



# SuperCharge Roadmap

**Paving the Way for Zero-Emission Vehicles**

APRIL 2022

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BY



# Foreword

The science is clear: the realities of climate change require urgent action. From governments, to cities, to businesses and not-for-profits, all sectors must work to reduce and eliminate greenhouse gas (GHG) emissions and scale our investments to do so expediently while maintaining our competitiveness.

To reach our net-zero climate goals, we will need to transform, retrofit, and innovate our existing high-emitting sectors – including transportation, which accounts for 35 percent of Toronto region’s emissions.

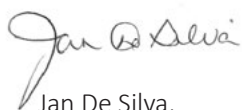
This change is underway. Ontario’s auto manufacturing sector is rapidly transforming into an electric vehicle (EV) leader, with billions in new investments announced by Ford, Honda, General Motors, Stellantis and LG Energy Solutions – all supported by the provincial and federal governments. Both governments are also implementing a critical minerals strategy to connect the resources in the north to manufacturers in the south. These commitments will ensure Ontario’s global leadership in the EV supply chain.

But once we build these vehicles, we need to make sure they can be bought and driven here too. The exponential growth of battery electric and hydrogen vehicles will require an equally massive scale-up of the infrastructure needed to support the fueling, charging and use of these vehicles. It will also require unprecedented partnership between our advanced manufacturing and growing technology sectors, along with the transportation and building sectors, to make this happen. With a need to both move quickly and to get this right, coordination among different governments and with the private sector will be the deciding factor in our success.

The Board is focused on addressing the greatest challenges of our times and recognizes that leading the global climate transition will be an unparalleled opportunity for our 11,500 members and the regional economy. In order to seize market share, we need to be able to successfully deploy at home. Climate action is not just an environmental or social issue – it is a critical economic issue. This foresight and coordinated action will solidify Toronto as one of the most competitive and sought-after business regions in the world.

Together with MaRS, the Board has convened the Climate Economy Strategic Council in order to position our climate innovators and our regional economy as a global leader in climate transition. This Roadmap supports the aims of the Strategic Council, and will help enable our region to decarbonize our transportation networks – building on the Board’s long history of transportation advocacy, strong energy sector network, and regional perspective. The concrete recommendations in this Roadmap can guide governments, the private sector and ecosystem partners on where to coordinate and prioritize action in order to enable a smooth, effective energy transition.

At its core, infrastructure is meant to enable a higher quality of life and a stronger economy. The vision, boldness and planning needed to undertake building vast networks like our existing electrical, pipeline and telecommunications grids underpins our economic prosperity today. Expanding this infrastructure to enable the adoption of zero-emission vehicles is vital to positioning our region to lead the world in the climate economy. Through collaboration and our enterprising spirit, Toronto will lead the way.



Jan De Silva,  
President & CEO, Toronto Region Board of Trade

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# Introduction

**W**e are at a decisive moment for climate action. Though our core objective is to preserve a livable planet, economic opportunity is also at stake.

After making commitments to reach net zero carbon emissions by 2050, governments and businesses are beginning to implement the actions needed to reach this goal. These actions span across the transportation, buildings, industry and power sectors. Of these sectors, transportation is facing the greatest pressure for a rapid decrease in emissions.

Transportation currently produces 35 percent of the Toronto region's emissions<sup>1</sup> and 25 per cent of Canada's emissions. The Toronto region has all the elements necessary to show leadership in a green transition, including plentiful sources of clean electricity, a fast-growing cleantech sector and a large auto manufacturing sector that is already shifting to electric vehicle production. The federal government is also proposing new 100% zero-emission vehicle sales mandates that kick in as early as 2035. This makes it particularly urgent to build supportive infrastructure that ensures that this target can be met.

In order for the Toronto region to secure its place as a leading low-carbon jurisdiction, we must plan for the critical infrastructure needed to green our transportation sector. We must increase our electrical generation capacity and build charging infrastructure for electrical vehicles. We must build the hydrogen and gas infrastructure needed to fuel other types of zero-emission vehicles. All of this requires that we move forward in a coordinated way.

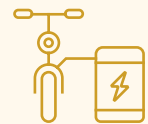
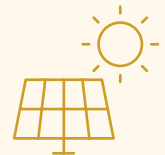
**We must**  
**increase our electrical**  
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**emission vehicles.**

Various levels of government have set climate targets and implemented policy supports for zero-emission and electric vehicles. For this reason, now is the opportune moment to create greater clarity around a green transition plan. To address this challenge, the Toronto Region Board of Trade (the Board) convened a symposium of influencers and experts in November 2021, where the challenges and opportunities of a green transition were discussed. Based on the outcome of those conversations, as well as additional stakeholder interviews and desktop research, we have created this Roadmap assessing the state of play in the Toronto region, as well as the actions needed to propel ourselves to the next level.

Throughout our symposium, we heard about the need for consensus on climate targets. Similarly, we heard that greater planning and coordination would help create better alignment on electrification infrastructure moving forward. The recommendations in this Roadmap provide the business community with insights into what is needed to address this lack of coordination. It focuses on challenges and solutions in four main areas of action: supporting fleet transitions, building the necessary charging infrastructure, reinforcing our clean electricity grid, and supporting the adoption of hydrogen and renewable natural gas (RNG) vehicles.

Through tools like this Roadmap, our goal is for Toronto's zero-emission vehicle infrastructure to be a global example of how to succeed in the economy and the environment of the future. This Roadmap therefore explores how to spark the investments and coordination necessary for this transition.





# Current Landscape

In the global fight against climate change, reducing transportation-related emissions is a foremost objective. Transport relies on fossil fuels more than any other sector and is responsible for 24% of global CO<sub>2</sub> emissions from fuel combustion.<sup>2</sup> Across the board, auto manufacturers are developing new electric vehicles, and there is continued innovation and attention on hydrogen as a fuel for medium- and heavy-duty trucks. This imperative is driving change internationally, domestically, and at local levels.

Since 2015, 193 countries have signed on to the Paris Agreement, pledging to keep global warming to no more than 1.5 degrees Celsius. Meeting this goal would mean reducing emissions by 45% by 2030 and reaching net zero by 2050.<sup>3</sup> In recognition of this imperative, citizens, businesses, and not-for-profits are making their own commitments and pushing governments to act.

