



Climate Leadership Plan Summary Report

November 2021





Land acknowledgement

The City of Kingston is on the traditional homeland of the Anishinaabe, Haudenosaunee and the Huron-Wendat, and thanks these nations for their care and stewardship over this shared land. Today, the City is committed to working with Indigenous peoples and all residents to pursue a united path of reconciliation.

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Key Terms

Adaptation: Adjusting to actual and expected future climate by taking measures that reduce climate-related risks and vulnerabilities to people, infrastructure, economy, and natural systems.

C40 Cities Climate Action Planning Framework: The Climate Action Planning Framework was developed in 2018 to support cities in developing climate action plans that are aligned with the objectives of the Paris Agreement. It provides a flexible and iterative framework that can be followed to ensure collaborative, inclusive and transformational strategies to reduce emissions and build resilience.

Carbon Neutrality: The outcome of a person, organization, business, or community avoiding or offsetting as many greenhouse gas emissions from the environment as it produces.

Climate Change: Change in the mean or variability of the earth's climate over time.

Greenhouse gas emissions (GHG): Any of the various gaseous compounds (such as carbon dioxide or methane) that absorb infrared radiation, trap heat in the atmosphere, and contribute to the greenhouse effect.

Mitigation: Reducing and avoiding emissions of greenhouse gases into the atmosphere to limit the magnitude of future climate impacts.

Net Zero Energy: The outcome of a highly energy efficient building that generates as much energy as it uses or procures to meet or exceed the annual energy consumption of its operations.

Net Zero Carbon: Minimizing carbon-based energy consumption through building design strategies and on-site renewable energy generation.

Quick Facts sections are presented throughout the Climate Leadership Plan. The metrics in the Quick Facts sections are explained below.

Annual community emissions reduction by 2040: This value represents the community emission reduction in 2040 compared to the 2011 baseline, resulting from implementing the new actions in the CLP. Additional reductions will also come from existing programs and ongoing improvements in equipment and vehicle efficiency.

Annual Emission Reduction Per Person: Summarizes the Annual Emissions Reduction (above) as of 2040 based on Kingston's future population, including projected annual population growth of 0.5 per cent.

Annual Energy Cost Savings: Outlines the community-wide energy cost change as of 2040 (in 2018 dollars) based on new actions in the Climate Leadership Plan. In 2018, Kingston's annual energy expenditure was more than \$500 million per year across the community. Under the 2040 Carbon Reduction pathway, the annual energy expenditure is projected to be only \$319 million (in 2018 dollars).

Number of Jobs: Represents the number of additional job creation by 2040 due to new building-related investments in retrofits, local renewable energy generation, and increased production of local food.

(See Mitigation Technical Appendix for job growth broken down by objective).

Kingston's climate is changing. We are seeing and feeling the impact of centuries of global fossil fuel emissions and other atmospheric pollutants from industrialization and urbanization. Heat waves, flooding, forest fires and smoky skies have become more common and costly across Canada, in Ontario, and here at home. These events threaten our health, economy, ecosystems, and infrastructure. Over the next 10 years, our ability to adapt, prepare, and shift away from fossil fuel use and towards a low carbon future will determine our climate reality for decades to come.

The City of Kingston recognizes the urgency of the climate crisis and was the first Ontario city to declare a climate emergency in 2019. Since then, we have increased the number of buildings, vehicles and equipment powered by low carbon renewable energy, and are fostering local renewable energy sources. We are expanding home energy efficiency programs for residents and making neighbourhoods more connected and sustainable. As cities and countries around the world introduce stronger emissions reduction regulations, and investments into low carbon technologies continue to grow, we are better positioned than ever to transition to a low carbon society.

Today, the City of Kingston is taking the next step in climate leadership through this renewed strategy to reduce emissions across all sectors and become carbon neutral by 2040. This Climate Leadership Plan (CLP) builds on Kingston's last decade of climate action and identifies bigger, bolder measures to achieve carbon neutrality while fostering a resilient, healthy community for the long term.

Purpose of the Climate Leadership Plan

The Climate Leadership Plan provides a roadmap for the City and community to reduce greenhouse gas emissions and reach carbon neutrality by 2040. The Plan includes 10 objectives and 54 actions. The CLP builds upon and renews the vision established in 2014 Climate Action Plan:

- Kingston is an innovative carbon neutral city that continues to work collaboratively with community partners to achieve climate leadership.
- Kingston is a healthy and resilient community and is able to mitigate the risks and benefit from the opportunities presented by a changing climate.
- Kingston has a thriving low-carbon economy.

Community-wide action is vital to achieve a carbon neutral Kingston. Not only does the City need to reduce emissions across all operations and assets, but as a community we must also work to lower emissions from businesses, manufacturing and commercial processes, schools, hospitals, residents, food transport and other sources. To achieve this, the CLP includes a mix of City-led actions and collaborative actions that need to be completed in partnership with community organizations and local partners.

What we heard

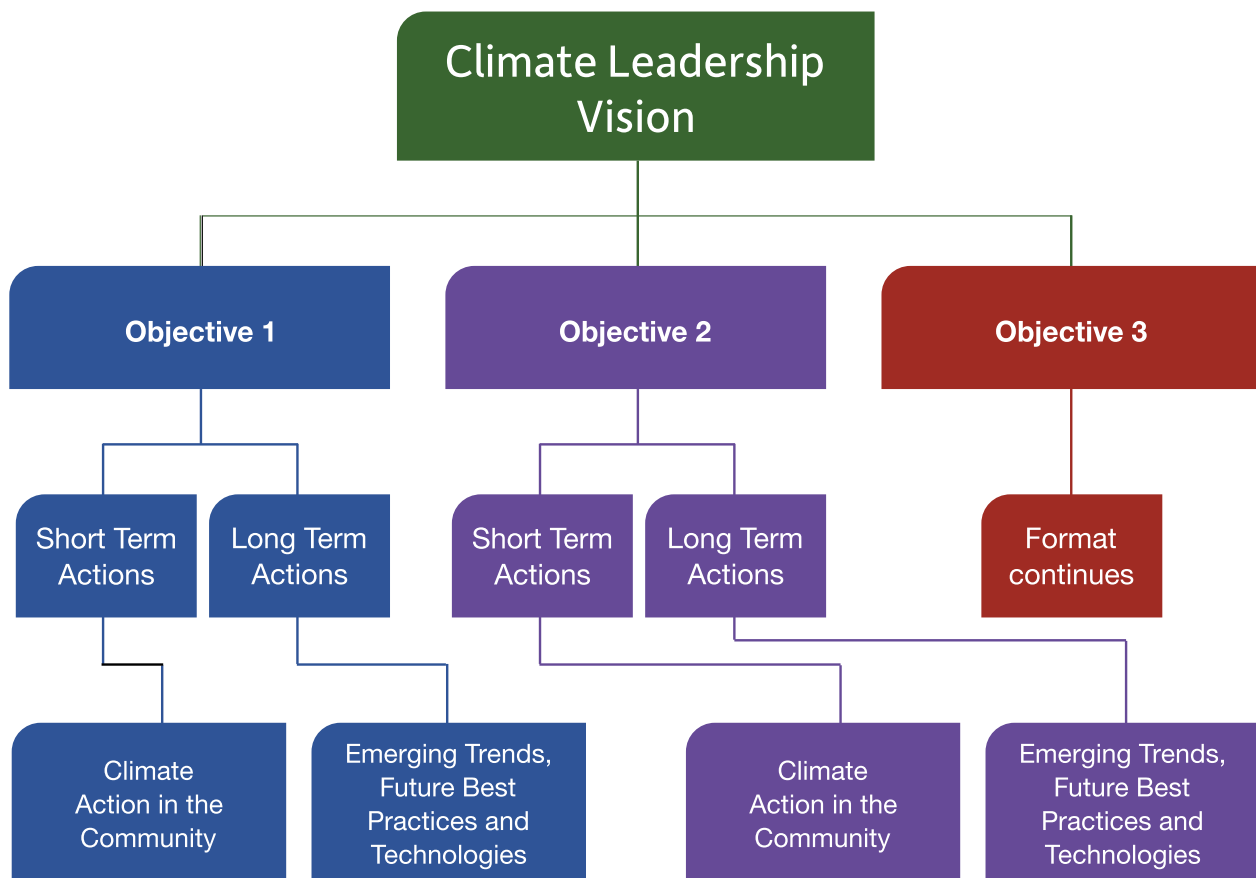
More than 75 per cent of survey respondents are interested in reducing emissions.

