



# Climate Change Action Plan

Progress Report 2021

December 2021





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Cover Photo Credit: Peter Dulis, We are Resilient Photo Contest submission

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# Land Acknowledgement

The lands which make up the present-day City of Mississauga are lived on and stewarded by Indigenous Peoples and have been since time immemorial. Their deeply spiritual, cultural, social, and economic connections with the environment make Indigenous Peoples uniquely positioned to provide knowledge and insights on how to address the impacts and root causes of climate change.

We acknowledge the lands that constitute the present-day City of Mississauga as being part of the Treaty Lands and Traditional Territory of the Mississaugas of the Credit First Nation, the Haudenosaunee Confederacy, and the Huron-Wendat First Nation. We recognize these peoples and their ancestors as peoples who inhabited these lands since time immemorial. The City of Mississauga is home to First Nations, Métis, and Inuit peoples.

We recognize and respect the traditions and stewardship of Indigenous peoples. We are committed to continue learning, engaging, and participating in the process of truth and reconciliation.

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## Mayor's Message



Last year marked the first full year of implementation of the City's Climate Change Action Plan. It was also a year of stress and uncertainty, as each of us confronted the COVID-19 pandemic. The reality is that climate change and COVID-19 present similar challenges. Both are global problems that affect the health, well-being, and livelihood of our communities. And both require quick mobilization of new policies, practices, and innovative solutions, as well as intense collaboration and changing mindsets for new ways of working, funding, and providing critical services to the community.

As we continue to implement the CCAP, it will be important for the City to prioritize actions that address both crises – actions that improve public health, contribute to a sustainable economy, and reduce the impacts of climate change.

The need to act has never been clearer. A recent report from the United Nations' Intergovernmental Panel on Climate Change is unequivocal that human-induced climate change is affecting weather and climate extremes across the globe, and that the climate is warming faster now than in previous decades. Many of these changes are irreversible for centuries to millennia. This report is an urgent call to action: all countries, regions, and cities need to act to make significant reductions in greenhouse gas emissions to limit further climate change.

As Canada's sixth largest city, the City of Mississauga recognizes that it has an important role to play in fighting climate change. I was recently named Chair of the Climate Change Committee for Ontario's Big City Mayors and I am honoured to be working with other big city mayors in Ontario to take bold and collective action. We know that cities are major contributors of greenhouse gas emissions and that cities are experiencing the impacts of climate change first-hand, from extreme heat to flooding to wind storms.

The Climate Change Action Plan is the City's 10-year roadmap for addressing climate change. It sets out the actions the City is taking for its own municipal operations and how it intends to encourage the community to get involved. But the City cannot do this alone. In order to achieve our vision of a low carbon and resilient community, businesses, industry, all levels of governments, and residents must come together to reduce our carbon footprints and continue to advocate for climate action across all sectors. We all have a role to play in climate action.

*Bonnie Crombie*

Mayor Bonnie Crombie



# Introduction

This is the first annual progress report on the City of Mississauga's Climate Change Action Plan (CCAP). Approved in December 2019, the CCAP presents the City's roadmap to reduce greenhouse gas (GHG) emissions and adapt to the impacts of climate change over the next 10 years. This report provides an update on the implementation progress of the CCAP and focuses on actions implemented in 2020 and 2021.

Please read through this report to see what the City has done, what we plan to do, and how you can help.

## CCAP Recap

The CCAP outlines the climate actions the City is taking over the next 10 years. The CCAP includes 89 actions, divided into five different categories (or "Action Pathways"). Every City department was involved in the development of the CCAP, and they are now involved in implementing its actions. This truly is a collaborative effort.

The CCAP is guided by the City's vision to be a low carbon and resilient community and has two main goals:

### GOAL: MITIGATION

Reduce GHG emissions 80% below 1990 levels by 2050, with a long-term goal of becoming a net zero community.

### GOAL: ADAPTATION

Increase resilience and the capacity of the city to withstand and respond to climate events.

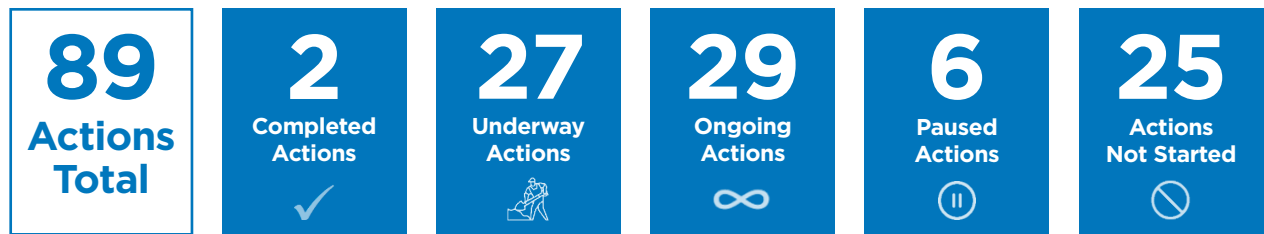
### ACTION PATHWAYS

The Plan includes five "Action Pathways":

1. Buildings & Clean Energy
2. Resilient & Green Infrastructure
3. Accelerating Discovery & Innovation
4. Low Emissions Mobility
5. Engagement & Partnerships

This progress report is organized by pathway.





## Progress Snapshot

In 2019, the City joined a growing number of Canadian municipalities in declaring a climate emergency, paving the way for the adoption of the CCAP later that year. The next year, we faced another global emergency – the COVID-19 pandemic. The pandemic required the City to adjust its priorities and expectations. It also presented the City with new funding challenges.

Despite these challenges, the City continues to make progress on climate action. Most CCAP actions are underway, and some have been completed. To date, the focus has been on foundational actions: actions that lay the groundwork for climate action in the City moving forward.

The City is committed to rapidly reducing emissions from its own operations, and to supporting the community in taking climate action.



# Greenhouse Gas Emissions Update

This section provides an update on Greenhouse Gas (GHG) emissions in Mississauga. This includes emissions from the city as a whole (referred to as “community emissions”), as well as emissions related to municipal operations and services (referred to as “corporate emissions”).

The 2020 corporate and community inventories are preliminary, as some of the information needed to calculate 2020 emissions will not be available until 2022 (e.g., industrial process emissions). The City will update its 2020 inventory once this information is available.

## Community Emissions

There are four main sources of community emissions:

1. Buildings
2. Transportation
3. Waste
4. Industrial processes

In 2019, Mississauga’s community emissions exceeded 8,000,000 tonnes CO<sub>2</sub>e, an increase of 2% (~160,000 tonnes CO<sub>2</sub>e) relative to 1990 levels. In 2020, community emissions decreased approximately 10% relative to 1990 (see Figure 1). As we all know, 2020 was a unique year – the COVID-19 pandemic changed the way we worked, travelled, and used energy, resulting in decreased emissions, particularly in transportation-related emissions. While this decrease is positive, it is important to acknowledge

that, in the years leading up to 2020, emissions were increasing.

