

# Central Saanich

## Electric Vehicle and Electric Bike Strategy

September 2020



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# 1. Background

## 1.1. Summary of Events Leading to this Report

On February 5, 2018, Council asked staff to:

*Provide options for Central Saanich to develop a community wide electric vehicle (EV) charging strategy which would consider ways to include public and private electric charging infrastructure within new developments and explore incentives for encouraging retrofits of existing buildings.*

Further, the District’s Climate Leadership Plan contains an action to:

*Develop a community electric vehicle strategy that includes a plan for increasing charging facilities at key locations throughout the community, considering requirements for charging stations in new residential and commercial developments, and providing parking spots for EVs only.*

As of May 2019, the Province of BC has adopted a mandate for 100% of light duty cars and trucks sold by 2040 to be zero-emission vehicles (ZEVs) with interim targets of 10% by 2025 and 30% by 2030. As of December 2019, the Federal Government followed suit with a mandate letter to do the same.

On December 16, 2019, Council resolved to:

*Adopt a new climate action target of net zero community and municipal emissions by 2050, with an interim target of a 45% greenhouse gas (GHG) emission reduction from 2007 levels by 2030.*

In one possible pathway to fulfil this commitment (see Figure 1)<sup>1</sup>, 25% of Central Saanich vehicles must be zero emission vehicles by 2030. This translates to approximately 3500 personal and 1300 commercial zero emission vehicles. By 2050, 100% of vehicles must be zero emissions.

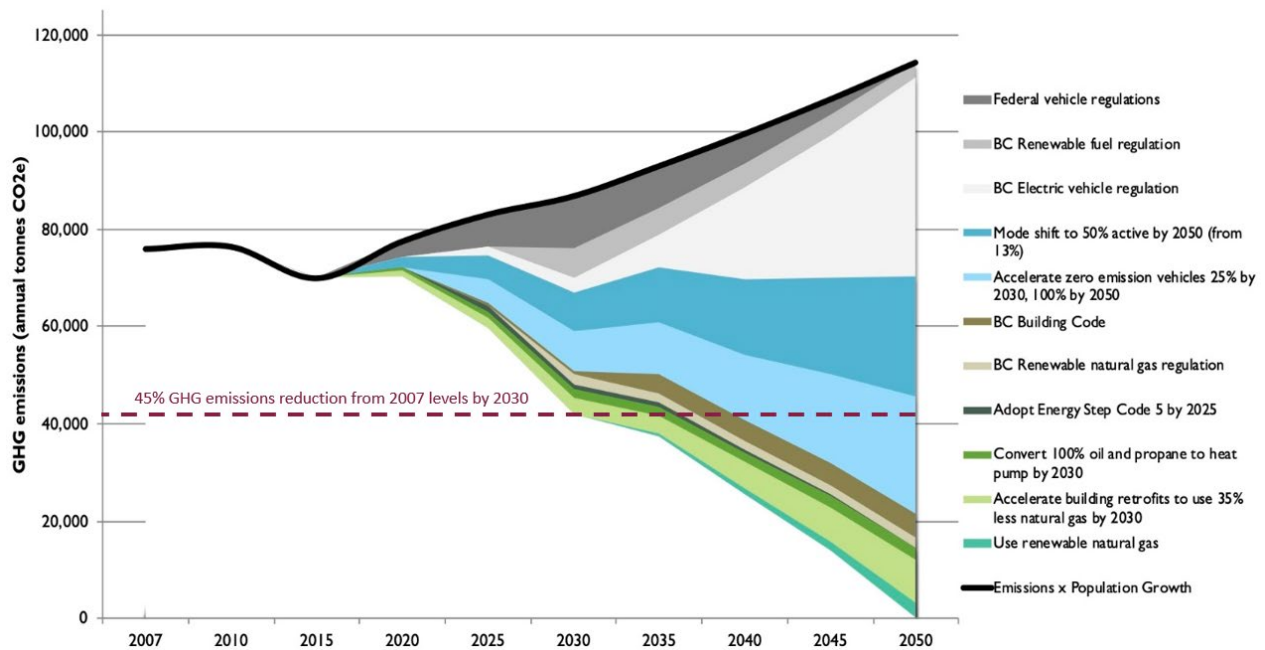


Figure 1: Central Saanich Pathway Scenario to become a Carbon Neutral Community by 2050<sup>2</sup>

<sup>1</sup> The previous climate action target was to reduce greenhouse gas emissions by 80% by 2050

<sup>2</sup> The black line in the diagram shows the projected future community greenhouse gas emissions should no action be taken. Each wedge of colour shows emissions reductions from the baseline due to each different action taken.

## 1.2. Purpose of this Strategy

Personal vehicles have a typical lifetime of around 15 years. Given the desire to have all personal vehicles electrified by 2050, only two vehicle lifetimes remain. The time to encourage rapid uptake of EVs is now. The Central Saanich EV and E-Bike (EB) Strategy seeks to identify opportunities to accelerate adoption of these technologies in order to meet the District’s climate action goals. Central Saanich can promote this uptake by expanding EV and EB infrastructure in areas where the District has control, and promote uptake through advocacy & partnership where the District has no direct control. Through these actions, the District will foster an environment favourable to EV and e-bike adoption and innovation.

## 1.3. Sustainable Transportation

While there are benefits to electrifying transportation, it is important to note that EVs are only one part of a sustainable transportation system. The adoption of EVs reduces tailpipe emissions, however, it doesn’t address the embedded emissions from vehicle manufacturing and road building, and pressure to expand roads for single occupancy vehicle use. Transit, cycling, and walkable, complete communities are key components of a comprehensive sustainable transportation strategy in terms of mode shift, while telecommuting, carpooling and flexible work hours reduce trip distance. The sustainable transportation pyramid (Figure 2) illustrates the steps to becoming a community with sustainable transportation, and the infographic (Figure 3) shows the GHG emissions associated with different types of transportation.