What's in the Climate Leadership Plan

The Climate Leadership Plan focusses on the 2022 to 2040 time period, with the ultimate goal of carbon neutrality across the whole community by 2040. Interim targets provide measurable goals for 2022, 2030 and 2040.

Ten overarching objectives guide the contents of the Climate Leadership Plan. Within each objective, actions have been divided into short term (next five years) and long term (next 6-19 years) depending on the scale of

the action, feasible timing, and the urgency of implementation. Each objective also includes a section on emerging trends, which are not formal actions but represent potential future opportunities for emissions reduction in Kingston. Community organizations who are showing climate leadership are profiled under each objective.



Plan Development

Building on the work already completed by the City, this Climate Leadership Plan is an integrated corporate and community climate change strategy and responds to Council's Strategic Priority to demonstrate leadership on climate action. The CLP assesses the likely impact of ongoing initiatives, and outlines objectives and actions to chart a path to achieve the City's target of carbon neutrality by 2040. The CLP was developed consistent with the C40 Cities Climate Action Planning Framework and the Natural Step Framework, an iterative framework commonly used by municipalities around the world to guide climate action plans.

Understand (Winter 2020):

Identify current emissions sources, existing plans and programs, and climate and extreme weather impacts in Kingston.

Assess (Spring 2020):

Evaluate potential emissions reduction approaches with input from community stakeholders, and climate-related risks and vulnerabilities.

Prioritize and refine (Summer-Fall 2020):

Work with City and community stakeholders on a list of actionable, impactful emissions reduction measures.

Plan (Winter- Fall 2021):

Document GHG reduction objectives, actions, and implementation schedule. Highlight top climate risks and next steps for resilience.

Implement (2021-2040):

Implementation tables identify roles and timelines for City actions. Adaptation Framework also created to support community assessment of climate risks.



Engagement: A Collaborative, Community Driven Process

More than 950 community members helped shape the Climate Leadership Plan. Engagement on the CLP took place between Spring 2020 and Fall 2021, and followed the City's [Framework for Public Engagement and COVID-19 protocols](#). Local experts and the community were engaged in many ways:

+800 residents and local businesses participated in surveys on climate risks, emission reduction priorities, and to provide feedback on the draft Plan. Residents had the option to complete the survey online, by mail and phone.

~60 City staff and local stakeholders were engaged through the Mitigation Technical Team, Adaptation Technical Team, and Community Advisory Group

+8 workshops with City staff, local technical experts and community stakeholders

20+ virtual coffee conversations with local businesses, the agricultural community and community leaders

+66 participants registered or attended the virtual Public Open House, with 50 views (and counting) of the recording on YouTube.



Current Context: Kingston's Changing Climate

Many of the actions in the Climate Leadership Plan are focused on helping Kingston limit greenhouse gas emissions to reduce the effects of climate change in the future. However, Kingston's climate is already changing, and it is imperative to adapt and prepare for climate impacts that are affecting the community today.

Some of the recent climate-related events that have impacted Kingston include:

- In 2016, Kingston experienced the driest summer on record since the 1880s.
- The summers of 2020, and 2021, Kingston experienced prolonged periods of high temperatures in the 30°C range, with cooling demands made more complex due to COVID-19.
- In October 2019, 52.4mm of rain fell over a 24-hour period, causing flooding and road washouts. The return period for this intensity of rainfall was historically one in five years. In the future, a comparable rain event can be expected more than once a year.
- In the spring of 2017 and 2019, above-average precipitation in the Lake Ontario-St. Lawrence basin contributed to record breaking inflows into Lake Ontario. Rain events like these are projected to become over three times more likely in the future.

What we heard

Sixty-two per cent of survey respondents said higher temperatures and extreme heat were priority climate hazards.

More than half (56 per cent) indicated that they had experienced or observed road washouts and flooding of parks, trails, and recreational areas. Nearly half of respondents (49 per cent) indicated that they had experienced or observed basement flooding.

Kingston's Changing Climate

- The historical average annual temperature is around 7°C. It is expected to increase by up to 4°C (to nearly 12°C) by the 2050s.
- Annual precipitation could increase by up to 10 per cent from the historical average. Precipitation is increasing in all seasons except summer.
- The number of hot days per year (over 30°C) may increase from six to 48 by the 2050s.
- The number of days with heavy rainfall (more than 20mm of rain) could increase by up to 25 per cent. Rainfall is also expected to get more intense, with more millimetres of rain falling during a typical rainy day and during storm events.

As part of the Climate Leadership Plan process, a vulnerability and risk assessment was completed to identify the priority climate impacts to City assets, services and the community. Prioritized climate impacts included:

Higher temperatures and increasing precipitation:

- Increased damage and shortened lifecycle of built and natural assets
- Increase in invasive species and pests causing damage and stress on natural areas
- Increase in vector-borne disease cases (such as Lyme disease)
- Reduced lifecycle of buildings and transportation assets from premature degradation related to the impact from weathering

Warmer temperatures can also generate opportunities in Kingston. However, opportunities must be approached with climate and environmental considerations in mind, as not to counter-act the objectives of the Climate Leadership Plan. Examples of opportunities include:

- Longer construction season.
- Longer summer recreation and tourism season.
- Decreased energy demand for energy for heating in winter months, supporting emissions reduction and energy cost savings.

