100% Renewable & Resilient Saanich

saanich.ca/climateplan

Electric Mobility Strategy

October 2020

Saanich

Territory acknowledgment

The District of Saanich is within Coast and Straits Salish territory, the territories of the Lekwungen peoples, known today as Songhees and Esquimalt Nations, and the **W̱SÁNEĆ** peoples, known today as **W̱JOŁEŁP** (Tsartlip), **BOḰEĆEN** (Pauquachin), **SȾÁUTW̱** (Tsawout), **W̱SIḴEM** (Tseycum) and **MÁLEXEŁ** (Malahat) Nations. The First Peoples have been here since time immemorial and their history in this area is long and rich.

The District of Saanich is proud that our name is derived from the **W̱SÁNEĆ** peoples. Saanich Council is committed to taking a leadership role in the process of healing wounds of the past and becoming a more just, fair and caring society.

The District of Saanich recognizes the Lekwungen and **W̱SÁNEĆ** peoples as the traditional custodians of the land in which our municipality is located. As we build formal government-to-government relationships with neighbouring First Nations governments, including the Songhees, Esquimalt, Tseycum, Tsartlip, Tsawout, Pauquachin and Malahat First Nations, the District will look for opportunities to collaborate on actions and issues of mutual interest, including actions related to climate change. The District respectfully acknowledges the First Nations' long history of land stewardship and knowledge of the land and will look for opportunities to learn from and collaborate with First Nations to help us improve our community's resilience to a changing climate.

Acknowledgments

Thank you to all those who contributed to the development of this Electric Mobility Strategy, including other District of Saanich departmental staff, staff from other regional municipalities and the Capital Regional District, members of the public and key stakeholders.

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1.0 Introduction

This Electric Mobility Strategy is intended to support a rapid transition to electric vehicles and e-bikes in Saanich. It contains 38 actions in five focus areas:

1. Electric Bikes (e-bikes)
2. Electric Vehicles (EVs)
3. Home and Workplace Charging
4. Public Charging Network
5. District Leadership

These actions are intended to support the following Saanich Climate Plan targets:

- By 2030, 22% of trips are by active transportation
- By 2050, 30% of trips are by active transportation
- By 2030, 36% of all passenger vehicles are EVs; and
- By 2050, all personal and commercial vehicles are powered by electricity or other renewable fuels

This strategy focuses on light duty electric vehicles and e-bikes because these are most readily available and will have the biggest impact on Saanich's community greenhouse gas emissions. As more electric and renewable energy medium- and heavy-duty vehicles become available, strategies to support a transition to these vehicles will be developed.

2.0 How the Electric Mobility Strategy was developed

The Electric Mobility Strategy was developed in a 6-phase process, as shown in Figure 1 below.

Phase 1

- The scope of the strategy and process for strategy development were defined and an engagement strategy was developed.

Phase 2

- Saanich staff reviewed previous engagement findings, conducted research on best practices and the experiences of leading jurisdictions, and analyzed relevant data. This included a 2018 report on electric vehicles (EVs) + electric bikes (e-bikes) in our region[1], as well as numerous other reports. Through this research and analysis, staff identified several proposed actions that the District of Saanich might take to support electric mobility in Saanich.

Phase 3

- The public and stakeholders were invited to review and provide feedback on the proposed actions (Saanich Sustainable Mobility Survey).

Phase 4

- Public and stakeholder feedback was incorporated into a draft Electric Mobility Strategy.

Phase 5

- The public and stakeholders were invited to review and provide feedback on the draft Electric Mobility Strategy.

Phase 6

- The Electric Mobility Strategy was revised to address feedback and then finalized.

[1] WATT Consulting Group, 2018. "Capital Region Local Government Electric Vehicle (EV) + Electric Bike (e-bike) Infrastructure Planning Guide." Prepared for Capital Regional District. November.

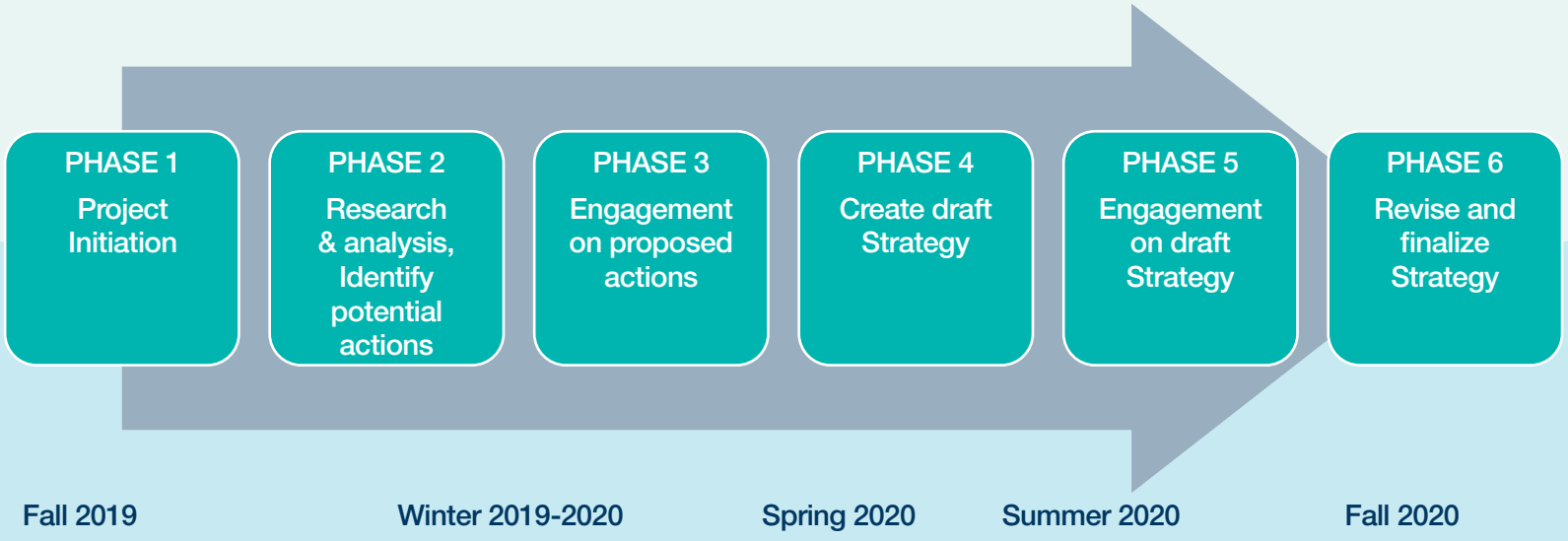


Figure 1: Process for Electric Mobility Strategy Development

2.1 Public and stakeholder engagement

Between 2018 and 2020 there has been considerable public and stakeholder engagement related to EVs and e-bikes in Saanich and the Greater Victoria region, including:

- Three phases of engagement between May 2018 and September 2019 as part of updating Saanich's Climate Plan;
- Engagement on EVs and e-bikes as part of the 2018 Capital Region EV and e-bike Infrastructure Planning Project;
- September 2018 Plugging the Gaps Event: a conversation about EV charging for people who live in condos and apartment buildings;
- Two phases of engagement with the development industry and other stakeholders as part of developing EV charging infrastructure requirements for new developments in Saanich, May 2018 – May 2019; and
- A two part engagement with the public and stakeholders on Saanich's draft Electric Mobility Strategy, Feb - Sept 2020 (described below).

Part 1 Engagement: Feedback on proposed actions

The engagement activities outlined above provided valuable information relating to the support of Saanich residents for EVs and e-bikes as well as the barriers and challenges to making the transition. This information, along with research on best practices, the experiences of leading jurisdictions, and analysis of relevant data was used to develop draft actions to support electric mobility in Saanich.

The original draft actions focused on six key areas:

1. Electric Vehicles
2. E-bikes
3. Home and Workplace Charging
4. Public Charging Network
5. Education and Outreach
6. District Leadership

Members of the public and stakeholders were invited to provide feedback on the draft actions through an online survey which was available from February 14 to March 8, 2020 (Saanich Sustainable Mobility Survey).

A series of backgrounders was developed to provide information on:

- Why electric mobility? The benefits of electric vehicles and e-bikes
- The role of electric vehicles and e-bikes in a sustainable transportation system
- Electric mobility market conditions
- Barriers to electric mobility

Links to the backgrounders were provided in the online survey.

There were 163 individual respondents to the Saanich Sustainable Mobility Survey plus nine respondents representing stakeholder organizations. In addition, comments were provided via email by four individuals and three stakeholder organizations.

There was a high level of support from both the public and stakeholder organizations for electric mobility in general. Nearly all actions had the support of at least 70% of survey respondents, with many having the support of 90+% respondents.

Several themes emerged from the comments, which are summarized in Table 1.

Table 1: Summarized feedback from Saanich Sustainable Mobility Survey

Theme	Summarized Feedback
Funding & Incentives	• Investments in electric mobility should be balanced with investments in transit (including electrification of buses) and active transportation infrastructure, and the ultimate goal should be to reduce the amount of travel by car. • Electric vehicles are relatively expensive and incentives should be provided, particularly for low-income people. There should be support for the purchase of used EVs, and higher priced EVs should not be subsidized. EVs have lower operating and maintenance costs, which increase affordability. • While incentives for e-bikes could encourage people to adopt e-bikes, incentives could also be provided for pedal bikes. Some people felt that pedal bikes should be encouraged over e-bikes. • The existing financial incentive program is generally not helping stratas in greater Victoria, and it would be good to have funding available for stratas that are keen to install charging but are not currently eligible for funding.
Safety	• The biggest barrier to biking is the lack of safe bike routes, including in rural Saanich. • There is concern about the impact of e-bikes on the safety of other active transportation users due to the higher speeds of e-bikes, and suggestions that they should be segregated from other active transportation. • There is a need for secure parking for e-bikes, because of the prevalence of bike theft and the higher price of e-bikes. • Actions to support electric mobility should not penalize people who are not able to make the switch to EVs or e-bikes.
EV Infra-structure	• New requirements for bike infrastructure will impose installation costs as well as ongoing costs for energy. • The market for new residential housing is already providing e-bike and EV charging in response to demand. • Strategies are needed for other kinds of electric mobility, including electric scooters, electric wheelchairs, electric skateboards, and four-wheeled vehicles that travel at lower speeds than cars. • There is a need for EV-charging in or near multi-family residential buildings. • Requirements for making new developments EV-ready help provide this charging capacity, but add to the cost of residential buildings, impacting affordability. • There is a need to expand the network of public charging stations; the District's public charging stations are often in use and not available. • Generally support for user fees for public charging stations. • There is a need for more fast-charging stations, to support long-distance travel, accommodate anticipated future expansion of the number of EVs, and encourage more people to switch to EVs. • There is an opportunity to install solar and/or wind generation in Saanich to support charging of electric vehicles.
Parking	• Several people cautioned against reducing the amount of parking available, for instance to accommodate e-bike parking. Priority parking for EVs could generate resentment from non-EV owners and is probably not needed. Access to HOV lanes might be a good non-financial incentive for switching to EVs. • A few people felt that the District should not provide free parking for staff.

Part 2 Engagement: Feedback on Draft Strategy

Feedback received from the public and stakeholders was used to refine the actions and make additions. These were then incorporated into a draft Electric Mobility Strategy which was reviewed by staff in several District of Saanich departments in addition to staff from the Capital Regional District and the City of Victoria because several of the actions involve or affect these jurisdictions.

Members of the public and stakeholders were then invited to provide feedback on the draft strategy via an online survey (Saanich Draft Electric Mobility Strategy Survey) from September 8 - 27, 2020.

The second survey received 196 responses, four of which were on behalf of organizations, and the remainder of which were from individuals. Three written responses were also received, one of which was from a stakeholder organization. In addition, presentations were made to three Saanich Advisory Committees:

- Planning, Economic Development & Transportation Advisory Committee on 10 September, 2020
- Environment & Natural Areas Advisory Committee on 16 September, 2020
- Active Transportation Advisory Committee on 22 September, 2020

Overall, there continued to be a high level of support for the actions within the strategy, with all but one action having the support of at least 70% of respondents and several having over 90% support (see Figure 2). Respondent were also able to provide comments on each section, which are summarized in Table 2.

Detailed engagement results can be found in the Electric Mobility in Saanich: Engagement Summary report, September 2020.

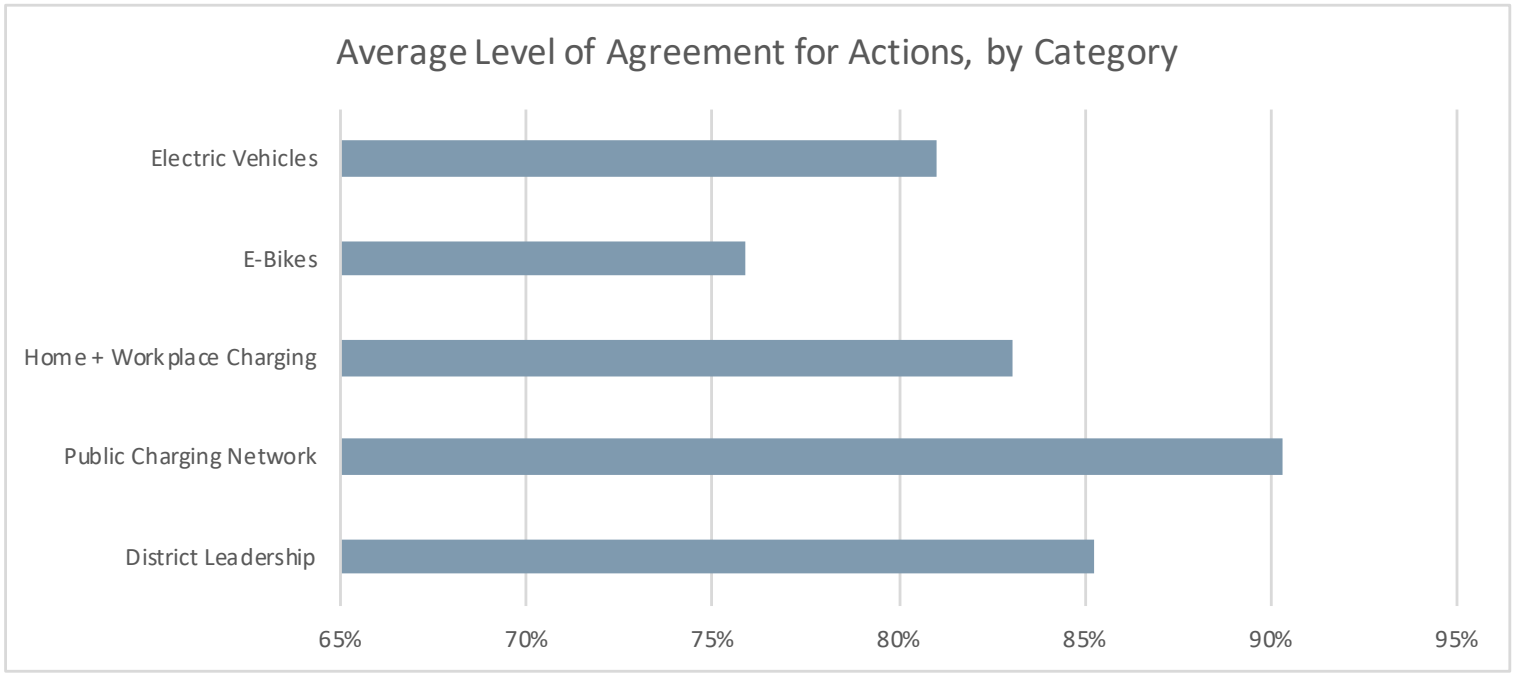


Figure 2: Level of support for draft actions, by category (Saanich Electric Mobility Strategy Survey)

Table 2: Summarized feedback from Saanich Draft Electric Mobility Strategy survey

Theme	Summarized Feedback
E-Bikes	• Concern over conflicts between trail users (e-bike users and pedestrians), with some suggestions about posting and enforcing speed limits on congested trails. • Divergent views on the benefits of lowering speed limits on residential streets – many were strongly supportive, many were opposed. • Suggestion to offer e-bike and cycling skills courses to address safety. • Concern over bike theft was noted by many participants. • Strong support for continued implementation of bike infrastructure, noting that this helps e-bikes and conventional bikes as well.
Electric Vehicles	• A very high level of support for Provincial/Federal incentives (for EVs as well as e-bikes and charging infrastructure). • Concern that higher income households will benefit disproportionately from EV investments. • A lot of interest in the potential for EVs as backup power storage. • Reminder that active transportation and public transit should be prioritized over private vehicle ownership. • Concern that EV uptake is limited by supply (not enough EVs on the lots or long wait times). • Mixed feedback on the need for communications and outreach – some felt it was very important, while others felt that it would be an ineffective strategy and/or that information on EVs is already widely available.
Home and Workplace Charging	• Actions to help multi-unit residential buildings (education, incentives, better access to public charging etc.) were strongly supported and identified as an important need by many respondents. • The need for legislative change (e.g. “Right to Charge”) to help multi-unit buildings install charging was identified as an elevated priority by many, while a few felt this was overly involved in matters of private property. • Concern about need for increased panel size or electrical capacity in existing buildings. • Concern about the capacity of the electrical grid and desire for more off-grid power generation to complement increased demand. • Suggestion that Saanich advocate to BC Hydro that rate structures and incremental upgrade costs don’t hinder the shift to electrification. • Suggestion that Saanich advocate to Measurement Canada to certify EV chargers and thereby enable costs to be recuperated by kWh.
Public Charging Network	• High level of support for increased public charging opportunities. • Desire for a more harmonized payment system for public EV stations. • Desire to introduce a fee for charging and enforce time limits at Saanich’s public EV stations.
District Leadership	• Desire for Saanich to lead by example through their own fleet as well as encouraging sustainable commuting choices for their employees. • Concern that a municipal e-bike fleet would be underutilized by staff.
Overall Strategy Content	• Some felt the actions were not bold or ambitious enough to reach our climate targets. • Several respondents raised questions about battery lifespan and recycling. • Most respondents felt the background information was useful and sufficient.