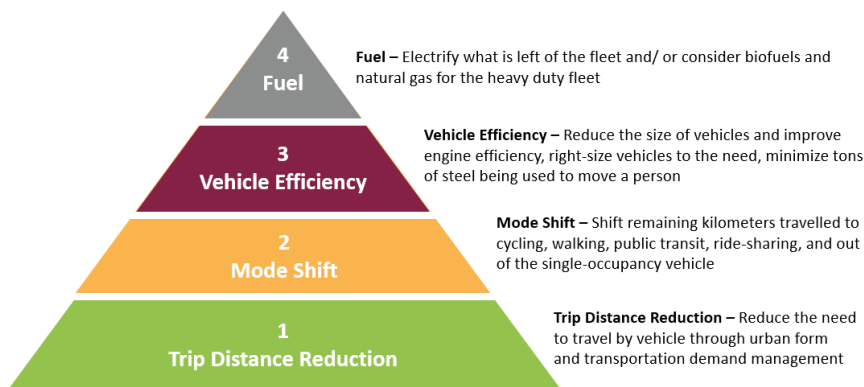


Figure 2: Sustainable Transportation Pyramid

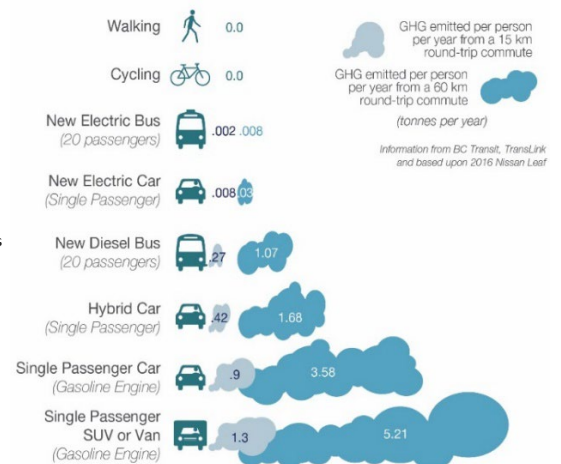


Figure 3: Transportation GHG emissions

By 2050, the District’s Climate Leadership Plan aims for 50% of all trips to be taken through sustainable methods such as transit, walking, cycling, or rolling. Currently, only 13% of trips in Central Saanich are sustainable. The District’s Active Transportation Plan, Saanichton Village Design Plan, and the Residential Infill Densification Guidelines all seek to address the need for a more active and complete community.

## 1.4. The Case for Electrified Transit

Transit has a large role in a sustainable transportation. Buses have lower per person emissions and require less space and resources than personal vehicles. Further, transit will become even more sustainable as it is electrified. BC Transit has the goal of converting all of its busses to electric models by 2040, and, starting in 2023, every new heavy-duty bus purchased by BC Transit will be electric. While transit electrification is out of the direct control of the District, the District can still advocate for and support these changes.

## 1.5. *The Case for Electric Bikes*

Action items for encouraging uptake of electric bikes (e-bikes) are proposed in this report in recognition of the role of active transportation in sustainable communities. E-bikes are speed limited to 32 km/hr in Canada and, compared to traditional bicycles, can be used by a broader range of ages and abilities. E-bikes can replace a greater number and length of car trips than traditional bicycles, thereby offsetting additional GHG emissions associated with single occupancy vehicle use.

## 1.6. *The Case for Electric Vehicles*

After more sustainable modes have been maximized, there are compelling environmental and financial cases for transitioning remaining fossil fuel powered vehicles to EVs.

### 1.6.1. *The Environmental & Social Case*

Transportation comprises 66% of the District's greenhouse gas (GHG) emissions<sup>3</sup> and 86% of Central Saanich residents journey to work by car<sup>4</sup>. Given that BC Hydro's electricity is currently 98% renewable, vehicle electrification is critical to supporting Central Saanich's GHG reduction targets. Further, replacing internal combustion engine (ICE) vehicles with EVs reduces smog and particulates, which increases air quality and provides community health benefits; vehicle noise pollution is also reduced. Energy resiliency for vehicles can be increased through regional renewable energy investment.

### 1.6.2. *The Financial Case*

BC had the highest average cost for unleaded gasoline across Canada in 2018. The provincial carbon tax currently adds \$0.0889/L at \$40/tonne of carbon dioxide equivalent (tCO<sub>2</sub>e)<sup>5</sup>, and this will increase as the cost rises to \$50/tCO<sub>2</sub>e by 2022. Maintenance costs are lower for EVs because they have fewer moving parts to maintain- an EV drivetrain contains as few as 20 moving parts, whereas an ICE drivetrain has 2,000 or more. Even the brakes in an EV last longer between servicing due to regenerative braking, which uses the energy normally dissipated into brake pads to recharge the battery. Federal and provincial rebates (see section 5) reduce the purchase cost. Together, these factors create a lower Total Cost of Ownership (TCO) for EVs than ICE vehicles. A 2018 Canadian study showing annual savings on fuel & maintenance in BC of \$2,318 for EVs and lifetime (10-year) savings of \$25,377<sup>6</sup>.

Further, the upfront cost of EVs is shrinking each year due to advances in manufacturing and economies of scale. Since 2010, battery costs per kWh of capacity have fallen by 85%. Further reductions in battery costs are projected to make EVs more affordable at purchase than ICE vehicles by 2025<sup>7</sup>.

## 2. Barriers to EV and E-Bike Adoption

Central Saanich staff provided input into the Capital Region Local Government EV and e-bike Infrastructure Planning Guide (2018), which reviewed how local governments can accelerate the uptake of EVs and e-bikes by collecting feedback from industry and the public. The CRD conducted a survey in order to understand barriers to EV and e-bike ownership which had 702 public respondents and 63 respondents from the development industry. The barriers are discussed further in the following section, and are summarized as a list in Section 8: Summary of Barriers to EV and E-Bike Adoption.

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<sup>3</sup> Central Saanich Climate Leadership Plan

<sup>4</sup> 2016 Canadian Census Journey to Work data

<sup>5</sup> BC Environmental Protection & Sustainability

<sup>6</sup> Source: 2° Institute: Comparing Fuel and Maintenance Costs of Electric and Gas Powered Vehicles in Canada, Sept. 2018

<sup>7</sup> Source: BloombergNEF

## 2.1. Barriers to EV Adoption

### 1. Initial purchase cost

The upfront cost of an EV is one of the key obstacles to widespread EV adoption. A 2017 survey found that the number one reason owners of gas powered vehicles choose not to purchase an EV is the price<sup>8</sup>, and 30% of CRD residents see the upfront cost of EVs as the main reason why they do not own or plan to own an EV.<sup>9</sup>

### 2. Ability to access at-home charging

With no fossil fuel-based light duty cars and trucks projected to be sold in BC beyond 2040, local governments have an important role to play in ensuring that there is adequate infrastructure to support EVs in their community. Lack of access to at-home charging poses a barrier to EV ownership, as EV owners charge at home 80% of the time. Approximately 20% of respondents in the CRD EV survey cited a lack of access to charging at home, and 27% cited a lack of access to home charging in multi-family buildings as the largest barrier to EV ownership.

Approximately 12% of Central Saanich residents live in apartment buildings, where they likely have limited opportunity to charge (Figure 4).

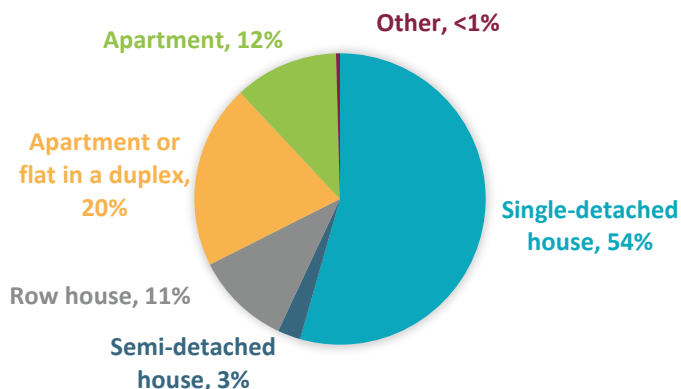


Figure 4: Central Saanich Dwelling Types<sup>10</sup>

In the CRD survey, 92% of public respondents felt it was important for local governments to ensure new residential construction is “future proofed” to allow for easy installation of EV charging equipment in the future. Further, 68% of respondents from the development industry supported CRD local governments having EV-ready requirements for new developments and 12% were neutral. Of development industry respondents, 85% expected a moderate to high demand for EV charging in developments in the next 5 years and 44% said that cost is a current barrier to installing charging infrastructure.

