E. REPORTS OF COMMITTEE

E.1 Committee of the Whole

E.1.a Report from the June 18, 2020 COTW Meeting

E.1.a.c Electric Vehicle Ready Requirements for New Construction

Moved By Councillor Loveday
Seconded By Councillor Alto

That Council:

1. Direct staff to forward Zoning Amendment Bylaw Nos. 20-001 and 20-075 to require that Electric Vehicle (EV) readiness be provided for all new residential development and five percent of new institutional, commercial and industrial development to the July 9th Council meeting for introductory readings.

2. Direct staff to monitor EV demand and the use of charging infrastructure in institutional, commercial and industrial land uses and bring forward recommended amendments to the requirement levels as deemed necessary.

CARRIED UNANIMOUSLY

F.2 Electric Vehicle Ready Requirements for New Construction

Committee received a report dated June 4, 2020 from the Director of Sustainable Planning and Community Development regarding information, analysis, and recommendations for requiring electric vehicle (EV) charging infrastructure in new development.

Committee discussed the following:

- *Carbon requirements for rental buildings*
- *Electric bike charging stations in new developments*
- *EV charging requirements for affordable housing developments*

Moved By Mayor Helps
Seconded By Councillor Alto

That Council:

1. Direct staff to forward Zoning Amendment Bylaw Nos. 20-001 and 20-075 to require that Electric Vehicle (EV) readiness be provided for all new residential development and five percent of new institutional, commercial and industrial development to the July 9th Council meeting for introductory readings.
2. Direct staff to monitor EV demand and the use of charging infrastructure in institutional, commercial and industrial land uses and bring forward recommended amendments to the requirement levels as deemed necessary.

CARRIED UNANIMOUSLY

Committee of the Whole Report
For the Meeting of June 18, 2020

To:	Committee of the Whole	**Date:**	June 4, 2020
From:	Karen Hoese, Director, Sustainable Planning and Community Development		
Subject:	**Electric Vehicle (EV) Ready Requirements for New Construction**		

RECOMMENDATION

That Council:

1. Direct staff to forward Zoning Amendment Bylaw Nos. 20-001 and 20-075 to require that Electric Vehicle (EV) readiness be provided for all new residential development and five percent of new institutional, commercial and industrial development to the July 9th Council meeting for introductory readings.
2. Direct staff to monitor EV demand and the use of charging infrastructure in institutional, commercial and industrial land uses and bring forward recommended amendments to the requirement levels as deemed necessary.

EXECUTIVE SUMMARY

The purpose of this report is to present Council with information, analysis and recommendations for requiring electric vehicle (EV) charging infrastructure in new development. In 2019, Council directed staff to undertake a legal review and prepare a bylaw to mandate 'EV-Ready' capability in new buildings that provide on-site parking.

On-road transportation accounts for approximately 40% of greenhouse gas emissions in Victoria and readying new buildings for EVs through charging infrastructure is a critical structural change in responding to the climate emergency. These amendments are being made to support the rapid adoption of EVs that is being seen in the community, with growth rates in excess of 50 percent a year based on local EV sales, as well as supporting the *Climate Leadership Plan* target stating that "by 2030, renewable energy powers 30 percent of passenger vehicles registered in Victoria, and 100 percent of passenger vehicles are renewably powered by 2050."

These bylaw amendments will ensure all new residential and a portion of institutional, commercial and industrial development will be built to be EV-ready. This will allow for the easy and cost-effective installation of EV chargers by residents and businesses in the future. The proposed approach was developed reviewing municipal best practices, market trends and research. The recommendations strike a balance between ensuring a minimized upfront cost for new construction and minimizing retrofit costs in the future.

These amendments are part of a larger City strategy to support EV adoption including on-street EV network expansion and participation in "topping up" grants for EV retrofits in multi-unit residential

buildings as part of the Clean BC Home and Workplace EV Charging Program. Victoria will be engaging further with industry regarding the development of a comprehensive EV strategy which includes on-street parking, that will be presented to Council in late 2020.

As directed by Council, staff considered the impacts of these zoning changes on housing affordability. In consultation with non-profit housing providers, it was determined that there was value requiring EV readiness in new affordable housing projects as it provides cost savings in future. The City's zoning regulations were also recently updated to provide reduced requirements for off-street parking in affordable housing developments.

The proposed amendments not only support the *Climate Leadership Plan*, they also address Council's strategic priority to "mandate electric vehicle charging capacity in all new developments" by ensuring that all new developments have energized stalls. They also align with both federal and provincial policies for EV adoption, where each level of government is targeting one hundred percent of vehicle sales to be EV's by 2040. Lastly, these amendments support *Go Victoria*'s vision for low carbon and clean mobility in Victoria.

PURPOSE

The purpose of this report is to present a recommended approach for EV charging infrastructure ('EV-ready') requirements in new residential, institutional, commercial and industrial development and to bring forward zoning bylaw amendments for Council's consideration.

BACKGROUND

At the meeting of January 31, 2019, Council passed a motion to undertake the necessary legal review and prepare a bylaw for first reading mandating 'EV-Ready' capability in new buildings that provide on-site parking, and that staff consider a possible exemption for affordable housing.

