

## **ENGINEERING SERVICES**

### **STREETS, TRAFFIC AND ELECTRICAL BRANCH**

#### **CURBSIDE ELECTRIC VEHICLE SUPPLY EQUIPMENT PILOT PROGRAM GUIDELINES**

##### **PURPOSE**

The purpose of this protocol is to set forth certain guidelines and decision-criteria to be applied by the City of Vancouver (the “City”) in assessing whether, and on what terms, to enter into agreements that grant persons rights to install a curbside electric vehicle charger. The City urges persons seeking to enter into such agreements with the City (“Proponents”) to refer to this protocol before proposing any such agreements. The City reserves the right to revise this licensing agreement at any time, and from time to time. This is a pilot program; non-residential applicants and residential applicants will have to comply with the following guidelines. This pilot program is part of the EV Ecosystem Strategy.

##### **SCOPE**

This protocol applies to the assessment of all proposed agreements between the City and other parties relating to curbside electric vehicle chargers owned by the proponent on City property. In the circumstances in which the City enters into an agreement that grants a Proponent a right to install any such a curbside charger, the Proponent is not required to obtain a building or development permit, but the Proponent must obtain any other required permits.

##### **REGULATORY CONTEXT**

Electric vehicle charging equipment are regulated by the CSA Group, Underwriters Laboratories (ULC), the National Electrical Manufacturers Association (NEMA), the International Code Council (ICC), International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) are among those actively engaged in the development of electric vehicle and EVSE technical and installation standards. All these bodies consider safety-related issues.

##### **Canadian Electrical Codes**

The Canadian Electrical Code, CE Code, or CSA C22.1 is published by CSA Group for addressing the installation and maintenance of electrical equipment in Canada. Section 86 of the Canadian Electrical Code outlines the particular requirements for the installation of electric vehicle charging systems and amends or supplements the general requirements of the Code which also apply. The CEC provides the standards to which electric vehicle supply equipment (EVSE) is designed and electrical contractors must follow when installing electrical components. All installations must be completed by a licensed electrical contractor.

Canadian Electric Vehicle Infrastructure Deployment Guidelines 2014 provide guidance on the deployment of EV infrastructure. [https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/environment-sustainability/electric-vehicles/DC14-071%20Canadian%20EV%20Infrastructure%20Deployment%20Guidelines%202014\\_web.pdf](https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/environment-sustainability/electric-vehicles/DC14-071%20Canadian%20EV%20Infrastructure%20Deployment%20Guidelines%202014_web.pdf)

## **GUIDING PRINCIPLES**

The following guiding principles describe certain City objectives that inform the remainder of this protocol.

<b><i>Infrastructure Investment</i></b>	Facilitate electric vehicle infrastructure growth that supports the technology needs of the Vancouver business community and propels economic development.
<b><i>Promoting Green Initiatives</i></b>	Encourage undertakings that support the Greenest City Action Plan, such as the provision of power for food carts, special events and electric vehicle charging stations.

## **DESIGN PRINCIPLES**

The following design principles have been established by the City to support a well-balanced approach to integrating curbside electric vehicle (EV) chargers into the public realm.

- Curbside EVSE will not be allowed for residential applications other than those where it is not possible to accommodate off-street parking, such as residents who do not have a back lane, or garage or potential for a garage or other off-street parking access on their property. Certain extenuating circumstances may be considered by the General Manager of Engineering Services for applicants that do not meet this standard.
- Efforts should be made to minimize the physical size of EVSE systems.
- EVSE systems, design and site decisions should respect safety and be designed in a manner that compliments the surrounding architecture and built form.
- EVSE systems must have a suitable cable management system (eg. retractable cord) that minimizes tripping or electrical hazards
- Innovation in design, including the integration of curbside EVSE into public realm, is encouraged.
- City streets, boulevards and sidewalks are a public space. Curbside charging infrastructure will be implemented in such a way as to minimize negative impacts to public space, and, as appropriate, maximize the public benefit.

