November 4, 2022

*Submitted electronically through the Environmental Registry of Ontario*

Ms. Tasneem Essaji
Director, Transportation Policy Branch
Ministry of Transportation
12th Floor, 438 University Ave
Toronto, ON M7A 1Z8

Dear Ms. Essaji:

The Electricity Distributors Association (EDA) appreciates the opportunity to provide comments on ERO 019-6000 Building public electric vehicle charging infrastructure.

The EDA represents local hydro utilities in Ontario, the part of the electricity system that is closest to customers. Ontario's local hydro utilities are on the front lines of power and work to keep our electricity system safe, reliable, and affordable for households, small businesses, farms, commercial, and industrial customers. Because local hydro utilities (or "local distribution companies" or LDCs, as they are known in Ontario) are so close to our customers, the EDA is a crucial source of information and helpful advice to governments—and we are essential partners in delivering on energy policy.

## State of Play of Public EV Infrastructure in Ontario

According to Natural Resources Canada's ("NRCan") Electric Charging and Alternative Fuelling Stations Locator, Ontario has 1,950 Level 2 (L2) stations totalling 4,902 ports, and 361 DC Fast Charging (DCFC, Level 3, or L3) stations totalling 1,064 ports. Most of these chargers are focused in and around large urban areas (e.g., Toronto, Ottawa, and southwest Ontario), and the rest are in remote northern Ontario municipalities. These remote L2 and L3 stations are hosted at a variety of locations such as retail stores, car dealerships, and gas stations. There is also a small number of Level 1 (L1) stations located on the sites of Ontario and federal government buildings in northern Ontario.

## Literature Review

Based on NRCan's Updated Projections of Canada's Public Charging Infrastructure Needs (March 2022), the ideal spacing between stations throughout Canada's National Highway System (NHS) is 65 km. This report also emphasizes the importance of community cluster charging, in addition to corridor charging, to increase the uptake of EVs by consumers—particularly those without access to residential charging. Also of note is the nuanced nomenclature of EV supply equipment (EVSE, commonly known as "the EV charging station") terminology. For example, this 2022 NRCan report specifies that a "charging site" is the location



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of infrastructure that supplies energy to recharge EVs, while its previous version used the term "charging station". This change was made because "charging station" is also frequently used to refer to a single piece of charging equipment.

To balance the cost of L2 vs. L3 chargers, the Fuels Institute's EV Charger Deployment Optimization report (August 2022) recommends mid-range DCFC chargers in the 20-50 kWh range. Doing so optimizes capital costs, demand for charging, and customers' willingness to pay. The report also suggests an ideal ratio of 10 to 15 EVs for every charging station, and that user fees should cover development costs in addition to commodity costs, while still being acceptable to users. Finally, the report underscores the importance of coordinating between stakeholders—including utilities—in the development of EV infrastructure, highlighting that stakeholder coordination is often the biggest barrier to EVSE deployment.

Through its August 2022 comments on the U.S. National Electric Vehicle Infrastructure (NEVI) Formula Program, the American Public Power Association (APPA) has expressed the importance of stakeholders planning with utilities on upgrades to serve load, an appropriately sized and resourced workforce to install and perform maintenance service on the EVSE, and encouraging flexibility for site hosts and local utilities to explore pricing innovation.

**Comments**

1. **Where are the geographic areas in Ontario where there are gaps in public EV charging infrastructure?**

**Charging stations**

In northern Ontario, public charging infrastructure ranges from less than 100 km between sites (e.g., Espanola to Sudbury) to over 250 km between sites (e.g., Hearst to Timmins). More chargers would need to be added to meet the NRCan-identified ideal spacing distance of 65 km between charging sites.

While the Ivy Charging Network and ONroute have a partnership to have 20 of 23 ONroute locations equipped with L2 and L3 chargers by the end of 2022, the coverage area is limited to Highways 400 (Vaughan to Barrie) and 401 (Tilbury to Bainsville). A group of LDCs in southwestern Ontario have formed a partnership to collaborate on developing a regional EV charging network strategy. The project, conducted by the Community Energy Association (CEA), proposes the installation of an additional seventeen L3 charging stations and at least four L2 stations across the study area.