There are several reasons for this increase. Most importantly, we are consuming more energy. We have also experienced significant population growth: since 1990, Mississauga’s population has increased by more than 260,000 people. In addition, Ontario’s electricity grid has gotten dirtier

**DID YOU KNOW?** Ontario’s electricity grid is getting dirtier and emitting more GHGs. This is because the Government of Ontario started burning more natural gas to generate electricity, as nuclear generators go offline to be refurbished and, in some cases, shut down permanently. According to the Ontario Clean Air Alliance, this increased reliance on gas-fired power plants will increase GHG emissions by more than 300% by 2030 and by 500% or more by 2040, reversing more than 40% of the GHG reductions that were achieved by phasing out coal-fired power plants. In response, Mississauga City Council endorsed a motion in March 2021 calling on the province to phase out its gas-fired power plants to reduce GHGs, and commit to replacing gas-fired power plants with clean energy and low carbon solutions. City staff continue to engage with the Independent Electricity System Operator to advocate for a clean electricity grid.



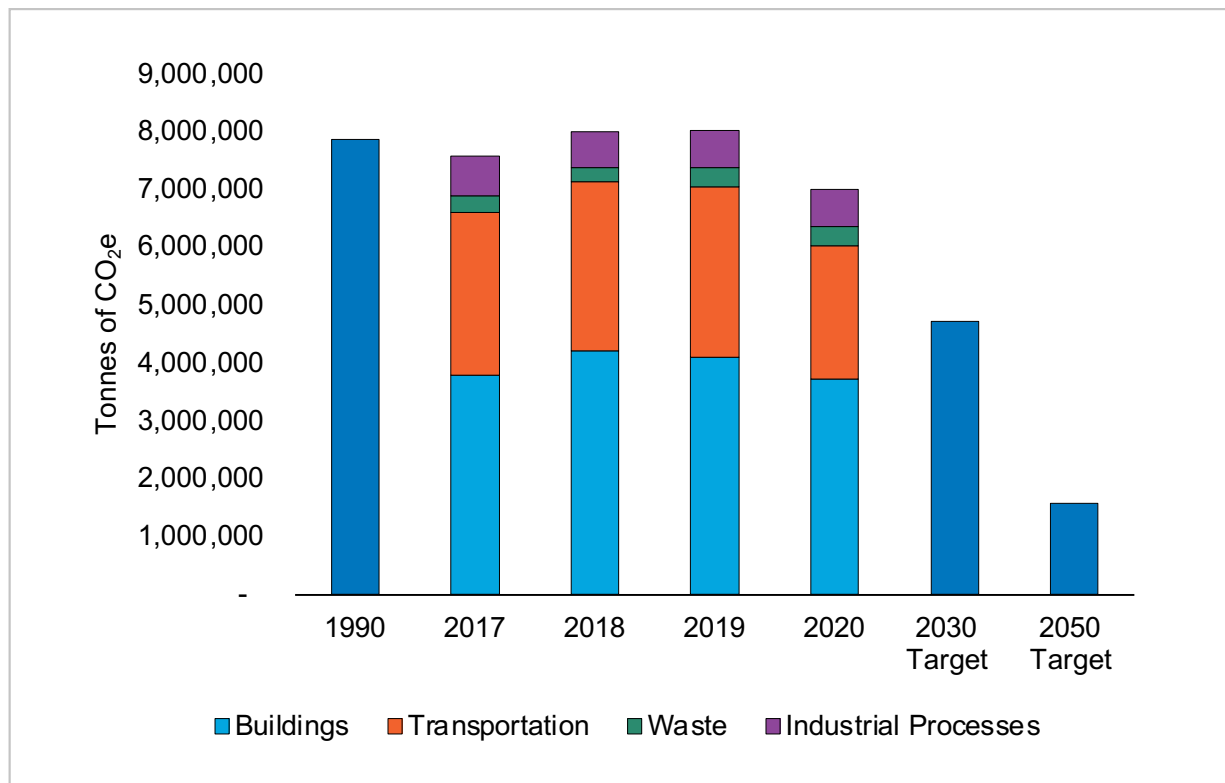


Figure 1: GHG Emissions from the community of Mississauga

over the past few years, meaning that there are more GHG emissions today than there were a few years ago for consuming the same amount of electricity. To meet the plan's targets, we all need to accelerate our actions to reduce emissions, particularly from the building and transportation sectors.

### Corporate Emissions

Corporate emissions represent approximately 1% of the total emissions in Mississauga. There are six main sources of corporate emissions:

1. Municipal buildings
2. Corporate fleet
3. Transit fleet
4. Fire fleet
5. Street lighting
6. Waste

Figure 2 outlines the trends in corporate GHG emissions over the past several years.

In 2019, GHG emissions from municipal operations were approximately 81,000 tonnes eCO<sub>2</sub>, an increase of approximately 20% relative to the 1990 baseline.