### 3. Range anxiety and lack of public charging infrastructure

Range anxiety refers to the fear of running out of battery power before reaching the next available opportunity to charge the vehicle. According to the CRD Infrastructure planning guide, range anxiety is one of the most reported barriers to EV ownership, and 19% of public participants who took the CRD’s EV survey viewed it as a barrier to purchasing an EV. Additionally, the CRD EV survey found that 90% of

<sup>8</sup> Source: Plug’N Drive

<sup>9</sup> Source: CRD. (2018). Backgrounder for Infrastructure Planning Guide

<sup>10</sup> Source: 2016 census profile of Central Saanich

respondents consider access to public EV chargers as important or very important for owning or deciding to purchase an EV.

However, several studies have found that there is a gap between perceived and real-world range anxiety, and that this anxiety can be alleviated with EV driving experience.<sup>11</sup> According to BC Hydro, 95% of car trips in BC are less than 30 km, and battery range is improving each year, with some newer model EVs capable of travelling a distance of over 500 km on a single charge.

#### **4. *Lack of experience with EVs and knowledge gaps***

Many potential buyers of EVs have a lack of knowledge and familiarity with them. A 2017 Canadian survey determined that 40% of EV owners were introduced to driving an EV by a friend, family member, or colleague before owning one.<sup>12</sup> Evidence suggests that an employee is six times more likely to purchase an EV after learning about the benefits from a workplace colleague who owns an EV, suggesting that providing opportunities to interact with EV technology may be an effective way to address this barrier.<sup>12</sup>

#### **5. *Lack of diversity of EVs available***

Approximately 10% of respondents in the CRD EV survey felt that a lack of variety in EV models available was a barrier to EV ownership. Greater diversity in EV model types have the potential to reach a broader market segment of potential buyers. By 2025, an additional 30 EV models are expected to join the EV market, including more SUVs, sedans, and trucks.<sup>9</sup>

## **2.2. *Barriers to E-bike Adoption***

#### **6. *Initial purchase cost***

E-bikes are generally more expensive than traditional bikes by approximately 25-40%. Results from the CRD survey found that 37% of respondents consider the price of e-bikes as a barrier to adoption. However, it is interesting to note that one study found that those that have access to test out an e-bike have a much higher willingness to pay for one.<sup>9</sup> This indicates that providing opportunities for community members to engage with e-bikes may increase their uptake in a community.

#### **7. *Lack of secure bike parking and end of trip facilities***

Concerns about theft of an e-bike is another barrier to ownership and can be partially explained by a lack of secure bike parking within communities. According to the CRD survey, 42% of public respondents consider this a critical issue that requires policy attention. Additionally, some e-bike owners find that it can be difficult to locate bike stands large enough to accommodate an e-bike, as well as parking facilities that allow charging of the e-bike. Further, similar to difficulties with EV charging in multi-unit residential buildings (MURBs), there is also often a lack of outlets near bike storage in MURBs. Additionally, a lack of end of trip facilities that include showers and lockers can discourage potential cyclists.

#### **8. *Social stigma***

A stigma is sometimes attached to e-bikes, due to the perception that they enable “cheating” by reducing the amount of physical effort to cycle. Individuals who hold this view may be uninformed about

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<sup>11</sup> Source: McKinsey & Company. (2017). Electrifying insights: How automakers can drive electrified vehicle sales and profitability.

<sup>12</sup> Source: Plug’N Drive. (2017). Driving EV Uptake in the Greater Toronto and Hamilton Area: How Driver Perceptions Shape Vehicle Ownership in the GTHA.

the utilitarian uses of an e-bike and the ability of an e-bike to be a substitute for car trips. Education and outreach may be the most effective way to address this barrier.

### 9. Safety concerns

Safety is often identified as a barrier to e-bike ownership, both due to concerns about the relative speed of an e-bike compared to a traditional bike, and concerns about cycling conditions on roads. The CRD survey found that 22% of respondents view safety concerns as a barrier to e-bike ownership. This demonstrates a need for improved cycling infrastructure, such as separated bike lanes.

## 3. EV and E-Bike Charging

### 3.1. EV Charging Infrastructure and Technology

The installation of EV supply equipment (EVSE) 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; and
- **EV Supply Equipment (EVSE, or EV charger)** with cable to reach the vehicle.

There are three types of EVSE: Level 1 (L1), Level 2 (L2), and Direct Current Fast Chargers (DCFC, colloquially known as Level 3). While many early adopters relied on overnight Level 1 charging, Level 2 charging provides a higher level of performance and better supports consumer expectations and continued uptake as EVs become more mainstream.

*Table 1: Comparison of EV Supply Equipment (EVSE) Types*

<i>EVSE Type</i>	<i>Level 1</i>	<i>Level 2</i>	<i>DCFC (Level 3)</i>
<i>Voltage</i>	120V 1-phase AC	208 V or 240V 1-phase AC	208 V or 480 V DC
<i>Current</i>	12- 16 A	Typically 32 A	<125 A (Typ. 60 A)
<i>Charging loads</i>	1.4 to 1.9 kW	3.6 to 7.2 kW	50 to 350 kW
<i>Distance per hour of charge time</i>	3 - 8 km	18 - 45 km	90 - 150 km
<i>Time to full charge</i>	8-12 hrs	4-6 hrs	0.5-1 hrs
<i>Common uses</i>	Charging at home	Charging at home, work, or on-the-go	Charging during long distance trips or on-the-go

*\* Note: The above table provides a generalized representation of time to full charge and distance per hour of charge time for comparison. These are influenced by a number of factors include type & age of vehicle and battery, battery monitoring systems, and arrival to market of higher capacity batteries and faster charging speeds in future.*



### 3.2. Current EV Charging Regulations in Central Saanich

Council has taken the initiative to require EV charging with the following wording currently included in covenants as part of rezoning applications for residential infill development:

*that the new dwellings will include a socket for electric vehicle charging that is constructed with a dedicated 240-Volt line, capable of 50 Amps, has a NEMA (6-50) socket, and located to serve a vehicle parking inside or outside of the garage;*

### 3.3. E-Bike and EV-Ready Charging Requirements across BC

Many precedents for requiring e-bike and EV-ready new development have been set by BC municipalities. An overview of the various EV charging requirements for public and private land uses adopted by local governments in BC is available in Appendix A of this report.

## 4. Current Status of EVs, E-bikes, and EV Charging in Central Saanich

### 4.1. Current Status of EV and E-Bike Uptake in the Community

EVs (including battery and plug in hybrid EVs) accounted for approximately 9% of all BC light duty vehicle sales in 2019 (see Figure 5a).<sup>13</sup> This is up significantly from 2018, when the market share was only 5%.