**Distribution infrastructure**

EV charging infrastructure extends beyond the above-ground charging stations and plugs that interface with EVs and their drivers. Distribution infrastructure conveys electricity to the site. From a utility planning standpoint, chargers—particularly publicly-available commercial EV

chargers—would potentially add significant demand. To prevent potential burden on the distribution system, public EV charging sites, being a source of increased electricity demand, would ideally be located away from major load centres. By doing so, a distributor would be better able to even out the demand profile of loads on its system.

The EDA's September 2022 comments to NRCan regarding Canada's Green Buildings Strategy (CGBS) highlight the importance of ensuring that new buildings are ready for EV chargers. To expedite EVSE installations while avoiding significant financial costs and schedule delays, requisite distribution infrastructure (e.g., conduits, transformers, space in electrical rooms) should be included in a building's planning stages. Doing so would be aligned with the federal government's 2035 zero-emissions vehicle (ZEV) mandate and the CGBS's principles of: i) considering economy-wide transformative planning, ii) designing with affordability in mind, and iii) staying flexible.

2. **In what kinds of situations are public EV chargers most useful (e.g., type of trip, length of trip, type of charging location)?**

NRCan's Updated Projections of Canada's Public Charging Infrastructure Needs emphasizes the importance of corridor and community cluster charging. It recognizes the centrality of community cluster charging to the uptake of EVs, particularly for individuals who are unable to access residential overnight EV charging, by modelling two scenarios with differing levels of home charging availability.

***Corridor charging***

Akin to a gas station on a road trip, corridor charging facilitates long-distance ground travel between municipalities for EV drivers. Consequently, corridor charging would require faster chargers (e.g., DCFC) to allow drivers to continue their journey without adding a significant delay. Since a robust corridor charging network is key to alleviating range anxiety among prospective EV purchasers, this type of public EV charging infrastructure is often funded by automakers as a loss-leader to market and sell EVs.

From a project development perspective, it may be more informative for policymakers and project developers to consider public EV charging infrastructure not as an evolution of the traditional gas service station, but from the perspective of public transit. A public transit system is generally not financially viable with user fees as its only source of revenue and requires financial support from governments. This is due to balancing the system's capital and operating costs with a fare that is palatable to users to ensure ridership, and because the use of public transit provides societal benefits that are not captured in a project's financial accounting (e.g., economic development, accessibility, etc.)

A public EV charging network shares many similarities with a transit system in this regard: it needs to meet geographic connectivity needs and be priced to encourage and ensure usage,

because of societal benefits outside of the project's financial accounting (e.g., electrification of freight and goods movement, improvement of local air quality, etc.)

Existing corridor public EV charging infrastructure, based on NRCan's Electric Charging and Alternative Fuelling Stations Locator, is most prevalent along provincially-managed 400-series highways. This can be attributed to the success of the Ivy Charging Network and its partnership with ONroute, and because 400-series highways connect the most populous urban centres of southern Ontario. Conversely, corridor public EV charging infrastructure tends to be less prevalent along regional and county roads, which are managed by smaller municipal governments. Consequently, more provincial-municipal collaboration in the project development and financing of corridor charging would be constructive in closing the charging infrastructure gap outside of large urban centres.

***Community cluster charging***

Community cluster charging is perhaps more important to encouraging EV uptake than corridor charging. Most passenger vehicles are used to commute to work and to run errands. They generally return home, where it is most convenient and economical to charge. For EV drivers who cannot access residential charging, as is often the case for those who live in multi-unit residential buildings, community cluster charging is vital to keep their EVs moving.

Although community cluster charging serves a different—but no less important—use case than corridor charging, the financing of these projects can similarly be likened to that of public transit systems, where user fees alone are insufficient to cover the capital and operating costs of the infrastructure. Typically located in places such as shopping malls, community cluster charging projects benefit from more flexibility, and mid-range L2 chargers (which are less expensive but slower than DCFC chargers) can be a viable option.

Unlike a highway gas station, users intend to spend an extended period at a community cluster destination. Situations where community cluster EV charging would be most useful are places where users intend to be productive—and consequently generating additional streams of revenue for the site operator—for a considerable period. Examples include, but are not limited to, offices, lodging, shopping malls, parks, arenas, theatres, and tourist destinations.

