicable [How-to guides](#) available on the City of Waterloo's neighbourhood's webpage. The City of Waterloo already has excellent resources dedicated to sharing best practices with communities. To mainstream climate change into all City operations, a project should be undertaken to first determine which guides may require modification, then to provide a system, timeline, and content for modifying them.

Relative impact: N/A

33) Explore further opportunities to promote programs to reduce the amount of congestion at school drop-offs. Parents driving their children to and from schools create significant congestion and result in increased idle times. Work with staff, educational institutions, and community groups to encourage parents to take advantage of public or active transportation, or to drop their children off further from the school.

Relative impact: N/A

34) Partner with Enova Power and Waterloo Region Community Energy (WRCE) to increase the general literacy of the City's energy system and transition plans among staff. A knowledge disconnect has been reported between our community energy goals and staff work. To close this gap, it is recommended that the City works closely with its energy partners to create an event such as a lunch and learn or an instructional packet, which would be beneficial to the long-term energy goals of the City.

Relative impact: N/A

35) Incorporate sustainability and climate change into neighbourhood newsletters and events. Community newsletters are an established conduit for delivering timely climate change information to residents. It is recommended that staff integrate appropriately suggested actions and information into existing newsletters under a 'green' section and/or time it with sustainability and climate change events hosted by the City.

Relative impact: N/A

36) Communicate the location of all dog waste bins. This is to encourage dog owners to take extra time to properly dispose of their dog's waste in a way that will contribute to the City's poop power program. This could be posted on existing wastebins, online, or in other formats.

Relative impact: N/A

37) Encourage neighbourhood green representatives. Work with neighbourhoods and existing community program partners to establish a green representative. Create and provide additional resources, such as a working group, guide, or training for those representatives.

Relative impact: N/A

- 38) Create education for residents on the ways that they can green their homes under established by-laws and existing programs.** For example, this could include explaining a resident's ability to grow native plants on their property or how to green their lawn. Having all the information in one, easy-to find and use place may encourage residents to act. There are several existing City or partner resources that could be leveraged for this action, such as the "Naturally Your Waterloo" guide, REEP Green Solutions Resources, the storm water management fee reduction rebate, and materials from the City's energy partners.

Relative impact: N/A

- 39) Conduct a review of all City by-laws and propose amendments that would allow residents to increase their own sequestration potential or decrease their emissions.** This work should include a review of other by-laws in similar municipalities which have been modified to increase sustainability. The aim is to identify which by-laws may be avoidably hindering progress in sustainability and climate change.

Relative impact: N/A

- 40) Continue to support private tree planting campaign efforts.** Continue to provide monetary and staff resource supports to the City's community partners (such as REEP) in planting trees on private properties.

Relative impact: N/A

- 41) Continue to conduct an urban tree canopy study.** The results can be used to target potential sequestration opportunities or to highlight locations which could benefit from natural cooling infrastructure.

Relative Impact: N/A

- 42) Install a poop power bin in uptown Waterloo.** Uptown is an area frequented by several dog owners and their pets. Adding a bin there would ensure visibility and high traffic, leading to greater waste diversion.

Relative impact: N/A



MEDIUM-TERM ACTIONS (3-4 YEARS)

43) Create a corporate electric vehicle charging strategy. As the City continues to transition to an electric vehicle fleet, a strategy should be created to consider the medium and long-term funding needs related to the supporting infrastructure including location, cost, need, maintenance, technical requirements, and back-end support. This strategy should be created with significant cross-divisional input.

Relative impact: high

44) Develop economic development resource guides for various sectors related to sustainability and climate change. Economic Development has a unique connection to industry within the City of Waterloo. Resource guides could help connect businesses to programs and partners such as Sustainable Waterloo Region, local green businesses, available federal, provincial, and municipal programs, etc. The guides could also provide an opportunity to educate and broadcast information related to the City's climate change goals, promote local technologies or companies leading the way in the sustainability and climate change space, and bring awareness to the economic costs of climate change.

Relative impact: high

45) Create training and information materials for incoming members of Council and leadership. Create a packet of accessible materials encompassing the current state of climate change work within the City that can be updated for new Council terms and when new members of leadership join the City.

Relative impact: moderate

46) Provide consultants and contractors with the City's carbon reporting expectations for projects. This would include things such as the emissions factors to use, reporting requirements, projected energy, and comparison, etc.