## **Important Considerations**

**The applicant is responsible for all costs including installation.** The program's intention is to establish a review and permitting process to allow for EVSE installations on City property. The applicant is the owner of the installation, and the City will not cover costs associated with the equipment or its installation and maintenance.

**Talk with a licensed electrical contractor early in the process.** All installations must be completed by a registered licensed electrical contractor. Installation costs will depend on if long conduit runs, extensive trenching, or electrical upgrades to your home are required.

**If EV charging can be accommodated on your property, a curbside EV charging station installation will not be considered.** Applicants may be advised to pursue the onsite EV charging if they have access to a lane or could have access to a garage, regardless of if the space is being utilized as a garage or not.

**For non-residential curbside installations, parking is restricted to electric vehicles connected to the charging station.**

Regular metered parking restrictions will apply.

**For residential curbside installations, there will be no changes to the existing parking regulations.**

Installation of a curbside charging station will not give residents special rights or privileges to the street parking adjacent to the station.

**Charging stations must be listed and certified for outdoor use (CSA certified).**

Non-residential applicants in this pilot are allowed to install Level 2 chargers or DC Fast chargers.

Residential applicants can only install Level 1 or 2 receptacles or chargers.

**Charging a fee for use of the electric vehicle supply equipment (EVSE) is prohibited.** You cannot accept payment from other persons for use of the electric vehicle charger. The resale of electricity is strictly prohibited by the *Utilities Commission Act* and is regulated by the BC Utilities Commission.

## **CITY GUIDELINES AND REQUIREMENTS**

### **1. PILOT STRUCTURE**

There are two streams for this pilot program. Applicants will have up to June 2019 to apply. Please indicate which stream you are applying under. Only property owners will be allowed to apply for this pilot and enter into a legal agreement. Tenants need to reach out to their property owner to get written permission to pursue an installation.

#### ***1.1 Non-Residential Applicants***

There will be five stations permitted under this pilot. The applicant is responsible for all costs including installation and unit costs and maintenance. Parking will be restricted to electric vehicles actively charging but access is open to the public and free to use.

#### ***1.2 Residential Applicants***

There will be fifteen stations permitted under this pilot. Only homes in RS/RT zones are eligible for this pilot program. Existing street parking regulations will remain in place but access to power will be controlled by the applicant through the use of a lock box.

The two program streams are clarified below:

<i>Curbside EV Charging Pilot Program (Open for applications for 2 years)</i>	Non-Residential Applicants	Residential Applicants*
		*Only RS/RT zoned homes, if off-street parking cannot be accommodated
Level of Charger Allowed	Dual port Level 2 and DC Fast Charging stations	Single port 120V (Level 1) or 240V (Level 2) outlet or hardwired charger with cable management system
Number of Installations allowed for pilot	5 installations	15 installations
Licensing Agreement is with	Property owner	Property owner
License Fee	\$200 one-time payment	\$200 one-time payment
Duration of installation term	5 years	5 years
Parking Restrictions	Restricted to electric vehicles connected to charging and parking will be metered	Existing parking regulations to be maintained
EV Charger Access	Public access and free charging	Private access, with homeowner/applicant allowed exclusive access via lockbox to control power
Notifications	BIA notification prior to installations	Neighbourhood notification prior to installations
Installation Costs	Business takes responsibility	Homeowner takes responsibility
Ownership and Maintenance	Business owns and maintains	Homeowner own and maintains
Insurance Requirements	Min. \$2M Commercial liability and City of Vancouver named as Additional Insured	Min. \$2M personal liability insurance on your home and vehicle

## **2. APPLICATION AND APPROVAL PROCESS**

### ***2.1 Pre-Application Consultation***

The City's Engineering Services Department requires that Proponents undertake pre-proposal consultation, with City staff, to discuss proposed curbside electric vehicle supply equipment (EVSE) installations. Staff will:

- Confirm eligibility of your property under the program's requirements;
- Ensure there is sufficient clearance along the curb in front of your property to accommodate an EVSE installation. This may require a site visit;
- Clarify any questions prospective applicants may have regarding the program and its requirements.