The U.S. government is investing \$5 billion (USD) over five years in building EV charging infrastructure across the country, in addition to a \$2.5 billion grant program to fund alternative fuel (EV, hydrogen, propane and natural gas) infrastructure in designated corridors.<sup>4</sup> These investments would help the country achieve its 2030 targets of 50% zero-emission vehicle sales and a 50-52% emissions cut below 2005 levels.<sup>5</sup>

In Canada, the Canadian Net-Zero Emissions Accountability Act legalizes the federal government's commitment to achieve net-zero emissions by 2050, which includes a commitment to reduce emissions by 40-45% below 2005 levels by 2030.<sup>6</sup> The federal government has announced a mandatory target for "all new light-duty cars and passenger trucks sales to be zero-emission by 2035"<sup>7</sup>, with interim targets of 20 percent by 2026 and 60 percent by 2030<sup>8</sup>.

In 2019, the automotive sector contributed \$13.9 billion to Ontario's GDP.

Ontario has more than 1,700 public charging station locations, providing a strong foundation of charging access across the province.

In Ontario, the provincial government has also committed to meeting 2030 Paris Agreement targets, as outlined in its 2018 *Made-In-Ontario Environment Plan*. Ontario has more than 1,700 public charging station locations,<sup>9</sup> providing a strong foundation of charging access across the province. Recently, the provincial government announced \$91 million in funding to develop charging infrastructure to support Ontario's electric vehicle (EV) industry.<sup>10</sup> Leveraging existing manufacturing and supply chain strengths, the provincial government aims to increase hybrid and EV production, secure a new vehicle assembly plant, increase Ontario's EV battery manufacturing capacity, and increase the sector's parts and innovation exports, as presented in its plan, *Driving Prosperity: Ontario's Automotive Plan*.

Beyond this, over the past year several companies in the automotive industry have announced major investments in new EV-related facilities in Ontario including Honda,<sup>11</sup> Ford,<sup>12</sup> General Motors,<sup>13</sup> and most recently a joint venture between LG Energy Solutions and Stellantis to manufacture EV batteries.<sup>14</sup>

The Ontario Government has also released its Low-Carbon Hydrogen Strategy, which lays out concrete actions to grow the production and use of this clean fuel.

The Toronto region, being a leading region in North American vehicle and components manufacturing, is well-positioned to be a catalyst for EV manufacturing and deployment. In 2019, the automotive sector contributed \$13.9 billion to Ontario's GDP.<sup>15</sup> The province hosts significant facilities from major infrastructure players and key companies in ZEV supply chains. The Toronto region also has access to abundant sources of clean electricity, including nuclear and hydroelectric generation. This low-carbon electricity positions the region to effectively reduce emissions through the electrification of transportation.





## DEFINING ZERO-EMISSION VEHICLES

The path to net-zero emissions in the transportation sector is supported by existing and emerging technologies and options. Transport Canada defines the term *zero-emission vehicle* as “a vehicle that has the potential to produce no tailpipe emissions,”<sup>16</sup> including battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEV), and hydrogen fuel cell vehicles (HFCV). For the purpose of this Roadmap and its focus on enabling infrastructure, we will be using the term *electric vehicle or EV* to refer to BEV and PHEV vehicles, and the term *zero-emission vehicle or ZEV* when speaking to the broader universe of HFCVs, BEVs and PHEVs. This Roadmap will also discuss the role of RNG as an alternative fuel for vehicles. While RNG has the potential to be carbon-neutral or even carbon-negative, depending on the source of the fuel, it is not considered a ZEV because it still produces some tailpipe emissions.<sup>17</sup>



## BATTERY ELECTRIC VEHICLES

EVs that have a battery instead of a gasoline tank, and an electric motor instead of an internal combustion engine. Plug-in hybrid electric vehicles are a combination of gasoline and electric vehicles.



## HYDROGEN FUEL CELL ELECTRIC VEHICLES

Combining hydrogen and oxygen to produce electricity with only water and heat as by-products, hydrogen fuel cells are an electrochemical power generator.



## RENEWABLE NATURAL GAS (RNG)

Created by capturing methane emissions from organic waste, landfills and wastewater treatment plants, RNG can be a carbon-neutral fuel technology, replacing conventional natural gas in vehicles.

## Symposium

In November 2021, the Board held a symposium to identify the specific challenges and recommended solutions in facilitating the infrastructure needed to support and enable the region’s transition to electric and zero-emission vehicles. The symposium had more than 40 participants and included key stakeholders such as integrated energy companies; electricity generators, transmitters and distributors; mobility service providers, transit agencies and fleet operators; charging networks; and technology companies.

Based on discussions at the symposium, the Board’s policy team conducted additional desktop research and stakeholder consultations to validate the perspectives that were shared. Throughout this research, we consistently came across a few key concerns. First, greening transportation will have an impact on companies that will need to transition their fleet operations. Second, policy support is needed for both electric and hydrogen infrastructure development and innovation. Third, greening transportation will have an impact on electricity demand within the province, which will impact electrical grids.

As such, the focus of this Roadmap is on fleet transitions, charging infrastructure, grid management and low-carbon fueling infrastructure.





# Fleet Transitions

Photo credit: CNW Group/Ontario Power Generation Inc

## ★ The Challenge

Transit agencies, logistics companies, and other fleet operators face difficulties when making long-term decisions for their fleet. With the increasing availability of both electric battery and hydrogen technologies, fleet operators need to make decisions with high lock-in costs and long-lasting implications. These leaders must not only assess how to finance the high upfront costs required to purchase new vehicles, but also understand the existing infrastructure that supports their fleet and how it may impact their operations. Diesel, propane, and natural gas are the current leading fuel choices for heavier vehicles. While hydrogen technologies have long been seen as the leading zero-carbon contender for certain segments of the larger, heavier vehicle market, electric buses from companies like New Flyer, Nova Bus, and BYD are starting to broaden the range of options.

Operators need to have confidence that their investment decisions can stand the test of time and that the necessary supportive infrastructure for their chosen technology is sustainable. This creates various challenges for fleet transition, including:

## Education

With advancement in zero-emission technologies, fleet operators are presented with various green technologies, each having their own advantages and use-cases. Education on the advantages and disadvantages of various ZEV types – both how they compare to conventional and alternative fuel vehicles as well as to each other – is necessary in these early stages to provide guidance to operators when making these choices. This includes understanding the charging and refueling infrastructure available for various zero-emission technologies. Notably, charging coordination can be a challenge when making decisions for zero-emission fleet investments, especially when understanding longer-distance routes.

Education is also necessary on a whole-systems approach. ZEV education goes beyond fleet operators and extends to the supporting fleet ecosystem. Therefore, domestic and international supply chains as well as insurance companies, driving operators, mechanical services, and others face a learning-curve in this transition.