3.0 What is electric mobility and why is it important?

In this strategy, "electric mobility" refers to the use of electric cars, electric bikes, electric scooters, electric skateboards, and other electric-powered machines to get around. This strategy focuses on electric vehicles (EVs) and electric bikes (e-bikes) because they are most prevalent, but other forms of electric mobility should not be overlooked as the E-Mobility Strategy actions are implemented.

Electric mobility is critical for reducing greenhouse gas emissions and combating climate change. Electric mobility has other benefits too, including:

- Increased affordability;
- Improved air quality;
- Reduced noise;
- Health benefits when using e-bikes and other forms of electric mobility.

These benefits are discussed in more detail below.

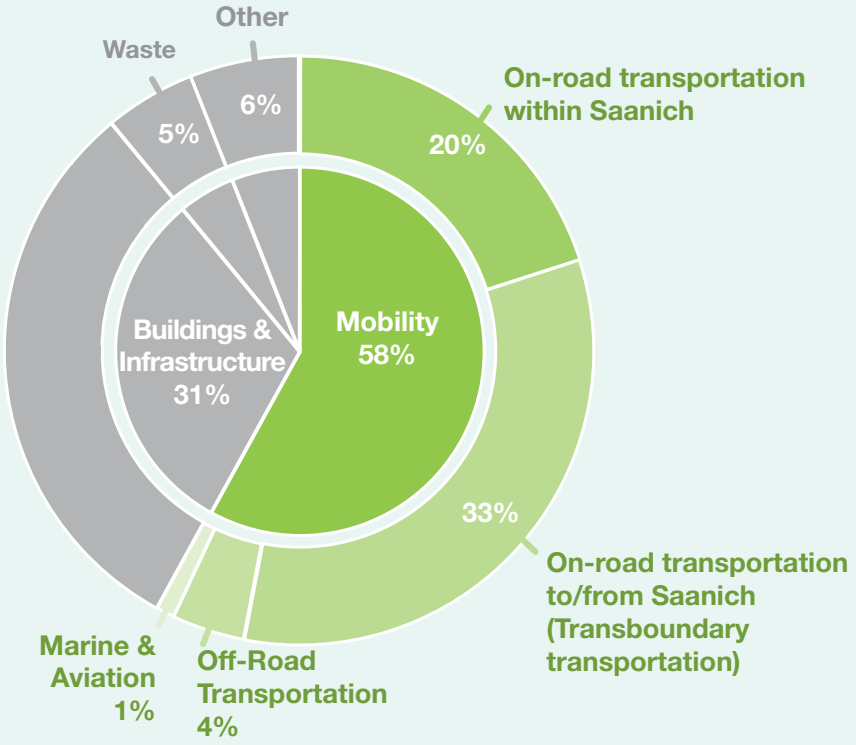


Figure 3: GHG emissions in Saanich by source, 2017

3.1 Climate action: reducing greenhouse gas emissions

To combat climate change, Saanich has set targets to reduce our community's greenhouse gas (GHG) emissions by 50% by 2030 and reaching net-zero emissions by 2050.

The District of Saanich is focusing resources on implementing the Active Transportation Plan. In addition, the Climate Plan includes actions to advocate for BC Transit and the Province of BC to improve transit service and electrify the transit fleet in order to encourage residents to use other, more sustainable modes of transportation. However, in Saanich's mixed rural and urban community, most travel is still by personal vehicle and on-road transportation is the largest source of Saanich's GHG emissions, accounting for more than half (53%) of emissions in 2017 (Figure 3).

As a result, the 2020 Climate Plan identifies the transition to electric vehicles as the most important strategy for reaching Saanich's GHG emission reduction goals, and could reduce community wide GHG emissions by 19% by 2050 (Figure 4).

This would require that:

- By 2030, 36% of all passenger vehicles are EVs; and
- By 2050, all personal and commercial vehicles are powered by electricity or other renewable fuels.

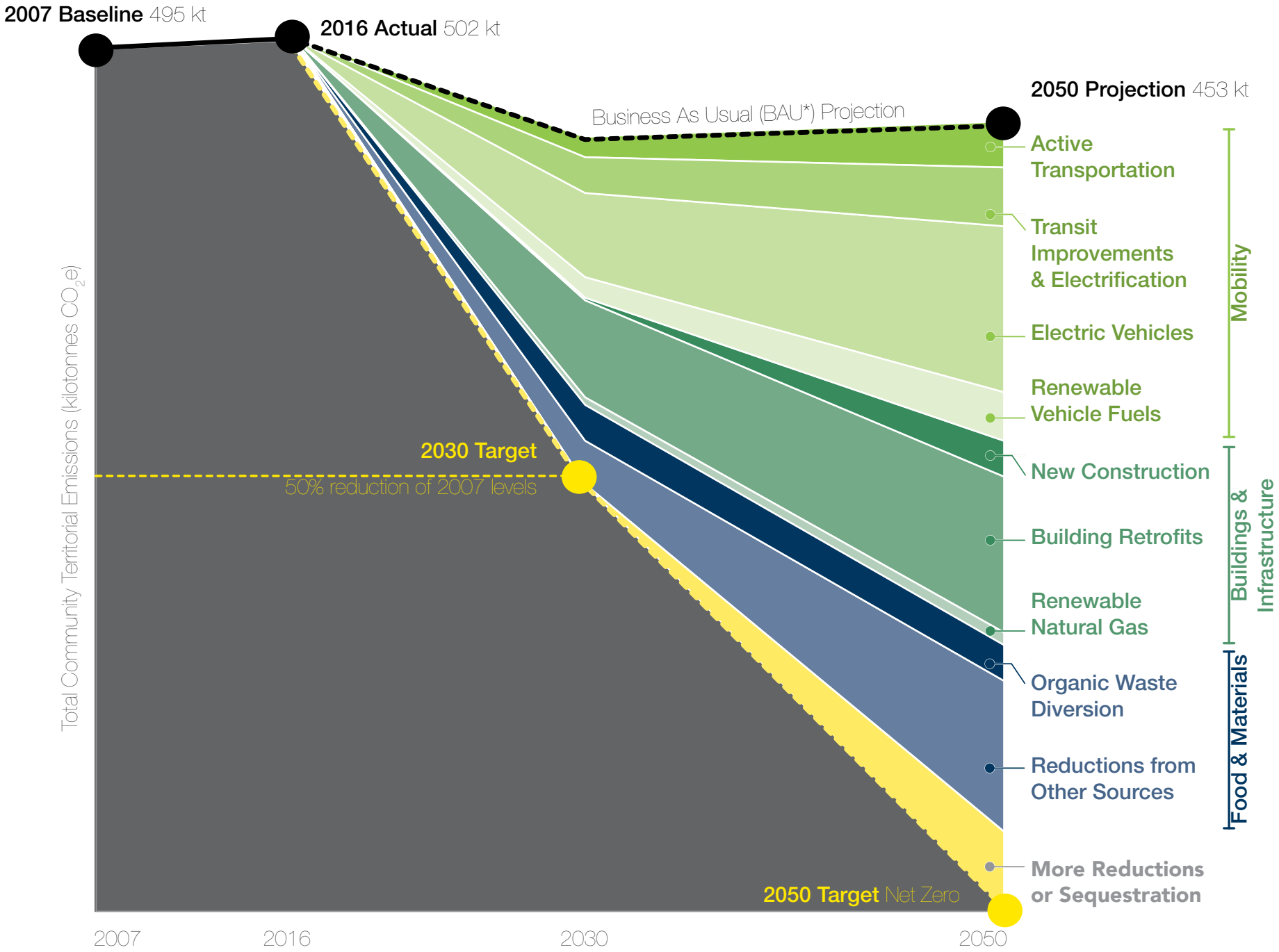


Figure 4: Modeled pathway to reach net zero GHG emissions in Saanich by 2050

In 2019, nearly 2% of passenger vehicles in Saanich were electric, and EVs accounted for 12.5% of passenger vehicle sales. Between 2017 and 2019, the rate of growth for EV sales was between 155 and 170%; a 125% rate of growth will need to be sustained in order to meet our targets:

- By 2025, 48% of new passenger vehicle sales will need to be electric
- By 2030, 100% of new passenger vehicle sales will need to be electric
- In this model, 100% of passenger vehicles will be electric by 2043.

This is consistent with the expectation that the purchase price of EVs will continue to drop and achieve parity with internal combustion engine cars around 2025[2].

Why are GHG emissions so low for electric vehicles?

Currently, BC Hydro electricity is 97% renewable, so a car powered by BC Hydro electricity has much lower GHG emissions than a gasoline-powered car (Figure 5). Additionally, electric engines are approximately 5 times more efficient than internal combustion engines, reducing energy use overall.

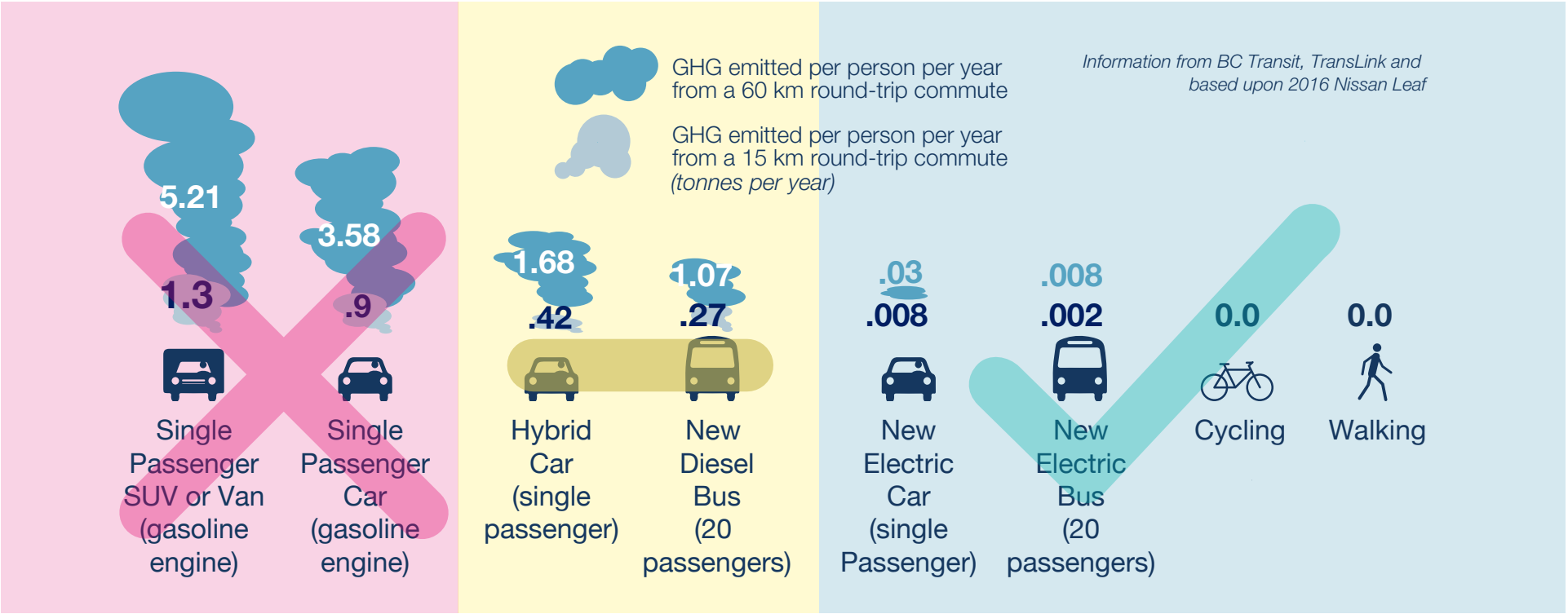


Figure 5: GHG emissions per trip for different modes of transportation

[2] International Council on Clean Transportation. April 2019. Update on electric vehicle costs in the United States through 2030.

3.2 Increased affordability

Personal vehicle affordability

While electric vehicles currently tend to cost more than comparable gasoline- or diesel-powered vehicles, they are cheaper to operate. This is for two reasons:

- The fuel cost is lower – for example, the fuel cost of driving 20,000 km per year in a Nissan Leaf EV is $490. It is more than three times that ($1,800) for an equivalent gas-powered vehicle; and
- Less need for maintenance – EVs have fewer and simpler components, they do not require oil changes, and regenerative braking means that EV brakes wear down much less.

An analysis by BC Hydro found that the total cost of ownership of three 2018 EV models was lower than the total cost of three comparable gas-powered vehicles (Table 3).

Table 3: Total cost of ownership (excluding depreciation) for first 5 years of car ownership (2018 vehicles)[3]

Electric	vs	Gas-powered
Chevrolet Bolt	$999 less than	Chevrolet Spark
Kia Soul EV	$1,736 less than	Kia Soul
Nissan Leaf	$1,465 less than	Honda Civic

It is expected that EV prices will fall over time, becoming the same as gas-powered vehicles by about 2025.[4] Added to the already low operating cost, this means that EVs will be more affordable than gasoline- or diesel-powered vehicles. Comparative lifespan and resale value data will become more available in coming years.

Figure 6 summarizes the improved efficiency and lower operating costs of electric vehicles.

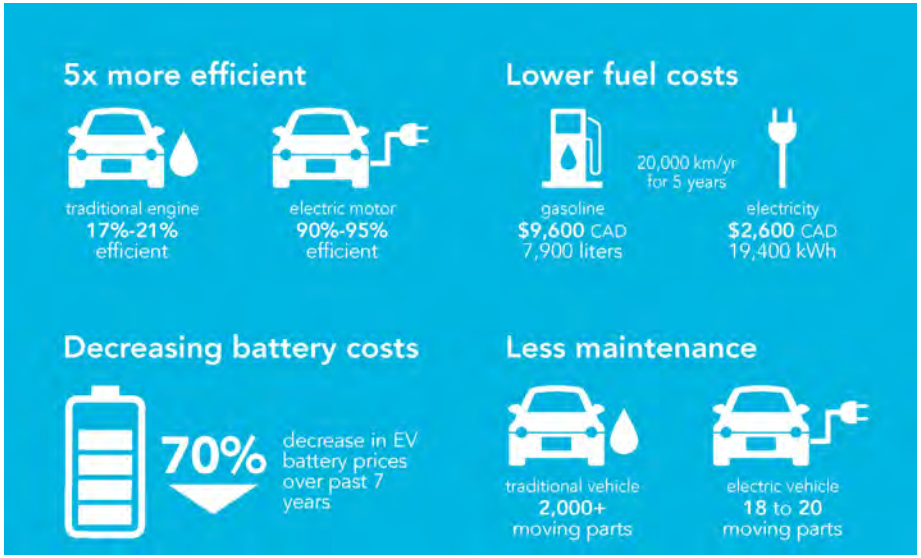


Figure 6: Increased efficiency and lower costs of EVs (Credit: C2MP)

[3] Source: Unplugged: Myths block road to the electric car dream, BC Hydro, April 2018: p. 5
[4] BloombergNEF, 2019. "Electric vehicle outlook 2019."