3. **What are the challenges with increasing public EV charging in Ontario and how could the government help address those challenges?**

LDCs face four categories of challenges regarding public EV infrastructure in Ontario. They are i) electrical infrastructure, ii) regulatory barriers, iii) project financing, and iv) residential charging.

| Challenge | How the government could help |
|---|---|
| ***Electrical infrastructure*** | |
| **Ensuring sufficient electrical infrastructure to service increased demand loads from community cluster and corridor charging.**<br><br>For example, a corridor charging station is located near a small community whose primary voltage is 4.16 kV. Installing electrical infrastructure for multiple L3 chargers (150-300kW/charger) can cause an issue and is something that should be considered to ensure adequate electricity distribution capacity. Those are not typically easy things to change unless there are multiple primary voltages in the area.<br><br>In rural areas, this need is even more pronounced. It is common for such communities to be on radial lines between towns, where connections may be more difficult to accommodate.<br><br>Conversely, community cluster charging is generally located in comparably more populated areas with existing amenities (e.g., mall) and those amenities' respective load demands, for which the existing electrical infrastructure sufficiently serves. Adding unspecified, growing demand through L2 chargers would similarly require significant capital investment and civil costs to upgrade transformers. | **MTO should work closely with LDCs to examine the infrastructure capabilities in the areas where the chargers are being considered.**<br><br>There should be regular planning conversations between the following stakeholders, to create alignment in efforts and ensure that new innovations and charging infrastructure can be integrated into the existing electricity grid:<br>• MTO<br>• LDCs<br>• various governments and governmental ministries (Ministry of Energy, Premier's Office, municipalities)<br>• auto manufacturers<br><br>Ontario's LDCs have been operating and planning distribution infrastructure for decades, but they require reasonable load estimates to fulfil expectations and targets from all levels of government (i.e. net-zero commitments, federal ZEV mandate, municipal mobility plans, regional green development standards, etc.) **LDCs would benefit from OEB guidance on whether to use load forecasts or actual load data.** This would impact the customer experience and EV uptake, in terms of whether customers would need to wait to use their EVs after purchasing, if there are additional distribution infrastructure upgrades required at their cost, or if they must rely solely on public charging infrastructure. |
| **Government programs do not always consider the electricity distribution system's current limitations.** For example, an LDC has | **System limitations should be openly discussed** when government programs to |

| Challenge | How the government could help |
|---|---|
| a business customer who wanted to take advantage of NRCan's Zero Emission Vehicle Infrastructure Program (ZEVIP) incentives to install charging stations at their facilities, but existing distribution infrastructure is not able to support the installation without upgrading the transformer. | incent EV charging infrastructure are designed or promoted. |
| **Consideration should be given as to incentives/benefits for electric utilities to upgrade their distribution assets in support of EV charging infrastructure.** There should also be a clear explanation and plan as to:<br>• who is paying for the chargers<br>• any upgrades and labour that may be required to the electricity grid to accommodate the chargers<br>• who will handle the on-going customer service complaints and broader administration to keeping the chargers in operating order | **Maintenance work for the charging stations should be considered** in this plan as well (i.e., who will service them, and how often).<br><br>**Funds should also be allocated to repair and/or replace chargers** that begin to malfunction. |
| ***Legislative and regulatory barriers*** | |
| **LDCs in Ontario do not have the regulatory approval or mandate from the Ontario Energy Board (OEB) to invest in EV infrastructure.**<br><br>Section 71 of the OEB Act limits distributors' business activity to distributing energy.<br><br>In a bulletin dated July 7, 2016, re: Electric Vehicle Charging, OEB staff express that "licensed electricity distributors are not precluded from owning and operating EV charging stations so long as the equipment provides for the management of load." While EV chargers could be enabled with demand response controls, dynamic load management cannot be realized with current one-way power flows. | For LDCs to access this exception as described by the OEB's July 2016 bulletin, **the OEB would need to update its policies, codes, and guidance to include two-way power flows.**<br><br>**A revisiting of the OEB Act may be a legislative approach** to provide LDCs with the flexibility and authority to own and operate EV charging infrastructure. |

