



# City of Richmond


## Report to Committee

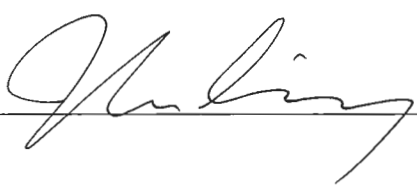
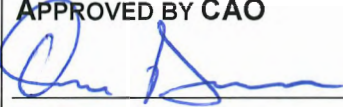
**To:** General Purpose Committee **Date:** August 16, 2019  
**From:** Peter Russell, MCIP, RPP **File:** 10-6000-00/Vol 01  
 Director, Sustainability & District Energy  
**Re:** **Public Electric Vehicle (EV) Charging Expansion – 2019 Funding Application to Natural Resources Canada**

### Staff Recommendation

That, as described in the staff report titled, "Public Electric Vehicle (EV) Charging Expansion – 2019 Funding Application to Natural Resources Canada" dated August 9, 2019 from the Director, Sustainability & District Energy:

1. The expansion of 20 public electric vehicle charging ports at a cost of \$700,000 funded by the Gas Tax Provision be approved;
2. The application to Natural Resources Canada's 2019 Zero Emission Vehicle Infrastructure Program for up to \$100,000 in grant funding be approved;
3. Should the funding application be successful, the Chief Administrative Officer and the Acting General Manager, Engineering and Public Works be authorized to execute the agreement with Natural Resources Canada on behalf of the City of Richmond;
4. The list of priority electric vehicle charging sites as described in the staff report titled "Public Electric Vehicle (EV) Charging Expansion – 2019 Funding Application to Natural Resources Canada" be endorsed; and,
5. That the Consolidated 5 Year Financial Plan (2019-2023) be amended accordingly.

  
 Peter Russell, MCIP, RPP  
 Director, Sustainability & District Energy  
 Att. 2

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Parks Services	<input checked="" type="checkbox"/>	
Recreation Services	<input checked="" type="checkbox"/>	
Facilities	<input checked="" type="checkbox"/>	
Transportation	<input checked="" type="checkbox"/>	
Finance	<input checked="" type="checkbox"/>	
Fleet Services	<input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: <b>GP - 14</b>	APPROVED BY CAO 

## Staff Report

### Origin

This report summarizes progress on a current grant application to Natural Resources Canada (NRCan) for cost-shared capital funding for provision of new public electric vehicle (EV) charging, for eight priority locations with 20 EV charging stations (ports) in Richmond. With Council approval, staff would complete and submit a grant application to NRCan for capital funding under the 2019 Zero-Emission Vehicle Infrastructure Program.

This report supports Council's Strategic Plan 2018-2022, Strategy #2: A Sustainable and Environmentally Conscious City:

*Environmentally conscious decision-making that demonstrates leadership in implementing innovative, sustainable practices and supports the City's unique biodiversity and island ecology.*

*2.1 Continued leadership in addressing climate change and promoting circular economic principles.*

### Background

In 2010, Council adopted targets in Richmond's Official Community Plan to reduce community greenhouse gas (GHG) emissions 33 percent below 2007 levels by 2020, and 80 percent below 2007 levels by 2050. Transportation accounts for more than half of Richmond's GHG emissions recorded in BC's Community Energy and Emissions Inventory, with emissions from personal transportation accounting for more than 40 percent of emissions.

Richmond's 2014 Community Energy and Emissions Plan (CEEP) outlines strategies and actions for the City to take to reduce community energy use and GHG emissions, including:

- **Strategy 7:** Promote Low Carbon Personal Vehicles; and,
- **Action 19:** Continue expanding the City-owned network of electric vehicle (EV) charging stations.

Modeling undertaken as part of the CEEP indicates Richmond's 2050 emissions reduction targets can only be achieved with the near-universal adoption of zero emissions personal vehicles by the 2040s, in addition to increasing transit ridership, walking, bicycling, car/ride sharing, and other transportation modes.

### City Action on Electric Vehicles

To support the transition to zero emission vehicles, multiple charging options should be available for EV users to avoid issues such as range anxiety (running out of charge). The City has undertaken a mix of policy and infrastructure actions, including:

1. **Electric Vehicle Charging:** On November 28, 2016, Council directed staff to report back regarding the potential installation of publicly accessible 'Level 3' DC Fast Charging stations, including an energy cost recovery approach, as part of advancing greenhouse gas emissions under the City's Community Energy and Emissions Plan. On

January 23, 2017, Council further directed staff to consult with the community to help gauge community support for the cost-recovery concept, as well as identify preferred locations for new charging stations.

