



Installing Chargers in Apartments and Condos

Policy pathways to make Alberta
multi-unit residences EV-ready

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PEMBINA
Institute

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The Pembina Institute acknowledges that the work we steward and those we serve span across many Nations. We respectfully acknowledge the space our organization is headquartered in as the traditional and ancestral territories of the Blackfoot Confederacy, comprised of the bands Siksika, Piikani, and Kainai, the Îyârhe Nakoda Nations, including the bands of Goodstoney, Chiniki, and

Bearspaw, and the Tsuut'ina Dené. These Lands are also home to the Métis Nation of Alberta — Region 3 whose Peoples have deep relationships with the Land.

These acknowledgements are some of the beginning steps on a journey of several generations. We share them in the spirit of truth, justice, reconciliation, and to contribute to a more equitable and inclusive future for all of society.

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Summary

This short guide outlines the actions that municipalities and the provincial government of Alberta can take to incentivize and otherwise support the installation of electric vehicle (EV) charging infrastructure in the province's multi-unit residential buildings (MURBs). We have also included steps that other stakeholders, such as financial institutions, utilities and industry associations, can take to contribute to electric vehicle preparedness in MURBs, making a building more desirable to live in and boosting its market value — a clear benefit to property owners.

The adoption of electric cars has accelerated across Canada, increasing from 3.5% of market share of new vehicle sales in 2020 to 11.7% in 2023. While sales growth in Alberta has lagged other provinces such as British Columbia and Quebec, uptake nevertheless continues to increase. Given current and projected growth rates in the EV sector, policy makers, utilities and municipalities need to create a regulatory environment that will advance the construction of charging infrastructure to keep pace.

Ensuring that residents have access to charging equipment — regardless of the type of home they live in — is essential to a successful transition away from internal combustion vehicles while also improving air quality and health outcomes. Installing chargers in MURBs additionally addresses equity issues: residents, regardless of income level, have equal access to energy required to operate a personal vehicle.

What municipalities can do: Key takeaways

- **Regulatory measures:** Require new MURBs to be 100% EV-ready, meaning there is sufficient electrical capacity and infrastructure in place to power EV chargers, which can be installed at a later date; establish targets to ensure progress.
- **Financing opportunities:** Set up a rebate program and other financing mechanisms to encourage building owners and condo boards to install an adequate number of chargers and make upgrades to the power supply as needed.
- **Community outreach:** Develop educational material for residents, property managers, building owners, and condominium corporations to learn more about charging infrastructure installation.

What federal and provincial governments can do: Key takeaways

- **Regulatory measures:** Standardize and streamline permitting and administrative processes (which can fall under Right to Charge legislation) and update building codes to encourage investment and help lower costs. Directing utilities to develop favourable rate structures and demand response systems will also incentivize buy-in and private investment.
- **Financing opportunities:** Set up a funding body to contribute to municipal-level financing for EV-ready retrofits in MURBs.
- **Community outreach:** Arrange ways to connect property owners and condo associations with service providers and engineering consultants who can provide advice on best practices for installing charging equipment.

What financial institutions and utilities can do: Key takeaways

- **Regulatory measures:** Explore utility investments in EV charging infrastructure and demand response programs to lower costs and improve the viability of installing and using chargers for both tenants and owners.
- **Financing opportunities:** Provide loans designed specifically for retrofits of existing MURBs.

Background

The growth of electric vehicles

In 2023, electric cars made up 11% of personal vehicle sales in Canada and 4% of sales in Alberta.^{1,2} The latest data from Statistics Canada shows that the share of new vehicle registrations in Canada that were either battery-electric or plug-in hybrid grew from 8.6% in Q1 2023 to 11.3% in Q1 2024, representing a 31% increase in market share or 53% growth in sales over the period (Figure 1). Growth in market share is projected to rise encouraged by the federal government's recent regulatory amendment mandating sales targets for automakers and importers: Zero-emission light duty vehicles are required to make up 20% of total sales by 2026, 60% by 2030, and 100% by 2035 under the Electric Vehicle Availability Standard.³