ISSUES & ANALYSIS

Proposed EV-Ready Requirements

Currently there are no requirements in the BC Building Code or any other municipal plan or by-law that require EV charging in new construction. While green building certifications, such as LEED, have contributed to the growth of voluntary EV charging infrastructure and some building owners are voluntarily building with energized stalls and even charging stations, this is yet to become a norm. However, there are many recent local government policy examples for EV regulations in new development (see Attachment E).

Category A: Residential Design Standard

With the proposed bylaw amendments, all new residential development (including both single family and multi-unit residential buildings) will have energized parking stalls, facilitating easy and cost-effective access to electric vehicle charging at home. EV chargers (charging stations) would not be required at the time of development, but may be easily installed post-occupancy by the building or EV owner. Staff recommend that these amendments come into effect October 1, 2020 to allow the development industry time to adjust their design and financial assessments.

At-home charging is a crucial factor in household EV adoption, and therefore the measures outlined in this report are targeted primarily at residential uses. It is also the most convenient and lowest cost option to implement. Establishing EV readiness associated with institutional, commercial and industrial uses is only meant to augment this critical residential option.

Table 1: Proposed Residential Requirements

Use or Class of Use	Minimum Number of Energized Electric Vehicle Outlets
Single Family Dwelling	1 per required vehicle parking space
Two Family Dwelling	1 per required vehicle parking space
Semi-attached Dwelling	1 per required vehicle parking space
Secondary Suite or Garden Suite	N/A
All other residential uses not specifically identified in this table	1 per vehicle parking space

Category B: Institutional, Commercial, and Industrial Design Standard

With the proposed bylaw amendments, Victoria will increase the available public and workplace charging for EV owners on the go or without access to charging at home. The design standard will ensure that five percent of stalls in these types of buildings with stall requirements over 15 will be equipped with electrical infrastructure. This targets commercial uses such as shopping malls or offices where cars are parked for longer durations or where employees are present. As with residential, EV chargers would not be required at the time of development but may be easily installed post-occupancy by the building owner.

At present, there are conflicting views on the appropriate percentage of EV readiness in the commercial sector from consultants and EV advocacy groups, and best practices in this area are still being developed. While some local governments have set blanket requirements of 10% or 20% of stalls for commercial and/or institutional land uses, there have been some critiques from both industry and EV advocates that these percentages may exceed demand, or that the requirements are not specific enough to the actual land uses and may lead to the overbuilding of infrastructure in some locations. Consequently, Victoria and a team of other BC municipalities are conducting further research with funding from BC Hydro to determine the appropriate percentage of EV readiness requirements for different institutional, commercial and industrial building use classes, with the aim to increase the requirement over time and to determine which use classes are most appropriate for mandating the actual charging station as well. Staff will review the bylaw to increase commercial requirements for different use classes in the future. This will be done in conjunction with the District of Saanich and the Capital Regional District.

Table 2: Proposed Industrial, Commercial and Institutional Requirements

Number of Vehicle Parking Spaces Provided	Minimum Number of Energized Electric Vehicle Outlets
<10	N/A
10-14	1
>15	2 energized electric vehicle outlets or 5% of the total number of required vehicle parking spaces, whichever is greater

Both of the City's zoning bylaws will need amendments to incorporate the above standards, including Zoning Bylaw 18-072, which applies to the Downtown Core Area, and Zoning Regulation Bylaw 80-159, which applies to the remainder of the City. The amendment bylaws are included as Attachments A and B to this report.

Financial Considerations

Cost of EV-Ready Infrastructure

The estimated costs across various development typologies and charging infrastructure types are listed in Table 3 below. These are provided for guidance only, as the cost estimates provided were prepared for the City of Richmond and are specific to the building types, driving distances and terrain in that region. The single family, townhouse and mid-rise building typologies used in Richmond's residential costing study are considered to be similar to construction commonly seen in the Capital Region.

Level 2 with EV Energy Management System is the policy/standard proposed. EV energy management systems (EVEMS) ensure that not all vehicles are charged directly at once. As such, it is lower cost because it requires less electrical capacity to the building.

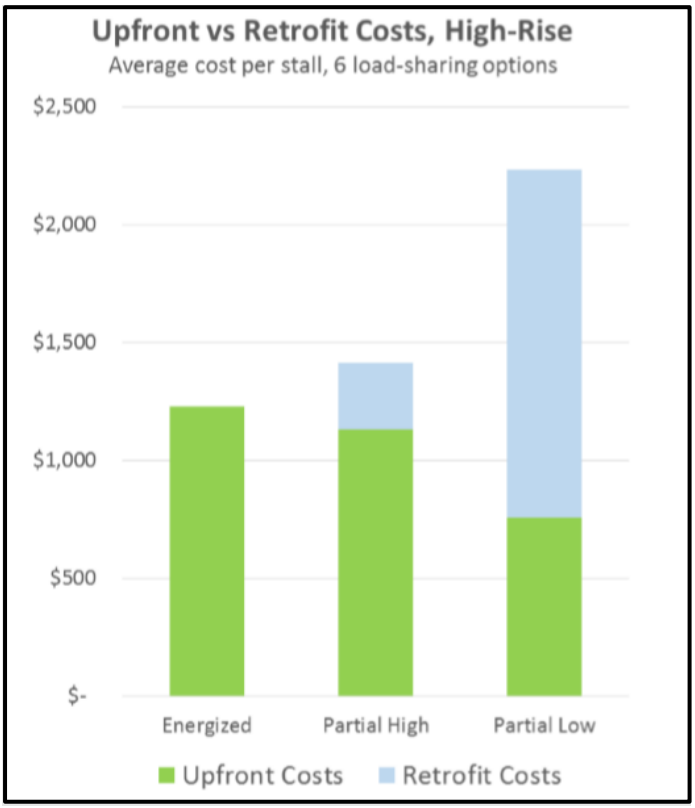
Table 3: Estimated EV-Ready Infrastructure Costs