A FedEx electric delivery truck manufactured by BrightDrop. These vehicles will start being produced in Ingersoll, Ontario later this year.  
Photo credit: FedEx

### Cost

As fleet operators grapple with technology decisions, high up-front cost implications present a challenge to their spending capacities. They must understand not only what credits and incentives may be available for each technology, but what the return on their investments may be in the long term.

Beyond the initial costs of vehicles and charging or fueling infrastructure, operators need to consider longer-term, more invisible operational costs alongside potential operating savings. Long-term cost implications include, but are not limited to, maintenance services (which may be less expensive but require specialized training), costs or savings related to fuel switching, the supply chain and availability of parts, any necessary software support for technological issues, and insurance availability.

### Service

As with any change in technology, service supports, maintenance, and repairs will need to change in tandem to ensure fleet operators are able to fluidly continue their business operations. In-house service offerings may require existing staff to reskill in order to better service their fleet. Specific to hydrogen technologies, fleet operators face decisions whether to use local or centralized H2 production for fueling their vehicles.

Within the broader fleet ecosystem, support services face challenges to their offerings. From software support to roadside service, some agencies may have to shift their product offerings to provide dedicated services for various types of ZEVs.



### FLEET CHARGING RATES

British Columbia changed its rate schedule to support fast-charging infrastructure for both public and private fleet usage. Offering two rate classes for fleet EV charging will allow customers to avoid prohibitively expensive demand charges through at least 2026, instead having these costs recovered through a higher but more predictable commodity price. Providing predictable and affordable electricity for fleet charging improves the business case for electrification and will encourage adoption. Alectra Utilities estimates that if Ontario adopted a similar approach, fleet operators could save approximately \$10,000 for every 10 vehicles using British Columbia's rate structure.



### PUBLIC TRANSIT

The Toronto Transit Commission (TTC), PowerON Energy Solutions (a subsidiary of Ontario Power Generation), and Toronto Hydro are working in partnership to electrify Toronto's bus fleet, with a target of a fully zero-emissions bus fleet by 2040. Through a subsidiary, PowerON will be designing, building, operating, and maintaining charging infrastructure to power the fleet.<sup>18</sup>



In addition to existing services for fleet transition, an advisory support framework could include transparent carbon pricing projections, clear and accessible market information, and ecosystem insights to help fleet operators make informed decisions about which technologies best suit their needed use-cases.



## ✓ Recommendations

### **Provide Advisory Support to Better Enable Fleet Transition Decisions**

When choosing the type of ZEV investment – be it the technology range, existing and available charging facilities and refueling stations – fleet operators may be overwhelmed and hesitant to invest, given the various economic considerations involved and the risks inherent in deploying new technologies. To help them make clear and cost-effective decisions suited to their needs, these operators would benefit from impartial, technology-agnostic advisory support.

Advisory supports are available for each of the leading technologies. For hydrogen vehicles, organizations like H2GO Canada, the Hydrogen Business Council of Canada and the Canadian Hydrogen and Fuel Cell Association can provide guidance, connections and advice.

In the electric vehicle space, several advisory supports exist. Toronto-based Plug N' Drive helps fleet operators with their in-house charging needs, options, and education, and electric fleet transition decisions. PowerON, provides fleet electrification advisory and planning services. Additionally, in support of the City of Toronto's Net Zero Strategy, Toronto Hydro is proposing to provide advisory

supports through its *Climate Advisory Services* to connect customers with advice, government funding and reputable service providers.

In addition to existing services for fleet transition, an advisory support framework could include transparent carbon pricing projections, clear and accessible market information (e.g. when certain vehicles will be available, range, anticipated vehicle costs, etc.), and ecosystem insights (e.g. current charging infrastructure for respective technologies, current and future ZEV development, etc.) to help fleet operators make informed decisions about which technologies best suit their needed use-cases.

### **Clear Infrastructure Planning and Coordination**

Fleet transition decisions benefit from greater clarity on the planned buildout of public charging or refueling infrastructure. This could be provided through government-supported planning processes or through consultation between industry and infrastructure providers on where and when stations will be needed. If multiple companies in the same geographic area are considering switching to ZEV fleets, coordinating their rollout may allow them to save on costs related to building new infrastructure.

### **Supportive Government Policies and Subsidies**

As fleet operators make their transition decisions, economic incentives will be needed to encourage fleet adoption and transformation. There is an opportunity for government funding to mitigate added costs for vehicles, related infrastructure, and any retraining programs needed. This support should accommodate innovative solutions – for example, the combination of EV chargers with energy storage infrastructure or a localized hydrogen refueling station.

There is also an opportunity for government policies to support public charging and refueling infrastructure that is accessible to fleets of both large and personal vehicles. For example, municipal governments can work with local parking authorities, other municipal lot owners, and local distribution companies (LDCs) to build out charging infrastructure in lots and on-street parking, providing a mix of both Level 2 and rapid charging opportunities for fleet drivers throughout the day.

Should fleet operators install charging infrastructure at their own depots, they must also understand the impacts this may have on their peak electricity demand and associated costs. To assist with this transition, the provincial government could direct the Ontario Energy Board to enable transitional demand charge rates as has been done in B.C.

### **A Consortium Approach for Knowledge Sharing**

Beyond their own depots, fleet charging infrastructure will require a collective approach – all players in the ecosystem will have a role to play. Organizations like CUTRIC (the Canadian Urban Transit Research & Innovation Consortium), OVIN (Ontario Vehicle Innovation Network), and the Pembina Institute are already bringing sector leaders together to address these challenges. This speaks to the need for knowledge sharing within the fleet ecosystem, which extends beyond fleet operators and includes municipal governments, local transportation and parking agencies, dedicated service offerings, and insurance agencies. Fleet transitions will benefit from having spaces to share best practices and address tangential issues like insurance, safety, and maintenance.



### **VEHICLE-FOR-HIRE SERVICES**

Taxi and ride-for-hire drivers must choose whether to transition their vehicles to ZEV technologies or not. While companies like Uber do not own their fleets, policies that support EV adoption can provide the necessary landscape for ride-for-hire drivers to make informed and cost-effective choices in line with climate goals.

