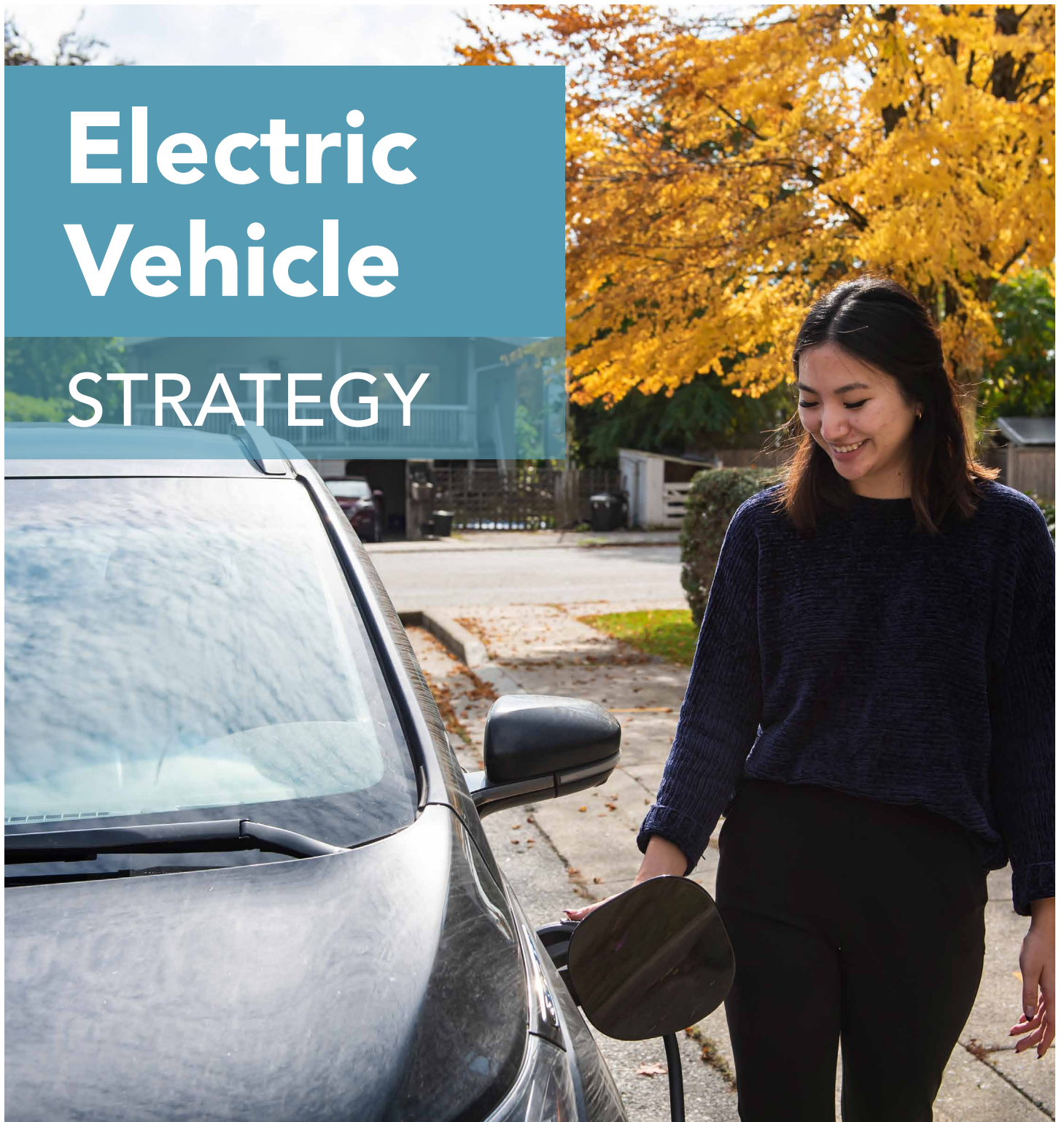


Electric Vehicle

STRATEGY



Approved June 17, 2024

Prepared by:

**District of North Vancouver &
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EXECUTIVE SUMMARY

How we move around the District of North Vancouver plays an important role in reducing carbon emissions. The District prioritizes safe and convenient active transportation, improved access to transit, and low carbon travel options as part of a broader approach to sustainable mobility.

The main objectives of the Electric Vehicle Strategy (EV Strategy) are to understand the barriers and opportunities in the transition to electric mobility, to identify charging infrastructure needs, and to help define the District's role in this respect.

Low carbon transportation is one of the six key action areas that the District is advancing to respond to the climate emergency, reduce greenhouse gas emissions, and improve our resilience to climate change. The District's Community Energy and Emissions Plan sets a target of reducing emissions by 45% by 2030 and achieving net zero emissions by 2050. While work is underway to implement active transportation, transit, and complete, compact community design, electrification of the passenger vehicle sector provides a key step towards achieving the District's 2030 emissions reduction target.



While the District has made progress in increasing access to charging, several barriers remain, particularly for residents in existing apartments and condominiums where installing charging equipment can be costly and complex. The EV Strategy was developed with these challenges in mind, through engagement, a review of leading practices, and by modelling the District's unique built form and landscape.

The following three areas were identified to support the transition to electric mobility:

- 1. Support charging at home:** Charging at home is generally the most cost-effective and convenient option for EV drivers. While the District currently requires EV charging in new developments, the District can play a role in supporting retrofits in existing multifamily buildings (e.g. apartments and condominiums).
- 2. Enable expansion of the public charging network:** Public charging stations provide access to charging for residents who are unable to charge at home. The District can help by installing public charging stations at District facilities and by facilitating privately-owned infrastructure and electric car-sharing in the community.
- 3. Lead by example:** The District is increasing efforts to demonstrate leadership in our corporate operations: Currently, 86% of the District's fleet passenger vehicles are electric and work is underway to electrify larger fleet vehicles.



The table below summarizes 11 actions the District can take to support EV charging at home, in the community, and through leading by example.

SUMMARY OF ACTIONS IN THE EV STRATEGY

1. **Support residents in existing multi-family buildings** by engaging with residents, building owners, and managers to raise awareness and facilitate EV Ready retrofits.
2. Update the District's **EV charging infrastructure policy for new developments** to ensure sufficient charging is provided for occupants of both residential and non-residential buildings. This formalizes the District's approach by moving the EV charging guidelines from the existing rezoning policy into the Zoning Bylaw.
3. **Install District-owned chargers** at strategic locations based on proximity to existing multi-family housing and amenities.
4. **Coordinate with BC Hydro and other private charging network providers** (e.g., Tesla and Parkland) to advocate for the deployment of public chargers in the DNV. This would include collaborative and proactive planning to coordinate installations and advance shared electrification goals.
5. Identify ways to **support EV charging infrastructure on private property**. This may include guidance or policy for public EV charging in parking lots (e.g. to enable accessibility of charging stalls) or connecting different private sector entities in the community to enable charging.
6. Raise awareness of charging infrastructure and **encourage EV charging installations at local workplaces**. This would include promoting available funding opportunities, and/or exploring incentive opportunities to encourage charging (e.g. District business licencing).
7. Consider updating relevant District policies to require new developments of a certain size to provide parking spaces and **EV chargers for car-share fleets** and explore other measures to support electric car share.
8. Explore opportunities to **support curbside charging and design practices** that promote accessibility and integrate with other uses in the street right of way.
9. **Encourage the electrification of ride-hailing** fleets operating in the District through existing tools (e.g. the Congestion and Curbside Management Permit and the Intermunicipal Business Licence).
10. **Develop a fleet electrification roadmap** that includes timelines for converting the District's light-, medium- and heavy-duty vehicle fleets to EVs, along with associated charging infrastructure.
11. Identify opportunities to **expand workplace charging** for District employees at DNV facilities.

1.0 DEVELOPING THE STRATEGY

Our Vision

The District's existing vision of a safe and sustainable transportation network within an inclusive, resilient, and vibrant community remains significant. This vision is outlined in the District's existing Official Community Plan (OCP), Transportation Plan, and Community Energy and Emissions Plan (CEEP).