Building Type	Charging Scenario	Cost Per Stall
Single family / Two family semi-detached dwelling	Level 2	$350
Townhouse	Level 2	$2655
	Level 2 with EVEMS*	$307
Mid-Rise	Dedicated Level 2	$2381
	Level 2 with EVEMS*	$569
High-Rise	Dedicated Level 2	$3023
	Level 2 with EVEMS*	$760

Installing charging infrastructure at the time of construction is far more cost effective than retrofitting buildings with charging at a later date. The graph below illustrates the upfront and retrofit costs associated with:

- fully energizing all stalls at time of construction
- partially energizing stalls to a high level of adoption at the time of construction and then the associated retrofit costs with a lower number of stalls in the future
- partially energizing stalls at a low level of adoption during construction and having to significantly retrofit a high number of stalls in the future.

The graph below illustrates the importance of building fully energizing stalls at the time of construction to avoid high retrofit costs in the future by individuals, non-profits and strata councils.



Affordable Housing Cost Considerations

"Affordable Dwelling Units" have their own parking designation in Schedule C of the *Zoning Regulation Bylaw,* where considerably less parking is required for an affordable housing building as compared to a similar residential building, as indicated in Attachment C.

City staff, in consultation with BC Housing, considered the possibility of exempting affordable housing from these requirements. It was agreed that as the usable life of a building can span over 100 years, wiring affordable housing buildings in the present insulates residents and building owners/operators against costly retrofits in a future, and reduces demand on subsidies and grants from taxpayers in a future where EVs will be the only engine type available for purchase as of 2040. The financial implications would result in an added cost of around $569-$760 space; however, this is significantly less than retrofitting projects in the future.

Provincial Incentive: CleanBC EV Charger Rebate Offers

At present, Provincial rebates are available to support individuals, organizations, buildings, and companies with the cost of purchasing Level 2 chargers. This rebate program, together with City policy, further supports residents in full implementation of residential EV charging. Earlier this year, Victoria City Council approved a top-up to these rebates.

The level of rebates available from CleanBC differs in regard to whether a building was built before or after a municipal EV readiness bylaw was put into place. For buildings constructed after municipal bylaws, the program will cover up to 50% of purchase and installation costs of eligible, new, Level

2 (208-volt or 240-volt) charging stations to a maximum of $5,000 (no more than $350 per station). The City is offering $2,000 per charger or up to 75% of cost for multi-unit residential buildings.

Engagement

The Council motion directed staff to prepare a bylaw without additional public engagement and for the public hearing process to serve as the public engagement process. However, before the motion was tabled, in conjunction with the CRD and Saanich, Victoria participated in various sessions with developers and builders on the topic of EV regulations in new construction. During these events, a 100% standard for residential and 5% standard for commercial charging was proposed and was generally well received by the development community.

Engagement Events

Project	Engagement Summary	# Participants
Capital Region EV and E-Bike Infrastructure Planning Project	Public Survey	702
	Development Industry Survey	63
	Development Industry Workshop, in collaboration with UDI	60
Plugging the Gaps	Presentations and workshop about EV charging retrofits for condo and apartment dwellers, in collaboration with CRD, City of Victoria, and Drive Electric Victoria	24

Regional Consistency

In order provide consistency to builders and developers across the region, Victoria and Saanich have attempted to align their approaches to EV ready implementation. As a result, the consultation around bylaw development was in partnership, the percentage requirements for residential and commercial buildings are similar, and the definitions used in the bylaws are similar.

OPTIONS & IMPACTS

Option 1 (Recommended)

Proceed with zoning bylaw amendments to require Electric Vehicle (EV) readiness for all new residential development, including non-market housing, and five percent of new commercial development effective Oct 1, 2020.

This option is recommended because it will contribute to reduce transportation emissions in Victoria through the electrification of passenger vehicles. It is a critical component towards achieving market transformation of EVs within the municipality and supports the targets established by the Provincial and Federal Governments and is aligned with other BC local governments.

Option 2

Do not proceed with the zoning amendments.

This option is not recommended as it pushes the market transformation process into the future and adds considerable costs to EV readiness by having it occur as a retrofit to buildings instead of integrating it into new construction. It would also slow down emissions reductions in the transportation sector.

Accessibility Impact Statement

This bylaw amendment will apply to residential parking stalls evenly across Victoria, meaning that all accessible parking stalls will also be EV ready. In a commercial context, the City will not require all accessible parking stalls to be EV ready as only five percent of these stalls over a certain threshold will be EV ready.

