EAC Report to Council, March 2021

Electric Vehicle (EV) Charging Infrastructure

The use of transportation fuels accounts for almost 38% of B.C.'s total greenhouse gas emissions annually. In the provincial climate change action plan announced in 2018, CleanBC, the Province of British Columbia committed to:

- Reducing greenhouse gas emissions from the use of transportation fuels
- Developing a low carbon transportation industry sector by supporting the transition to clean energy vehicles
- Expanding the range of transportation technology and low carbon fuel options for British Columbians

In line with these commitments, the Province passed the Zero-Emission Vehicles Act (ZEV Act) on May 30, 2019. The ZEV Act requires automakers to meet an escalating annual percentage of new light-duty ZEV sales and leases, reaching: 10% of light-duty vehicle sales by 2025, 30% by 2030 and 100% by 2040. Electric vehicles are currently the leading ZEV available and in production, and sufficient charging infrastructure will be critical to their success.

Current White Rock Policy

In a joint letter to the City in February 2020, the Victoria Electric Vehicle Association and Plug-in Richmond identified White Rock as one of a number of municipalities in BC with "exceptionally low EV infrastructure requirements". The current White Rock OCP policy 12.5.7 reads;

> *Electric Vehicles – Require one electric vehicle charging station for every 10 parking spaces in new multi-unit residential and mixed use buildings. Provide rough-ins for an additional one electric vehicle charging station for every 10 parking spaces, for future use as electric vehicle use increases.*

A review of the requirements in White Rock's neighbouring municipalities in Metro Vancouver indicates than many have more ambitious requirements than those specified in White Rock's 2017 OCP (see attached Supplemental Information). In several of these municipalities, the requirements were updated following the 2018 announcement of CleanBC and the ZEV Act.

For a small municipality like White Rock, many of the options and initiatives available to address climate change will require the City, with its limited resources and fiscal capacity, to seek collaboration, funding and support from other levels of government. Therefore, if the City is committed to taking action on climate change, it is important to demonstrate this commitment by taking every available opportunity within its means to contribute to the wider regional, provincial, and national goals. The establishment of forward-looking, best practice requirements for EV Charging Infrastructure in new buildings is an opportunity for White Rock to take action to reduce transportation related greenhouse gas emissions.

In addition, current and prospective residents will recognize White Rock as a City with the kinds of programs and amenities which make it a desirable location to live and work.

Options for EV Charging Infrastructure

According to recent data, there is a high cost for the retrofit of existing parking spaces in multi-residential buildings;

> "a single EV charger in apartments participating in incentive programs in B.C. has averaged about $7,000, with many buildings facing significantly higher costs".

As a component of this cost, a charging station's hardware (apart from the electrical conduit and load capacity) varies from $400 to $4,000 for a level 2 unit (EV charging terminology is explained in the attached Supplemental Information), depending on required features and the location for installation. Metro Vancouver suggests the total cost of a retrofit can be as high as $20,000 per unit. Clearly, even with a variety of retrofit incentive programs in place, these costs will be a challenge.

The most efficient and cost-effective delivery of the basic infrastructure for EV charging (electrical conduit and load capacity) is during initial construction.

> "Making parking EV-ready typically adds 1-to-2 per cent to the overall cost of constructing new onsite parking…"

However, it does not follow that full installation of charging units is always most efficient at initial construction. The actual charging hardware/unit which connects to this electrical infrastructure comes in a variety of configurations. For example, units can be for charging a single vehicle or 2 vehicles simultaneously or include the technology for power sharing among up to 4 charging units. Although the charge per vehicle is not as rapid when the electrical load is shared (though a vehicle will be charged overnight), the upfront costs per parking stall can be 50-60% lower than single user units. Some units provide the user with free power, while others are configured for user-pay, with different costs depending on how the use is tracked and costs recovered.

In some cases, new apartment or strata owners may not own an EV and will not immediately require a charging unit. On the other hand, some builders may find that providing a fully outfitted charging unit, user-pay or otherwise, shared power or single user, is an enticement to buyers. With the variety of charging units and configurations available, and with more innovations likely to come in the future, the builder, the strata, and/or the individual owner are in a better position than the municipality to determine which is best for their needs.

Some municipalities have focused on requiring that a percentage of parking stalls in new construction be equipped with complete Level 2 charging stations. In the alternative, some municipalities have opted for a focus on "EV ready" requirements, with the installation of charging units for later determination.

Incentives and Rebates

Federal - The federal government has recognized the importance of EV charging infrastructure and has provided for higher capital cost allowances under the Tax Code.

Provincial - CleanBC has a variety of incentives and rebates for homeowners, builders, and stratas through FortisBC or BC Hydro in their respective delivery areas. These incentive programs include retrofits as well as new building construction, with complete charging hardware and/or EV readiness. For example, the most recent program provided funding of up to $600 per parking stall for EV ready infrastructure installation, and $1,400 to $3,400 per charger for installation of charging hardware.