Fleet vehicle affordability

Businesses and other organizations such as local governments and school districts have fleets of vehicles that they use for a variety of purposes. The intensive use of fleet vehicles means that the business case for electric fleet vehicles can be strong and the potential use of these vehicles by multiple people can increase awareness and familiarity with EVs.

As an example of the savings that could be realized from switching to electric fleet vehicles, EV suitability assessments of 12 fleets that participated in the BC Fleet Champions Program found opportunities for switching to EVs that could result in a total cost saving of $3.8 million across the 12 fleets.[5] The average EV studied would save more than $2,800 in costs of ownership, 4.72 tonnes of GHG emissions, and more than 1,500 litres of fuel every year (Table 4).

Another example of the potentially strong business case for switching to electric fleet vehicles is an analysis of the maintenance cost savings of New York City's (NYC) electric fleet vehicles (Table 5). This comparison shows that the maintenance costs of the battery EVs were 80% lower than the gas-powered vehicles.

3.3 Cleaner air and quieter streets

EVs do not burn fossil fuels, so they do not create exhaust-related air pollution such as particulates or smog. Like other motor vehicles, wear of the tires and brakes of EVs and of the road surfaces they drive on create particulate air pollution. However, the regenerative braking of EVs means that their brakes have less wear than other vehicles.

Because EVs do not have an internal combustion engine, they are much quieter than gasoline- or diesel-powered vehicles.

Table 4: BC Fleet Champions EV Suitability Assessment Results (2016-2018)[6]

Number of fleets	12
Number of vehicles included in study	242
Number of electric vehicles recommended	148
Share of vehicles with a suitable EV option	61%
Total potential cost of ownership reduction	$3,814,090
Total potential GHG reduction	6,113 tons
Total potential fuel reduction	1,993,993 litres
Average savings per vehicle per year: • Cost of ownership savings • GHG emission reduction • Fuel savings	 $2,831 4.72 tons 1,539 litres

[5] Source: https://pluginbc.ca/wp/wp-content/uploads/2018/06/FBC-Summary-Sheet-June-27-2018.pdf

[6] Source: https://pluginbc.ca/wp/wp-content/uploads/2018/06/FBC-Summary-Sheet-June-27-2018.pdf

Table 5: NYC fleet maintenance cost comparison (2018)[7]

Model	System	Number	Maintenance cost
Bolt	BEV	93	$204.86
Focus electric	BEV	7	$386.31
Leaf	BEV	149	$344.14
Focus	gas	11	$1,805.24
Fusion	gas	62	$1,621.34
Taurus	gas	38	$922.67
Fusion hybrid	hybrid	205	$1,310.89
Prius	hybrid	1131	$893.31
Volt	PHEV	43	$1,210.40
Fusion energi	PHEV	154	$496.73

[7] Source: "Reducing Maintenance Costs With Electric Vehicles," NYC Fleet Newsletter, Issue 255, March 8, 2019.

[8] Elmira Berjisian and Alexander Bigazzi, 2019. "Summarizing the Impacts of Electric Bicycle Adoption on Vehicle Travel, Emissions, and Physical Activity." REACT (Research on Active Transportation) Lab, University of British Columbia.

3.4 Benefits of e-bikes

Personal e-bikes

E-bikes can be used by a greater range of ages and capabilities than conventional bicycles. They can also be used for trips that are less likely to be made on conventional bikes – for long trips, for routes with steep hills, or for hauling young children or cargo.

A 2019 report by UBC researchers summarizes the findings of multiple studies over the past decade on the impacts of e-bikes and estimates that one e-bike could displace 1,980 km of vehicle travel and 520 km of transit travel per year, saving 0.46 tonnes in GHG emissions per year.[8]

This increases the accessibility of cycling to a much larger audience and provides them with the advantage of active transportation health benefits. In addition, there is the opportunity, particularly with e-cargo bikes, for an e-bike to replace the purchase of a car or family vehicle. This has considerable cost benefits both in terms of the upfront purchase costs and annual fuel and maintenance.

Fleet e-bikes

In urban areas where there is traffic congestion and limited parking and curbside access, e-bikes can be a cost-effective solution for deliveries. This is discussed in more detail in the "Fleet e-bikes" section in Chapter 5: The role of EVs and e-bikes in a sustainable transportation system.

4.0 Electric mobility 101

4.1 Electric vehicles[9]

An electric vehicle (EV) is an automobile that uses an electric motor as a source of propulsion.

There are four main kinds of electric vehicles:

1. Battery electric vehicle (fully electric) (BEV):
   A BEV relies completely on the electric battery and motor to propel the car. These vehicles store electricity onboard with battery packs, and are powered by electricity from an external source by plugging into an outlet or charging station.
2. Fuel cell vehicle (FCV)
   An FCV is an electric vehicle that uses a fuel cell instead of a battery to power its on-board electric motor. These vehicles are fueled with hydrogen.
3. Plug-in hybrid electric vehicle (PHEV):
   PHEVs have a two-part drive system, and are equipped with an electrical drive and battery storage capacity, in addition to an internal combustion engine (generally with larger battery storage and a smaller engine than Hybrid Electric Vehicles). The batteries can be recharged by plugging into an electrical outlet, as well as via a gas-powered alternator and/or by regenerative braking.

   Extended range electric vehicle (EREV) are a form of plug-in hybrid electric vehicle (PHEV), but the gas engine functions as a generator (alternator) to charge the battery rather than propelling the vehicle. Generally, EREVs will drive exclusively in electric mode until the battery is depleted; at that point, the gas generator will kick in to keep the battery charged until the car plugs in.
4. Hybrid electric vehicle (HEV):
   An HEV is a “traditional” or “conventional” hybrid, and has a two-part drive system: a conventional fuel engine and an electric drive. These vehicles do not plug in; electrical energy is generated via an alternator or regenerative braking.

The different kinds of electric vehicles (except FCVs) are summarized in Figure 7.

Figure 7: Different kinds of electric vehicles. Credit: C2MP

A commonly-used term is zero emission vehicle (ZEV), which refers to electric vehicles with no tailpipe emissions (BEVs and FCVs). However, ZEV is also often used as a catch-all; for example, government ZEV mandates generally categorize PHEVs and EREVs among ZEV vehicles, though these have combustion engines.

[9] Definitions in this section are taken from C2MP and Fraser Basin Council, 2018. Residential Electric Vehicle Charging: A Guide for Local Governments. City of Richmond.

4.2 EV charging infrastructure[10]

Plug-in electric vehicles (BEVs and PHEVs) can be charged by plugging them into a regular outlet (Level 1 charging) or into an EV charging station. There are two kinds of EV charging stations: Level 2 or Direct Current Fast Charging (DCFC).

Level 1 charging uses a standard house plug (120V) and provides the slowest charging, at about 3-8km of range per hour of charge time. When charging cars overnight (8–10 hours), Level 1 chargers can fully recharge most PHEVs and "top up" a BEV from a typical work commute.

Level 2 charging uses a dedicated 208V or 240V circuit like those used for clothes dryers. Level 2 chargers are generally the preferred option for home charging. Level 2 is also appropriate in public locations where cars generally park for one or more hours, which allows EV owners to top up their charge while shopping, recreating, or working.

DC fast charging stations can provide 125km or more of range per half hour of charging. DCFC charging is generally not considered suitable for residential installations due to the high cost of equipment, installation, and power requirements. Not all electric vehicles can plug into a DCFC charger.

The different kinds of EV charging infrastructure are summarized in Figure 8.

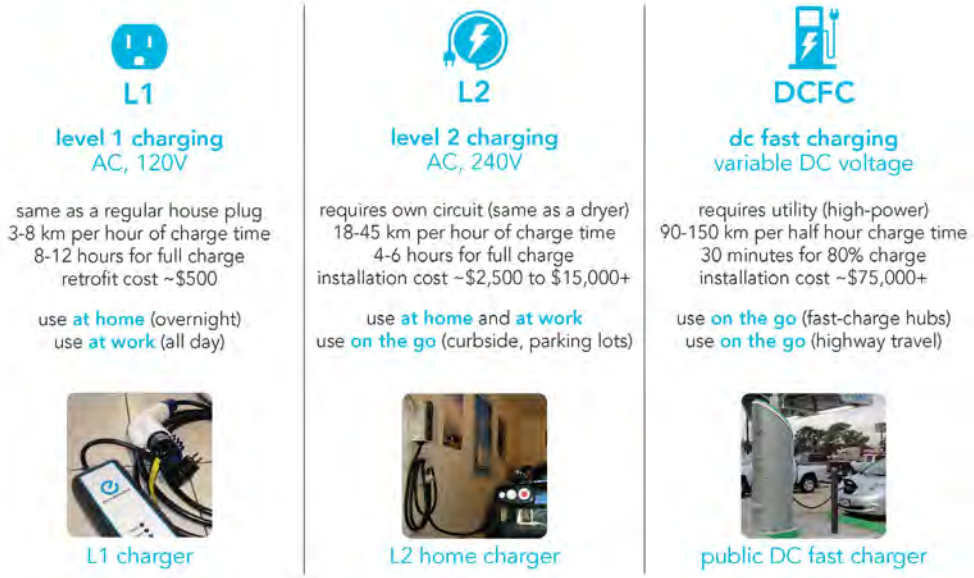
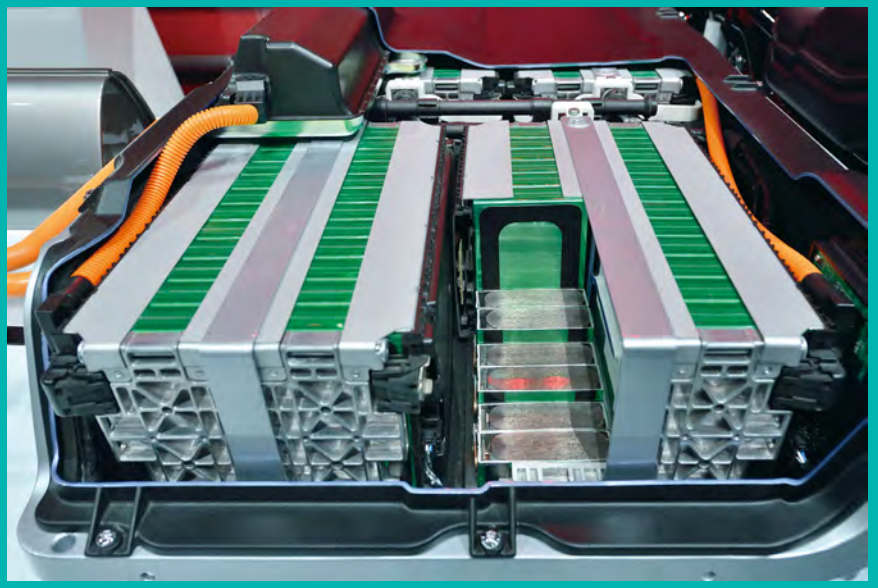


Figure 8: Different kinds of EV charging infrastructure.



What about the batteries?

Battery life is an important consideration for many buyers, as are the environmental concerns about what happens to the batteries at the end of their useful life. As vehicles have come out with larger battery packs, and advancements have been made in battery technologies, it is now expected that an EV battery will last the lifespan of the vehicle. Geotab, a leading telematics firm analyzed data from over 6,000 EVs of various makes and model years and found that average battery degradation was about 2.3% per year across all EV types.

The market is growing for "second-life" applications of EV batteries, such as stationary energy storage (e.g. for off-grid or peak demand uses). There is currently a market for lithium-based battery recycling, although not yet at the capacity and efficiency needed for the projected scale. However, the value of these batteries' minerals and materials are driving a lot of activity in this space. There is a role for higher levels of government to ensure extended producer responsibility and ensure reuse or recycling for EV batteries at the end of their useful life.

[10] Definitions in this section are taken from C2MP and Fraser Basin Council, 2018. Residential Electric Vehicle Charging: A Guide for Local Governments. City of Richmond.

4.3 Electric bicycles

Electric bicycles or e-bikes are classified as "motor-assisted cycles" in BC's Motor Vehicles Act. To be considered a motor-assisted cycle, an e-bike must have:

- an electric motor of 500 watts or less;
- functioning pedals; and
- a maximum speed of 32 km/h without pedalling.

In BC, a motor-assisted cycle can be operated without license plates or insurance. The person operating it does not need to have a driver's license, but must be at least 16 years old and must wear a helmet.[11]

There are three different classes of e-bikes:[12]

1. Pedal Assist (also known as "pedelecs") bikes automatically provide power (or assistance), which can be increased depending on the conditions (i.e. for going up steep grades or pedalling against a strong headwind).
2. Power-On-Demand systems only provide power when initiated by the user using a throttle typically integrated into the handgrip.
3. Hybrid systems combine both the automated pedal-assist sensor and the option to manually engage the motor by utilizing the throttle.

[11] More information is available on the ICBC website: https://www.icbc.com/vehicle-registration/specialty-vehicles/Low-powered-vehicles/Pages/Electric-bikes.aspx

[12] Definitions are modified from WATT Consulting Group, 2018. "Capital Region Local Government Electric Vehicle (EV) + Electric Bike (e-bike) Infrastructure Planning Guide." Prepared for Capital Regional District. November.

4.4 Other kinds of electric mobility

There are a growing number of electric micro-mobility options, a selection of which are described below.

Electric-powered mopeds and scooters

Electric-powered mopeds and scooters are classified as "limited speed motorcycles" in BC. They have an electric motor that is less than 1,500 watts and go a maximum speed of 70 km/h. Limited speed motorcycles must be licensed, registered and insured and the operator must have a driver's license and wear a motorcycle helmet.

Electric mobility scooters

Electric-powered mobility scooters or motorized wheelchairs help people with mobility challenges to get around. In BC, motorized wheelchairs do not have to be licensed or insured and the operator does not need to have a driver's license. Motorized wheelchairs can be used on sidewalks or roads, following the same rules as pedestrians.

Mini motorcycles

Mini motor vehicles, which are also called pocket bikes or mini choppers, cannot be used on roads in BC because they do not meet federal safety standards for use on public roads.

Electric skateboards and scooters

Electric skateboards have an electric motor that is usually placed under the deck or inside the wheels and the speed is controlled by a hand-held wireless device. Electric skateboards generally have top speeds between 15 and 50 km/h.

Electric scooters are kick or push scooters with an electric motor. They have handlebars and a deck and the operator stands on the deck.

Electric skateboards and scooters cannot be used on roads or sidewalks in BC because they do not meet provincial safety standards. They can be used in places where BC's Motor Vehicle Act does not apply, such as private property that does not have public vehicle access or on trails when permitted by a municipal bylaw.[13]

Electric unicycles

Electric unicycles have an electrically-propelled wheel with foot supports on either side. They generally can travel between 25-50 km/h. Similarly to electric skateboards and scooters, electric unicycles cannot be used on roads or sidewalks in BC.

[13] https://www.icbc.com/vehicle-registration/specialty-vehicles/Low-powered-vehicles/Pages/Motorized-scooters-and-skateboards.aspx

Provincial pilot projects

The Province of BC has recently amended Part 13 of the BC Motor Vehicle Act (BC MVA) to allow pilot projects that would research, test, and evaluate new regulatory approaches to matters not currently set out in the MVA framework. Pilot projects provide opportunities for the Province to work with local governments to support active transportation and improve road safety.

