

The Unique Role of Canadian Cities in Accelerating Zero-Emission Transportation



Priority Municipal Actions to Enable Zero Emission Vehicle Adoption

Transportation is a leading source of community emissions and to decarbonize the way Canadians move, Canada's cities must be key players in accelerating the adoption of light-, medium- and heavy-duty zero-emission vehicles (ZEVs). Municipal authority and community connection **uniquely position cities** to directly impact ZEV adoption and see the benefits of improved air quality and quieter streets. Many cities are already transforming transportation by prioritizing active, shared, and public transportation over personal vehicles. ZEV adoption is part of a **broader sustainable transportation framework** that improves mobility and reduces emissions by electrifying diverse modes (including micromobility like bikes), improving urban design, and reducing travel demand. Yet, without transitioning the remaining vehicles on city roads to zero-emission, Canada and Canadian cities **will not meet** their climate targets.

Based on extensive modelling of municipal ZEV strategies coast-to-coast, these priority actions were selected based on their ability to address the **most significant barriers** to ZEV adoption and then ordered based on the number of vehicles impacted. Each action can be achieved via levers under 'HOW?' which are ordered based on the effectiveness of reducing adoption barriers. For example, requirements are more effective than voluntary programs, though impact will be ultimately defined by **municipal design**. Complementary implementation of the actions, and of levers within each action, will enable municipalities to accelerate emissions reductions, create healthier streets, and ensure an equitable transportation transition.

DEFINITIONS

Electric Vehicles (EVs): vehicles powered by electricity, including Battery Electric Vehicles or Plug-in Hybrid Electric Vehicles.

EV-Ready: parking spaces that have the complete electrical circuit terminating in an energized outlet capable of Level 2 EV charging (i.e., 208V or 240V). Does not need to include the charger itself. Can be completed during construction or as a retrofit.

EV Charging Network: a network of public and private charging infrastructure that includes Level 2 and Direct Current Fast Charging (DCFC) stations. Each station is a site that can have one or more chargers where an EV can plug in.

Shared Fleets: any service where individuals can make use of a vehicle as a driver, a passenger, or to have goods transported without owning the vehicle. Includes car shares and ride-hailing (e.g., Uber, Lyft, taxis).

Zero-Emission Vehicles (ZEVs): vehicles that emit no tailpipe greenhouse gas emissions, including Electric Vehicles and Hydrogen Fuel Cell Vehicles.

Zero-Emission Zone (ZEZ): an area where ZEVs, pedestrians, and cyclists are granted unrestricted access. Other vehicles are either prohibited from entering or permitted to enter upon payment of a fee.

Level 1 Charging: uses a 120 V circuit, typically with a standard outlet and a portable charge cord. Provides roughly 80 km of range in 10 hours of charging.

Level 2 Charging: uses a 208 V or 240 V circuit (similar to an electric oven), typically with a wall- or ground-mounted charger. Provides roughly 400 km of range in 10 hours of charging.

DC Fast Charging: sometimes referred to as "Level 3" charging, a DC fast charger delivers 400 V to 800 V power directly to an EV's battery. Provides roughly 300 km of range in 15 to 60 minutes, depending on the vehicle and the power level.

Priority Municipal Actions to Enable Zero Emission Vehicle Adoption

LEGEND

NUMBER OF VEHICLES IMPACTED BY ACTION



All vehicles circulating in a city



All vehicles in existing buildings



All vehicles in new buildings



Vehicles in municipal and shared fleets

MUNICIPAL REVENUE OR INVESTMENT



Revenue generation potential



No cost or cost neutral potential




Investment required



1

Create advantages for ZEVs in the city



HOW?

A. Implement Zero-Emission Zone or other forms of mobility pricing 

B. Offer favourable parking policies (e.g., preferred parking fees, reserved parking) and curbside and/or loading zone access for zero-emission personal and shared vehicles and light-, medium-, and heavy-duty fleets  

WHY?

ZEVs should be made a more appealing, affordable option over internal combustion engine vehicles to encourage adoption. Advantages should be integrated with a municipal sustainable transportation framework that prioritizes active, shared, and public transportation and the evolving demands for fleets (e.g., increasing freight transportation and for-hire delivery services). Further, these advantages should be designed and implemented in consultation with equity-denied groups to **strengthen ZEV benefits** and mitigate potential negative impacts.


WHO IS TAKING ACTION IN CANADA?



The City of Montreal offers reduced residents-only parking fees for EVs in its **Règlement Sur Les Tarifs (2022)**. The City offers **EV-only** metered parking spots, in addition to metered curbside EV charging stations. The City also set the deployment plan of a low-emission zone pilot and the expansion of urban logistics spaces for delivery fleets as core targets for 2023 in its **Transportation Electrification Strategy 2021-2023**.