Extreme heat and dry conditions in summer:

- Higher demand for cooling centres, greenspace, and outdoor recreation (especially waterfront activities)
- Increase in heat-related health risks, especially for vulnerable groups such as elderly, youth, and low-income individuals

- Increase in temperature and water-related stress on parks, trees, gardens, and vegetation
- Water supply issues for those who rely on well water for residential, business, or agricultural use
- Power outages due to grid overload during heat waves

Higher temperatures and changing freeze-thaw cycles in winter:

- Power outages caused by more occurrences of freezing rain, winter precipitation or freeze-thaw cycles
- Infrastructure damage due to freeze-thaw cycles and rapid winter temperature changes
- Rapid snow melt causing greater demand on drainage systems and risk of winter flooding

More frequent and intense precipitation and flooding:

- Increase in frequency and magnitude of combined sewer overflows
- Increase in road and culvert washouts, particularly in older areas of the City and in the downtown core
- Increased runoff and risk of water contamination caused by flooding
- High water levels leading to flooding and damage or closure of waterfront areas

More frequent and intense severe weather events:

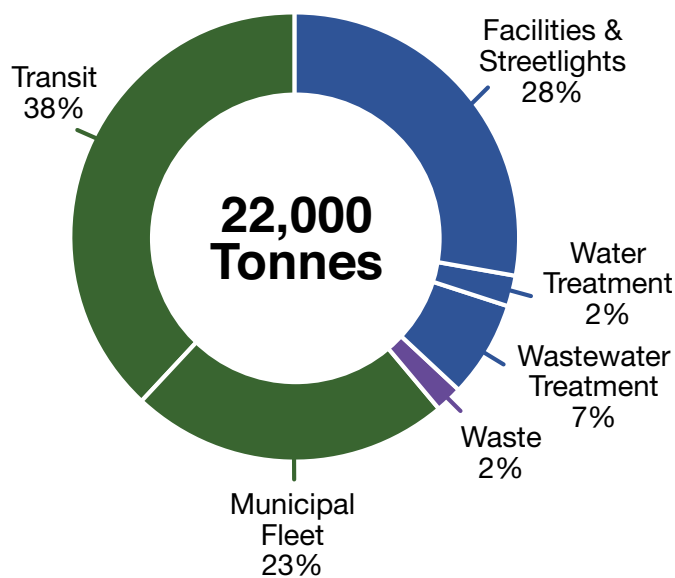
- Greater risk of power outages
- Higher demand on emergency response and community support services
- Damage to infrastructure and property due to severe weather (e.g. wind, storm activity) and flooding
- Increase in damage and/or disruption to business continuity, offices, industrial and commercial processes

Current Context: City and Community Emissions

Corporate Emissions Reduction Targets

The City of Kingston measures corporate greenhouse gas (GHG) emissions on an annual basis. In 2018, corporate emissions from City operations totaled just over 22,000 tonnes, a decrease of 12 per cent since 2011. The three largest municipal emissions sources are transit, facilities, and other fleet vehicles.

Figure 1: The City of Kingston’s Corporate Emissions by Sector as of 2018.



- Transportation
- Buildings
- Trash

The City’s 2019-2022 Strategic Plan targets a 15 per cent reduction in emissions from municipal operations by 2022 compared to 2018 levels, and carbon neutrality no later than 2040.

City targets:

- 15% by 2022
- 30% by 2030
- 100% by 2040

The purchase of electric transit and fleet vehicles will lead to a seven per cent reduction in emissions by 2022. Retrofits of City buildings are a priority and are expected to contribute a further two to three per cent reduction. Near- and net zero energy new builds have also been constructed, and all new construction or major renovations will aim for Net Zero Energy where feasible. Once emissions reductions actions are implemented by the City, municipal buildings and vehicles will still require energy to provide services to the community. Purchasing clean energy or carbon offsets may be needed for the City to achieve carbon neutrality by 2040.

New Low Carbon Facilities in Kingston

The City of Kingston has completed the construction of the new Kingston Fire & Rescue Maintenance Garage. The mechanical heating, cooling and ventilation systems are fully electric, eliminating significant GHG emissions. The building envelope is well insulated in the walls and ceilings, LED lighting is used throughout the facility, and advanced controls ensure a safe environment, while maximizing energy efficiency. A large ground mounted solar system will be installed as the final phase of the project. With this final addition, 100 per cent of the building’s energy requirements will be generated on-site, making the new garage the City’s first Net-Zero Energy facility.

Figure 2: Kingston Fire & Rescue Maintenance Garage



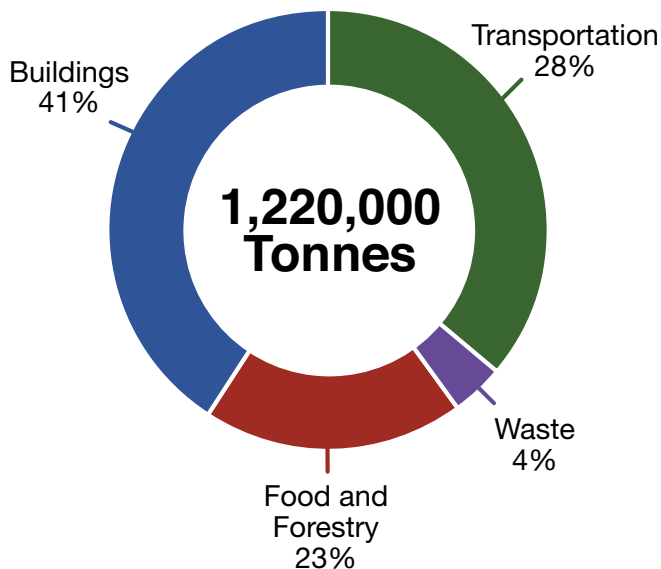
Community Emissions Reduction Targets

The City's corporate emissions represent less than two per cent of Kingston's overall community emissions, highlighting the importance of collaboration with residents, businesses, and industry.

The community inventory, which includes data from 2018, reports 1.21 million tonnes of carbon emissions over four sectors (see chart below).

Community emissions in 2018 were six per cent lower than in 2011. This reduction is primarily the result of a significant decrease in the emissions associated with Ontario's decision to phase out coal generated electricity. This action at the provincial level reduced building sector emissions in Kingston by 16 per cent. Conversely, population growth has led to a nine per cent increase in emissions, due mainly to food transportation.

Figure 3: The City of Kingston's Community Emissions by Sector as of 2018

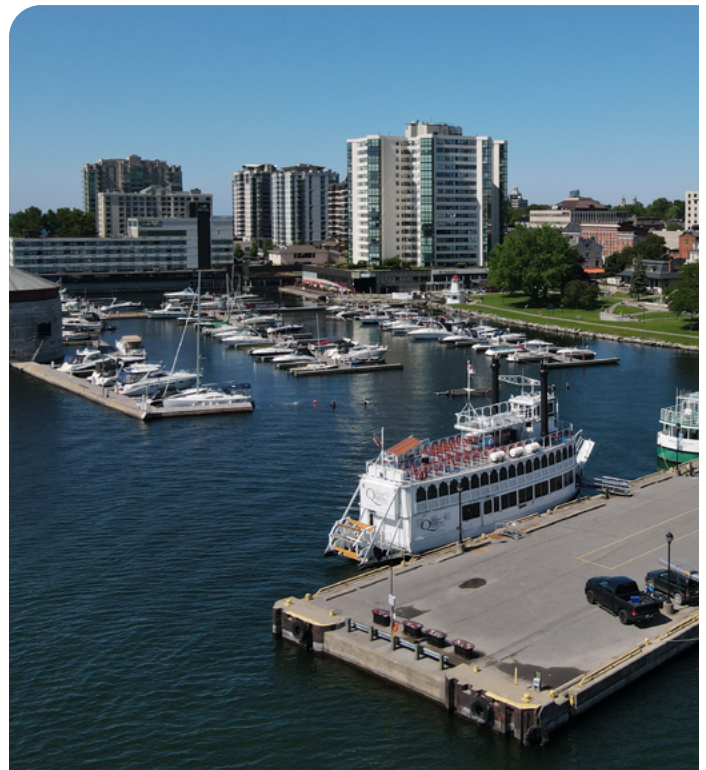


Through the Climate Leadership Plan, the City of Kingston aspires to extend its goal of carbon neutrality across the community by 2040. Short-, medium- and long-term targets were developed based on the targets set by Council in the 2019-2022 Strategic Plan.