In early 2020, the Province announced the first phase of pilot projects focused on the use of emerging zero-emission mobility devices such as electric scooters. The Motor Vehicle Act Pilot Project Proposal outlines the process and timelines for pilot projects, which are initiated by local governments through an application process to Ministry of Transportation and Infrastructure (MOTI) and may remain in force for a maximum of 3 years to promote the goals of research and evaluation. While the District of Saanich is not participating in this first pilot phase, the results from other pilot projects will be useful to:

- understand the potential of new and emerging transportation modes to move people safely and efficiently while reducing traffic congestion; and
- test and evaluate how to regulate micro mobility devices at a local level under local authority over streets and traffic.

Municipalities in British Columbia have the authority to regulate speed limits on their roadways, although they do not currently have the authority to change the default speed limit under the BC MVA. Should a Phase 2 intake for Motor Vehicle Act Pilot Projects occur, Saanich staff are hopeful this will include the potential for pilot speed limit reductions on specific roads. In preparation for this potential opportunity, the District of Saanich is exploring the opportunity to form a proposal to MOTI for a pilot project that would set the statutory speed limit to 40km/h on streets without a yellow directional dividing line, mainly residential streets. Staff are also exploring the possibility of collaborating with the Capital Regional District (CRD) and other regional municipalities on such a project.

Reducing speed limits has many benefits, including reducing vehicle operating speed and improving community livability, but most notably it improves road safety, particularly for vulnerable road users such as pedestrians, cyclists, and motorcyclists. The largest safety risk for vulnerable road users is the potential for collisions with motor vehicles and the risk of serious injury and death from a collision increases with increased speed. As with phase 1 pilot projects, the results of any pilot would be useful in understanding the potential impact of statutory speed limit reductions to assist with future policy and legislation.

5.0 The role of EVs and e-bikes in a sustainable transportation system

Electric Vehicles (EVs) and e-bikes are part of a sustainable transportation system, which involves:

- **creating complete communities to reduce the need for vehicle travel;**
- **shifting transportation choices from single-occupant vehicles to walking, biking, transit, and ride-sharing;**
- **improving the efficiency of vehicles as well as how we use them, for instance through right-sizing vehicles to the need; and**
- **switching the fuel used in vehicles to low-carbon renewable choices such as electricity.**

Saanich's Electric Mobility Strategy reflects the role of EVs and e-bikes in a sustainable transportation system, and the important role that local governments play in supporting their adoption. However, the Climate Plan contains additional and complementary actions to support the elements of a sustainable transportation system that are not covered within this strategy.

5.1 Sustainable transportation modes

Active transportation

Walking, cycling, wheeling, and other human-powered forms of transportation (often referred to as "active transportation") are the most sustainable modes of transportation. They have no GHG emissions (except for the GHG emissions associated with constructing, maintaining and disposing of the bike, for example, or the related infrastructure such as roads and sidewalks, etc.) and they also support health, safety, equity, community building and local businesses.

E-bikes are part of active transportation. Although there are some small GHG emissions associated with their operation (from the electricity used to charge their batteries, which in BC is 97% renewable), e-bikes otherwise have all the benefits of active transportation and can make cycling possible for more people and more trips. Other kinds of electric active transportation include electric scooters and electric skateboards. Electric wheelchairs and scooters improve accessibility and make active transportation more feasible for people with mobility challenges.

Public transit is the next most sustainable form of transportation. Transit moves more people using less space and resources than personal vehicles, making transit essential for moving people efficiently in urban areas. Even for buses that are fueled by diesel or gasoline, the fuel (and GHGs) per person for a trip by bus is less than for the same trip by single-occupant vehicle (unless there is extremely low ridership). The case for public transit is even stronger when the buses are powered by BC Hydro electricity, which is 97% renewable. BC Transit has a target of a fully electric fleet by 2040 and plans to start purchasing only electric heavy-duty buses starting in 2023.

Saanich's Active Transportation Plan includes transit. Strategy 1G.7 of the plan explains:

> *"There are several reasons why integrating transit with walking and cycling is important, including the fact that most people using transit are accessing it by foot or by bicycle. As a result, improving access and connections to transit for people walking and cycling and improving the customer experience at bus stops and exchanges can help to not only promote transit but also to encourage more walking and cycling."*

Integration of different transportation modes can support sustainable transportation choices. One example is to provide end of trip bike facilities (such as secure bike parking and e-bike charging) at major transit stations or park-and-ride lots. Another is to locate sharable bikes or e-bikes next to EV charging stations, so that drivers can use a bike for trips they need to make while their EV is charging.

Active transportation and transit targets

Saanich's Active Transportation Plan establishes a vision, goals and targets to improve walking, cycling and other active mobility options in Saanich and will guide Saanich's investments in active transportation over the next 30 years.

In 2016, 6% of trips in Saanich were made by walking, 6% by bike, and 12% by transit. The Active Transportation Plan aims to increase these shares, so that half of all trips in 2050 are made by active transportation (Figure 9).

Saanich's new Climate Plan has additional and complementary strategies and actions for sustainable mobility including investing in active transportation, prioritizing transit-supportive policies and practices, and accelerating electric and renewable mobility. The Climate Plan also calls for accelerating the 2036 active transportation target so that it is achieved by 2030. This is necessary if we are to meet our climate targets of a 50% reduction in community wide GHG emissions by 2030.

In January 2020, Saanich Council approved accelerated implementation of the Active Transportation Plan as one of seven accelerated actions in response to the Climate Emergency declared by Saanich Council in March 2019.

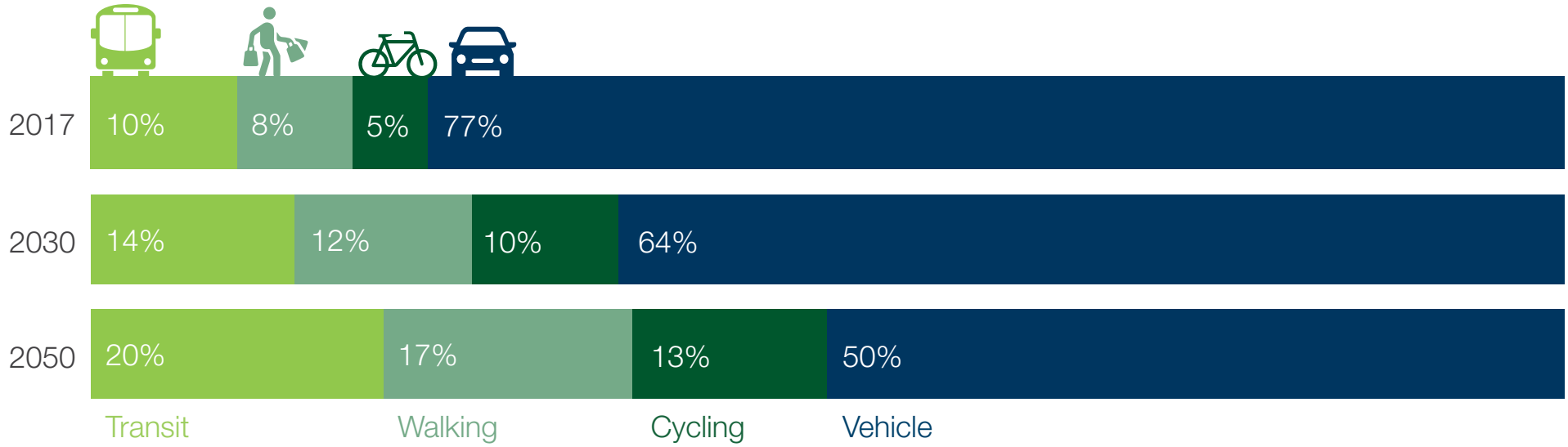


Figure 9: Accelerated Active Transportation Targets in Saanich Climate Plan

Private vehicles and car-sharing

If people need to travel by personal vehicle, the GHG emissions are much lower when those vehicles are electric. Investing in EVs can also improve air quality and reduce noise pollution in the community.

Car sharing, such as through Modo or ZipCar, reduces the need for people to purchase and maintain their own vehicles and can provide more affordable transportation choices. Because car-share vehicles tend to be used more intensively, the business case for switching to EVs can be stronger for car share vehicles than for private vehicles. Additionally, car-share vehicles are used by many people, providing an opportunity for those people to gain familiarity and experience with driving an electric vehicle.

However, access to charging is a challenge for car shares because the charging infrastructure is an additional capital expense, adding to the already generally higher up-front cost to purchase an EV compared to an internal combustion engine vehicle. And the need to access charging may place constraints on where car share EVs can park, for example only at car-share parking spaces with EV chargers rather than any car share parking space. Moreover, while an EV is charging it is not available for use and the more kilometres EVs are driven, the more charging they need.

Ride-sharing

Ride-sharing includes carpooling, taxis, and ride-hailing services such Uber and Lyft. In the CRD, new or expanded taxi fleets must be eco-friendly vehicles, which are defined to include electric and gas-electric hybrid vehicles as well as any vehicle that meets fuel-efficiency requirements. Carpooling and ride-hailing services rely on private vehicles, which can be electric, gas or diesel-powered, depending on the owner's preference.

Because taxis and ride-hailing services must travel to pick up passengers, they travel more distance than a personal vehicle for the same trip. This means that, all else being equal, they will have more GHG emissions and other impacts such as air pollution and congestion than a personal vehicle for the same trip. Pooling rides (where two or more passengers share all or part of a trip) can compensate for the distance driven to pick up passengers – a U.S. study found that if riders share at least half the trip, the climate impacts are the same or less than if they each took a personal vehicle.[14]

Ride-hailing and taxis can have additional negative impacts if they displace trips that otherwise would have been taken by active transportation or transit. However, ride-hailing and taxis can foster the use of transit by providing connections to transit routes from areas with limited local transit, helping to foster low carbon transportation and increase mobility.

The negative impacts of taxis and ride-hailing can be reduced by electrification of these vehicles, and the higher distance traveled by ride-hailing vehicles and taxis provides a good business case for using EVs, due their lower fuel and maintenance costs. Additionally, promoting pooled rides and providing connections to transit can further reduce their negative impacts.

[14] Union of Concerned Scientists, 2020. "Ride-Hailing's Climate Risks." February.

5.2 Fleet vehicles

Electric fleet vehicles

Businesses and other organizations such as municipalities and school districts have fleets of vehicles that they use for a variety of purposes. Like car-share and ride-share vehicles, the intensive use of fleet vehicles means that the business case for electric fleet vehicles can be strong and the potential use of these vehicles by many people can increase awareness and familiarity with EVs.

E-bikes

In urban areas where there is traffic congestion and limited parking and curbside access, e-bikes can be a cost-effective solution for deliveries. An analysis of different scenarios of package delivery methods in the Toronto-Hamilton region of Ontario found that the combination of local micro-hubs for distribution of delivery packages and e-bikes for delivery of those packages was faster and cheaper than use of larger "urban consolidation centres" combined with conventional delivery vehicles (trucks or step vans).[15] This is largely because the e-bikes are easier to park and unload than conventional delivery vehicles. Additional cost savings were achieved because e-bike drivers are typically paid less than drivers of conventional delivery vehicles.

District of Saanich fleet

The District of Saanich has a fleet of 264 vehicles, including 20 garbage trucks and 4 fire engines. In 2014, the electric vehicle pool fleet program was established, replacing older gasoline vehicles with EVs and reducing the total number of vehicles due to car sharing. Saanich now has 19 EVs, including two electric Zambonis. The recent increase in trials of larger EVs and trucks and progress being made on other zero emission fuels will assist with the future replacement plan for our heavy-duty vehicles, which make up the majority of the District's remaining fleet.

Saanich's new Climate Plan has several actions related to the District's fleet, including converting all light duty vehicles to zero emission vehicles, developing a fleet strategy to reduce the emissions from medium and heavy duty fleet vehicles and developing an e-bike fleet program. These actions are also included in this Electric Mobility Strategy.

[15] Janelle Lee and Carolyn Kim, 2019, "Delivering Last-Mile Solutions: A Feasibility Analysis of Microhubs and Cyclelogistics in the GTHA," Plan Canada. Fall 2019: pp. 43-47.

5.3 Equity

A sustainable transportation system provides safe, affordable, convenient and reliable mobility for everyone. In developing and implementing policies and actions to support electric mobility and sustainable transportation, it is important to evaluate their equity implications. Who will benefit from the policy or action? Will it improve mobility for people who have had less access to safe, affordable, convenient and reliable transportation? Will it improve the access to employment, education, childcare and services for the people who need improved access?

This strategy considers how to support the transition to electric mobility in Saanich, including through supporting the uptake of EVs. EVs are only accessible to people with enough money or borrowing capacity to buy them, which means that public investments in infrastructure for EVs, such as public charging stations, really only provide a direct benefit to these people. However, these investments provide an indirect benefit to everyone by reducing the pollution associated with personal vehicles. And, to the extent that they support an expanded market for EVs, they can make EVs accessible to more people through lower prices for new EVs and increased supply of used EVs.

As discussed in the benefits section of this strategy, EVs have much lower operating costs than fossil-fueled vehicles. As the purchase price of EVs becomes comparable to or less than other vehicles (due to purchase incentives or a maturing market), EVs will become an increasingly affordable personal vehicle option. “Price parity” with conventional cars is currently expected to be met around 2025.

Equity considerations can also location choices for new public EV chargers (e.g. close to MURB building types that have more challenges electrifying) and training for local workers to work on EV cars, like through Camosun College’s trades programs.

Other public investments, such as in transit and active transportation, benefit anyone who can get to them. Expanding the active transportation network geographically provides access for more people and improving active transportation infrastructure can increase the safety and enjoyment of using active transportation modes. Investing in transit can provide better access and improved service, helping to improve the quality of mobility for people who use transit and making it a more viable option for getting around.

E-bikes make biking possible for a wide range of ages and capabilities, helping more people to enjoy the benefits of active transportation. However, e-bikes cost considerably more than pedal bikes and may not be an affordable option for some people. Incentives that reduce the purchase price of e-bikes will make them accessible to more people.

While e-bikes cost more than pedal bikes, they are typically only a fraction of the cost of purchasing a car or truck and have very low operating costs, making them a more affordable transportation option than personal vehicles, provided that e-bikes are suitable for the kinds of trips people need to make.

Other forms of electric mobility, such as electric scooters and electric skateboards, provide transportation options that may be more suitable for certain people, or help people to access other modes of transportation.

As the actions in this strategy are implemented, and as new actions and policies are identified, their equity implications will be evaluated. Emphasis will be placed on improving the access to sustainable mobility options for people who have had relatively less access, to help ensure that everyone in Saanich has equitable access to transportation options that meet their needs.

6.0 Electric mobility market conditions

6.1 Provincial and federal government policy on EVs

British Columbia's Zero Emissions Vehicles Act sets targets for the share of zero-emission vehicles[16] in total light duty vehicle sales in BC:

- 2025 - 10%
- 2030 - 30%
- 2040 - 100%

The federal government has set the same targets nationally. These targets help spur auto manufacturers and car dealerships to provide more Zero Emission Vehicles (ZEVs) and help address local supply issues.

The provincial and federal governments also provide incentives (rebates) to help cover the cost of purchasing new and used EVs and e-bikes and installing EV charging infrastructure in homes and workplaces.