### ***2.2 Application Submission:***

A Proponent must submit:

- A completed application form to the City's Engineering Services Department before the City will enter into any License Agreement. This form will be provided by staff after confirming eligibility;
- A site plan drawing, either digital or on graphing paper identifying scale and locations, dimensions, and measured distances of:
  - The proposed location of the EVSE installation, relative to the curb, sidewalk and property lines
  - Depth and distance of proposed trenching area and path for the electrical conduit, from the electrical connection source to the installation;
  - Any significant physical elements on the streetscape near the installation, including trees, vegetation, streetlight poles, fire hydrants, etc.
  - Location of underground utilities, use VanMap
  - The locations of existing public EVSE locations within 500m;
  - Cross-section of the depth and size of the base underground that is to be installed to support the pedestal or EVSE unit.
- A spec sheet of the charging unit/pedestal outlet that will be installed, including detail on the cord management system if it will be a complete hardwired charging unit.
- Any other information requested during the pre-application consultation.

### ***2.3 Engineering Plan Review:***

Following the application review, the City will respond either granting preliminary approval or notifying the Proponent of the City's decision to not enter into a License Agreement. If given direction for the Proponent to go forward, the applicant will be required to submit engineering drawings with the help of a licensed electrical contractor:

1. A detailed site-plan of the installation and conduit, with dimensions and distances relative to the property line or curb, as well as all underground utilities located in the vicinity;
2. An elevation drawing showing the detailed side view of the installation, with dimensions and elevations;
3. A single-line diagram, load calculations, voltage calculations and available short circuit current and installation plan for review.

The Proponent and electrical contractor are responsible for locating underground utilities and including their locations on the drawings. To do so:

1. Contact [BC One Call \("Call Before You Dig"\)](#) by phone or online
2. E-mail [ENCU@vancouver.ca](mailto:ENCU@vancouver.ca) and request a utilities map – Please include in the request the area of interest. You may screenshot the map

The City will invoice the Proponent for the Engineering Plan Review, with fee amounts in accordance with the Street Utilities By-Law 10361. The City will endeavour to issue final drawing approvals within 10 business days, unless drawing revisions are necessary. Engineering Services may establish more specific review and approval procedures in conformity with the foregoing.

#### **2.4 Licence Agreement:**

Once the City has issued final drawing approvals, the Proponent may enter into a five-year licence agreement with the City.

**For Non-Residential:** The City requires the Proponent carry \$2M commercial liability insurance and must name the City of Vancouver as Additional Insured during the entire five year term of the Licence Agreement. The Proponent must be able to provide proof of insurance before signing the Licence Agreement, and on an annual basis as requested.

**For Residential:** The City requires the Proponent carry \$2M personal liability home insurance and vehicle insurance during the entire five year term of the Licence Agreement. The Proponent must be able to provide proof of insurance before signing the Licence Agreement, and on an annual basis as requested.

The Proponent will be issued an invoiced a one-time Licensing Fee of \$200.00 for the use of City property for the five year term.

#### **2.5 Electrical Permit Application**

An Electrical permit must be obtained from the Permits and Licensing Office, following the Engineering plan approval. Electrical permit application submittals include:

- Electrical Permit Application that clearly states “Curbside Electric Vehicle Pilot Program Installation” in the description, and fee as required by the Electrical By-law 5563
- Single-line diagram showing load calculations, voltage calculations and available short circuit current and installation plan for review. (The same package sent to Engineering can be used for this submission).
- Manufacturer’s specifications and installation guidelines for the EV charging station including the approved product listing agency (i.e. CSA or equivalent) number
- Existing service panel and ratings, proposed charging load and load calculations for the EVSE

An inspection of the installation is required at all stages of the construction, ie. an underground pre-backfill inspection and final inspection.

## **2.5 Proponent Responsibilities**

Each Proponent will be responsible for:

- Securing all required authorizations, approvals and permits, prior to commencing construction (including required City permits);
- All costs associated with modifying or replacing City-owned public property; and
- Provision for supplying and maintaining power and all other associated costs.
- Costs for removal, decommissioning of EVSE once no longer desired or agreement terminated
- Certification - chargers must meet the appropriate codes and standards, is CSA certified and is so marked. Owners are prohibited from using equipment that has not been certified for this use.

