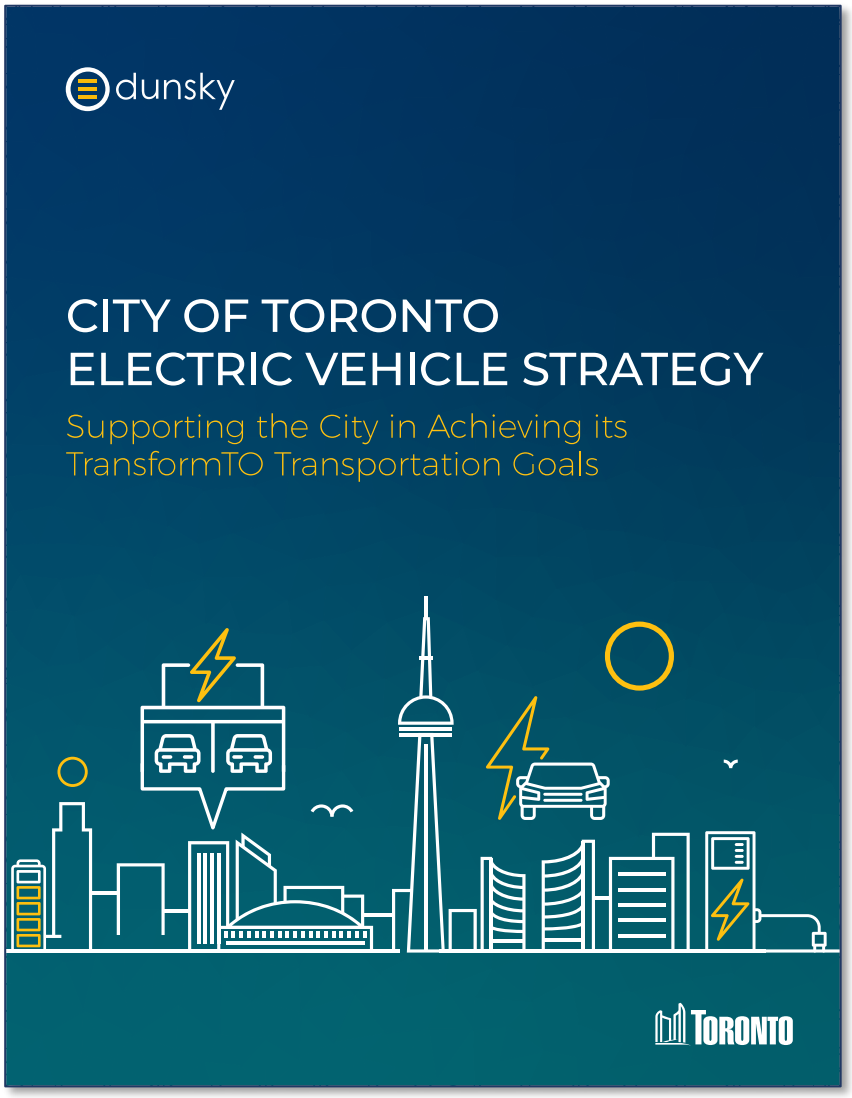
TORONTO



ELECTRIC VEHICLE STRATEGY

IMPLEMENTATION STATUS UPDATE

July 2022

INTRODUCTION

Toronto's first Electric Vehicle (EV) Strategy was approved by City Council on January 29, 2020. The EV Strategy identifies specific actions that the City of Toronto can take to encourage and support Toronto residents, commuters, and businesses to switch from gasoline- and diesel-powered vehicles to electric vehicles.

The EV Strategy focuses on passenger vehicles (cars, vans, trucks, and SUVs), and includes 10 actions the City can take to:

- Increase charging availability;
- Address cost and convenience barriers;
- Increase public awareness and education; and
- Create economic opportunities that will benefit the local economy.

This report provides the first status update on implementation of the EV Strategy.

EV STRATEGY IMPLEMENTATION UPDATE - OVERVIEW

The City is undertaking numerous initiatives to support the transition to electric vehicles, including actions specified in the EV Strategy, with several City Divisions, Agencies, and Corporations working individually and in collaboration with each other on the various initiatives. The cross-corporate EV Working Group serves as a focal point for coordination of the City's EV-related activities.

Figure 1 is the implementation roadmap from the EV Strategy, with an additional column at the right hand side to show the implementation status of each action as of May 2022. Green indicates that the action is either complete or underway, blue that the action is planned for the next 1-2 years, and grey that the action is not complete, underway, or planned for the next 1-2 years. Each EV Strategy action is undertaken by one or more City Divisions, Agencies, or Corporations identified as the lead(s) for that action, with support provided as needed from other Divisions, Agencies, or Corporations.

In general, EV Strategy implementation is on track. As shown in Figure 1, most of the EV Strategy actions with an "Immediate" timeline are underway, with the exception of actions 1.1, 1.2, 1.3, and 2.2. With the additional resources now available in Environment and Energy Division, these actions will be undertaken over the coming 1-2 years. It is not anticipated that this delay will materially affect the timeline for the transition to EVs in Toronto.

Most of the Near Term (2021-2023) actions in the EV Strategy are also either underway or planned for the next 1-2 years. The exception is action 9.2: Explore opportunities to avoid waste and support end-of-life reuse. While this action is not currently in the

Figure 1: Electric Vehicle Strategy Implementation Roadmap and Status Update as of July, 2022

