CITY OF NANAIMO
THE HARBOUR CITY

Staff Report for Decision

DATE OF MEETING September 9, 2024

AUTHORED BY TING PAN, MANAGER, SUSTAINABILITY

SUBJECT E-MOBILITY TECHNICAL STUDY

OVERVIEW

Purpose of Report

To present the result of e-mobility technical study and propose next steps.

Recommendation

That Council:

1. adopt a "Lead in the Gaps" approach on e-mobility as recommended in the E-Mobility Landscape and Options for Nanaimo Technical Report (Attachment A); and,

2. direct staff to identify key actions to address all critical barriers identified in the E-Mobility Landscape and Options for Nanaimo Technical Report and report back to Council for consideration, and as a first step:
    a) prepare a business case for consideration for the 2026-2030 Financial Plan to provide long-term, sustainable resources to improve active transportation networks for Council's consideration; and,
    b) leverage external funding and partnerships to expand and improve electric vehicle charging infrastructure in the role of a facilitator, partner, and/or landowner.

BACKGROUND

In 2019, Council set new targets of reducing community-wide emissions by 50% to 58% below 2010 levels by 2030 and 94%-107% by 2050. Transportation emissions make up about 70% of the total greenhouse gas (GHG) emissions based on City of Nanaimo's 2023 community emissions inventory and have been at similar levels since 2007. *City Plan: Nanaimo ReImagined* includes the following policies where e-mobility would play a role in achieving the GHG reduction targets:

> C1.1.9 By 2050, all transportation trips are zero carbon, through active transportation and zero emission vehicle adoption.

And:

> C1.1.10 Prioritize walking, rolling, cycling, and transit over other transportation modes to help Nanaimo achieve a zero-carbon transportation system.

The *Integrated Action Plan* includes Priority Action 7: Develop a program to encourage the adoption of e-bikes with equity considerations.

Staff commissioned the technical study (see report in Attachment A) to better understand the current state of e-mobility in Nanaimo, assess the impact of e-mobility in reducing emissions and replacing vehicle driving distance through both business-as-usual and optimal scenarios, collect information from the community on relevant barriers and opportunities, and explore the potential role the City could take.

As part of the study, a statistical mail survey and a public survey were conducted using the same survey questions (Attachment B). The statistical survey results were analyzed by the consultant and used in the forecast to provide a more accurate and fuller picture of e-mobility use throughout the city. The public survey, analyzed by staff, received more responses from current e-mobility users to help gauge the differences in their behaviours, attitudes, and perceptions from the general trend.

The study also included in-depth interviews with three equity-deserving groups and individual e-bike users and non-users, as well as a workshop with Staff from Sustainability, Current Planning, Community Planning, Transportation, Recreation Services, and Facility Asset Planning.

DISCUSSION

Current E-Mobility Adoption

The City has seen a steady growth in the number of electric vehicles (EVs), including both battery electric vehicles and plug-in hybrid electric vehicles in recent years, reaching approximately 1,110 vehicles in 2022, compared to only 162 vehicles in 2018. However, EVs only represent a little more than 1% of the total light-duty vehicles in Nanaimo, meaning most of the vehicles are internal combustion engine (ICE) vehicles that contribute to the community's GHG emissions.

Based on the statistical survey, Nanaimo has a relatively high e-bike population of approximately 10,000 e-bikes, making up 18% of the stock of all bicycles and 23% of adult bicycles. For comparison, e-bikes make up 10% of the stock of all bicycles and 11% of adult bicycles in the Capital Regional District (CRD) based on their 2022 Origin-Destination Survey.

About half of the surveyed households (51%) have at least one adult bicycle or e-bike, compared to two-thirds (66%) in the CRD. It is estimated that 12% of Nanaimo's adult population has e-bikes.

Although bike/e-bike population is relatively large in Nanaimo, they are primarily being used for exercise and recreational activities as opposed to commuting or running errands, a pattern that is distinctly different from regions where better cycling networks and infrastructure are available.

Both the statistical survey and the recent census estimate between 1 and 2% of the trips are being made by bike or e-bike in Nanaimo, significantly lower than the 8% observed in the CRD. As a result of this pattern, it can be reasoned that a small proportion of actual vehicle trips, or vehicle driving distance, are being displaced by e-bikes, despite their relatively large numbers in our community.

Potential Impact

The study forecasted e-mobility adoption under Business-As-Usual (BAU) and Optimal scenarios to determine whether Nanaimo can reduce transportation emissions to at least 50% below 2010 levels by 2030 and 100% by 2050. In order to isolate the impact of EV and e-bike adoption, the study assumes no other mode-shift efforts are incorporated (i.e., transit, bike, reduction in vehicles on the road, or other e-micromobility modes).