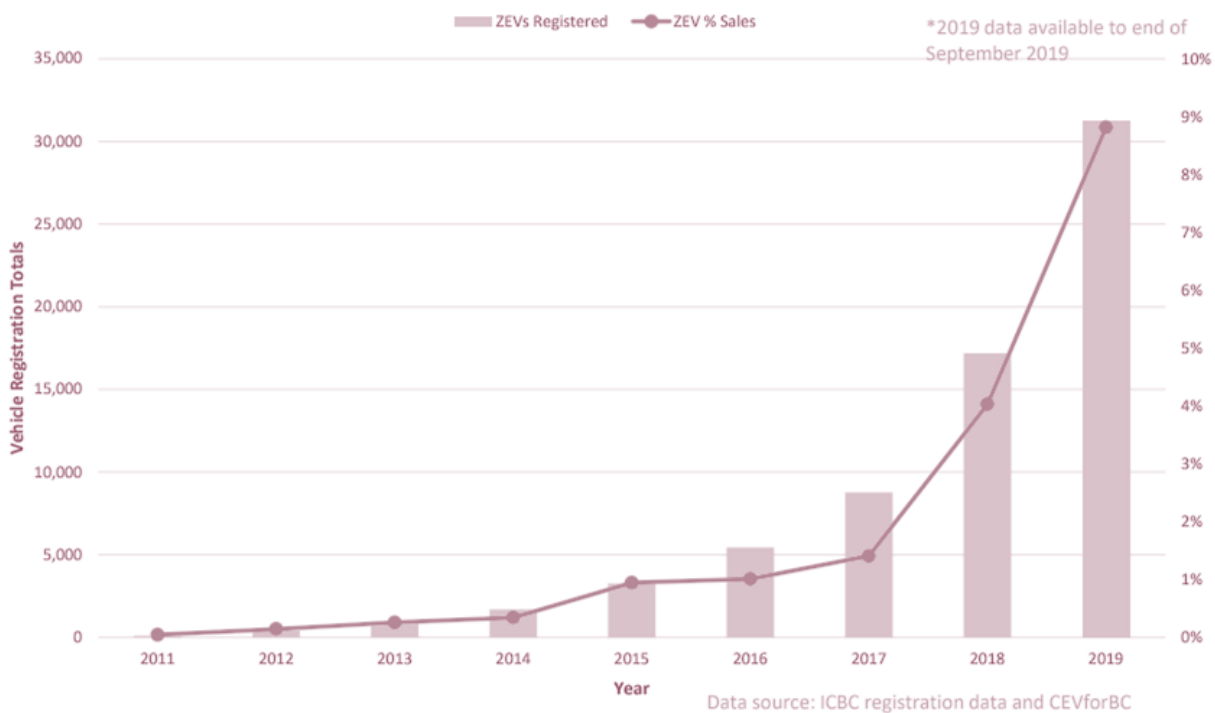


Figure 5a: EV Portion of BC Light Duty Vehicle Sales

Residents of the District are also acquiring electric vehicles and, as of the end of 2019, there were a total of 232 battery EVs (BEVs) on the road. Following the provincial trend, the District also saw a jump between 2018 and 2019, from 0.7% to 1.4% of vehicles registered in the district<sup>14</sup>.

<sup>13</sup> Source: ICBC Vehicle population data

<sup>14</sup> Source: Ibid

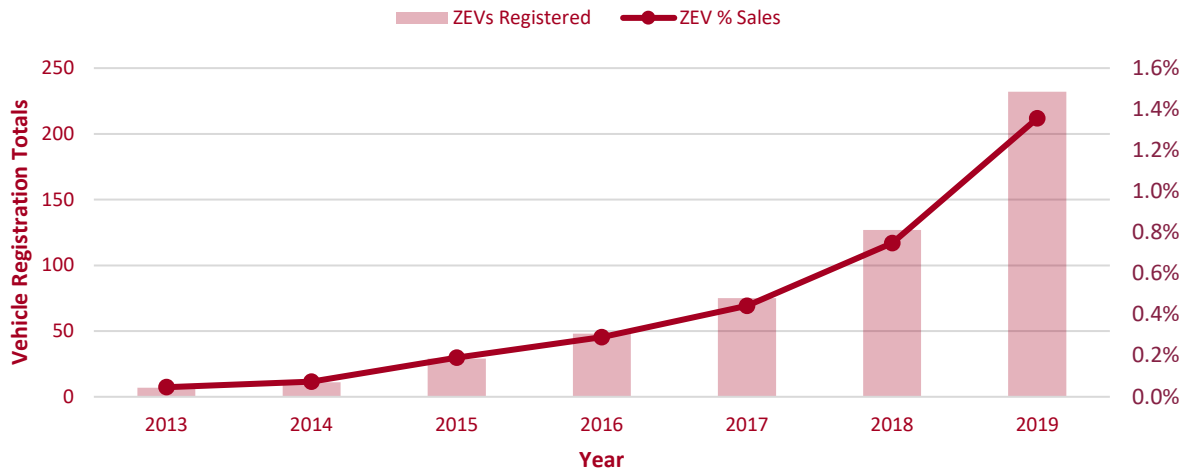


Figure 6b: EV Portion of the District of Central Saanich Vehicle Sales

E-bike sales as a percentage of total bike sales in the Capital Region have also been on the rise, with some bike shops reporting the total fraction of these sales as high as 33%.<sup>15</sup> Locally, Brentwood Cycle estimates that the proportion of sales that are e-bikes is 10%, and growing since e-bikes were first introduced to the shop in 2018.

#### 4.2. Current Status of EV and E-Bike Uptake in the Municipal Fleet

In 2018, fleet emissions accounted for 273 tCO<sub>2</sub>e, equivalent to 81% of the District’s municipal emissions (Figure 7). Electric vehicles are a key strategy to reduce fleet emissions and will be required to reach the District’s climate leadership goals. There is a strong business case for fleet electrification due to the intensive usage of fleet vehicles and the reduced maintenance requirements of EVs.

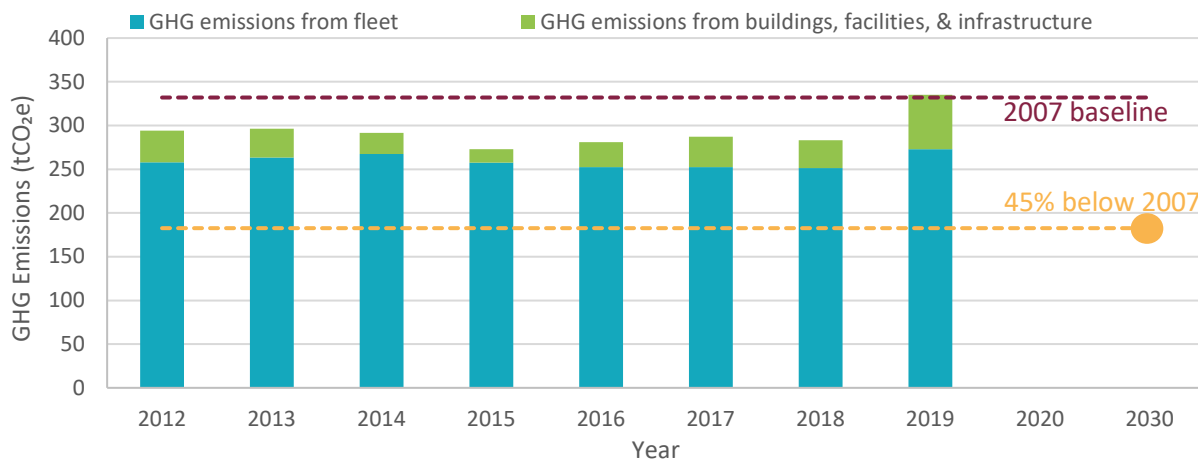


Figure 7: Central Saanich Municipal Emissions and 2030 Goal

The 2018 Climate Leadership Plan contains direction on electrifying and right-sizing the municipal fleet:

- Transition the light-duty fleet to EVs at the time of renewal, or in advance of renewal where fuel and maintenance costs support the investment; and
- Convert heavier-duty fleet vehicles to lower emission vehicles best suited to meet the performance requirements

<sup>15</sup> Source: Watt Consulting. 2018. Capital Region Local Government Electric Vehicle and Electric Bike Infrastructure Backgrounder.

To address these goals, the District took the West Coast Electric Fleets “On-Ramp” Pledge to:

*Evaluate EVs as part of all fleet purchases and leases (including, but not requiring, piloting the use of a small number of EVs) and annually revisiting this pledge to consider a higher EV procurement goal.*

Subsequently, in 2019, a number of municipal actions were taken that are projected to reduce municipal fleet emissions by approximately 7 tCO<sub>2</sub>e each year. These actions include:

- Addition of three Kia Soul EVs to the fleet
- Introduction of car-sharing into the District: three Modo<sup>16</sup> vehicles, including one Kia Soul EV, were introduced and located for public or municipal use
- Installation of five new EV chargers: one for public use and four to support growing municipal and Modo EV fleets
- Right-sizing of the municipal fleet: traded larger vehicles for more appropriate sized ones that serve the same function (e.g. replaced an F350 with an F150) and retired vehicles with poor fuel efficiency in favour of the EVs previously mentioned
- Piloting of an e-bike on a water metering route by Public Works, offsetting 230 kgCO<sub>2</sub>, saving 100 L of fuel, and providing a healthy and well-received change for staff. Due to the success of the pilot, the e-bike was purchased for continued usage.

### 4.3. Current Status of Public EV Charging in Central Saanich

The District of Central Saanich first installed EV chargers for general public use in 2013: one each at the cultural centre and municipal hall. Usage for the initial charger at municipal hall was switched to the new Modo Kia Soul EV in 2019 and an additional charger (FLO model) was installed next to it in June 2019 to take its place as a charger for the general public. These chargers are all Level 2 units and the usage of them is currently free of charge to the public. Additionally, the Keating industrial area benefits from two publicly available Level 2 chargers installed & operated by the Co-op on Keating Cross Rd. There are currently no DCFCs in the District.

Since the inception of the first units in 2013, 21.9 MWh has been provided to EVs at a total estimated cost of \$2,500. This has amounted to about 94,000 km of charge<sup>17</sup> provided over the last six years, and equates to roughly 19 tCO<sub>2</sub>e avoided when assuming a baseline scenario of gasoline vehicles<sup>18</sup>. The usage of these chargers has increased since 2013, and more than doubled within the last year alone.

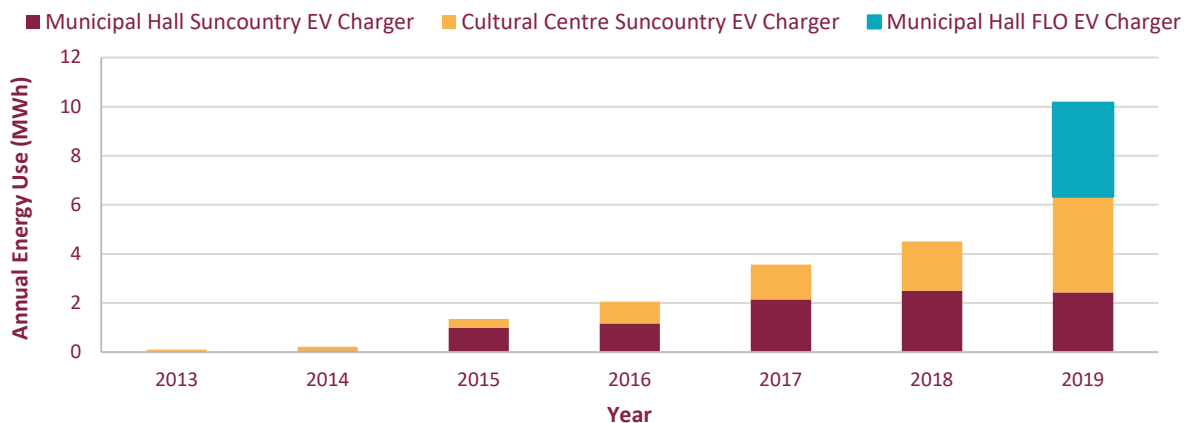


Figure 8: Central Saanich Public EV Charger Usage

<sup>16</sup> Modo is a carshare co-operative & alternative to private vehicle ownership that allows individuals to rent vehicle use for short periods of time

<sup>17</sup> Assuming 233 Wh/km, Source: AES Engineering

<sup>18</sup> Internal calculations using emission factors sourced from Centre for Corporate Climate Leadership and Canada’s National Inventory Report

## 5. Rebates

There are federal and provincial rebates available to homeowners and businesses for the purchase of EVs or of EV charging equipment (Table 2). In addition, the BC Scrap-it program provides incentives for EVs and e-bikes when a gas-powered vehicle is turned over to be taken off the road permanently.

*Table 2: EV and E-Bike Incentives Available to BC Residents*

	<i>New EV</i>	<i>Used EV</i>	<i>E-Bike</i>
<b>Federal IZEV Program</b>	\$5,000		
<b>Provincial CEV Program</b>	\$3,000		
<b>BC Scrap-It Program</b>	\$6,000	\$3,000	\$850
<b>Total Incentive Available</b>	\$14,000	\$3,000	\$850

There are also provincial incentives available for the purchase and installation of Level 2 EV charging equipment in single family homes, MURBs, or workplaces (Table 3). Additionally, a program called ZAPBC offers a free Level 2 charger (\$1,000 value) of a specific make and model, however, this incentive cannot be combined with the Provincial rebate program.

*Table 3: EV Charging Equipment Incentives Available to BC Residents*

	<i>Residential (Single-Family, Townhouse, Duplex)</i>	<i>Residential (MURB-Condo, Apartment) Existing Building</i>	<i>Residential (MURB-Condo, Apartment) New Construction</i>	<i>Commercial (Workplace)</i>
<b>Provincial CleanBC/ BC Hydro Program</b>	\$350	\$2,000 per station to a max of \$14,000	\$350 per station to a max of \$5000	\$2,000 per station to a max of \$14,000
<b>Zap BC Program</b>	Free charger (\$1,000 value)			
<b>Total Incentive Available</b>	Rebates cannot be combined			

## 6. EV and E-Bike Action Plan

Potential areas of action for accelerating the adoption of EVs and e-bikes within Central Saanich are discussed in the following section, and a full summary of the possible actions that could be taken is provided in Section 7: Recommended Actionable Items.