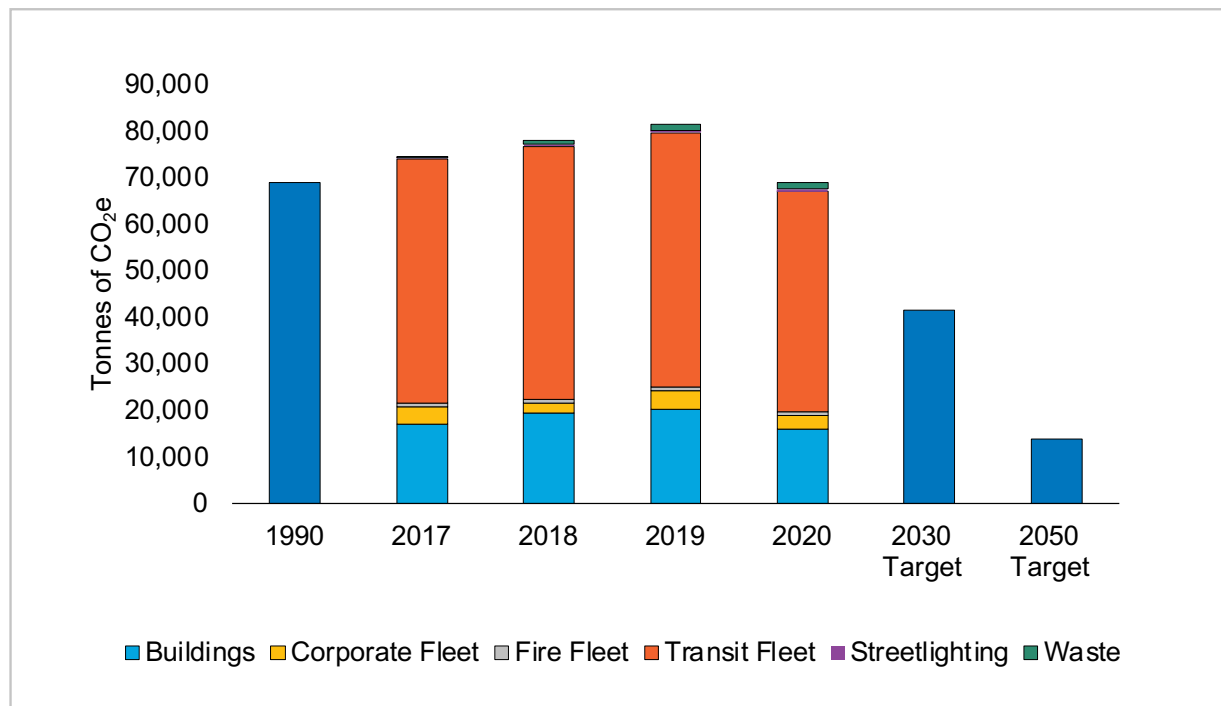


Figure 2: GHG Emissions from Corporate Operations

In 2020, the City's GHGs decreased by approximately 12,000 tonnes compared to 2019 levels. This decrease can be attributed in large part to COVID-19, as there were partial building shutdowns and City services were significantly reduced (e.g., decreased MiWay service and City programs). Despite these exceptional circumstances, total corporate emissions in 2020 were still higher than the 1990 baseline, signalling that efforts to reduce emissions need to increase, especially











from the City's transit operations and municipal buildings, in order to meet the City's GHG reduction targets.

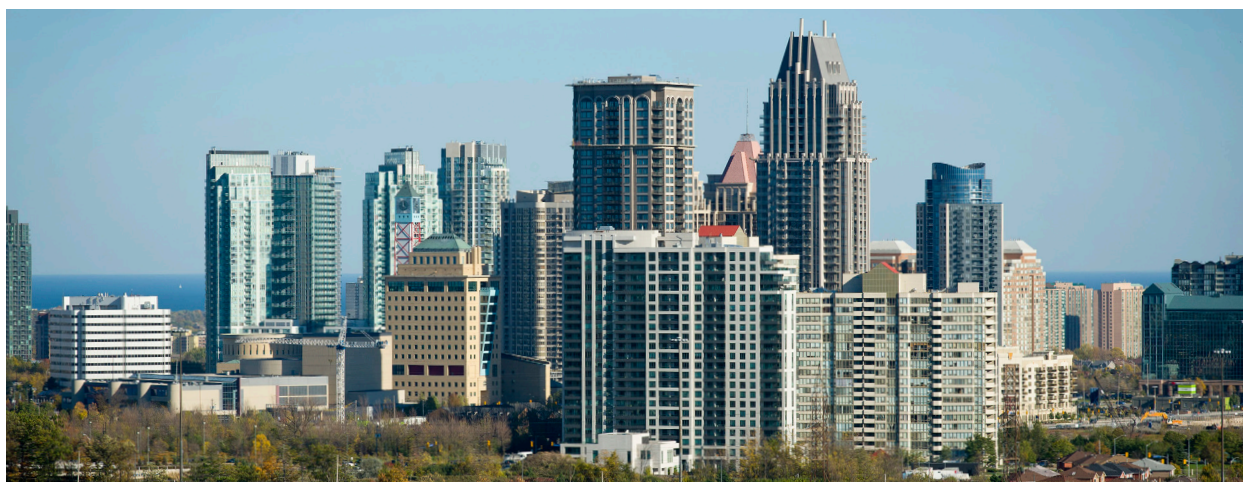
Similar to community emissions, corporate emission increases can be attributed to a number of factors, including increased consumption, a dirtier electricity grid, and significant population growth. Population growth has driven an increased demand for municipal services, such as the expansion of public transportation.

# Progress Update

The progress report is organized by Action Pathway. For each pathway, the number of actions that are complete, underway, ongoing, paused, or not started is indicated. A number of specific actions

that have been implemented or are underway are also highlighted. A list of all 89 actions and their status can be found in the Appendix.

Action Pathways		Action Progress	
	Buildings and Clean Energy		Completed - the action has been fully implemented
	Resilient and Green Infrastructure		Underway - implementation has begun
	Accelerating Discovery and Innovation		Ongoing - the action is continuous and has no end date
	Low Emissions Mobility		Paused - implementation had begun, but has now been paused <sup>1</sup>
	Engagement and Partnerships		Not Started - implementation has not begun <sup>2</sup>

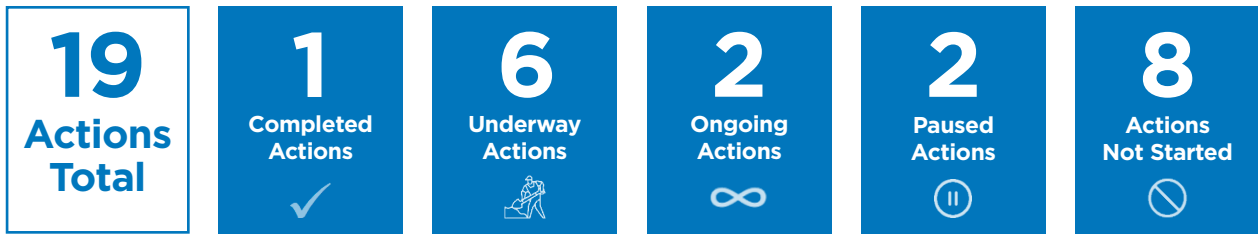


<sup>1</sup> Several of these actions are paused due to COVID-related delays.

<sup>2</sup> Most of these actions are medium to long-term actions, or actions that cannot be implemented until other actions are completed.



## Buildings and Clean Energy



Buildings are the largest source of emissions in the city, comprising approximately 50% of community GHG emissions. Buildings of all types, including residential, commercial, and industrial buildings, require energy for lighting, heating, and cooling, as well as operating equipment and appliances. The amount of energy consumed is influenced by a number of factors, including the number of occupants, size of the building, activities taking place within the building, and the age of the building.

### Corporate Actions

Emissions from buildings account for approximately 20% of corporate emissions. In order to achieve its targets, the City will need to continue decreasing emissions and improving energy efficiency in the buildings it owns and operates.

### Corporate Green Building Standard

Approved in 2019, the City's Corporate Green Building Standard is a set of performance requirements that apply to new construction and major renovations at City-owned and operated buildings. The intent is to promote environmentally, financially, and socially responsible practices in building design and construction, and to support the City's goal of reducing GHGs produced by its

buildings. The Standard includes three increasing levels of performance: the first level is mandatory. Performance levels will be revised every five years with increasingly stringent requirements.

The City is already applying the first level of the Standard to new buildings and major renovations. For example, in order to meet level one of the Standard, the City is installing triple-glazed windows, high-efficiency lighting (LED), rooftop solar panels, heat pump-style rooftop units, and heat recovery from the adjacent ice plant for the Burnhamthorpe Community Centre renovation and expansion (set to be completed by 2023). The building will be 30% more energy efficient than if it were built according to the Ontario Building Code.