2

Develop a reliable and equitable charging network

HOW?

A. Directly invest and install charging infrastructure while leveraging funding from senior levels of government and/or utilities with consideration for **future-proofing** electrical capacity 

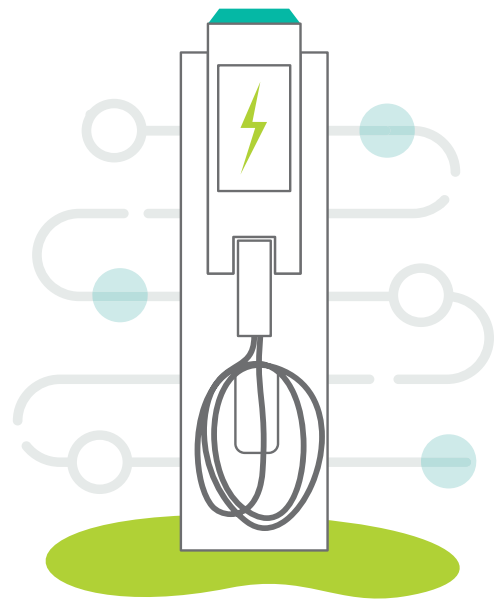
B. Accelerate private sector investment by removing regulatory barriers (e.g., ensure that EV charging spaces are counted within minimum onsite parking requirements; do not apply building permitting to EV charging - only electrical permitting; etc.) and including EV charging requirements in business licenses for appropriate businesses (e.g., gas stations)  

C. Provide financial incentives for private sector investment in charging infrastructure if in municipal jurisdiction, or seek changes to enabling legislation to provide incentives 

WHY?

More than half of Canadians agree that there are **too few** public charging stations. Public and workplace charging is critical for those without a driveway, garage, or other access at home, while also supporting longer trips and shared fleets. Municipalities can improve access by installing infrastructure on City property (e.g., City facilities and on-street).

With increasing EV adoption, the private sector can play a key role in deploying infrastructure where there is a strong business case. Cities can encourage private investment and partnership to expand the network. Yet, the private sector will not necessarily build infrastructure everywhere needed to ensure **equitable access** nor at the pace required to meet municipal goals. Direct municipal installation can be targeted to fill these gaps and is important given the total amount of parking cities typically control.

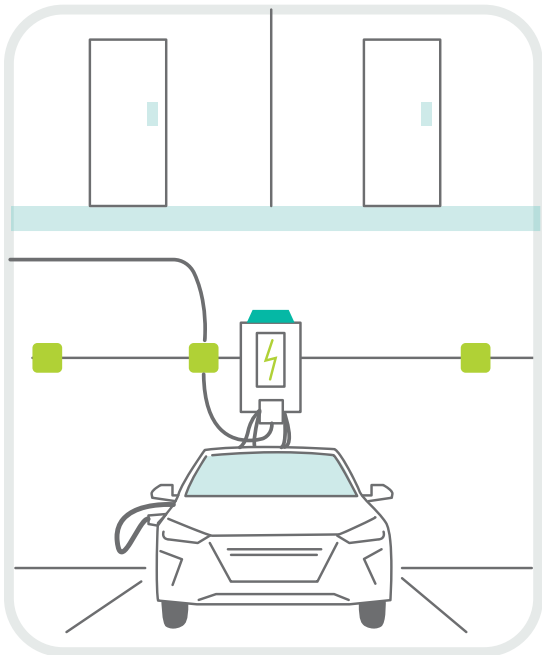


WHO IS TAKING ACTION IN CANADA?

The City of Ottawa now offers 52 Level 2 and two fast-charging **public chargers** on-street and at City facilities and plans to identify new opportunities as it develops its EV Strategy. The City of Montreal has installed nearly **1,000 public chargers** to date and has plans to install an additional 600 Level 2 and 60 fast-charging chargers by 2023. The City of Vancouver is encouraging private sector investment by imposing a \$10K business license **fee** on gas stations and large parking lots that do not install EV chargers. These fees are expected to add 21 DCFC and 320 Level 2 chargers.

3

Enable EV-Ready retrofits in existing buildings



HOW?

A. As market evolves, develop requirements (e.g., in Parking Bylaw) for comprehensive (e.g., 100%) EV-Ready retrofits for multi-family buildings and 20+% in non-residential buildings by a certain date (e.g., 2030) 💰

B. Offer financial incentives or financing to implement comprehensive (e.g., 100%) EV-Ready retrofits 💰

C. Offer or partner on educational resources for multifamily condominiums and rental apartments navigating EV-Ready retrofits 💰💰

WHY?