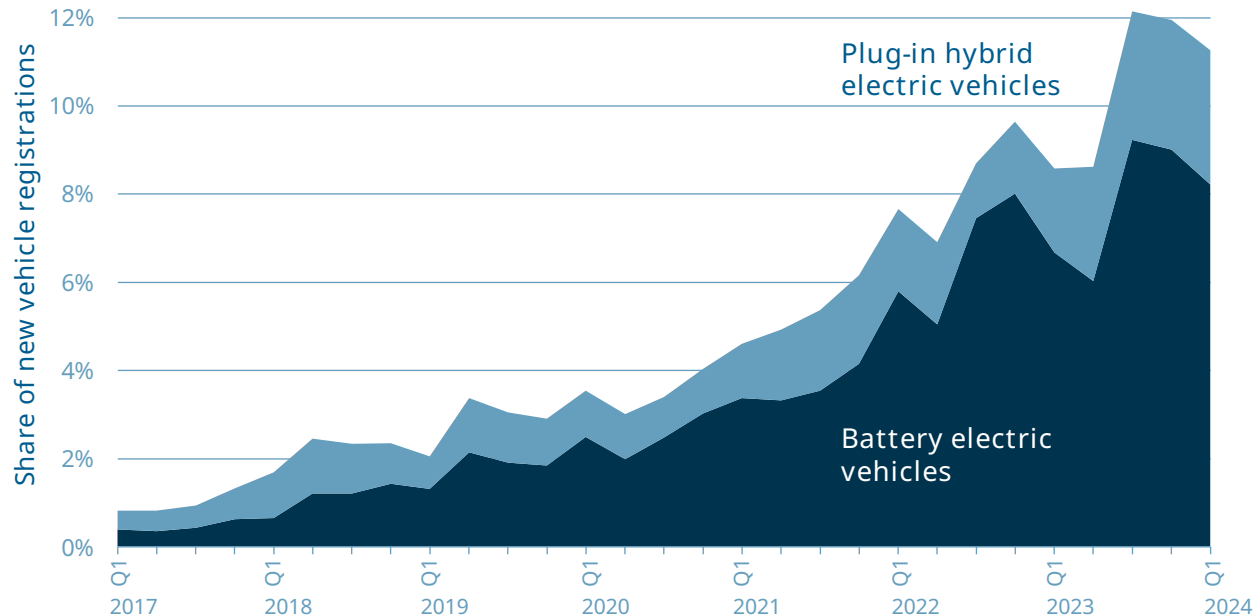


Figure 1. New vehicle registrations in Canada by quarter

Data source: Statistics Canada⁴

Electric vehicles and multi-unit residences

As much as 72% of electric vehicle charging in Canada occurs at home. Workplace and public charging stations make up the balance.⁵ However, as more Canadians replace internal combustion cars with electric ones, the demand for chargers located in apartment and condo parking stalls will increase.

Approximately 20% of households in Alberta register as residing in MURBs (Figure 2), and the densification of Alberta’s urban centres will see this number rise sharply. The onus will largely fall to municipalities to respond to increased demand for chargers on site. Planners, owners and developers can expect that charging stations will soon be a deciding factor when someone is considering both their next car purchase and their choice of residence.

As the era of the internal combustion engine recedes, municipal policymakers will need to incentivize and support the deployment of charging infrastructure. Key to creating a sufficient and equitable supply of charging stations will be ensuring that chargers are installed in multi-unit residential buildings.

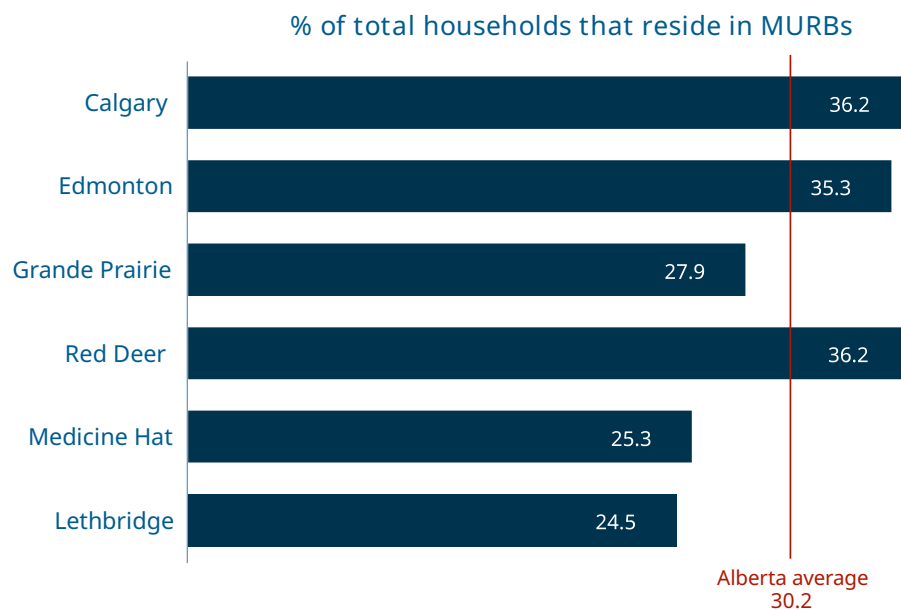


Figure 2. Proportion of households residing in MURBs in Alberta

Note: Includes row houses and apartments.