### Energy Conservation Strategy

The City has released its latest "5 Year Energy Conservation Plan (2019-2023)," which focuses on improving energy performance and fighting climate change in City-owned facilities. The plan targets a 5% reduction in energy use and GHG emissions per facility over the next five years. Under the previous plan, the City was able to, among other things, decrease energy use intensity by 9.3% and GHGs by 8.1% from 2014 – 2019.



In 2019, the first year of the newest energy conservation plan, there was a 1% increase in energy consumption and a 3% increase



in GHGs. While a number of upgrades resulted in a 1% reduction in electricity consumption (e.g., lighting upgrades), increased rentals and hours – especially in indoor swimming pools – resulted in a 4% increase in natural gas consumption.

Last year saw significant reductions in energy consumption and GHGs in municipal buildings. These data are considered an anomaly as partial building shutdowns due to COVID-19 distorted the data. As building rentals and hours resume, it is expected that energy consumption and GHGs will increase if no additional action is taken. Significant GHG

reduction efforts, such as deep energy retrofits, will be necessary to meet the City's targets.



**30% decrease in corporate building emissions in 2019 relative to 1990**

### Actions in the Community

In the community, buildings are the largest source of GHGs, accounting for more than 50% of total emissions. The City is committed to supporting residential, commercial, and industrial property owners in improving the energy efficiency of existing buildings and ensuring that future properties and developments are designed for a low-carbon and resilient future.

#### District Energy

District energy (DE) is an efficient system for providing heating and cooling to buildings. Instead of each building having its own boilers and chillers, a central plant produces thermal energy that is distributed to buildings through a network of pipes. As noted in a UN publication on District Energy in Cities, DE “is one of the least-cost and most-efficient solutions for reducing GHG emissions and primary energy demand.”

Given its potential significance to Mississauga in reaching its GHG reduction targets, the City is supporting efforts to advance DE systems in the city. This includes supporting a potential DE system at Lakeview Village, which is expected to use the waste heat from the adjacent GE Booth Wastewater Treatment Plant as its main energy source. The City is also working with a consultant, along with major property owners in the Downtown and others, to determine if it would be feasible to build a low carbon DE system in Mississauga's Downtown, which is projected to grow significantly in the coming years.

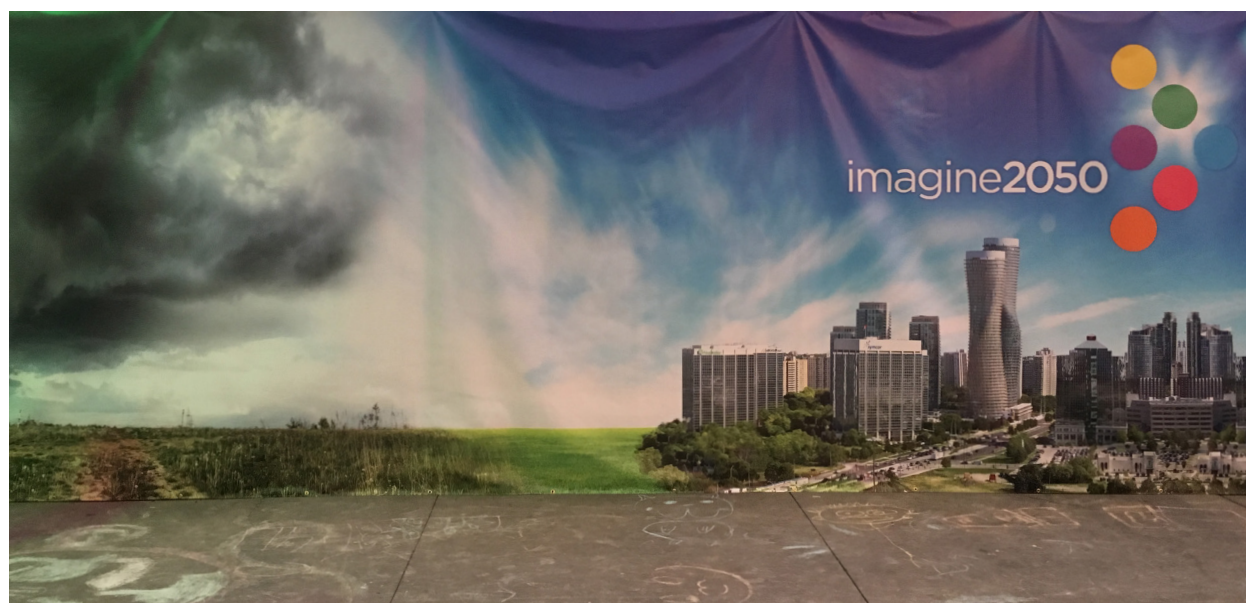
### **Home Retrofits Design Study**

The City is working with the City of Brampton and Town of Caledon to design a home energy retrofits program for single-family homes. The program is intended to improve energy efficiency and

reduce GHG emissions from these homes, with the added benefit of energy savings for residents. The design phase will also focus on how to minimize financial barriers for homeowners.

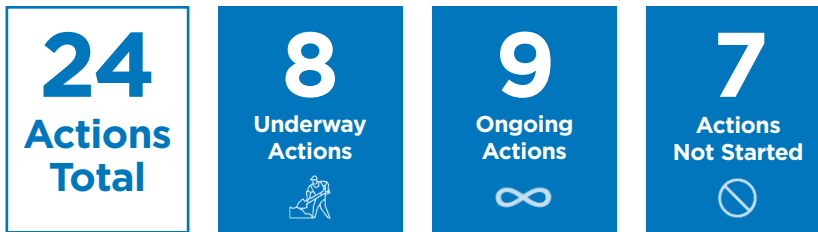
### **Green Development Standards**

The City is working to reduce GHGs and increase the resilience of new buildings. In 2021, the City received funding from the Federation of Canadian Municipalities (FCM) to update its Green Development Standards. This funding will help the City develop standards that ensure new private developments prioritize energy efficiency, reduce GHGs, and increase climate resilience. The update will involve extensive consultations with the building industry, community groups, and members of the general public. Work on the update has begun, with the final standards expected to be completed in early 2023.





## Resilient and Green Infrastructure



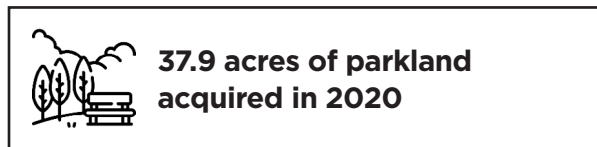
The past two years have shown the importance of adaptation and resilience in the face of unprecedented changes. They have also highlighted the importance and value of natural areas for the well-being of the community. As GHG emissions increase worldwide, we will continue to experience more frequent and prolonged extreme weather events, including higher temperatures and increased precipitation. Continuing to prepare for this 'new normal' is important in ensuring the city can effectively respond to and recover from extreme weather events. A key aspect of this preparation is the protection and enhancement of natural systems across the city.

### Actions in the Corporation and Community

Greenspace and natural systems provide a host of services to the community, including flood protection, carbon sequestration, and regulating local temperatures. The City remains committed to expanding greenspaces – specifically parkland – throughout Mississauga, especially in areas facing increased population growth.