2019 – 2022 Strategic Plan

This work supports *Strategic Objective 6 – Climate Leadership and Environmental Stewardship # 17 (2021): "Mandate electric vehicle charging capacity in all new developments."* While the proposed amendment does not mandate EV chargers in all new developments, it does mandate EV readiness through energized stalls. As described above, EV readiness creates the conditions for the easy and affordable installation of EV charging stations in 100% of residential parking spots and 5% of commercial parking spots.

Impacts to Financial Plan

No additional resources are needed for the bylaw amendments.

Official Community Plan Consistency Statement

This bylaw amendment aligns with OCP Section 7: "Transportation and Mobility and specifically GOAL 7 (A) Transportation options reduce fossil fuel dependence, help conserve energy and produce low greenhouse gas emissions and other air contaminants" (page 55).

CONCLUSIONS

This report outlines a recommended approach for requiring EV ready charging infrastructure in new building developments, with consideration of the impacts of these changes to non-market housing developments. EV readiness will contribute to reducing transportation emissions in Victoria through the electrification of passenger vehicles and supports the goals in the *Climate Leadership Plan* and *Go Victoria*. It is a critical component towards achieving market transformation of EVs within the municipality and supports the targets established by the Provincial and Federal Governments.

Respectfully submitted,

Robyn Webb
Community Energy Specialist
Community Planning Division

Karen Hoese, Director
Sustainable Planning and Community
Development Department

Report accepted and recommended by the City Manager:

Date: June 10, 2020

List of Attachments

- Attachment A: Zoning Amendment Bylaw No. 20-001
- Attachment B: Zoning Amendment Bylaw No. 20-075
- Attachment C: Zoning Regulation Bylaw Schedule C: Off-Street Parking Regulations for Affordable Housing
- Attachment D: EV Infrastructure Types
- Attachment E: Local Government Examples
- Attachment F: Electric Vehicle Charging Infrastructure Technical Bulletin (2020).

NO. 20-001

A BYLAW OF THE CITY OF VICTORIA

The purposes of this Bylaw are to amend the Zoning Regulation Bylaw by adding new definitions in Schedule A – Definitions and amending Schedule C – Off-Street Parking to establish electric vehicle charging design standards.

The Council of The Corporation of the City of Victoria enacts the following provisions:

1 This Bylaw may be cited as the "ZONING REGULATION BYLAW, AMENDMENT BYLAW (NO. 1210)".

2 Bylaw No. 80-159, the Zoning Regulation Bylaw, is amended as follows:

(a) Schedule A – Definitions is amended by adding the following definitions immediately after the definition of **"Dwelling Unit"**:

"Energized Electric Vehicle Outlet" means a connected point in an electrical wiring installation at which current is taken and a source of voltage is connected to supply utilization equipment for the specific purpose of charging an electric vehicle.

"Electric Vehicle Charger" means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch circuit and an electric vehicle.

"**Electric Vehicle Energy Management System**" means a system consisting of monitors, communications equipment, controllers, timers, and other applicable devices used to control electric vehicle supply equipment loads through the process of connecting, disconnecting, increasing, or reducing electric power to the loads."

(b) Schedule C – Off Street Parking is amended by adding the following immediately after section 2.3.4:

"2.4 Electric Vehicle Charging Infrastructure Requirements

1. The owner or occupier of any land or any building or other structure, for each use present on the land or in the building or other structure, must provide energized electric vehicle outlets for parking spaces in accordance with Table 3.

2. All energized electric vehicle outlets shall provide, at a minimum, a Level 2 electric charging level as defined by SAE International's J1772 standard.

3. Energized electric vehicle outlets shall be labelled for their intended use for electric vehicle charging only.

4. Energized electric vehicle outlets shall not be placed within the minimum vehicle parking space dimensions or drive aisle identified in Figure 2 of this Schedule.

5. An energized electric vehicle outlet shall be assigned to an individual vehicle parking stall and shall be located no further than 1.0m from that stall.

6. No more than one energized electric vehicle outlet may be assigned to an individual vehicle parking stall.

7. Where an electric vehicle energy management system is implemented, the electric vehicle management system must meet the requirements set out in Electric Vehicle Charging Infrastructure Technical Bulletin (2020).

8. Sections 2.4.3 and 2.4.5 do not apply to Single Family Dwellings, Two Family Dwellings or Semi-Attached Dwellings.

9. Section 2.4.1 does not apply to:

    a. visitor parking spaces; or

    b. a building existing prior to October 1, 2020; or

    c. parking spaces in a development in which, prior to October 1, 2020:

        i. an application has been submitted for the development to the City in accordance with the City's Land Use Procedures Bylaw; or

        ii. a building permit application has been submitted for the development in accordance with the City's Building and Plumbing Regulation Bylaw.

Table 3: Minimum Number of Required Energized Electric Vehicle Outlets

Use or Class of Use	**Minimum Number of Energized Electric Vehicle Outlets**
Residential	
Single Family Dwelling	1 per required vehicle parking space
Two Family Dwelling	1 per required vehicle parking space

Semi-attached Dwelling	1 per required vehicle parking space
Secondary Suite or Garden Suite	n/a
All other residential uses not specifically identified in this table	1 per vehicle parking space
Commercial, Institutional and Industrial	
Number of Vehicle Parking Spaces Provided	
<10	n/a
10-14	1
>15	2 energized electric vehicle outlets or 5% of the total number of required vehicle parking spaces, whichever is greater

Effective Date

3 This Bylaw comes into force on October 1, 2020.

READ A FIRST TIME the day of 2020.