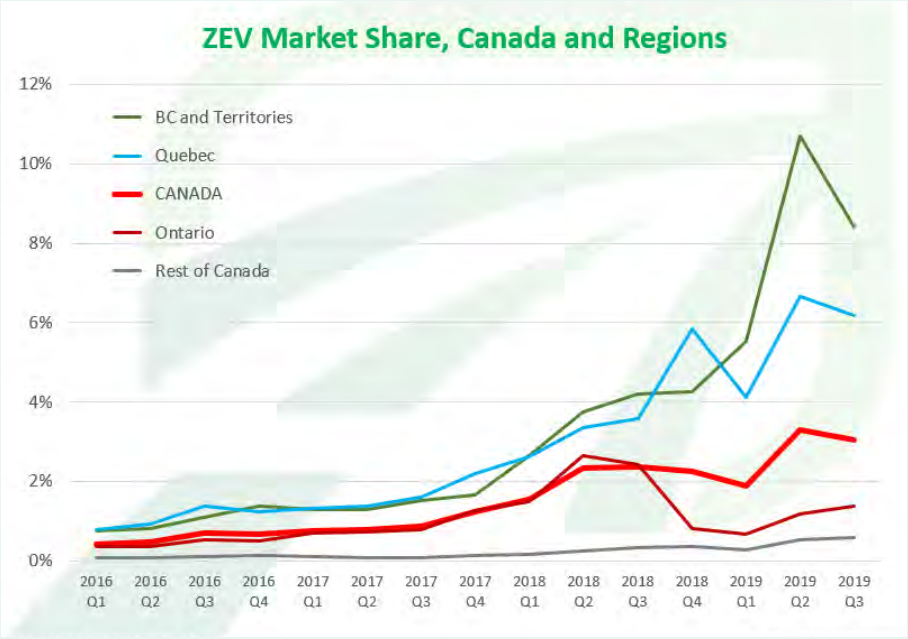


Figure 10: Electric vehicle market share by province
(Source: Electric Mobility Canada, Electric Vehicle Sales in Canada – Q3 2019)

6.2 Trends in EVs and e-bike ownership

Electric vehicles

Worldwide, annual EV sales are more than 2 million/year, with most of the sales in China, Europe, and the U.S.

EV ownership is growing quickly in BC and the rest of Canada. BC leads the rest of Canada in EV market share, with EVs accounting for more than 10% of light duty vehicle sales in BC (including both passenger and commercial vehicles). Canada-wide, EV sales increased by 25% from 2018 to 2019. Figure 10 shows Zero Emission Vehicle (ZEV) market share by province from 2016 to 2019, with BC leading the rest of Canada in ZEV market share.

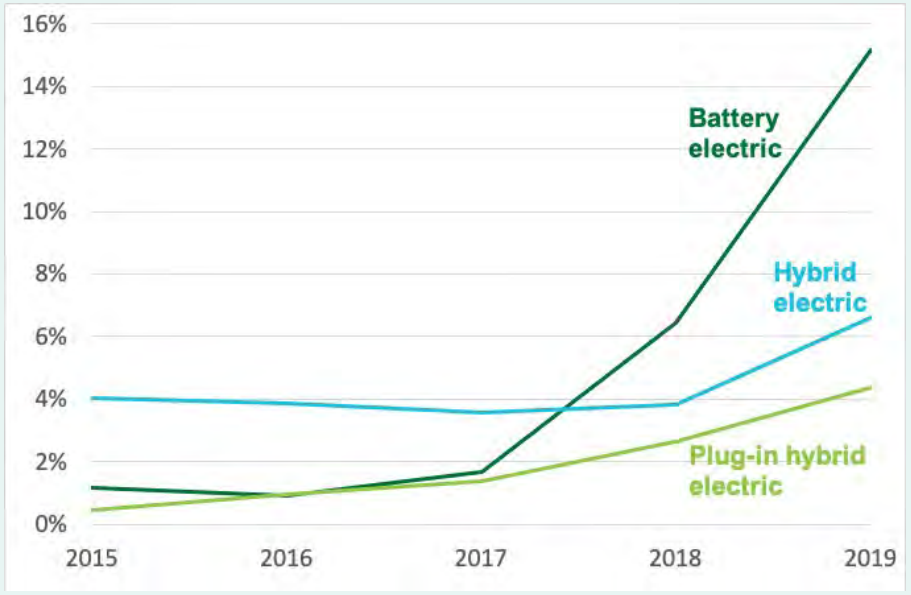


Figure 11: Share of EVs in new passenger car registrations in BC
(Source: Statistics Canada. Table 20-10-0021-01 New motor vehicle registrations)

[16] Under Bill 19, "Zero Emission Vehicle" is defined as being propelled by electricity or hydrogen from an external source, and emitting no GHGs at least some of the time that the vehicle is operated.

Figure 11 shows the share of EVs in new passenger car registrations in BC, broken down by type of vehicle. What is striking in this figure is the huge increase in the share of battery-electric vehicles – from only 2% of new registrations in 2017 to 15% in 2019. What is also apparent is that battery-electric vehicles have overtaken plug-in hybrid and hybrids in market share.

The number of electric vehicles in the Capital Regional District (CRD) grew from only 100 vehicles in 2011 to 1,900 vehicles in 2017 (Table 6). However, EVs still accounted for less than 1% of vehicles in 2017 in the CRD overall.

The number of electric cars in Saanich grew 700% from 2015 to 2019, but still accounted for only about 2% of total passenger cars in 2019 (Table 7).

Table 6: Vehicles by fuel type in the Capital Regional District[17]

	2011		2017	
	Number	%	Number	%
Gasoline	219,700	94.4%	239,000	93.6%
Hybrid (PHEV and non plug-in)	2,800	1.2%	5,300	2.1%
Electric (ZEV)	100	0.0%	1,900	0.7%
Diesel	9,900	4.3%	8,200	3.2%
Biodiesel	300	0.1%	400	0.2%
Other or unknown alternative fuel	0	0.0%	500	0.2%
Total	**232,800**	**100.0%**	**232,800**	**100.0%**

Table 7: Passenger Vehicles in Saanich, 2015 to 2019[18]

	2015	2016	2017	2018	2019
Gasoline or Diesel	59,450	61,240	60,860	61,370	61,500
Hybrid	1,400	1,500	1,700	1,900	2,300
Electric	150	260	440	730	1,200

E-bikes

Information on the total number of e-bikes in Saanich or the CRD is not available. However, in a survey of five local bike shops in 2018, all five shops indicated that sales of e-bikes are growing and could be even higher if the price of e-bikes comes down.[19]

In 2017, there were more vehicles per household (1.67) than adult bicycles per household (1.30) on average in Saanich and bikes accounted for only 5% of total trips of Saanich residents (Table 8).

In the CRD, the average bike trip is 3 km and the average car trip is 6 km (Table 8). A 2019 study by UBC researchers found that e-bike trips are 6 km on average.[20] This suggests that e-bikes have considerable potential to displace vehicle trips in the CRD.

[17] Source: 2017 Capital Regional District Origin Destination Household Travel Survey.

[18] Source: ICBC statistics: https://public.tableau.com/profile/icbc#!/vizhome/QuickStatistics-PoliciesinforceVehicleInsurancePoliciesinForce.

[19] See section 3.2 of Watt Consulting Group, 2018. "Capital Region Local Government Electric Vehicle (EV) + Electric Bike (e-bike) Infrastructure Backgrounder". Prepared for Capital Regional District. September. https://www.crd.bc.ca/docs/default-source/climate-action-pdf/reports/electric-vehicle-and-e-bike-infrastructure-backgrounder-sept-2018.pdf?sfvrsn=a067c5ca_2

[20] Elmira Berjisian and Alexander Bigazzi, 2019. "Summarizing the Impacts of Electric Bicycle Adoption on Vehicle Travel, Emissions, and Physical Activity." REACT (Research on Active Transportation) Lab, University of British Columbia.

Table 8: Mode shares in 2017 in Saanich (share of trips)[21]

Mode	From District	Within District
Auto driver	64%	53%
Auto passenger	16%	18%
Transit	12%	7%
Bicycle	5%	5%
Walk	2%	16%
Other	1%	1%

Table 9: Daily average trip lengths, CRD, 2017[22]

Mode	Average km
Auto driver	6.0
Auto passenger	5.3
Transit	6.2
Bicycle	3.0
Walk	0.7
Other	4.5

[21] Source: 2017 Capital Regional District Origin Destination Household Travel Survey.

[22] Source: 2017 Capital Regional District Origin Destination Household Travel Survey.

7.0 Barriers to electric mobility

7.1 Barriers to electric vehicles

In 2018, the Capital Regional District (CRD) surveyed residents about factors that impact their decision to purchase an Electric Vehicle (EV), as well as challenges faced by EV owners.[23] The survey revealed that there are several potential barriers to EV adoption in the CRD, including the price of EVs, lack of knowledge and experience with EVs, lack of variety and model types, "range anxiety", a lack of public charging stations, and inability to charge at home (Figure 12).

Purchase price

30% of CRD survey respondents indicated the purchase price of EVs is an important barrier to EV adoption. To help address this barrier, the provincial and federal governments have rebates for purchases of new and used EVs, intended to partially offset their higher purchase price. It is expected that EV prices will fall over time, becoming the same as gas-powered vehicles in about 2025.[24] As discussed in Chapter 3: What is Electric Mobility & Why is it Important?, electrical vehicles are cheaper to operate than gas or diesel vehicles due to fuel and maintenance cost savings, leading to increased affordability.

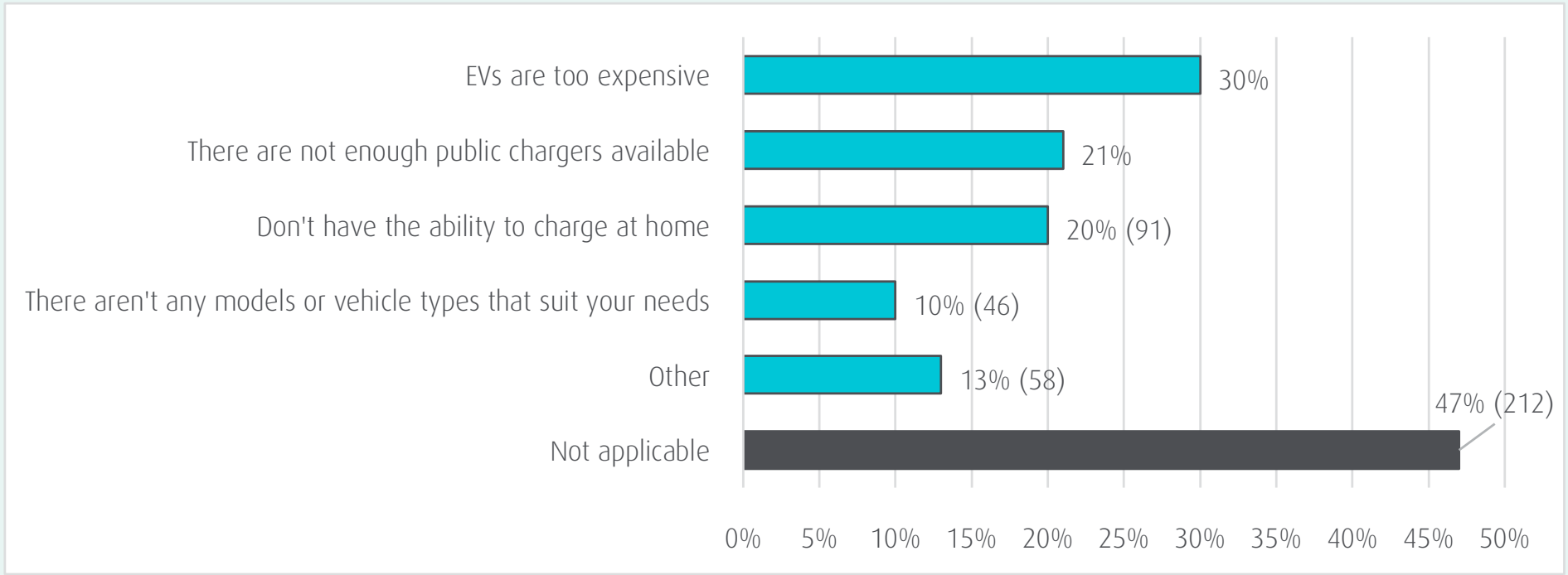


Figure 12: Barriers to electric vehicles, CRD Survey responses 2018

[23] WATT Consulting Group, 2018. "Capital Region Local Government Electric Vehicle (EV) + Electric Bike (e-bike) Infrastructure Backgrounder". Prepared for Capital Regional District. September.

[24] Bloomberg NEF, 2020. Electric Vehicle Outlook 2020. https://about.bnef.com/electric-vehicle-outlook/

Lack of knowledge and experience with EVs

EVs are a relatively new technology and are still unfamiliar to many people. Providing opportunities for people to learn about and test-drive EVs will help to remove this barrier, as will increases in EV ownership over time so that they become more common. Organizations such as the Victoria Electric Vehicle Association, often with support from Emotive (a collaboration between the Province of BC, BC Hydro, the Fraser Basin Council, several academic institutions, regional governments, and over 100 communities and businesses), frequently host events to help increase awareness and understanding of electric vehicles.

Lack of variety and model types

Only approximately 10% of CRD survey respondents identified a lack of variety of EV models as a barrier to purchasing an EV. However, it could still impact more widespread EV adoption as people who are looking for larger family vehicles or pick-up trucks may find limited EV choices. Currently, there are 17 BEV and 30 PHEV models available in BC.[25]

There can be limits on the availability of some EV makes and models, reducing opportunities to test-drive these vehicles and requiring sometimes lengthy waits for delivery. A survey of dealerships across B.C. in June and July of 2018[26] found that about 40% of dealerships in BC had EVs on their lots. On Vancouver Island and the Sunshine Coast, 43% of dealerships had EVs on their lots and stated wait times to take delivery of EVs ranged from a few days to over a year.

An informal survey of the online inventories of selected dealers[27] in the Greater Victoria area in June 2020 revealed that 35% of these dealers had battery electric vehicles (BEVs) in their new passenger vehicle inventories and 47% had BEVs in their used inventories. Table 10 shows the totals from this informal survey. The survey also revealed that, in these inventories at least, there were several EVs of certain makes and models (Chevrolet Bolt, Kia Soul and Nissan Leaf) but much fewer EVs of other makes and models.[28]

Table 10: Online inventories of selected dealers, June 2020

	Number	Share
Number of dealers		
Dealers - total	17	
Dealers with new EV	8	47%
Dealers with used EV	8	47%
Number of vehicles in online inventories		
New vehicles - total	2,247	
New EV	175	8%
Total used	699	
Used EV	40	6%

[25] https://pluginbc.ca/wp/wp-content/uploads/2019/11/Electric-Cars-in-BC.pdf

[26] Clean Energy Canada 2018. "Batteries Not Included". October. https://cleanenergycanada.org/wp-content/uploads/2018/10/Report_EVAvailability2018_Web-1.pdf

[27] Online inventories of 18 CEV for BC eligible dealers, accessed on June 25, 2020.

[28] It is important to keep in mind that this is a single point-in-time snapshot of the online passenger vehicle inventories of selected dealers and that it was taken during the stage 3 lockdown due to the COVID-19 pandemic which involved extra safety precautions and physical distancing measures that may have impacted car dealers' operations. See for example https://www.newcardealers.ca/new-car-dealers-in-bc-adapt-in-the-face-of-covid-19/

Range anxiety

Range anxiety is the fear of running out of battery power before being able to recharge an EV. As the battery range of EVs increases and as the network of charging stations expands, range anxiety should fall. Most new battery-electric models available in BC have ranges of 235 km or more.

The average daily driving distance in Saanich is 15.8 km in Saanich East and 17.3 km in Saanich West.[29] This suggests that a typical Saanich driver does not need to have range anxiety for local trips and might be able to go a few days on a single charge. However, it is important to recognize that a wider network of EV charging infrastructure is needed for longer road trips.

Increasing the number of public charging stations both locally and as part of a larger provincial and national/North American network also helps to address range anxiety, so that EV drivers know they have options to recharge if needed.

Inability to charge at home or work

In BC, 90% of EV owners charge their cars at home or work, so lack of charging opportunities at these locations can be important barriers to EV ownership. In the CRD survey, about 20% of respondents said lack of home charging is a barrier. This included people who live in apartments or condos with no opportunity to charge an EV, and people whose house does not have a driveway or garage, which limits the opportunity to charge an EV. Similarly, in a survey for Saanich's Climate Plan, 35% of survey respondents said that having charging equipment at home might help them choose an EV for their next vehicle purchase.

The Saanich Electric Mobility Survey included questions on whether respondents had an EV and, if so, whether they had access to charging at home or work and where they typically charge their car. Of those who own an EV, 91% have access to charging at home and 12% have access to charging at work. Most (86%) charge their EV at home and almost half (45%) use public charging stations, while only 9% charge at work (Figures 13 and 14).