The City is also committed to reducing risks to its most critical services. By enhancing the resiliency of the built

and natural environment and protecting ecosystem services, Mississauga will be better positioned to cope with the impacts of climate change.



### Natural Asset Management

In 2021, the City worked with the Municipal Natural Assets Initiative (MNAI) to develop a preliminary inventory of natural assets in Mississauga, which includes natural resources and ecosystems within the city (e.g., forests, parks, fields). The inventory includes a complete list of natural assets in the community, their geographic boundaries, and information about their condition and risks that they may face now and in the future. This information will help the City incorporate natural assets into its asset management planning, as well as develop a mechanism to value natural areas and the benefits they provide to the city. Ultimately, this process will serve to decrease costs to the city, increase levels of service, enhance the City's ability to adapt to climate change, and protect and enhance the multitude of other benefits that natural assets bring to the community.

## Stormwater Master Plan

In 2020, the City's stormwater team began to develop a Stormwater Master Plan, titled 'Build Beautiful.' The plan will outline actions and recommendations for managing rainwater over the immediate and long-term in Mississauga, and will account for the expected impacts of climate change. With this new plan, the City is charting a visionary course towards protecting businesses and residents and preserving the natural environment by refining its approach to stormwater-related issues, such as flooding and water quality.



**14 LIDs installed throughout  
City road right-of-ways  
as of summer 2021**

## Low Impact Development

Low Impact Development (LID) is the strategy of filtering, storing, and returning rainwater and snow melt to the ground. This is done by combining traditional and natural practices to mimic pre-development conditions. In Mississauga, LIDs are increasingly being used in land planning and development decisions. In addition, our parks team continually looks for opportunities to include sustainable LID technology in park development and reconstruction.

LIDs have been installed throughout the city to manage stormwater runoff from roads. For example, in Fall 2020, the City's stormwater team piloted the use of porous asphalt on a residential road – a



novel LID technology that allows water to drain through the asphalt and into a stone bed below. Through this process, the stormwater quality is improved through filtration and some of the stormwater will be absorbed into the soil below, with the remaining filtered runoff sent to the City's storm sewer network. Located in the cul-de-sac of Fowler Court, the pilot site will be monitored to determine its effectiveness and the potential to use the technology throughout the city.

## One Million Trees Program

Our forestry and parks teams continue to implement the One Million Trees program, with the goal of planting one million trees by 2032. The program was launched in 2012 to help conserve and enhance the city's open spaces and forested areas, and to expand the urban forest canopy. Since 2019, in collaboration with volunteers, community groups, students, organizations and businesses, more than 150,000 trees have been planted. More than 400,000 trees have been planted since the start of the program.





**>400,000 trees  
planted through One  
Million Trees program**

### Shade Program

Shade in parks is becoming increasingly important as temperatures continue to increase and heatwaves become more frequent and longer. Shade trees and shelters provide park users with protection from the sun and heat, and from other climate events. Our parks team has initiated a Shade Program for new and existing parks. The program identifies criteria, shade options, and funding strategies for different types of shade structures, and will ensure that shade is required for basic park development. Shade structures may include the planting of shade trees or other natural assets, or installing infrastructure solutions such as gazebos.

### Urban Agriculture Strategy

The City's environment team is leading the efforts to develop an urban agriculture strategy that will help identify the City's role in supporting urban-scale food production across Mississauga. Through the strategy, the City will work to encourage healthier lifestyles, empower the community to learn new skills about growing and harvesting produce, and support local businesses with ties to urban agriculture. The strategy intends to expand existing urban agriculture initiatives across the city, and is expected to be completed in early 2022.



**19% Urban Tree Canopy  
Cover as of 2014**



## Accelerating Discovery and Innovation



Climate change requires innovative interventions and responses. In recent years, cleantech has emerged as a driving force behind many of the world's leading climate change solutions, making strides in significantly improving efficiencies in energy production and resource management, and preventing and reducing degradation to the environment. At the same time, climate change considerations need to be integrated into decision-making frameworks to ensure that these considerations are not missed.

### Corporate Actions

The City recognizes the importance of leading by example and piloting new innovations within the corporation as a means to share lessons learned and experiences with residents, businesses, and other Canadian municipalities.

#### Task Force on Climate-Related Financial Disclosures

The City's finance team has begun to include climate-related financial disclosures in its annual financial

reporting to share climate-related risks and opportunities in a consistent and comparable manner. The City provides climate-related information using the internationally-adopted Task Force on Climate-related Financial Disclosures (TCFD) Recommendation Framework. Annual TCFD-recommended disclosures help generate information that supports decision making, such as how to allocate limited funds in the transition to a low-carbon economy. Mississauga is one of only a handful of Canadian municipalities to include TCFD disclosures in its financial reporting.

### Actions in the Community

Partnerships play an important role in advancing progress on climate change. The City continues to explore strategic partnerships with external organizations to pilot new programs and actions that result in real change in the city.



### Dog Waste Program

In 2019, the City launched its innovative Dog Waste Pilot Program, in collaboration with Sutera Inc. The program aimed to help divert dog waste from the landfill and convert it into energy. City staff and Sutera Inc. worked together to design a fully in-ground concrete container that holds dog waste below ground where it is cooler and out of direct sunlight. Storing the waste below ground reduces odour and means that the waste can be collected when the container is full. In June 2021, Council approved City staff's recommendation to continue the program and expand it

to select parks in 2023. The program has successfully addressed the disposal of dog waste at participating City parks, while also helping to improve waste diversion and reduce recycling contamination in those parks. Based on waste audits in these parks, the City has seen a decrease in contaminated recycling, from 81% in 2017 to 53% in 2020.

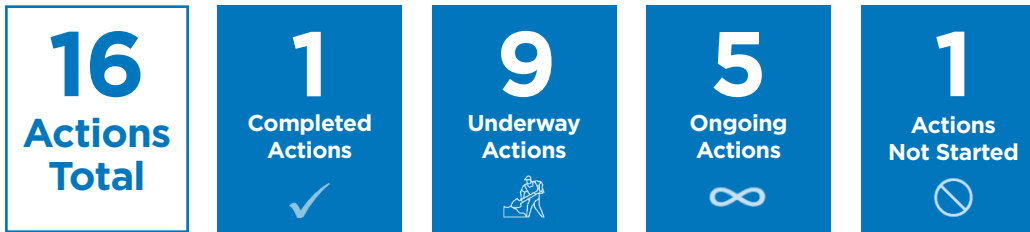


**34.4 metric tonnes  
of dog waste collected  
since 2019**





## Low Emissions Mobility



In Mississauga, the transportation sector - which includes cars, trucks, and buses - produces approximately 30% of the city's total emissions, second only to buildings. The City is committed to reducing emissions from its corporate and transit vehicles, while encouraging the use of low or zero carbon transportation options in the community. As both the corporation and community move toward low emission mobility options, it will be important to ensure that appropriate infrastructure is in place to accommodate these changes.

