Electric Vehicle Strategy

June 2020

Contents

Acknowledgements: The content of this Strategy was inspired by the electric vehicle strategies of the City of North Vancouver, the City of Portland, and PlugInBC.

Introduction

Delta has been carbon neutral in the City's civic operations since 2012 and achieved the goal of a 20% reduction in greenhouse gas emissions over 2007 baseline levels in 2015. Delta's Official Community Plan includes goals to reduce community emissions even further, and these targets will be updated to be consistent with the most recent targets of the Intergovernmental Panel on Climate Change. The City's Community Energy and Emissions Plan notes that one important way we can achieve these targets is by promoting electric vehicle charging station installations, which will in turn encourage the purchase and use of electric vehicles.

Daily decisions on how we travel play a key role in the amount of greenhouse gas emissions generated by our community. Transportation comprises 60% of Delta's community greenhouse gas emissions and the City's corporate emissions are influenced by fleet operations. Delta has been working continuously on reducing our greenhouse gases and on climate mitigation and adaptation. Electric vehicles are an important part of the solution.

While infrastructure improvements for alternative modes of transportation take time to implement, we can lighten our carbon footprint now by encouraging electric vehicle use. Delta residents use vehicles for 80% of all trips and 76% of Delta residents commute outside the municipality for work. More environmentally-friendly modes such as walking (10%), taking transit (7%), and biking (2%) are far less common.

Promoting and supporting electric vehicle adoption in the community will help Delta achieve its greenhouse gas reduction goals. This also aligns with the work of other levels of government, such as the provincial Zero-Emission Vehicles Act and the federal Incentives for Zero-Emission Vehicles program.

Electric Vehicles 101

Types of Electric Vehicles

An electric vehicle (EV) is powered partially or entirely by a rechargeable battery that runs an electric motor. EVs can be recharged by plugging into the electricity grid. There are two types of EVs:

1. **Battery Electric Vehicles (BEV)** run entirely on electricity, using an electric motor and battery, and must be plugged into the electricity grid to fully recharge
2. **Plug-in Hybrid Electric Vehicles (PHEV)** use an electric motor and battery that are recharged by plugging into the electricity grid, but also have an internal combustion engine to be used when the battery is running low

This Strategy does not consider Hybrid Electric Vehicles (HEVs) to be electric vehicles because they do not plug into the electricity grid. HEVs use gasoline and regenerative braking to power an electric motor and an internal combustion engine.

Why Use Electric Vehicles?

This Strategy aims to encourage residents and organizations to make the switch to electric vehicles. Some of the benefits of electric vehicles include:

- **Reduction of tailpipe emissions:** Battery Electric Vehicles produce no greenhouse gas tailpipe emissions. Plug-in Hybrid Electric Vehicles produce far less emissions than a gasoline engine.
- **Fewer lifecycle emissions:** EVs produce 80% fewer lifecycle emissions than the average gasoline-powered vehicle (Pembina Institute).
- **Low cost to fuel:** EVs cost about 5 times less to fuel than gasoline vehicles. Some municipalities and private businesses in the Lower Mainland currently offer free public charging for EVs, offering even greater fuel cost savings.
- **Less maintenance:** EVs have only 18 to 20 moving parts, compared to over 2000 in gas-powered vehicles, so they require significantly less maintenance.
- **Health benefits:** As we transition to EVs, there will be less air pollution from vehicle exhaust. EVs are also quieter, meaning less noise pollution.
- **Faster commute:** Residents in BC with an EV can access the high occupancy vehicle (HOV) lanes by displaying an EV decal.

Barriers to Electric Vehicle Adoption

Despite their recent surge in popularity, significant barriers to EV adoption remain:

- **Initial purchase cost:** The high purchase price of new EVs is a considerable barrier for many potential owners, despite rebates for new EVs and future savings in operating costs. As more used EVs become available and battery costs decline, this barrier will become less significant.
- **Ability to charge at home:** Many potential EV owners will only choose to purchase an EV if they will be able to charge the vehicle at home. While owners of single family homes typically have access to a household electrical outlet and may have the capacity to retrofit in a proper charging station, those who reside in multi-family buildings face significant challenges to charging station access and often lack the ability to install stations.
- **"Range anxiety":** According to BC Hydro, 70% of British Columbians are reluctant to switch to an EV out of fear that the vehicle will have insufficient range to reach its destination, thus stranding the vehicle's occupants. Although the latest generation of EVs average a range of 250 km and BC's fast-charge infrastructure covers much of BC's highway network (there are 250+ fast-charge stations in BC), range remains a common concern.
- **Knowledge gaps:** Other knowledge gaps include confusion about the types of EVs and charging infrastructure, where and how to charge an EV, the costs associated with charging, battery replacement, and the benefits of owning an electric vehicle.
- **Availability:** Potential EV owners have reported some difficulty in locating EVs at dealerships for test drive and purchase. BC's Zero-Emission Vehicles Act will address this by requiring 10% and 100% of new vehicles sold in BC to be zero emission by 2025 and 2040, respectively.

The City has the ability to focus policies, strategies, and land use plans on reducing existing and perceived barriers to EV adoption. Education initiatives will play an important role in supporting the community's transition to EVs.

Types of Electric Vehicle Charging

Electric vehicle charging stations are classified according to the rate at which they can recharge EV batteries. There are three types of EV charging stations:

Type of Charging	Voltage	Type of Connector	Recharge Time	Typical Use	Installation Cost
Level 1	120 volts	Standard household (120 V) outlet	8-12 hrs	At home (overnight) or at work (all day)	Retrofit: up to $500
Level 2	240 volts	Specialized station on dedicated circuit	4-6 hrs	Homes, workplaces, public places	$2,500-$15,000+
Level 3 or DC Fast Charging	480 volts	Specialized station and utility connection	<30 min	Commercial settings or along transit corridors	$75,000+

E-bikes and E-scooters

While electric vehicles are defined in this Strategy as passenger vehicles, electric scooters (e-scooters) and electric bikes (e-bikes) are becoming increasingly popular and can also be considered electric vehicles. E-bikes and e-scooters provide an environmentally-friendly alternative to gas-powered vehicles and are addressed in the action plan of this Strategy.

Delta's Actions to Date

Delta's Community Energy and Emissions Plan (2013) includes an action (#14) to promote electric vehicle charging stations, with three key elements to the action:

1. Install charging stations at high-profile municipal facilities;
2. Encourage charging stations on private property; and
3. Require new developments to be "EV ready".

As described below, Delta has begun to address each of these elements.

Public charging stations

In October 2019, BC Hydro installed Delta's first EV charging station on public land at South Delta Recreation Centre. It is a DC Fast Charge station containing two charge points, otherwise known as a dual point station. Five Level 2 dual point charging stations were installed at civic facilities in North Delta (3), Ladner (1), and Tsawwassen (1) in 2019/2020. Delta is pursuing federal funding to install an additional 10 Level 2 dual point charging stations at public facilities by the end of 2021.

EV charging requirements in new construction

Delta's Zoning Bylaw requires 20% of the parking stalls in multi-unit residential or mixed use buildings with more than six dwelling units to be provided with a Level 2 charging station or a roughed-in conduit or cable with an electrical panel and physical space for associated equipment for a Level 2 charging station (i.e. "EV ready"). The parking spaces are to be separately metered and clearly identified as being for electric vehicles by signs or paint markings on the pavement.

Fleet considerations

The City's Corporate Climate Action Initiative includes a green fleet management plan that has been in place for almost 10 years. Delta has purchased numerous Hybrid Electric Vehicles, right-sized vehicles in its fleet, and uses biodiesel year round. Delta is reviewing which plug-in electric vehicles are most appropriate for civic operations; this review will be ongoing as new models come to market.

Goals

The goal of Delta's Electric Vehicle Strategy is to remove barriers to EV ownership by increasing access to charging infrastructure and providing public education about EVs and EV charging.

Objectives

The Strategy has the following objectives:

1. Maximize and optimize access to EV charging;
2. Increase the use of electric vehicles and decrease the use of fossil fuel vehicles; and
3. Increase awareness and knowledge level of EVs and EV charging options among residents.

Actions

1.0 Charging Infrastructure: New Buildings

Most EV owners charge their vehicles at home. While owners of single family houses may find it relatively easy to set up charging at home, this can be more difficult for renters, those who do not have a garage or exterior outlet, and residents of multi-family homes. In new construction, there are opportunities to have charging stations incorporated into the building from the start of occupancy, thus avoiding costs associated with retrofitting at a later date.

