



## REPORT

Report Date: June 22, 2021  
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Meeting Date: July 6, 2021  
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TO: Vancouver City Council

FROM: General Manager of Planning, Urban Design and Sustainability

SUBJECT: Requirements for Electric Vehicle Charging in New Non-Residential Buildings – Climate Emergency

### **RECOMMENDATION**

THAT Council approve, in principle, amendments to the *Parking By-law* to:

- a. require electric vehicle (“EV”) charging infrastructure in new, non-residential buildings except hotels and bed and breakfasts, such that 45% of stalls are EV-ready, not including shared vehicle stalls and accessible stalls;
- b. require EV charging infrastructure in new hotels and bed and breakfasts, such that 100% of parking stalls, including shared vehicle stalls and accessible stalls, are EV-ready;
- c. enable the option of using DC Fast Charging in place of Level 2 charging in all new non-residential buildings;
- d. require that EV charging infrastructure in all shared vehicle stalls in all new buildings include a charging station;
- e. require EV charging infrastructure in shared vehicle parking stalls in all new, non-residential buildings, except hotels and bed and breakfasts, such that 100% of shared vehicle parking stalls are EV-ready;
- f. require EV charging infrastructure in accessible parking stalls in all new, non-residential buildings, except hotels and bed and breakfasts, such that 45% of accessible parking stalls, and a minimum of one accessible parking stall, are EV-ready; and

- g. clarify and restructure section 4.14 to accommodate the amendments set out in items (a) through (f) above;

FURTHER THAT the Director of Legal Services be instructed to bring forward for enactment the necessary amending By-law generally in accordance with Appendix A.

### **REPORT SUMMARY**

This report advances the Climate Emergency Action Plan by increasing access to electric vehicle charging in buildings, consistent with Big Move 3, which seeks to ensure that by 2030, 50 % of the kilometres driven on Vancouver's roads are by zero emissions vehicles.

This report recommends changes to the new construction requirements for non-residential buildings that will better reflect how users access these buildings, enabling more people who commute by car to switch to an EV; and, for businesses to offer EV charging to their customers and other visitors. These comprehensive requirements have minimal increases in new construction costs and would significantly reduce future costs of retrofitting for EV chargers.

This report recommends:

- Creating EV charging requirements for **all forms of new non-residential buildings**, including updates to the existing EV charging requirements for new Commercial Buildings that were introduced in 2013.
- Allowing developers to **substitute DC Fast Charging** in place of Level 2 charging to support potential business, operational, or other benefits.
- **Re-defining car-share stalls** (also known as Shared Vehicle stalls) in new construction to require that charging infrastructure, including a charging station, be included in Shared Vehicle stalls within newly constructed buildings.
- Establishing minimum amounts of EV charging requirements in **accessible stalls** in new non-residential buildings.

These new requirements will complement existing regulations for new residential construction, ongoing efforts to expand the public charging network, retrofits in multi-family rental buildings, among other policies under development to support Vancouver residents and visitors.

Based on consultation with Development, Buildings and Licensing, the short term impacts on permitting staff are expected to be manageable and will be further minimized through staff and industry training. Over the longer term, ensuring that new buildings are designed to meet future needs will minimize the need for charging retrofits and the accompanying pressures on permitting staff.

### **COUNCIL AUTHORITY/PREVIOUS DECISIONS**

- In November 2020, Council adopted the [Climate Emergency Action Plan](#) (CEAP), with a comprehensive objective to cut emissions to 50% of 2007 levels by 2030; and an objective specific to ZEVs that 50% of the kilometres driven on Vancouver's roads will be ZEVs by 2030.

- The CEAP's recommendations I, J, K, and L aim to support increased access to EV charging so that residents and businesses can be confident in having access to charging when they make the switch to EVs. Within the suite of actions to increase access to EV charging, recommendation K of the CEAP directed staff to develop standards for electric vehicle charging in new, non-residential buildings.
- In March 2018, Council approved changes to the Vancouver Building By-law and Parking By-law to require that 100% of parking stalls, excluding visitor stalls in new multi-unit residential buildings include EV charging infrastructure. Council subsequently approved updates in April 2020 to these By-laws to clarify that all new residential parking stalls in one- and two-family dwellings must also have EV charging infrastructure.
- In November 2016, Council adopted the EV Ecosystem Strategy, which established 32 priority actions for the City between 2016 and 2021, with the aim of achieving broader home, workplace, and public charging opportunities for the growing EV market.
- In August 2013, Council adopted new minimum requirements for all parking stalls in new one and two-family homes, 20 per cent of parking stalls in multi-unit residential buildings, and ten per cent of parking stalls in new commercial buildings, such that they be equipped with a "Level 2" charging circuit under the Vancouver Building By-law.
- In October 2012, Council adopted Transportation 2040, which includes actions to support electric vehicle deployment and the provision of charging infrastructure.
- In 2009, Council adopted requirements in the Vancouver Building By-law for electric vehicle charging circuits in new homes and multi-unit residential buildings. These were the first such requirements in North America.