In August 2021, the Metropolitan Area Planning Council released recommendations for electric vehicle adoption, based on a ride-for-hire working group. Set to encourage EV adoption for vehicle-for-hire services, the recommendations include establishing an electric vehicle rebate for low- to moderate-income as well

as qualified high-milage fleet operators and drivers. The group also recommended that utilities support residential charging by offering incentives to offset the costs of installing electric vehicle charging stations and file proposals for an electric vehicle charging rate structure. To improve EV charging infrastructure, the group recommends that anonymized and aggregated origin/destination data from ride-for-hire providers be collected and published to help inform where charging infrastructure should go.<sup>19</sup> Should the Toronto region adopt similar regulatory measures, it will be in a better position to enable vehicle-for-hire services to operate on EV technologies.





# Charging Infrastructure

## ★ The Challenge

For vehicle owners considering switching to an EV, their largest concerns include where, when, and how they will charge their vehicle. It is not enough that chargers are both easy to find and use – they must be *seen* as such. Perceptions matter as much as reality when it comes to consumer choices.

The coming need to massively scale up charging infrastructure will be vital to encouraging the continuing adoption of EVs. Locating new chargers in places with customer demand and system capacity is no small feat. These stations must be accessible, convenient, and form a network across the broadest geography possible. While public stations will be essential, they are only one part of the equation as most EV drivers do 80% or more of their charging at home.<sup>20</sup> Many drivers will also not need to charge daily, as the majority of commutes are well within the driving range of existing EVs.<sup>21</sup>

Fortunately, governments are stepping up to support the rollout of charging stations. In the most recent federal election, the Liberals pledged \$700 million to add 50,000 EV chargers and hydrogen stations, and \$100 million for existing buildings to install charging stations.<sup>22</sup> Previous rounds of federal funding for charging infrastructure covered up to 50% of project costs, up to a dollar cap based on charging speed, a model expected to be applied to this program as well. The Ontario Government has also announced a partnership with Ivy Charging Network to build 69 fast chargers across all 23 ONroute stations, alleviating range anxiety concerns along Ontario's major highway network in southern Ontario.<sup>23</sup>

To ensure that consumers feel confident that they should invest in EVs, it will be essential to build robust charging infrastructure that guarantees there is no shortage of chargers to deter potential purchasers. Achieving this goal will require solving several different challenges simultaneously, including:



### PLACES TO CHARGE

This section focuses on the need for more **public charging stations** that are accessible to all members of the public, and that may be located on-street, in public parking lots, or at service stations.

However, this is only one segment of the total number of chargers that EV owners could use. There are already high numbers of **personal chargers** (often at-home chargers in garages or driveways) and **private chargers** (e.g. in residential or office buildings, or private corporate lots).

## TORONTO PUBLIC CHARGING TARGETS TO BE INSTALLED IN PUBLIC LOCATIONS

BY 2025

220 DCFC ports

3,000 Level 2 ports

BY 2030

650 DCFC ports

10,000 Level 2 ports



Source: City of Toronto EV Strategy

### Education

Potential EV customers often lack knowledge and expert support when choosing among available charging products or determining installation needs.<sup>24</sup> They may also be unaware of whom they would need to consult to determine whether their home's current electrical supply can support a Level 2 EV charger and what potential electricity connection upgrades might cost. These knowledge barriers may prevent some would-be owners from making the leap to electric at this time.

### Market Economics

Current prevailing rates for public charging are still insufficient to cover the costs of building infrastructure. This was the conclusion of Toronto Hydro, based on financial modeling that found "charging rates according to a commercial payback period were not competitive with current prevailing pay-per-use rates across the different EV charger levels."<sup>25</sup> At present, it appears that businesses and property owners are subsidizing rates to entice customers to visit – in effect, allowing low EV charging rates to act as a 'loss leader' for the business. While this approach may currently make sense for these businesses, rates are likely to rise in the future – particularly for charging operators who cannot cross-subsidize from other business operations. This may be offset by continued government subsidies, increased utilization of charging stations, and credits from the Clean Fuel Standard.

### Perceptions of Public Charging Access

While there are more than 850 publicly accessible EV charging ports available in Toronto today, many

potential drivers are still concerned about their ability to access convenient charging infrastructure when and where they need it. As EV sales increase, the number and prominence of charging stations will need to similarly scale. Dunskey's research into optimal ratios between EVs and charge ports found that by 2025, 50 U.S. metropolitan centres are expected to have 256 EVs for each DC fast charging port and 15 EVs for each Level 2 port.<sup>26</sup> Despite the fact that Toronto's EV strategy sets ambitious targets for the number of public chargers in the city, Dunskey estimates that Toronto is not on track to meet these ratios by 2030.<sup>27</sup> Further efforts to increase the number of public charging stations will be needed, as will ensuring that the public is aware of the prevalence and convenience of these stations.

### Appropriate Mix of Charging Speeds

In addition to the total number of chargers, it is also essential to consider expected demand both for Level 2 chargers and DC fast chargers. While DC chargers are much faster, they are typically more expensive to use and still require more than 30 minutes for a full charge (although very fast chargers under development could cut this time in half). High-use commercial drivers could find their working hours disrupted by charging times and may prefer having access to overnight Level 2 charging options. An Uber study from Europe estimated that "without overnight charging, drivers can face an additional opportunity cost of >20% of their daily revenue if they can't combine charging with their normal breaks."<sup>28</sup> Ensuring that sufficient public chargers are available in convenient locations will be vital to encouraging EV uptake among high-use drivers.





### Garage Orphans

“Garage orphans” is a term used to refer to individuals who cannot install their own at-home EV charger – either because they rent, live in a home that does not have a parking space, or live in a condo or apartment building. While each municipality is different, an increasing number of households will fall into this category – for example, 44 percent of Toronto households lived in an apartment in 2016.<sup>31</sup> These households will need access to some combination of overnight charging (either on street, in a parking lot, or in their parking garage) and rapid chargers before they feel confident in purchasing an EV.

### Approvals and Permitting

For builders of charging infrastructure, securing appropriate approvals and signoffs is essential. Some charging network operators choose to partner with site hosts and have those hosts manage the permitting and approval process – partly to simplify operations, since processes can vary dramatically by municipality. Other charging operators have flagged a number of challenges, including:

- **Municipal Plan Review:** Complex design review requirements and lengthy applications can result in incremental costs during the definition phase for a charging project that is small in comparison to typical building projects.
- **Electricity Utility Challenges:** There are about 60 local distribution companies for electricity across Ontario, each with their own processes to add or upgrade service. These processes can vary dramatically in process, time, and cost – with some providing excellent customer service and others limiting the number of fast chargers that can be installed at one site without giving clear reasons.
- **Sign Permits:** The Ontario Ministry of Transportation Highway Corridor management, as well as individual municipalities, often duplicate efforts to review and approve new signs indicating where fast chargers are located.