Data source: Statistics Canada⁶

How EV ownership benefits municipalities

Multiple community-wide benefits can accrue with an increase in EV ownership.

Affordability and local economic benefits

In side-by-side comparisons, and factoring in the lower cost of maintenance, electric cars typically cost less than an internal combustion model over the lifetime of the vehicle.⁷ A portion of the savings will likely be spent in the local economy.

Equity

As the sticker price of EVs declines to price parity with conventional cars, buying an electric vehicle becomes increasingly affordable, especially when the lower cost of maintenance compared to an ICE vehicle is factored in. The benefits of EV ownership multiply when tenants in multi-unit residences have access to charging stations. Conversely, the absence of chargers in MURBs leads to greater social disparities with some demographic sectors having far greater means and access to clean driving vehicles and less exposure to air pollution.

Improved air quality and noise reduction

The absence of tailpipe emissions, a primary source of air pollution, improves local air quality. Cleaner and much quieter than internal combustion models, electric cars are directly linked to better health outcomes, especially for children, seniors, and those with asthma and cardiovascular problems. The Atmospheric Fund has estimated that over the next 25 years, the federal EV Availability Standard will result in \$90 billion in health benefits, largely due to the reduction in ailments and disease caused by air pollution, and 11,000 avoided premature deaths.^{8,9}

Decline in greenhouse gases

Accounting for the life-cycle emissions of a vehicle's components and fuel — including mining extraction, battery manufacturing, and charging on relatively carbon-intensive grids such as Alberta's — EVs emit far fewer pollutants than fossil-fuelled vehicles.¹⁰ As the grid decarbonizes, EVs will become nearly carbon neutral. Transitioning to emission-free mobility is essential to achieving net-zero GHGs by 2050.

When is a building EV-ready?

When all the infrastructure required for charging electric vehicles except the charger itself has been installed, a building is understood to be “EV-ready.”

Buildings outfitted with backend infrastructure such as a larger electrical panel that can accommodate increased power usage and electrical conduits that can be connected to a charger at a later date are “EV-capable.” An EV-ready building includes the installation of wiring and fully energized electrical outlets near parking stalls so that chargers can be added when demand for charging access increases.

Property owners who invest in making their building EV-ready will, on average, see cost savings that are two to six times greater than the expenses that would be incurred by incremental

upgrades and retrofits. The substantial savings are the result of minimizing the inefficiencies of multiple retrofit construction projects and spreading out the costs and risks associated with installing chargers in stages. Additionally, being EV-ready reduces the complexities that come into play when individual tenants install a charger in their assigned parking spot.

The Pembina Institute recommends that MURBs under construction install all the necessary infrastructure for a building to be EV-ready, and that existing MURBs be retrofitted to prepare for many or all parking spots to be EV-ready.¹¹ There are various ways to manage the costs associated with retrofits and for different levels of government to support developers and property owners to take this approach.

Choosing a charger: Level 1 vs. Level 2 chargers

In multi-unit buildings, we generally recommend installing Level 2 charging with load management capabilities rather than Level 1, for three reasons: flexibility, performance, and cost.

Level 2 systems are typically designed to supply enough power to charge multiple vehicles parked for long periods of time — often overnight in residential parking areas. Allowing load-sharing among several Level 2 chargers minimizes the need for infrastructure upgrades.¹² When only some chargers on a shared circuit are used, the full Level 2 charging rate of 32 km to 96 km of range per hour is enough to ensure a full charge to all vehicles. The slowest charging rate for Level 2 load-shared systems (for instance, when all shared chargers are in use) is on par with a Level 1 charging rate; when not all chargers are in use Level 2 systems are much faster than Level 1.