The sale of electricity by the property owner/tenant to others for the use of the charging station is prohibited. Restriction of the use of the station by the property owner/tenant, other than by connecting an electric vehicle to the station for the purposes of recharging, is prohibited.

## **3. NOTIFICATION REQUIREMENTS**

### **3.1 Non-residential Applicants**

Non-residential applicants will be required to notify neighbours of intention for an EVSE installation through their Business Improvement Association.

### **3.2 Residential Applicants**

The City will mail notices to the residents on the block notifying them of the Proponent's application to the City to install an EV charger.

## **4. LOCATION AND SITING**

### **4.1 Curbside Electric Vehicle Supply Equipment (EVSE) Placement Criteria**

The process for installing EV charging at a particular location will depend on the property ownership and type of land use. Several primary factors relevant to siting EV charging installations within a property are listed below, followed by more detailed information on the process for installing a charging station.

- Can only be installed where there is a curb in the utility/planting strip.
- Be at least 30cm (12 inches) from the face of the curb (in the utility/planting strip)
- Preserve as much sidewalk width (path of travel) as possible, but no less than 1.5m (5 feet) – if there is no utility/planting strip sidewalk encroachment may be considered if there is sufficient sidewalk space remaining (minimum 1.5m or 5 ft).
- Avoid conflicts with other utility infrastructure (existing utilities and laterals must be shown on site diagram for permit application)
- Avoid conflicts with street trees, street tree protection will be required which comply with Section 7 of the *Protection of Trees Bylaw 9958; Protection of Trees during Construction*
- Be at least 5m (16 feet) from fire hydrants

- Avoid interference with vehicular sight lines at street corners or driveways
- Minimize the removal of vegetation
- EV charging station cords may not cross sidewalks, walkways, roads or driveways, trenching may be required
- Proximity to electric power service. In some situations it may be more cost effective to install a new service drop and meter from a utility distribution transformer if that would result in a shorter power run to the preferred site for the charging station installation.

#### **4.2 Constructability**

As stated above, placing equipment near power sources will reduce the extent of trenching needed for conduit runs. Many installations will still require some amount of trenching and in these situations it is best to go through softer features, such as grass medians, rather than sidewalks, asphalt or areas with extensive landscape features. Trenches should be a minimum of 46cm (18 inches) below ground.

#### **4.3 Mounting**

Charging station outlets and connector devices shall be no less than 46 cm (18 inches) or no higher than 1.5m (5 ft) from the top of surface where mounted, and shall contain a retraction device and/or a place to hang permanent cords and connectors sufficiently above the ground or paved surface.

#### **4.4 Cord Length and Tripping Hazard**

The EVSE can have varying lengths of cords, however a maximum cord length of 7.6m (25 feet) will be allowed for non-residential dual-port chargers, or 6m (20 feet) for single-port chargers. The EV inlet location on electric vehicles varies by auto manufacturer. When selecting a location for an EVSE, cord length and inlet location should be considered in an effort to avoid tripping hazards. Cord management systems, including reels and weighted pulley systems, may be required to ensure cords do not become hazards or nuisances.

The City may enter into License Agreements contrary to these preferences in its discretion, but in those circumstances, the City is more likely to require the relevant Proponent to undertake public or community notification.

## **5. DESIGN GUIDELINES**

### **5.1 General**

Installation of the EVSE must be in compliance with all CEC standards, the City of Vancouver's street design standards and trenching standards adhere to the City's Street Restoration Manual.

Proponents will be responsible for all design work, including but not limited to, investigation, structural and foundation design, and electrical design work for EVSE.

- Orient the EV charging station such that if there is an enclosure door, it will not open past the curb face or over the sidewalk. Preference is for units without enclosure doors.