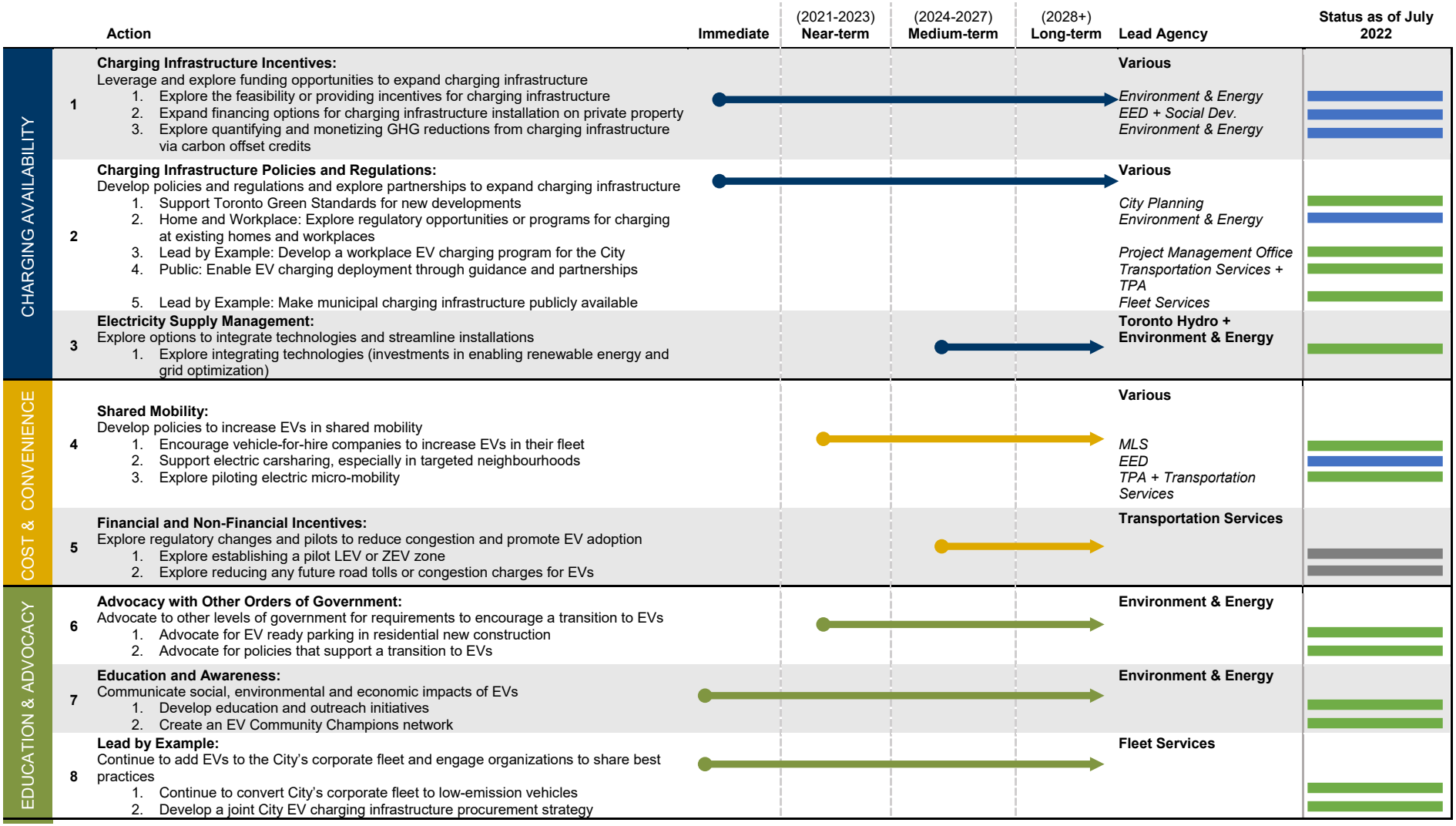


Figure 1: Electric Vehicle Strategy Implementation Roadmap and Status Update as of July, 2022, continued

		Action	Immediate	(2021-2023) Near-term	(2024-2027) Medium-term	(2028+) Long-term	Lead Agency	Status as of July 2022
ECONOMIC OPPORTUNITIES	9	**Research and innovation:** Support EV related research 1. Support post-secondary institution and private sector EV research 2. Explore opportunities to avoid waste and support end-of-life reuse		→	→	→	**Environment & Energy**	
	10	**Economic impacts of EVs:** Promote economic benefits of EV technology in Toronto 1. Support efforts to host EV industry events 2. Help attract EV-related industries and businesses		→	→	→	**Economic Development and Culture**	

Status Legend: Complete or underway; Planned for 2022-2023; Not complete, underway or planned for 2022-2023

workplan for the coming 1-2 years, staff will take advantage of opportunities to pursue this topic as they arise.

Additionally, work has begun on a Medium Term (2024-2027) action: Toronto Hydro is proceeding with two initiatives exploring the enablement of renewable energy and grid optimization (action 3).

ELECTRIC VEHICLE STRATEGY – IMPLEMENTATION DETAILS

This section provides details on the implementation of actions in the City of Toronto Electric Vehicle Strategy, as of July 2022. Each action has a timeline, which is shown in the Electric Vehicle Strategy Implementation Roadmap (Figure 1) and at least one activity. Table 1 lists the actions and the activities; clicking on the title of each action will go to the page in this report where that action is discussed.

Table 1: EV Strategy Actions and Activities

CHARGING AVAILABILITY	**1. Charging Infrastructure Incentives** • Explore the feasibility or providing incentives for charging infrastructure • Expand financing options for charging infrastructure installation on private property • Explore quantifying and monetizing GHG reductions from charging infrastructure via carbon offset credits
	2. Charging Infrastructure Policies and Regulations • Support Toronto Green Standards for new developments • Home and Workplace: Explore regulatory opportunities or programs for charging at existing homes and workplaces • Lead by Example: Develop a workplace EV charging program for the City • Public: Enable EV charging deployment through guidance and partnerships • Lead by Example: Make municipal charging infrastructure publicly available
	3. Electricity Supply Management • Explore options to integrate technologies and streamline installations • Explore integrating technologies (investments in enabling renewable energy and grid optimization)

Table 1: EV Strategy Actions and Activities, continued

COST & CONVENIENCE	**4. Shared Mobility** • Encourage vehicle-for-hire companies to increase EVs in their fleet • Support electric carsharing, especially in targeted neighbourhoods • Explore piloting electric micro-mobility
	5. Financial and Non-Financial Incentives • Explore regulatory changes and pilots to reduce congestion and promote EV adoption • Explore establishing a pilot LEV or ZEV zone • Explore reducing any future road tolls or congestion charges for EVs
EDUCATION & ADVOCACY	**6. Advocacy with Other Orders of Government** • Advocate for EV ready parking in residential new construction • Advocate for policies that support a transition to EVs
	7. Education and Awareness • Develop education and outreach initiatives • Create an EV Community Champions network
	8. Lead by Example • Continue to convert City's corporate fleet to low-emission vehicles • Develop a joint City EV charging infrastructure procurement strategy
ECONOMIC OPPORTUNITIES	**9. Research and Innovation** • Support post-secondary institution and private sector EV research • Explore opportunities to avoid waste and support end-of-life reuse
	10. Economic Impacts of EVs • Support efforts to host EV industry events • Help attract EV-related industries and businesses

Action 1:
Explore options to integrate technologies and streamline installations

Timeline: Medium-term (2024-2027)

Activity #1: Explore the feasibility of providing incentives for charging infrastructure

From the Electric Vehicle Strategy:

The City should explore options for providing incentives in home, public, workplace and fleet settings. Each segment has its own set of benefits and challenges.

1. *Home: Most EV charging occurs at home (with Level 1 or Level 2 infrastructure). Not all residents will benefit from incentives for home charging (i.e. some residents who are garage orphans, lacking a private parking space on their property). Other residents may need more funding (i.e. existing MURBs typically require greater cost to install charging infrastructure).*
2. *Public: Charging curbside (i.e. on-street) or in parking areas at publicly or privately owned destinations. Typical infrastructure is Level 2 or DCFC. Increased access to public infrastructure reduces reliance on home and/or workplace charging.*
3. *Workplace: Shared charging for employee parking areas. Can be open to public use, but typically dedicated to employees.*
4. *Fleet: Charging infrastructure for corporate or delivery fleets, typically used in support of an organization's operations and activities. Can be open to public use where feasible or dedicated to the fleet.*

Incentives could take the form of rebates or tax incentives. Rebates will likely be reliant on third-party funding, which the City should actively solicit.

Status Update, May 2022:

- The Atmospheric Fund's EV Station Fund provides funding (up to 50 percent of project costs) to eligible stakeholders throughout the Greater Toronto and Hamilton Area (GTHA) for installation of EV charging infrastructure. The EV Station Fund aims to serve the community equitably and will prioritize installation of chargers in underserved areas such as multi-family residential buildings, community properties, and on-street parking. The EV Station Fund was launched in January 2022.
- In 2022-2023, Environment and Energy Division staff will determine options the City can pursue to support and encourage provision of EV charging infrastructure in existing residential and commercial buildings in Toronto. This will be informed by engagement with stakeholders to better understand their needs, the challenges they face, and potential opportunities.

Activity #2: Expand financing options for charging infrastructure installation on private property

From the Electric Vehicle Strategy:

Toronto homeowners and building owners can get low-interest loans from the City to cover the cost of targeted improvements to their homes and buildings. The Home Energy Loan Program (HELP) and High-Rise Retrofit Improvement Support Program (Hi-RIS) respectively support single family and multifamily property improvements (e.g. installing energy efficiency, renewable energy, water conservation, and other defined measures). City Council recently approved the inclusion of EV charging stations (Level 2) in these programs.