### ***CITY MANAGER'S/GENERAL MANAGER'S COMMENTS***

The City Manager recommends approval of the foregoing.

### ***REPORT***

#### ***Background/Context***

The City has required various forms of EV charging in new construction since 2011. In 2013, the City's first non-residential requirements were enacted. The 2020 Climate Emergency Action Plan includes direction from Council to update the requirements for new non-residential buildings.

The City presently requires 10% of parking stalls in Commercial buildings, or the Commercial component of mixed-use buildings, to have Level 2 EV charging infrastructure. These requirements are in addition to charging requirements in new residential buildings.

British Columbia has mandated that all new light-duty vehicles sold in BC be electric by 2040. The City of Vancouver has amongst the highest rate of EV adoption in North America, and expects that all new light-duty vehicles will be EVs closer to 2030. This is aligned with the findings of the International Energy Agency's Net Zero by 2050 analysis.

The requirements set forth in this report seek to create EV charging opportunities that better match driving and charging behaviours based on a building’s use without creating complexity for designers, builders and City development review staff.

**Strategic Analysis**

**Avoiding Retrofit Costs and Meeting Future Needs**

Existing buildings are challenged by higher costs to retrofit with EV charging infrastructure, compared with new construction. In some cases, retrofit costs can be up to ten times what they would be in new buildings. The recommendations in this report seek to minimize future retrofit costs, ensuring that long-term charging needs will be met.

The research that underpins the recommendations in this report identified the need for workplace charging in the region will likely peak at just over 40% of residents in the early 2040s. Given that this policy will apply to buildings that will still be in operation well past that time, it is prudent to plan for those long-term needs now.

**Updates to EV Charging Requirements in Non-Residential Buildings**

The City has existing requirements for new Commercial buildings; however, the existing requirements were developed with less advanced technology and may not suit the needs of the end users. Further, of the 36 different forms of non-residential building listed in the Parking Bylaw, many types do not consider EV charging at all.

The proposed requirements for new non-residential buildings are summarized in Table 1, below. Draft by-law language detailing the proposed requirements are included in Appendix A.

*Table 1 - Summary of Proposed Requirements*

Building / Parking Stall Type	Proposed Requirement	Additional Notes
<p><b>All Non-residential Buildings</b> (except hotels and B&amp;Bs)</p>	<p><b>45% EV-Ready</b></p> <ul style="list-style-type: none"> <li>- Minimum 5% or at least 2 parking stalls Level 2 without EV Energy Management System (“Opportunity Charging”)</li> <li>- Remaining energized stalls can be Level 2 with or without EV Energy Management System (“Opportunity” or “Workplace” Charging)</li> </ul> <p>Option to <b>substitute DC Fast Charging</b> capacity for equivalent Level 2 capacity</p>	<ul style="list-style-type: none"> <li>- Supports minimum amount of opportunity charging</li> <li>- Balances costs by allowing most charging to be for workplace charging</li> <li>- Building operators can replace workplace charging with opportunity charging in future as needed.</li> <li>- Allows builders to create different business opportunities for EV charging</li> </ul>

<b>Hotels, Bed-and-Breakfasts</b>	<b>100% EV-readiness</b> , allows for use of EV Energy Management Systems  Option to <b>substitute DC Fast Charging</b> as above	<ul style="list-style-type: none"> <li>- Charging behaviour equivalent to residential</li> <li>- Eventually, most tourists driving in Vancouver will be in zero-emissions vehicles</li> </ul>
<b>Shared Vehicle (Car-share) Stalls</b>	<b>100% Level 2, including charging station</b> , also known as “Electric Vehicle Supply Equipment”	<ul style="list-style-type: none"> <li>- Supports car-sharing fleets in transitioning to zero-emissions</li> <li>- DC Fast Charging substitution does not apply</li> </ul>
<b>Accessible Parking Stalls</b>	<b>100% Level 2</b> in hotels, bed-and-breakfasts (and residential)  <b>45%</b> and at least one parking stall Level 2 in all other building uses  DC Fast Charging substitution does not apply	<ul style="list-style-type: none"> <li>- Calculated separately from other stall counts</li> <li>- Provides increased electrical service but does not restrict accessible stalls to ‘EV-only’</li> </ul>

### ***Implications/Related Issues/Risk***

#### ***Financial***

All costs associated with the infrastructure in the recommendations in this report are the responsibility of the property developer. Any revenues from fees to access the charging infrastructure would accrue to the building operator.

The City collaborated with the City of North Vancouver and AES Engineering to complete a costing study of different charging scenarios in non-residential buildings. Based on the results of the AES study mentioned above, the cost of construction ranges from approximately \$1,200 to \$2,500 per energized parking stall. The study indicated that these costs are typically lower than for the City’s existing 10% Level 2 requirements in commercial buildings, which were estimated to range from \$2,477 to \$5,732 per energized parking stall. This savings is due in large part to the use of energy management systems that these recommendations support. Retrofitting a building with EV infrastructure could cost up to ten times more than including it in new construction.