- 15% by 2022
- 30% by 2030
- Carbon Neutral by 2040

Quick Facts – By implementing the Climate Leadership Plan:

- 574,000 tonnes annual community emissions reduction by 2040
- 4,400 kg annual Emission Reduction Per Person
- \$197,000,000 annual Community Energy Cost Savings
- 4,000 jobs created from the actions in this Plan



Kingston's Pathway to Carbon Neutral

Implementing the CLP's objectives can reduce community emissions by 65 per cent by 2040 compared to 2011 levels. This would put Kingston on track to meet its 30 per cent reduction target by 2030, with reductions of 45 per cent anticipated by 2035 and 65 per cent by 2040. Buildings and transportation are the largest sources of emissions and will account for the majority of emissions reductions across the community. Other significant opportunities to reduce Kingston's emissions include the widespread adoption of electric vehicles, energy retrofits of existing buildings, and switching fossil fuel-based industrial processes to low carbon energy sources. Support for local food systems and land-use policies that place residents along transit routes and within walking or cycling distance of their daily needs are also fundamental to community success.

Remaining Emissions

The modeling completed for the Climate Leadership Plan shows that even the drastic transformation of Kingston's buildings, transportation and food systems cannot fully balance energy demand (and related emissions) with local renewable generation. Climate plans issued by all levels of government recognize the role of external and future-focused solutions, including purchasing renewable energy produced outside of Kingston, carbon offsets, and exploring emerging carbon sequestration technologies. Periodic updates to the Climate Leadership Plan will help identify additional opportunities to reduce emissions as innovative technology advances and collaborative community action evolves over time.



Objectives and Actions

The Climate Leadership Plan consists of nine emissions reduction objectives across four sectors, and one objective focused on adaptation and resilience. Each objective includes short term and long-term actions. The detailed descriptions for each action can be found in the full Climate Leadership Plan report.

Buildings and Energy Production

1. Accelerate local production of renewable and low carbon energy and energy storage.

Short term actions (Implementation within the next 1-5 years)

- 1.1. Seek out new partnerships to inform the community of available sustainable energy resources and financing options, while continuing to work in collaboration with groups like Sustainable Kingston.
- 1.2. Advocate for provincial support and policy for virtual and community-level net metering arrangements.
- 1.3. Install photovoltaics on all new municipal buildings where feasible and explore options for solar photovoltaics during roof replacements or other major renovations of municipal facilities.
- 1.4. Develop partnerships to accelerate local academic and commercial cleantech research into renewable and low-carbon energy and storage technologies.

Quick Facts – By implementing the actions in Objective 1:

- 36,000 tonnes annual community emissions reduction by 2040

Long term actions (Implementation within the next 6-20 years)

- 1.5. Explore opportunities for new community-owned renewable energy projects and organizations, including solar energy co-operatives.
- 1.6. Monitor changes to the Independent Electricity System Operator (IESO) demand response and capacity auctions, which provide opportunities to contribute to dynamic grid management in support of distributed energy generation.

2. Support Kingston residents to invest in low carbon retrofits for their homes.

Short term actions (Implementation within the next 1-5 years)

- 2.1. Once available, promote the Kingston Home Energy Retrofit Program (KHERP) that will provide low-interest financing and incentives, energy audits and other decision-support tools to owners of one-family homes.
- 2.2. Work with local utilities to develop financing and rental programs for low carbon home heating and cooling equipment.
- 2.3. Partner with St. Lawrence College and other education providers to encourage continued integration of advanced energy efficiency curriculum into skilled trades programs.
- 2.4. Advocate that Ontario enact legislation that requires home energy performance and energy costs to be disclosed at the time of sale.

Long term actions (Implementation within the next 6-20 years)

- 2.5. Assess the feasibility of extending the Kingston Home Energy Retrofit Program to multi-unit residential buildings (MURBs), institutionally-owned residential dwellings and affordable housing units.

Quick Facts – By implementing the actions in Objective 2:

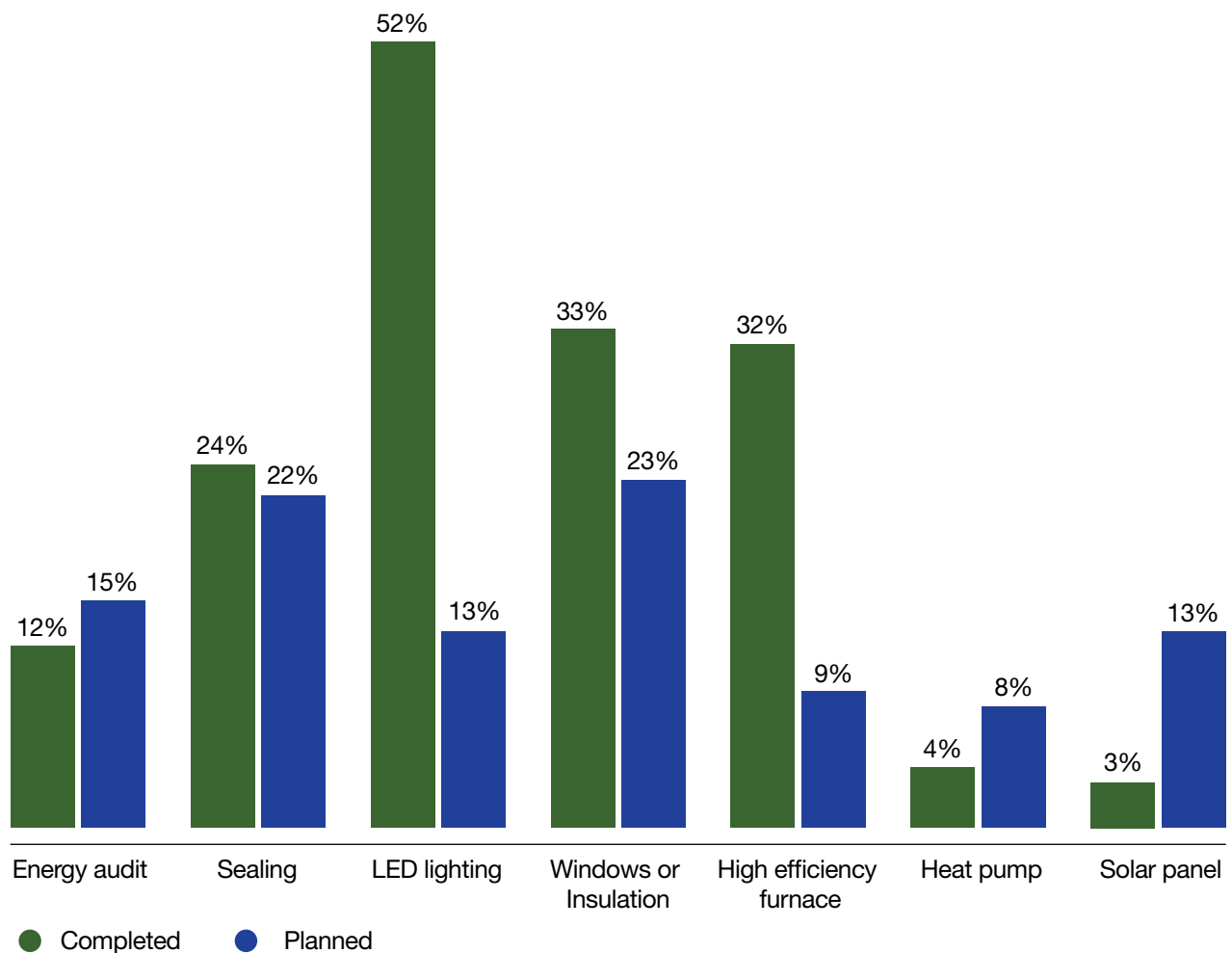
- 57,000 tonnes annual community emissions reduction by 2040