While at a minimum, the City should continue to support EV charging infrastructure as an eligible improvement under these programs, there are also opportunities to:

- *Expand the eligibility of participants for EV charging infrastructure financing outside of the residential sector;*
- *Dedicate additional funds to financing EV charging improvements; or*
- *Increase marketing efforts to have more residents knowledgeable and participating in these programs.*

Status Update, May 2022:

- The Home Energy Loan Program (HELP) supports single family property improvements (e.g. installing energy efficiency, renewable energy, water conservation, and other defined measures including EV charging infrastructure).
    - To date, one EV charging station has been funded under the Home Energy Loan Program, with a second installation pending.
- The City's Energy Retrofit Loan program provides low-interest loans to help building owners improve the energy efficiency of their buildings. EV charging infrastructure can be eligible for financing under this program when included in a retrofit project that results in energy cost savings.
    - To date, there has been one EV-related project financed under the Energy Retrofit Loan program, involving 32 Level 2 and 16 Level 3 (DCFC) charging stations.
- In 2022-2023, Environment and Energy Division (EED) staff will explore equitable options the City can pursue to support and encourage provision of EV charging infrastructure in existing residential and commercial buildings, informed by engagement with stakeholders to better understand their needs, the challenges they face, and potential opportunities.

Activity #3: Explore quantifying and monetizing GHG reduction from charging infrastructure via carbon offset credits
From the Electric Vehicle Strategy: *Explore the potential for City assets to be used to generate carbon offset credits and allocate revenues from the sale of credits to be reinvested in actions that:* • *Expand the network of charging infrastructure;* • *Reduce the cost of EV ownership through financial incentives; or* • *Educate or inform consumers of the benefits of EVs.*
Status Update, May 2022: • This action is in Environment and Energy Division's 2022-2023 workplan.

Action 2:

Develop policies and regulations and explore partnerships to expand charging infrastructure

Timeline: Immediate

Activity #1: Support Toronto Green Standards for new developments

From the Electric Vehicle Strategy:

The TGS are the City's sustainable design requirements for new private and city-owned developments. Tier 1 performance measures are mandatory and require charging units in:

- *20% of parking spaces in Mid to High-rise and Commercial buildings; and*
- *25% of parking spaces in City-Owned facilities.*

In addition, 100% of parking spaces must be designed EV capable (i.e. must be designed to allow for future installation). Opportunities exist to further TGS' support by:

1. *Mandating 100% EV ready to require parking spaces to feature a complete electrical circuit terminating in an electrical outlet for the purpose of EV charging. To classify as EV ready, charging units are not required to be installed in the parking spots. This update will simplify and reduce the cost of future charging infrastructure installation.*
2. *Amending Low-Rise Residential building (i.e. 4 storeys or less with a minimum of 5 dwelling units) requirements to mandate EV ready charging infrastructure for parking spaces.*
3. *Supporting developers in achieving the TGS requirements (e.g. educate on technical options available, or develop guides, case studies). Increased awareness of load management technologies can support meeting a 100% EV ready requirement without a significant increase in cost.*

Status Update, May 2022:

- The City of Toronto has introduced and increased EV charging requirements for new development through the Toronto Green Standard since 2010. In December 2021, City Council approved the introduction of EV charging infrastructure requirements in the City-wide Zoning By-law, which has the effect of extending EV charging requirements to all new buildings. These requirements are that all parking spaces in buildings for residents must be equipped with an adjacent Energized Outlet capable of providing Level 2 charging or higher and 25% of all other parking spaces in buildings must also be so equipped. Electric vehicle supply equipment, otherwise known as EVSE or EV charging stations, may be installed later by the developer, a condominium corporation, or the owner of the parking space using the energized outlet in place. Toronto Green Standard version 4, which came into effect on May 1,

2022 for new planning applications, includes the Zoning By-law EV Ready requirements.

- As with the Toronto Green Standard, the Zoning By-law's residential EV-related requirements may be implemented using any of the following strategies: dedicated electrical outlet, receptacle or EVSE supplied by a separate branch circuit or using Electric Vehicle Energy Management Systems (EVEMS) load sharing technologies, which allow multiple vehicles to charge on the same circuit reducing both power requirements and installation costs.
- To make it easier to install EVSE and limit the number of variance applications, the new zoning amendments introduce permissions for EV infrastructure to be located within defined areas of the parking space. EVSE installed in these locations will not be considered obstructions to the required minimum parking space dimensions. Previously, the Zoning By-law did not allow any fixed objects within the minimum required dimensions of a parking space, including EV equipment. This resulted in many applications for Zoning By-law amendment or minor variance to install EV charging equipment within a parking space.
- It's important to note that this is not the only permitted location to install EV charging equipment. EV infrastructure can also be installed outside and adjacent to the parking space, as long as it complies with other regulations in Zoning By-law 569-2013, including those related to obstructions. The Electrical Safety Code has additional requirements related to the location of electrical equipment which may further restrict where EVSE can be located, or specify additional safety measures.
- In 2022-2023, City Planning and Environment and Energy Division will work in collaboration with the Clean Air Partnership will engage with the development industry and create information resources to support the industry in meeting the City's EV charging infrastructure requirements.

Activity #2: Home and Workplace: Explore regulatory opportunities or programs for charging at existing homes & workplaces

From the Electric Vehicle Strategy:

The City should explore approaches to support the installation of charging infrastructure in existing buildings. These approaches need to consider the unique challenges of installing charging infrastructure in existing structures, while also preserving housing affordability. A review of the City's legal authority to require minimum levels of charging infrastructure would also be beneficial.

An initial step will be further, more targeted, consultations with homeowners, multifamily building owners, workplace owners, contractors, property managers, and charging infrastructure suppliers to understand the opportunities for increasing charging availability in the existing building stock. With a clear understanding of these opportunities, the City will

consider appropriate approaches to support charging infrastructure development in workplaces.

For residential buildings, the barriers and opportunities will vary by segment:

1. *Existing Single Family Homes with access to a private parking space primarily face a financial hurdle to install infrastructure.*
2. *Existing MURBs with private parking spaces can face substantially greater financial, physical, and administrative barriers to install charging infrastructure.*
3. *Garage Orphans, lacking a private parking space on their property, face greater barriers; this leads them to be reliant on public or workplace charging infrastructure.*

With a clearer understanding of the barriers and opportunities, the City can consider appropriate policies to support charging infrastructure development. In addition, exploring how to increase signage and wayfinding for charging stations to help residents find chargers.

Finally, one consistent concern that was heard from the public was around lack of access to home charging. Some ideas that were shared repeatedly were to explore the option for allowing front-yard parking permits to support home charging or create neighbourhood charging hubs. These types of options should be further explored.

Status Update, May 2022:

- In 2022-2023, Environment and Energy Division staff will determine policy and programmatic options the City can pursue to support and encourage provision of EV charging infrastructure in existing residential and commercial buildings in Toronto. This will be informed by engagement with stakeholders to better understand their needs, the challenges they face, and potential opportunities.
- Optimally, provision of EV charging infrastructure in existing buildings will occur in the context of overall electrification of these buildings in order to achieve the City's goal of reaching net zero GHG emissions by 2040. Therefore, a priority will be to ensure that policy and programs related to EV charging infrastructure are integrated into or harmonized with implementation of the Net Zero Existing Buildings Strategy.

Activity #3: Lead by Example: Develop a workplace EV charging program for the City

From the Electric Vehicle Strategy:

The City should lead by example through the establishment of a workplace charging program that will provide charging infrastructure for a percentage of the City's workforce that commutes via personal vehicle.

Developing a workplace charging program will also provide a valuable learning opportunity for the City to understand the opportunities and challenges for expanding workplace charger availability. For example, in support of this initiative, the City could develop a policy manual

for workplace charging and hold short information sessions for interested employees regarding proper usage and etiquette of charging infrastructure.

To support other workplaces, the City should explore making internally developed materials publicly available (e.g. policy manual for workplace charging, information session presentations) and also provide workshops or learning opportunities to residents and local workplaces.