#### ***Human Resources/Labour Relations***

City Development, Buildings, and Licensing (DBL) staff contributed to the design of this bylaw change and support implementation of the proposed changes in June 2022 as it does not significantly impact their operations. These bylaw changes will be accompanied by staff training in DBL.

City staff will also conduct industry training prior to enactment of the proposed requirements.

No additional positions are expected to be required in support of this program at this time.

## ***Environmental***

This work is one of the priority actions from the Climate Emergency Action Plan and plays a significant role in reducing GHGs in Vancouver and the region. The transportation sector generates approximately 40% of the emissions that the City has regulatory influence over, of which internal combustion vehicles generate the majority of emissions.

## ***Equity, Engagement, and Accessibility Considerations***

### **Equity**

By increasing access to workplace and opportunity charging, more people will be able to access EV charging without requiring their own investment in infrastructure. Moderate and lower-income households for whom driving is necessary will benefit from access to lower cost “fuel” (electricity is about 10-15% of the cost of gasoline) and fewer maintenance costs.

Additional Details on Implications for Equity are included in Appendix D.

### **Engagement**

City staff engaged the Urban Development Institute (UDI), the Persons with Disabilities Advisory Committee (PDAC) and numerous technical experts. Their input was incorporated into this p

Policy design and in general they were supportive.

## ***CONCLUSION***

Staff recommend Council approve the proposed requirements for electric vehicle charging in new non-residential buildings proposed in this report as part of the implementation of the Climate Emergency Action Plan.

\* \* \* \* \*

**DRAFT**

*Note: A By-law will be prepared generally in accordance with the provisions listed below, subject to change and refinement prior to posting.*

**BY-LAW NO. \_\_\_\_\_**

**A By-law to amend Parking By-law No. 6059  
Regarding Updated EV Charging Infrastructure Requirements**

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This By-law amends the indicated provisions of the Parking By-law No. 6059.
2. In section 2, Council adds the following new definitions in the correct alphabetical order:
  - (a) **“DC Fast Charging** means electric vehicle supply equipment that supplies direct current (DC) power to a vehicle with an output voltage of 50-1000V and typically supplies output power between 25 and 400kW;” and
  - (b) **“Electric Vehicle Energy Management System** means a system used to control electric vehicle supply equipment loads through the process of connecting, disconnecting, increasing, or reducing electric power to the loads and consisting of any of the following: a monitor(s), communications equipment, a controller(s), a timer(s), and other applicable device(s);”.
3. Council strikes out section 4.14 and substitutes the following:

**“4.14 Electric Vehicle Charging Infrastructure Requirements**

  - 4.14.1 Dwelling Uses  

Where parking spaces are provided for dwelling uses, an energized outlet capable of providing Level 2 charging or higher must be installed in each parking space, excluding visitor parking spaces.
  - 4.14.2 Non-Dwelling Uses (except Hotel and Bed and Breakfast Accommodation Uses)  

Where parking spaces are provided for non-dwelling uses, except hotel and bed and breakfast accommodation uses, an energized outlet must be installed in at least 45% of the parking spaces provided, of which at least 5% of the total number of parking spaces provided, or two parking spaces, whichever is greater, must be capable of Level 2 charging or higher and may not implement an Electric Vehicle Energy Management System.
  - 4.14.3 Hotel and Bed and Breakfast Accommodation Uses  

Where parking spaces are provided for hotel or bed and breakfast accommodation uses, an energized outlet capable of providing Level 2 charging or higher must be installed in each parking space.

4.14.4 Other Requirements

In addition to the requirements set out in sections 4.14.1, 4.14.2, and 4.14.3:

- (a) for dwelling uses, and hotel and bed and breakfast accommodation uses, electric vehicle supply equipment must be installed in each shared vehicle parking space provided; and
- (b) for non-dwelling uses, except hotel and bed and breakfast accommodation uses:
  - (i) an energized outlet capable of providing Level 2 charging or higher and electric vehicle supply equipment must be installed in each shared vehicle parking space provided, and
  - (ii) an energized outlet capable of providing Level 2 charging or higher must be installed in at least 45% of all accessible parking spaces provided, or one accessible parking space, whichever is greater.

4.14.5 Energized outlets must be labeled for their intended use for electric vehicle charging, and installed in conformance with Sentence 10.3.1.1.(1) of Division B of the Building By-law.

4.14.6 The number of energized outlets required for non-dwelling uses under sections 4.14.2 and 4.14.3 may be reduced by substituting energized outlets capable of providing DC fast charging, if the total electrical capacity provided by the DC fast charging outlets meets or exceeds the total electrical capacity that would be provided by the energized outlets required under sections 4.14.2 and 4.14.3.

4.14.7 If a development contains parking for more than one of the uses listed in sections 4.14.1 through 4.14.3, the parking spaces provided for each use must meet the energized outlet requirements for that use.”.

4. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

5. This By-law is to come into force and take effect on June 1, 2022.

ENACTED by Council this \_\_\_\_\_ day of \_\_\_\_\_, 2021

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
City Clerk