Consultation results were summarized in a Report to Committee (“Public Electric Vehicle Charging Infrastructure Expansion”, May 18, 2018), with a map of desired locations for public electric vehicle charging in Richmond (see Attachment 1). This report also included a recommendation on cost recovery for public EV charging, by application of user fees at publicly accessible EV charging stations through bylaw.

In 2018, Council approved two locations for Direct Current (DC) Fast Charging equipment at City Hall and the Richmond Olympic Oval, with an approved capital budget allocation of \$300,000. This funding was subsequently leveraged in a grant application to Natural Resources (NRCan) Canada’s Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative. On July 11, 2019 NRCan informed staff that the application was approved and the City would be receiving a matching \$300,000 funding grant through this program. Combined with previously approved \$300,000 in capital funding from the City, a total of \$600,000 is now available for two additional DC fast charging sites, which will now include DC Fast Chargers at King George Park and the Richmond Ice Centre / Watermania area. These new sites were chosen, as they met the criteria of the funding program. As such, the Consolidated 5 Year Financial Plan (2019-2023) will need to be amended accordingly.

2. **Leading EV Charging Requirements in Private Developments:** On December 18, 2017, City Council adopted a requirement in the Parking and Loading section of the Richmond Zoning Bylaw that all residential parking spaces in new developments feature an energized electrical outlet capable of providing Level 2 charging. The City was the first jurisdiction in North America to implement such a requirement. Other jurisdictions are now building from Richmond’s leadership – the City of Vancouver and several other local governments in Metro Vancouver have subsequently made similar amendments to their Zoning Bylaws to require Level 2 charging readiness in non-visitor parking stalls.
3. **New Charging Infrastructure:** In March 2013, the City also installed four public Level 2 charge stations (total of eight charging ports) at the following locations:
  - Steveston Community Centre;
  - Thompson Community Centre;
  - Cambie Community Centre; and,
  - City Hall

Additionally, the Richmond Olympic Oval offers two Level 2 charging stations in the parkade reserved for facility users.

As summarized in Table 1 below, usage of the City’s charging points has grown, indicating growing demand for public charging. The hours of use experienced at some stations suggest that City-owned EV charging infrastructure is reaching capacity.

**Table 1: Usage of City-owned EV charging infrastructure**

	2013	2014	2015	2016	2017	2018
<b>Times used</b>	776	1,974	4,597	7,159	10,924	17,059
<b>Charging time</b>	975 hours	2,609 hours	8,377 hours	11,995 hours	18,300 hours	31,745 hours
<b>Energy used</b>	4,345 kWh	11,809 kWh	35,904 kWh	48,406 kWh	82,984 kWh	138,740 kWh
<b>Energy cost</b>	\$434	\$1,181	\$3,590	\$4,841	\$8,298	\$13,874

"Levels" of EV Charging

Industry standards for electric vehicle charging, including power delivery level and typical application is summarized in Table 2.

**Table 2: Common EV service equipment charging levels.**

<b>Charging Level</b>	<b>Voltage</b>	<b>Amperage</b>	<b>Approx. km of range per hour</b>	<b>Time to fully Recharge</b>	<b>Applications</b>
<b>AC Level 1</b>	120 VAC	12-16 A	~ 7 km/hr	5 to 30 hours	At home, at work
<b>AC Level 2</b>	208 / 240 VAC	<=80A (30 A most common)	~ 45 km/hr (at 30A)	2 to 8 hours	At home, at work, public charging
<b>DC Fast Charge ("Level 3")</b>	200-400 VAC	80-400 A	200-1000 km/hr	<10 min to 1 hour	Major public rapid-recharge locations

Current Funding Partnership Opportunity

In summer 2019, City staff began preparing a new grant application under NRCan's Zero-Emission Vehicle Infrastructure Program for partial funding of 20 EV charging ports at eight locations in Richmond, with detail on location criteria and recommended sites provided in the Analysis section of this report. The NRCan program requires a minimum of 20 EV charging ports to qualify for the grant program and that applicants demonstrate secured funding is in place. Subject to Council approval, staff will proceed to complete this application prior to the September 18, 2019 submission deadline.

**Analysis**Criteria for Prioritizing EV Charging Locations

Community feedback indicated that both DC Fast Charging and Level 2 charging infrastructure is desired across the community (see map in Attachment 1). In-person open house and online feedback gained in 2017 provided feedback on where public EV charging infrastructure is preferred in Richmond.