Status Update, May 2022:

- Since 2019, the City has been operating a pilot workplace EV charging program with EV charging stations available for City employee use at City Hall and Metro Hall (4 Level 2 charging stations at each location).
- Fleet Services Division is leading a major expansion of the City's corporate EV charging infrastructure that will enable and support accelerated transition of City Fleets to electric vehicles. The expanded charging station network is estimated to be launched by Q3 2022. The network will also enable the expansion of the City's workplace charging program, and will be made accessible to public where feasible. Fleet Services launched an employee survey on March 21, 2022 to help inform the development and implementation of the City's workplace charging program.

Activity #4: Public: Enable deployment through guidance and partnerships

From the Electric Vehicle Strategy:

The City should undertake the following four sub-actions to increase public infrastructure:

1. *Identify high-priority areas for public charging infrastructure. The City is to identify high-priority areas for public charging infrastructure. This research is necessary to identify where charging infrastructure is most valuable, most needed, and not detrimental to other land uses or the electric grid. This activity will be very important to guide the installation of public charging infrastructure.*

   It should be noted that it is not an easy undertaking; significant time and resources will be required.

2. *Explore partnerships with other entities to install public charging infrastructure. The City should look for ways to partner with other entities to leverage private investment to deploy public charging infrastructure. Significant interest was shown by the private sector to work with the City during the development of this Strategy's stakeholder engagement workshops;*
3. *Establish a preferred approach to roll out public charging infrastructure. In collaboration with partners, an approach should be agreed upon for the roll-out of public charging infrastructure. Ultimately, the approach selected should include a combination of Level 2 and DCFC infrastructure.*

4. *Reduce barriers to the installation of public charging infrastructure. The City is to prioritize reducing barriers within its control to deploying public charging infrastructure. Barriers may include access to public rights-of-way and rules regarding use of public lands. For example, the City could explore:*
    - *Allowing and/or prioritizing public charging infrastructure in public rights-of-way;*
    - *Adopting single-side parking on alternate-side parking streets to facilitate charging infrastructure installation;*
    - *Converting roadside lamps to charging ports;*
    - *Allowing overnight charging in underutilized lots (e.g. parks, community centres, churches, TTC lots); or*
    - *Allowing reserved parking for charging in residential neighbourhoods.*

Status Update, May 2022:

- On-street EV charging program
    - Toronto Hydro and Transportation Services partnered to install 17 EV charging devices on nine streets across the city for a 12-month pilot period beginning October 1, 2020. These stations are part of two separately approved Council pilots referred to as the Downtown and Residential Electric Vehicle Charging Station pilots, which aim to achieve the following goals:
        - Understand charging usage in the City of Toronto;
        - Help permit parking holders gain access to on-street charging;
        - Understand charging in combination with paid parking; and
        - Support the reduction of GHG emissions and other emissions harmful to air quality.
    - In January, 2022, City Council approved an extension of the pilots to May 31, 2022. City Council also directed the General Manager, Transportation Services to work with Toronto Hydro, the Toronto Parking Authority, and relevant stakeholders to install an additional 17 or more on-street charging stations in 2022. Transportation Services expects to install 32 additional on-street charging stations in 2022, with funding support from The Atmospheric Fund and Energy and Environment Division and project execution support from Toronto Hydro.
    - City Council has directed that a minimum of 50 public on-street EV charging stations be installed in 2023.
    - Beginning in 2023, Toronto Parking Authority will take over responsibility for installing and operating all City-provided on-street public EV charging stations.
- Parking Garage Charge Station Pilot Project
    - This is a joint pilot project of Toronto Parking Authority (TPA) and Toronto Hydro to deploy 32 EV charging stations at TPA-operated parking facilities. The pilot will be executed in two phases:
        - Phase 1 will upgrade TPA's 9 existing legacy EV charging stations to Level Two (L2) smart chargers

        - Phase 2 will add 20 additional L2 charging stations and 3 fast charging stations
    - Feasibility and design work is now underway and installation will be complete by the end of 2022.

- Toronto Parking Authority's Electric Vehicle (EV) Charging Program
    - As the centrepiece of its strategic platform, Toronto Parking Authority (TPA) is developing an Electric Vehicle (EV) Charging Program that will leverage TPA's portfolio of 300+ off-street facilities and 20,000 on-street parking spaces to develop a public network of EV charging. EV charging services are a key component of TPA's transformation to a mobility provider, while also supporting the City of Toronto's Net Zero Strategy and will support TPA's growth and financial returns over the long-term.
    - As part of Phase 1 of TPA's EV Charging Program, TPA is planning to install up to 500 EV chargers at TPA off-street parking facilities by the end of 2024 including a minimum of 108 new charging ports in 2022 alone. This will represent the first phase of TPA's EV Charging Infrastructure Plan, which will see a comprehensive network of EV infrastructure constructed across TPA's portfolio of off-street and on-street parking.
    - Development of the Phase 1 EV Charging Program involves a number of workstreams that are being carried out in parallel to advance the work as quickly as possible. These workstreams are now underway and include:
        - The development of an EV Charging Infrastructure Deployment Plan, which will identify where TPA should invest in EV charging infrastructure, as well as the type and number of chargers;
        - The completion of site readiness assessments, which will confirm the hydroelectric capacity available for the EV charging infrastructure; and
        - The completion of engineering design and tendering for the EV charging infrastructure to be installed, as well as, contract administration services for the actual installations carried out by others.

- City Divisions, Agencies, and Corporations will work together to ensure that public EV charging infrastructure is deployed in a way that optimizes the key areas of user experience including:
    - Interoperability of charging stations (a single card or app access to all City-provided charging stations)
    - Alignment on fees charged to users while ensuring equitable access to EV charging
    - Alignment on branding and signage, to minimize confusion and allow users to easily find and use City-provided charging stations.

- Public EV Charging Infrastructure Plan
    - In 2022-2023, Environment and Energy Division will coordinate development of a Public EV Charging Infrastructure Plan. The Plan will provide the detailed information needed for planning and decision-making for publicly-accessible EV charging infrastructure across Toronto between 2023 and 2040, and will involve three interconnected parts:
        1) Assessment of where publicly-accessible EV charging will be needed over time;
        2) Identification of potential locations for the needed publicly-accessible EV charging infrastructure; and
        3) Identification and evaluation of different models for investment in and ongoing operation of this infrastructure
    - The Plan will be developed by a consulting team with guidance from an EED Program Manager and a Steering Committee with representatives from Toronto Hydro, Toronto Parking Authority, Transportation Services, and possibly other City divisions. Target completion is Q2 2023.
    - The Plan will draw on work already underway, including the on-street charging program and TPA's deployment plans for EV charging services, and will involve extensive public and stakeholder engagement. The Plan will also integrate with relevant initiatives currently underway, including the City-wide Parking Strategy and the development of by-law updates and complementary programs to achieve the vehicle electrification targets that were approved by City Council in December 2021.
- The Atmospheric Fund’s EV Station Fund program
    - The Atmospheric Fund’s EV Station Fund provides funding (up to 50 percent of project costs) to eligible stakeholders throughout the Greater Toronto and Hamilton Area for installation of EV charging infrastructure, including for installation in public places and on-street. Not only is the EV Station Fund a potential funding resource for public EV charging infrastructure in Toronto, but insights and experiences from projects funded by the EV Station Fund can inform subsequent public EV charging infrastructure deployment.
- City-wide Parking Strategy
    - The City will be developing a City-wide Parking Strategy that seeks to effectively manage Toronto's parking system as key driver to advancing a number of Council-approved policies and objectives, including achieving TransformTO targets, ensuring future economic vitality for the city and its businesses, advancing improvements to mobility and our transportation network and other critical pieces of work that support neighbourhoods and residents. The development of the City-Wide Parking Strategy is a collective effort between several City partners that have mandates requiring innovation related to Toronto's parking systems and infrastructure and is expected to be presented to Council in early 2024.

Activity #5: Lead by Example: Make municipal charging infrastructure publicly available

From the Electric Vehicle Strategy:

Explore the opportunity to offer the City's private charging infrastructure for public use during times of non-use (e.g. at night when employees are at home). When exploring this opportunity, it will be important to understand potential liability concerns with granting access to the public.