The forecast results show that Nanaimo achieves the 2050 emissions reduction target under both scenarios mainly due to the provincial Zero Emission Vehicle mandate. Nanaimo makes about a quarter of the way to meeting the 2030 target under either scenario, while the optimal scenario gets slightly closer, and results in EV uptake ramping up sooner and achieving earlier emissions reductions.

E-bike adoption, if doubled by 2030, is estimated to replace approximately 380 km of the average annual driving distance per vehicle. However, this replacement distance is dwarfed by the projected average annual driving distance per vehicle in Nanaimo, making up only 1 to 2% of the annual driving distance.

Overall, e-mobility is unlikely to help cut transportation emissions dramatically in the short term without active transportation modes (i.e., cycling, walking, and transit) becoming more dominant modes of transportation. If enabled, e-mobility will eventually help the City meet its 2050 emissions reduction target, and e-bikes will have the potential to play a much more impactful role in mode shift and reducing vehicle driving distance if they are used more for commuting and errands.

Barriers

The study identified a range of barriers to both EV and e-micromobility (primarily e-bikes, but including e-scooters, e-skateboards, electric wheelchairs, etc.) and rated them critical, moderate, or low. Below are the tables summarizing the barriers as well as the existing or planned government initiatives that aim to address them.

Table 1: E-Micromobility Barriers

Barriers	Rating	Initiatives
A: Affordability	Critical	Provincial e-bike purchase incentives and PST exemption. City's pilot e-bike share program.
B: Accessibility, comfort, ability, and familiarity	Critical	City's pilot e-bike share program.
C: Access to secure parking and charging	Critical	City's bike valet services at City-run special events. City's investment in the end of trip facilities toolkit and the recent addition of $75k per year for 2024, 2025, and 2026 for secure bike parking. City's current General Development Permit Area Design Guidelines project. City's planned Parking Bylaw update project.

D: Access to travel routes and infrastructure designed for micromobility	Critical	City's active transportation capital projects, improving crossing points, connections and traffic control measures, and reducing potential conflicts.
E: Access to safe and appropriate travel routes and infrastructure	Critical	City's active transportation projects, maintaining, creating, and expanding safe cycling network.
F: Uncertainty, lack of awareness of definitions, regulations, and legislation	Moderate	Provincial Motor Assisted Cycle (E-Bike) Regulation. City's amended Traffic and Highways Regulation Bylaw to regulate micromobility devices.
G: Automobile-dominant culture (culture and perceptions)	Moderate	City's promotion, education, and outreach on active transportation, such as GoByBike events.
H: Travel conditions (challenging weather or terrain)	Low	None.

Table 2: EV Barriers

Barriers	**Rating**	**Initiatives**
A: Affordability	Critical	Provincial and federal EV purchase incentives.
B: Availability of new and used EVs	Critical	Provincial Zero-Emission Vehicles Act.
C: Availability of EV models to persons with disabilities	Moderate	Unsure.
D: Lack of knowledge and experience with EVs	Moderate	Provincial CleanBC Go Electric Program community outreach free consultation services.
E: Ability to install home charging	Critical	BC's EV charger rebates. City's 100% EV-Ready requirements for residential new construction. City's EV Charging Infrastructure Rebate Program.
F: Ability to access EV-charging support programs	Moderate	Provincial CleanBC Go Electric Program's free consultation services to workplaces and condos/apartments.
G: Ability to use public charging	Moderate	Unsure.
H: Cost and time burden to use public charging	Moderate	Federal, provincial, and City's investment in public charging stations at suitable locations.

In summary, affordability is the leading barrier for both EVs and e-micromobility, preventing equitable access to e-mobility benefits. For e-micromobility, a leading barrier is access and safety of active transportation infrastructure, followed by lack of secure parking. EV charging in existing multi-family buildings presents major challenges, such as costly upgrades and occupants' limited control over changes to their homes; but home charging in existing multi-family buildings will be increasingly important as EVs become more affordable and greater proportion of residents living

in condos and apartments. Where multi-family home charging is not feasible, public charging is important to condo and apartment dwellers to access EV charging.

Equity

It is important to note that cars, electric or otherwise, remain out of reach for many, despite their use being the dominant mode of transportation. Car ownership broadly, and EV ownership specifically, is less accessible to many equity-deserving people and families.

Interviews with three select organizations that represent low-income people and families, racialized people and communities, renters, and residents of multi-family buildings found that key barriers identified in the initial research broadly aligns with feedback from these community organizations, and in addition:

1) Electric vehicle ownership is not a priority for many individuals in equity deserving communities.
2) Active transportation, including e-micromobility and transit, is a critical mobility priority.
3) For some, access to e-micromobility, including through Nanaimo's e-bike share pilot, is limited by required access to a smart phone and credit card.

Equity-deserving group representatives were united in the need to prioritize e-micromobility over EV investment to support equity-deserving communities.

Benefits

Physical health, lower transportation costs, and ability to travel on more difficult terrain with an active mode are the top e-micromobility benefits identified by survey respondents, while lower fuel costs and reduced environmental impacts are the top EV benefits.