City staff have subsequently identified specific locations for future Level 2 and Level 3 EV charging installations, and have applied the following criteria to guide prioritization of future installations, as funding becomes available.

1. Public consultation results on desired EV charging locations

2. City-owned public locations (parks, recreation facilities and civic buildings) whereby there is customer demand for EV charging. Ideal sites for public charging that were considered needed to have sufficient existing capacity for installation of charging infrastructure with adding transformer capacity.
3. Geographic distribution of EV charging opportunities across Richmond

Prioritized locations for new EV charging (current funding application)

Eight locations have been identified that have sufficient existing electrical capacity for EV charging infrastructure and service equipment under NRCan’s current funding program. These sites are summarized in Table 3, and have been spatially represented on a map in Attachment 2. Each of these sites would be equipped with a two-port Level 2 charging station in nearby onsite public parking (signed and stenciled for EVs), but there is also potential that one or more of these sites could include DC Fast Charging capacity, subject to more detailed analysis. Table 3 shows that, with Council endorsement of funding and locations, a total of 56 Level 2 and four DC Fast Charge City-owned charging points will be distributed across the community to support the shift to electric vehicle adoption.

**Table 3: Proposed Locations of NRCan Co-Funded EV Charging Stations**

	Private and Public Owned	City-Owned – Full Public Access	
	Restricted Access	Existing / Approved Locations	New Stations
<b>Steveston, Seafair, Thompson, Terra Nova Neighbourhoods</b>	4	4 (Level 2)	
Steveston Tennis Courts			2
West Richmond Community Centre			4
Britannia Heritage Ship Yards			4
Garden City Community Park			2
<b>City Centre, Sea Island Neighbourhoods</b>	70	16 (2 DC, 4 Level 2)*	
Minoru Park (Arenas)			2
<b>Bridgeport, West Cambie, East Cambie Neighbourhoods</b>	36	5 (1 DC, 2 Level 2)*	
<b>Gilmore, Broadmoor, Blundell, Shellmont Neighbourhoods</b>	8		
South Arm Community Centre			2
Blundell Park			2
<b>Hamilton, Fraser Lands, East Richmond Neighbourhoods</b>	5	3 (1 DC, 2 Level 2)*	
Hamilton Community Centre			2
		28 (4 DC, 8 Level 2)*	20 ports (Level 2)

\* Indicates new Level 2 and DC Fast Charging locations funded by the Electric Vehicle & Alternative Fuel Infrastructure Deployment Initiative, approved by NRCan July 11, 2019, to be installed.

### Next Steps

Pending Council approval, staff will proceed with engineering design and installation of EV charging equipment for eight locations, with a total of 20 charging stations (ports), as shown in the shaded area of Table 3.

### Resource Implications

As the City expands its public charging infrastructure, there are expected resource implications associated with installation, maintenance, repairs, complaint management, data analytics and administration that will exceed current capacity. A minimum of one additional maintenance technician position is expected to be required for this purpose. This requirement and associated costs will be submitted for consideration in the 2020 budget process.

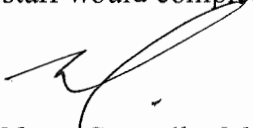
### **Financial Impact**

The expansion of 20 EV charging ports is proposed to be funded from the Gas Tax Provision account in the amount of \$700,000. With Council approval, staff will proceed to complete a \$100,000 funding grant application under the Natural Resources Canada's 2019 Zero Emission Vehicle Infrastructure Program. If the grant is successful, the funding received will offset the funding from the Gas Tax Provision, maintaining the project budget at \$700,000. The Consolidated 5 Year Financial Plan (2019-2023) will be amended accordingly.

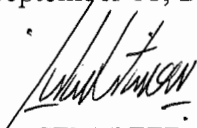
Council previously endorsed a cost recovery approach to impose user fees and time limits on public EV charging, and staff will bring forward proposed amendments to applicable Bylaws in a future Council Report to implement this cost recovery approach.

### **Conclusion**

Expansion of City-provided public electric vehicle charging infrastructure is a tool to advance community electric vehicle adoption, and helps meet policy objectives that would drive significant GHG emission reductions with respect to mobility in Richmond. Eight locations with a combined total of 20 electric vehicle charging ports would be available for public charging. Staff are seeking Council support for submitting a \$100,000 grant application to Natural Resources Canada's Zero-Emission Vehicle Infrastructure Program. With Council approval, staff would complete and submit this application prior to the September 18, 2019 deadline.