What we heard

Almost all of residents who responded to the City's Climate Leadership Plan Mitigation Survey indicated they had already or planned to complete small-scale energy efficiency projects at home, such as installing LED lighting, upgrading to more efficient furnaces, or replacing windows and/or insulation. Low carbon energy and fuel switching retrofits, such as installing solar panels and heat pumps, were less common. According to the survey, the biggest barriers residents face for home retrofits are cost and lack of incentives.

The City plans to launch a program to help residents retrofit their homes to reduce GHG emissions associated with household energy use and which may also lead to savings on home energy costs.

Figure 4 (below): City survey results showing which home retrofits respondents have planned or completed for their homes.



3. Partner with Kingston businesses to retrofit and fuel-switch existing commercial buildings.

Short term actions (Implementation within the next 1-5 years)

- 3.1. Deliver an education program that informs commercial building owners of the costs and benefits of fuel switching, deep carbon retrofits, building commissioning and available incentives and financing options. Develop and foster partnerships to promote and pilot new fuel switching programs within Kingston, including Enbridge's geothermal retrofit program and upcoming programs from Hydro One.
- 3.2. Promote local training programs that develop qualified energy professionals who can deliver audits and feasibility studies to businesses in Kingston.
- 3.3. Advocate that Ontario be an early adopter of a national retrofit building code, once available.

Long term actions (Implementation within the next 6-20 years)

- 3.4. Streamline permitting and approvals, including adapting permitting fees for renovations that target significant emissions reductions. Also explore options for a rental licensing program to incentivize energy efficiency in targeted sectors.
- 3.5. Encourage partnerships to offer coordination services for deep carbon retrofits to help building owners select qualified designers and contractors and verify post-construction performance.

Quick Facts – By implementing the actions in Objective 3:

- 31,000 tonnes annual community emissions reduction by 2040

4. Demonstrate leadership by making all municipal facilities Net Zero Energy by 2040, where feasible, and work with all levels of government to reduce emissions from other publicly owned buildings.

Short term actions (Implementation within the next 1-5 years)

- 4.1. Retrofit City facilities to reduce emissions 15% by 2026 from 2018 levels, and develop the Net Zero Energy 2040 strategy to be incorporated with the Energy and Asset Management Plan (EAMP) strategy.
- 4.2. Incorporate innovative approaches to guide retrofit initiatives at heritage buildings wherever feasible.
- 4.3. Advocate that Ontario adopt emissions targets for provincial buildings and invest in retrofits to reduce emissions from K-12 schools and healthcare facilities.
- 4.4. Engage with the federal government to develop a data-sharing plan for clean electricity purchases on behalf of Kingston's federally-owned facilities.

Long term actions (Implementation within the next 6-20 years)

- 4.5. Implement the Facilities Net Zero Energy 2040 Plan to achieve Net Zero Energy in all municipal facilities by 2040.
- 4.6. Explore opportunities to support the development of a zero carbon district heating system serving the Queen's University campus and the Kingston Health Sciences Centre.
- 4.7. Work with federal partners as they implement emissions reductions projects at federally-owned buildings within Kingston.

Quick Facts – By implementing the actions in Objective 4:

- 73,000 tonnes annual community emissions reduction by 2040

5. Advance the adoption of net zero ready new construction ahead of the release of requirements expected in national building and energy codes in 2030.

Short term actions (Implementation within the next 1-5 years)

- 5.1. Promote the City's existing Green Standard Community Improvement Plan, which incentivizes low carbon new buildings, the Savings by Design and Commercial Custom New Construction programs both offered by Enbridge Gas, as well as third party distributed generation systems. Include these incentives in an education campaign for developers highlighting the business case for low carbon new construction of offices, condominiums and one-family homes.
- 5.2. Train the City's building inspectors in emerging construction techniques for highly energy efficient buildings.
- 5.3. Enhance design policies for mid-rise and tall buildings to improve building efficiency, promote multimodal lifestyles not dependent on personal automobiles, and increase overall livability.

Long term actions (Implementation within the next 6-20 years)

- 5.4. Advocate that Ontario be an early adopter of national net zero ready new construction building and energy codes as they are developed.
- 5.5. Work with planners and developers to explore the feasibility of low carbon infill development.
- 5.6. Integrate embodied carbon assessments into local new construction incentive programs to encourage understanding of life cycle carbon impacts from materials selection.

Quick Facts – By implementing the actions in Objective 5:

- 1,000 tonnes annual community emissions reduction by 2040.

What we heard

In a recent public engagement, residents and local businesses told that the best way to support efforts to reduce GHG emissions, include:

- Increasing access to financial incentive programs, such as low interest loans for energy efficient retrofits of existing homes
- Supporting group purchasing of locally produced clean energy

These priorities are included as short-term actions in the Climate Leadership Plan.



Waste

6. Produce renewable natural gas locally from waste sources and encourage adoption of other low carbon fuels.

Short term actions (Implementation within the next 1-5 years)

- 6.1. Develop infrastructure to locally produce renewable natural gas (RNG) as outlined in the City's Biogas Master Plan. Identify a local partner interested in purchasing RNG to retain environmental benefits within Kingston.
- 6.2. Increase diversion of organic waste through expansion of the City's Green Bin program.
- 6.3. Continue to procure biodiesel for the City's transit bus fleet during its transition to low carbon transit vehicles and explore feasibility of increasing to B50 or B100 in the interim.
- 6.4. Advocate for provincial regulations that enable tracking of industrial, commercial and institutional waste at the municipal boundary level.

Long term actions (Implementation within the next 6-20 years)

- 6.5. Encourage the industrial sector to accelerate its switch to renewable energy for process loads through purchase of renewable natural gas or use of green hydrogen.

Quick Facts – By implementing the actions in Objective 6:

- 145,000 tonnes annual community emissions reduction by 2040



What is Renewable Natural Gas?

Industrial processes make up a large share of Kingston's emissions. Renewable natural gas – or biogas – is a renewable energy source produced from the decomposition of organic matter. It can be substituted for conventional natural gas and distributed through existing pipelines. Utilities Kingston's new Biogas Master Plan identifies potential sites to produce renewable natural gas from both wastewater and source separated organics collected through the Green Bin program. Increasing the amount of food waste gathered through the Green Bin program will help curb emissions and could also contribute to local production of renewable natural gas. Agricultural waste, commercial food waste and municipal organic waste from surrounding communities could further bolster production and position Kingston as a local leader for renewable energy. By using renewable natural gas, the City and community organizations can reduce emissions and contribute to the development of a local clean fuel economy.