Role of the City

The study explored potential roles for the City depending on varying levels of leadership and a variety of levers, such as regulations, assets, development approvals, spending, and advocacy.

Some key findings include:

1. Higher levels of leadership are considered to provide more control over outcomes and targets; but a lower role for EVs and higher role for e-micromobility would be recommended.
2. Regulations and Development Approvals are effective low-cost tools but cannot be implemented in isolation.
3. Operational and capital spending is highly impactful but constrained. They must be tailored to reach the highest need and impact.

In both statistical and public surveys, respondents identified increasing bike lanes as the top role of the City.

In conclusion, the study recommends the City adopt a "Lead in the Gaps" approach. This means the City takes an active role in addressing select critical barriers for e-micromobility and EVs, with focus on e-micromobility (E-micromobility barriers B, C, D, and E and EV barrier E as listed in

Table 1 and 2 above). City considers addressing other barriers in a partner or facilitator role on a case-by-case basis.

Update on Provincial E-Bike Incentive Program

There is considerable demand for the provincial e-bike purchase incentive program in Nanaimo. Based on the conversation with staff from the Ministry of Transportation and Infrastructure (MoTI), the 2023 provincial e-bike incentive program provided a total of 112 rebates to Nanaimo residents with the following breakdown:

Rebate Amount	Number of Rebates Granted
$350	6
$1,000	14
$1,400	92
Total $144,900	**112**

MoTI staff informed City staff the province intended to renew the program this November to grant additional rebates to those on the waitlist from 2023. The renewed program will eliminate the $350 rebate tier and only offer income-qualified $1,000 and $1,400 rebate tiers, and the income qualification will be based on household income instead of individual income.

Staff learned that there were over 800 Nanaimo residents on the waitlist. While the actual number of eligible applicants is likely smaller because of the changing criteria and voluntary withdrawals, the required funding to support this many applications will likely be in the tune of $1 million. The City has the option to provide municipal top-up rebates for Nanaimo residents once the provincial funding is exhausted. However, given the large number of Nanaimo applicants, it is unlikely the funding will be fully allocated before the end of 2024. Staff plan to work with MoTI staff and monitor rebate allocation process before proposing further action.

OPTIONS

1. That Council:

    1. adopt a “Lead in the Gaps” approach on e-mobility as recommended in the E-Mobility Landscape and Options for Nanaimo Technical Report (Attachment A); and,

    2. direct staff to identify key actions to address all critical barriers identified in the E-Mobility Landscape and Options for Nanaimo Technical Report and report back to Council for consideration, and as a first step:

        a) draft a business plan to be included in the 2026-2030 Financial Plan to provide long-term, sustainable resources to improve active transportation network for Council’s consideration; and,
        b) leverage external funding and partnerships to expand and improve electric vehicle charging infrastructure in the role of a facilitator, partner, and/or landowner.

    - The advantages of this option: Adopting a “Lead in the Gaps” approach is anticipated to lead to high impactful actions to reduce transportation emissions and lower transportation costs to all, especially those who face more challenges

to access safe, comfortable, convenient, accessible, enjoyable, and affordable travel in our community. This approach is aligned with many *City Plan: Nanaimo ReImagined* Desired Outcomes.

Developing a business plan to improve active transportation network and leveraging external funding and partnership to expand EV charging infrastructure would allow Staff to direct limited resources to highest need and impact consistently over the long term.

- The disadvantages of this option: Not all identified barriers to e-mobility will be addressed in the short term.
- Financial Implications: Addressing identified barriers to e-mobility would require Staff and financial resources. While leveraging external funding and partnerships to improve EV charging, infrastructure can be undertaken with existing resources, providing long-term sustainable resources. Improving the active transportation network would require a detailed business plan.

2. That Council provide alternate direction.

SUMMARY POINTS

- The City of Nanaimo Staff commissioned a study to better understand the current state of e-mobility in Nanaimo, assess the impact of e-mobility in reducing emissions and replacing vehicle driving distance, collect information from the community on relevant barriers and opportunities, and explore the potential role the City could take.
- The study identified barriers to e-mobility adoption in Nanaimo and rated them critical, moderate, or low.
- Staff recommend that Council adopt a 'Lead in the Gaps" approach on e-mobility to address the identified barriers, and in addition direct Staff to develop a business plan to improve the active transportation network and leverage external funding and partnership to expand electric vehicle charging infrastructure.

ATTACHMENTS:

ATTACHMENT A: E-Mobility Landscape and Options for Nanaimo Technical Report
ATTACHMENT B: Nanaimo E-Mobility Survey

Submitted by:

Ting Pan
Manager, Sustainability

Concurrence by:

Jamie Rose,
Manager, Transportation

Jeremy Holm
Director, Planning & Development

Poul Rosen
Director, Engineering