The Community Energy and Emissions Plan identifies the transportation sector as the single largest contributor to greenhouse gas emissions in the District (52%), with the vast majority of emissions coming from personal vehicles (96%)¹ (Figure 1).

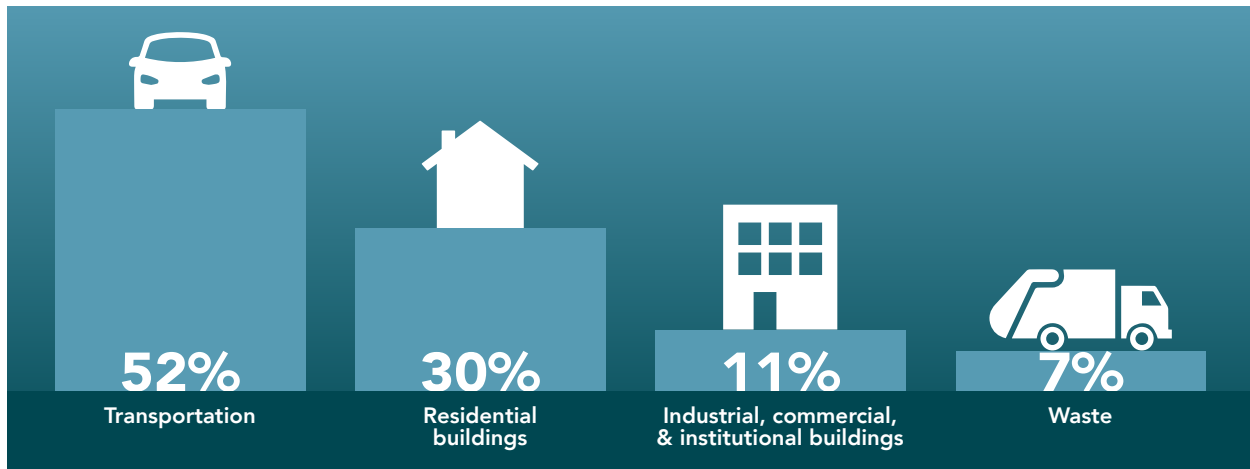


Figure 1: Greenhouse gas emissions in the DNV

The District recognizes the importance of advancing active and shared transportation initiatives, while also responding to the urgent need to rapidly reduce emissions from passenger vehicles. Electrification of the passenger vehicle sector is one part of a broader approach to low carbon mobility in the District (Figure 2).



¹ District of North Vancouver Community Energy and Emission Plan (2019)

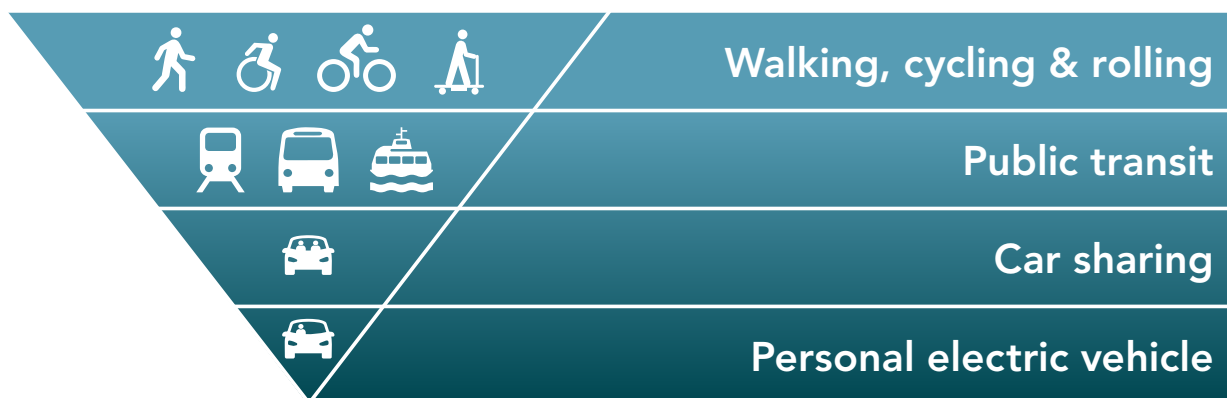


Figure 2: Low carbon mobility hierarchy

Policy Context

On May 1, 2023, Council directed staff to proceed with the development of an Electric Vehicle Strategy. The Strategy responds to an action in the Official Community Plan (OCP) Action Plan to develop an EV Strategy to accelerate the transition to low carbon mobility. The Strategy also supports objectives in the District's Community Energy and Emissions Plan (2019) and Corporate Plan (2023-2026) to reduce emissions from the transportation sector.

Approach to Strategy Development

Three objectives were identified to guide the development of the Electric Vehicle Strategy:

1. Identify the barriers and opportunities in the transition to electric mobility.
2. Identify the charging infrastructure needs for the District.
3. Define the District's role in this transition.

These objectives were pursued through a combination of research, engagement, and technical modelling. The project team completed workshops and interviews with District advisory committees, staff, technical consultants, property owners, industry experts, and relevant organizations including EV charging providers, BC Hydro, building associations, car share organizations, and the broader community. The general timeline for the EV Strategy is illustrated below and a list of participating organizations is provided in Appendix C.

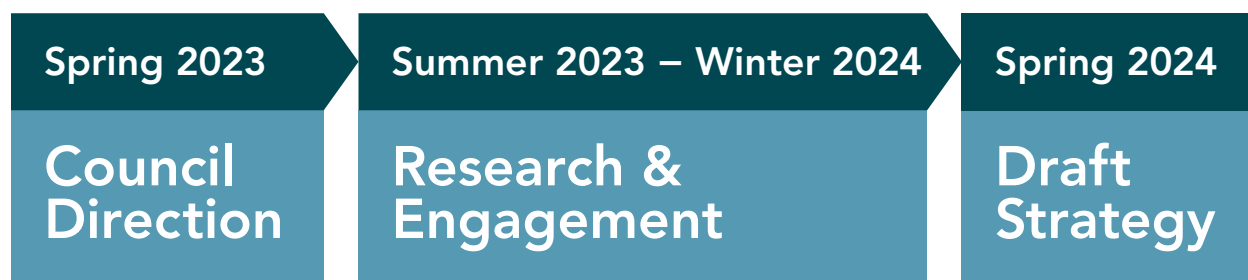


Figure 3: Timeline for development of the Electric Vehicle Strategy

Increasing access to EV charging infrastructure is a fundamental component of accelerating the transition to electric mobility. To help assess the EV charging needs in the DNV, the District retained Dunskey Energy + Climate Advisors (“Dunskey”). This assessment included EV adoption and charging forecasts for the DNV and factored in the influence of urban form and demographics. Detailed results of this analysis are outlined later in the Strategy.

The Strategy provides foundational information about EVs and EV adoption, supportive policies from other levels of government, and future charging infrastructure needs. Finally, the Strategy identifies a range of actions the District can take to accelerate EV adoption and support the infrastructure needs in the community.

The information in this document is based on a snapshot in time and is anticipated to be updated in the future.

Promoting equity

The Strategy has largely been shaped by the need to promote equity among community members. This includes identifying and reducing barriers to accessing public charging infrastructure, particularly for residents that are most likely to face challenges and high costs in retrofitting their homes for EV charging.

E-bikes

The District recognizes the importance of e-bikes and e-mobility devices in increasing access to clean and affordable transportation. In 2023, the District, along with the City of North Vancouver and the District of West Vancouver established an ongoing e-bike share program across the North Shore.



E-Bikes in the DNV

More residents are choosing to travel by bike thanks to the North Shore E-Bike Share Pilot. Growing ridership and positive feedback from community members is demonstrating that e-bike share provides an efficient and sustainable travel option in the region.

2.0 ABOUT ELECTRIC VEHICLES

What is an Electric Vehicle?