Relative impact: moderate

47) Create an internal accountability system for staff. This may include individual or division targets, performance evaluation metrics, etc.

Relative impact: moderate

48) Use existing opportunities to connect with staff on sustainability and climate change issues using tailored materials and messaging. There are several outlets to connect with staff on issues of sustainability and climate change that have not yet been explored. These include staff meetings, work lunches, webinars, and online resources. Use these opportunities to send out targeted messaging to inform staff or enact action.

Relative impact: low-moderate

49) Investigate a mileage reimbursement initiative for non-vehicular transit alternatives as personal sustainable travel during work activities. Drivers receive monetary reimbursement for kilometres driven during job duties. This is intended to compensate for gas usage and wear and tear on vehicles. However, there is no existing program for other modes of transit such as bicycles that may also experience wear and tear during work activities and require regular maintenance. Investigate the creation of a program which compensates active transit users for their low-carbon transportation options.

Relative impact: low

- 50) Propose a green grant for mitigation-related community projects.** Work with communities to create a neighbourhoods grant specifically targeted at projects that can reduce emissions on a local scale. Examples could include creating materials or campaigns surrounding no-mow landscaping, putting up community solar projects, or finding creative ways to reduce car commuting.

Relative impact: N/A



LONG-TERM ACTIONS (>5 YEARS)

- 51) Develop a green purchasing strategy.**

Purchasing low-carbon goods or services requires extensive top-down and bottom-up collaboration and expertise. Develop a strategy that includes working with each division to develop educational tools, accountability systems, tailored goals, and policies to reduce the actual or embedded emissions within the goods and services purchased. This should be a comprehensive strategy that spans from large construction projects down to office supplies. The largest focus should be on projects or procurement with the largest materiality.

Relative impact: high

- 52) Integrate climate change and energy into all major community and corporate plans.**

Identify which plans would benefit from a climate lens. Create a process which ensures that these factors are considered in the decision and review process. It is recommended during this process to host internal workshops with select divisions to consider how to incorporate climate change considerations into the technical aspects of their plans. Divisions are best prepared to modify their own work and may benefit from dedicated time and goal to discuss integrating climate change with each other in a facilitated setting.

Relative impact: high

- 53) Create a high-level pathway to net-zero by 2050 for all corporate emissions not considered in the Corporate Greenhouse Gas and Energy Roadmap-Phase 1 (CORP2022-013).**

This should include considerations of projects which may not be feasible within the five-year timespan of this plan for resource, technological, legislative, or other reasons, but that could significantly contribute to the City's net-zero target by 2050 goal. The aim of this is to incorporate promising initiatives into future work when the conditions are more favourable, or to work towards larger initiatives over a longer period.

Relative impact: high

- 54) Create a process to monitor embodied carbon from construction projects.** Develop a simple process which uses already included or easy-to-include information from construction projects (e.g. weight of cement) to begin to consider embodied carbon considerations of construction projects. This action will prepare the City and contractors for more detailed monitoring in the future.

Relative impact: high

55) Create an internal process to embed emissions considerations into selected City projects. This information should be in a format where it can be readily presented to Council as part of regular project proceedings.

Relative impact: high

56) Ensure that any City facilities that have food services or can be reasonably expected to host large events where food will be served have adequate compost facilities. Work with members of the Staff Association and City labour groups to develop guidelines. Explore the possibility of purchasing and providing on-site micro-composting opportunities for City staff to use.

Relative impact: low-moderate

57) Create a City policy on the holistic evaluation of the environmental impacts of equipment switching. In the City's pursuit of reduced GHG emissions, it is important to consider the other potential environmental impacts of switching to new fuel sources. This includes the carbon intensity of switching to electrification, the embodied carbon in new equipment, and the mining and disposal of the materials in electric vehicles and small machinery. It is recommended that a policy be implemented to encourage the holistic evaluation of new equipment choices including the available technology, the timeline of acquisition, and the relative environmental trade-offs.

Relative impact: low

58) Ensure consistency in garbage disposal across City facilities. Garbage disposal receptacles should be consistent in shape and messaging across City facilities to encourage a unified message and education surrounding waste. Research and implement techniques to encourage users to properly dispose of and reduce their waste, such as placement, sizing, and signage.