| Challenge | How the government could help |
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| While LDCs' affiliates are not prohibited from owning and operating EV charging infrastructure, **there is not yet a strong business case for public EV charging.**<br><br>Several LDCs have conducted the analysis and found that utilization of public chargers needs to be at a much higher rate to cover maintenance and installation costs. | A potential option is to **allow LDC ownership and use the typical rate of return model on infrastructure**, while also incenting charger installations through grants to project developers (e.g., EVSE vendors, site operators, municipalities).<br><br>LDCs have two approaches to investing in charging infrastructure:<br>• "Make-ready" model: an LDC invests in the electrical infrastructure and upgrades necessary at the site, while the site host is responsible for the procurement, installation, and ownership of the charging station itself.<br>• "owner-operator" model: an LDC invests in all the electrical equipment and infrastructure upgrades, as well as the station itself |
| ***Project financing*** | |
| The **business case for public EV charging** stations must consider:<br>• Adequate number of chargers to service demand (by EV drivers), balancing between overbuilding and future-proofing for load demand growth due to electrification<br>• Whether there is enough demand to ensure utilization<br>• Capital costs (expensive, high-capacity equipment and related civil costs to update the physical distribution infrastructure; supply chain delays; real estate to site charging station)<br>• Operation and maintenance costs (appropriately trained and resourced workforce; servicing, repairing, and replacement costs of equipment) | **Government assistance to project developers (e.g., EVSE vendors, site operators, municipalities)** would be very helpful, as well as **marketing campaigns to spotlight the potential partners**. For example, the government could incent owners of shopping malls and plazas to allow more public charging infrastructure on their properties.<br><br>Any provincial government actions to incent EVSE deployment need to **complement federal programs** (e.g., NRCan's ZEVIP).<br><br>Efforts should be made to ensure that provincial programs **do not compete with the federal programs** (e.g., an LDC's participation in a provincial program should not preclude its participation in a federal program, and vice versa). |

| Challenge | How the government could help |
|---|---|
| | **MTO should plan for operational, maintenance and administrative costs related to on-going service and repairs on public EV charging stations over their expected useful life (EUL).** Regular maintenance service, in addition to ad-hoc repairs as needed, is essential to maintaining safe and reliable operations for the public. One way to do this is through reliability standards and/or reliability transparency for EVSE. Some examples include the UK Department for Transport, U.S. Federal Highway Administration, New York State, and California. |
| ***Residential charging*** | |
| In both NRCan's and the Fuels Institute's reports, **projections for public charging are predicated on a given level of residential charging access**, as it is the most economical and convenient option for EV drivers.<br><br>While this proposal seeks comments on public EV charging, **residential charging availability is a significant factor impacting the need for public EV charging infrastructure**.<br><br>LDCs see widespread adoption of EVs in their service areas, but **no visibility on where in their distribution system these increased loads are located, making capacity upgrade planning difficult**. | **LDCs would appreciate anonymized information from MTO on EV ownership registration within their service territories, in the form of full, 6-character postal codes and the number of EVs registered within them.** Knowing the registered location of EVs will help to determine load demand growth, a key input that informs distribution capacity upgrades and system planning (i.e., how many transformers are needed on specific block).<br><br>While such data is available for purchase from vendors in the private sector on a subscription basis, MTO should facilitate that knowledge transfer, free of charge or on a cost-recovery basis, to LDCs in support the 2035 ZEV mandate. |

## Recommendations

In summary, the EDA's recommendations are:

1. Governments should work closely with LDCs and project developers of public EV charging infrastructure, in examining and ensuring electricity distribution system capabilities when

siting projects. Physical infrastructure and system limitations should be openly discussed in government incentive program designs and promotion.

2. The OEB should provide guidance to LDCs on capital investments to support an EV-charging environment by:
    a. allowing LDCs to own EV charging stations and use the typical rate of return model for infrastructure,
    b. giving LDCs guidance on using existing load data vs. projected load data to inform distribution system planning, and
    c. updating its policies, codes, and guidance to include two-way power flows.
3. Governments should incent charger installations by:
    a. providing funding through grants to private-sector project developers and municipalities,
    b. incenting businesses to site public charging infrastructure on their properties (e.g., shopping malls, office buildings, lodging, etc.),
    c. designing and delivering programs which complement those from other levels of government and allow for stacking of incentives, and
    d. identifying potential project partners.
4. Because public charging infrastructure projections are predicated on specific levels of domestic charging availability, LDCs would appreciate anonymized information from MTO on EV ownership registration within their service territories, in the form of full, 6-character postal codes and the number of EVs registered within them. This would inform distribution capacity upgrades and system planning in support of residential EV charging.

Thank you once again for the opportunity to comment on this proposal. We look forward to continued engagement with MTO and other stakeholders on public EV charging infrastructure in Ontario by offering valuable LDC feedback. If you have any questions, please contact Tina Wong, Senior Policy Advisor at twong@eda-on.ca or (905) 265-5334.

Sincerely,

Teresa Sarkesian
President and CEO
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