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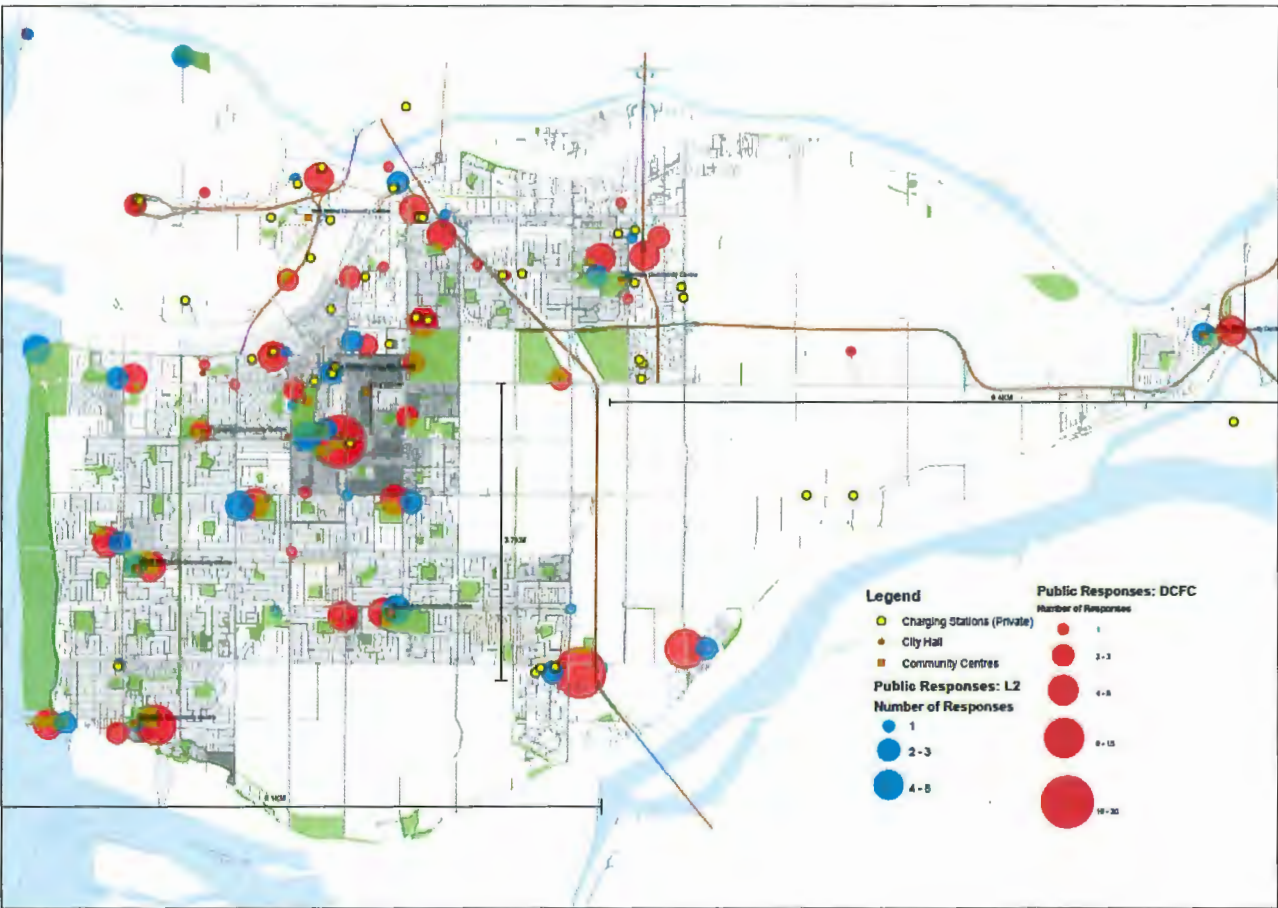
- Att. 1: Map of Public Responses Regarding Preferred Locations for Additional City-Owned EV Charging Infrastructure  
2: Map of Public EV Charging Stations in Richmond – Current and Proposed Locations



**Attachment 1: Map of Public Responses Regarding Preferred Locations for Additional City-Owned EV Charging Infrastructure**

**Notes:**

- Circle size indicates number of respondents who selected a site.
- Red circles represent DC Fast Charge infrastructure.
- Blue circles represent Level 2 charging infrastructure.
- Green stars represent existing City-owned Level 2 charging infrastructure.



**Attachment 2: Map of Public EV Charging Stations in Richmond – Current and Proposed Locations**