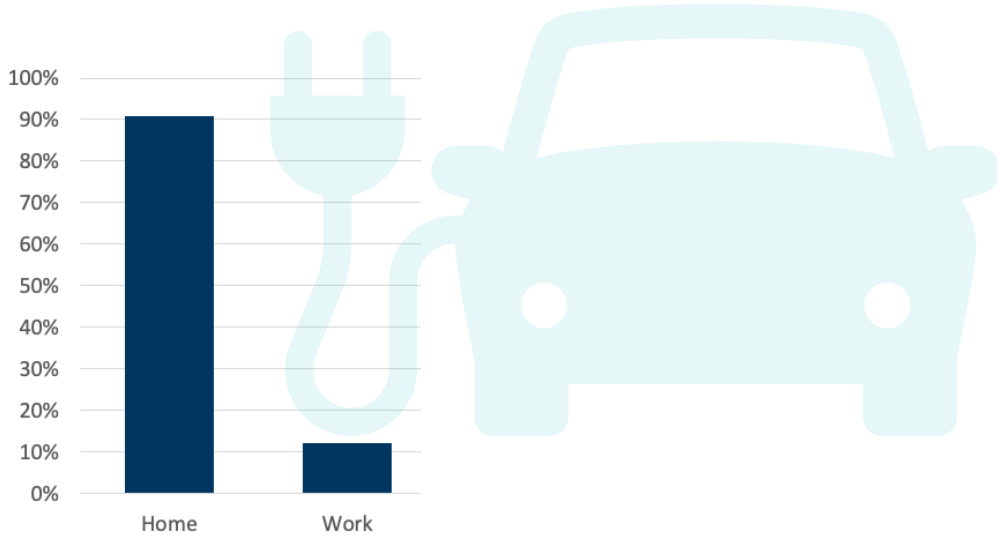


Figure 13: EV owners' access to charging – survey responses

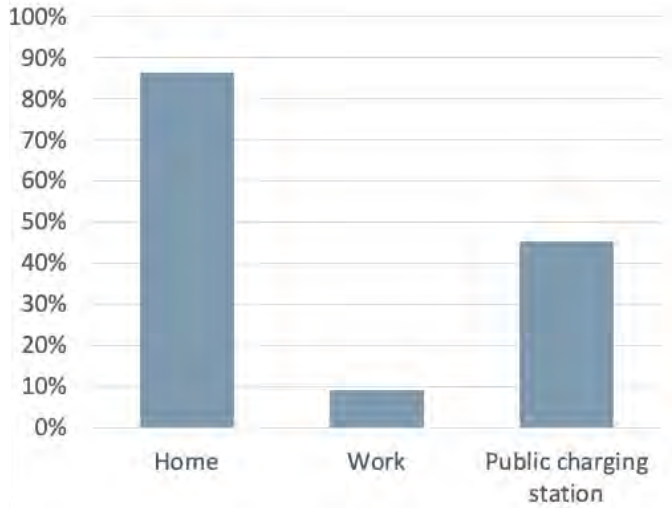


Figure 14: Where EV owners charge their cars – survey responses

[29] 2017 Capital Regional District Origin Destination Household Travel Survey.

In Saanich, most people live in single-family detached homes, duplexes or townhouses, where there are likely good opportunities to install EV charging stations. About 20% of Saanich households live in apartment buildings, which may have more limited opportunities for EV charging (Figure 15).

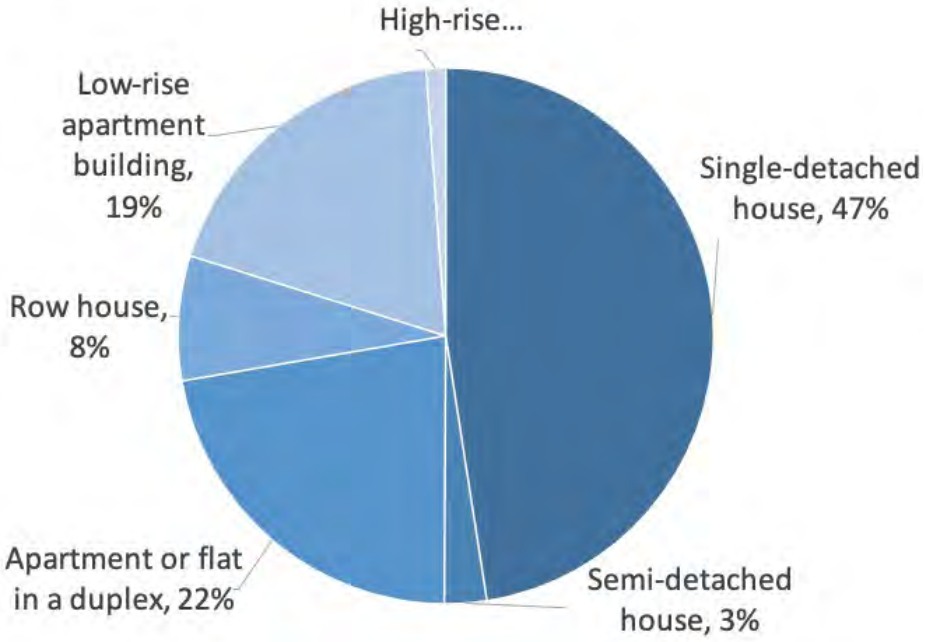


Figure 15: Saanich households by housing type, 2016 Census

Retrofitting existing buildings to include EV charging is far more costly than incorporating "EV-ready" electrical infrastructure at the time of development. In condo buildings, the need to get Strata approval, secure funding, and amend Strata bylaws all add to the complexity. Rental buildings suffer from a "split incentive" issue, whereby the building owner or manager may not be interested in a costly upgrade that has no financial payback and may not benefit all renters.

Although it is not common practice as of yet, apartments and condos should be encouraged to optimize the electrical capacity of their building and plan for 100% of units to have access to charging through the use of energy management systems (shared circuits). The current practice of installing one or several stations on dedicated circuits runs the risk of "eating up" the electrical capacity and making it more difficult for all building residents to have access to charging in the future.

Plug in BC (pluginbc.ca) and Metro Vancouver (EV Strata Condo) have resources to help tenants or strata members who want to install EV charging in their buildings. In addition, the EV Advisor service from Plug in BC provides up to four hours of support and consultation services for multi-unit residential buildings, free of charge. "Right to charge" legislation could further help residents of apartment buildings by requiring strata councils and landlords to accommodate reasonable requests from residents to install EV charging.

In September 2019 Saanich Council approved new requirements for EV charging infrastructure in new buildings in Saanich, which came into effect in September 2020. The requirements cover new residential, institutional, commercial and industrial buildings and are intended to help ensure that new buildings in Saanich will have enough EV charging capacity for current and future EVs.

Currently, the provincial government is offering incentives to offset the cost of installing EV charging stations at home or work (for existing buildings only); information is available online at https://goelectricbc.gov.bc.ca/#rebates.

Lack of public charging stations

A lack of public charging stations can be an important barrier to EV adoption. About 20% of the respondents to the CRD survey said this was a barrier to EV ownership for them. Similarly, in a survey for Saanich's Climate Plan, 41% of survey respondents said that more public charging might help them choose an EV for their next vehicle purchase.

By providing access to EV charging, public charging stations are important for reducing range anxiety. They can also provide access to charging for EV owners who are not able to charge at home or work.

In the Saanich Electric Mobility Survey, several people noted the need to expand the public charging network in Saanich and that the public charging stations provided by the District (at recreation centres, the Cedar Hill Golf Course, and Municipal Hall) are often in use and not available.

Public charging stations in Saanich and CRD

As of August, 2020, there were approximately 75 public EV charging stations in Saanich, including five DC fast charging stations (one at Uptown Shopping Centre, two at Saanich Plaza, and two at the Petro-Canada station on Patricia Bay Highway near Elk Lake). This works out to 1 charger per 16 EVs or 1 charger per 1,645 residents.

An analysis of public charging infrastructure in the cities around the world with the highest EV uptake found that availability of public charging was linked with electric vehicle uptake.[30] The study also found that there is no universal benchmark for public charging. For instance, in the Netherlands, where there is relatively limited private parking, 2-7 EVs per charging station is typical while in California, where EV owners have more access to home and workplace charging, there is typically 25-30 EVs per charging station.

Assuming that Saanich is more similar to cities in California than in the Netherlands, this suggests that there may be sufficient charging to accommodate the current number of EVs in Saanich. However, as the number of EVs in the region grows, so will demand for public charging stations.

A 2018 gap analysis undertaken for the CRD[31] identified areas in the CRD where there would likely be high demand for public EV charging stations (Figures 16 and 17) and recommended priority locations for Level 2 and DC fast charging (DCFC) stations. In Saanich, these include:

Level 2:

- Cordova Bay
- Strawberry Vale

DCFC:

- Broadmead Village
- Elk/Beaver Lake Regional Park

It should be noted that after this report was published, Petro-Canada opened two fast chargers at its station on Patricia Bay Highway near Elk/Beaver Lake Regional Park (in December 2019).

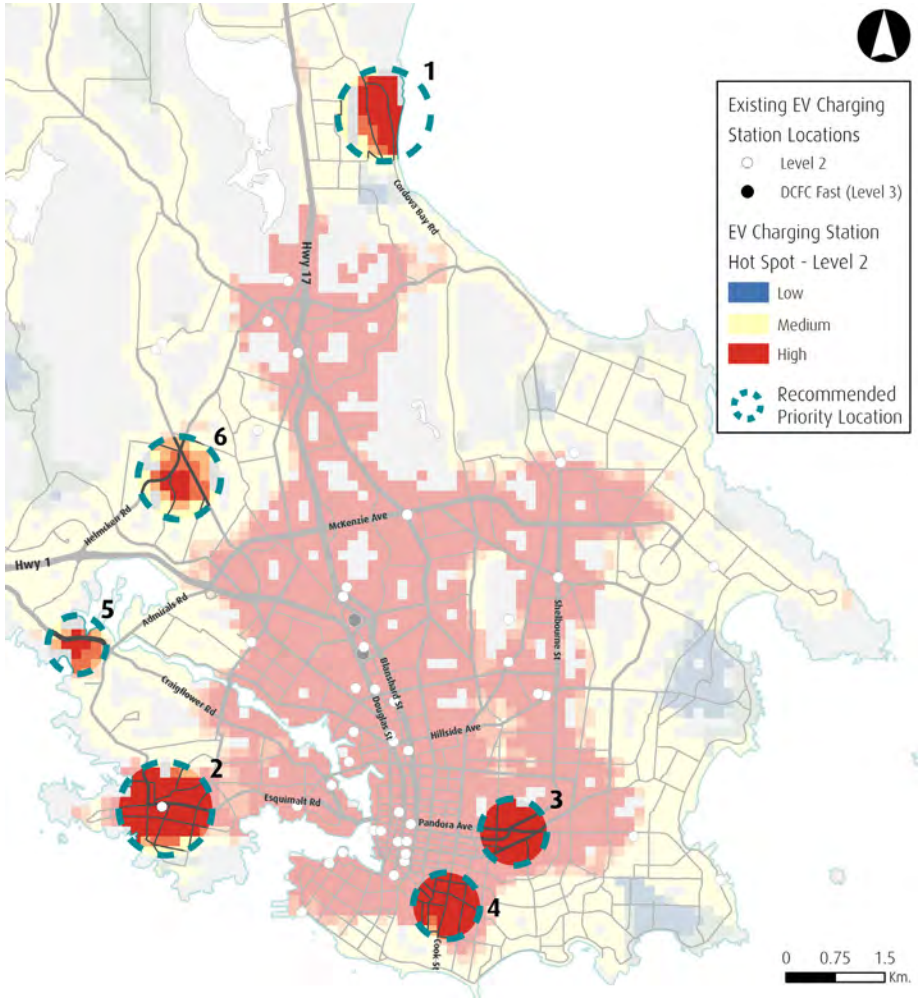


Figure 16: Recommended Priority Locations for Level 2 Charging Stations, Core Area

[30] Dale Hall and Nic Lutsey, 2017. "Emerging Best Practices for Electric Vehicle Charging Infrastructure". White Paper. The International Council on Clean Transportation. October.

[31] WATT Consulting Group, 2018. "Capital Region Local Government Electric Vehicle (EV) + Electric Bike (e-bike) Infrastructure Planning Guide." Prepared for Capital Regional District. November.

District of Saanich public EV charging stations

The District of Saanich owns and operates 12 public Level 2 charging stations. There are two at each of the District's four recreation centres as well as two at Cedar Hill Golf Course and two at the Municipal Hall. The use of these charging stations has increased every year since they were installed in 2013 (Figure 18). To help meet current and expected future demand, the District plans to install an additional 20 new public Level 2 charging stations at various locations in Saanich by the end of 2021 (Figure 11).

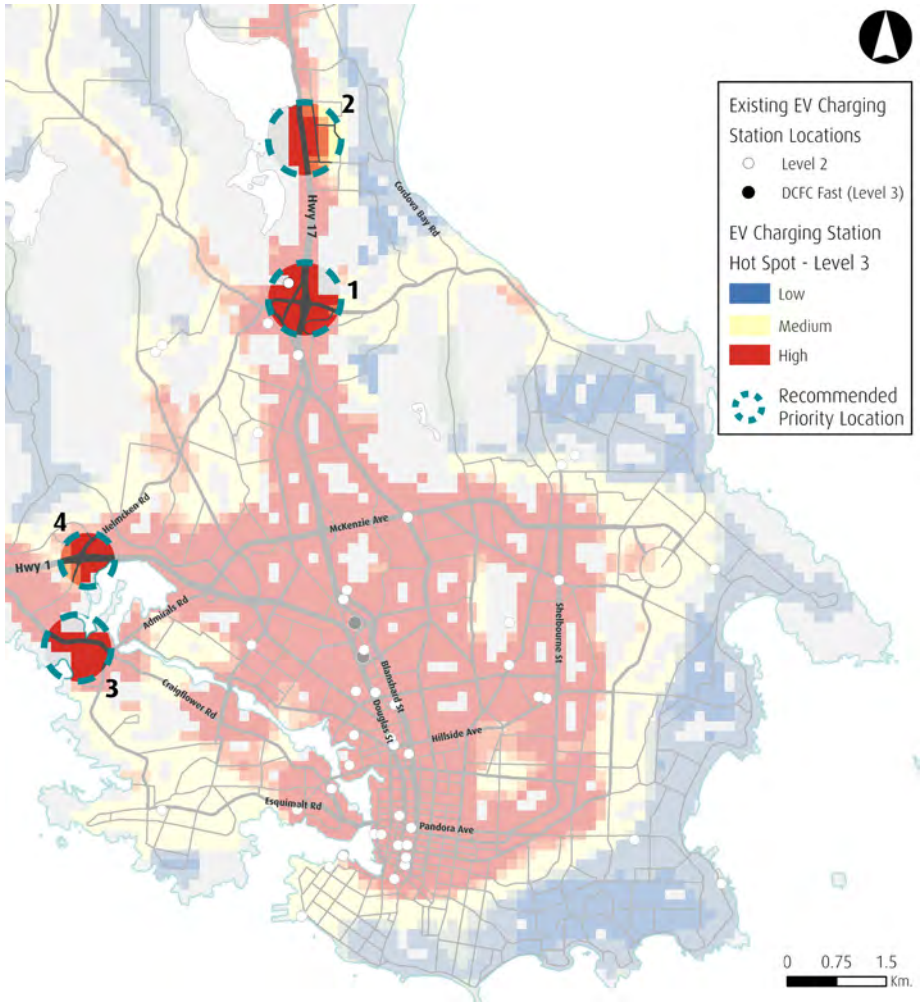


Figure 17: Recommended Priority Locations for DC Fast Charging (Level 3) Stations, Core Area

The 20 new stations will more than meet this target and will reduce the number of EVs per charging station in Saanich from 16 EVs per station to 12 EVs per charging station based upon the 1,200 EVs in Saanich in 2019. Saanich's public EV charging stations have been free to use since they were first installed as a means to support early uptake of EVs in the community. However, EVs have become more mainstream and now congestion at the charging stations has become an issue. To encourage turnover at the chargers, and to recoup the electricity, maintenance and replacement costs, Saanich is introducing a $1/hour fee at its charging stations, beginning January 1, 2021.