READ A SECOND TIME the day of 2020.

Public hearing held on the day of 2020.

READ A THIRD TIME the day of 2020.

ADOPTED on the day of 2020.

CITY CLERK MAYOR

NO. 20-075

A BYLAW OF THE CITY OF VICTORIA

The purposes of this Bylaw are to amend the Zoning Bylaw 2018 by adding new definitions in Section 2.1 – Administrative Definitions and amending Section 5.1 – Off-Street Parking Regulations to establish electric vehicle charging design standards.

The Council of The Corporation of the City of Victoria enacts the following provisions:

1 This Bylaw may be cited as the "ZONING BYLAW 2018, AMENDMENT BYLAW (NO. 5)".

2 Bylaw No. 18-072, the Zoning Bylaw 2018, is amended as follows:

(a) Section 2.1 – Administrative Definitions is amended by adding the following definitions immediately after the definition of **"Dwelling Unit"**:

"Energized Electric Vehicle Outlet" means a connected point in an electrical wiring installation at which current is taken and a source of voltage is connected to supply utilization equipment for the specific purpose of charging an electric vehicle.

"Electric Vehicle Charger" means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch circuit and an electric vehicle.

"**Electric Vehicle Energy Management System**" means a system consisting of monitors, communications equipment, controllers, timers, and other applicable devices used to control electric vehicle supply equipment loads through the process of connecting, disconnecting, increasing, or reducing electric power to the loads."

(b) Section 5.1 – Off Street Parking Regulations is amended by adding the following immediately after section 5.1.3:

4. Electric Vehicle Charging Infrastructure Requirements

a. The owner or occupier of any land or any **Building** or other structure, for each use present on the land or in the **Building** or other structure, must provide **Energized Electric Vehicle Outlets** for parking spaces in accordance with Table 3.

b. All **Energized Electric Vehicle Outlets** shall provide, at a minimum, a Level 2 electric charging level as defined by SAE International's J1772 standard.

c. **Energized Electric Vehicle Outlets** shall be labelled for their intended use for electric vehicle charging only.

d. **Energized Electric Vehicle Outlets** shall not be placed within the minimum vehicle parking space dimensions or **Drive Aisle** identified in Figure 1, Part 5.

e. An **Energized Electric Vehicle Outlet** shall be assigned to an individual vehicle parking stall and shall be located no further than 1.0m from that stall.

f. No more than one **Energized Electric Vehicle Outlet** may be assigned to an individual vehicle parking stall.

g. Where an **Electric Vehicle Energy Management System** is implemented, the **Electric Vehicle Management System** must meet the requirements set out in Electric Vehicle Charging Infrastructure Technical Bulletin (2020).

h. Section 5.1.4 does not apply to:

   i. visitor parking spaces; or

   ii. a **Building** existing prior to October 1, 2020; or

   iii. parking spaces in a development in which, prior to October 1, 2020:

      A. an application has been submitted for the development to the City in accordance with the City's Land Use Procedures Bylaw; or

      B. a building permit application has been submitted for the development in accordance with the City's Building and Plumbing Regulation Bylaw.

Table 3: Minimum Number of Required **Energized Electric Vehicle Outlets**

Use or Class of Use	**Minimum Number of Energized Electric Vehicle Outlets**
Residential	
Condominium (**Dwelling Unit** in a **Building** regulated by the *Strata Property Act*)	1 per required vehicle parking space
Apartment (**Dwelling Unit** secured as rental in perpetuity through a legal agreement)	1 per required vehicle parking space
Affordable (**Affordable Dwelling Units** secured in perpetuity through a legal agreement)	1 per required vehicle parking space

Assisted Living Facility	1 per required vehicle parking space
All other residential uses not specifically identified in this table	1 per required vehicle parking space
Commercial	
Number of Vehicle Parking Spaces Provided	
<5	0
>5	1 **Energized Electric Vehicle Outlet** or 5% of the total number of required vehicle parking spaces, whichever is greater

(c) Section 5.1.4 Bicycle Parking Specifications and Section 5.1.5 Bicycle Parking Exemptions shall be renumbered to Section 5.1.5 and Section 5.1.6 respectively.

(d) Section 5.1.4.h.i is amended by deleting the words “Table 3” and replacing with “Table 4”.

Effective Date

3 This Bylaw comes into force on October 1, 2020.

READ A FIRST TIME the day of 2020.

READ A SECOND TIME the day of 2020.

Public hearing held on the day of 2020.

READ A THIRD TIME the day of 2020.

ADOPTED on the day of 2020.