### 6.1. Proposed Fee for Use of Public EV Charging Infrastructure

Currently, public charging is free in Central Saanich for EV owners, but it may be more beneficial to both EV drivers and the municipality to instate a small per-hour fee for charging at public chargers.

Free charging can impede turnover at chargers, causing line-ups and reduced access for EV owners who require a charge to complete their trip. It can also reduce access for those that do not have the ability to install a charger at home, such as those living in apartments or stratified condos. A time-based fee encourages EV drivers to move their car once their charge is complete.

Other municipalities have already begun to move towards charging a small fee per hour of Level 2 charging. Examples are the Township of Esquimalt, which established a \$1/hour fee in 2017, the City of Richmond, which is now establishing a \$2/hour fee, and the City of Victoria, which is currently developing a bylaw to establish a \$1/hour charging fee. The District could also consider the possibility of a phased in fee, where the first time increment (ex. first two hours) is free and then subsequent hours have a small fee associated to encourage moving the vehicle.

Best practices for EV adoption dictate that the cost of public charging should be lower than the cost of gasoline. Table 4 shows how a \$1 per hour public charging fee compares to the price of gasoline and to the cost of at home charging.

*Table 4: EV charging costs compared to equivalent gasoline prices<sup>19</sup>*

<i>Type of Charging</i>	<i>Cost to Charge</i>	<i>Cost for 100 km of Charge<sup>20</sup></i>	<i>Cost to Charge as an Equivalent Gas Price<sup>21</sup></i>
<b>Charging at Home</b>	\$0.11/kWh	\$2.20	\$0.28/L
<b>Public Level 2 Charging</b>	\$1/hour	\$3.03 (@6.6kW)	\$0.38/L
<b>DCFC (Level 3) (50 kW)</b>	\$16/hour	\$6.40 (@50 kW)	\$0.80/L
<b>DCFC (Level 3) (30 kW)</b>	\$16/hour	\$10.67 (@30 kW)	\$1.33/L

In a 2018 survey conducted by the CRD, the majority of respondents indicated that they would be willing to pay a \$1 per hour fee for public charging. The CRD recommends that municipalities adopt a rate of \$1 per hour for Level 2 charging, and a rate of \$16 per hour for DCFC charging.

Revenue from any small-fee system implemented could potentially be reinvested back into expanding, improving, and maintaining Central Saanich public EV charging infrastructure. It is of note that there are typically costs associated with software subscriptions that assign a fee to charging. An analysis of the cost to the District and the benefit of a fee to EV drivers should be carried out prior to establishing one.

<sup>19</sup> Source: CRD. (2018). EV and E-bike Infrastructure Planning Guide

<sup>20</sup> assumes 20kWh/ 100 km

<sup>21</sup> Cost for 100 km of charge divided by a fuel efficiency of 8L/ 100 km

## 6.2. Proposed Public Central Saanich EV Charging Infrastructure

In recent years, demand for public electric charging within the District has increased. For example, in the last year, use of the EV charger at the Cultural Centre has doubled.

A 2018 gap analysis study undertaken by the CRD as part of its EV Infrastructure Planning Guide for local governments identified areas across the CRD where there is likely demand for additional Level 2 and 3 public EV charging stations. The maps below identify these locations, which, in Central Saanich, are:

- Brentwood Bay, Level 2
- Keating, Level 2

There were no opportunity sites identified for DCFC (Level 3) chargers in Central Saanich.

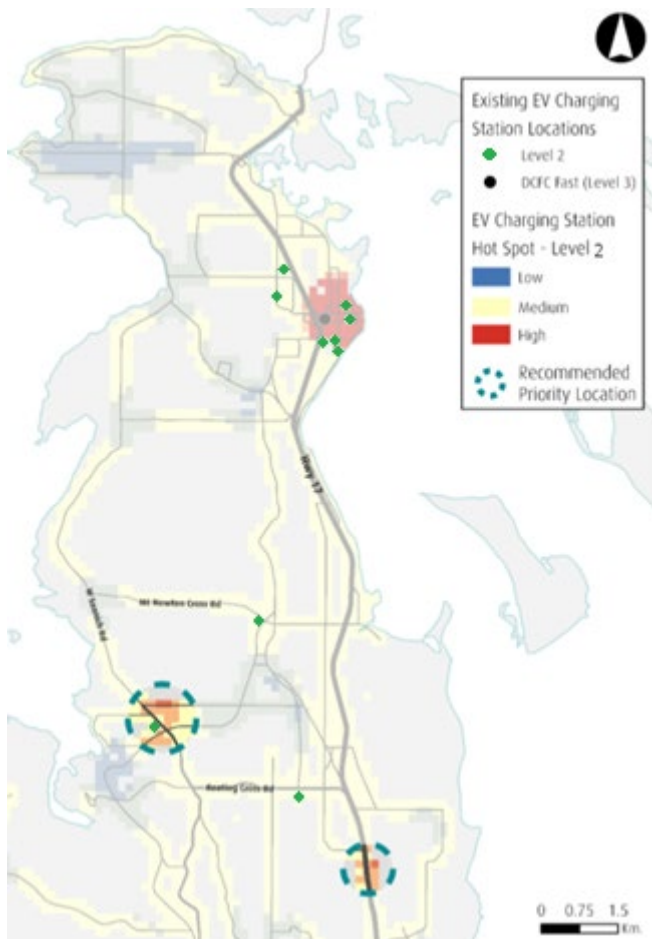


Figure 9a: Opportunity sites for Level 2 chargers on the Saanich Peninsula

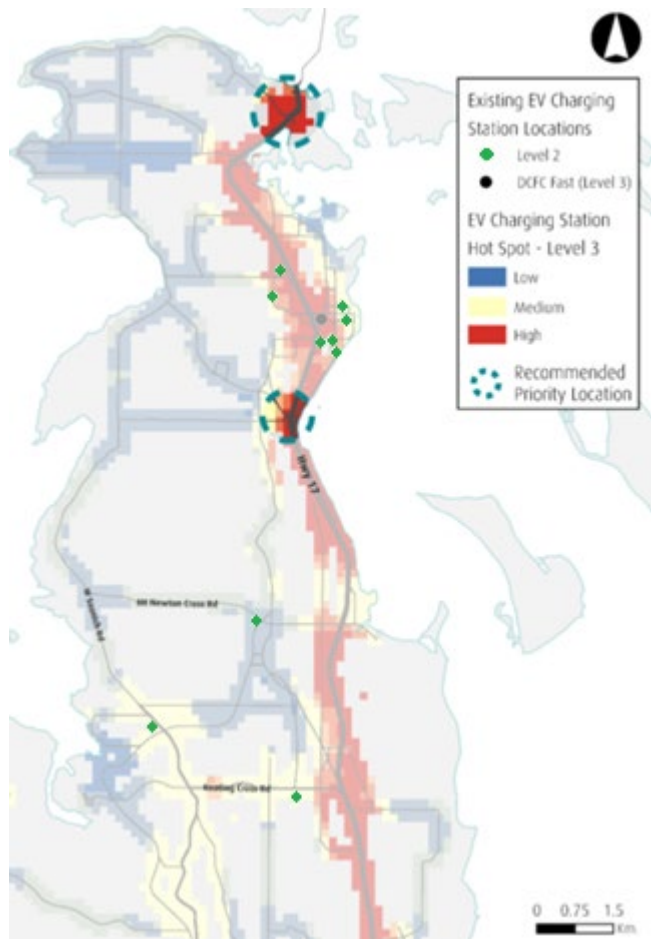


Figure 8b: Opportunity sites for DCFC (Level 3) chargers on the Saanich Peninsula