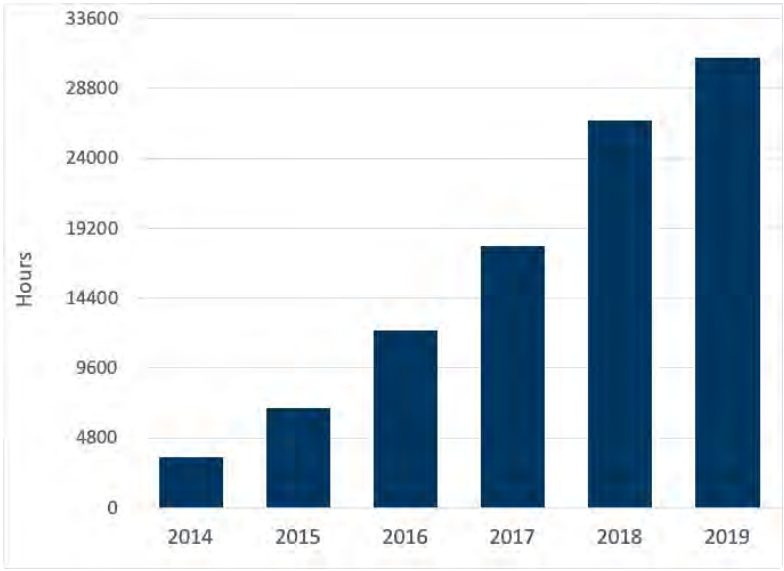


Figure 18: Total annual connection time – District of Saanich public EV charging stations

Table 11: District of Saanich public Level 2 charging stations

Site	Charging stations	
	Existing	New
Cedar Hill Golf Course	2	2
Cedar Hill Recreation Centre	2	2
Gordon Head Recreation Centre	2	
G. R. Pearkes Recreation Centre	2	2
Saanich Commonwealth Place	2	4
Municipal Hall	2	2
Municipal Hall Annex		2
Beckwith Park		1
Cadboro Gyro Park		2
Hampton Park		1
Mount Douglas Park		2

Fast charging networks

There are initiatives to develop fast charging station networks across Canada, including BC Hydro's network of 70 fast charging stations along BC's highways and Petro-Canada's network of fast-charging stations. By the end of 2020, the BC government's Go Electric Program will have deployed 149 fast-charging stations across the province, in partnership with BC Hydro, FortisBC, local governments, industry and academic institutions.

Online tools such as ChargeHub provide real-time maps of the public charging network: ChargeHub.

7.2 Approaches to support EV adoption

25 cities around the world lead EV adoption, accounting for 42% of global passenger EV sales through 2018. These cities tend to use several different approaches for supporting EV adoption, including:

- Areas that are only accessible by zero-emission vehicles
- Exemption from licensing restrictions or quotas
- Financial incentives for EV purchases
- Financial incentives for charging station infrastructure
- EV-ready building requirements
- Non-financial incentives such as priority road access or parking benefits
- Support for electric ride-sharing and car-sharing
- City fleet electrification
- Zero-emission bus targets
- Consumer awareness programs[32]

These approaches provide best practice examples to inform development of actions to support electric mobility in Saanich. Many have already been implemented in Saanich, the region or province, such as financial incentives for EV purchases and charging station infrastructure and, most recently, EV-ready building requirements.

[32] The International Council for Clean Transportation, 2019. "Electric vehicle capitals: Showing the path to a mainstream market," ICCT Briefing, November.

7.3 The role of government

In the early stages of the transition to EVs, government incentives, sales targets, infrastructure requirements, non-financial incentives, and other supports help to spur the development of a market for EVs and the charging infrastructure needed to support them. In Canada, the provinces of BC and Quebec have strong government support for EVs, such as large purchase rebates and mandated sales targets, and these provinces lead the rest of the country in EV adoption.

As the EV market matures and EV prices fall, there will be less of a need to provide incentives to offset their higher purchase price. And as EVs begin to become progressively larger shares of total personal and commercial vehicles, it will make less sense to provide non-financial incentives to EVs, since the non-financial incentives will be enjoyed by more than a small minority of early adopters. As the number of EVs increase, so too will the need for EV charging infrastructure. Fortunately, the development of EV charging equipment and electric vehicle energy management systems, which allow multiple EV chargers to share a single electrical circuit, has reduced the cost of installing EV charging infrastructure.

The nature of government support for EVs may therefore shift as the market matures, with scaled-back financial and non-financial incentives to spur EV adoption and stronger policies, such as EV-ready requirements for buildings, Right to Charge legislation, and mandated EV sales targets, to ensure a continued shift to EVs as well as ensuring there is a charging network in place to support EVs. This transition is occurring in leading EV jurisdictions around the world. For instance, many cities in China have stopped providing city-level financial incentives for purchase of EVs. EVs in California only have access to HOV lanes for the first 3 years after purchase and will get discounts on tolls, rather than being exempted from paying tolls entirely. Stockholm and Oslo have eliminated free parking for EVs and Oslo has reduced bus lane access for EVs and eliminated free charging. Several jurisdictions have implemented EV sales and fleet electrification targets, licensing restrictions, and/or zero-emission zones where non-EVs are prohibited and are expanding the charging network through EV-ready building requirements and provision of public charging infrastructure.[33]

Different levels of government support the transition to EVs in different ways. The provincial and federal governments have implemented mandatory targets for the sale of electric vehicles and provide incentives to help offset the cost of purchasing electric vehicles and installing charging infrastructure.

The provincial government can also support the transition to EVs through vehicle licensing and regulations.

In BC, local governments like the District of Saanich can support the transition to electric vehicles by implementing EV-ready building requirements for new buildings and supporting retrofits of existing buildings, providing public charging infrastructure and showing leadership by electrifying their fleets and providing workplace charging. Figure 19 summarizes the roles of local governments.

Both the provincial and local governments can provide non-financial incentives such as access to HOV lanes or dedicated/preferential parking, provide support for electric ride-sharing and car-sharing, and implement consumer awareness programs.

The District of Saanich has supported the transition to EVs by providing a network of public EV charging stations (since 2013), undertaking initiatives to increase public understanding of EVs, and, most recently, adopting EV-ready requirements for new buildings, which came into effect in September 2020.

Since they were installed in 2013, there has been no fee to use the District's public charging stations. This was intended to encourage people to switch to EVs and help alleviate range anxiety. As the number of EVs in Saanich rises, there is less need to provide free EV charging to encourage early adopters, and it becomes important to consider cost-recovery to avoid providing an unnecessary subsidy that is accessible to only some Saanich residents. Charging a user fee also helps to reduce congestion at charging stations, making the stations available to more EV users.

[33] The International Council for Clean Transportation, 2019. "Electric vehicle capitals: Showing the path to a mainstream market," ICCT Briefing, November.

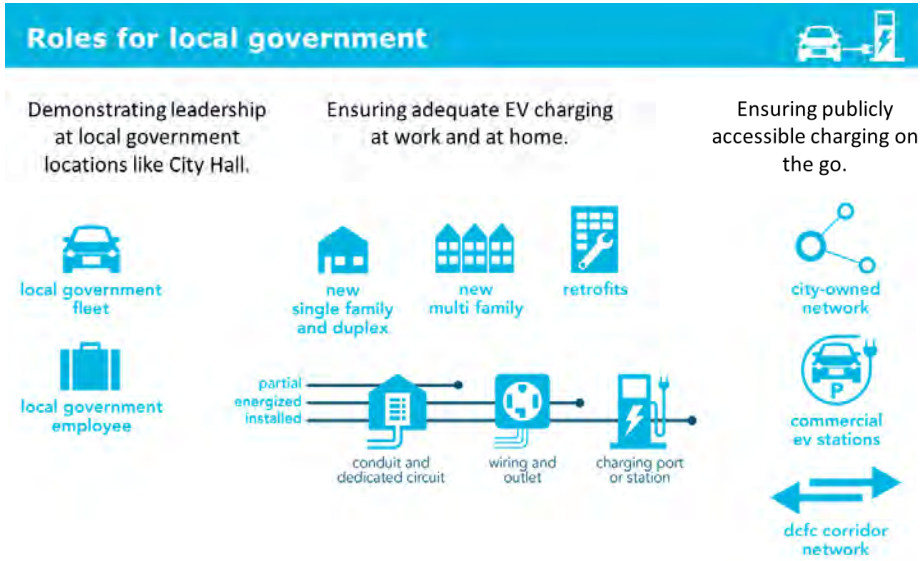


Figure 19: The roles for local government in supporting the transition to electric vehicles (Credit: C2MP)

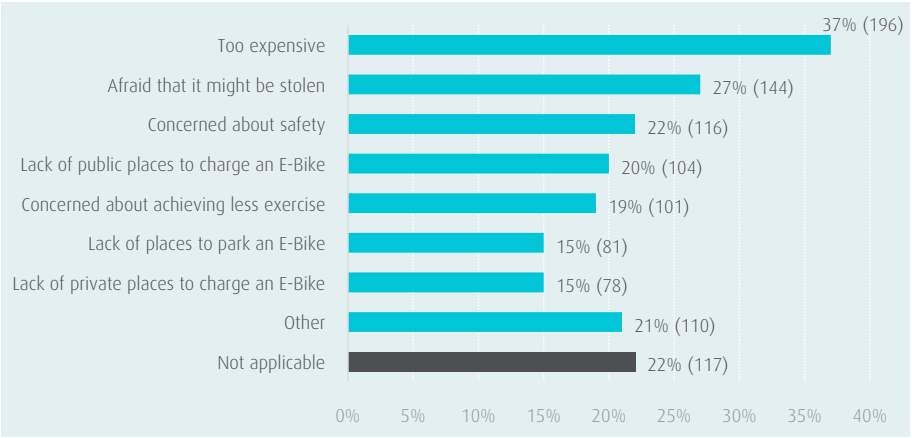


Figure 20: Barriers to e-bike ownership, CRD Survey 2018[34]

7.4 Barriers to e-bike adoption

The 2018 CRD survey identified several potential barriers to e-bike ownership. The most important barrier is the price of e-bikes, followed by concern that the e-bike would be stolen, concerns about safety, and lack of public places to charge an e-bike (Figure 20).

Price of e-bikes

E-bikes tend to be more expensive than conventional bikes; in North America, the difference is about 25-40%. Rebate programs for e-bikes could help reduce this barrier. In Saanich there is potential for e-bikes to replace car trips, and an e-bike is a fraction of the cost to purchase and operate compared to a vehicle.

Secure parking for e-bikes

The higher price of e-bikes can make them more of a concern for theft, and 27% of the respondents in the CRD survey identified fear of theft as a barrier. A follow up question in the survey asked "what would make you feel comfortable parking your e-bike in a publicly accessible location?" Common responses included:

- Locked or supervised area
- A secure designated e-bike parking facility
- Surveillance cameras
- A paid parking facility for e-bike users

Similarly, in the Saanich Electric Mobility Survey, several people noted the need for secure parking for e-bikes given the prevalence of bike theft in Greater Victoria and the higher price of e-bikes.

[34] Source: WATT Consulting Group, 2018. "Capital Region Local Government Electric Vehicle (EV) + Electric Bike (e-bike) Infrastructure Planning Guide." Prepared for Capital Regional District. November.`

Safety

Concern about safety has been identified in studies as a barrier to e-bike adoption, including concerns about the safety of the e-bike itself (which can travel up to 30 km/hour) and about the safety of riding an e-bike on the road. More than 20% of the CRD survey respondents identified safety concerns as a potential barrier, and some respondents cited the need for better cycling infrastructure including protected bike lanes.

The impacts of e-bikes on the safety of other active transportation users (pedestrians, other cyclists, etc.) was also raised by several respondents in the Saanich Electric Mobility Survey.

Exercise

A barrier that has been identified in some studies is the perception that e-bikes are more suitable for people with mobility challenges and that riding an e-bike is “cheating” because it requires less effort than pedaling a conventional bike. Almost 20% of CRD survey respondents identified a concern about less exercise as a potential barrier to buying an e-bike. However, this is offset by people who purchase an e-bike so that they can use it for trips they were less likely to make on a conventional bike, such as for long trips, hilly routes, or hauling children or cargo.

[35] Saki Aono and Alexander Biazzi, 2019. "Industry Stakeholder Perspectives on the Adoption of Electric Bicycles in British Columbia," Transportation Research Record, vo. 2673(5): 1-11.

7.5 Approaches to support e-bike adoption

A 2017 survey of industry stakeholders on e-bike adoption in BC provides useful insights on approaches to support e-bike adoption. Based on the survey responses, recommendations for e-bike policy include:

- Developing general cycling infrastructure addresses a key barrier to e-bike adoption and can help reduce the potential for conflicts between e-bike users and pedestrians and other cyclists.
- E-bike incentive programs address the barrier due to the higher purchase price of e-bikes; incentives could take the form of sales tax reductions or exemptions, retail discounts, rebates, or inclusion of e-bikes in commuter benefit programs.
- Education programs are an effective way to support e-bike adoption, particularly rental/demo programs.[35]

In addition, land use planning for compact, complete communities is important for active transportation including using e-bikes. Ideally, the typical e-bike trip of 6 km would be sufficient to access work, school, childcare, shopping, health care, community services, leisure activities, etc.

As outlined in Section 4.4, a reduction of the statutory speed limit to 40km/hr on residential streets would also support the transition to active transportation and e-bikes, addressing to some degree concerns over safety. Should there be a second phase of Provincial Motor Vehicle Act Pilot Projects that included the potential for pilot speed limit reductions on specific roads, the District of Saanich is interested in participating with other regional partners.

Saanich Electric Mobility ACTION PLAN

8.0 Saanich Electric Mobility Action Plan

This section presents actions for the District of Saanich to support the transition to electric mobility in our community. These actions are intended to support the following targets from Saanich's Climate Plan:

- By 2030, 22% of all trips are taken by walking and cycling
- By 2050, 30% of all trips are taken by walking and cycling
- By 2030, 36% of all passenger vehicles are EVs; and
- By 2050, all personal and commercial vehicles are powered by electricity or other renewable fuels

The actions reflect best practices and the experiences of leading jurisdictions as well as analysis of relevant data. They aim to address the barriers identified in this strategy and have been informed by stakeholder and public engagement on electric mobility in the region.

Some actions are replicates or similar to actions in the Climate Plan and where this is the case, the Climate Plan action is identified. The actions also help to achieve the mode shift target in the Active Transportation Plan that half of all trips will be by bike, walking and transit by 2036. This has been accelerated to 2030 in the Climate Plan.

Five focus areas have been used to organize the actions:

- Electric Bikes
- Electric Vehicles
- Home and Workplace Charging
- Public Charging Network
- District of Saanich Leadership

Development of the actions was guided by the following principles, many of which also guided development of Saanich's Climate Plan:

- **Be bold** – Be ambitious and courageous, and lead by example.
- **Be evidence-based** – use available science and policy research to make proactive and informed decisions about effective actions while being adaptable and responsive to future developments. In the case of uncertainty, the precautionary principle will guide decision-making.
- **Share the benefits** – ensure that benefits and burdens of the transition to electric mobility are shared equitably.
- **Improve wellbeing** – design policies and actions to support electric mobility to achieve multiple benefits.
- **Be collaborative** – engage, collaborate and partner with departments across the District of Saanich and with residents, businesses, institutions and senior levels of government.
- **Prioritize active transportation first**, then shifting to EVs.
- **Act regionally** – transportation systems cross municipal borders, so the transition to electric mobility is best achieved through regional collaboration.

The tables on the following pages present the individual actions that make up the Saanich Electric Mobility Action Plan. In the tables:

- Timeframes reflect both the urgency of each action and the expected timeline when it will be most relevant.
- Priorities are based on consideration of:
  - Likely effectiveness of the action to support electric mobility;
  - Ability and capacity of the District of Saanich to undertake the action; and
  - Compatibility and synergy with other District of Saanich initiatives, policies and objectives.