Because Level 1 charging occurs on dedicated circuits and is seldom managed to optimize electricity use, load sharing is not possible. As a result, users of Level 1 systems experience a slower charge of around 8 km of range per hour. Because of the slower charging rate, Level 1 systems more often experience periods when a full charge cannot be achieved (for example, when temperatures drop) than would occur using a Level 2 system.

While Level 1 charging equipment is less expensive than networked Level 2 equipment, most other elements, such as the backend infrastructure (panels, conduit, wires, transformers, etc.) have comparable costs. The electrical upgrade required will depend on the degree of load sharing selected.

What municipalities in Alberta can do to advance EV-ready MURBs

Through policy and regulatory measures, municipalities in Alberta can take steps to accelerate the installation of charging infrastructure in MURBs. Some of the measures listed below are already in place in other parts of Canada. More than a dozen municipalities in the country, including Toronto and Vancouver, have put forward policies that require all residential parking in new developments be EV-ready. In addition, several municipalities have initiated programs that offer incentives to property owners to retrofit multi-unit residences to be EV-ready.

Policy and program recommendations for municipalities

Table 1. Recommendations for municipal actions

| Recommendation | Role of municipality |
|--|---|
| <p>1. Set EV-readiness targets for multi-unit buildings.</p> <p>Targets should be time bound and align with local, regional, and national climate actions, regulations, and goals including the federal EV Availability Standard under which by 2035, all new cars sold will be electric.</p> | <p>Embed targets for the completion of EV-ready infrastructure in a specified number of MURBs in municipal climate plans, urban planning strategies and building policies.</p> |
| <p>2. Update regulations and/or bylaws to include EV-ready requirements for new multi-unit buildings. New requirements can be added to zoning or parking bylaws and should require that residential building parking be 100% EV-ready and that parking at non-residential buildings be 20% EV-ready.¹³</p> <p>Some municipalities have reduced or eliminated minimum parking requirements in new developments to encourage other modes of transportation and to accommodate densification and more affordable housing. These municipalities also have 100% EV-readiness requirements; other municipalities use a quota system, such as one EV-ready stall per dwelling.</p> | <p>Update bylaws and regulations applicable to urban development that lead to the adoption of EV-ready installation in new builds.</p> <p>The provincial government can adopt these policies and/or clarify municipalities' ability to do so.</p> |
| <p>3. Set up a rebate program to encourage owners and condo associations to retrofit their building. Key factors to include:</p> <ul style="list-style-type: none"> • The program incentivizes comprehensive (i.e., many or all stalls) EV-ready retrofits in residential and non-residential buildings. • The program provides funding for EV-ready planning as a first step, to ensure that additional loads on the electrical system are taken into consideration. | <p>Engage with the provincial government and utilities to explore top-up incentives.</p> |

| | |
|---|--|
| <ul style="list-style-type: none"> • The program incentivizes right-sizing of parking, i.e., determining the correct number of parking spaces. Typically, there is an oversupply of parking spots. Instead, extra spaces can be repurposed for storage, bicycle racks, or other amenities. • The program incentivizes the installation of parking spots and services for carshare options. • The program mitigates against property owners raising rents due to retrofits. | |
| <p>4. Engage in community outreach that targets residents, rental building owners and condominium corporations to disseminate information on EV charging infrastructure in multi-unit buildings</p> | <p>Create and disseminate education programs (online, in person, or both), or fund third-party organizations to do so.</p> |

In addition to the many steps available to municipalities to advance charging infrastructure deployment in MURBs, it’s important to keep in mind that the first step for the building owner should be to hire an engineering consultant who can analyze the needs of an individual building and present cost-effective options. For example, it may be possible in a single project cycle to make one floor of a parkade EV-ready while the other floors can be made EV-capable. Some property owners may also be interested in installing heat pumps, rooftop solar, or battery energy storage, which will benefit from coordinated electrical capacity planning. An engineering consultant would be able to consider the electrical needs of these options along with preparing EV-ready options.

Municipal plans in Alberta for EV infrastructure

Decision-makers in some of Alberta’s municipalities have recognized the multiple benefits of the transition to electric cars, including cleaner air, improved health outcomes, reduced greenhouse gas emissions, and household cost savings realized over the lifetime of car ownership. As of 2024, three municipalities are in the early stages of planning new regulatory requirements and funding programs to advance the installation of charging equipment in MURBs.