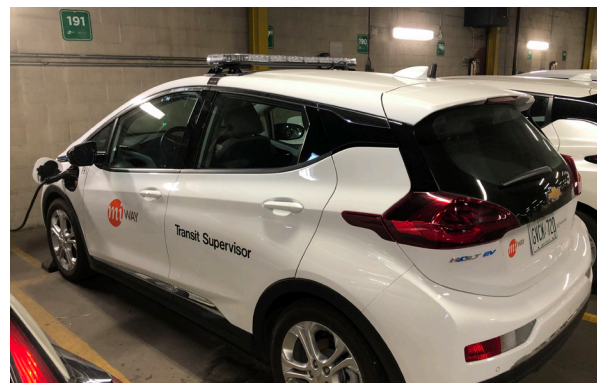
### Corporate Actions

The largest source of corporate GHG emissions is the City's transit operations, which account for approximately 70% of total emissions. In order to achieve its targets, the City will need to significantly decrease emissions from transit operations.

### Electrification of MiWay Buses and Fleet

The City has committed to purchase only second-generation hybrid buses as of 2020 and, from 2028 onwards, will only purchase zero emission buses. MiWay has already purchased 41 second-generation hybrid buses to add to its fleet, representing 8% of its bus fleet. MiWay is also working to replace its light duty change-off vehicles with electric ones. It currently

has 10 electric cars and will purchase approximately 44 more in the next four years. By 2025, 83% of all non-revenue transit vehicles will be zero-emission.



In order to accommodate the increased electrification of the City's transit and fleet vehicles, the City is working to increase the number of electric vehicle (EV) chargers in its facilities. Currently, the City has installed 10 EV chargers at MiWay's Central Parkway, and 59 more are planned for installation between 2021 and 2023 at the City's Central Parkway, Mavis, and Malton yards.

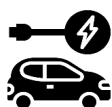


**59 corporate EV charger installations planned**



### Hydrogen Fuel Cell Electric Bus Pilot

In 2021, the City started Phase 1 of a pilot project for hydrogen fuel cell electric buses. Working with the Canadian Urban Transit Research & Innovation Consortium (CUTRIC), Phase 1 is a feasibility study, which includes an analysis of costs, GHG emissions, and impacts on MiWay's operations. MiWay is also working with CUTRIC to secure funding for piloting 10 hydrogen buses in its transit fleet.



**54 Electric and Hybrid-Electric Fleet vehicles as of fall 2021**

### Green Fleet and Equipment Policy

In 2020, the City approved a Green Fleet and Equipment Policy, which prioritizes the purchase of electric fleet and equipment. The policy lays the foundation for management and staff to purchase low or zero-emission vehicles and equipment, and to improve the fuel efficiency and use of existing fleet and equipment. It also identifies roles and responsibilities of staff in the electrification of the City's fleet and equipment, and in aligning the purchase of infrastructure required for the electric fleet or equipment.

### Electric Lawn Equipment

Lawn equipment, such as lawn mowers and leaf blowers, produce a significant amount of GHGs. According to the U.S.



Environmental Protection Agency, in one hour of operation, a new gas-powered lawn mower produces the same emissions as 11 new cars.

In 2020, the City's Park Operations team debuted its first all-electric grass cutting equipment. This is part of a pilot project to begin transitioning small equipment used by the parks team from gas/diesel to battery-powered units.

### Actions in the Community

The City remains committed to supporting residents who choose low or zero-emission mobility options, including active transportation.



**14.5 kilometers of new bicycle lanes in 2020**

## Active Transportation

The City continues to improve active transportation infrastructure. This includes the construction of new sidewalks through the annual Sidewalk Infill program, expanding cycling infrastructure through the City's cycling program, and taking a 'Complete Street' approach in development and reconstruction to ensure future roads are designed for all users. Active transportation is also supported through the implementation of key planning documents, such as the City's 2021 Pedestrian Master Plan and the 2018 Cycling Master Plan Update. Some highlights for 2020 include the construction of 3.7 kilometers of sidewalks city-wide through the Infill program, 14.5 km of new cycling infrastructure, and the construction of new multi-use trails on Mavis Road and Derry Road West.



**3,422 battery electric & plug-in hybrid electric vehicle registrations in Mississauga**

## Community EV Charging Stations

In addition to installing EV chargers for municipal operations, the City is also supporting the construction of public EV chargers. With funding support from Natural Resources Canada, 12 EV chargers have been commissioned for Sheridan College's Hazel McCallion Campus and in the Streetsville neighborhood.

The City is also planning to install 10 EV charging stations at the Central Library parking garage in partnership with Alectra Utilities and their Alectra Drive – Smart EV

Charging for Workplaces project. The goal of the project is to evaluate the impact of EV charging on the hydro grid and a building's hydro consumption, as well as stimulate the adoption of EVs at the project's program sites. By participating in the project, the purchase and installation of the EV chargers are free to the City.



## Regional Zero Emission Vehicle Strategy

The City is working with the City of Brampton, Town of Caledon, Region of Peel, and the local conservation authorities to develop a regional Zero Emission Vehicle Strategy. The strategy will support the implementation of municipal actions to drive adoption of zero-emission vehicles in the Region of Peel. The strategy is currently under development, with the final version expected in 2022.



## Engagement and Partnerships



Outreach and education are a critical part of implementing the CCAP. Everyone who lives, works, and plays in Mississauga has a role to play in climate action. It is important that community members have a clear understanding of the challenges and opportunities arising from climate change, and understand what they can do to reduce emissions and adapt to climate change.

The COVID-19 pandemic has changed how we interact and connect with one another. Many in-person events went virtual, while others were cancelled. Similarly, many of the City's plans for climate change outreach and education were impacted. Despite these setbacks, the City was still able to successfully conduct outreach events and continue the conversation on climate change action and awareness.

### Actions in the Community

#### Climate Change Youth Challenge

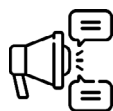
In 2020, the City launched its first-ever Climate Change Youth Challenge: Mission to Earth, a virtual educational program for secondary and post-secondary

students. The six-month program engaged and challenged youth to develop sustainable solutions for Mississauga, such as transitioning to efficient energy systems, building innovative green spaces, or reducing single-use plastics.



**150+ youth engaged in climate youth challenge**

The program concluded with a virtual summit event that brought together youth, community members, local government leaders, and industry experts to celebrate and inspire youth to continue taking action on climate change. The program engaged over 150 students, with 22 teams participating from both Peel School Boards, the University of Toronto Mississauga, and community youth groups.



**Four climate change campaigns launched since 2019**



Images from #SaugaClimateReads campaign

### Sauga Climate Reads

In an effort to promote climate literacy and capture a wide audience, the City's Environment team collaborated with the Library team to launch Sauga Climate Reads, a 12-month campaign that featured a book recommendation from either a City Councillor or City staff member on climate change from Mississauga's Library catalogue. The book recommendations appealed to children, teens, and adults. The full collection can be found on Mississauga's OverDrive portal.