#### AMSTERDAM:

##### THE RIGHT TO CHARGE

The Netherlands has taken a unique approach to proactively solving the charging access barrier for residents. Anyone purchasing an EV who does not have their own driveway or garage (up to 90% of workers and residents in Amsterdam) has the right to request a charger be installed close to their home.<sup>29</sup> If there is not already a public charger within 300 metres of their home, municipalities work with a charging network provider to install one within months.<sup>30</sup> Usage data is also monitored to identify areas where additional chargers may be needed to meet demand. This approach helps solve two problems: ensuring that those who will need a charger can access one, and also that chargers are installed where there will be guaranteed demand.

## Uptake of electric vehicles is strongly tied to government requirements and incentives. BC and Quebec lead the country in EV sales – a function of combined provincial and federal rebates as well as their provincial EV-sales mandates.

Site selection can complicate infrastructure buildout. While many builders would only be looking at adding charging infrastructure to their own property, charging network operators may consider a number of possible locations and assess them based on a number of factors, including the cost of distribution system upgrades they would need to cover. Some network operators find it difficult to get information about areas with excess system capacity, which has hampered their buildout process.

### **Data Sharing**

While the absence of available data is not currently a barrier to the installation of charging infrastructure, it does present challenges to ensure that investments are being made efficiently. Currently, it is difficult to understand present and future demand patterns that would assist with determining where and in what number new chargers are needed. In Amsterdam, the government partnered with charging operators to use data to plan and manage the charging network.<sup>32</sup> Chargers are sited in areas with high demand, and usage insights help ensure their effectiveness is optimized.

More data-sharing about when chargers are used, and typical demand draw, could assist with electricity load management and could inform future infrastructure investments to ensure a resilient and reliable supply of electricity. Current pilots in Toronto and across the region are starting to examine what insights could be gleaned from this information.

### **Incentives**

While this report is focused on the supportive public infrastructure required to support ZEV adoption, the issue of personal vehicle incentives was raised by several participants in the SuperCharge symposium and through our research.

Uptake of electric vehicles is strongly tied to government requirements and incentives. BC and Quebec lead the country in EV sales – a function of combined provincial and federal rebates as well as their provincial EV-sales mandates. In Ontario, EV purchases slowed after provincial incentives were removed in 2018, and no sales mandate is currently in place.



### **EV STATION FUND: INTEGRATED FUNDING AND ADVISORY SUPPORT**

The Atmospheric Fund (TAF) has launched a new program, the EV Station Fund, which will support the installation of roughly 300 charging stations in the Greater Toronto and Hamilton Area (GTHA) by the end of 2023. The EV Station Fund offers rebates to organizations installing local EV charging stations, thanks to funding provided by Natural Resources Canada's Zero Emission Vehicle Infrastructure Program.

Although EV drivers overwhelmingly prefer to charge at home, 46% of Ontario residents don't live in single-family homes, making access to convenient and accessible charging a challenge. The EV Station Fund aims to address this barrier by enabling the installation of charging stations in multi-family buildings, public spaces, and workplaces – particularly in areas with where charging access is currently most limited.

TAF has also partnered with two expert firms that can support program applicants with technical advisory services, ranging from site assessment to project planning to installation. TAF will contribute additional funding to help cover the costs of these services.



## ✓ Recommendations

### Coordination

Coordination among governments and across the sector can be challenging. While municipalities have a leading role to play in supporting the build-out at specific sites, the Province should ensure a whole-of-government approach to building charging infrastructure with a clear strategy and clear set of goals – including keeping pace with leading U.S. states on vehicle-to-public charger ratios. As part of this strategy, Ontario should convene an ongoing forum for coordination between the province, municipalities, utilities, and the private sector to address issues with the buildout of EV charging infrastructure as they arise.

In addition, municipalities must integrate planning for EV charging infrastructure into their “business as usual” urban planning and infrastructure renewal processes. Road resurfacings and utility upgrades provide lower-cost opportunities to rough-in or build new charging stations. And a longer-term planning vision can help maximize investments, for instance making sure that charging stations are not rendered unusable by later installation of bike lanes.

### Approvals and Permits

EV owners need to be able to travel with confidence across the region and beyond. They should not have to grapple with underbuilding of needed charging infrastructure in some municipalities due to their own process challenges. Proactively setting clear expectations would help ensure greater consistency and efficiency across municipalities. The Provincial Government should set a performance standard (e.g. 90 days) for municipal approvals related to installing public EV chargers and ensure that they are not duplicating existing municipal approvals. This standard should be overseen and tracked by the Ministry of Transportation to ensure that municipal processes do not unduly hold up the installation of charging infrastructure and to help provide greater uniformity across the province.

### Incentives and Policies

Experience shows that government incentives have had a positive impact on encouraging EV adoption and the construction of charging infrastructure. Federal funding programs for public chargers will prove useful over the coming years, but further support and removing red tape would help further accelerate adoption. The Provincial Government should reintroduce



incentives for electric vehicle purchases and charging infrastructure, including support for any localized grid upgrades necessary to enable charging. Restoring the Building Code requirement to rough-in for EV charging infrastructure can also help futureproof buildings at a relatively low cost today, avoiding the need for expensive and difficult retrofitting later. Municipalities may also choose to support this process, either by introducing their own 100% EV-ready development standards or offering incentives to encourage the uptake of personal EVs.

### Equity and Access

Charging infrastructure is often first built in wealthier areas, where early adopters of EVs are more likely to live. However, rideshare and taxi drivers make up a significant portion of high-usage drivers and are more likely to live in suburbs or apartment buildings, which makes them more likely to be garage orphans. A study in Los Angeles also found that lower-income neighbourhoods are more likely to lack fast charging stations.<sup>33</sup> To ensure that these drivers have access to overnight charging in their neighbourhoods, municipalities should consider partnering with utilities and charging network operators to allow EV purchasers to register their need for charging solutions, helping direct infrastructure buildout to areas that might otherwise be overlooked. This can be a valuable tool in ensuring equitable access to charging while also spurring a more broadly distributed charging network, spurring additional interest in EVs among residents.