There are a number of technologies that fall under the umbrella of “electric vehicles.” The term typically encompasses:

- **Battery electric vehicles (BEVs):** electric vehicles that have an electric motor and that plug in to charge (e.g., Tesla Model 3, Chevrolet Bolt, Nissan Leaf).
- **Plug-in hybrid electric vehicles (PHEVs):** hybrid vehicles that can plug in to charge and operate in electric mode for short distances (e.g. 30 to 80 km), but which also include a combustion engine for longer trips (e.g., Toyota Prius Prime, Ford Escape Plug-in Hybrid).
- **Hydrogen fuel cell electric vehicles (FCEVs):** vehicles in which fuel cells located onboard the vehicle are used to convert hydrogen fuel into electricity, which then powers the electric motor.

The term EV typically excludes conventional hybrid vehicles that do not plug in to charge as these are considered internal combustion engine (ICE) vehicles. In this strategy, “EV” refers exclusively to BEVs and PHEVs. While hydrogen fuel cell vehicles may fall under the umbrella of low carbon vehicles, this technology is not the focus of this strategy.



EV Benefits

Electric vehicles powered by renewable electricity can reduce emissions by 80% when compared to a gas vehicle, even when factoring in emissions from manufacturing and vehicle maintenance². Maintenance costs of EVs are approximately 50% lower compared to a gas vehicle due to the simpler and more efficient electric motor.^{3,4} Lower fuel and maintenance costs can help offset the high upfront cost of an EV.

Types of EV Charging Infrastructure

There are three primary levels of EV charging: Level 1, Level 2 and Direct Current Fast Charging (DCFC), sometimes referred to as Level 3. Each of these varies in how quickly they can charge a vehicle (Table 1).

Table 1. Overview of EV charging levels⁵

	LEVEL 1	LEVEL 2	DCFC
Typical charge speed	Slowest 24-48 h+	Medium 8-12 h (at home)	Fastest 15 min-1h
Type of electric circuit	120 V	240 V	480 – 600 V
Typical power output	1.4 kW	6.6-19.2 kW	25-350+ kW

Additional information on EV charging standards is available for reference in Appendix A.

Increasing Access to Charging

Despite their benefits, access to charging remains a major barrier to EV adoption in the District. Most EV charging takes place at home where it is most affordable and convenient, and this trend is expected to continue (Figure 4). The majority of people living in ground-oriented housing like single-detached homes have access to a parking space attached to their home. Installation of EV charging in these settings can be relatively simple, although electric service upgrades are sometimes required.

² Source: International Council on Clean Transportation, Global Comparison of the Life-Cycle Greenhouse Gas Emissions of Passenger Cars (2021), 28.

https://theicct.org/sites/default/files/publications/Global-LCA-passenger-cars-jul2021_0.pdf

³ Clean Energy Canada, The True Cost (2022), 8.

https://cleanenergycanada.org/wp-content/uploads/2022/03/Report_TheTrueCost.pdf

⁴ Chris Harto, Electric Vehicle Ownership Costs: Today's Electric Vehicles Offer Big Savings for Consumers (Consumer Reports, 2020), 9.

<https://advocacy.consumerreports.org/wp-content/uploads/2020/10/EV-Ownership-Cost-Final-Report-1.pdf>

⁵ Values reflect an illustrative range in the expected charging speeds for battery-electric light duty vehicles with battery sizes ranging from approximately 50 to 100+ kWh. Charging time (h) can be calculated by dividing the battery capacity that needs to be restored (kWh) by the power level of the charger being used (kW).

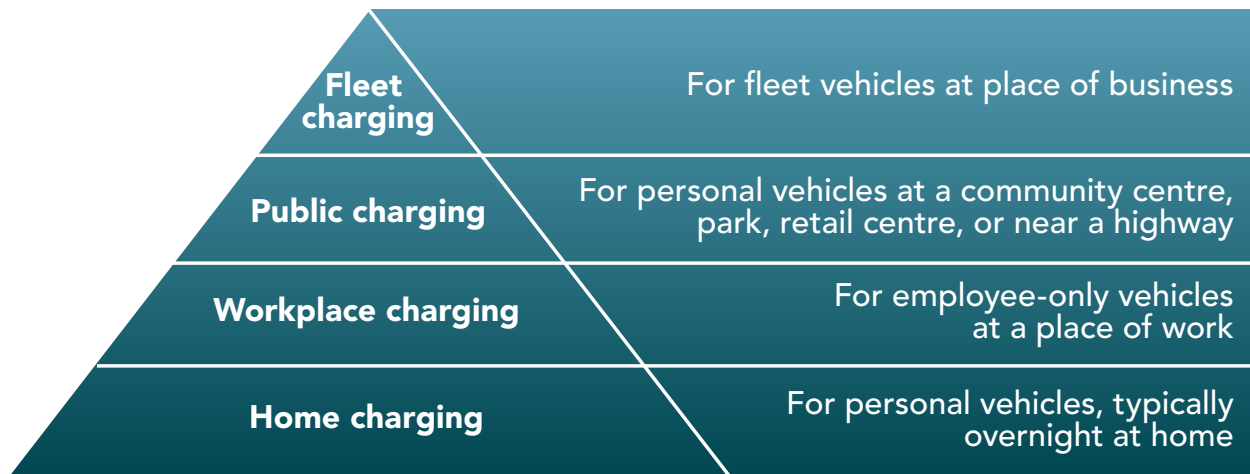


Figure 4. Charging categories: Most charging occurs at home

However, District residents looking to install EV chargers in multifamily buildings face greater challenges due to financial, technical and logistical barriers. Some residents of multifamily buildings rely on street parking.

For those that lack access to charging at home, public charging has an important role to play. By supporting additional public charging, more residents and visitors have access to charging thus lowering barriers for EV adoption.

Programs and policies from other levels of government to support EV adoption are included in Appendix B.



3.0 ELECTRIC VEHICLE OWNERSHIP IN THE DISTRICT

Current Levels of EV Adoption

Rates of EV adoption in the DNV are significantly higher than other areas of Metro Vancouver and the rest of the Province. In 2023, approximately 37% of new passenger vehicles sold in the DNV were either battery EVs or plug-in hybrid EVs (Figure 5).

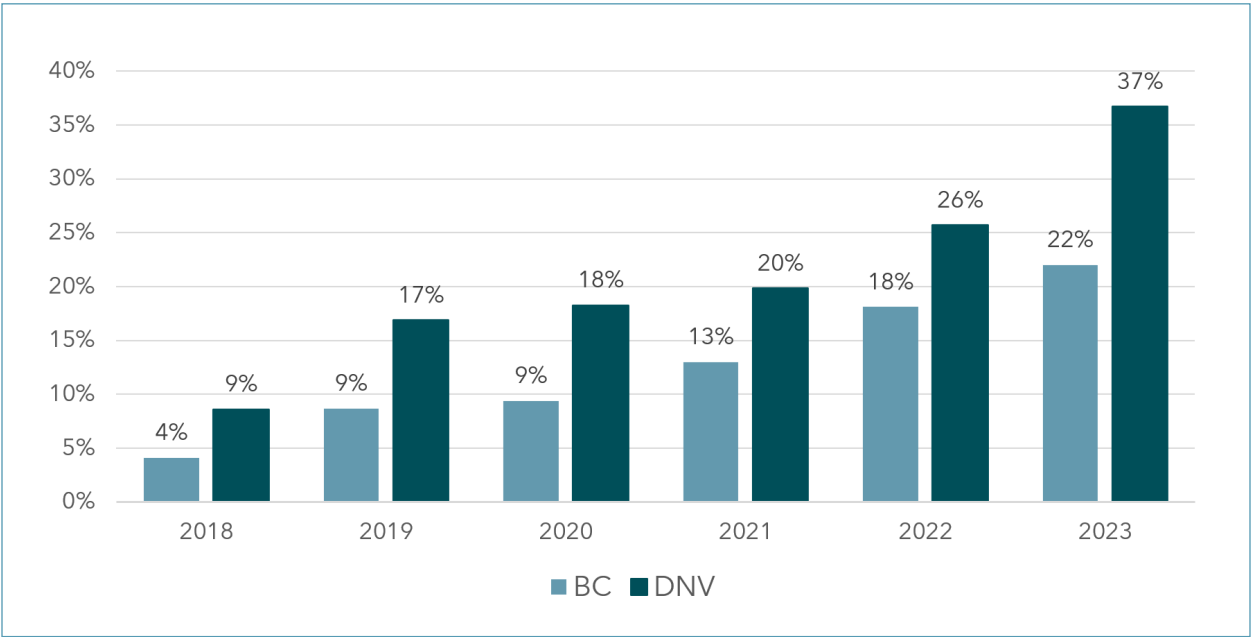


Figure 5: EVs as a percentage of total vehicle sales

As of 2023, there were approximately 3,900 battery EVs and plug-in hybrid EVs registered in the District, representing approximately 6% of vehicles on the road.⁶ Between 2018 and 2022, the number of EVs **increased sevenfold**. The rapid transition to EVs in the District is expected to continue as public awareness, supportive programs, and charging infrastructure continue to expand.