### Community Gardens Program

The City's Community Gardens Program is a partnership between Ecosource and the Parks, Forestry, and Environment Division. The program connects residents in Mississauga neighbourhoods with gardening spaces that encourage active and healthy living, and help green the city.

Community gardens play a vital role in building sustainable local food systems, creating resilient community spaces, and providing access to fresh, healthy and nutritious food. These gardens have been especially important during the COVID-19 pandemic by providing safe spaces for community members to connect and improve collective health and well-being.



**10 public community gardens in Mississauga parks**

As part of the City's multi-year funding agreement with Ecosource, each year Ecosource installs one garden on parkland and two smaller gardens on private lands. As of 2021, there are 10 public community gardens in Mississauga parks.



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# Looking Ahead



Photo Credit: Farhaan Iqbal Hussain, We are Resilient Photo Contest submission

While the City has laid a solid foundation for climate change work moving forward, there is a need to move quicker. The City is committed to being a climate leader to meet its targets in the CCAP. To this end, the City is focused on two main actions: decreasing GHGs from the MiWay bus fleet and decreasing GHGs from, and improving the resilience of, municipal buildings.

The City will also work within the community to help residents and businesses decrease their GHG footprint and adapt to the impacts of climate change. Since buildings are the largest source of emissions in Mississauga, the

City will focus in particular on decreasing GHGs from this sector. This includes advancing a regional home energy retrofits program and working with multi-unit residential building owners to decrease their buildings' GHGs.

As highlighted throughout this report, reaching the targets of the CCAP will require a coordinated effort. This includes support from other levels of government. The City will work to lead and inspire the community to take climate change action so that Mississauga continues to be a place where neighbourhoods, businesses, institutions, and residents thrive.

# Appendix

The table below provides an overview of the 89 actions in the City's Climate Change Action Plan, including their action ID, action description, and implementation status.

## Buildings and Clean Energy

Action		Status
1-1	Support and encourage developer-led efforts to include low carbon energy systems in new development	Ongoing
1-2	Conduct a district energy feasibility study in the downtown for community and municipal buildings to advance low carbon energy systems in Mississauga	Underway
1-3	Conduct a study to identify mechanisms to enhance community energy planning through the Official Plan or other planning tools (i.e. Development Master Plan) particularly in growth areas and areas for major redevelopment	Not Started
2-1	Include policy direction in the City's Official Plan to support the Climate Change Action Plan	Underway
2-2	Incorporate a climate impact lens in to streetscape design in the Downtown Public Realm Strategy and, once complete, consider applicability city-wide	Underway
2-3	Revise the development application requirements and update the complete application criteria in the Official Plan to align with the updated Green Development Standards	Not Started
3-1	Update the Green Development Standard to include energy and resilience considerations within building, site features, and boulevard design	Underway
3-2	Identify opportunities to introduce new legal and/or policy tools, including by-laws, to require implementation of climate resilience measures (e.g., green roof by-law) in new buildings	Not Started

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Action		Status
4-1	Conduct a GHG Reduction and Solar Feasibility Study for Corporate Buildings	Complete
4-2	Explore models to finance investment in renewable capacity to meet City facility needs	Not Started
4-3	Identify and advance opportunities for renewable energy generation and storage at City-owned facilities to supply the needs of existing and future City-owned facilities and buildings	Paused
5-1	Build all new municipally-owned buildings to be more energy efficient and near net-zero	Ongoing
5-2	Retrofit municipally-owned buildings to reduce natural gas and electricity consumption	Paused
5-3	Develop municipal resilient design guidelines to complement existing Energy Design Guidelines to apply to retrofits and lifecycle replacements of municipal buildings	Not Started
6-1	Support new Sustainable Neighbourhood Retrofit Action Plans or other neighbourhood level action planning that focuses on retrofitting multi-unit residential buildings to be more energy efficient and resilient	Underway
6-2	Develop energy and resilience retrofit programs for homeowners and landlords to promote opportunities, existing programs, incentives, and technologies that improve resilience, drive energy efficiency, and reduce greenhouse gas emissions	Underway
6-3	Develop targeted programming based on energy maps and community greenhouse gas emissions inventories and continue to update data sets on regular cycles (e.g., annually/every five years)	Not Started

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Action	Status
<b>6-4</b> Encourage the use of low carbon heating and cooling technologies (e.g., heat pumps) for space and water heating and cooling	Not Started
<b>6-5</b> Promote building envelope upgrades (e.g. wall insulation, energy efficient windows) in residential, commercial, and industrial buildings	Not Started

## Resilient and Green Infrastructure

Action	Status
<b>7-1</b> Create a targeted municipal green infrastructure program, which includes developing a Geographic Information System (GIS) based inventory, and monitoring assets with a particular focus on the impact of climate change over time	Underway
<b>7-2</b> Develop an Asset Management Plan for all municipally-owned and/or managed natural assets	Underway
<b>7-3</b> Develop a mechanism to value green infrastructure assets and the benefits of these assets to the community	Underway
<b>8-1</b> Explore options to enhance resilience in City-owned spaces and parks (e.g., walking pathways in parks) as opportunities arise on a site-by-site basis	Underway
<b>8-2</b> Develop and continuously update City design and maintenance standards for trees, shrubs, and perennials in urban locations to include considerations of advanced technology, species selection, and climate impacts (e.g., drought) in line with Recommendation 12 from the City's Parks and Forestry Master Plan	Ongoing

# Appendix

Action		Status
8-3	Create design guidelines to consider alternative adaptive materials (e.g., more resilient to heat, freeze/thaw, wind) in the engineering and design of public spaces	Underway
9-1	Continue to create response plans for climate-related risks (e.g., heat) to ensure suitable warning systems and response procedures are in place during extreme weather events	Ongoing
9-2	Update and expand climate-related risk and vulnerability assessments for the community and the Corporation, with a specific focus on vulnerable populations, and develop targeted adaptation plans	Not Started
9-3	Conduct a climate vulnerability assessment of all existing municipal assets as part of the development of asset management plans	Not Started
9-4	Develop an urban agriculture and food security strategy	Underway
9-5	Work with regional partners to enhance existing programs and services to address health impacts from climate change, increase awareness and responsiveness, and identify effective interventions and partnerships	Not Started
10-1	Increase the urban tree canopy and the diversity of tree species being planted on public and private lands	Ongoing
10-2	Finalize and implement invasive species monitoring and control within the context of climate change, as per the Invasive Species Management Plan (2019)	Ongoing
10-3	Review existing watering programs based on changing climate conditions and consider alternative sources of water, including potential rain capture or irrigation systems	Underway