Opportunities for access may exist for various City groups, including Fleet Services, TTC, and the Toronto Parking Authority. It is likely that the barriers facing each group, and even within each group, will vary depending on the location and type of charging infrastructure.

Status Update, July 2022:

- Fleet Services Division is leading a major expansion of the City's corporate EV charging infrastructure that will enable and support accelerated transition of City Fleets to electric vehicles. The expanded charging station network is estimated to be launched by Q3 2022. The network will also enable the expansion of the City's workplace charging program, and will be made accessible to public where feasible. The expanded City of Toronto corporate EV charging station network is expected to have 350 charge ports available by the end of 2022, and 1,200 charge ports available by 2025 at more than 100 City locations.

Action 3:
Explore options to integrate technologies and streamline installations

Timeline: Medium-term (2024-2027)

Activity #1: Explore integrating technologies (investments in enabling renewable energy and grid optimization)

From the Electric Vehicle Strategy:

Accommodate the integration of technologies including EVs, their charging infrastructure, and renewable generation into the electrical grid. Initial steps include:

1. *Investigate battery storage to enable fast EV charging infrastructure;*
2. *Track EV charging using meter data to assess impact on distribution grid and optimize upgrades;*
3. *Investigate power quality impacts on grid due to vehicle charging; and*
4. *Investigate vehicle grid bidirectional charging impact.*

Status Update, July 2022:

- Toronto Hydro is proceeding with two initiatives exploring the enablement of renewable energy and grid optimization.
- The Renewable-Enabling Energy Storage System program (REBESS) is designed to address issues arising from having higher photovoltaic (PV) load compared to grid load on some of our feeders. Significant amounts of renewable generation from Toronto Hydro customers would result in a fundamental change in the direction of the power flow conditions on our distribution grid. Research shows that large-scale deployment of renewable generation on the grid can cause issues such as unintentional islanding and overvoltage on feeders. In addition to avoiding such issues, other benefits of implementing REBESS include:
    - Deferral of distribution capacity upgrades
    - Electric-energy time shift
    - Solar PV operation support
    - Voltage support
    - Electric Vehicle (EV) charging support
- The Grid Performance Energy Storage System (GPESS) program targets the application of battery energy storage systems to address and eliminate issues such as voltage flickers and momentary interruptions, and provide ride-through capabilities for customers while improving the overall reliability of the grid. Benefits of implementing GPESS units can include:
    - Improved power quality and reliability
    - Solar PV operation support
    - Deferral of distribution capacity upgrades

  - Voltage support
  - EV charging support
  - Black-start capabilities

- In addition, Toronto Hydro launched its EV Smart Charging Pilot Program in partnership with Plug'n Drive and Elocity Technologies Inc. This free pilot is available to select residential EV charger owners who live in Toronto. The program aims to help improve the EV charging experience and will assist Toronto Hydro in developing future EV programs.
- Selected participants will receive a free Hyper Integrated EV (HIEV™) EVPlug smart charging device, a solution by Elocity Technologies Inc. This smart device is expected to allow the participant to control their EV charging schedule using a smartphone app.
- The goals of this pilot are to:
  - Understand EV charging patterns and behaviours in Toronto, including duration, frequency and time of charging
  - Control charging schedule
  - Gather information to assist in the development of future programs and to offer increased support for EV drivers
  - Provide EV charger owners with access to monitor, schedule and control charging through a mobile app
  - Understand grid impacts and EV charging demands

Action 4:

Shared Mobility: Develop policies to increase EVs in shared mobility

Timeline: Near-term (2021-2023)

Activity #1: Encourage vehicle-for-hire companies to increase EVs in their fleet

From the Electric Vehicle Strategy:

The City should explore ways to encourage vehicles-for-hire to electrify. The City could transition the industry via:

- *Regulations. The City could explore modifying the Vehicle-for-Hire By-law to gradually require vehicles-for-hire to electrify. Any changes to the By-law would reflect the availability of charging stations in the City and involve stakeholder and industry consultations.*
- *Incentives. The City could explore providing incentives to encourage vehicles-for-hire to electrify. For example, the City may explore the ability to offer discounted licensing fees to for-hire EVs.*

Informational resources developed for vehicles-for-hire may also support and encourage their electrification.

Status Update, July 2022:

- Municipal Licensing and Standards (MLS) has partnered with the University of Toronto to undertake an emissions calculations and modelling project. The amount of greenhouse gas emissions generated by Toronto's vehicle-for-hire industry is currently unknown, particularly in comparison to other transportation sources such as personal vehicles. Establishing an emissions baseline for the industry is critical as the City considers the most effective policy options and initiatives to meet emissions reduction targets and goals set out by Council. In addition, a baseline analysis is critical to determining the most effective and equitable policy options, as some emissions reduction initiatives may have financial implications on drivers, and this is typically an industry of already low-wages.
- While the University of Toronto project is underway, MLS is convening, in consultation with the Environment and Energy Division and The Atmospheric Fund, a Vehicle-for-Hire group, under the already established Electric Vehicle Working Group, that brings relevant stakeholders together to develop a strategy to accelerate emissions reductions and electrification of the vehicle-for-hire industry, including considerations for equity and potential implementation challenges for any proposed advice; the results of this work shall be considered by the Executive Director, Municipal Licensing

and Standards as an input to the development of any requirements or programs that seek to reduce emissions in the Vehicle-for-Hire industry.

- In December 2021, City Council directed MLS to report back in the first quarter 2023 on recommended by-law updates and complementary programs to achieve the vehicle electrification and emissions reductions targets for the vehicle-for-hire industry, including outcomes of the proposed Vehicle-for-Hire group under the Electric Vehicle Working Group, and results of the third-party vehicle-for-hire emissions study, with implementation beginning by the end of 2023.
- In December 2021, City Council also directed MLS to set a goal of Net Zero for 2030 for vehicles for hire, and to align the plans for vehicle electrification and emissions reduction to achieve this goal.

Activity #2: Support electric car sharing, especially in targeted neighbourhoods

From the Electric Vehicle Strategy:

In partnership with car-sharing companies, the City should explore the opportunity to support the expansion of EV car share fleets, especially in targeted neighbourhoods. Ideas to explore to facilitate a transition to EVs include:

- *Requiring some portion of public charging infrastructure in targeted neighbourhoods to be designated for car-sharing services (e.g. an on-street public Level 2 charging station with two ports could designate one port for car-sharing services)*
- *Designating on-street car share vehicle parking areas (CVPA) for EVs;*
- *Temporarily waiving or reducing car share permitting fees for EVs; or*
- *Prioritize the issuance of permits for CVPAs for EVs Charging infrastructure access for car-sharing services will likely be a primary concern for establishing EVs in their fleets.*

Status Update, July 2022:

- This action is in Environment and Energy Division's 2022-2023 workplan.

Activity #3: Explore piloting electric micro-mobility

From the Electric Vehicle Strategy:

The City could review piloting a city service for shared pedal assist ebikes through the Toronto Parking Authority, ensuring it complements bike sharing, public transit and Vision Zero safety for active travel modes. While such programs expand opportunities for electric mobility and alternatives to driving, it is important to research and monitor impacts on safety, affordability, public health, and the environment.

A pilot project approach would allow the city to evaluate the potential benefits (e.g. enabling last kilometer needs, reducing time for short trips, providing options for all demographics,

and encouraging residents to be more physically active) while also reviewing the challenges (e.g. concerns about safety risks for riders and the public, sidewalk and cycling path litter and obstructions, diversion of trips from active and less polluting modes [i.e. walking, cycling and public transit], e-waste, and emissions from collecting, recharging and re-distributing fleets) associated with electric micromobility.