Did you know?

In 2018, INVISTA began implementation of a sewer water discharge management partnership with the City of Kingston and Utilities Kingston that reduced emissions by more than 4,000 tonnes.

Transportation

7. Develop active transportation connections and foster transit-oriented development to encourage a shift to sustainable modes and a reduced reliance on personal vehicle use.

Short term actions (Implementation within the next 1-5 years)

- 7.1. Continue to implement the Active Transportation Master Plan (ATMP), creating an integrated city-wide active transportation network, neighbourhood-level connections, and programming and policy initiatives that foster a culture of active transportation.
- 7.2. Develop Official Plan policies and bylaws that focus new residential growth in dense, walkable locations that are well connected to transit. Reduce parking requirements for new residential and non-residential development along transit corridors and nodes, and promote car-sharing infrastructure that utilizes electric vehicle charging stations.
- 7.3. Implementing the 5-year transit planning cycle, continue to increase transit ridership through discounted transit passes, addition of express routes, reviewing 'gaps' in the transit system, and other system improvements.
- 7.4. Promote the success of the City's remote work (telework) policy and encourage other organizations to maintain remote learning and working opportunities developed during the COVID-19 pandemic.

Long term actions (Implementation within the next 6-20 years)

- 7.5. Promote 15-minute city concepts that allows appropriately located and denser residential and commercial development within existing built up areas.

- 7.6. Encourage micro-mobility sharing solutions (i.e. small, speed-limited vehicles such as e-bikes and e-scooters.) aimed at facilitating a shift away from single-occupancy automobile trips.
- 7.7. Develop partnerships to extend opportunities to work and learn from home to rural residents. Advocate for investment in Kingston from the federal government's Universal Broadband Fund, which promises to connect all Canadians to high-speed internet by 2030.

Quick Facts – By implementing the actions in Objective 7 and 8 (combined):

- 220,000 tonnes annual community emissions reduction by 2040

What we heard

According to a City survey, 64 per cent of respondents would like to increase their walking and cycling (active transportation) to reduce GHG emissions.

In addition, 58 per cent of respondents indicated that if they were to purchase a personal vehicle they would be interested in an electric vehicle (EV). Thirteen per cent of respondents identified cost as a barrier to purchasing an EV.

Did you know?

In 2021, the City of Kingston added two electric buses, seven light duty EVs and three electric ice resurfacing machines to its fleet. By 2040, 100% of Kingston's bus fleet will be electric.



8. Transition to electric- and renewably-powered personal, municipal, and commercial motorized vehicles.

Short term actions (Implementation within the next 1-5 years)

- 8.1. Monitor charging demand and expand the City's existing network of electric vehicle charging stations. Explore partnerships for sharing of charging infrastructure for large local commercial fleets.
- 8.2. Work with Utilities Kingston and Hydro One to develop a leasing program for charging infrastructure for commercial vehicle fleets. Include low-interest loans for purchase of home smart chargers through the Kingston Home Energy Retrofit Program.
- 8.3. Encourage local car dealerships to offer electric vehicles to test drive and ensure that repair services are widely available. Hold annual or semi-annual community EV test drive days.
- 8.4. Work with the Taxi Commission to develop minimum EV requirements for taxi and ride-share fleets.
- 8.5. Explore and encourage a comprehensive car-sharing program in Kingston.

Long term actions (Implementation within the next 6-20 years)

- 8.6. Update the City's Electric Vehicle Strategy to include new municipal policies to encourage adoption of electric vehicles.
- 8.7. Prioritize electrification of the City's bus fleet and Solid Waste Collection fleet, aiming for complete transition by 2040.
- 8.8. As commercial electric vehicles become more widely available, explore group procurement for multiple commercial partners.
- 8.9. Advocate that Ontario ban the sale of gas-powered cars by no later than 2035.

Emerging Trends, Technologies and Future Best Practices

Countries around the world are taking bold measures to reduce emissions from fossil fuel vehicles. Norway aims to become the world's first country to end the sale of cars with internal combustion engines, setting a 2025 deadline. Britain will ban the sale of new cars and vans that use fossil fuels starting in 2030, five years earlier than previously planned. Canada recently announced it will ban the sale of fuel-burning new cars and light-duty trucks as of 2035. Provincially, Quebec will limit sales of fossil fuel vehicles starting in 2035, and British Columbia has introduced a phased approach through its Zero-Emission Vehicles Act (ZEVA) that requires dealerships to sell or lease an increasing percentage of electric vehicles before a ban comes into effect in 2035.



Food and Forestry

9. Improve the vibrancy of the local food system to help reduce dependence on high carbon imported food.

Short term actions (Implementation within the next 1-5 years)

- 9.1. Develop a local food strategy and education program in line with the City's Culinary Strategy, including support for farm-to-table initiatives and food recovery programs. Develop municipal guidelines for farmers markets, community gardens, apiaries, and edible forests.
- 9.2. Further reduce emissions from transportation of food by encouraging the development of a local electric delivery van sharing program.
- 9.3. Engage with farmers markets, agricultural producers and restaurants to track local food purchases. Create and update estimates for the embodied carbon footprint of common retail food products based on their sources.

Long term actions (Implementation within the next 6-20 years)

- 9.4. Engage with hospitals and other major institutions, including providing food services to set targets for local food and food recovery.

Quick Facts – By implementing the actions in Objective 9:

- 11,000 tonnes annual community emissions reduction by 2040:
- \$18 million annual economy activity and local food sales