Relative impact: low

59) Continue to monitor and evaluate the progress of carbon budgeting as a GHG reduction mechanism in other municipalities. Engage with other municipalities, consultants, and researchers on the practical requirements, outcomes, and lessons learned of creating and implementing a carbon budget.

Relative impact: low

60) Continue the implementation of the Environmental, Social, and Governance Investment Framework. This framework, approved in Council report CORP2022-003- Investment Policy Update on February 28th, 2022, permits staff to invest up to \$10 million in ESG investments. ESG investments will be highlighted for Council awareness as part of the annual investment report.

Relative impact: NA

61) Review alternative building materials for construction projects. Many traditional construction materials, such as concrete and asphalt, are very high in embodied carbon. Continuously review how lower-carbon alternatives can be substituted while ensuring the safety, longevity, and services of the infrastructure are maintained.

Relative impact: NA



NEXT STEPS

An update of the actions will be provided every year beginning in 2025 and ending in 2028. This update will be provided as part of the annual Sustainability and Climate Change Update Report presented to Council by the Strategic Initiatives Division. The update will include a brief descriptor of the status of each action marked with a 'Completed', 'In-Progress', or 'Not completed'. Actions with notable progress or updates will include a brief descriptor and/or reference to the relevant Council report. The CorCAP update will be its own independent section in the larger report. The updates will also include significant work that has impacted building emissions, such as the upcoming 2025 completion of the next iteration of the ECDM Plan.

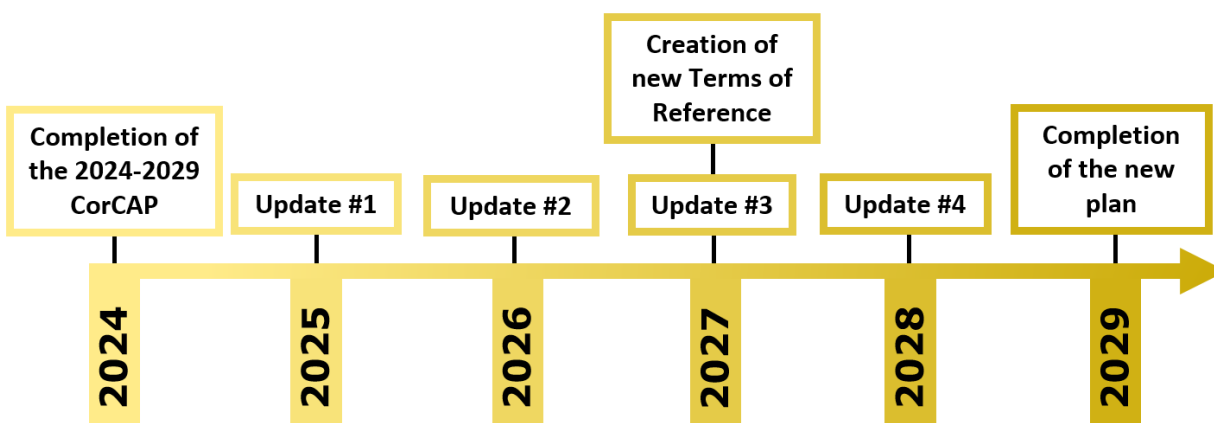


Figure 4 Outline of the next steps of the Corporate Climate Action Plan from 2024-2029

This plan is intended to cover a span of 5 years, ending in 2029. Mid way through the plan, staff will provide a recommended Terms of Reference to Council for the creation of a new or updated plan. This recommendation will include considerations of aligning upcoming plans and activities with the three and one year budget cycles.

Upon approval of this plan by Council, the Strategic Initiatives Division and Environmental Sustainability Team will immediately begin work on implementing the actions.

BEYOND THIS PLAN

This plan is one of several mechanisms and initiatives designed to help the City of Waterloo reach its 2030 and 2050 goals. Several actions in this plan will continue to evolve and grow past the intended end date of 2029 and will work towards the final goal of net-zero by 2050. Starting in 2027, the City will begin to re-evaluate this plan in the context of the changed landscape of legislation, available technologies, staff culture and expertise, and available funding. Staff will then propose the next best actions in terms of strategy. This may be to provide updates to this plan, create a new five-year plan, create a 20-year plan, or any combination of things.