Electric bikes

Table 12: Actions to support electric bikes (e-bikes)

#	Action	Description	Timeframe	Priority
EB1	Accelerate implementation of the Active Transportation Plan	Accelerate implementation of the Active Transportation Plan in order to meet the GHG emissions targets outlined within the Climate Plan (Climate Plan Action M1.1).	2020-2025	High
EB2	Plan compact, complete communities and focus density in nodes and corridors	Prioritize land use planning for compact, complete communities so that work, amenities and key services are available within the typical 6km e-bike trip range. Through the local area plan amendments and future corridor studies, focus additional growth and density on key nodes and corridors with access to frequent transit and the AAA network.	2020-2025	High
EB3	Identify and plan for infrastructure to ensure the safety and security of e-bike riders and others	In collaboration with the CRD and other regional partners, identify and plan for the infrastructure needed to ensure the safety of e-bike riders as well as other active transportation users. This could include: • widening multi-use trails that are becoming congested. • creating pull-outs and parking for cargo/delivery e-bikes. • providing secure bike/e-bike parking in commercial areas. • posting speed limits on congested trails.	2020-2025	High
EB4	Advocate to the provincial and federal governments for an e-bike incentive program not linked to Scrap-It	Advocate to the provincial and federal governments to provide an e-bike incentive program beyond the existing Scrap-It program.	2020-2022	High
EB5	Provide 'top-up' incentives to augment provincial/ federal e-bike incentive programs	Monitor the development of a provincial and/or federal e-bike incentive program and provide additional "top-up" incentives to support local uptake based on assessed need.	2020-2022	High

Electric bikes

#	Action	Description	Timeframe	Priority
EB6	Pilot an e-bike incentive/ trial program	Pilot an e-bike incentive/trial program that complements any provincial or federal government e-bike incentive program, ideally in collaboration with other regional partners (Climate Plan Action M1.2).	2020-2022	High
EB7	Increase awareness of e-bikes through a comprehensive communications campaign	Increase awareness of e-bikes through a comprehensive communications campaign, ideally in collaboration with other regional partners. As part of this effort, link residents with opportunities to learn e-bike safety skills through community partners and/or recreation centres.	2020-2023	High
EB8	Support lower speed limits on residential streets	Support changes to provincial legislation to lower default speed limits on residential streets to improve safety for all transportation modes including pedestrians and cyclists (Climate Plan Action M1.7).	2020-2023	High
EB9	Review and update the Zoning Bylaw to consider amendments that support e-bikes	Review and update the bicycle parking requirements for new developments in the Zoning Bylaw to consider amendments that support e-bikes, such as the standard, size, location and quantity of bike parking giving consideration to increased bike size, e-cargo bikes, charging, shelter, security and end of trip facilities.	2021-2023	High
EB10	Advocate to BC Transit and the CRD to update their infrastructure design guidelines to support e-bikes	Advocate to BC Transit and the CRD to update their infrastructure design guidelines to consider amendments that are supportive of e-bike facilities (e.g. secure parking, shelter, larger spaces, charging) at park-and-ride lots, major transit stops, and other sites to support multi-mode use.	2021-2023	Medium
EB11	Develop policies and infrastructure to support other kinds of e-mobility in collaboration with the Province and regional partners	In collaboration with the Province and regional partners, develop policies and infrastructure to support other kinds of electric mobility devices, such as electric scooters, electric skateboards and electric unicycles as well as electric wheelchairs that improve accessibility and make active transportation feasible for people with mobility challenges. This should be informed by the BC Motor Vehicle Act Pilot Projects.	2021-2023	Medium

Electric vehicles

Table 13: Actions to Support Electric Vehicles

#	Action	Description	Timeframe	Priority
EV1	Advocate to provincial and federal governments to maintain EV incentive programs	Advocate to the provincial and federal governments to maintain EV incentive programs until the purchase cost of EVs is on par with the cost of fossil-fueled vehicles, and to prioritize making EVs more affordable for people who might otherwise not be able to purchase EVs. • Incentives should increase affordability of EVs for lower-income residents. • Similar incentives should be provided for new and used EVs.	2020-2025	High
EV2	Increase awareness of EVs through a comprehensive communications campaign	Increase awareness of EVs through a comprehensive communications campaign, ideally in collaboration with other regional partners, for example: • Information materials such as short videos, testimonials, presentations, sound-bytes and images on the benefits of EVs and the regional charging network. • Free, earned and paid media promoting EVs and the EV charging network. • Promotional and educational opportunities such as “ride and drive” events and ‘commuter challenges’ in collaboration with relevant organizations (e.g. Emotive and PluginBC, local EV associations, etc.). • Support for local car dealers, where appropriate, to have EVs available at their dealerships for test drives.	2020-2023	High
EV3	Explore E-mobility requirements and incentives for business licenses and fees	Explore whether and how electric mobility requirements or incentives might be included in Saanich business license requirements and fee structures (e.g. for business licenses for ride-hailing services).	2021-2022	Medium

Electric vehicles

#	Action	Description	Timeframe	Priority
EV4	Encourage and support regional organizations to convert their fleets to Zero Emission Vehicles (ZEVs)	In collaboration with the CRD and other regional municipalities, encourage and support BC Transit, School Districts, businesses, and other organizations in Saanich to convert their fleets to zero emission vehicles (ZEVs) (Climate Plan Action M3.7): • Support BC Transit's plan to electrify its fleet and advocate for the necessary funding as required. • Provide information to local School Districts, businesses, and other organizations in Saanich on the advantages of converting their fleet vehicles to ZEVs and support the reduction of barriers identified.	2020-2025	Medium
EV5	Support car sharing organizations to electrify their fleet	Support car sharing organizations to electrify their fleets. • Engage with car-share organizations in Saanich to understand the barriers they face to electrifying their fleets. • Where feasible, pursue actions that help reduce or remove these barriers.	2021-2023	Medium
EV6	Advocate that higher levels of government work to remove barriers to EV adoption	Monitor barriers to EV adoption and provide feedback and advocacy to higher levels of government or organizations as needed. This may include but is not limited to: • Measurement Canada and the need for a meter certification that facilitates kWh billing. • BC Hydro and the need for rate structures and fair/reasonable upgrade costs to facilitate electrification. • Provincial government to ensure extended producer responsibility and the reuse and recycling of EV batteries.	2021-2024	Medium
EV7	Explore the potential for EVs to act as backup power supply	Work with research institutions, BC Hydro, and other stakeholders to explore the potential for EVs to act as a backup power supply during power outages.	2023-2025	Low

Home and workplace charging

Table 14: Actions to Support Home + Workplace Charging

#	Action	Description	Timeframe	Priority
H+W1	Monitor Saanich EV Infrastructure Requirements for New Developments and share knowledge regionally	Monitor implementation of the District of Saanich Electric Vehicle (EV) Infrastructure Requirements for New Developments that came into effect in September 2020, including any feedback and future recommendations. Share learnings and best practices with neighbouring local governments to support regional consistency on EV charging policies and procedures.	2020-2025	High
H+W2	Advocate for Right to Charge legislation	Advocate to the provincial government to enact Right to Charge legislation (a requirement that strata councils and landlords accommodate reasonable requests from residents to install EV charging) that supports a 100% EV-ready approach in multi-unit residential buildings (MURBs) (Climate Plan Action M3.6).	2020-2021	High
H+W3	Create guidelines for 100% EV-ready feasibility studies in existing multi-unit residential buildings	Create guidelines for undertaking 100% EV-ready feasibility studies/ plans in existing multi-unit residential buildings (MURBs).	2020-2021	High
H+W4	Promote incentives for EV charging infrastructure	Promote provincial and federal financial incentives for installing EV charging infrastructure in existing homes and workplaces.	2020-2023	High
H+W5	Provide 'top-up' incentives to augment provincial/ federal EV charging infrastructure incentives for existing MURBs as required	Determine whether there is a need to augment provincial and/or federal incentives for installing EV charging infrastructure in existing multi-unit residential buildings (MURBs) in Saanich, and, if so, provide the required additional 'top-up' incentives to the extent that is feasible.	2021-2022	High
H+W6	Explore the need for and provide incentives for EV charging infrastructure feasibility studies in existing MURBs if required	Determine whether there is a need to provide financial incentives to help offset the cost of feasibility studies for installing EV charging infrastructure in existing multi-unit residential buildings (MURBs) in Saanich, and, if so, provide the required additional incentives to the extent that is feasible.	2021-2022	High

Home and workplace charging

#	Action	Description	Timeframe	Priority
H+W7	Provide EV charging infrastructure education for MURBs	Provide EV charging infrastructure education and resource materials to strata councils/members, rental apartment building owners and the Vancouver Island Strata Owners Association to support EV charging in existing multi-unit residential buildings (MURBs).	2020-2021	Medium
H+W8	Identify and address potential policy barriers to EV infrastructure in existing buildings	Identify and address potential District of Saanich procedural or policy barriers to installing EV infrastructure in existing buildings.	2021-2023	Medium
H+W9	Support off-site EV charging for MURBs	Identify and pursue opportunities to support EV charging access for multi-unit residential buildings (MURBs). This could include the installation of curb-side charging stations, or working with public and community institutions (e.g. District facilities, schools, churches) to install EV chargers that can be used overnight by residents in nearby MURBs (see PN1).	2021-2023	Medium
H+W10	Support workplace EV charging	Identify and pursue opportunities to support and promote installation of workplace charging stations at existing buildings.	2021-2023	Low
H+W11	Support dedicated EV charging access for car shares near MURBs	Consider approaches to support dedicated EV charging access for car sharing organizations in or near multi-unit residential buildings (MURBs).	2022-2023	Low
H+W12	Explore various financial approaches to overcome the capital cost barrier to EV charging	Explore various financial approaches to help overcome the capital cost barrier for installing EV charging infrastructure in existing buildings, such as EV charging manufacturer shared cost models, EV infrastructure levies on benefiting strata units (would require a change to the Strata Property Act), or tax incentives. Pursue promising approaches where feasible.	2022-2023	Low

Public charging

Table 15: Actions to Support the Public Charging Network

#	Action	Description	Timeframe	Priority
PN 1	Identify priority areas in Saanich for the provision of additional public EV charging stations	Identify priority areas in Saanich for the provision of additional public EV charging stations e.g. to support residents of multi-unit residential buildings where it may be challenging or costly to retrofit in the short term, access for car share organizations etc. This should be informed by the Capital Region EV Infrastructure Road Map (underway) and include: • equity considerations • a review of the Streets and Traffic Regulation Bylaw for the opportunity to support/enable on-street EV charging infrastructure in the public right of way • a review of funding opportunities to provide public charging stations in these areas, taking into consideration technical factors, ongoing management, convenience and accessibility for potential users.	2021-2024	High
PN 2	Work with BC Hydro and the provincial and federal governments to install more DC fast charging stations in Saanich	Work with BC Hydro and the provincial and federal governments to install more DC fast charging stations in Saanich, in locations that are convenient for travelers and residents of existing multi-family buildings and as part of a larger regional, provincial and national network.	2020-2022	High
PN 3	Explore how to encourage private sector investment in new EV charging infrastructure	Explore how to encourage private sector investment in new EV charging infrastructure, for instance by allowing installation of charging infrastructure in the public right of way (see PN 1) or through rezoning and development approval processes.	2021-2025	Medium
PN 4	Embed EV charging considerations in Saanich planning processes	Embed EV charging considerations in Saanich planning processes so opportunities to identify gaps or expand or upgrade infrastructure are assessed at key planning junctures (e.g. local area plans, facility upgrades, etc.).	2021-2023	Medium

Saanich leadership

Table 16: Actions to support District of Saanich leadership

#	Action	Description	Timeframe	Priority
Lead 1	Develop a fleet strategy to reduce corporate emissions	Develop a fleet strategy (Climate Plan Action L3.1) that includes the transformation of all fleet (including police and fire) to 100% renewable energy. Considerations will be given to rightsizing the fleet, vehicle operation optimization, renewable fuel choices and emerging technologies.	2020-2021	High
Lead 2	Convert all light-duty fleet vehicles to zero-emissions vehicles	Convert all light-duty fleet vehicles to zero-emissions vehicles (Climate Plan Action L3.2). Continue to replace light-duty internal combustion fleet vehicles with zero-emissions vehicles, and build fleet charging stations.	2020-2025	High
Lead 3	Develop an e-bike fleet program	Develop an e-bike fleet program (Climate Action L3.3). Implement a pooled electric bike program for work trips.	2020-2022	Medium
Lead 4	Implement a Climate Friendly Commuter Program and improve bike parking at all Saanich facilities	Implement a climate friendly commuter program (Climate Action L2.1) that aims to achieve 100% sustainable commuting by Saanich staff (including by renewable-energy or zero-emission vehicles, public transportation and active transportation). Such a program will actively encourage staff to shift towards walking, cycling, public transit use and carpooling. Staff will conduct analyses to understand current commuting patterns among staff, identify potential barriers to climate friendly commuting, learn best practices, and examine a range of potential solutions, such as: • Promoting public transit use to Saanich staff for commuting and appropriate work trips • Implementing an employee loan program for personal e-bike purchases to be repaid on employee pay cheques (the employee would also pay the interest) • Improving bike parking at all Saanich facilities to meet or exceed current bylaw requirements for new construction, with the consideration of replacing car parking with bike parking (rather than removing green space) and adding charging stations for e-bikes and e-scooters.	2020-2022	Medium

9.0 Implementation and monitoring

Implementation and monitoring of the Electric Mobility Strategy will be led by the Sustainability Division, working in collaboration with both internal staff and external organizations. Implementation will require support from other divisions and departments including Community Planning, Current Planning, Transportation, Building, Bylaw, Licensing and Legal Services, Facility Operations, Police, Fire, Fleet and Waste Services, and Finance and Communications.

9.1 Monitoring and reporting

Progress on implementation of the Electric Mobility Strategy will be reviewed annually and the Action Plan will be updated on a rolling basis in consultation with relevant departments. Requests for financial and other resources required for implementation of this strategy will be included within the District's annual financial planning and budget processes.

The Sustainability Division will monitor and report on implementation of the Electric Mobility Strategy as part of the annual Climate Plan Report Card with support from the internal Climate Working Group. The annual Climate Plan Report Card will be presented to Council and posted on the District website.

Table 17 lists the metrics that will be used for monitoring and reporting as well as the sources of information for the metrics. It is important to note that accurate and timely reporting is dependent upon data provision from ICBC and that data for some of the metrics above is not collected annually, e.g. metrics dependent upon the CRD Origin-Destination Survey are only collected every 5 years. These metrics may be adjusted as new data becomes available or as new actions require.

9.2 Strategy review and update

The Electric Mobility Strategy will be reviewed by the Sustainability Division every five years to ensure it is still relevant and to take advantage of new opportunities and technologies. Significant updates to the strategy will be presented to Council for approval.

Monitoring and reporting

Table 17: Monitoring and reporting metrics and data sources

Metric	Data source
Personal EVs in Saanich: • Absolute number • Share of the total number of registered personal vehicles	ICBC data
Commercial electric and renewable-powered vehicles in Saanich: • Absolute number • Share of the total number of registered commercial vehicles	ICBC data
Municipally owned public EV charging station use: • Total hours of use annually • Average daily hours of use per station in each calendar year • Total electricity use annually • Average daily electricity use per station in each calendar year	FLO dashboard data
Availability of home, workplace, and public EV charging stations in Saanich • # energized outlets and charging stations in new development • # new buildings & parking spaces/units with energized outlets and charging stations • # energized outlets and charging stations installed in existing residential, institutional, commercial and industrial buildings • # existing buildings & parking spaces/units with energized outlets and charging stations	Building permits • Uptake of rebates • Permit data • Surveys of contractors, stratas and rental building owners • Surveys of businesses
# and percentage of Saanich fleet vehicles converted to electric or renewably-powered vehicles	Saanich fleet info
Implementation of Electric Mobility Strategy Actions:	Sustainability division staff will track and evaluate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