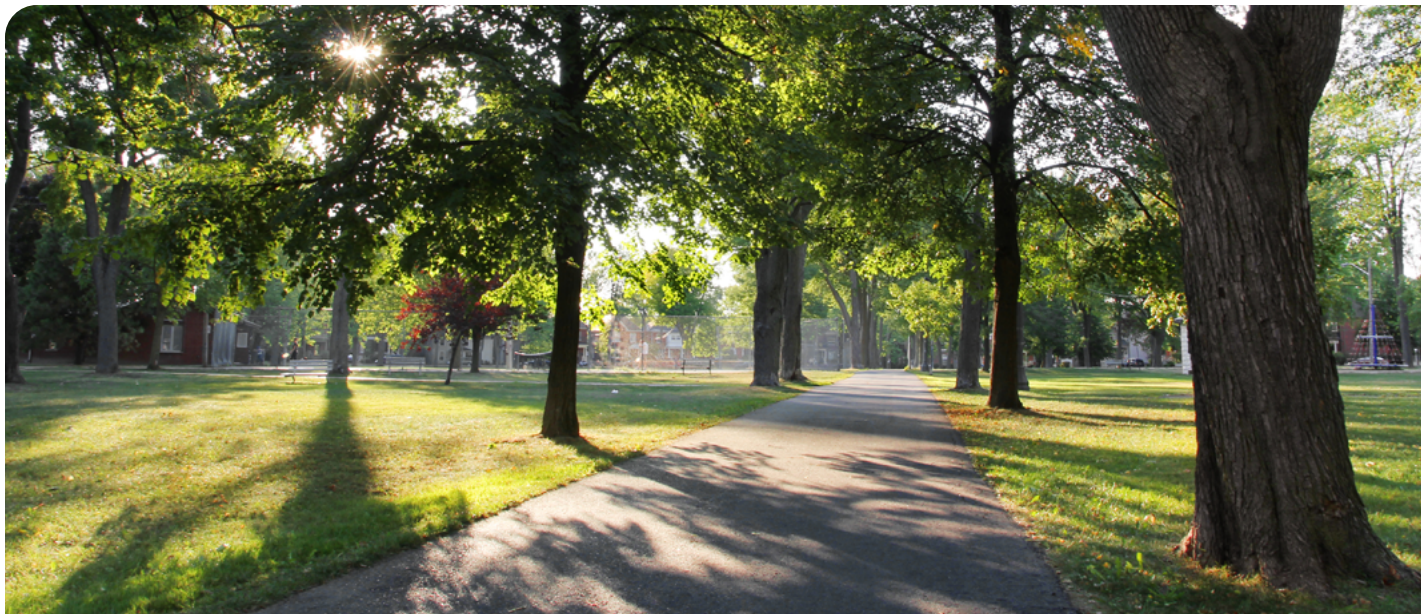
What we heard

According to a City survey, three quarters of respondents are interested in purchasing local food. The most common barriers to purchasing locally grown food were cost (34 per cent) and variety (29 per cent).

“In this changing world, we should become more dependent on local food systems, but these are the same systems that are more impacted by extreme heat and climate change.” Survey Respondent.

Did you know?

In 2019, the City planted 1,500 new trees with a further commitment to increase the tree canopy by a total of 7,850 trees by 2022.



Climate Change Adaptation & Resilience

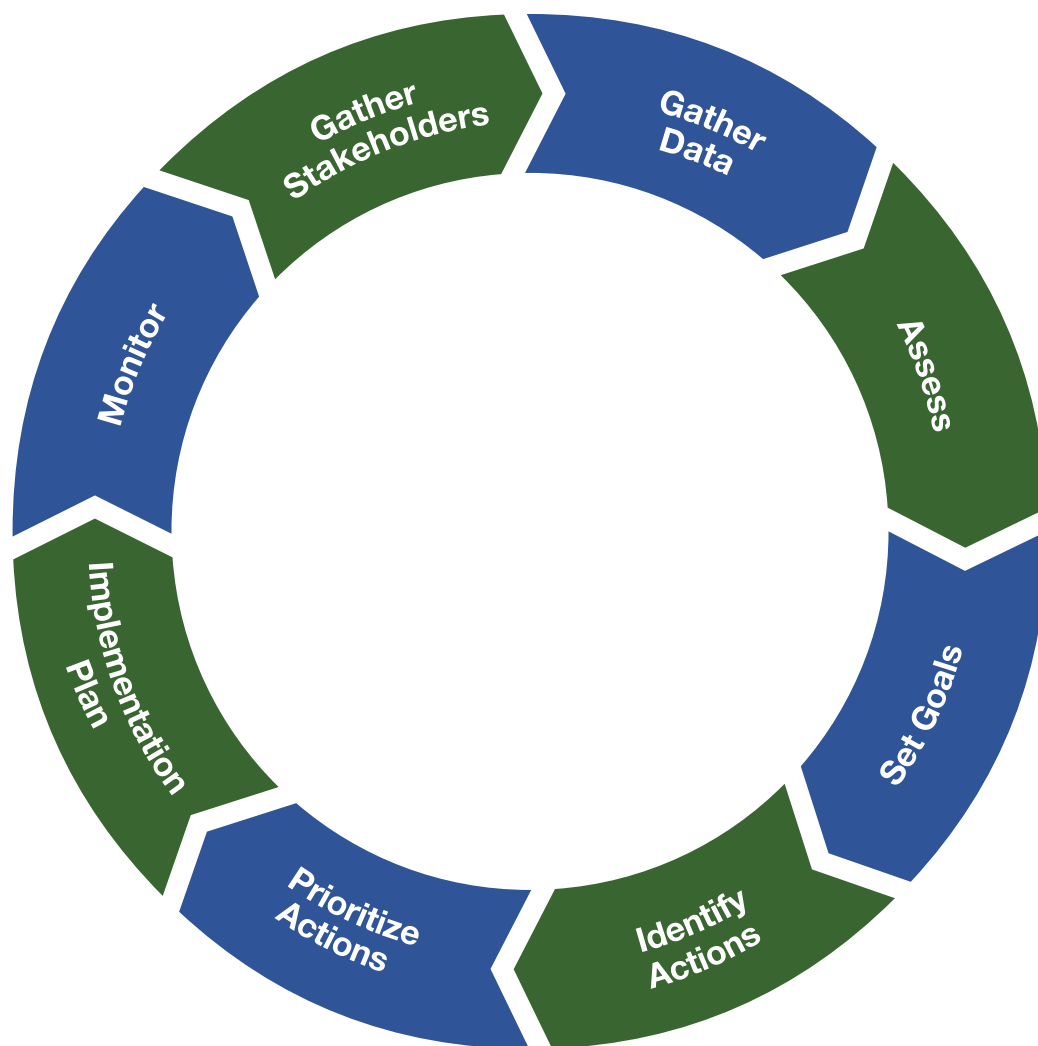
10. Proactively manage climate-related impacts to municipal critical infrastructure and services, and support community organizations and businesses in assessing and reducing their own climate risks.

- The Vulnerability and Risk Assessment resulted in a range of considerations that the City of Kingston can use to adapt critical municipal infrastructure and services. Recommendations and more detailed descriptions of how the City can address priority climate risks can be found in the Baseline Vulnerability and Risk Assessment Report. Highlights of best practices for reducing climate risk to municipal infrastructure and services are outlined below.
- **Afforestation and Increasing Tree Canopy:** Trees offer many benefits, including carbon sequestration and climate resilience. Afforestation (establishing a forest on land not previously forested) is an important part of addressing climate change. The City plants trees annually and plans to double its tree canopy, such as through the neighbourhood tree planting program. Continued tree planting of diverse tree species can build ecological and social resilience and support the reduction of carbon from the atmosphere.
- **Asset-specific Adaptation:** Engineering assessments can help protect the City's most vulnerable infrastructure by considering current and projected changes to climate conditions that impact the civic assets and infrastructure. Aging or heritage buildings, energy systems, stormwater and sewer infrastructure, shoreline assets, and transportation routes in critical corridors may be prioritized.
- **Geospatial Mapping of Risks and Vulnerabilities:** Climate risk hotspots can be more easily managed by creating a geospatial database of risks to municipally owned and operated critical assets. Risk maps are considered best practice for targeting climate resilience interventions, and have been developed in cities such as Metro Vancouver, Montreal, Calgary and Edmonton.
- **Incorporate Climate Hazard Preparedness into Emergency Management:** To prevent and reduce the consequences of climate-related hazards, the City must plan for localized climate impacts such as power outages, flooding and disruptions to access routes. Best practice is to ensure emergency response and continuity plans address current and future climate risks.
- **Climate Change in Asset Management:** Ontario Regulation 588/17 requires that climate change considerations are included in municipal asset management planning. Measuring and costing the impact of climate change on asset deterioration is challenging, with no universally accepted methodology. Despite this, municipalities in Ontario such as the Regional Municipality of Peel, City of Toronto, and the Town of Halton Hills are advancing projects to incorporate future climate projections into lifecycle planning and costing.
- **Climate Assessments for Capital Projects:** As future development and infrastructure is planned, the City can explore stronger requirements to ensure climate risk and GHG emissions are evaluated for major projects and investments.
- **Identify opportunities to Protect and Increase Green Infrastructure:** Green infrastructure (such as greenspaces, bioswales, trees, rain gardens, green roofs etc.) provides ample benefits for community health and wellness, climate resilience and emissions reduction. Protecting green spaces and ecologically valuable areas such as wetlands is important to maintain ecological resilience and biodiversity in Kingston. Further, green infrastructure can help reduce rainwater runoff and flood risk, provide natural cooling and shading, and provide mental and physical health benefits for community. Natural assets can also help purify air and absorb and store carbon.