At-home charging access is critical to enable households to choose EVs for their next vehicle, but **fewer than half of Canadians** say they can charge at home. Canadians who live in existing multi-unit residential buildings (MURBs) face challenges due to the cost and complexity of installing EV charging infrastructure. Comprehensive EV-Ready retrofits in MURBs and other non-residential buildings are **more cost-effective** for broad charging access compared to a piecemeal approach.

WHO IS TAKING ACTION IN CANADA?

Having required EV-Readiness in new buildings since 2018, the City of Vancouver has expanded its focus to existing buildings. The City will pay for **EV charging** installation in multi-family apartments (up to \$93K per building), owning and operating the stations. Cities should consider going further by supporting comprehensive (100%) EV-Ready retrofits in multi-family condominium and apartment parking. This future-proofing enables all households to easily install a charger as they adopt EVs. Cities could replicate or advocate for the **CleanBC EV Ready Rebate Program** which funds EV-Ready Plans (i.e., feasibility studies requiring one EV-Ready space per unit) and, subsequently, rebates for EV-Ready retrofits (\$600 per space) and EV chargers. The City of Vancouver leverages this program for apartment EV-Ready Plans and infrastructure funding.


COMPLEMENTARY IMPLEMENTATION FOR CROSS-SUBSIDIZATION

Actions should be implemented in a portfolio approach to achieve the most emission-mitigating and cost-effective impact. No one action offers a complete solution to ZEV adoption and associated emission reductions. Further, collective implementation can support cross-subsidization. Vancouver's business license fee (see Action #2) is expected to generate **\$1.6M** in revenue, which will fund climate action including EV charging in rental buildings (#3). ZEZs or parking fees (#1) could generate funds for municipal charging network investment (#2) or be revenue-neutral by redistributing to mitigate inequitable costs.


4

Ensure all new buildings are EV-Ready

HOW?

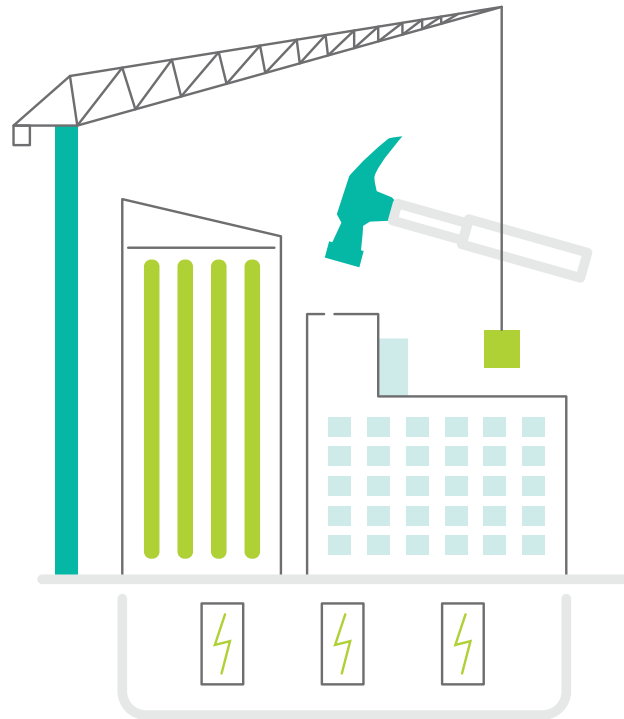
A. Enact bylaw requirement that 100% of parking spaces in new residential buildings and between **20% and 40%** for non-residential buildings be EV-ready 

If municipality believes EV-Ready requirements are not in their jurisdiction:

B. Advocate for the Province to a) include in the Building Code or b) allow municipal authority on this matter 

WHY?

At-home charging access is one of the most important **considerations** in purchasing an EV, with workplace access also being important. Future-proofing electrical infrastructure for EV charging is **most cost-effective** during construction, reducing buildings' future retrofit needs.



WHO IS TAKING ACTION IN CANADA?

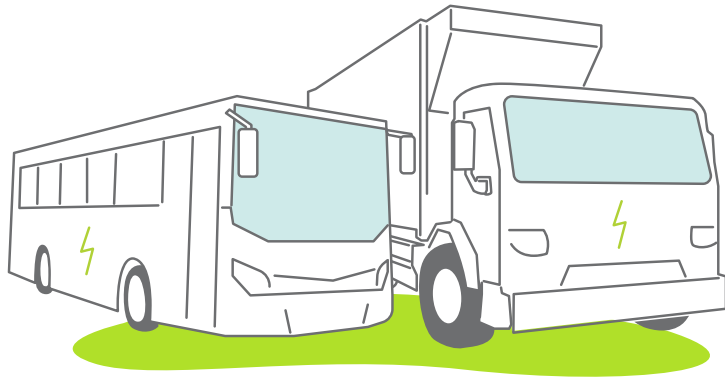
The City of Toronto requires 100% of parking spaces in most low- and high-rise residential buildings (excluding visitor parking) and 25% of spaces in non-residential buildings to be EV-Ready. These requirements were adopted in Toronto's **Zoning Bylaw 569-2013** (Sec. 200.5.1.10, amended 2021) and the **Toronto Green Standard v. 4**. Over a dozen municipalities across Canada have adopted EV-Ready new construction bylaws.