In the meanwhile, new ideas in sustainability will continue to be fostered at the City as staff look to integrate climate change considerations into everything they do in a way that is grounded, implementable, and transformational.

APPENDIX A: ACTION IMPLEMENTATION

The following table represents the suggested list of divisions within the City of Waterloo who will be consulted during the initial phases of a specific action. Consultation in a project does not necessarily constitute leadership or significant involvement but is rather an opportunity to discuss a particular division's involvement at any given time. The reason for this approach is twofold: 1) During engagement staff noted that often divisions were not consulted during projects that they felt would benefit from their input, and 2) This approach allows more flexibility in assigning staff and leadership to a project that can consider existing workload, existing or planned projects with significant synergies, growing staff expertise, and changes in division composition. The lead for each action will be assigned by leadership during the initiation of the project in consultation with EST and Strategic Initiatives.

BUILDINGS AND FACILITIES ACTIONS

Table 1 Action implementation staffing for City buildings and facilities.

1) Continue to convert natural gas fuelled heating systems to electronically powered heating systems.		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
	High																										

	Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
2) Continue to implement the City of Waterloo's Green Building Policy.	High									●					●											
3) Ensure that all new iterations of the City of Waterloo's Green Building Policy and any future corporate plans or greenhouse gas modeling align with the corporate 2050 net-zero target.	High									●																
4) Continue to replace equipment at failure with GHG/energy efficient improved performance equipment.	High									●					●											
5) Continue to implement energy efficient systems when major building systems (e.g., roofing, cladding, windows, mechanical, electric controls) reach their end of life or require a major overhaul.	High									●					●											

SHORT-TERM ACTIONS (1-2 YEARS)

Table 2 Action implementation staffing for short-term actions.

	Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
6) Implement a large-scale public awareness and education strategy focused on the sustainability and climate change work done by the City.	High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						●	●		●	●
7) Formalize the internal decision-making process regarding available funding for corporate sustainability and climate change initiatives.	High	●													●											
8) Advocate to the provincial and federal government for funding and legislative changes.	High	●																		●						

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
9) Create and distribute an internal educational list of potential mitigation actions that could benefit from sustainable funding streams or subject matter expertise.	High																										
10) Continue to build on the progress of the creation of the Climate Action Reserve Fund.	High																										
11) Actively seek external funding for sustainability and climate change work.	High																										
12) Outline and report which scope 3 emissions will or will not be considered by the City of Waterloo.	High																										
13) Continue to leverage debenture financing in support of increased climate action investment.	High																										

	Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
14) Create a GHG mitigation goal and roadmap for small equipment used for City operations and maintenance.	Moderate		●				●	●	●						●	●									●	●
15) Determine an internal decision-making structure for projects.	Moderate		●	●	●		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●
16) Increase employee knowledge on all the different ways they can safely commute to various City Buildings.	Moderate		●											●				●								
17) Examine the potential of cross-departmental sharing of zero-emissions vehicles.	Moderate		●					●	●			●				●		●				●	●	●	●	●
18) Right-size fleet.	Moderate														●	●										
19) Improve fleet and equipment tracking.	Moderate															●										
20) Explore opportunities to reduce vehicle use during regular City operations.	Low-moderate															●							●	●	●	●

	Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
21) Explore further opportunities to transition annual floral displays to perennials	Low-moderate								●			●														
22) For annual reporting purposes (e.g., the Sustainability and Climate Change Update Reports) ensure the distinction and inclusion of both greenhouse gas and energy reductions/increases for the City.	Low		●							●																
23) Determine the feasibility of doing an assessment on GHG retrofits of wastewater pump stations.	Low		●							●					●											●
24) Provide employee training for energy efficiency.	Low		●											●			●									
25) Provide employee training for efficient driving.	Low		●													●	●									
26) Integrate Sustainability and climate change wording into job postings.	Low		●														●									

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
27) Create ‘green event’ guides for all City hosted, endorsed, and sponsored events.	Low																										
28) Embed sustainability and climate change as part of departmental and divisional staff meetings.	Low																										
29) Continue to review the potential of limiting grass mowing in areas that could be replaced with perennial gardens, meadows, or naturalized.	Low																										
30) Create division-use accounts for the ION, GRT, Neuron, and any other widely available modes of active or public transportation.	Low																										
31) Define City policy on consideration of sequestration sources in possible carbon accounting and possible future carbon budgeting activities.	N/A																										