To keep up with demand, staff propose the installation of three Level 2 charging stations for public use on District properties. The estimated cost of purchase and installation of one station is between \$6,000 and \$9,000 and depends on a number of factors that mainly center on the proximity and capacity of electrical services at the site. Additional costs, roughly estimated as between \$5,000 and \$6,000, apply if there are no electrical services available at the site yet.

Tentative proposed locations are:

- Brentwood Bay - 1209 Clarke Road (Cultural Centre)
- Saanichton - 1903 Mt. Newton Cross Road (Municipal Hall)
- Keating – opportunity site to be determined

### **6.3. *Proposed Public Central Saanich E-Bike Infrastructure***

A Central Saanich Active Transportation Plan is currently underway, with completion expected in late 2020. The plan will include identification and prioritization of opportunities within Central Saanich to improve cycling infrastructure.

### **6.4. *Proposed EV-Ready Requirements for New Development***

EV-ready requirements are intended to ensure that new developments within the District are sufficiently prepared for an increase in EVs over the coming years. The proposed EV-Ready requirements are specific to the land uses and expected demand for each building type as outlined in the Land Use Bylaw Part 6: Off-street parking, Loading and Screening Regulations. This allows for a requirement that is responsive to the land use and is less likely to result in overbuilding of infrastructure. The proposed requirements would apply to residential, industrial, commercial, and institutional developments, and would also include an e-bike ready component.

A report on EV-ready requirements for new development will be presented to Council separately for consideration.

### **6.5. *Proposed EV Charging Retrofit Strategy for Existing Buildings***

Strategies for encouraging the retrofitting of EV charging in existing buildings center on education, outreach, bylaws, and strata bylaw recommendations.

The municipality could promote the province's free EV Advisor to strata corporations in order to ensure that information is readily available to them. According to Plug In BC, an explanation of how strata corporations can ensure that EV owners are paying for their own electricity use can improve receptiveness to installing EV infrastructure, and the EV Advisor service is a great source of this information. The EV Advisor can offer up to four free hours of support and consultation, in person, over the phone, or can even attend strata meetings to provide information.

Additionally, the District could advocate for "right to charge" legislation by the BC government. This legislation would support the access of residents of apartments or condos to charging at home by requiring stratas to accommodate reasonable requests to install EV charging infrastructure.

Further, it is interesting to note that strata members in communities where EV-ready requirements have been implemented for new development are more receptive to retrofitting EV charging for their existing unit. In these areas, retrofitting EV charging is more likely to be seen as an investment in the resale value of the unit. Therefore, implementing EV-Ready requirements for new development can also be a strategy for encouraging EV charging retrofits in existing development.

The District could also consider making an online e-bike and EV-friendly strata registry and map to inform residents which buildings are EV-friendly and to allow stratas to showcase their achievements. This could be done for Central Saanich alone, but may potentially be more effective if done in coordination with the CRD and other municipalities.

## 7. Recommended Actionable Items

The actionable items in Table 5 seek to encourage EV and E-Bike adoption in Central Saanich by addressing barriers to adoption that were described in the background of this report and reiterated in Table 6 in Section 8. In the below table, “Control” is defined as Central Saanich having Direct (D) control over an action, or Indirect (I) control, where we are advocating/supporting external bodies and partners.

*Table 5: Actionable Items*

<b>1.0</b>	<b><i>Community Electric Vehicle And E-Bike Uptake</i></b>	<b><i>Barrier #</i></b>	<b><i>Control</i></b>
<b>1.1</b>	Support Provincial and Federal mandates for light-duty EV adoption. Advocate for accelerating the mandate timeline as well as expanding mandate scope to capture the medium and heavy-duty zero emission vehicle markets	5	I
<b>1.2</b>	Advocate for continued provincial and federal incentives to encourage the uptake of EVs, such as incentives for the purchase of EVs and for the purchase and installation of EV chargers. Advocate for the inclusion of equity provisions in incentive programs to help support access to the technology for communities that have reduced access	1	I
<b>1.3</b>	Advocate for e-bike incentives and for the Province to exempt e-bikes from Provincial Sales Tax charges. If the opportunity presents, explore contributing a municipal top-up incentive for e-bikes	6	I/D
<b>1.4</b>	Implement actions outlined in the upcoming Central Saanich Active Transportation Plan to improve the safety of and increase the amount of bicycle infrastructure, and to increase the number of secure end-of-trip facilities	7, 9	D
<b>1.5</b>	Advocate for the electrification of ride-hailing vehicles and encourage the Central Saanich Police Service, BC Transit, School District 63, businesses, and other organizations in Central Saanich to identify opportunities to transition their fleets to EVs and e-bikes and install EV charging	3, 4	I
<b>1.6</b>	Monitor developments in the legality of alternative electric mobility technologies such as e-scooters, e-skateboards, etc.	5	I
<b>1.7</b>	Track and communicate relevant metrics related to EVs and EBs including: number of EVs registered in the District, number of charging stations, charging stations/capita, and proportion of District neighbourhoods with access to public charging	3, 4	D
<b>2.0</b>	<b><i>Public Charging Network</i></b>	<b><i>Barrier #</i></b>	<b><i>Control</i></b>
<b>2.1</b>	Improve public Level 2 EV charging access, beginning by doubling the number of municipally owned, publicly accessible Level 2 charging stations within the municipality. Annually review the daily usage trends of the public charging infrastructure and increase the number of charging stations as demand dictates.	3	D
<b>2.2</b>	Investigate implementing a small fee or fee past a certain time limit for EV charging to encourage EV charging turnover and increase charger availability for EV owners who do not have access to charging at home, while still maintaining a cost incentive compared to fossil fuel vehicles.	3	D
<b>2.3</b>	Investigate implementing a bylaw to enforce proper usage of public EV charging. For example, non-electric vehicles parked in EV charging station spots and EVs that are left parked in spots when not actively charging may be fined and/or towed.	3	D