Status Update, July 2022:

- Toronto Parking Authority's Bike Share program currently has a fleet of 300 e-bikes, which will increase to 525 in 2022. The program has 7 e-charging stations, increasing to 15 by the end of 2022. An e-bike currently gets about 2.5X the number of rides that a regular bike in the Bike Share system receives. A fully charged e-bike can travel for distances of 70km. They take about 8 hours to fully charge.
- Transportation Services Division is leading development of policy and programs related to electric micro-mobility devices. In recent years, this has involved assessing and making recommendations on the City's participation in provincial pilot projects for e-bikes and e-scooters.
- The City is allowing for the continued use of cargo e-bikes that support businesses in meeting unprecedented demand for local deliveries while also making way for a new micromobility pilot for large cargo e-bikes over 120kg unladen to operate on roads, bike lanes and cycle tracks, and to be able to park like other commercial vehicles, including in designated on-street commercial loading zones and delivery vehicle parking zones. The large cargo e-bikes are an emerging form of micromobility that are bicycles with additional carrying capacity, as well as an electric motor to assist cyclists pedalling with the additional weight. The City has opted-in to a provincial pilot project for large cargo e-bikes which will be launched in 2022 and will allow the City to evaluate use and impacts of such e-bikes in Toronto.
- Throughout the pandemic, cargo e-bikes have supported businesses in meeting enormous demand for local deliveries, as well as provided a new cycling option for residents and families to get around the city. Cargo e-bikes are popular among businesses and delivery agents because they are viewed as a safe, economically and environmentally sustainable alternative to delivery vehicles, and will play an important role in supporting Toronto's economic recovery from COVID-19.
- In May 2021, City Council voted to decline the option to participate in the provincial e-scooter pilot. Based on extensive research and information from other jurisdictions, this decision supports Toronto's commitment to safety and accessibility as well as the City's Vision Zero road safety plan. Both shared and privately-owned e-scooters remain prohibited on public streets, bike lanes, sidewalks, pathways, trails and other public spaces. They may be used on private property, with permission from the property owner.

Action 5:

Explore regulatory changes and pilots to reduce congestion and promote EV adoption

Timeline: Medium-term (2024-2027)

Activity #1: Explore establishing a pilot LEV or ZEV zone

From the Electric Vehicle Strategy:

The City can explore the establishment of a LEV or ZEV zone. A pilot project would be beneficial in determining the potential impacts of these zones, best practices, and lessons learned for future electrification.

When establishing a zone, access and equity will be an important consideration that should be included as part of the pilot project

Status Update, July 2022:

- A pilot LEV or ZEV zone may be an option for considered by Environment and Energy Division for incentivizing uptake of personal electric vehicles and disincentives to discourage use of fossil-fueled personal vehicles. This would be done in consultation with relevant City Divisions.

Activity #2: Explore reducing any future road tolls or congestion charges for EVs

From the Electric Vehicle Strategy:

In the longer term, if road tolls or congestion charges are implemented by the City, consider reducing or exempting EVs from their payment. As these types of charges are not currently imposed by the City, the development of a statement of intent would be sufficient until such a time that these types of charges are implemented. The City could also explore exempting deliveries made by EVs from regulations which restrict vehicle activities (e.g. Noise Bylaw).

Status Update, July 2022:

- Work has not begun on this action and is not planned for 2022-2023.

Action 6:

Advocate to other levels of government for requirements to encourage a transition to EVs

Timeline: Near-term (2021-2023)

Activity #1: Advocate for EV ready parking in residential new construction

From the Electric Vehicle Strategy:

As the City enforces the Ontario Building Code for new residential construction, the City should advocate to the Province to re-require EV readiness for new residential construction. EV ready requires parking spaces to feature a complete electrical circuit terminating in an electrical outlet for the purpose of EV charging.

Status Update, July 2022:

- When City Council approved the Net Zero Strategy in December, 2021, they requested that the Government of Ontario and Provincial agencies and corporations implement legislation, regulations, policies/or programs to encourage the transition to electric vehicles, including supporting and encouraging Electric Vehicles-ready new construction (item 2021.IE26.16, Part 15)
- Staff in City Planning and Environment and Energy will take advantage of opportunities to advocate that the Province of Ontario implement policies to support EV-ready new construction.
- The City's requirements for EV-ready new developments in the Zoning By-Law and Toronto Green Standard will ensure that all new construction subject to the development approval process will have 100% EV-ready residential parking spaces and that 25% of other parking spaces will also be EV-ready.

Activity #2: Advocate for policies that support a transition to EVs

From the Electric Vehicle Strategy:

Advocate for Provincial and Federal policies to encourage the transition to EVs. Opportunities exist at both levels of government for rebates for new and used vehicles, to establish a ZEV policy or mandate, or to maintain existing benefits for EV drivers (e.g. HOV lane access on provincial highways).

Status Update, May 2022:

- When City Council approved the Net Zero Strategy in December 2021, they requested that the Government of Ontario and Provincial agencies and corporations implement legislation, regulations, policies/or programs to encourage the transition to electric vehicles, including:
  - financial incentives for new and used Electric Vehicles;
  - financial incentives for home, workplace and fleet Electric Vehicles charging infrastructure;
  - establish a provincial sales mandate for Zero Emission Vehicles ("Zero Emission Vehicles" are battery-electric vehicles, plug-in hybrid electric vehicles or hydrogen fuel cell vehicles) that meets or exceeds any federal sales mandate for Zero Emission Vehicles:
  - support and encourage Electric Vehicles-ready new construction;
  - funding for publicly-accessible Electric Vehicle charging infrastructure, including for bi-directional chargers;
  - maintain existing benefits for Electric Vehicle drivers (e.g. High Occupancy Vehicle lane access on provincial highways); and
  - add financial incentives for purchasing all bikes, e-bikes and other non-carbon vehicles that are approved for use on City of Toronto road ways and cycling infrastructure. (item 2021.IE26.16, Part 15)
- City Council also requested that the Government of Canada and Federal agencies and corporations implement new and maintain existing financial incentives to encourage the transition to electric vehicles, including:
  - maintain purchase incentives for new electric vehicles and providing purchase incentives for used electric vehicles;
  - provide financial incentives for home, workplace and fleet electric vehicle charging infrastructure; and
  - provide funding to provinces and municipalities for public electric vehicle charging infrastructure, including for bi-directional chargers. (item 2021.IE26.16, Part 16)
- In August 2021, the Chief Planner & Executive Director of City Planning Division provided a response on behalf of the City to the Province of Ontario's Greater Golden Horseshoe Transportation Plan Discussion Paper. The response highlighted the need to transition to low carbon transportation.

- In Fall 2021, Transportation Services staff represented the City on the Province of Ontario's Transportation Electrification Council (TEC), advocating for City priorities with respect to transportation electrification. Following the conclusion of the TEC meetings, staff sent a letter to the Assistant Deputy Minister, Integrated Policy and Planning Division, Ontario Ministry of Transportation with a series of suggestions from City of Toronto staff, informed by the topic areas explored by the TEC and the technical background, expertise, and experiences of City of Toronto staff.
- In December 2021, the Federal Government released discussion papers on federal policy on zero emission light duty vehicles and medium and heavy duty vehicles, respectively. Due to the timing of the release (on December 17, 2021), the short time for response (responses were due January 21, 2022), and competing priorities, staff were not able to provide a City of Toronto response to either discussion paper.

Action 7:

Communicate social, environmental and economic impacts of EVs

Timeline: Immediate

Activity #1: Develop education and outreach initiatives

From the Electric Vehicle Strategy:

The City should pursue a number of different education and outreach initiatives, including:

1.1. Hosting a website that acts as centralized information hub;

1.2. Developing and/or promoting existing toolkits for targeted stakeholder segments:

- *Architects and developers: Include information on ensuring new construction is EV ready;*
- *Building operators, condominium boards, landlords and employers: Include information on installing and maintaining charging infrastructure; and*
- *Vehicle dealerships and sales staff: Include information on EV benefits to simplify sales process;*

1.3. The City to explore the creation of a resident-led public charging initiative to identify new locations for public charging infrastructure. This should include on-street charging. This initiative will help site new public charging across Toronto.