# Electricity Grid

## ★ The Challenge

Electrification will require significant investment decisions to be made, such as how and where to generate more clean electricity and how to build renewed transmission and distribution lines to get power where it's needed. Beyond demand challenges for customers, the following challenges exist for grid operators:

### Coordination and Long-term Planning

A major challenge to EV adoption – both for personal and commercial uses – is the lack of coordinated long-term planning on both climate targets and infrastructure pathways. Each level of government has set their own targets and objectives in varying time frames, some of which conflict and have not yet been reconciled. For example, the federal government's proposal for a net-zero electricity grid by 2035 runs counter to Ontario's current long-term electricity supply plans and does not incorporate the timing of various municipal net-zero targets.

Long-term grid management planning can only lead us to a net-zero economy if climate change goals are included as an input. With the long lead time needed to build major new generation and transmission assets, there is a need for coordination amongst all levels of government with respect to grid management and climate expectations. These long-term outlooks need to align, with regulators playing a role in oversight and approvals that reflect political decisions on the public interest. Failure to achieve this risks missing emissions targets, reducing the reliability of the grid, and requiring more costly quick fixes that create affordability challenges for customers.

With the long lead time needed to build major new generation and transmission assets, there is a need for coordination amongst all levels of government with respect to grid management and climate expectations.





### Load Management

Effective grid management will be critical for supplying enough power for projected increases in demand in a coordinated and cost-effective manner. With the goal of minimizing emissions, electricity planning must be done in a comprehensive manner, including consideration of various energy sources and keeping relevant policy objectives in mind.

Load management, particularly at the local distribution level, will be needed as personal EV users plug into the grid at all times of the day and night, increasing electricity demand. This poses a challenge for utilities and customers as infrastructure may need to be upgraded to handle larger energy loads.

For personal EV adopters, an increase in their demand on the grid in residential settings may increase demand during off-peak times. A National Grid UK study estimated that in a fully EV environment, jurisdictions could see a 30% increase in peak demand.<sup>34</sup> In the Toronto region, regulators and utilities must focus on maintaining reliability for customers – particularly during localized demand spikes, such as when multiple EVs are all being charged on the same block. Building upgrades may need to be considered to offset this impact, or distributed energy resources (DER) like solar and storage may be considered as potential solutions.

### Cost Responsibility and Investment Cycles

While governments work on four-year cycles, businesses and the climate do not. This funding misalignment poses a challenge to how funding programs for EV innovation and infrastructure development are rolled out. Reducing the uncertainty of four-year political cycles will be necessary for utilities and organizations in the ecosystem. All players within the ecosystem will need to come together to advocate for greater certainty and to work towards implementing plans to achieve the targets set by government.

Without clearer government policy direction, regulatory processes like those led by the Ontario Energy Board (OEB) can present challenges for utilities looking to make forward-looking, innovative

investments to improve net-zero readiness. While there is an essential role for scrutiny to ensure that investments are prudent, the current framework may inhibit the ability to act on longer-run investments that are needed and that may extend beyond the typical 5-year rate application period reviewed by the OEB.



### Recommendations

#### Government Alignment

To better enable LDCs and the IESO to manage the investment required to meet increased demand for electricity, it is imperative that the energy ecosystem find stability outside of the four-year political cycle. To that end, governments must align their long-term targets while defining climate action as being in the public interest. This clarity would allow businesses and utilities to develop implementation plans to achieve those targets. Government should then only re-engage as necessary to help the business community if needed, such as when incremental obstacles arise during implementation. Strategies like the City of Toronto's Net Zero Strategy, which has been accelerated to 2040, provide an example of a long-term vision upon which utilities and other businesses could build their plans for the adoption of EVs, the deployment of charging and refueling equipment, and the expansion of local distribution infrastructure. However, a municipal strategy alone does not provide sufficient rationale for investments in an OEB hearing. There needs to be clear and aligned strategic policy direction from government, with LDC plans being responsive to those net-zero strategies. Regulators must ensure that the utilities tackle the challenge set out by government prudently.

#### LDC Enabling Policies

As the transportation sector moves towards zero-emission technologies, and electricity needs increase, impacts will be felt more so at the local level rather than provincially. As higher demand will impact LDCs, it is imperative to empower them to proactively address electrified transportation needs within their service areas.



## The Province should engage industry and public stakeholders to determine a proactive plan for the full spectrum of electricity infrastructure investments and how those costs will be recouped.

Specifically, LDCs need to ensure they have the capacity to deliver power to customers at peak times, and both LDCs and the IESO need to be able to manage that peak. LDC-enabling policies should also go beyond reactionary measures and provide them with the ability to utilize software technologies and incentives to smooth demand peaks where and when needed. For example, LDCs would be better positioned to optimize the need for the new capital investments through software management.

### **Cost and Responsibility**

This year alone, the provincial government is spending nearly \$7 billion to reduce electricity prices for consumers.<sup>35</sup> With the looming need to invest billions of additional dollars into expanding and reinforcing the system to account for increased electrification, and with both residential and business consumers already feeling stretched, there is a need for an open, consultative process to assess costs and determine how they should be paid for. The Province should engage industry and public stakeholders to determine a proactive plan for the full spectrum of electricity infrastructure investments and how those costs will be recouped. In a positive move for customers, the Ontario Ministry of Energy has requested in a **recent letter** that the Ontario Energy Board explore implementing an ultra-low overnight time-of-use electricity price – a move that could further strengthen the business case for EVs.

### **DER Processes**

There is a need for greater clarity on the intended vision and regulatory framework for distributed energy resources (DERs) like solar panels and localized storage. While provincial agencies have led multi-year engagements, including the IESO's **DER Roadmap** and the OEB's **DER Connection Review**, these processes cannot take the place of a clear government-led plan. The Province should exercise its leadership to ensure that these processes are integrated under the central vision of a new long-term energy plan. This plan should account for the role that can be played by vehicle to grid technologies as prospective participants in the energy market. These solutions can benefit from technology-enabling policies, which can enhance innovation.

It is therefore necessary for a clear strategic net-zero vision that reflects federal, provincial, and municipal government alignment, ensuring all inputs are in place. Within this clarity, DER processes will be able to be better integrated in government net-zero goals and grid management at large.



### **VEHICLE-TO-GRID TECHNOLOGIES**

In November 2021, Hydro One and Peak Power launched a pilot program to study the benefits of using EV charging technology to improve power resiliency and reliability for customers. Using two-way Vehicle-to-Home (V2H) charging technology, the program will test the ability of EVs to act as batteries and provide back-up electricity through simulated power outages. Its aim is to study how this technology can improve the reliability of Hydro One's distribution system as the grid demand increases.<sup>36</sup> Vehicle-to-grid applications are also being tested for HFCVs.



Photo credit: CNW Group/Enbridge Gas Inc.