CITY CLERK MAYOR

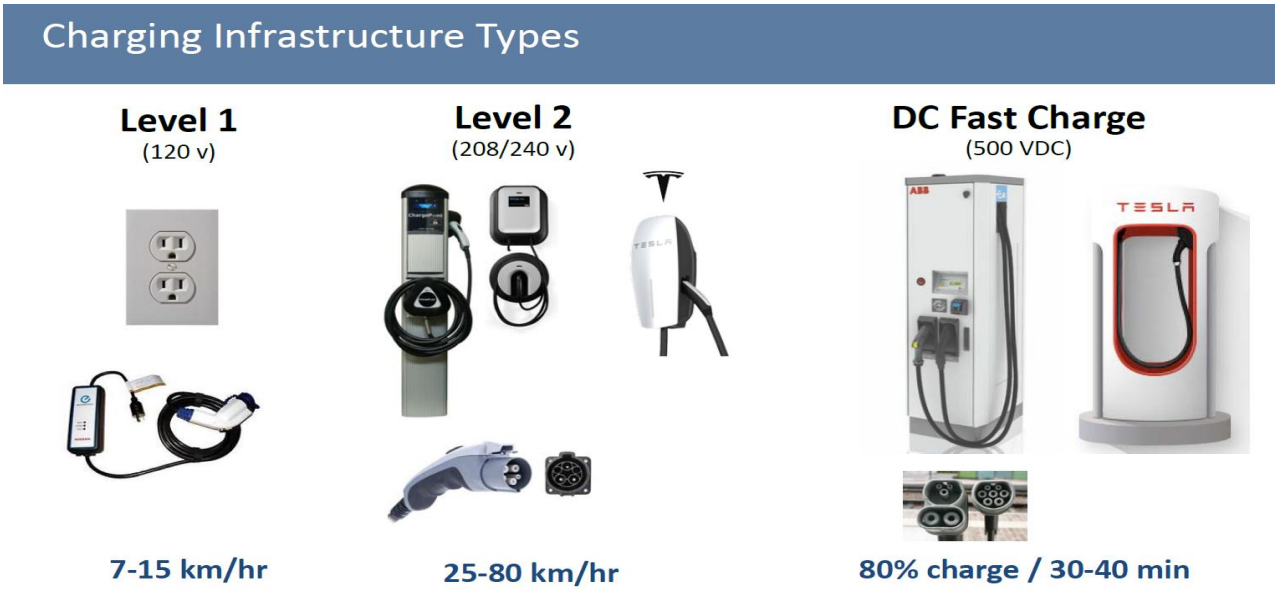
Zoning Regulation Bylaw Schedule 'C':
Off-Street Parking Regulations for Affordable Housing

Column A	Column B	Column C
Use or Class of Use	Minimum Parking Spaces	Minimum Visitor Parking Spaces
Residential		
Condominium (**Dwelling Unit** in a **Building** regulated by the *Strata Property Act*)	0.65 spaces per **Dwelling Unit** that is less than 45m²	0.10 spaces per **Dwelling Unit**
	0.80 spaces per **Dwelling Unit** that is equal to 45m² and up to 70m²	
	1.20 spaces per **Dwelling Unit** that is more than 70m²	
Apartment (**Dwelling Unit** secured as rental in perpetuity through a legal agreement)	0.50 spaces per **Dwelling Unit** that is less than 45m²	0.10 spaces per **Dwelling Unit**
	0.60 spaces per **Dwelling Unit** that is equal to 45m² and up to 70m²	
	1 space per **Dwelling Unit** that is more than 70m²	
Affordable (**Affordable Dwelling Units** secured in perpetuity through a legal agreement)	0.20 spaces per **Dwelling Unit** that is less than 45m²	0.10 spaces per **Dwelling Unit**
	0.50 spaces per **Dwelling Unit** that is equal to 45m² and up to 70m²	
	0.75 spaces per **Dwelling Unit** that is more than 70m²	
All other multiple dwellings	0.65 spaces per **Dwelling Unit** that is less than 45m²	0.10 spaces per **Dwelling Unit**
	0.80 spaces per **Dwelling Unit** that is equal to 45m² and up to 70m²	
	1.20 spaces per **Dwelling Unit** that is more than 70m²	
Assisted Living Facility	0.35 spaces per **Dwelling Unit** or residential unit	0.10 spaces per **Dwelling Unit** or residential unit
Commercial		
Hotel	0.25 spaces per room	-

EV Infrastructure Types

Definitions:

- **"Electric Vehicle (EV)"** means a vehicle that operates, either partially or exclusively, on electrical energy from an off-board source that is stored on-board for motive purposes, but does not include vehicles that cannot be licensed by the Insurance Corporation of British Columbia.
- **"Energized Electric Vehicle Outlet"** means a connected point in an electrical wiring installation at which current is taken and a source of voltage is connected to supply utilization equipment for the specific purpose of charging an electric vehicle.
- **"Electric Vehicle Charger"** means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch circuit and an EV.
- **"Electric Vehicle Energy Management System"** means a system consisting of monitors, communications equipment, controllers, timers, and other applicable devices used to control electric vehicle supply equipment loads through the process of connecting, disconnecting, increasing, or reducing electric power to the loads.
- **"Level 2 Charging"** means an EV charging level as defined by Society of Automotive Engineers (SAE) International's J1772 standard (208/240 volts).



Because EV charging takes longer than refilling at a gas station, at-home charging is the most convenient, reliable, and preferred location with EV owners tending to charge at home over 80% of the time. L2 charging, with a similar output as a clothes dryer, provides a higher level of performance which more quickly charges a vehicle, supporting a better consumer experience and is consistent with recent policy across BC and North America. This bylaw amendment recommends 100% adoption of EV readiness in the residential sector for these reasons.

The installation of EV charging equipment requires the following electrical infrastructure:

- **Sufficient capacity** at the building's electrical panel for EV charging;
- **Electrical raceway** and conduit from the electrical panel to each parking stall;
- **Energized outlet** at each parking stall;
- **EV Energy Management Systems (EVEMS)** are optional control technologies that enable the power drawn to be shared or prioritized between chargers, thereby reducing peak power demand, making efficient use of electrical capacity, and greatly reducing electrical infrastructure costs. EVEMSs are recognized in the 2018 edition of the Canadian Electrical Code and are currently in the process of being adopted into the BC Electrical Code; Technical Safety BC has developed a variance process to permit installation of EVEMSs in the interim. The 'Smart' chargers used with EVEMSs can facilitate billing, which is a common concern for strata's in shared parking areas.
- **EV charger** (also know as EV Supply Equipment or EVSE) with cable to reach the vehicle.

The most cost-effective time to install EV charging infrastructure is during construction. The recent emergence of EVEMSs has significantly reduced the cost of installation in new multi-family residential and commercial development by reducing the amount of electrical capacity and infrastructure. The City of Victoria will require the abovementioned electrical infrastructure up to and including an energized outlet for each parking space in residential developments and will allow EVEMSs to provide a flexible and cost-effective approach for achieving this requirement.

A minimum performance standard (see Table 1) should be achieved where an EVEMS is installed. The performance standard requirements indicate that the maximum number of L2s that can be connected to the same circuit for various circuit ratings. New developments must achieve at least 12kWh per vehicle over an eight our period when all vehicles are charging simultaneously (i.e. allocate at least 8A per vehicle on a 208V or 240V circuit, if all vehicles are sharing power equally). Greater allowable levels of sharing are appropriate beyond 80A, given the greater diversity of electrical loads possible at these higher amperages. Additionally, no more than 1 vehicle should be able to charge on a 20A circuit and no more than 2 on a 30A circuit. A Technical Bulletin will be drafted to outline these standards for the development community.

Table 1: Performance Requirements

Minimum Circuit Breaker Rating (AMPS)	Maximum Number of L2 Chargers Per Circuit
20	1
30	2
40	4
50	5
60	6
70	7
80	8
90	10
100	11
125	14
150	17

Attachment E

Recent Local Government Policy Examples for EV Regulations in New Development

Community (Date in Effect)	Single Family	Multi-Family	Commercial/ Institutional
City of Burnaby (2018)	100% of residential parking stalls provided with energized L2 outlet. Excludes secondary suites and visitor parking.		
City of Coquitlam (2018)	One energized L2 outlet per residential dwelling unit.		
City of New Westminster (2019)	100% of residential parking stalls provided with energized L2 outlet. Excludes visitor parking and new secondary suites in existing single detached homes.		10% of commercial and institutional stalls L2 energized in developments with 10 or more parking stalls.
City of North Vancouver (2019)	100% of stalls provided with energized L2 outlet.	100% of resident stalls and 20% of residential visitor stalls provided with energized L2 outlet.	20% of commercial stalls provided with energized L2 outlet.
City of Port Coquitlam (2018)	One stall per residential unit roughed-in (all electrical infrastructure other than wire), Level 2.		
City of Port Moody (2019)	100% of residential parking stalls provided with energized L2 outlet, excluding visitor parking, secondary suites and new spaces to serve existing units.		20% of commercial stalls capable of providing L2 charging.
City of Richmond (2018)	100% of residential parking stalls provided with energized L2 outlet, excluding visitor parking.		
City of Vancouver (2018)	One energized outlet per parking area (garage, carport).	100% of residential parking stalls provided with L2 energized outlet.	10% of commercial stalls L2 energized in developments with 10 or more parking stalls.
District of Saanich (2020)	100% of residential parking stalls provided with energized L2 outlet. Excludes secondary suites and visitor parking.		5% of commercial stalls provided with energized L2 outlet with exemptions for certain use classes.
District of Squamish (2019)		100% of residential parking stalls provided with L2 energized outlet.	5% of commercial stalls L2 energized in developments.

To date, the District of Saanich is the only municipality in British Columbia have mandated the installation of actual charging capacity in new developments. Through the BC Hydro Sustainable Communities program, Victoria is participating in research on the ideal percentage of EV readiness as well as actual chargers for commercial parking spaces across different use classes. Part of this work will include a critical costing study for each region in BC. The City is committed to amending the EV readiness parking spot percentage requirement for commercial buildings over time, which could include an analysis of the requirement for actual charging infrastructure as well.

Electric Vehicle Charging Infrastructure Technical Bulletin (2020)

Performance Requirements

A baseline performance standard of at least 12kWh per vehicle over an eight-hour period is required when all vehicles are charging simultaneously (i.e. allocate at least 8A per vehicle on a 208V or 240V circuit, if all vehicles are sharing power equally). Greater allowable levels of sharing are appropriate beyond 80A, given the greater diversity of electrical loads possible at these higher amperages. Additionally, no more than 1 vehicle should be able to charge on a 20A circuit and no more than 2 on a 30A circuit.

Circuit Breaker Amperage	Maximum Number of Electric Vehicle Ready Parking Spaces
20	1
30	2
40	4
50	5
60	6
70	7
80	8
90	10
100	11
125	14

Electric Vehicle (EV) Ready Requirements in New Construction

1

Purpose

- Present a recommended approach for EV charging infrastructure requirements for new residential, commercial, industrial and institutional developments.
- Consider potential impacts on affordability.
- Bring forward zoning bylaw amendments for Council's consideration.

2

Climate Leadership

- 80% GHG reduction by 2050 target
- 100% Renewable Energy targets

Figure 1: City of Victoria GPC Compliant Inventory, 2017

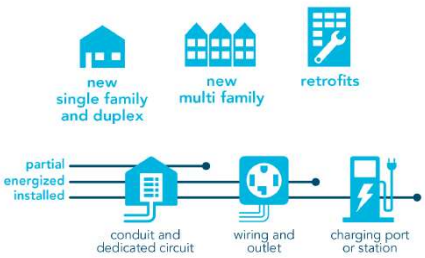
3

RW1

Local Government Role in EV Adoption

Demonstrating leadership at local government locations like City Hall.

Ensuring adequate EV charging at work and at home.



Ensuring publicly accessible charging on the go.

4

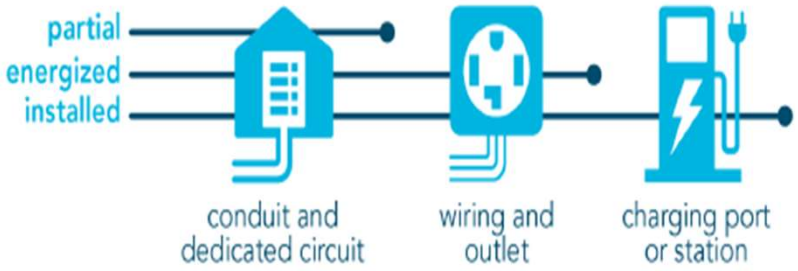
Slide 4

RW1 [@Andrea Hudson] we were not sure whether to include this slide or not. I am ok if it gets removed.
Robyn Webb, 6/16/2020

Residential Standard

Use or Class of Use	Minimum Number of Energized Electric Vehicle Outlets
Single Family Dwelling	1 per required vehicle parking space
Two Family Dwelling	1 per required vehicle parking space
Semi-Attached Dwelling	1 per required vehicle parking space
Secondary Suite or Garden Suite	N/A
All other residential uses not specifically identified in this table	1 per vehicle parking space

5



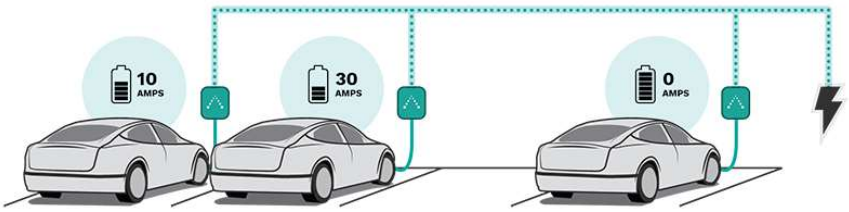
6

Institutional, Commercial and Industrial Standard

Number of Vehicle Parking Spaces Provided	Minimum Number of Energized Electric Vehicle Outlets
<10	N/A
10-14	1
>15	2 energized electric vehicle outlets or 5% of the total number of required vehicle parking spaces, whichever is greater

7

Institutional, Commercial and Industrial Standard



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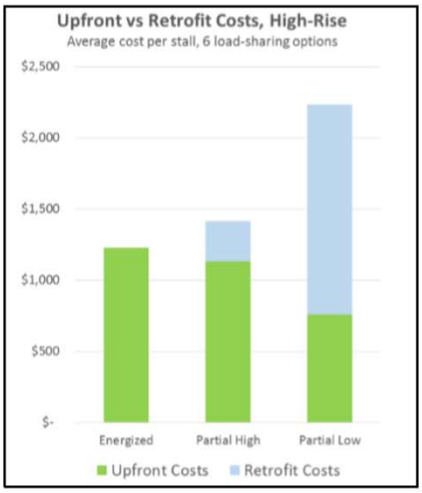
Financial Considerations

- Installing charging infrastructure at time of construction more cost effective than retrofitting buildings at a later date.
- Provincial rebates currently available for new and existing buildings.
- City's top up only for existing multi-unit residential buildings.



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Affordability Considerations

- Impacts of zoning changes on housing affordability was considered.
- Current zoning bylaw requirements for off-street parking considerably less for affordable housing developments.
- Wiring affordable housing buildings in the present insulates against costly retrofits in future (life of a building can span over 100 years).
- Reduces demand on subsidies and grants in a future where EVs will be the only engine type available for purchase as of 2040.

10

Recommendations

That Council:

1. Direct staff to forward Zoning Amendment Bylaw Nos. 20-001 and 20-075 to require that Electric Vehicle (EV) readiness be provided for all new residential development and five percent of new institutional, commercial and industrial development to the July 9th Council meeting for introductory readings.

2. Direct staff to monitor EV demand and the use of charging infrastructure in institutional, commercial and industrial land uses and bring forward recommended amendments to the requirement levels as deemed necessary.