1.4. Promoting existing rebates for new and used EV purchases to ensure consumers are aware of these programs;

1.5. Leveraging affiliate agencies and corporations to partner and promote EV and charging information;

1.6. Exploring partnerships with non-governmental organizations or others to implement education and outreach initiatives; and

1.7. Developing standard signage requirements for EV charging infrastructure, to improve visibility and simplify the process for EV owners who are using a charging station at a new location.

When designing the education packages, information on both the benefits and challenges of vehicle electrification should be discussed. For example, as EVs are quieter vehicles, there may be new risks associated with pedestrian safety. Such challenges can be explored by the City to determine whether education and outreach are sufficient to mitigate the risk, or if further actions are required.

Status Update, July 2022:

- To increase awareness and understanding about EVs and support increased uptake of EVs in Toronto, the City is undertaking an EV Outreach Initiative in collaboration with Clean Air Partnership and Plug'n Drive. The EV Outreach Initiative will take place between January 2022 and March 2023 and will include:
    - Creating an EV exhibit and associated resources to take to events such as the National Home Show to engage with the public and raise awareness of EVs;
    - Developing and distributing print and online information and education materials on EVs, building on what is already available, and tailoring the materials to meet the specific needs of Toronto residents, businesses, developers, architects, contractors, and City of Toronto employees;
    - Conducting an EV outreach campaign with ongoing communication about EV benefits, news, rebates, etc. via newsletters, blog posts, social media and e-blasts;
    - Delivering EV-focused presentations;
    - Incorporating EVs into the City of Toronto Neighborhood Climate Action Champions Program;
    - Conducting online surveys at the outset of the project to better understand the information gaps and perceived barriers to EVs among Toronto residents and businesses; and
    - Conducting surveys during the project to gain insights into awareness changes due to the project.
- The EV Outreach Initiative is supported by a $300,000 grant from Natural Resources Canada's Zero Emission Vehicle Awareness Initiative.

Activity #2: Create an EV Community Champions network

From the Electric Vehicle Strategy:

Live Green Toronto develops programs and provides resources to engage the community to accelerate the reduction of GHG emissions. They actively engage residents in Toronto to support the City's initiatives. Creating an EV Community Champions network would help further engage residents in implementing the Strategy's actions. Initially, neighbourhoods that have high rates of EV adoption can be a preferred focus area for this activity

Status Update, July 2022:

- Rather than create a new community network, Environment and Energy Division will incorporate EVs into the existing Neighborhood Climate Action Champions Program. This approach leverages the infrastructure and volunteer connections that have already been created for the Neighborhood Climate Action Champions Program, and helps to integrate EVs into broader community engagement on climate action.

Action 8:

Continue to add EVs to the city's corporate fleet and engage organizations to share best practices

Timeline: Immediate

Activity #1: Continue to convert City's corporate fleet to low-emission vehicles

From the Electric Vehicle Strategy:

As part of the Sustainable Fleets Plan, the City will continue converting their fleets to low-emission vehicles including EVs. The plan will consider the current state of EV technology and determine which vehicles can be feasibly transitioned in the near future without compromising service quality. Barriers to the further electrification of light-duty vehicles (e.g. access to charging infrastructure, range limits) should be identified and solutions proposed to address these challenges. A key barrier to explore is the cost of developing charging infrastructure at the City's corporate sites.

In addition, the City should conduct outreach to the private sector, community organizations, and neighbouring jurisdictions to share lessons learned and best practices associated with fleet electrification.

Status Update, July 2022:

- The City's Sustainable Fleets Plan aims to transition City Fleets to sustainable, climate resilient, carbon-neutral operations. The Plan's key objectives are:
  - Transition 20 per cent of City-owned fleet to zero emission vehicles by 2025, and 50 per cent by 2030;
  - Achieve a 65 per cent greenhouse gas reduction by 2030 (from 1990 levels); and
  - Net zero greenhouse gas emissions by 2040.
- Fleet Services is undertaking a major expansion of City's corporate electric vehicle (EV) charging infrastructure to enable and support accelerated transition of City fleets to EVs, and help with broader promotion and adoption of EVs in Toronto, and the Greater Toronto and Hamilton region. The primary user group of the corporate charging network will be City-owned EVs. The network will also enable the expansion of the City's workplace charging program, and will be made accessible to public where feasible. The expanded City of Toronto corporate EV charging station network is expected to have 350 charge ports available by the end of 2022, and 1,200 charge ports available by 2025 at more than 100 City locations.
- The Toronto Transit Commission (TTC) Green Bus Program was approved by the TTC Board in November 2017, with the target of procuring only zero-emission buses starting in 2025 and achieving an entirely zero emissions bus fleet by 2040.

- Since the Board's approval of the Green Bus Program, the TTC has procured 310 of the latest clean diesel buses; 255 of latest generation hybrid electric buses (HEV); the City of Toronto's first 60 battery-electric eBuses, which entered service in 2019; and retrofitted three of TTC's eight garages with the required eBus charging systems infrastructure.
- The TTC has gained valuable experience from its last procurement of 255 HEVs and 60 eBuses. The TTC will be applying lessons learned to develop technical and commercial specifications for the next 600 new accessible buses, including approximately 300 HEVs and 240 eBuses, to be delivered in 2023 through early 2025.
- Since 2017, the TTC has been working in partnership with Toronto Hydro on the installation of required electrification infrastructure for the existing fleet of 60 eBuses. As the TTC continues on its path to full electrification of the bus, Wheel-Trans and non-revenue vehicle fleets, this infrastructure must be expanded accordingly. The TTC is working with Ontario Power Generation and Toronto Hydro to ensure on-time upgrade of the local grid distribution system and implementation of required infrastructure at TTC sites.
- Between 2018 and 2019, a total of 255 of the latest generation hybrid diesel-electric buses were procured by TTC. Hybrid diesel-electric buses are equipped with both a clean diesel engine and an electric generator/motor. The on-board batteries, which drive the electric traction motor, are charged by the generator driven by the diesel engine and supplemented by the recovery of braking energy through regenerative braking. The clean diesel engine used on the hybrid buses is smaller in size compared to the engines used in the clean and conventional diesel buses. In addition, these buses have all-electric accessories such as electric power steering, air compressor, etc. All these features result in a reduction in fuel consumption of 47%, and in turn, a proportional reduction in tailpipe emissions.
- TTC is currently working with the Infrastructure Canada to secure matching funds under the Zero Emissions Transit Fund. This would leverage existing funding, sourced through the City of Toronto's City Building Fund, to increase the next zero-emissions bus deployment from 240 to 400 eBuses and to accelerate deployment of charging infrastructure to prepare for the next 150 eBuses.

Activity #2: Develop a joint City EV charging infrastructure procurement strategy

From the Electric Vehicle Strategy:

A standardized City-wide electric vehicle charging infrastructure technical requirements would simplify procurement processes and streamline activities. Opportunities currently exist to harmonize standards by:

- *Identifying technical requirements for internal and public facing charging infrastructure; and*
- *Standardizing signage, installation standards, guidelines, and policies.*

Status Update, July 2022:

- Fleet Services is working closely with key City stakeholders on implementing a standardized approach to electric vehicle charging infrastructure development and management, including:
  - Coordinated charging infrastructure planning and development, including technical requirements and optimum capacity and energy management;
  - Standardized contract for procurement of electric vehicle supply equipment and associated services, available to all City entities; and
  - Standardized policies, user interface and information, signage, and other associated guidelines, processes, and procedures.
- City Divisions, Agencies, and Corporations will work together to ensure that public EV charging infrastructure is deployed in a way that optimizes the key areas of user experience, including:
  - Precedence for deployment aimed at integration with active transportation infrastructure and the public transit system in order to maximize public health benefits, reduce collisions, minimize emissions, and increase productivity through reduced traffic congestion.
  - Interoperability of charging stations (a single card or app access to all City-provided charging stations);
  - Maximize opportunity for shared infrastructure investment between EV charging for personal automobiles and deployment of electric micro-mobility
  - Alignment on fees charged to users while ensuring equitable access to EV charging; and
  - Alignment on branding and signage, to minimize confusion and allow users to easily find and use City-provided charging stations.