Proposal to amend OCP Policy 12.5.7

Considering the variables involved in determining appropriate policies and bylaws to enable EV charging infrastructure in new buildings, an ambitious requirement for "EV readiness", as opposed to complete charging stations, has become the recognized best practice. A strong requirement for EV readiness provides for a future reliant on electric vehicles. At the same time, EV readiness avoids onerous upfront

expenditures which may be unnecessary in the near-term transition period, limit the future utilization of innovations in charging hardware, or fail to anticipate the development of other zero emission technologies which do not require electrical charging stations.

In view of the importance of effective EV charging infrastructure requirements, the EAC recommends that OCP Policy 12.5.7 be amended as follows;

Electric Vehicles- Require the following electric vehicle charging components in new residential, multi-unit residential, and commercial buildings. A minimum of;

- *1 Level 2 EV-ready parking stall in single-family homes with garages*
- *20% of parking stalls to be Level 2 EV-ready in commercial buildings*
- *100% of resident parking stalls to be Level 2 EV-ready in multi-unit residential buildings*
- *50% of visitor parking stalls to be Level 2 EV-ready in multi-unit residential buildings*

Adoption of this amendment will provide the foundation for amending the zoning bylaw as it pertains to electric vehicle charging infrastructure.

Supplemental Information - EV Charging Infrastructure Requirements

Background material and information used in this document is available via the following;

https://pluginbc.ca/

https://electricautonomy.ca/2021/01/07/ev-readyresidential-buildings/

https://electricautonomy.ca/2021/02/11/multifamily-building-ev-retrofit/

http://www.metrovancouver.org/services/air-quality/climate-action/transportation-programs/ev-strata-condo/key-info/chargers-installation-costs/Pages/default.aspx

https://goelectricbc.gov.bc.ca/

http://www.metrovancouver.org/_layouts/download.aspx?SourceUrl=http%3a//www.metrovancouver.org/services/air-quality/AirQualityPublications/SiteAssessmentTool-EVstation.xls

EV Charging Terminology

Level 1 Charging

Level 1 is known colloquially as a "trickle charge." All EVs come with a cordset that plugs into the car's J-1772 or Tesla port with the other end plugging into a standard home wall outlet.

- Uses a connection to a standard 120-volt outlet
- Charges 8 km per hour
- Takes 12 to 20 hours to fully charge a battery EV (6 to 12 hours for a plug-in hybrid)
- Used mostly in homes

Level 2 Charging

Level 2 chargers are very common and can be found at community centres, parks, shopping malls, hotels, parkades and rest areas. Electric vehicle owners typically install one in their home garage using a 240v connection.

- Uses a connection to a 240-volt outlet, like those used by ovens and clothes dryers
- Charges 30 km per hour
- Takes 6 to 14 hours to fully charge a battery EV (4 to 8 hours for a plug-in hybrid)
- Used in homes, businesses, and common areas

Level 3 Charging

Level 3 charging is better known as Direct Current Fast Charging or simply 'fast charging'. These charging stations enable most EVs to charge to 80% in under an hour, making road trips easier and quicker.

- Uses a direct current connection to an electrical system
- Charges 100 km per 30 minutes or 80% charge at 50 kW (varies by vehicle type)
- Takes 1 to 4 hours to fully charge a battery EV (15 minutes to 3 hours for a plug-in hybrid)
- Used mostly in businesses and common areas

"EV-Ready"

This refers to the provision of wired electrical conduit and sufficient load capacity (at the electrical panel) to provide for installation and operation of charging station hardware. For example, an L1 "EV-ready" parking stall still requires the installation of a 110v receptacle before an EV can be plugged in.

Current White Rock Policy and Bylaw for EV Charging Requirements in New Buildings

OCP policy 12.5.7;

> Electric Vehicles – Require one electric vehicle charging station for every 10 parking spaces in new multi-unit residential and mixed use buildings. Provide rough-ins for an additional one electric vehicle charging station for every 10 parking spaces, for future use as electric vehicle use increases.

Bylaw 2262 (Amending Bylaw 2000)

4.17 Provision of Electric Vehicle Charging Infrastructure

4.17.1 For new buildings that include multi-unit residential uses, a minimum of 1 of every 10 off-street parking spaces shall feature an energized outlet capable of providing Level 2 charging or higher to the off-street parking space.

An additional 1 of every 10 off-street parking spaces shall feature roughed-in electric vehicle charging infrastructure, including an electrical outlet box located within 3 metres of the parking space. Where more than 1 of every 10 off-street parking spaces features an energized outlet capable of providing Level 2 charging or higher is provided, the minimum number of off-street parking spaces featuring roughed-in electric vehicle charging infrastructure may be reduced by the number of off-street parking spaces that feature the energized outlets beyond the minimum requirement. This section does not apply to new buildings with fewer than 10 off-street parking spaces.

4.17.2 Energized outlets, provided pursuant to Section 4.17.1 above, shall be labelled for their intended use for electric vehicle charging.

4.17.3 Where an electric vehicle management energy system is implemented, the Director of Engineering may specify a minimum performance standard to ensure a sufficient rate of electric vehicle charging.