1.0 Charging Infrastructure: New Buildings	
1.1	Bring forward a recommendation to revise the Zoning Bylaw to require up to 100% of parking stalls in new multi-family buildings to provide an energized electrical outlet capable of providing "Level 2" or higher EV charging
1.2	Bring forward a recommendation to revise the Zoning Bylaw to require one energized electrical outlet capable of providing "Level 2" EV charging in all new single-family homes
1.3	Bring forward a recommendation to revise the Zoning Bylaw to require up to 100% of staff parking stalls at new commercial and industrial buildings to provide an energized electrical outlet capable of providing "Level 2" or higher EV charging
1.4	Bring forward a recommendation to revise the Zoning Bylaw to require a percentage of bicycle lockers or bicycle storage rooms to have an energized electrical outlet for e-bike charging
1.5	Review the Zoning Bylaw to determine if the minimum bicycle space dimensions accommodate an e-bike
1.6	Consider requiring new or renovated gas stations to install EV charging stations
1.7	Bring forward a recommendation to revise the existing Revitalization Tax Exemption Program bylaws which provide development cost charge reductions for 'low environmental impact' projects to include recognition of providing EV charging stations above and beyond minimum zoning requirements for developments in the consideration of the overall tax exemption.
1.8	Track all installations of EV charging stations (both publicly-available and private) to ensure a robust database of stations throughout the City. Ensure all stations in multi-family buildings are included on Metro Vancouver's EV-friendly strata building online map (www.EVcondo.ca).

2.0 Charging Infrastructure: Existing Buildings

Retrofitting multi-family buildings with EV charging infrastructure can be logistically challenging and quite costly, depending on the location of the parking spaces and the proximity to the electrical panel. Because of the high costs associated with some retrofits, current provincial incentive programs for existing multi-family buildings have been successful to the point of being over-subscribed. Incentives at the local government level can further assist building owners. There are also opportunities for the City to work with strata corporations regarding their concerns related to strata approval, payment for electricity, and the retrofit process.

2.0 Charging Infrastructure: Existing Buildings	
2.1	Explore incentive or rebate opportunities at the municipal level that complement provincial rebate programs to encourage retrofits of existing buildings with EV charging stations
2.2	Advocate for provincial regulations to require that strata corporations allow the installation of EV charging infrastructure where it is technically feasible and safe (i.e. “right to charge” legislation)
2.3	Work with utility and community partners to provide technical assistance to building managers and homeowners to install EV charging stations in existing buildings

3.0 Public Charging Network

Public charging stations provide an important service for those residents who are unable to access charging for their vehicles at home. Public stations will be particularly important to bridge the years until more multi-family buildings host private charging stations. Recreation facilities, other municipal facilities, and on-street parking in commercial zones are all ideal locations for public charging. Although Level 2 stations are the most common station type in the public realm, DC Fast Chargers are an important element of the public charging network because they are the only stations that approach the short time associated with refueling a gasoline or diesel vehicle. When the refuelling time is reduced to 15 minutes or less, public charging becomes a viable substitute for home charging.

3.0 Public Charging Network	
3.1	Continue to identify external funding and grant opportunities for public charging station installations
3.2	Identify opportunities to install EV stations or conduit in conjunction with major public works projects in strategic locations and in streetscape planning
3.3	Conduct a gap analysis to identify priority locations for public charging stations (both Level 2 and DC Fast Charge)
3.4	Explore best practice methods for design and siting of charging stations
3.5	Install charging stations at locations identified by the gap analysis, including at least one DC Fast Charge station in each of Delta’s three communities, possibly in partnership with BC Hydro
3.6	Establish policies and processes that make it easier to provide publicly accessible charging on private property and encourage private commercial property owners to do so
3.7	Encourage Translink to install and maintain EV charging stations at Park & Ride lots
3.8	Analyze charging station usage data to determine daily usage trends
3.9	Based on results from 3.8, consider introducing bylaw revisions that address enforcement of parking time limits and non-EV parking at EV charging stations
3.10	Based on results from 3.8, develop policy recommendations for implementation of fees for public use of charging stations to maximize station access and reduce congestion
3.11	Develop policies and standards for EV charging station signage, including parking rates, time limits, and “parking while charging” restrictions
3.12	Explore opportunities to integrate personal e-bike and e-scooter charging infrastructure into EV charging stations and bike racks at public facilities

4.0 City Fleet

Delta's corporate vehicle fleet contributes almost 30% of the City's greenhouse gas emissions associated with city operations. The transition to electric vehicles, where feasible, will provide significant emission reductions and Operating cost savings. As vehicles come up for replacement, an electric version should be considered first. However, charging infrastructure is required at corporate vehicle parking locations in conjunction with the purchase of the City's first EVs.