- Minimize the size of any enclosure around a charging station or cord
- Colors and materials for any enclosure should minimize their visibility and integrate with the design of surrounding buildings and landscaping
- No advertising is permitted on the charging station or associated enclosure. The City of Vancouver will place an informational sign/sticker on or adjacent to the charging station. Successful applicants may post advertisements elsewhere, including within their premises or on their website

### **5.1.1 Non-residential Applicants**

#### ***DC Fast Charger guidelines***

For non-residential applicants installing a DC fast charger, please refer to the installation guidelines for your model.

All chargers should have the following features:

- Smart card authentication
- Multiple, customizable pricing plans
- Built-in electricity metering
- Automated billing
- Any network services related to taking payments must be PCI compliant.
- Provide both CHAdeMO and SAE CCS connector types
- Preference for output power equal to or greater than 50kW
- Remote monitoring

#### ***Level 2 EV Charger guidelines***

For non-residential applicants installing a Level 2 charger, please refer to the installation guidelines for your model. Non-residential applicants are strongly encouraged to install a dual port system or two single port units to provide the redundancy standard similar to other public charging stations.

All chargers should have the following features:

- Smart card authentication
- Multiple, customizable pricing plans
- Built-in electricity metering
- Automated billing
- Any network services related to taking payments must be PCI compliant
- Remote monitoring
- SAE J1772 connector
- Where multiple charging stations are installed, load sharing features may not be enabled.

### **5.1.2 Residential Applicants**

#### ***Level 1 and 2 EV Charger guidelines***

Residential applicants are permitted to install a single-port Level 1 or 2 outlet for charging. For residential applicants installing a 240V outlet, there are dual 240V/120V cords available or 240V cords with outdoor locking cover. Refer to the installation guidelines for your model.

If a residential applicant is seeking to install a hardwired charger, the equipment must have a cord management system that is reviewed and approved by staff.

All equipment must be CSA approved, weather-proof and have a locking cover and/or power switch to ensure that access is restricted to the homeowner.

### **5.2 Accessibility**

Accessibility requirements to consider are: 1) being able to exit the vehicle and approach the EVSE; 2) use the accessibly designed EVSE; and 3) complete the charger connection with the vehicle.

### **5.3 Lighting**

Where charging station equipment is installed, adequate site lighting shall exist. In general, street lighting should be sufficient. Recommendations for lighting levels can be found in the most current edition of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.

### **5.4 Electrical Equipment Protection**

The CEC requires that the outdoor receptacle have ground fault interrupt protection.

### **5.5 Environmental Protection**

Charging equipment exposure to the elements should be minimized as much as possible. Areas prone to flooding or standing water should be avoided as much as possible and the appropriate environmental protection be provided.

### **5.6 Signage**

Each charging station space shall be posted with signage indicating electric vehicle charging available. Signage for EVSEs should be as follows:

- The sign shown in Figure 1 is the symbol for identifying electric vehicle charging stations.



Figure 1 Sign for Electric Vehicle Parking

For non-residential installations:

- The City will install a sign that indicates parking is restricted for EV charging only.

For residential installations:

- The City will install a sign indicating that this is an EV charger installed as part of the City of Vancouver's Curbside EV Charging Pilot Program.

## **6. CONSTRUCTION REQUIREMENTS**

The installation of an EVSE requires that a certified electrician install the charging station in a residential home or on public property. The contractor will need to perform a site visit to estimate the cost of installation. The Canadian Electrical Code (CEC) covers the technical requirements for the installation of an EVSE. The placement of the equipment, the location of the electric supply for the EVSE will impact the cost of the installation along with additional cost factors. All electrical work must be done by a registered licensed electrical contractor. The registered licensed electrical contractor must then proceed as follows:

- Read the station manufacturer's installation instructions.
- Consult the station nameplate in order to make sure the apparatus is approved (recognized seal of approval), and determine the type of charging station, e.g., a 208/240 V, 30 A station
- Ensure that the electrical installation is capable of handling the additional load, (each station is considered a continuous load).
- Use the appropriate method of cabling between the panel and the station.
- Install a breaker of appropriate ampacity in the panel.
- Install an external power cycle switch such that the City can access the switch without disturbing the homeowner in the event the homeowner is unavailable.
- Anchor the station solidly.
- Make the connection and energize the charging station.
- Check whether the station operates correctly.