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
32) Implement sustainability and climate change considerations into all applicable How-to guides available on the City of Waterloo's neighbourhood's webpage.	N/A																										
33) Explore further opportunities to promote programs to reduce the amount of congestion at school drop-offs.	N/A																										
34) Partner with Enova Power and Waterloo Region Community Energy (WRCE) to increase the general literacy of the City's energy system and transition plans among staff.	N/A																										
35) Incorporate sustainability and climate change into neighbourhood newsletters and events.	N/A																										
36) Communicate the location of all dog waste bins.	N/A																										

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
37) Encourage neighbourhood green representatives.	N/A																										
38) Create education for residents on the ways that they can green their homes under established by-laws and existing programs.	N/A																										
39) Conduct a review of all City by-laws and propose amendments that would allow residents to increase their own sequestration potential or decrease their emissions.	N/A																										
40) Continue to support private tree planting campaign efforts.	N/A																										
41) Continue to conduct an urban tree canopy study.	N/A																										
42) Install a poop power bin in uptown Waterloo.	N/A																										

MEDIUM-TERM ACTIONS (3-4 YEARS)

Table 3 Action implementation staffing for medium-term actions.

	Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
43) Create a corporate electric vehicle charging strategy.	High	●	●	●				●	●	●	●	●		●	●	●	●	●					●		●	●
44) Develop economic development resource guides for various sectors related to sustainability and climate change.	High	●	●																							
45) Create training and information materials for incoming members of Council and leadership.	Moderate	●																								
46) Provide consultants and contractors with the City's carbon reporting expectations for projects.	Moderate	●								●						●										
47) Create an internal accountability system for staff.	Moderate	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
48) Use existing opportunities to connect with staff on sustainability and climate change issues using tailored materials and messaging.	Low-moderate																										
49) Investigate a mileage reimbursement initiative for non-vehicular transit alternatives as personal sustainable travel during work activities.	Low																										
50) Propose a green grant for mitigation-related community projects.	N/A																										

LONG-TERM ACTIONS (5+ YEARS)

Table 4 Action implementation staffing for long-term actions.

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
51) Develop a green purchasing strategy.	High																										
52) Integrate climate change and energy into all major community and corporate plans.	High																										
53) Create a high-level pathway to net-zero by 2050 for all corporate emissions not considered in the Corporate Greenhouse Gas and Energy Roadmap-Phase 1 (CORP2022-013).	High																										
54) Create a process to monitor embodied carbon from construction projects.	High																										
55) Create an internal process to embed emissions considerations into large projects.	High																										

		Estimation of corporate greenhouse gas reduction impact	Office of the CAO	CAO/Strategic Initiatives	Economic Development	READI	Community Services	Community Outreach and Programming	Recreation Services	Parks, Forestry, and Cemetery Services	FDMS	Fire Rescue Services	Municipal Enforcement Services	Corporate Services	Corporate Communications	Finance	Fleet and Procurement	Human Resources	Information Management	Legal Services	Legislative Services	Integrated Planning and Public Works	Planning	Engineering Services	Building Standards	Transportation Services	City Utilities
56) Ensure that any City facilities that have food services or can be reasonably expected to host large events where food will be served have adequate compost facilities.	Low-moderate																										
57) Create a City policy on the holistic evaluation of the environmental impacts of equipment switching.	Low																										
58) Ensure consistency in garbage disposal across City facilities.	Low																										
59) Continue to monitor and evaluate the progress of carbon budgeting as a GHG reduction mechanism in other municipalities.	Low																										
60) Continue the implementation of the Environmental, Social, and Governance Investment Framework.	N/A																										

61) Review alternative building materials for construction projects.	N/A	Estimation of corporate greenhouse gas reduction impact
		Office of the CAO
		CAO/Strategic Initiatives
		Economic Development
		READI
		Community Services
		Community Outreach and Programming
		Recreation Services
		Parks, Forestry, and Cemetery Services
		FDMS
		Fire Rescue Services
		Municipal Enforcement Services
		Corporate Services
		Corporate Communications
		Finance
		Fleet and Procurement
		Human Resources
		Information Management
		Legal Services
		Legislative Services
		Integrated Planning and Public Works
		Planning
	●	Engineering Services
	●	Building Standards
		Transportation Services
		City Utilities

APPENDIX B: GLOSSARY

Adaptation: Changes in existing processes, practices, and structures to moderate potential damages from the actual or expected impacts of climate change, or to benefit from opportunities associated with climate change. An example is increased shade cover over a sidewalk to reduce the impacts of increased heat.