Climate leadership is a collaborative effort that requires community organizations and businesses to better understand and manage their climate risks. To support Kingston's organizations and businesses in measuring and managing climate impacts, the CLP presents a framework for climate adaptation planning that can be used by anyone in the community to understand risks and plan for current and future climate impacts.

- Identify stakeholders to be involved in the process
- Gather climate projections and other relevant data
- Assess vulnerabilities and risks
- Identify adaptation and resilience goals and objectives
- Identify and prioritize adaptation actions
- Establish monitoring and implementation plans
- Re-assess and repeat process

Figure 5 (Below): Climate Adaptation Framework Diagram



Climate Action in the Community:

Community profiles

Our community includes many organizations, institutions and businesses who are already demonstrating climate leadership and working to create a more sustainable, resilient and low carbon Kingston.

Climate leadership in Kingston

St. Lawrence College Low Carbon Skills Training: Working closely with partners and the City of Kingston, St. Lawrence College is continually evolving its programs to meet the needs of the future and promote Kingston as a low carbon community. The Energy Systems Engineering Technician and Technology, Wind Turbine Technician, and Environmental Technician programs are part of the College's mainstream programming. Low Carbon building skills modules have been developed and incorporated into building trades programs.

Habitat for Humanity low carbon homes: Habitat for Humanity partners with families and individuals in the Kingston area to help build or improve a place they can call home. Habitat for Humanity is constructing four townhomes where they are aiming to decrease greenhouse gas emissions by a minimum of 25 per cent below the requirements of the Ontario Building Code. They are partnering with Lafarge Canada to use newly developed EcoPact low carbon concrete for the foundation of these homes, and with assistance through the City of Kingston's Community Climate Action Fund they will install air-source heat pumps in each of the four homes.

INVISTA sewer discharge partnership: In 2018, INVISTA recognized an opportunity to partner with Utilities Kingston and the City to optimize the process for the management of sewer water discharge at the Kingston plant. The solution reduces INVISTA Kingston Site greenhouse gas emissions by over 4,000 tonnes of CO₂. INVISTA benefits from reduced energy consumption and reduced costs, and the environment benefits from reduced carbon emissions. This initiative also helps Utilities Kingston and the City move closer to meeting their emission reduction goals without incurring additional costs.

Li-Cycle battery recycling: Li-Cycle is North America's largest lithium-ion (Li-ion) battery resource recycling company, focused on extracting the valuable materials found inside end-of-life batteries and then returning these critical materials back into the supply chain. With recycling facilities in Kingston, Rochester, and soon Arizona – and more planned around the globe – Li-Cycle has created a closed-loop, domestically-sourced Li-ion battery supply chain.

Kingston Coalition for Active Transportation (KCAT): Since 2008, KCAT has worked to help improve active transportation in Kingston. In 2020, as a response to public health restrictions related to the pandemic, KCAT organized and implemented a "Quiet Streets" pilot that successfully showed how Kingstonians can navigate their neighbourhoods to get to amenities and services they need. Building on that success, KCAT will be implementing pilots of "School Streets" and "Play Streets" to further illustrate how streets can be made safer and more available to everyone, not just car owners.

Loving Spoonful: Loving Spoonful connects people in Kingston with good food. Loving Spoonful convenes the Kingston Community Gardens Network (KCGN), a network of over 30 community gardens on both private and municipal lands throughout the Kingston area. The KCGN now includes 14 allotment gardens, 14 collective gardens, 5 food forests, and 7 non-food gardens.

Sustainable Kingston Conservation Services: Sustainable Kingston is a non-profit organization that supports the community in achieving its vision of becoming Canada's most sustainable city. Sustainable Kingston offers home energy audits, which have helped thousands of people identify energy saving opportunities, upgrade their homes, and receive rebates for doing so while lowering their carbon footprints.

SWITCH: SWITCH is a network of businesses, research and educational institutions, public sector, energy professionals, students and community volunteers dedicated to making Southeastern Ontario a leading centre in sustainable energy. Since 2004, SWITCH has coordinated educational opportunities and funding programs focused on microFIT and FIT contracting, home energy retrofit programs, trends in solar and wind energy technology, and initiatives to promote the electrification of transit and transportation.



Implementing the Climate Leadership Plan

The City will continue to monitor and report on emissions every year, and will regularly review the status of the Climate Leadership Plan actions. The CLP will be updated approximately every five years to identify new actions to reduce Kingston's remaining emissions.

The City will also consider implementing a carbon budget for its operations. A carbon budget is the cumulative total emissions allowed over a period of time (e.g. annually, every five years) to stay within a certain global temperature change threshold (1.5 or 2 degrees Celsius) to avoid the most catastrophic impacts of climate change. Kingston has reviewed several carbon budget scenarios and is now well-positioned to

establish a formal budget to help prioritize key actions. Implementing a carbon budget would put Kingston in line with other early municipal adopters such as the City of Edmonton and others considering this approach, including Halifax, Toronto, and Ottawa.

The Climate Leadership Plan will also support the City in applying a climate lens to planning and projects. A climate lens is a framework to help the City consider emissions and climate risks within plans, projects and investments, and embeds climate change as a norm in decision making, moving Kingston further towards a low carbon and resilient future.



Conclusion: Climate Leadership in the Future

We are at a pivotal point of the climate crisis. This Climate Leadership Plan represents Kingston's opportunity to come together as a community to reduce our impact on the climate and the environment, stimulate the economy, and build a more resilient future. By 2040, the successful implementation of the Climate Leadership Plan will have eliminated nearly 15 million tonnes of cumulative carbon emissions from being released into the atmosphere. More than 12 per cent of total energy used within the community will be renewable and locally generated. Resilience will be improved through backup energy storage, reduced reliance on personal automobiles and a shift to active transportation, transit, and electric-powered mobility, strengthened local food systems, and more adaptive community infrastructure. More than 40 per cent of all trips will be made by transit or active transportation, promoting community health and well-being, and the tree canopy will have been significantly expanded to provide biodiversity, mental health and emissions reduction benefits.

Climate leadership in Kingston will be achieved through the collective efforts of the City, businesses, industries, institutions, and residents. As the CLP is implemented, there will be many new opportunities for anyone in the community to be climate leaders, by making changes in how we move, eat, and live. All are encouraged to check the City's website for progress on the CLP and news about how to get involved. Together, we will lead Kingston through this crucial next decade and ensure a healthy, thriving and resilient community for the long term.

Want to learn more?

Read the full Climate Leadership Plan at <https://getinvolved.cityofkingston.ca/climate-leadership-plan>.