<b>2.4</b>	Seek partnerships with other municipalities and the CRD to leverage opportunities for external funding for public charging infrastructure through such partners as Natural Resources Canada and BC Hydro (including for DCFC stations)	3	I
<b>3.0</b>	<b><i>Charging Infrastructure in New Buildings</i></b>	<b><i>Barrier #</i></b>	<b><i>Control</i></b>
<b>3.1</b>	Adopt e-bike and EV-ready requirements for new construction in Central Saanich to ensure resident access to at home charging in new buildings and employee and customer access to charging where appropriate in institutional, commercial, and industrial settings	2, 3	D
<b>3.2</b>	Explore requiring new developments to include end of trip facilities, such as lockers, showers, secure bike parking, and/or e-bike charging.	7	D
<b>4.0</b>	<b><i>Charging Infrastructure in Existing Buildings</i></b>	<b><i>Barrier #</i></b>	<b><i>Control</i></b>
<b>4.1</b>	Promote existing provincial incentives for the installation of EV charging in MURBs and workplaces	2	I / D
<b>4.2</b>	Explore contributing top-up incentives towards the installation of EV charging in existing MURBs	2	D
<b>4.3</b>	Advocate for “Right to Charge” provincial legislation, which would require stratas to accommodate reasonable requests to install EV charging infrastructure	2	I
<b>4.4</b>	Connect residents and stratas with online educational resources regarding the installation of EV charging in existing buildings, such as the free BC EV Advisor service	2	I / D
<b>4.5</b>	Explore collaborating with the CRD and other municipalities to make an online e-bike and EV-friendly strata registry and map to inform residents and allow stratas to showcase their achievements	2, 4, 7	I
<b>4.6</b>	Explore the need for installing curbside EV charging stations near higher density multi-unit residential buildings where retrofitting EV charging in those buildings would be difficult or cost prohibitive	2, 3	D
<b>4.7</b>	Explore partnering with establishments that have ample neighbourhood parking space, such as schools or churches, to install publicly-available EV charging and improve access to charging in neighbourhoods with multi-unit residential buildings	2, 3	I
<b>5.0</b>	<b><i>Electric Vehicle and E-Bike Education and Outreach</i></b>	<b><i>Barrier #</i></b>	<b><i>Control</i></b>
<b>5.1</b>	Increase general EV, EV charging, and e-bike knowledge in the community through informational sessions, “ride and drives,” and other opportunities for exhibiting the technologies. Partner with such organizations as Emotive, PluginBC, local EV or e-bike clubs, businesses who have adopted EVs in their fleets, and strata associations in order to showcase EVs, e-bikes, EV fleets, and EV retrofits in existing buildings	4, 8	I / D
<b>5.2</b>	Further develop Central Saanich “Active and Electric Transportation” webpage and the Districts social media with information and links to available incentives and resources. Explore using testimonials, contests, the District’s quarterly newsletter, and paid social media ads to build the EV and e-bike audience in the District	4, 8	D
<b>5.3</b>	Consider raising the profile of the municipal EV fleet using vehicle graphics	4	D

5.4	Explore showcasing renewable energy and electric mobility technology through an EV or e-bike demonstration project, such as a solar powered charging station	4, 8	D
5.5	Create case studies specific to Vancouver Island to show range of EVs for island travel	3	D
6.0	<b><i>Municipal Electric Vehicle and E-Bike Uptake</i></b>	<b><i>Barrier #</i></b>	<b><i>Control</i></b>
6.1	Purchase an e-bike for the Public Works Department to use for water metering and consider purchasing an additional e-bike to add to the shared fleet at the Municipal Hall, particularly for employees who frequently travel to and from Fire Station #1	4, 8	D
6.2	Continue to prioritize procurement of electric vehicles & equipment and consider pledging to pursue a higher procurement goal with West Coast Electric Fleets	4, 8	D
6.3	Continue to send Public Works staff to information building and knowledge sharing events such as the annual BC West Coast Electric Fleets symposium in Vancouver. Share these opportunities with other local organizations and businesses	4, 5	D
6.4	Complete an analysis of opportunities for replacing District medium and heavy-duty fossil-fuel fleet vehicles with electric alternatives	5	D
6.5	Connect with other BC municipalities to explore the possibility of standardizing purchases of fleet EVs in order to facilitate bulk purchasing and reduced cost	1	I / D
6.6	Ensure municipal EVs have net positive life cycle impacts through minimum lifetime mileage targets and factoring environmental impacts into replacement decisions	1	D
6.7	Prioritize location of EV charging stations near identified accessible parking areas where logical, as way of future-proofing for automated vehicles (and overlap with accessibility considerations), changes to parking lot configurations, and cost-efficiency for electric infrastructure. Work with local partners on similar strategies.	3, 5	I / D

## 8. Summary of Barriers to EV and E-Bike Adoption

<b><i>Table 6: Barriers to EV and E-Bike Adoption</i></b>	
<b>#</b>	<b><i>Barriers to EV Adoption</i></b>
1	Initial purchase cost (EV)
2	Ability to access at home charging
3	Range anxiety and lack of public charging infrastructure
4	Lack of experience with EVs and knowledge gaps
5	Lack of diversity of EVs available
<b>#</b>	<b><i>Barriers to E-Bike Adoption</i></b>
6	Initial purchase cost (e-bike)
7	Lack of secure bike parking and end of trip facilities
8	Social stigma
9	Safety concerns

## Appendix A: Examples of EV-Ready Requirements for New Development Adopted by BC Local Governments

<b>Community (Date in Effect)</b>	<b>Single Family</b>	<b>Multi-Family</b>	<b>Commercial/ Institutional</b>
<b>City of Burnaby (2018)</b>	100% of residential parking stalls provided with energized L2 outlet. Excludes secondary suites and visitor parking.		
<b>City of Coquitlam (2018)</b>	One energized L2 outlet per residential dwelling unit.		
<b>City of New Westminster (2019)</b>	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.
<b>City of North Vancouver (2019)</b>	100% of stalls provided with energized L2 outlet.	100% of resident stalls and 20% of residential visitor stalls provided with energized L2 outlet. All secure bicycle storage must include level 1 (110v) electric outlets for electric bicycle charge.	20% of commercial stalls provided with energized L2 outlet.
<b>City of Port Coquitlam (2018)</b>	One stall per residential unit roughed-in (all electrical infrastructure other than wire), Level 2.		
<b>City of Port Moody (2019)</b>	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.
<b>City of Richmond (2018)</b>	100% of residential parking stalls provided with energized L2 outlet, excluding visitor parking.		
<b>City of Vancouver (2018)</b>	One energized outlet per parking area (garage, carport).	100% of residential parking stalls provided with L2 energized outlet. Each two long-term bicycle spaces must have an electrical outlet.	10% of commercial stalls L2 energized in developments with 10 or more parking stalls.
<b>District of Squamish (2019)</b>		100% of residential parking provided with L2 energized outlet.	
<b>District of Saanich (Sept 2020)</b>	One parking space per unit to feature an energized outlet capable of providing L2 charging.	100% of all off-street parking spaces require an energized outlet capable of providing L2 charging. Excludes visitor parking.	Between 0- 5 % dependent on land uses and expected demand for each building type.
<b>City of Victoria (Oct 2020)</b>	One L2 energized outlet per required parking space.	One L2 energized outlet per vehicle parking space.	Between 0-5 % depending on number of parking spaces provided.