# Low-Carbon Fueling Infrastructure

## ★ The Challenge

When developing solutions for a net-zero future, the full range of technological solutions need to be considered. In addition to battery electric vehicles, fuels like hydrogen and renewable natural gas (RNG) present additional options for continuing to move people and goods with minimal or no GHG emissions.

These technologies have many benefits, such as not needing to account for the weight of a battery and being able to refuel quickly. These benefits are valuable for fleets that want to minimize potential downtime. RNG is a well-established fuel that can be easily swapped in for conventional natural gas (CNG), while hydrogen has not yet gained as much commercial market share in part because of cost and infrastructure challenges. The widespread adoption of these vehicles also faces unique challenges that will need to be specifically addressed for low-carbon fuels to become a more prominent part of the net-zero transportation solution. These challenges include:

### Integrated Planning

Getting low-carbon fuels into a vehicle requires an integrated systems approach, including production, distribution, storage, and the vehicle fueling station itself. This raises the challenge of coordination among different actors to help ensure that growth in supply and demand is as closely aligned as possible. Determining where to build fueling stations also requires cross-actor coordination. Fueling stations may be co-located with production facilities or could be tied in with the existing pipeline network. For long-haul truck fleets to begin switching their vehicles, it will require a coordinated buildout of sufficient fueling locations along major routes to increase confidence in making the switch. The decision is easier for localized fleets that are able to co-locate all their infrastructure. This is one reason that hydrogen fuel cell buses have seen significant adoption, with more than 2000 deployed worldwide.<sup>37</sup>



### ON-SITE FUEL CELL FLEETS

One area where adoption of hydrogen fuel cell vehicles has already started taking place is within distribution centres. Companies like Canadian Tire and Walmart have switched their forklift trucks to run on hydrogen, allowing the companies to maintain high performance without emissions. Canadian Tire produces its hydrogen on-site through water electrolysis, allowing them to avoid additional costs and challenges with transporting the fuel.<sup>44</sup>





### Economics

High costs have been a major barrier to increasing the rate of adoption. At present, hydrogen fuel cell vehicles can cost two to three times more than diesel-powered alternatives.<sup>38</sup> This is largely seen as due to a lack of production scale, leading to higher unit costs for each vehicle. In a similar manner, while prices have begun to come down, fuel costs have also remained more expensive compared to conventional fuels. The need for high upfront capital investment to build fueling infrastructure has also hampered adoption in two ways: (i) by making it more difficult for a fleet operator to run pilot projects and gain experience with the technology, and (ii) through inhibiting station developers who do not have clear projections of either anticipated demand and whether they will be able to recoup their costs.<sup>39</sup>

### Ecosystem Support


As an emerging industry, there is a need to further build out the wraparound supportive infrastructure necessary for growth at scale. Symposium participants said that fleet operators find it difficult to access sufficient advisory support to determine which fuel sources make the most sense for them based on vehicle size and required range. Increased adoption will also require skilled maintenance personnel and appropriate facilities, which are currently lacking.<sup>40</sup> Governments must also be prepared to work with industry to resolve regulatory issues and update codes and standards as development and adoption progress.



### MUNICIPAL TRANSIT

In 2021, the City of Hamilton announced its first RNG bus, in partnership with Enbridge Gas. These buses are estimated to use and divert 450 tonnes of organic waste from the landfill yearly and can be replaced one-for-one with diesel buses without compromising performance.<sup>45</sup> Operating with carbon-negative RNG (fuel that goes beyond net-zero) provided from the StormFisher facility in London, Ontario, this type of vehicle technology helps create a circular economy.<sup>46</sup>



A large yellow circle is positioned in the upper left quadrant of the page. Below it, a white semi-truck is shown from the side, driving on a multi-lane highway. The truck is white with a large trailer. The highway has a metal guardrail on the right side, and there is green grass in the foreground. The background is a clear sky.

Given the enormous amount of goods movement along the Windsor-Montreal Highway 401 corridor, the Provincial Government should work with the federal government, industry, and other stakeholders to assess the feasibility and commercial market for enabling a hydrogen fueling network along this route.

## Recommendations

### Incentives to Assist with Reaching Scale

Governments should provide equitable financial incentives to all viable low-carbon fuel technologies, including hydrogen and RNG, based on their potential to reduce emissions. In particular, if the government wants to encourage the adoption of hydrogen, it may need to provide initial support in order for fuel production, as well as the number of refueling stations, to reach critical capacity.<sup>41</sup> This is particularly important for overcoming the cost barriers that inhibit piloting a small number of hydrogen vehicles within a fleet. Any actions and investments here must be coordinated between the levels of government and grounded in both a coherent hydrogen strategy, as well as a climate change strategy.

### Develop and Site a Hydrogen Hub

The provincial and municipal governments can play a coordinating role in efforts to develop a hydrogen production and fueling hub in the Toronto region. Working with hydrogen suppliers, utilities, and potential fleet operators, these partners can identify viable areas to pair low-cost supply with consolidated demand for fuel. This approach would help the industry achieve scale and a sustainable financial model sooner. If done correctly, the private sector could potentially cover all construction and operating costs.

### Assess Feasibility of Transportation Corridor

Hydrogen's potential use for long-haul transportation requires coordination across jurisdictions, which would ensure that infrastructure is appropriately sited. Coordination would also reassure investors that customer demand will be there to support those stations. Given the enormous amount of goods movement along the Windsor-Montreal Highway 401 corridor, the Provincial Government should work with the federal government, industry, and other stakeholders to assess the feasibility and commercial market for enabling a hydrogen fueling network along this route. This can incorporate lessons from the Alberta demonstration project announced last year to test long-range fuel cell vehicles between Calgary and Edmonton.<sup>42</sup>

### Develop RNG Strategy

According to a 2020 study, Canada has a feasible potential for RNG production of 155 PJ, equivalent to 3.3% of Canada's present natural gas consumption.<sup>43</sup> With this understanding of production capacity, a strategy should be implemented to determine where best this fuel can be used to reduce emissions in support of a net-zero future. This strategy should be guided by the federal government, working closely with provinces, territories, and industrial partners.

# Conclusion

This Roadmap makes it clear that the transportation transition will not be easy. Indeed, change is never easy – particularly when it touches every aspect of our lives, including how we move around. However, it is eminently achievable. This roadmap is intended to focus efforts on building the pathways needed to decarbonize our transportation sector.