⁶ Insurance Corporation of British Columbia

Permits issued for EV charging in the District

An increasing number of residents in the District are installing EV chargers at home. Over 1000 electrical permits have been issued for EV charging stations since 2017 (Figure 6).

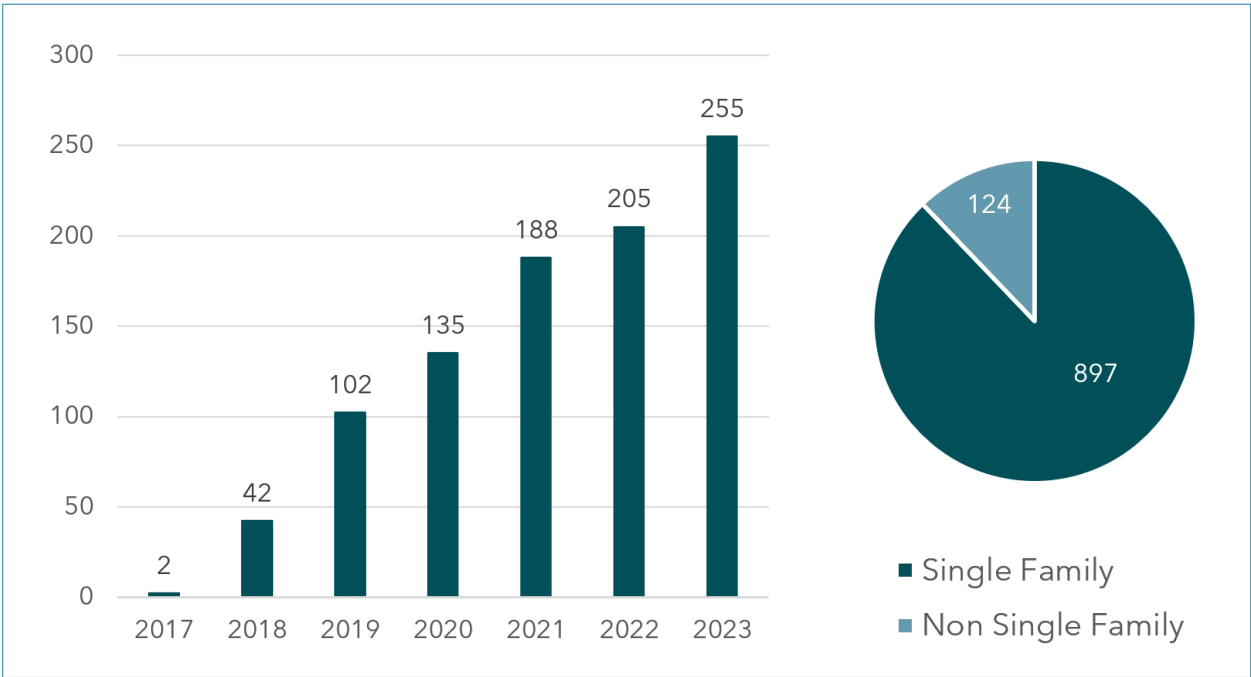


Figure 6: Permits issued for EV chargers in the District (2017-2023)

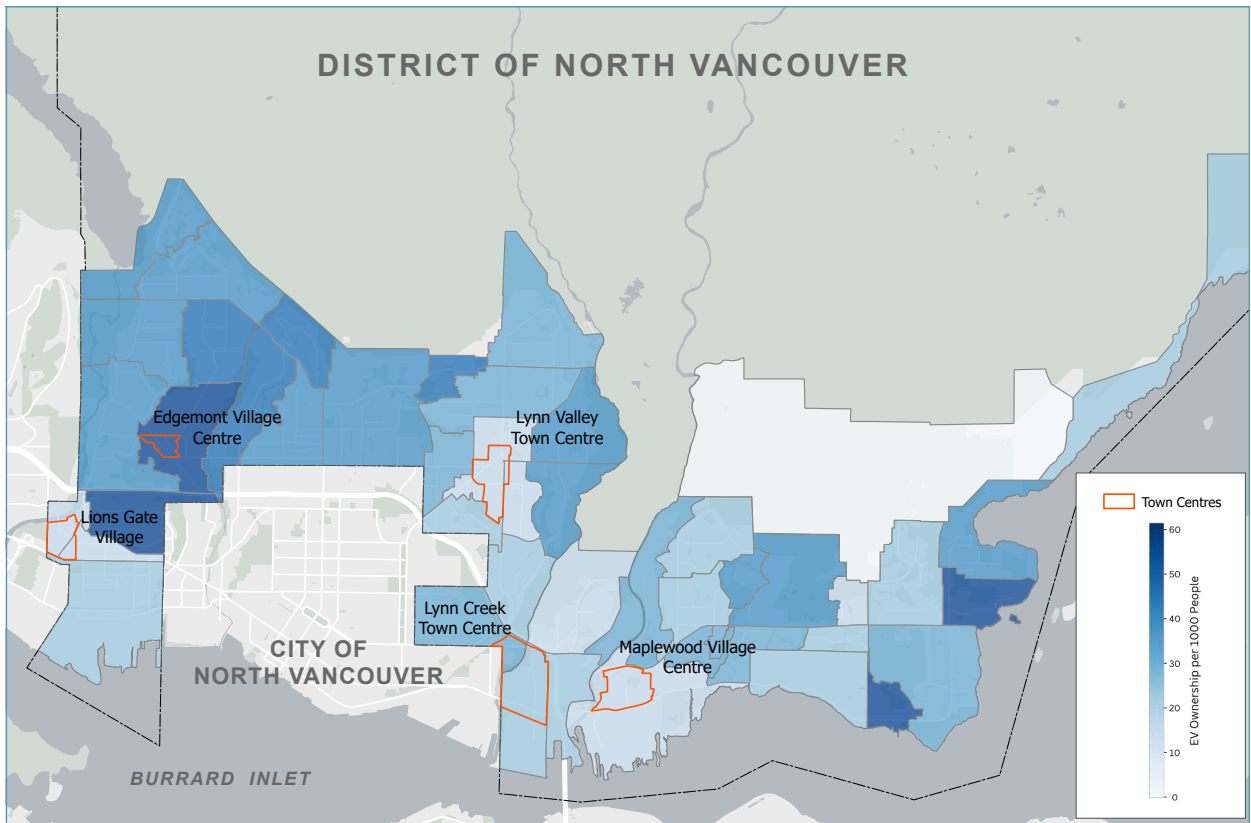
The majority of electrical permits issued for EV charging (88%) were for installations in single family homes, despite that approximately half of all households in the District are located within multifamily buildings.⁷ The greater number of permits issued for EV charging in single family homes reflects the relatively easier process to install chargers in this type of building compared to multifamily buildings. This illustrates the need for increasing access to public EV charging to support residents in multifamily buildings who are more reliant on this type of infrastructure.

Did you know?

Both the Government of British Columbia and the Government of Canada have now committed to requiring automakers to sell an increasing share of EVs such that 100% of new passenger vehicles sold will be electric or plug-in hybrid by 2035.

⁷ Statistics Canada. 2023. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E> (accessed April 18, 2024)

Electric vehicle owners typically live in single family neighbourhoods where it is expected to be easier to install charging infrastructure (Map 1). Lower EV ownership is observed in the District's town and village centres where there may be less access to private charging.



Map 1: EV ownership by neighbourhood

Existing EV Charging Stations in the District

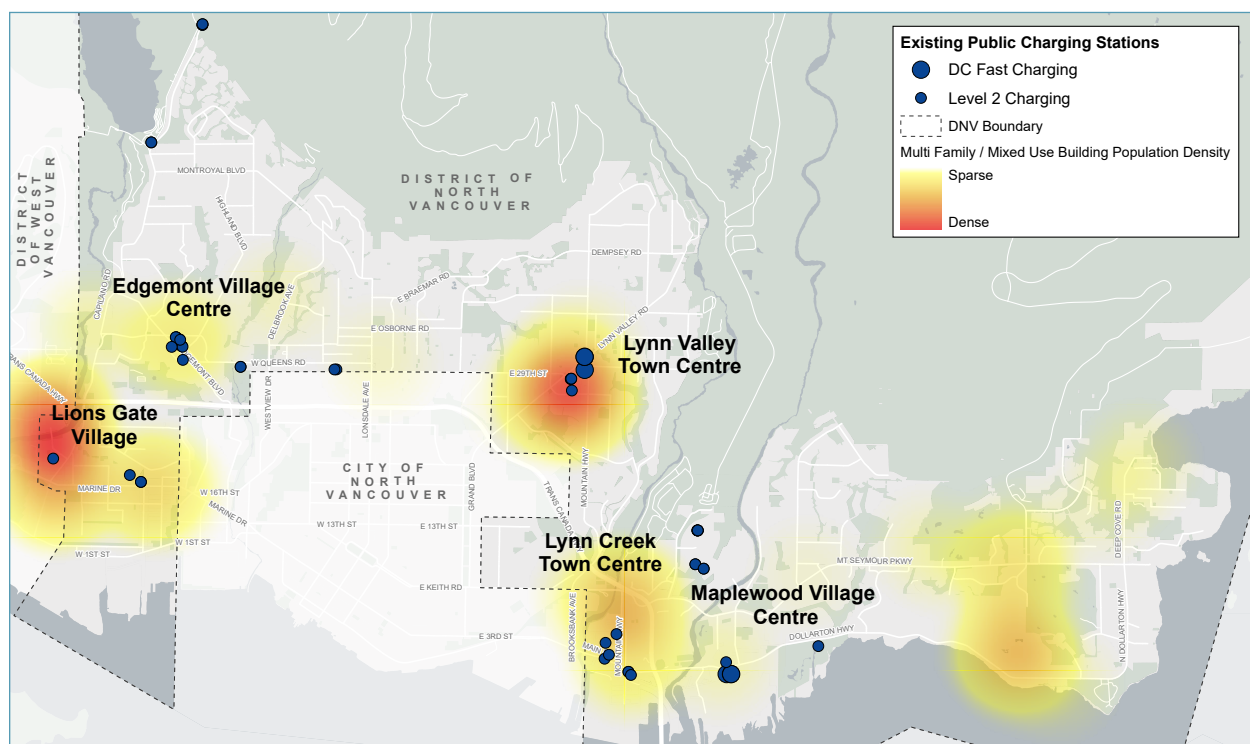
Existing public EV charging stations in the District as of Spring 2024 are shown in Map 2. The blue points on the map indicate 64 public EV charging stations provided by both private and public sector organizations. In 2024, the District operates 20 public charging stations at the following facilities:

Location of District-owned EV charging station	Type of EV charging station
District Hall	2 x Level 2 chargers
Delbrook Community Recreation Centre	4 x Level 2 chargers
Lions Gate Community Recreation Centre	10 x Level 2 chargers
Lynn Valley Village	4 x Level 2 chargers

The District is currently planning installations at Lynn Creek Community Recreation Centre (4 x Level 2 chargers) and Norgate Park (2 x Level 3 DC fast chargers), with additional public charging infrastructure, supported by senior government granting programs, being considered for other locations.

The District has recently implemented fees for the use of public EV charging stations to encourage turnover as demand for charging increases. In addition to public charging stations, the District also operates 23 stations to support corporate fleet vehicles at the Municipal Hall, the Operations Centre, the Gerry Brewer Building, and at District Fire Halls.

The map below illustrates the areas with higher multifamily population density and existing multi-family residential buildings where residents might be more reliant on public charging. This spatial analysis helps inform the District's decision-making to ensure that future public charging infrastructure is located in areas that can serve these community members.



Map 2: Existing public EV charging stations

EV Charging Needs

EV Adoption Forecasts

The EV adoption forecasts below were modelled using historic trends along with sales targets under British Columbia's Zero Emissions Vehicle (ZEV) Act. The ZEV Act requires 100% of vehicle sales to be EVs or plug-in hybrid EVs by 2035, following specific milestones (26% by 2026, 90% by 2030). Figure 7 below forecasts the share of EVs as a percentage of all vehicles on the road. Note that the percentage of new electric vehicles in the District for 2023 (37%) already exceeds the provincial ZEV sales target for 2026 of 26%.

By as early as 2030, one in five cars in the District is expected to be electric. By 2050, nearly all vehicles on the road will be electric. Two key factors lead to high rates of EV adoption in the District: (1) residents of the District have, on average, higher incomes, and (2) many residents live in ground-oriented homes where they are more likely to have access to home charging.

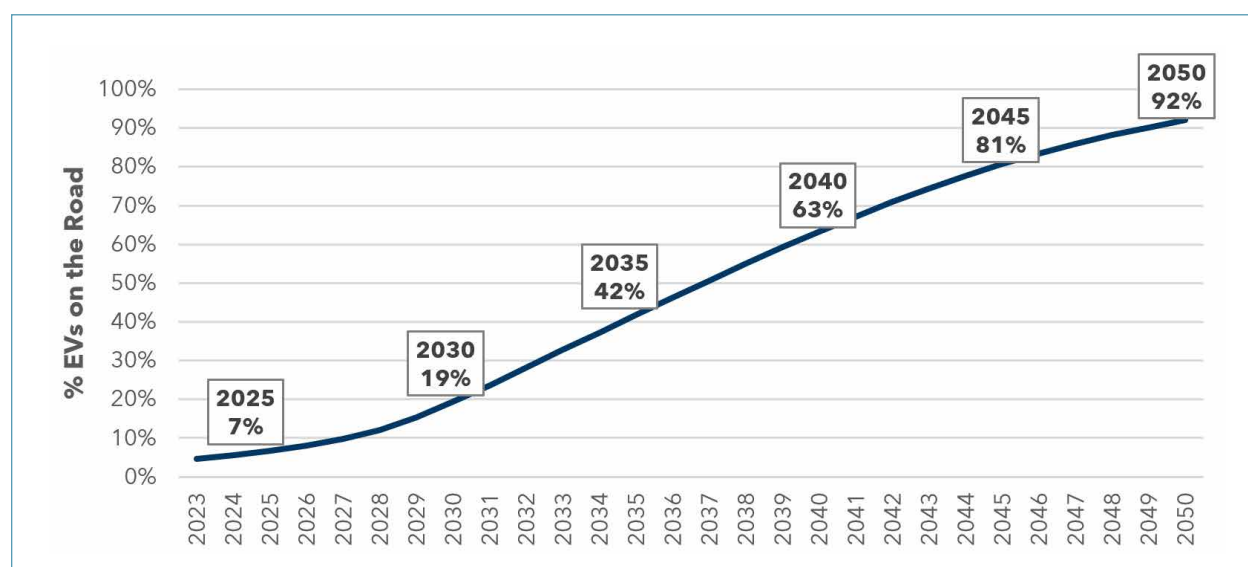


Figure 7. EV forecasts as a percentage of vehicles on the road in the DNV between 2025 and 2050

Public Charging Needs

Public charging generally refers to publicly available stations located in the community (e.g. at a community centre, park, retail centre, or near a highway), as opposed to private stations located at home.

The forecasted public charging needs were modelled using the District's unique built form and landscape. The forecast considers current EV adoption in the DNV, housing type, population growth, and other inputs such as existing District policies that encourage EV charging in new developments. To ensure that all residents of the DNV have adequate access to charging, the forecast below illustrates that **approximately 660 public charging ports will need to be installed by 2030** (Figure 8). Approximately 90% of the public charging infrastructure is expected to be deployed as Level 2 ports and the remaining infrastructure as DC fast charging ports.

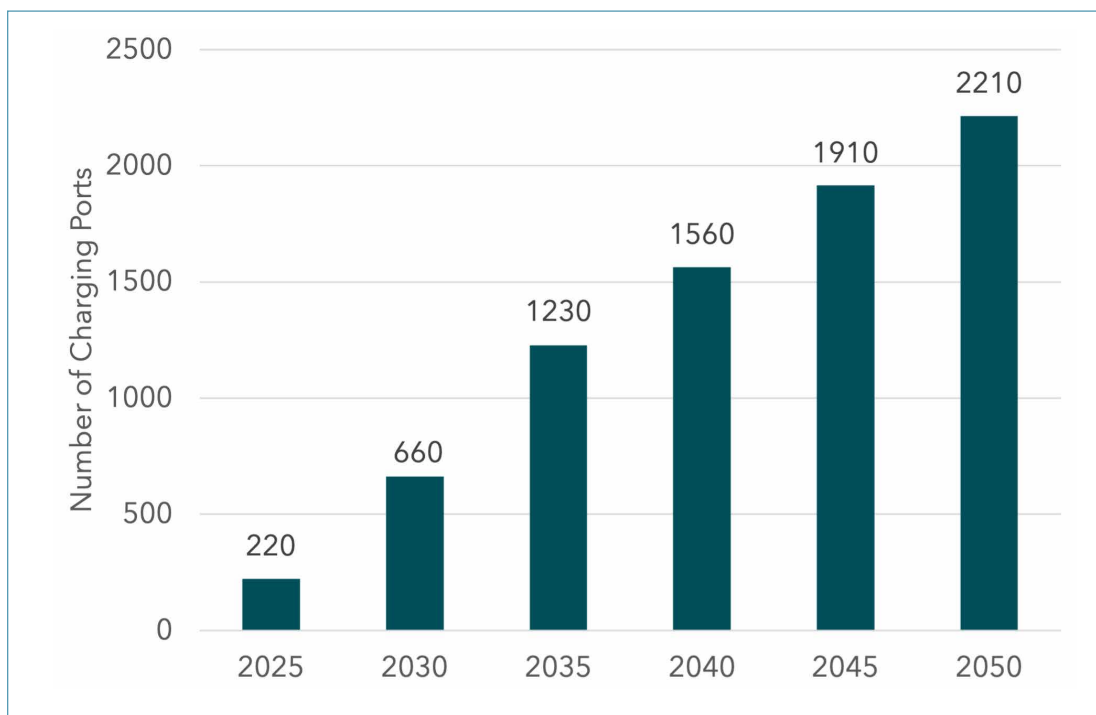


Figure 8. Forecasted demand for public charging

While a number of other organizations are committed to supporting the build-out of the public charging network in BC the District will play a role in deploying publicly accessible charging ports at District-owned facilities. By deploying public EV charging, the District can help ensure that infrastructure is located where it is needed most (e.g. near multi-family residential buildings where access to home charging may be limited) and fill in gaps in the network not covered by other organizations.

The District should target approximately 40% of the total forecasted demand for public EV charging. This target considers historical installations and current plans of major EV charging providers including BC Hydro and Tesla. The District is expected to play a more significant role in deploying Level 2 chargers due to the longer dwell times associated with District-owned sites (community centres and parks) that are appropriate for this speed of charging. Overall, the District can play a less significant role in deploying DC fast charging ports as this infrastructure is being deployed by organizations including BC Hydro, Tesla, and others. Tesla has deployed 38% of public fast charging to date in Canada and BC Hydro is expected to install approximately 30% of fast charging needs in BC.^{8,9,10} Other private organizations like Parkland/Chevron, Petro Canada, and others are expected to continue deploying additional fast charging infrastructure.

⁸ Emma Jarratt, "2023 EV charging networks report: Canada's public charger installations grew 30 per cent since start of 2022," Electric Autonomy Canada, March 14, 2023.

<https://electricautonomy.ca/2023/03/14/2023-canada-ev-charging-networks-report/>

⁹ BC Hydro, BC Hydro's Electric Vehicle Infrastructure Five-Year Plan – 2025 (2022).

<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/power-smart/electric-vehicles/ev-5-year-ev-fast-charging-network-deployment-plan.pdf>

¹⁰ Government of British Columbia, British Columbia Public Light-Duty Zero-Emission Vehicle Infrastructure Study (2021). https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/bc_public_ld_zev_infrastructure_study_final_20210505.pdf

Workplace Charging Needs

Workplace charging generally refers to employee-only stations located at a place of work. Approximately 270 additional charging ports are expected to be needed at workplaces in the DNV as employee-only charging by 2030. Employers can access funding streams to support this charging through the Government of BC's Go Electric and NRCan's Zero Emission Vehicle Infrastructure Programs. Providing workplace charging facilitates overall access to charging for commuters who lack charging access at home or who may require charging prior to returning home.

Charging in Multi-family Buildings

Home charging generally refers to private stations located at home. A major driver of demand for public charging is lack of access to home charging. To improve home charging access among residents of multifamily buildings, EV Ready parking is needed. An 'EV Ready' parking space features an electrical outlet capable of providing Level 2 EV charging (Figure 9).



Figure 9. EV Ready parking

Adapting to provincial housing legislation

At time of writing this Strategy the Province is introducing new housing legislation that may influence parking requirements in some new multi-family residential buildings in certain areas of the District. The District is monitoring this new legislation as it emerges and will consider how any changes might impact demand for EV charging stations.

Charging in new multi-family buildings

Installing a sufficient number of EV Ready parking spaces when a new multi-family building is being constructed is important. Installing EV Ready parking spaces 'future-proofs' a new building with the most convenient type of charging (at home) and helps prevent the need for retrofits in the future.

The District has had a policy in place to encourage EV charging infrastructure in new multifamily buildings since 2014. This policy was updated in 2021 and currently applies to rezoning applications for new large developments. The policy sets guidelines for 100% of residential parking stalls in new multifamily developments to be 'EV Ready' (featuring electrical outlets capable of providing Level 2 charging or higher). The current policy also applies to new commercial and industrial parking spaces, encouraging EV Ready parking in a minimum of 20% of parking stalls in these buildings and in 100% of designated accessible parking stalls.

The District's current policy encourages the use of an EV Energy Management System (EVEMS) or 'load sharing' system which allows multiple EVs to charge on the same electrical circuit, significantly reducing the capacity of electrical infrastructure and the associated capital and operating costs. While the current policy has encouraged EV charging in new developments, the District should formalize its approach by moving the EV Ready guidelines from the existing rezoning policy into the Zoning Bylaw.

Charging in existing multi-family buildings

In existing buildings, comprehensive EV Ready retrofits where all parking stalls are made to support EV charging can have significantly lower costs than incremental retrofits to individual parking spaces in multi-family buildings.

It is estimated that **4,640 parking spaces** in multi-family buildings across the DNV would make good candidates for comprehensive EV Ready retrofits by 2030. Enabling charging in multi-family buildings reduces the amount of public charging needed as more community members can charge at home.

However, retrofitting existing multi-family buildings for EV charging is a significant barrier to EV adoption due to the complexity and costs involved. Existing multi-family buildings may not have sufficient electrical service capacity on site to service charging stations, especially if other electrification upgrades are also being considered: for example, installing electric heat pumps. Upgrading electrical service infrastructure to enable EV charging and other upgrades can be cost-prohibitive and prevent building upgrades from occurring. Strata organizations and building managers often have limited knowledge of the technology and have limited access to support for weighing options and managing upgrades.

Recent changes were made to the Strata Property Act that intend to ease EV charging in strata buildings. In 2023, the Province of BC passed legislation to enable strata corporations to more easily install electric vehicle charging. The new regulations require strata corporations, with five or more units, to obtain an electrical planning report to help plan for future building upgrades like EV charging and electric heat pumps. While these initiatives can support residents that are able to install EV charging, the District expects an ongoing need for public EV charging installations to ensure access to charging in the community.

Resources and support for community members

At time of writing this Strategy multiple levels of government and utilities are offering rebates to help offset the cost of EV charging stations and the associated infrastructure. Additional information and support are available through initiatives like Emotive, CleanBC Go Electric Program, and PlugInBC. The District promotes these resources on the municipal webpage (DNV.org) and will continue to raise awareness to support charging infrastructure at home and at work.

Supporting safe EV charging installations

It is important to apply for a permit to help ensure that EV charging infrastructure is installed properly and in compliance with relevant safety standards. A permit is required before work can begin. Visit [DNV.org](https://www.dnv.org) to learn more about permit requirements for electrical equipment like EV charging stations.

Working with BC Hydro

BC Hydro monitors energy use and prepares demand forecasts to ensure that the electrical grid will meet future energy needs. BC Hydro adjusts their plans and programs as more people and businesses look to transition away from fossil fuels across the Province by switching to an EV or installing a high-efficiency home heating system like a heat pump. Currently, BC Hydro is accelerating energy efficiency programs and policies to reduce the overall load on the electrical grid, while also increasing energy resources to meet future power needs. At the time of writing, BC Hydro has issued a call for power to acquire more renewable electricity to meet future demand. New electricity generation is expected to come primarily from solar and wind energy technology.

The District works closely with BC Hydro to proactively plan for the energy transition and to advance energy efficiency initiatives in the community.

Incentives for shifting when you charge your EV

BC Hydro has developed a new optional program to encourage residents to shift their electricity use to periods of the day when demand for energy is lower by offering a lower price for electricity used during these times. EV users who opt in to this 'time-of-day' pricing will be able to save money on their utility bill by charging their vehicle between 11pm to 7 am. This program is expected to be available in 2024.

4.0 ACTIONS

The District is taking action to reduce emissions from the transportation sector. This includes improving active and shared transportation options, implementing walkable community design and foundational measures to support the transition to electric vehicles.

This strategy illustrates access to charging as a central barrier to greater EV adoption and forecasts the charging infrastructure needs in the District. This section identifies 11 actions the District can take to address this barrier and ultimately to reduce emissions from passenger vehicles in the community.

The actions focus on supporting EV charging at home, in the community, and through leading by example. These actions reflect best practices of leading jurisdictions and leverage existing programs and mechanisms to address the barriers identified in this Strategy.

Support charging at home

The District has a role to play to ensure that new developments are equipped to support EV charging at home, where it is most convenient and affordable. The District can also support residents in existing multi-family residential buildings in enabling additional EV charging at home.

ACTION	IMPACT
1. Support residents in existing multi-family buildings by engaging with residents, building owners, and managers to raise awareness and facilitate EV Ready retrofits.	Medium
2. Update the District’s EV charging infrastructure policy for new developments to ensure sufficient charging is provided for occupants of both residential and non-residential buildings. This formalizes the District’s approach by moving the EV charging guidelines from the existing rezoning policy into the Zoning Bylaw.	Medium

Enable expansion of the public charging network

The District has a role to play in filling gaps in the public charging network in order to serve community members who are unable to charge at home. The District can expand the public charging network by deploying additional charging infrastructure on DNV-owned property, and by facilitating privately-owned infrastructure and electric car-sharing in the community.

Did you know?

The District has secured funding for the installation of public charging stations through the federal Zero Emissions Vehicle Infrastructure Program (ZEVIP) and is pursuing additional funding through the CleanBC Communities Fund – Investing in Canada Infrastructure Program.

ACTION	IMPACT
3. Install District-owned chargers at strategic locations based on proximity to existing multi-family housing and amenities.	High
4. Coordinate with BC Hydro and other private charging network providers (e.g., Tesla and Parkland) to advocate for the deployment of public chargers in the DNV. This would include collaborative and proactive planning to coordinate installations and advance shared electrification goals.	Medium
5. Identify ways to support EV charging infrastructure on private property . This may include guidance or policy for public EV charging in parking lots (e.g. to enable accessibility of charging stalls) or connecting different private sector entities in the community to enable charging.	Medium
6. Raise awareness of charging infrastructure and encourage EV charging installations at local workplaces . This would include promoting available funding opportunities, and/or exploring incentive opportunities to encourage charging (e.g. District business licencing).	Medium
7. Consider updating relevant District policies to require new developments of a certain size to provide parking spaces and EV chargers for car-share fleets and explore other measures to support electric car share.	High
8. Explore opportunities to support curbside charging and design practices that promote accessibility and integrate with other uses in the street right of way.	Medium
9. Encourage the electrification of ride-hailing fleets operating in the District through existing tools (e.g. the Congestion and Curbside Management Permit and the Intermunicipal Business Licence).	Medium

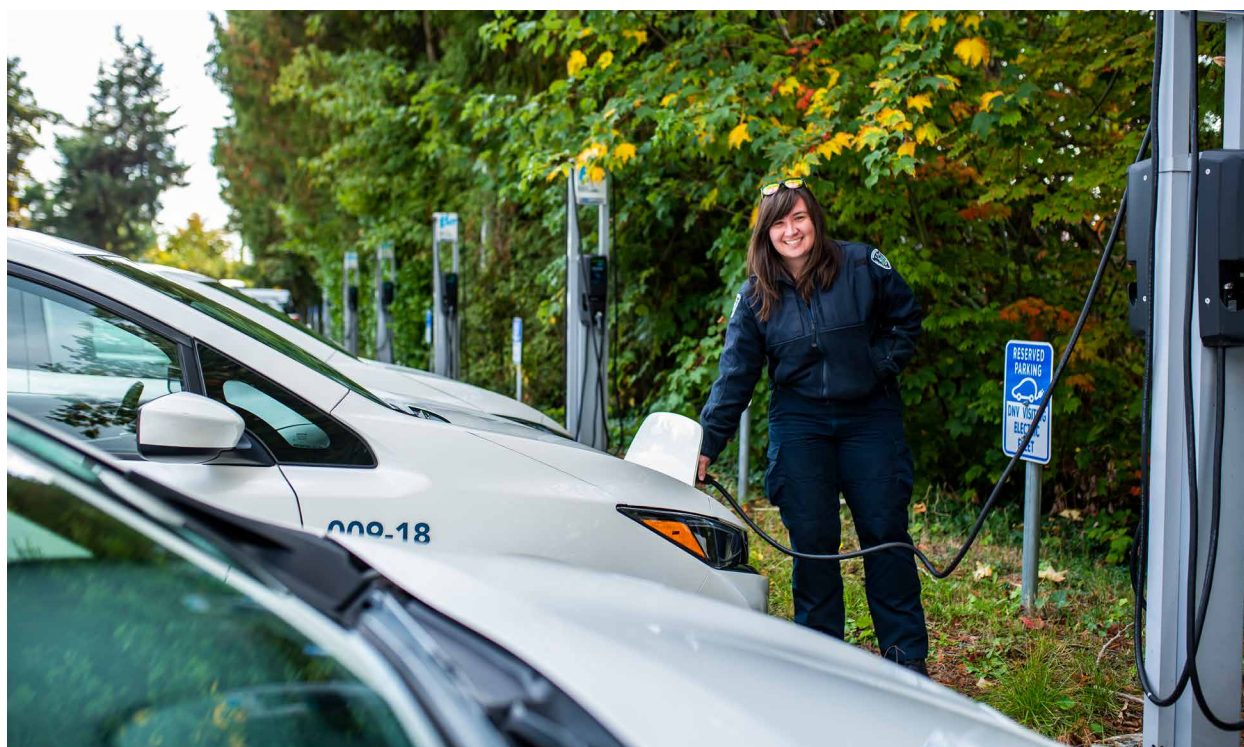
Lead by example

The District can demonstrate leadership by reducing emissions from corporate fleet vehicles and expanding workplace charging options for staff. These efforts can be integrated within a sustainable transportation framework that prioritizes active, shared, and public transportation.

DNV fleet is electrifying.

The District is actively replacing fossil fuel fleet vehicles with electric alternatives to reduce emissions from corporate operations. Currently, 32 of 37 light duty DNV fleet vehicles are EVs, and more medium and heavy duty EVs are on the way.

ACTION	IMPACT
10. Develop a fleet electrification roadmap that includes timelines for converting the District's light-, medium- and heavy-duty vehicle fleets to EVs, along with associated charging infrastructure.	High
11. Identify opportunities to expand workplace charging for District employees at DNV facilities.	Medium



APPENDIX A: EV CHARGING STANDARDS

Currently, there are a range of different EV charging connectors in use. The connector is the plug that connects an EV to a power supply.

Over time, charging standards have evolved. CHAdeMO is the standard for most vehicles manufactured in Japan, while SAE J1772 / CCS, is the predominant connector used by most North American automakers today (except Tesla).

The Tesla charging standard is called NACS, or “North American Charging Standard”. In 2023 Tesla opened up their once propriety NACS standard to other automakers, and a growing number of manufacturers have signaled their intent to incorporate Tesla’s NACS system in new vehicles.

Table 2. Overview of charging connector standards¹

TYPE OF CONNECTOR	MAX DCFC POWER LEVEL (KW)	PRIMARY APPLICATIONS
 SAE J1772 “Combined Charging System” (CCS Combo Type 1)	500	• CCS1 supports both Level 2 and DC fast charging • Until recently, CCS1 was the predominant connector used by non-Tesla North American automakers
 North American Charging Standard (NACS)	250+ ²	• A proprietary charging connector developed by Tesla • Supports both Level 2 AC and DC fast charging • A number of major North American automakers have announced plans to switch from CCS1 to NACS for 2025 vehicles
 CHAdeMO	400	• Original DC fast charge connector, but decreasing in popularity in North America

¹ Source for images: GreatDrok, Wikimedia Commons (Accessed on January 30, 2024).
<https://commons.wikimedia.org/wiki/File:Type1-ccs.svg#;>
[https://commons.wikimedia.org/wiki/File:Tesla-hpwc-model-s.svg;](https://commons.wikimedia.org/wiki/File:Tesla-hpwc-model-s.svg)
https://commons.wikimedia.org/wiki/File:Chademo_type4.svg

² A max power rating has not yet been confirmed.

APPENDIX B: SENIOR GOVERNMENT POLICIES

The federal government, provincial government and other regional and local governments across the Province have taken a wide range of actions to support EV adoption. The District and its residents can leverage the existing funding and supports, including many of the policies and programs outlined below.

Federal Government

EV Purchase Incentives

The Government of Canada administers the iZEV and iMHZEV programs which provide point-of-sale rebates towards the purchase of electric vehicles, including passenger vehicles as well as medium and heavy-duty EVs.

Funding for EV Charging Infrastructure

Through the Zero-Emission Vehicle Infrastructure Program (ZEVIP), the federal government provides organizations with funding to support EV charger deployments in public places, on-street, in multifamily buildings, at workplaces and for commercial fleets.

Clean Fuel Regulations

The Government of Canada's Clean Fuel Regulation requires producers to reduce the carbon intensity of their fuels over time. Credits can be traded across producers to offset emissions. Notably, owners and operators of public EV chargers whose electricity displaces the use of gasoline or diesel transportation fuels are eligible to earn credits for trading.

Provincial Government

The Province of BC is a leader when it comes to EV-supportive policies. This includes taking the core steps of adopting purchase incentives, investing in infrastructure and enacting a strong Zero Emissions Vehicle (ZEV) sales mandate. This supportive ecosystem has led to some of the highest rates of EV adoption in Canada. In 2023, over 22% of passenger vehicles sold in BC were battery EVs or plug-in hybrid EVs.³

EV Purchase Incentives

Through the Province's CleanBC Go Electric program, District residents are eligible for incentives towards the purchase of an EV. These incentives are scaled according to income level and range depending on vehicle type. These point-of-sale rebates can be combined with the federal iZEV incentive. In addition to incentives for purchasing light-duty vehicles, the Government of BC administers programs to support the transition to EVs for medium and heavy-duty vehicles, airport and specialty vehicles, electric school buses, cargo e-bikes, and off-road vehicles.

EV Ready Rebates

This provincial rebate program helps enable EV Ready retrofits in multifamily buildings. Property owners can receive funding for EV Ready planning, electrical installations, and EV charger installations. Some municipalities in BC are offering rebate top-ups for EV Ready retrofits in multifamily buildings. This funding can be used to support the development of an EV Ready plan, and to support the installation of necessary electrical infrastructure.

³ Statistics Canada, "Table 20-10-0024-0: New motor vehicle registrations, quarterly."
<https://doi.org/10.25318/2010002401-eng>

Low-Carbon Fuel Standard

Similar to the federal Clean Fuel Regulations, the Province's Low-Carbon Fuel requirements set standards to reduce the carbon intensity of liquid transportation fuels produced or imported into the province. Owners and operators of EV charging stations in the province are eligible to earn credits.

Did you know?

The District is eligible to receive credits as a supplier of low carbon fuel (EV charging) under the Province of BC's Low Carbon Fuel Standard and the federal government's Clean Fuel Regulation. Revenue from the sale of these credits on an annual basis helps offset the cost of operating the District's charging infrastructure.

Rebates for Home and Workplace Charging

In addition to funding for multifamily buildings, rebates are available to support home and workplace charging. Through CleanBC's Go Electric program, District residents can access funding for Level 2 chargers for single-family homes, duplexes, and other semi-detached houses. Rebates for chargers and free EV charging advisory services are also available for workplaces.

Public Fast Charging Network

Through BC Hydro, the Province is expanding the public fast charging network in BC. At the end of the 2023 fiscal year, BC Hydro had deployed 141 DCFC ports at 83 sites across the province. By 2030, the Province aims to have 3,000 public EV charging ports available, approximately 2,000 of which are expected to be DCFC fast charging ports.

APPENDIX C: ENGAGEMENT SUMMARY

The EV Strategy was developed through a combination of research, engagement, and technical modelling. The project team engaged with industry experts and interested groups through workshops and targeted interviews. An updated webpage was promoted through a variety of communication channels to further raise awareness in the community and assess a level of support for the direction of the strategy. The project team also considered input received during a two-year public engagement process to develop the Community Energy and Emissions Plan, where feedback showed that 68% of respondents were supportive or strongly supportive of actions to increase EV uptake.

The project team engaged with District staff, advisory committees, technical consultants, property owners, industry experts, and relevant organizations including EV charging providers, BC Hydro, building associations, car share organizations, and the broader community. A list of groups who participated is provided below.

- | | |
|---|--|
| 1. DNV Climate Action Advisory Committee | 16. Grouse Mountain Resort |
| 2. DNV Major Infrastructure Projects Advisory Committee | 17. Chemtrade Logistics Inc. |
| 3. Province of BC – Ministry of Energy, Mines and Low Carbon Innovation | 18. BC Hydro |
| 4. District of West Vancouver | 19. Tesla |
| 5. City of North Vancouver | 20. Chargepoint |
| 6. Capilano University | 21. Electric Advantage |
| 7. School District 44 | 22. Flo |
| 8. Tsleil-Waututh Nation | 23. Evo Car Share / BCAA |
| 9. Vancouver Coastal Health | 24. Modo Carsharing Co-op |
| 10. North Vancouver Chamber | 25. Squamish Nation |
| 11. Capilano Suspension Bridge | 26. Parkland Corporation |
| 12. Seaspan | 27. Building Owners and Managers Association of BC |
| 13. Holiday Inn | 28. Condominium Home Owners Association of BC |
| 14. Mt Seymour Resort | 29. Landlord BC |
| 15. Pattison Food Group | |