4.0 City Fleet	
4.1	Provide training for staff about EVs and EV charging station infrastructure. Possible opportunities available with BC Hydro or Community Energy Association.
4.2	Develop an "electric first" fleet and equipment policy for the City that prioritizes the procurement of electric versions of vehicles and equipment, given model availability and ability to perform the required function. The policy will ensure that the lower fuel and operating costs of electric vehicles and equipment along with the environmental and health benefits (reduced air pollution and greenhouse gas emissions) are considered in the context of higher initial capital equipment costs. The target net cost of the electric vehicle or equipment over its service life should be financially sustainable through the available funding provided in the equipment replacement reserve.
4.3	Develop a comprehensive plan for location and timing of charging station installations for fleet EVs. Priority locations: City Hall pool car compound, Ladner Works Yard, and North Delta Works Yard.
4.4	Based on plan developed in 4.3, install charging stations for new EVs as they are purchased for the fleet
4.5	Monitor daily usage (kilometres traveled) of combustion engine fleet vehicles, including carpool vehicles, to assess suitability for replacement with EVs
4.6	Replace combustion engine vehicles with EVs as current fleet vehicles come up for replacement, where feasible (see 4.2). Take advantage of federal and provincial rebate incentives.
4.7	Install EV charging stations in City staff parking lots. Encourage City staff who must drive to work to drive EVs.
4.8	Join educational networks for fleet managers such as West Coast Electric Fleets
4.9	Raise the profile of EVs in the City fleet through the use of vehicle graphics and specific branding

5.0 Education and Outreach

Providing timely and practical information to residents can reduce the barriers associated with EV ownership. An education and outreach program can address common misconceptions about range, types of charging options, station locations, costs of EV ownership, and financial incentives.

5.0 Education and Outreach	
5.1	Host public demonstrations of EV technology
5.2	Advertise aspects of BC's Zero-Emission Vehicles Act that are relevant to the public (e.g. only EVs for sale in the province by 2040)
5.3	Share information about EVs that are currently available by providing links to BC Hydro and PlugInBC
5.4	Share information about where to locate EV charging stations in Delta (e.g. link to www.PlugShare.com)
5.5	Provide information about how to install a charging station at a single family home
5.6	Work with partners to develop EV charging outreach and education materials and programs targeted to builders and architects
5.7	Add a section on EVs to the City website and provide regular updates on social media. Ensure residents are kept up to date on any changes to vehicle purchase incentive programs.
5.8	Develop educational materials for display and handout at public events
5.9	Provide enhanced signage at EV charging stations to raise the profile of the stations and disseminate EV information
5.10	Promote installation of EV charging infrastructure at workplaces by raising awareness among employers, building managers, and property owners and disseminating information about the installation process and available financial incentives
5.11	Provide education to stratas, landlords, and property managers to facilitate EV charging retrofits in existing multi-family buildings. Promote resources available through www.EVcondo.ca.

Resources

Metro Vancouver – resources for electric vehicle charging in condos, apartments, and townhouses
www.EVcondo.ca

PlugInBC – represents groups and organizations supporting the uptake of electric vehicles in BC
https://pluginbc.ca/

PlugShare – international mapping resource showing locations of EV charging stations
https://www.plugshare.com/

BC Hydro – information about owning an electric vehicle
https://www.bchydro.com/powersmart/electric-vehicles/owning-an-electric-vehicle.html

CEV for BC – provincial rebate program for purchase of new electric vehicles
https://www.cevforbc.ca/clean-energy-vehicle-program

Zero-Emission Vehicles Act of British Columbia
https://news.gov.bc.ca/releases/2019EMPR0018-001077

Clean Energy Canada – climate and clean energy think tank at Simon Fraser University
https://cleanenergycanada.org/

Transport Canada – federal rebate program for purchase of new electric vehicles
https://www.tc.gc.ca/en/services/road/innovative-technologies/zero-emission-vehicles.html