Comparison of EV Charging Requirements in other Municipalities

In a joint letter to the City in February 2020, the Victoria Electric Vehicle Association and Plug-in Richmond identified White Rock as one of a number of municipalities in BC with "exceptionally low EV infrastructure requirements". Many of White Rock's neighbouring municipalities in Metro Vancouver have more ambitious requirements than those currently specified in the city's OCP.

City of Burnaby

Zoning Bylaw 13903, Amendment Bylaw No. 24, 2018 includes provisions for electric vehicle charging requirements for new residential developments.

- All parking spaces for dwelling units shall include an energized outlet capable of providing Level 2 charging or higher
- Includes single-family homes and multi-family buildings of all sizes
- Exceptions include visitor and secondary suite parking, and parking for existing units
- Bylaw is in effect starting September 1 2018.

City of Coquitlam

The zoning bylaw has been amended to include EV parking spaces. See Part 714 of the bylaw.

- July 30th 2018. See the requirements guide.
- All new constructions must have one energized outlet capable of L2 charging for every dwelling unit (includes single family and MURBs).

City of New Westminster

- Starting April 1, 2019, all new buildings that contain at least one residential unit will be required to install a Level 2 (208 to 240 volt) energized outlet to the residential parking spaces. See details here.
- Please view the City's updated Development Permit Area (DPA) guidelines to learn more about the recommended EV charging infrastructure for new commercial, institutional and industrial buildings.

City of North Vancouver

The zoning bylaw has been amended to include 100% EV ready parking in multi-unit residential buildings:

- This applies to development or building permit applications accepted for review on or after June 1, 2019.
- All parking spaces in new residential buildings must have a labelled, energized outlet capable of providing Level 2 charging for an electric vehicle.
- This includes all new single family, coach houses, duplexes, triplexes and apartments, as well as parking spaces for shared vehicles.
- Secondary suites are not included.
- EV energy management systems or "load sharing" can be used to meet the requirements

District of North Vancouver

Implementation of EV Charging Infrastructure with Development policy requiring multi-family, commercial, and industrial builds, document 2380934. Approved in 2014.

- Multi-family in District of North Vancouver:
    - 20% of parking stalls are EV-ready (wired for L1 charging)
    - Conduit in place for 100% of parking stalls to be wired for L1 in the future
- Commercial/Industrial in District of North Vancouver:
    - Approximately 10% of parking stalls are EV-ready (wired for L2 charging)

City of Port Coquitlam

Zoning Amendment Bylaw 4035 requires EV charging in new builds (residential and mixed use):

- In effect Jan 23 2018

- For a residential building other than a building with a common parking area, one parking space per dwelling unit shall be provided with roughed-in electric vehicle charging infrastructure including an electrical outlet box located within 3 metres of the unit's required parking space.
- For a residential building with a common parking area, a separate single utility electrical meter and disconnect shall be provided in line with the electrical panel(s) intended to provide for charging of electric vehicles located within 3 metres of the unit's required parking space.
- In a mixed-use building including residential uses and a common parking area, a separate single utility electrical meter and disconnect shall be provided in line with the electrical panel(s) intended to provide for charging of electric vehicles located within 3 metres of the unit's required parking space.

City of Port Moody

EV ready requirements appear in bylaw 2937 Section 6.11 March 1, 2019.

- See the technical bulletin here.
- All spaces in new residential constructions require an energized outlet capable of L2 charging.
- 20% of spaces in new commercial constructions require an energized outlet capable of L2 charging.

City of Richmond

Zoning Bylaw 8500 requires EV charging in new builds (residential only), revising bylaw 9756.

- October 15, 2017.
- 100% of new residential parking spaces, excluding those provided for visitors use, shall have access to an adjacent energized outlet capable of providing Level 2 charging.

City of Surrey

The zoning bylaw was amended on February 25, 2019 to require Electric Vehicle (EV) charging infrastructure in ALL new residential and commercial developments.

- February 25, 2019. See the technical bulletin here.
- 100% of residential parking spaces in new residential developments must each have an installed energized electrical outlet capable of providing Level 2 charging for an electric vehicle. This requirement applies to both single-family and multiple unit residential dwellings.
- 50% of visitor parking spaces in multiple unit residential developments must each have an installed energized electrical outlet capable of providing Level 2 charging for an electric vehicle.
- 20% of parking spaces in new commercial developments must each have an installed energized electrical outlet capable of providing Level 2 charging for an electric vehicle.

City of Vancouver

Building Code Bylaw 10908 requiring EV charging in new builds (commercial and residential), revised bylaw Electric Vehicle Charging s 10.2.3.

- This bylaw was updated on March 14, 2018 to increase the percentage of EV-ready stalls in multi-unit residential buildings from 20% to 100%
- For new buildings current bylaw requires:
    - 1 EV-ready stall in single-family homes with garages
    - 10% of stalls be EV-ready in commercial buildings
    - 100% of stalls be EV-ready in multi-unit residential buildings