EFFECTIVE AND EQUITABLE DESIGN



The design of the HOW? (the levers for action) will define the effectiveness in driving adoption. Anchored in local context and municipal policy, the design should accelerate existing efforts in alignment with the city's climate targets. Ongoing consultation with diverse groups is critical to ensure access and benefits are equitably distributed. The option to use, own, or ride a ZEV should be available to all, which could be enabled through **a needs assessment** during design or reinvesting revenues into active and public transportation (#5). Access to benefits - including lower lifetime costs, improved air quality, and noise reduction - could be enabled by earmarking investments in ZEV infrastructure (#2) or supports (#4) for equity-denied communities. Negative impacts should be mitigated, which could be achieved by exempting equity-denied/low-income residents from additional costs of operating internal combustion engine vehicles (#1).

5

Accelerate ZEV adoption in municipal fleets and transit



HOW?

A. Develop, or accelerate, fleet decarbonization plans for light-, medium-, and heavy-duty vehicles with a ZEV requirement for replacements, based on current and future model availability  

WHY?

Municipalities have direct fleet control and can benefit from the lower total cost of ownership of certain ZEVs. Eliminating tailpipe emissions from municipal vehicles can **improve** local air quality, particularly for residents living in high-traffic areas. Electrifying public transit supports broader sustainable transportation efforts by supporting mode shift and increasing ZEV access to a broad population. Leading by example also enhances awareness-building efforts and contributes to growing momentum in the supply chain by providing a clear demand signal for ZEV options.

WHO IS TAKING ACTION IN CANADA?

The City of Edmonton has **40 electric buses** in operation on almost every route of its transit service, with 20 more on the way. Halifax Regional Municipality has committed to electrifying over half its transit fleet and is procuring **60 e-buses** to be on the road by 2024. The City of Ottawa has announced a plan to add **450 e-buses** by 2027, on a path towards a fully electric transit fleet by 2036. The City of Vancouver is electrifying a substantial portion of its fleet, including light-, medium-, and heavy-duty vehicles. The City has **145 EVs in operation**, including 55 heavy-duty vehicles ranging from Zambonis, greens mowers, utility vehicles, and forklifts.

FUTURE-PROOFING DESIGN

All design should consider future-proofing for the levels of ZEV adoption expected: reaching **nearly 100% of vehicles** on the road in the next two to three decades. Cities should carefully evaluate how to minimize costs of EV charging infrastructure while adequately providing for drivers' current and future charging needs. For example, investing in an evaluation of streetlight circuit capacity for EV charging can **significantly reduce implementation costs** of public Level 2 charging in residential neighbourhoods by avoiding costly new electrical service. Likewise, engaging with stakeholders (e.g., utilities, designers, contractors, building managers, etc.) in the development of policies and charging infrastructure will improve implementation.

6 Encourage electrification of shared fleets 🚗

HOW?

A. Revise licensing and/or bylaws to require 100% of ride-hailing (e.g., Uber, Lyft, taxis) fleets to be zero-emission by 2030 🚗💡

B. Offer preferable terms (e.g., higher allowances on fleet size, lower permit or licensing fees, improved parking access) or offer financing to offset the upfront costs for EV shared fleets 🚗💡🚗

C. Integrate shared fleet needs into city-wide charging network planning (Action #2) by providing Level 2 charging for “return-to-base” car share, and DC fast charging for ride-hailing (e.g., Uber, Lyft, taxis) 🚗💡🚗

D. Amend land-use bylaw to eliminate or reduce the total amount of parking required in residential new construction when including dedicated EV car-share parking 🚗💡

WHY?

Important **emissions reductions** can be achieved by electrifying these high-kilometrage vehicles and by minimizing reliance on personal vehicles. It also increases EV access to those who do not own or who cannot afford a vehicle and the **likelihood of adoption** of those considering one.



WHO IS TAKING ACTION IN CANADA?

The City of Calgary's **Parking Policy (2021)** sets out the annual fees for car share vehicles and offers a 50% reduction for fully-electric car share vehicles.

For more information, please visit:

The Green Municipal Fund or
Low Carbon Cities Canada (LC3)

Questions?

Please e-mail them to info@lc3.ca

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Co-created with:

