Report to Smart Growth Committee

DATE: January 27, 2017

TO: Smart Growth Committee (SGC)

FROM: Neil MacEachern, Environmental Coordinator

SUBJECT: **Electric Vehicle Charging Infrastructure**

EXECUTIVE SUMMARY

The installation of electric vehicle (EV) charging infrastructure is a strategic direction set out in our Environmental Strategic Plan, a recommendation of the Corporate & Community Climate Action Plan, and a guideline pursuant to the Environmental Conservation designation of the Official Community Plan. Despite these directions, there have been no defined actions to encourage their use, and to date EV charging installations in new buildings have been limited.

This report proposes that consideration be given to amending regulations to require installation of EV charging 'rough-ins' (adequate electrical panels, conduit and outlet boxes) in new ground-oriented and apartment buildings, and electrical upgrades when the power supply is changed in existing apartment buildings. It also proposes that our policies be amended to promote installation of EV charging infrastructure in commercial, industrial, and institutional buildings (ICI) developments through consideration at the time of rezoning. Prior to bringing forward any bylaw or policy amendments, it recommends that staff consult with development and building industry representatives to obtain feedback on the proposal.

RECOMMENDATION

That staff be authorized to consult with the development and building industries regarding proposed policy and bylaw amendments with respect to EV charging infrastructure.

1. BACKGROUND

The City of Port Coquitlam has committed to integrate energy and emissions management into its day-to-day operations and community planning processes. To this end, the municipality has developed a number of policies to reduce emissions and set targets for community greenhouse gas (GHG) reductions. The majority of the identified environmental actions which are intended to reduce our transportation emissions have yet to be assessed and implemented, such as car-free incentives, car share parking and incentives, limiting on-street parking and developing EV

charging infrastructure. Recent changes to the BC Building Code have retained municipal powers to regulate EV charging in buildings.

Reviewing the City's policies and regulations is proposed at this time for a number of reasons:

- The work will contribute to the Official Community Plan update
- Port Coquitlam currently has only 7 public level 2 (208/240V) EV charging stations.
- EVs have the potential to significantly reduce GHGs generated from transportation. An estimated 40% of vehicles in Canada will need to be electric by 2040 to meet provincial and national GHG targets.
- Most EV charging is likely to occur at an owner's home. Approximately 40% of Port Coquitlam residents now live in apartments, limiting the capacity for independent installation of EV charging. The construction of condominium apartments has outpaced single-residential home development in Port Coquitlam by a factor of 10 to 1 over the last 5 years and this trend is expected to be continued.
- BC Hydro has developed an internal program specifically to manage electrical use for projected EV uptake.
- Since 2011, annual sales of EVs in BC have increased by an average 105% year-over-year, with sales projected to represent 20-50% of vehicles by 2030: One-third of Canadians surveyed in 2015 expressed interest in purchasing an EV, but uptake remains constrained primarily by limited charging infrastructure.
- Long-range and mass-market oriented EVs are now available, with purchase price parity with combustion engine vehicles predicted by 2022-2024.

2. COMMENTS AND ANALYSIS

2.1. Understanding EV Infrastructure and its Costs

The need to set regulations that would require installation of EV services arises from several issues. Developers of both ground-oriented and apartment buildings respond to market demand in determining what amenities to include in their buildings, but EV infrastructure has not yet been recognized by the majority of developers or home buyers as an important asset. However, in all building types, the upfront cost of installing EV charging infrastructure at the time of construction is dramatically lower than attempting to retrofit the building at a later date. Residential infrastructure is critical, as 80% of EV charging is normally done at the owner's home. The City has the ability to influence EV uptake and reduce future costs by amending its policies and regulations to require the provision of charging infrastructure at the time of new residential development and electrical upgrading.

Residential EV charging generally comes in two forms, Level 1 or Level 2. Level 1 charging uses a normal household plug (120 volts, 15 amps). Although Level 1 might provide a sufficient charge for an average daily commute (which for Port Coquitlam residents is 23.6 km), it is limited to approximately 6-11 km of added range per hour that the vehicle is plugged-in. This is not considered sufficient, as a full charge may require up to 98 hours for some vehicles. Level 2 charging, which uses similar wiring to a stove or dryer to transmit more power (208/240 volts, 12 to 80 amps), can deliver 20-65 km of added range per hour of charging, which allows for most vehicles to be full charged overnight. Level 2 is the industry standard, and is generally the

minimum level used when EV specific infrastructure is installed in a building.

The cost to install new infrastructure will vary due to a number of factors, including parking configuration, distance to the building electric room, and materials and labour pricing, among others. Estimated costs in Table 1 assume that the power supply circuit is shared between four parking spaces. However, newer charging technology allows for a virtually unlimited number of charging stations on one high power circuit, which could push the costs of rough-ins lower than indicated below.

Table 1

Cost of installing 40A Level 2 charging rough-ins, load-shared			
	Rough-in at retrofitting Per space	**Rough-in at construction Per space**	
Cost	$	$	% of dev't. cost
Ground-oriented Residential	$60 – $2,800	$60 – $350	0.01% – 0.05%
Multi-Unit Residential	$1,500 – $16,000	$200 – $1,150	0.17% – 0.66%

*Development cost is estimated to be 85% of local sale price

2.2. Other Communities

Municipalities in the Lower Mainland have taken varied approaches to EV charging requirements, including adoption of regulatory bylaws and policies applicable to new developments and rezoning applications. For the most part, the communities that have adopted specific regulations to date have strong environmental platforms, such as Vancouver, North Vancouver City and Richmond. A number of other municipalities are also exploring options to introduce policies and regulations.

2.3. Proposed Amendments:

It is proposed that the City:

- Require rough-ins of Level 2 EV charging infrastructure to the garage or parking area of new ground-oriented residential dwellings (single residential, duplex, townhouse and rowhouse units) to provide that one parking space per dwelling unit has access to a future plug in.
- Require rough-ins of Level 2 EV charging infrastructure in new apartment buildings with electrical outlets sited to be accessible to each parking space allocated to residents, but not visitors. The configuration of the outlets may be designed to be shared, so, for example, four spaces could share one outlet.
- Adopt a policy that would promote installation of prewiring or rough-ins of Level 2 EV charging infrastructure in commercial, industrial, and institutional buildings, with a determination of the appropriate infrastructure for the project to be made at the time

of rezoning for this type of use.

- Require that the power supply at all residential buildings be adequate to power potential future EV charging demands when the incoming power supply is changed

The recommendation to require roughed-in infrastructure for residential developments is intended to provide residents with the opportunity to install wiring at a much lower cost than if they were to retrofit a site without this infrastructure. The option to require wiring in addition to roughing-in is not recommended at this time due to the higher cost to implement this option and the current level of demand in Port Coquitlam.

The benefits of requiring installation of EV infrastructure in all commercial, industrial and institutional developments is not as clear as that established for residential developments, and will vary with the type of business, who uses the parking spaces for what length of time, and numerous other factors. For example, a commercial use unlikely to warrant an EV installation might include a drive-through restaurant. Similarly, it may not be of value to an industrial use such as a trucking business. Businesses are also more likely to install this infrastructure if it will serve their customer or employee needs and the costs to retrofit a surface parking lot is generally less than it is for an underground parking structure or garage. For these reasons, staff are not recommending that the City impose a requirement for ICI uses but the benefits be evaluated on a case by case basis through the rezoning process.

The process to ensure upgrading of existing electrical services is more involved because the City does not implement its own electrical inspections. Coordination with provincial electrical inspectors would be required to develop the appropriate legislation for this purpose and ensure awareness of the requirement, particularly if the work does not involve a building permit (e.g. transformer upgrading). This issue will be further reviewed as part of the recommended consultation.

Implementation of the proposed regulations would be through the normal building permit process following an amendment to the Building and Plumbing Bylaw. At the time of building permit application, the drawings and electrical diagrams would be reviewed to ensure that the rough-ins are included as part of normal building permit review processes. There would be marginal additional costs to the municipality associated with additional time it would take to explain the requirement to our builders, at least until it becomes a standard element within the building industry, as well as in review of the building permit plans; the developer would see a marginal increase in building permit fees as they are related to total construction costs.

3. OPTIONS

SGC may:

(1) Authorize staff consultation with the development and building industries to obtain their feedback (recommended).

(2) Proceed directly to Council with a recommendation that an amending bylaw be brought forward. In accordance with our established practice, this option is not recommended to ensure that developers and builders have an opportunity to comment on proposed regulatory changes before they are finalized.

(3) Determine that the City does not wish further consider a bylaw amendment regarding EV charging at this time but continue to encourage charging infrastructure. This option is not being recommended as few developments are providing the infrastructure with current policies and introducing a requirement for EV infrastructure would best meet anticipated demand at the lowest cost to residents.

Neil MacEachern, MSc, RPF, EP(EMSLA)

Appendix 1

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1. STATUS OF ELECTRIC VEHICLES AND CHARGING

Currently, 24 models of electric vehicle (EV) are currently available in Canada. To date, some 4000 EVs have been registered in BC, which currently comprise approximately 2% of car sales in the province, over 2/3 of which are estimated to be in the lower mainland. Since 2011, sales of EVs in BC have more than doubled annually. However, uptake of electric vehicles has historically been limited due to three primary factors: uncompetitive pricing, limited battery range, and a lack of charging infrastructure.

Recent advances in battery technology have resulted in massive increases in range, and reductions in the price of EVs. The best-selling Nissan Leaf has seen an 86% increase in range and a 23% decrease in price since 2011. New models from Hyundai, Nissan, Tesla and Chevrolet that are, or will be available this year will deliver 345+ km of range for under $43,000. It is expected that these models will strongly impact market penetration of EVs, as 350 km range is considered sufficient by 75%, and 400 km by 89% of drivers. Further, Ford intends to introduce 13 electric models by 2020, and petrochemical giant BP projects a 100-fold increase in EV sales by 2037. Notably, the Tesla has received 373,000 paid reservations for its forthcoming Model 3, and purchase price parity between electric and combustion engine vehicles is expected between 2022 and 2024.

Despite improved technology and lower operating costs, charging remains a barrier to uptake. Inability to charge at sufficiently fast rates exacerbates 'range anxiety', the fear that a driver will run out of charge. In order to deliver higher speed charging, the power source must deliver both sufficient amperage (the flow rate of electricity) and voltage (the energy level of the electricity), which together yield power in watts (W). The charging rate of a vehicle depends not only on its power supply, but also its internal hardware, with common charging capacities of 3.3 kW (3,300 W), 6.6 kW, 7.2 kW or higher.

Efficiency of EVs is measured in kWh (as seen on hydro bills) consumed per 100 km of driving. This efficiency depends on an EV's design, but today ranges from 12.9 to 24 kWh per 100 km. Equivalent energy consumed by comparable gasoline vehicles is 50.4 to 126.1 kWh per 100 km - four to five times less efficient. With BC residential hydro rates, per kilometre costs of operating an EV are generally less than 20% of those of a gasoline powered car (see Table 2). Current trends indicate that by 2019, combined purchase and operating costs of EVs will break even with combustion engine vehicles in the first five years of ownership.

Table 2

Operating Costs of EV and Gasoline Vehicles				
Model	**Smart Fortwo EV**	**Tesla Model S P100D**	**Honda Fit DX**	**Cadillac CT6**
kWh per 100 km	12.9 (hwy)	24 (city)	50.4 (hwy)	126.1 (city)
Gasoline L/100 km	-	-	5.2	13
Cost per 100 km*	$1.06	$2.92	$6.89	$16.90

*Electricity cost: 8.89 c/kWh (low), 12.23 c/kWh (high); Fuel cost: $1.30/L

Notably, an EV's 'charger' is located inside the vehicle, and converts household AC (alternating current) to storable DC (direct current) electricity. The plug and control box used to deliver the power is referred to as Electric Vehicle Charging Station (EVCS). To function, an EVCS requires a receptacle, wiring with appropriate routing (typically encased in protective conduit), and sufficient electrical panel capacity.

Level 1 charging, using a household 120V, 15A plug, although often sufficient for daily use, is limited to approximately 6 to 11 km of range per hour of charging. Level 2 charging (208/240V, 12 to 80A) can provide range of 20-65 km per hour plugged in.

DC fast charging provides 60 to 125A at 480V, which bypasses a vehicle's internal (AC) charger to deliver to supply DC power directly to the battery. This allows for up to 400+ km of range to be added per hour of charging. However cost from $35,000 to $130,000 per charger prevents practical application in most residential settings.

Load sharing (or load balancing), is the process of managing multiple charging stations on a single circuit. It allows for more than one vehicle to be charged simultaneously or successively with less required infrastructure. Although load sharing may sometimes reduce the individual speed of those simultaneously charging, it will maximize overall charge delivery. 'Smart' charging systems, which network between charging points, can optimally distribute power, and prevent additional electricity costs.

Currently, 7 public and an unknown number of private level 2 charging stations exist in Port Coquitlam. There are no DC fast charging stations in the city. For the 40% of Port Coquitlam residents who live in apartments, likely with limited capacity to add an EVCS, charging may be limited to the few public stations. However, level 2 stations at the workplace may make EV ownership more feasible for those without charging at home.

2. EMISSIONS REDUCTION POTENTIAL

The capacity for emissions reductions in the City of Port Coquitlam from the use of electric vehicles is significant. Currently, over half of community greenhouse gas emissions result from automotive transportation. Given that 97% of power generated in the province is effectively zero-carbon, a switch to even a modest proportion of electric vehicles would substantially ease CO_2 emissions. If charged on BC-generated power, full life-cycle emissions for an electric vehicle (including manufacturing and repair) would be 80% less than a combustion engine equivalent. Importantly, research has indicated that all vehicles sales must be electric by 2035 to limit global warming to 1.5 degrees Celsius. Additionally, the adoption of electric vehicles would reduce other automotive pollutants, improving local air quality.

Adoption of EVs in the province has increased at an average rate of 105% per year since 2011. Although this proportional increase not indefinitely sustainable, overall volume is suspected to increase rapidly. Projections of EV adoption vary, but range from 24% to 27% (SFU) for the lower mainland, 20%-50% provincially (BC Hydro) and 35% globally (Bloomberg) by 2030. With complementary policies, uptake could reach 65.3% by 2040 (SFU). The related emissions reductions with these estimates are shown in Table 3.

Table 3

Annual Emissions from Electric Vehicle Adoption in Port Coquitlam							
EV Uptake Rate	**<1% (2017 baseline)**	**20%**	**24%**	**27%**	**35%**	**50%**	**65.3%**
Emissions from Vehicles (tCO2e)	179,784	144,905	137,930	132,698	118,747	92,588	65,907
Vehicle Emissions Reduction (tCO2e)	-	34,878	41,854	47,085	61,037	87,195	113,877
Reduction in total community Emissions	-	10.2%	12.2%	13.7%	17.8%	25.5%	33.2%

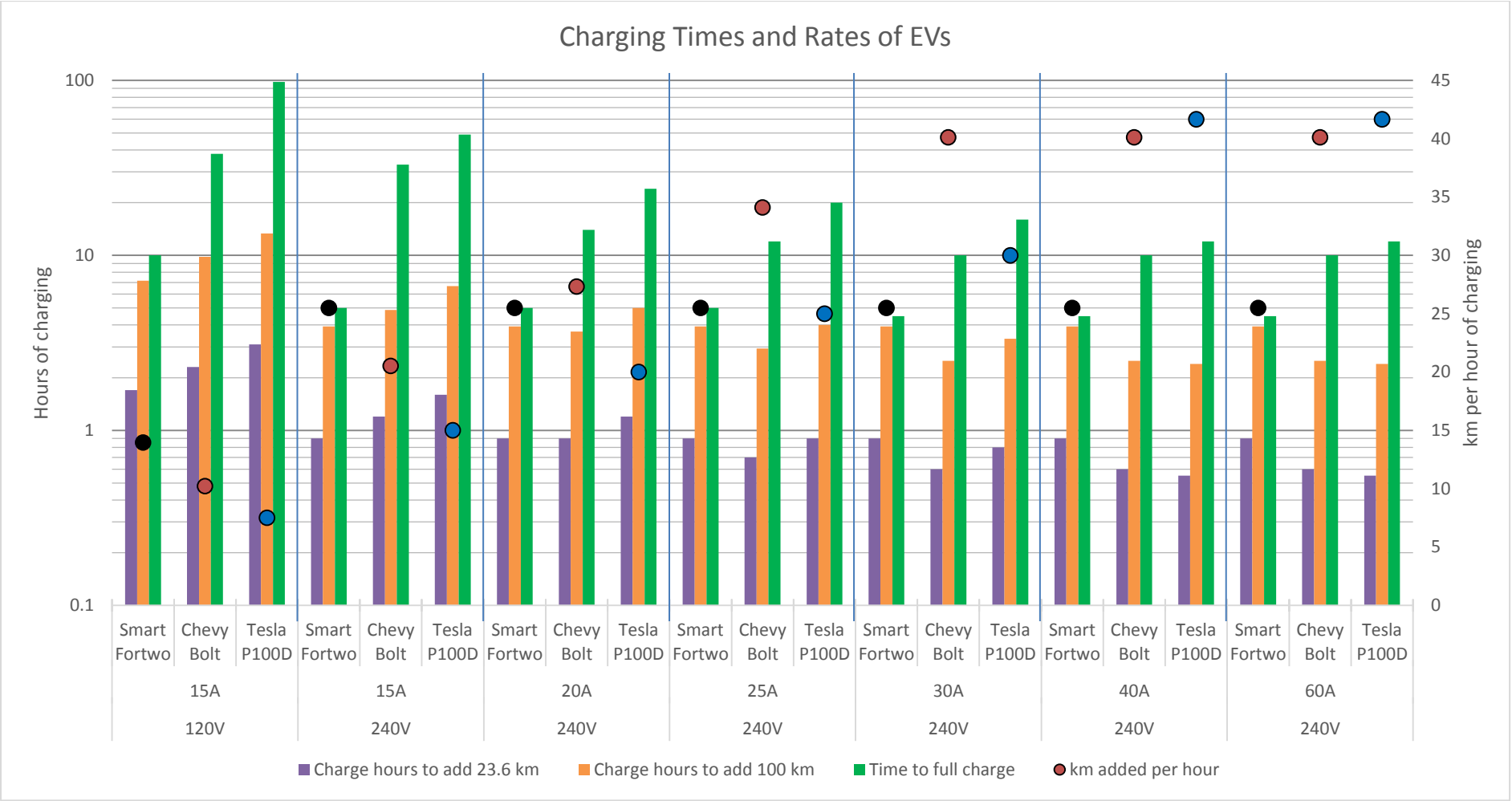
3. CHARGING REQUIREMENTS

Level 1 EVCS, effectively an adaptor plug attached to a normal household outlet, provides 6-11 km per hour of charging, is generally adequate for daily use: the average commute of a Port Coquitlam resident is 23.6 km return. However, level 1 charge rates are unlikely to relieve 'range anxiety' associated with longer distance applications, and level 2 is considered standard for residential EV charging. DC fast charging is generally considered too costly for residential applications.

In addition to voltage (e.g. level 1 vs. 2), current (amperage) also affects charging speed. As current represents the 'volume' of electricity delivered, the higher the current, the faster an EV will charge. In the planning of EV charging infrastructure, desired amperage will affect the required panel capacity, wiring gauge, conduit size, and charging station, with potential cost implications. Notably, there may be drop off in the benefit of additional current if based on the limitations of a vehicle's internal charger (see Figure 1). However, limitations in present vehicles may not be indicative of forthcoming models, as the trend has been for continually higher current handling capacity.

Load sharing can reduce the amperage requirements of charging infrastructure, as it allows for the current from one circuit to be split among multiple charging stations (e.g. a 120-amp circuit providing 30 amps each to 4 stations). Digital control of load sharing allows for the redirection of current based on charging requirements. An example would be a shared circuit delivering 30 amps to each station if 4 cars are plugged in, but 40 amps to 3 cars when one finishes charging (see Figure 2). This rerouting of current ('smart charging'), can reduce the overall required amperage, physical infrastructure and cost of EV charging significantly, although it generally requires an internet connection via Wi-Fi or cellular network.

Figure 1

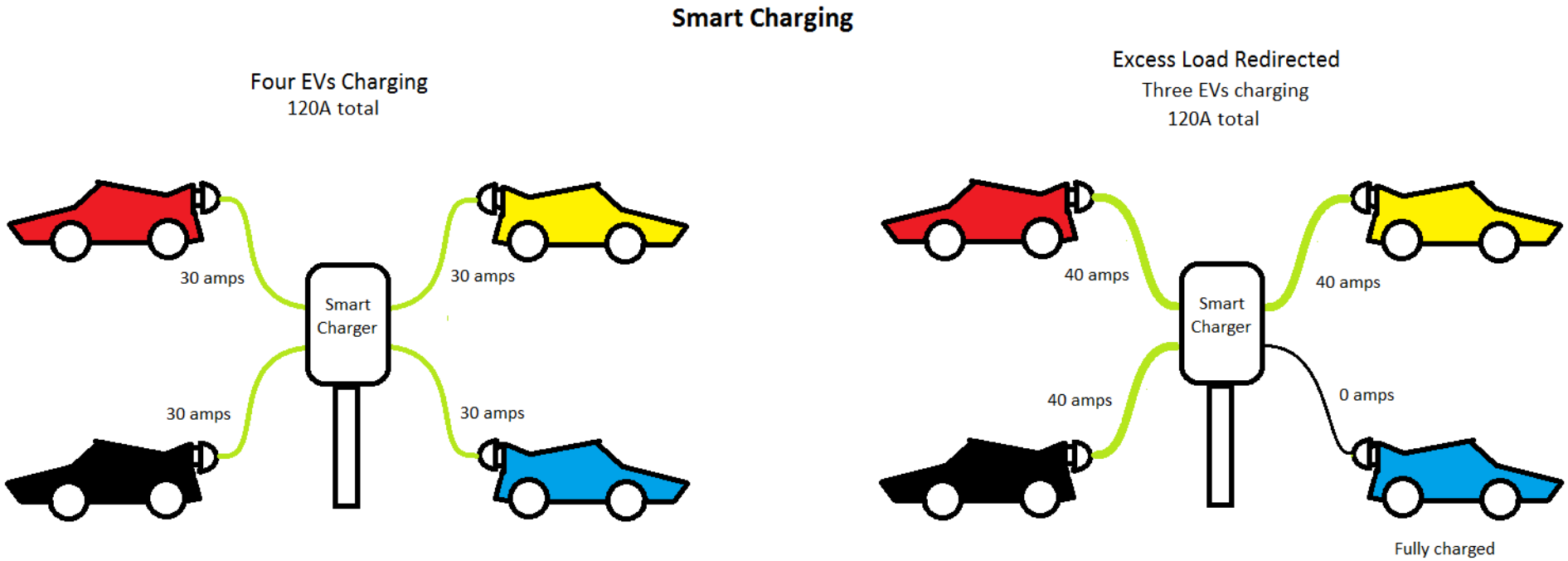


*Smart Fortwo EV: Efficiency: 12.9 kWh/100km, Max charge rate: 3.3 kW, Battery capacity: 17.2 kWh, Full range: 135 km

Chevrolet Bolt: Efficiency: 17.6 kWh/100km, Max charge rate: 7.2 kW, Battery capacity: 60 kWh, Full range: 383 km

Tesla Model S P100D: Efficiency: 24 kWh/100km, Max charge rate: 10 kW, Battery capacity: 100 kWh, Full range: 517 km

Figure 2


Smart Charging
Four EVs Charging
120A total
30 amps
30 amps
30 amps
30 amps
Smart Charger
Excess Load Redirected
Three EVs charging
120A total
40 amps
40 amps
40 amps
0 amps
Smart Charger
Fully charged

Some municipalities have EV charging regulations that require a dedicated 40A circuit breaker per charging station (capable of delivering 32A per BC code) to allow for a full vehicle charge in a reasonable timeframe. However, since the probability of all vehicles in a facility requiring a full charge simultaneously is low, a load-shared circuit with an average 15A per space (12A delivered) could be able to supply 60A or more to one EV when other vehicles are not charging. Today's commercially available load sharing charging stations can manage an indefinite number of charging vehicles on one sufficiently large circuit.

4. COST OF CHARGING INFRASTRUCTURE

The cost of installing level 2 charging varies dependent on a number of factors. These include: proximity of charging point to electrical room, the type, number and capacity of charging stations, electrical panel capacity, building type and structural materials, required permitting, labour rates and assorted materials costs (e.g. wiring, conduit, interrupters).

For a single house, overall costs of an EVCS and required infrastructure generally range from $800-3500. Of this, the largest cost is the charging station ($500-$1000). However, the need to replace an inadequate electrical panel may add $1500 to $3000 to installation cost, whereas an electrical panel to accommodate EVCS upon construction may cost up to $350, but often will add no cost at all.

The costs to multifamily residential structures vary considerably more, from $4,500 to $20,000 per station. In addition to the possible need to replace or add electrical panels ($4,500+), the installation of conduit may require concrete coring and engineering work, further raising costs by several thousand dollars. If there is insufficient transformer capacity, the cost of upgrading may reach $300,000 per building, practically rendering charging supply installation unfeasible. Correspondingly, installing basic infrastructure at the time of construction can reduce installation costs dramatically, compared to an existing building requiring modification.

According to research done in the lower mainland, the cost of installing EV charging rough-ins during residential construction ranges from $60 to $350 for ground-oriented, and $200 to $1,150 for multi-unit dwellings, per parking space. Comparatively, the cost of retrofitting to install rough-ins after construction may reach $2,800 in a ground-oriented, and $16,000 in a multi-unit setting (see Table 4). Notably the cost installing parking alone may be up to $35,000 per space – proportionally a much larger cost. The cost for EV infrastructure in commercial and institutional settings has not been assessed, but is expected to be comparable to or less than multi-unit residential. Note that estimated costs in Table 3 assume that the power supply circuit is shared between four parking spaces. However, newer charging technology allows for a virtually unlimited number of charging stations on one high power circuit, which could push the costs of wiring lower than indicated below.

Table 4

Cost of installing 40A Level 2 charging rough-ins, load-shared			
	Rough-in at retrofitting Per space	**Rough-in at construction Per space**	
Cost	$	$	% of dev't. cost
Ground-oriented Residential	$60 – $2,800	$60 – $350	0.01% – 0.05%
Multi-Unit Residential	$1,500 – $16,000	$200 – $1,150	0.17% – 0.66%

*Development cost is estimated to be 85% of local sale price

5. OTHER CONSIDERATIONS

As multi-unit residential buildings are often managed by strata organizations or property management firms, coordination of EV charging installation and acquiring required authorizations to do so, may be particularly challenging for individual residents. Property managers/owners or strata membership may be resistant to installing, or allowing the installation of EV charging infrastructure. However, the existence of rough-ins and wiring would obviate the need for any building structural changes, which may reduce physical, financial and social barriers to charging infrastructure.

The billing for electricity use is an additional consideration. Although sale of electricity for profit is prohibited in BC, employers, landlords and strata organizations are permitted to resell electricity at cost to employees, tenants, and strata members, as the case may be. A common approach is a flat fee for the use of chargers (commonly $1/day) to cover the costs to the common electric account. However, the increasingly frequent use of networked charging systems allows tracking of actual electrical usage for each user, which also prevents unauthorized use of charging stations.

An additional consideration is the placement of charging outlets, as parking spaces are often assigned to a unit before sale, and it is unknown which buyers may need EV charging. A possible solution would be the establishment of outlets at each parking space; however, this would increase the amount of required infrastructure and cost. These could be reduced through the use of load sharing from a single outlet at a cluster of up to four parking spaces, which would allow access for each. Additionally, multiple clusters could share a circuit to reduce infrastructure requirements (see Figure 3).

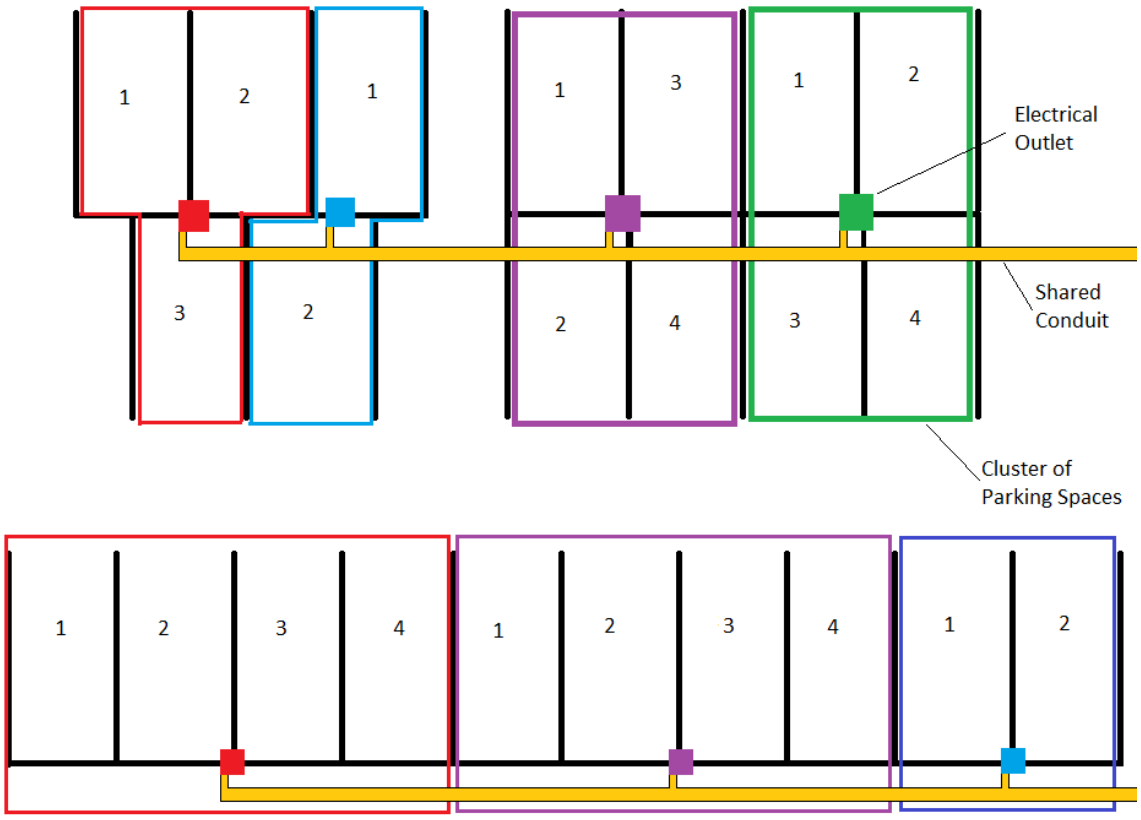


Figure 3: Load sharing among multiple parking clusters

Finally, the installation of EV infrastructure will require some change to established building practice. However, changes to the BC Building Code, which come into force December 2017, will require substantially greater modification to building design in the province. Regulatory changes to building requirements conducted in concert with those at the provincial level may reduce the aggregate impact on planning and design in new builds.

Another consideration for future EV charging is the role of changing technology and how this may alter required infrastructure. Although it is difficult to predict how technology will change over time, it is probable that networked charging will become more sophisticated, vehicle battery capacity will improve, potential charging rates will increase, and vehicles will become less expensive and more efficient. In any scenario, however, electricity will need to be delivered to EVs in sufficient quantities.

6. OTHER MUNICIPAL POLICIES AND REGULATIONS

City of Vancouver

The City of Vancouver building bylaw currently requires all new one- and two-family homes to be wired for level 2 (40A) charging. Twenty percent of parking spaces in multi-family or the multi-family component of a mixed use buildings must be level 2 wired, with sufficient space in the electrical room for expansion to all wire spaces to level 2. These were originally enacted in 2010. The requirement for ten percent of parking spaces in commercial, or the commercial component of a mixed use buildings to be level 2 wired was later added.

City of North Vancouver

City of North Vancouver rezoning guidelines require 20% or residential parking spaces to be wired for Level 2 (40A) charging, and that the remaining 80% of spaces have rough-ins, for the future installation of charging stations.

District of North Vancouver

The District of North Vancouver administrative and operational policy since 2014 has required 20% of residential parking stalls wired for level 1 charging, with the remainder of spaces rough-in for level 1. Approximately 10% of commercial and industrial parking spaces must be wired for level 2 charging (dependent on location).

City of Burnaby

The City of Burnaby through its rezoning bylaw provides the option of 9% of residential parking spaces to be equipped with wired level 1 charging stations, and 1% of equipped with wired level 2 charging stations, in exchange for a reduction in the required number of parking spaces.

City of Richmond

The City of Richmond requires in its Official Community Plan that 20% of residential parking stalls be provided with a wired level 1 receptacle, and that an additional 25% be roughed-in for level 1 charging. The City is current exploring options to raise requirements to level 2.

Corporation of Delta

Currently, the Corporation of Delta is revising its zoning bylaw to potentially require that 20% of parking spaces in residential or mixed use buildings with 6 units to be wired, or roughed-in for level 2 charging.

City of Port Moody

The City of Port Moody is considering a zoning bylaw amendment to require 10% of residential off-street parking at least one of the visitor space to include electrical infrastructure and space allocation to accommodate electric vehicle supply equipment in multi- residential uses with three or more units.

7. RELEVANT LEGISLATION AND PROGRAMS

BC Building Act

The Building Act excludes electric vehicle charging infrastructure from being a restricted matter. This allows for municipal governments to regulate, via parking or building bylaws, electric vehicle charging stations, including the number, location, and type of charging stations (and related matters such as signage) and any wiring or pre-ducting required in a building or facility to charge electric vehicles that use the building for parking.

BC Strata Property Act

The Strata Property Act (SPA) governs the responsibilities and requirements of Strata corporations in the province. Although there is no specific language regarding EV charging in the Act, Section 258 of the law does define rules for parking allocations (e.g. Common property v. Limited Common Property v. Strata lot, exclusive rights use, etc.). These are relevant in cases where not all parking spaces have access to EV charging.

Section 71 (a) of the SPA requires a three-quarter vote at a general meeting before making “a significant change in the use or appearance of common property”. Installation of a charging station would change the appearance of the common property and may be viewed by some as changing the appearance “significantly”. Correspondingly, infrastructure installed prior to initial sales require no such strata approvals.

Section 128 of the SPA requires a three-quarter vote at a general meeting for a bylaw that levies a reasonable user fee (e.g. for EV charging). In the absence of a bylaw for a new user fee, under section 125(6) a strata council may make a rule for the fee but that rule would lapse unless approved by a majority vote of owners at the subsequent general meeting.

BC Utilities Commission Act

Section 3 of the Act allows only ‘eligible persons’ as approved by the commissioner, to generate, produce, transmit, distribute or sell electricity, contingent upon the execution of an energy supply contract. However, Landlords and employers providing electricity to tenants/employees may resell at it cost. Also, a fee for the charging service (i.e. use of charging infrastructure) can be levied upon users equivalent to the value of the service, or on a time-of-use basis.

BC Electrical Code

The BC Electrical Code covers all electrical system installation and modification in the province. Section 86 governs electrical equipment pertaining to EVs. Two articles are particularly relevant for EVs in this context.

Article 86.304 requires that for each installation of electric vehicle charging equipment rated at 60A or more, a disconnecting means capable of being locked in the open position must be installed on the supply side charging station within sight of and accessible to the charging equipment.

Additionally, Article 86.306 requires that receptacles for electric vehicle charging equipment must be permanently labelled, in an appropriate configuration, and, if installed outdoors, protected with a ground fault circuit interrupter within 2.5m of finished grade.

BC Motor Vehicles Act

Section 42 of the Motor Vehicles Regulations regulates the use of High Occupancy Vehicle (HOV) lanes in the province, which prevents vehicles with too few occupants from using HOV lanes. As of March 2016, electric vehicles are excluded from these occupancy requirements, and can use HOV lanes at all times.

Metro Vancouver Transportation Programs

Metro Vancouver actively promotes the use of electric vehicles on its own website and Emotive.ca, and the establishment of EV charging infrastructure in multi-family residential settings at EVCondo.ca. The latter provides guidance to EV owners, strata councils and property managers through the process, including sample strata bylaws, electrician contact information, common challenges and solutions, and a list of EV-friendly strata buildings.

BC Clean Energy Vehicle Program

The BC Clean Energy Vehicle for BC Point of Sale Incentive Program (CEVforBC) is a provincial government program that incents the purchase of new battery-only electric, plug-in hybrid, and extended range electric vehicles (i.e. battery driven with gasoline-powered generator). Incentives range from $2,500 to $5,000 depending on vehicle type, applied to pre-tax sale price. The program expires in March 2018, or when funding runs out (86% has to date been disbursed).

Scrap-it program

The Scrap-it program is a not-for-profit program that will reimburse up to $3,250 for the purchase of an electric vehicle, contingent upon the scrapping of an older combustion engine vehicle. Both new and used electric vehicles are eligible, and the program is funded by scrap vehicle revenue, commercial contributors and some government grants. There is no set expiry for the program, but it is subject to change at any time.