Calgary

In 2022, the City of Calgary released its climate strategy, which identifies the need for publicly accessible community charging hubs, street-side charging, and an EV-ready policy. The strategy includes a goal that, by 2030, all newly constructed residential buildings and 10% of the parking space allotted for new commercial buildings be fully EV-ready.¹⁴ Since the release of the strategy, Calgary has installed more than 200 public charging stations across the city in public parkades, transit stations, and recreation centres.¹⁵ Several MURBs are also equipped with charging stalls for residents.¹⁶

Edmonton

In 2018, the City of Edmonton released its electric vehicle strategy, highlighting the role of EVs in making Edmonton a cleaner city and the actions that the city will take to facilitate the transition to electric passenger vehicles.¹⁷ One of the goals stated in the strategy is to make Edmonton EV-ready. The strategy acknowledges the need for chargers in MURBs and a variety of options are currently under consideration. In 2022, Edmonton and local utility EPCOR announced a 10-year partnership to install community EV chargers, including eight that are now publicly accessible and offer free charging.¹⁸

Canmore

The Town of Canmore's 2018 climate action plan includes a commitment to review bylaws, support the development of charging infrastructure, and encourage residents to adopt EVs.¹⁹ In 2023, city officials consulted with stakeholders on a one-per-dwelling EV-ready requirement for MURBs²⁰ and in 2024 launched an EV Readiness Research pilot project to collect local data on installing EV chargers in buildings, both existing and now under construction.²¹ Canmore's efforts recognize the fast pace of EV adoption, the community benefits, and the advantages of futureproofing multi-unit buildings.

Further actions in other municipalities

Richmond, B.C.: EV-ready requirements for new construction

- The first city in Canada to adopt EV-ready requirements for the construction of new residential buildings
- A good example of the effectiveness of outcomes-based regulation and the use of load-sharing strategies to reduce costs and minimize electrical upgrades

The City of Richmond, B.C., is the first municipality in Canada to implement EV-ready requirements for new construction. In 2017, city council added an amendment to the Richmond Zoning Bylaw mandating that every residential parking space in all new building types (detached homes, townhouses, apartments) be EV-ready.²² Visitor parking spaces are excluded from the requirement.

Most new multi-unit developments comply by using EV energy management systems (EVEMS) to manage the increase in energy demand on the electrical system. This significantly reduces the

electrical capacity required and the associated costs. To ensure that tenant drivers receive an adequate charge, the Richmond bylaw specifies that where EVEMS is used:

- The system must be capable of supplying a minimum performance level of 12 kWh per parking space over an eight-hour overnight period, assuming that all parking spaces are in use by a charging EV.
- Communications technology is installed to support EVEMS (e.g. cellular, wireless, or cabled infrastructure).

These requirements have since been adopted by dozens of other local governments, including Toronto and Vancouver. A similar requirement for non-residential parking is currently under consideration.

Vancouver, B.C.: Rental building EV-ready top-up program

- Mandates EV-ready retrofits for all building types
- Program designed specifically for rental buildings to ensure tenant access and equity

In 2018, the City of Vancouver raised the percentage of EV-ready parking stalls required in new MURBs from 20% to 100%. The City also requires one EV-ready stall per new single-family residence with a garage, and EV-readiness for 45% of parking stalls in new commercial buildings and up to 100% of parking stalls attached to hotels.

Vancouver launched an incentive program to accelerate EV-ready retrofits in existing rental buildings in 2021.²³ Ensuring access to EV charging in rental buildings is an important factor in an equitable EV charging strategy, primarily because low-income, racialized, and other disadvantaged groups are more likely to be renters than homeowners.

Functioning as a top-up to the CleanBC Go Electric Rebate Program for apartment buildings, the 2021 initiative invites owners of rental buildings to apply for the city to install EV chargers for tenant use. The City contributes up to \$93,000 over and above funding available through the CleanBC program (which offers up to \$137,000), to cover expenses associated with an EV-ready plan, infrastructure and charging equipment.²⁴ The City of Vancouver is aiming to install EV chargers in at least 700 parking stalls over four years.²⁵

Waterloo, Ontario: All new builds must be EV-ready

- EV-ready requirements applicable to all new buildings, residential and non-residential
- Surface parking lots require a minimum number of chargers

In 2020, the City of Waterloo adopted a zoning bylaw amendment that requires EV-ready parking spaces in all new residential, mixed-use and non-residential buildings, effective January 2021.²⁶ In keeping with EV-ready principles, the parking spaces must be designed to allow for the future installation of EV charging equipment.