Action 9:

Support EV related research

Timeline: Immediate

Activity #1: Support post-secondary institution and private sector EV research

From the Electric Vehicle Strategy:

The City should support world class, innovative EV research in Toronto's post-secondary institutions and private sector through:

1. *Providing direct funding or in-kind support;*
2. *Providing timely and high-quality data for research projects;*
3. *Providing access to transportation and planning professionals to help inform and guide research; or*
4. *Incorporating research outcomes into pilot projects for real-world testing and verification.*

Ongoing research tends to attract funding and support for more research as research clusters have strong advantages for fostering collaboration and innovation. The City should focus its support for EV-related research in a way that will help leverage and attract support from other sources, while also supporting the City's own needs in the electric mobility landscape. Some potential research topics that could be addressed include:

- *Optimization of charging infrastructure distribution, siting and capacity*
- *Development of innovative customer interfaces for locating charging stations and making payments*
- *Vehicle grid integration opportunities, including smart charging and vehicle-to-grid*
- *Optimization of EV fleet logistics and charging, including for shared mobility applications.*

Status Update, July 2022:

- Municipal Licensing and Standards (MLS) has partnered with the University of Toronto to undertake an emissions calculations and modelling project concerning the vehicle-for-hire industry. The amount of greenhouse gas emissions generated by Toronto's vehicle-for-hire industry is currently unknown, particularly in comparison to other transportation sources such as personal vehicles. Establishing an emissions baseline for the industry is critical as the City considers the most effective policy options and initiatives to meet emissions reduction targets and goals set out by Council. In addition, a baseline analysis is critical to determining the most effective and equitable policy options, as some emissions reduction initiatives may have financial implications on drivers, and this is typically an industry of already low-wages.

- Fleet Services has had preliminary discussion on or is considering research on optimization of charging infrastructure distribution, siting and capacity; vehicle grid integration opportunities, including smart charging and vehicle-to-grid; and optimization of EV fleet logistics and charging, including for shared mobility applications.
- Environment and Energy Division (EED) staff met with researchers in the University of Toronto's EV Research Centre (https://utev.utoronto.ca/) and have connected them with Toronto Hydro and Toronto Parking Authority.
- Environment and Energy Division (EED) was the "client" for a University of Toronto graduate student project to identify approaches taken in other jurisdictions to incentivize uptake of EVs and disincentivize use of fossil fueled-vehicles. The project took place between January and April 2022 and resulted in a report with information that is a useful input to EED's work to prepare financial options and other incentives that the City could provide to encourage uptake of personal electric vehicles and disincentives to discourage use of fossil-fueled personal vehicles within the City of Toronto boundaries, as directed by City Council (item 2021.IE26.16, Part 12).
- Toronto Hydro is proceeding with two initiatives exploring the enablement of renewable energy and grid optimization, as discussed under Action 3 above.

Activity #2: Explore opportunities to avoid waste and support end-of-life reuse

From the Electric Vehicle Strategy:

The City can support research opportunities for new uses for EV batteries and components after the effective useful vehicle life. Support towards these types of opportunities, or access to municipal resources (e.g. EV batteries after decommissioning vehicles) could benefit the private sector or academics in this space. Research may lead to new market opportunities for battery recycling and the development of pathways for second life applications of EV batteries.

Status Update, July 2022:

- While this action is not currently in Environment and Energy Division's 2022-2023 workplan, staff will take advantage of opportunities to pursue this topic as they arise.

Action 10:

Promote economic benefits of EV technology in Toronto

Timeline: Near-term (2021-2023)

Activity #1: Support efforts to host EV industry events

From the Electric Vehicle Strategy:

The City can support efforts to host EV industry conferences, events and forums in Toronto by providing, when they fit existing Divisional programs and funding mechanisms, support in such areas as venues, funding and staff technical support as well as by partnering with event organizers in their bidding and planning. Such events could be used to discuss the current state and long-term evolution of the EV market and associated policies. In addition, the conference could look at EVs place in the regional automobile industry, workforce expansion, and the role of regional and local economic development organizations in supporting this industry. Depending on the topics covered, the City could play a role to encourage local businesses to participate.

Status Update, July 2022:

- No in-person events ran in 2020 or 2021 due to COVID-19 pandemic restrictions on gatherings and travel.
- Economic Development and Culture (EDC) promoted several virtual events hosted by local organization such as CUTRIC and Plug'n Drive.
- EDC will continue to work with Destination Toronto on attracting international EV-related events as restrictions ease.

Activity #2: Help attract EV-related industries and businesses

From the Electric Vehicle Strategy:

The City can aid EV-related businesses to establish themselves in Toronto by supporting investment or providing general business development assistance. This is a unique opportunity, with Ontario well positioned as the centre of the Canadian automobile industry. The range of support activities will vary depending on the type of enterprises, whether they be a manufacturing facility, or a small start-up. Mentoring, training, and guidance in navigating the processes to establish a business in Toronto will be helpful for businesses and entrepreneurs.

The City can also support efforts by external investment agencies, such as Toronto Global, to attract the EV industry.

Status Update, July 2022:

- Economic Development and Culture (EDC) has regular engagement with the ~16 companies in Toronto's EV cluster, as well as associated clusters such as electric micro-mobility, shared mobility, mobility as a service, and public transit. Sustainable transportation is one of the fastest-growing green sectors in Toronto, with electric micro-mobility in particular seeing dramatic uptake. EDC includes all electric power vehicles in its definition of EVs, and a lot of its work is focused on things like e-bikes.
- EDC's flagship sustainable transportation project for 2022 and beyond is the establishment of an industry park that will support local manufacturing, strengthen local supply chains, and help create a local industry cluster organization. EDC is presently pursuing provincial and federal funding for this.
- EDC has assigned new staff resources to the Green Market Acceleration Program (GMAP) to support the sustainable transportation file. Currently, EDC is working with the Ontario Vehicle Innovation Network (OVIN) to explore private-sector partnerships for expanding public EV charging infrastructure and deploying technology pilot programs. Other City divisions and agencies are engaged via the Electric Vehicle Working Group.
- As part of the updated TransformTO strategy, EDC will be undertaking three key actions focused on the sustainable transportation sector. However, the timelines for these actions are contingent upon additional funding.
- As part of the Net Zero Strategy – assuming additional funding is received – EDC will:
    - Undertake market research of key products and services required to achieve the targets and goals, reporting to Council by Q3 2024.
    - Develop green industry growth roadmaps for each green sector and a workforce development plan, reporting to Executive Committee in 2023 and 2024.
    - Consult with the local green industries on opportunities to develop green industry cluster management organizations and the necessary steps to achieve implementation by 2023.
- EDC will continue to work with Toronto Global on attracting international companies to Toronto. Most interest is in C/AVs rather than EVs, though many C/AVs are also electric. Toronto Global notes that there is a significant charging infrastructure gap between Toronto and peer cities such as Vancouver and Montréal when it comes to attracting EV dealerships. There is broad international interest in electric micro-mobility, public transit, and autonomous trucking/logistics.
- Transportation Services manages Toronto’s Transportation Innovation Zone at Exhibition Place, which offers opportunities for commercial testing and demonstration of new transportation technologies, including EVs and EV charging. This complements the support provided by EDC.