Carbon Dioxide (CO₂): A greenhouse gas molecule that contains two oxygen atoms and one carbon atom. It is produced from burning fossil fuels as well as the respiratory and decomposition process of most animals. Other sources include forest fires, volcanic eruptions, and the production of cement. Carbon dioxide is often considered the primary greenhouse gas that is emitted through human activities.

Community emissions: All greenhouse gas emissions produced by the activities of the community of the City of Waterloo. This includes most transportation, homes, businesses, waste, and agriculture within the city.

Corporate emissions: All greenhouse gas emissions produced by the assets and activities of the governing body of the City of Waterloo. This includes all City-owned buildings, fleet, staff activity (such as driving and flying), and equipment.

Environmental Sustainability Team (EST): An internal team comprised of cross-divisional leadership and staff created to streamline sustainability initiatives across the City.

Embodied Carbon: The greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, transportation, installation, maintenance, and disposal of building materials. Embodied carbon constitutes a significant percentage of global emissions.

Greenhouse Gas: Gases which trap heat in the atmosphere.

Greenhouse Gas Inventory: A calculated list of emissions sources quantified using standardized methods such as emissions factors and energy use.

Hydrochlorofluorocarbons (HCFCs): Compounds containing carbon, hydrogen, chlorine, and fluorine molecules. Uses include refrigeration, air conditioning, foam blowing, solvents, aerosols, and fire suppression.

Hydrofluorocarbons (HFCs): Man-made organic compounds that contain fluorine and hydrogen atoms. Uses include refrigeration, air-conditioning, insulating foams and aerosol propellants. HFCs are currently banned in Canada due to their global warming potential.

Land use change: A process by which human activities transform the natural landscape. Land use-planning is a process integrated to regulate this process in a municipality.

Methane (CH₄): A colourless, odorless flammable gas. It is produced during the production and transport of coal, natural gas, and oil, from livestock and agricultural practices, and from the decay of organic waste in municipal solid waste landfills. Methane is a key component of natural gas used to

generate electricity for domestic heating and cooking. It has 20-80 times more potential to trapped heat in the atmosphere than carbon dioxide.

Mitigation: Reducing the amount of greenhouse gases in the atmosphere. This can be either through reducing the amount of gasses emitted, or increase the amount sequestered.

Net-Zero: When the amount of greenhouse gases going into the atmosphere are balanced by the amount of greenhouse gases being removed from the atmosphere.

Nitrous Oxide (N₂O): Also known as “laughing gas”, it is a colourless gas with a sweetish odor. It is emitted during agricultural, land use, and industrial activities, combustion of fossil fuels and solid waste, and during the treatment of wastewater. Nitrous oxide is the third most impactful greenhouse gas.

Sustainability Advisory Committee (SAC): A public advisory committee of Council composed of residents who work, live, or study within the City of Waterloo. The committee provides advice to Council on matters pertaining to sustainability.

Scope 1 Emissions: Direct greenhouse gas emissions from sources that are owned or controlled by the corporation. Examples include combustion processes from boilers in buildings and facilities, vehicles, and furnaces.

Scope 2 Emissions: Indirect emissions from the generation of purchased electricity consumed by the corporation. An example would include power utilized by the City, for instance interior lighting for an office space, from an offsite production facility.

Scope 3 Emissions: Indirect emissions which are consequences of the activity of the corporation, but which are not from sources directly owned or controlled by the City. Examples include purchased goods and services, business travel, and employee commuting.

Strategic Initiatives Division: A division of the City of Waterloo within the Department of the Office of the CAO. This division houses the coordination of the Sustainability and Climate Change portfolio for the corporation and community of the City of Waterloo.

Supply chain materials: All the raw materials and parts that are made into a product and distributed up the chain for manufacture and sale. For example, before a chair can be made wood and the metal for screws must be harvested and mined.

Upstream transportation: All the transportation activities (and associated emissions) that provide a company with the goods or services that it has paid for. For example, when pens are shipped to the City that transportation creates emissions.