Waterloo's bylaw includes a second requirement specifically for surface parking lots in all building types. Instead of an EV-ready requirement, surface lots must install a minimum number of Level 2 chargers based on the number of parking spaces. Where charger installation is required in a residential surface parking lot, at least half of the charger-supplied spaces must be designated as visitor parking.

Recommendations for stakeholders working with municipalities

To accelerate the deployment of EV charging infrastructure in multi-unit buildings, the federal government, provincial government, utilities and financial institutions can lend support to the efforts being made at the municipal level. Recommendations for supporting actions are highlighted in Table 2.

Table 2. Recommendations for supporting actions

| Supporting action | Implementing partner organization |
|--|---|
| Create EV-ready loan programs specifically for retrofits of existing buildings. | Banks, credit unions, the Canadian Infrastructure Bank, or impact investing organizations |
| Assist municipalities in setting up Clean Energy Improvement Programs (CEIPs) and address regulatory limitations to expand the ability of municipalities to provide project financing that is repaid through the municipal tax system. ²⁷ | Government of Alberta |
| Explore utility investment in EV charging infrastructure in multi-unit buildings and workplaces to bring utility companies along as active participants in deploying infrastructure. | Alberta Utilities Commission Utility companies |
| Offer utility demand response programs so that EV charging in MURBs is optimized to minimize the impact of high-demand periods on the electricity grid. | Government of Alberta Alberta Utilities Commission Utility companies |
| Adopt provincial Right to Charge 2.0 legislation (which could be done through amendments to the Alberta Condominium Property Act) to streamline the administrative process required to install EV chargers. | Government of Alberta |
| Include EV-ready requirements in provincial and federal building codes ²⁸ to provide clarity for stakeholders in new construction, including developers, engineering firms, and tenants. | Government of Alberta Government of Canada |
| Develop ways to connect building owners and condo boards with charging-as-a-service providers (i.e., EV charger installation and operation companies) and engineering firms. | Industry associations, building owners and condo boards, charging-as-a-service providers and engineering firms. |

Right to Charge 2.0

Right to Charge 2.0²⁹ is model legislation that outlines a series of requirements to make it easier to install EV charging infrastructure in multi-family buildings. The requirements compel owners of multi-unit condominiums and rental buildings to plan for installing charging stations and the resulting increased demand on the electrical system. The legislation can require building owners to commission electrical planning reports that analyze charging options and electrical upgrades.

Other requirements can include limiting the voting threshold needed to approve EV-ready retrofits in condominiums so that charging initiatives can move more quickly and efficiently from proposal to implementation stage. Changes to the voting process itself (e.g., specifying that the percent of votes required is a percentage of those present at the SGM or AGM, and not a percentage of all condo owners in the building) would further advance EV-ready retrofits and alleviate impediments such as owner absenteeism.

Introducing EV-specific amendments to all provincial condominium legislation would help clarify and highlight the rights and obligations of condo corporations when installing EV charging infrastructure in their building, while at the same time alleviating concerns regarding potential legal challenges.

British Columbia's Bill 22: The Strata Property Amendment Act, 2023 is a model of how the condominium approvals process for EV charging installation can become less onerous and better suited to facilitate deployment of much-needed on-site chargers.

Conclusion

Due to regulatory changes, greater diversity in EV models on the market, lower purchase costs, and maintenance advantages over ICE vehicles, the uptake in electric cars will continue along a growth trajectory in Alberta and across Canada. More EVs on the road will fuel demand for charging infrastructure both in homes and residential buildings. Installing infrastructure in multi-unit buildings is more complicated than in smaller buildings and, to date, MURBs have not received adequate support at any government level.

Municipalities can do more to assist building owners and developers prepare to future proof their building stock through EV-ready requirements and retrofit programs. Since incremental upgrades to EV infrastructure costs two to six times more than installing charging equipment at the beginning of construction, these programs should encourage building owners and developers to undertake comprehensive, large-scale retrofits or, in the case of new builds, installation in the initial stages of construction, which will yield substantial savings. The

provincial government can bolster municipal level initiatives through financing incentives, updated building codes and regulatory measures for condo governance and also direct utilities to develop supportive rate structures and demand response programs. Good planning avoids unnecessary costs and provides an adequate supply of charging infrastructure, so everyone has equal access to EVs and charging, regardless of where they live.

Endnotes

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Photo: Jason Wang, Pembina Institute