Important: Construction must comply with all applicable regulations, including the City of Vancouver *Zoning and Development By-Law No.3575*, the *Street Utilities Bylaw No. 10361*, the *Electrical Bylaw No. 5563*, and the Canadian Electrical Code and the *Electrical Bylaw No. 5563*.

Trenching completed on the street right-of-way, as well as any tunnelling completed underneath the sidewalk, must be restored according to specifications in the City's Street Restoration Manual, with special attention paid to Section 02223:

[https://vancouver.ca/files/cov/vancouver\\_street\\_restoration\\_manual.pdf](https://vancouver.ca/files/cov/vancouver_street_restoration_manual.pdf)

Specifically note that for tunneling under side-walk:

- Backfill will need to achieve 95% compaction, use control density fill (CDF)
- Photos of trenching and backfill, a concrete ticket should be provided to engineering following backfill

## **7. MAINTENANCE AND DECONSTRUCTION REQUIREMENTS**

The station owner is required to remove the station upon moving or selling the property, if the new owner is not willing to take responsibility and ownership of the EVSE and sign a new licensing agreement.

- Non-residential applicants are responsible for all ongoing maintenance costs. Applicants will be required to carry commercial liability insurance and name the City of Vancouver as additional insured.
- Residential applicants are responsible for all ongoing maintenance costs. Applicants will be required to carry personal liability insurance on their home and vehicle.

## **8. CONTRACT CHARGES**

### ***8.1 Estimated Fees***

Permitting fees are minimized by submitting complete, clear documentation. The fees indicated here represent estimated minimum permitting costs for construction of a new curbside installation of an on-site EV charging station. Your installation costs can be determined by the complexity of your location, proximity to power, distance to curb that you will need to run power from and which will determine your costs for electrical permits.

These fees have been provided as a rough guideline to help you in planning your project. Please confirm fees at the time of applying as they are subject to change annually.

#### *Engineering Plan Review*

The fee schedule for the Street Utilities By-law can be found here <https://vancouver.ca/files/cov/vancouver-development-building-permit-fees.pdf>  
Engineering Plan review for the installation of curbside EVSE is \$667.23 as of 2018, and is subject to increases in subsequent years.

#### *Sidewalk Repair/Replacement*

If the installation work requires sidewalk repair/replacement, the applicant has the option to have the City complete the work, or have their own contractor complete the work.

- In the case of the City completing the sidewalk repair a fee of \$232.60 applies.
- In the case of the applicant's contractor completing the sidewalk repair, a fee of \$85.35 applies for inspection of the work.

#### *Electrical Permit*

Electrical permit fees are based on all labour and material for electrical construction work required and is site specific. Construction costs are highly dependent on the electrical supply available, the need for upgrading and length of trenching required. See the fee schedule

<http://vancouver.ca/files/cov/electrical-permit-fee-schedule.pdf>

- For non-residential applicants they may expect electrical permit fees in the range of \$700-\$900.
- For residential applicants they may expect electrical permit fees in the range of \$250-\$700.

Inspection fees are included in the permit. However, you may have to pay a re-inspection fee of \$163.00 plus GST in the event you require a re-inspection. Please see this link for booking your inspection: <http://vancouver.ca/home-property-development/electrical-inspection.aspx>

#### *Licensing Agreement Fee*

A fee of \$200 for the use of City property under the license agreement will be charged.

#### *Other Cost Considerations for the Applicant*

In addition, applicants need to consider contractor costs for installation, including trenching and electrical work. Below are general EVSE station unit costs to help estimate total project costs.

Estimated costs for a DC Fast Charger unit	\$10,000-\$40,000
Estimated costs for a Level 2 charger single connector unit	\$4,000-\$8,000
Estimated costs for a Level 2 charger dual connector unit	\$8,000-\$10,000

## **9. LICENSE AGREEMENT TERMS**

License Agreements shall be based on the form approved by Vancouver City Council on June 27, 2017.