One cross-cutting theme we heard from the symposium, research, and individual consultations was the need for greater coordination on timelines, targets, planning, and funding. While this needs to happen, we also heard that time is of the essence. We can't spend the rest of this decade planning but not taking action.

And there is plenty to do. Better advisory supports and opportunities to share knowledge can support fleets looking to transition. Streamlined approvals and improving equitable access to chargers can ensure that we maximize the benefits of charging infrastructure buildout. Developing a long-term vision, sorting out cost responsibility and empowering utilities is necessary to ensure our electricity grid is ready to support electrification. And commitments to work with industry to establish hydrogen hubs and corridors can fuel the growth of low-carbon fuel vehicles. These recommended actions can spark the investments and coordination necessary for the region's net-zero transition, enabling sustainable economic prosperity in the decades ahead.

The Board, along with the broader business community, are eager to engage so that our region seizes the full economic benefits possible from being a leader in the climate economy. This includes the need to demonstrate leadership through creating the infrastructure necessary to electrify and decarbonize our personal vehicles and fleets.

Working together, we can pave the way for a net-zero transportation future.







## SPONSOR MESSAGE

# Powering Forward: Building a greener city through electrification



As extreme weather and other climate-related emergencies become more frequent, we're increasingly witnessing the impact that climate change can have on cities and communities across Canada and around the world. With cities consuming 78 percent of the world's energy and producing more than 60 percent of greenhouse gas (GHG) emissions, solutions to the climate challenge must start at the local level. Fortunately, cities around the world, including Toronto, are among the most active and important climate strategists, policymakers and overall enablers of transformational action. For example, the City of Toronto has released a Net Zero Strategy with a goal of achieving community-wide net-zero emissions by 2040 — 10 years earlier than initially planned.

Given the scale of the climate emergency, we know there isn't any one single solution that can get us to net zero. However, we also know that one of the main opportunities for significantly reducing emissions is to electrify major sectors of our economy, including transportation — which is currently the largest source of GHG emissions in Ontario. Electrification is a safe, reliable solution, especially in jurisdictions like Ontario, where we have a provincial grid that's more than 90% emissions-free. That means we have the potential to achieve significant GHG reductions in this province by replacing more emissions-intensive fuel sources with electricity.

As the local distribution company for the city of Toronto, Toronto Hydro's number one priority is ensuring the safe and reliable delivery of electricity to where it's needed. As an electrical utility, we're well-positioned to power transformation through supporting increased electrification as part of a

coordinated climate action strategy for building a greener and more sustainable city. To keep pace with the electrification needs of the fastest growing city in North America, Toronto Hydro has already been strategically investing billions of dollars to renew and expand the electricity distribution system that delivers clean electricity to nearly 800,000 homes and businesses across the city on a daily basis.

As more people and segments of the economy become reliant on electricity to meet critical needs, ensuring the capacity and resilience of the grid will take on an even greater level of importance. To help address this, Toronto Hydro regularly looks at emerging drivers of electricity usage in Toronto, such as the electrification of public transit and adoption of electric passenger vehicles. Toronto Hydro isn't an electric vehicle (EV) company, but we believe EVs are the future of transportation. That's why we're excited to continue supporting transportation electrification in Toronto — both by preparing the local grid for increased electricity demand and by directly supporting and enabling electrification projects across the city.

Meeting the City of Toronto's ambitious net-zero target will require equally ambitious support from businesses. To meet the challenge, Toronto Hydro filed an innovative Climate Action Plan with the City last year, outlining proposals for how we can help get Toronto to net zero. Our plan — which we believe is the first of its kind in Canada — is focused on three main goals: delivering nationally-significant emissions reductions, stimulating and facilitating the local cleantech economy, and advancing social equity in Toronto. A copy of our Climate Action Plan is available on our website.



## Toronto Hydro will be responsible for upgrading the electrical supply to TTC properties to ensure safe and reliable delivery of power capable of supporting the TTC's increasingly electrified fleet.

Toronto Hydro is committed to playing a leading role in climate action, both through our own action and through partnership and collaboration. We're proud to have developed a plan capable of helping the City implement its Net Zero Strategy, and we're excited to continue working with the City and other stakeholders to help put our plan into action.

### Supporting fleet electrification

As part of our role in promoting transportation electrification across the city, Toronto Hydro has been supporting the Toronto Transit Commission's (TTC) transition to electric buses. To support the TTC's first wave of electrification, Toronto Hydro helped deliver the electrification infrastructure that allowed 60 eBuses to enter service by the end of 2020 (which, at the time, represented the largest fleet of electric buses in North America). We helped the TTC select locations for its eBus program by identifying garage locations with enough available electrical capacity to support eBus charging. Where additional capacity was required for more eBuses, we installed battery energy storage systems to support the charging infrastructure.

Building on the success of that partnership, Toronto Hydro is proud to be partnering with Ontario Power Generation (OPG) and the TTC to help enable full electrification of the TTC's fleet and further reduce GHG emissions in the city. This partnership is the largest transit electrification project to date in North America and represents a big step towards transforming the sector. Toronto Hydro will be responsible for upgrading the electrical supply to TTC properties to ensure safe and reliable delivery of power capable of supporting the TTC's increasingly electrified fleet.

Working with customers like the TTC provides tremendous insight into customer needs, valuable

construction experience, and operating experience with new EV and energy storage technologies. These partnerships make us better positioned to accommodate more of these kinds of projects, which are critical for achieving the City's electrification goals.

### Piloting on-street EV charging

When it comes to personal vehicles, more Toronto residents than ever before own EVs, and that number continues to grow. Toronto Hydro's electricity system powers nearly 3,000 EV chargers at residential and commercial properties across the city, and there are more than 800 public charging stations connected to our grid. Still, public charging infrastructure remains a barrier to even more widespread EV adoption — particularly for residents living in condos and apartments, and for those without driveways and garages who rely on street parking.

Toronto Hydro wants to make owning an EV easier and more accessible for all residents. To help make that a reality, we partnered with the City to install on-street EV charging stations on select streets across Toronto as part of a pilot project to better understand charging usage patterns in the city. The charging stations — which are available to permit parking holders requiring Level 2 EV charging — were installed in areas with enough capacity for dedicated EV parking spots and where the utility pole placement allowed for safe installation with minimal disruption to the surrounding community.

Toronto Hydro's on-street charging pilot project allows us to better understand charging usage in the city and supports the reduction of GHG and other emissions harmful to air quality. We're excited to continue working with the City to extend the life of our existing charging stations and to potentially install additional charging stations for the benefit of Toronto residents.

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