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Action		Status
10-4	Create a community tree monitoring program to involve residents in the upkeep and maintenance of trees in their neighbourhoods	Not Started
10-5	Continue to diversify vegetation community types, including meadow, wetlands, and forests, in public spaces	Ongoing
11-1	Work with partners to monitor and model air quality	Ongoing
11-2	Update Idling Control By Law and corporate policy (09-00-02 – Unnecessary Vehicle Idling) and explore enhanced enforcement models for personal, municipal, and freight vehicles	Not Started
11-3	Work with other levels of government within the goods movement sector to explore pilot projects in Mississauga that improve local air quality	Not Started
11-4	Update the Corporate Smog and Air Health Advisory Response Plan	Not Started
12-1	Assess the condition of the existing stormwater system as part of the Stormwater Asset Management Plan	Ongoing
12-2	Develop a comprehensive long-term stormwater management strategy to reduce surface runoff and enhance flood resilience	Underway
12-3	Explore the use of green infrastructure to manage stormwater on publicly and privately owned properties (e.g., permeable paving, blue roofs)	Ongoing
12-4	Develop neighbourhood-based flood mitigation plans (for urban overland and sanitary flooding) to identify opportunities to decrease flood risk	Ongoing

# Appendix

## Accelerating Discovery and Innovation

Action		Status
13-1	Develop a clean energy and innovation network to support cleantech sector growth, facilitate business-to-business connections, and identify top priorities for the sector and the City	Not Started
13-2	Explore partnership opportunities to deploy clean energy technology solutions in Mississauga	Not Started
13-3	Develop innovation challenges to provide opportunities for the public to co-problem solve local issues or problems (e.g., localized flooding), test out new ideas, and connect with the City	Paused
13-4	Explore innovative pilot projects and opportunities to enhance resilience and reduce greenhouse gas emissions (e.g., heat pump retrofits)	Ongoing
13-5	Work with industry and businesses to support initiatives to decrease emissions and enhance resilience	Ongoing
14-1	Develop a lifecycle cost analysis framework to apply to all lifecycle replacements, equipment, and new buildings	Not Started
14-2	Apply a climate lens to Corporate business continuity plans for critical infrastructure sectors to ensure climate impacts are considered	Not Started
14-3	Develop a climate change decision-making framework or policy to guide municipal decision making	Not Started
15-1	Work with partners to provide input to industry on emerging low carbon technologies for specific applications to deliver City services	Not Started

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Action		Status
15-2	Research changes and innovation in the transportation and energy sectors to identify low-carbon opportunities for the Corporate fleet	Ongoing
16-1	Develop a Corporate waste reduction strategy	Underway
16-2	Develop and maintain industry and community partnerships to provide consistency, control operational costs, and improve waste diversion rates	Underway
16-3	Explore opportunities to implement the circular economy to reduce waste	Ongoing

## Low Emissions Mobility

Action		Status
17-1	Use improved analytical platforms (e.g., telematics) to monitor driver behaviour and develop a driver training program to reduce fuel consumption and Corporate idling	Underway
17-2	Develop a green fleet policy to (1) prioritize electrification opportunities for all City fleets and equipment; and (2) continue to identify opportunities for proper vehicle allocation, route optimization, and right-sizing fleet	Complete
17-3	Electrify the light duty transit vehicles and Corporate fleet and equipment and expand use of renewable fuels	Underway
17-4	Assess charging infrastructure options for future electrification of transit (e.g., depot vs. on-route charging)	Underway
17-5	Replace the transit bus fleet with low or zero emission vehicles	Ongoing

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Action		Status
17-6	Pursue innovative low or zero emissions pilot and partnership opportunities (e.g., hydrogen or electric bus pilots)	Ongoing
17-7	Assess infrastructure readiness for electric vehicle charging infrastructure in Corporate and municipal parking facilities to accommodate the electrification of the Corporate and transit fleets	Ongoing
18-1	Encourage and enable micro-mobility systems and establish a policy framework for shared micro-mobility systems (e.g., bike share) in Mississauga	Underway
18-2	Include climate change considerations (e.g., extreme weather, tree canopy) in the development of the Complete Streets Design Guidelines as per Action 1 of the City's Transportation Master Plan	Underway
18-3	Develop a zero emissions vehicle strategy to accelerate the adoption of zero emissions vehicles	Underway
18-4	Prioritize active transportation improvements in roadway development and redevelopment	Ongoing
18-5	Install electric vehicle charging infrastructure at City-owned properties (e.g. city hall) for use by employees and the general public	Underway
18-6	Work with industry partners and other levels of government to promote innovative technologies and pursue alternative fuels initiatives in the goods movement sector	Not Started
18-7	Develop transportation demand management requirements for new developments in line with Recommendation #4 in the City's Transportation Demand Management Strategy and Implementation Plan	Underway

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Action	Status
<b>18-8</b> Identify and address gaps and inconsistencies in the pedestrian network, consistent with Action 14 of the City's Transportation Master Plan	Underway
<b>18-9</b> Expand the City's bicycle parking supply, including short-term and long-term facilities on commercial, residential, and City-owned properties, consistent with Action 1.4 in the Cycling Master Plan Update (2018)	Ongoing

## Engagement and Partnerships

Action	Status
<b>19-1</b> Work with partners to support industry and all levels of government in promoting and developing low carbon and resilient standards, policies, and programs	Ongoing
<b>19-2</b> Pursue opportunities to collaborate with community groups and organizations to accelerate climate action	Ongoing
<b>19-3</b> Develop an education program on climate and emergency preparedness	Ongoing
<b>19-4</b> Assess the public's familiarity with and views on climate change and develop a behaviour change strategy to inform current and future engagement work	Paused
<b>19-5</b> Develop climate hubs to establish a centre for climate-related training programs, information, tools, and networks	Paused
<b>19-6</b> Create targeted programming based on energy usage in residential, commercial, and industrial buildings to promote energy efficiency retrofits	Underway
<b>19-7</b> Work with partners to advocate to the provincial and federal governments for funding to improve low-carbon transit	Ongoing



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Action		Status
20-1	Showcase new and existing climate actions throughout the city through signage, promotional materials, case studies, awards, etc.	Ongoing
20-2	Promote and engage community groups, businesses, and municipal staff in workplace transportation demand management (TDM) programs across Mississauga	Paused
20-3	Develop targeted outreach and engagement opportunities for youth in Mississauga	Ongoing
20-4	Develop and deliver training to 311 staff to connect residents and businesses with new and existing programs to promote and support rebates, incentives, products, and services	Not Started
20-5	Work with partners to deploy programs to drive climate action in the business sector	Ongoing
20-6	Conduct community action campaigns to promote individual action on climate change	Ongoing
21-1	Develop a climate-themed event as part of the Smart City Centre for Civic Curiosity	Not Started
21-2	Develop tools and technologies (e.g., surveys, apps) to support and drive behaviour changes in the community	Ongoing
21-3	Develop a community climate leaders program to encourage, support, and empower key target audiences (e.g., youth, businesses) in Mississauga to take action	Not Started
21-4	Explore opportunities to provide information about financial and non-financial incentives for home energy and resilience retrofits (e.g., energy efficiency upgrades, renewable installations)	Underway