Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Notice of Meeting and Meeting Agenda
Environmental Services Committee

Wednesday, July 21, 2021 | **1:30 PM** | **6th Floor Boardroom, 625 Fisgard St. Victoria, BC V8W 1R7**

B. Desjardins (Chair), N. Taylor (Vice Chair), D. Blackwell, L. Helps, M. Hicks, G. Holman, J. Olsen, G. Orr, J. Ranns, K. Williams, R. Windsor, C. Plant (Board Chair, ex-officio)

The Capital Regional District strives to be a place where inclusion is paramount and all people are treated with dignity. We pledge to make our meetings a place where all feel welcome and respected.

1. Territorial Acknowledgement

2. Approval of Agenda

3. Adoption of Minutes

3.1. 21-595 Minutes of the June 16, 2021 Environmental Services Committee Meeting

Recommendation: That the minutes of the Environmental Services Committee meeting of June 16, 2021 be adopted as circulated.

Attachments: Minutes: June 16, 2021

4. Chair's Remarks

5. Presentations/Delegations

Due to limited seating capacity, this meeting will be held by Live Webcast without the public present.

To participate electronically, complete the online application for "Addressing the Board" on our website. Alternatively, you may email the CRD Board at crdboard@crd.bc.ca.

6. Committee Business

6.1. 21-593 Millstream Meadows Remediation Project Update

Recommendation: The Environmental Services Committee recommends to the Capital Regional District Board:
That this staff report be received for information.

Attachments: Staff Report: Millstream Meadows Remediation Project Update

Appendix A: Site Location Plan

6.2. 21-561 Recycling Regulation Policy Intentions Paper - Feedback and Next Steps

Recommendation: The Environmental Services Committee recommends to the Capital Regional District Board:
That this report be received for information.

Attachments: Staff Report: Recycling Reg. Policy Intentions Paper-Feedback/Next Steps

Appendix A: Recycling Reg. Policy Intentions Paper-Summary Feedback

6.3. 21-469 CRD Electric Vehicle Infrastructure Roadmap

Recommendation: [At the June 16, 2021 Transportation Committee meeting, the following report was referred to the Environmental Services Committee for information. Please note, the report was received for information by the CRD Board on July 14, 2021:]
That this report be received for information.

Attachments: Staff Report: CRD Electric Vehicle Infrastructure Roadmap

Appendix A: CRD Electric Vehicle Infrastructure Roadmap - Dunsky Consulting

Appendix B: Regional Electric Vehicle Infrastructure Roles

7. Notice(s) of Motion

8. New Business

9. Adjournment

Next Meeting: September 29, 2021 (Special)

Capital Regional District

625 Fisgard St.,
Victoria, BC V8W 1R7

Meeting Minutes

Environmental Services Committee

Wednesday, June 16, 2021 **1:30 PM** **6th Floor Boardroom**
625 Fisgard St.
Victoria, BC V8W 1R7

PRESENT
Directors: B. Desjardins (Chair), N. Taylor (Vice Chair), D. Blackwell (EP), L. Helps (1:45 pm) (EP), M. Hicks (EP), G. Orr (EP), J. Ranns (EP), K. Williams, R. Windsor (EP)

Staff: R. Lapham, Chief Administrative Officer; L. Hutcheson, General Manager, Parks and Environmental Services; G. Harris, Senior Manager, Environmental Protection; R. Smith, Senior Manager, Environmental Resource Management; M. Lagoa, Deputy Corporate Officer; S. Orr, Senior Committee Clerk (Recorder)

EP - Electronic Participation

Regrets: G. Holman, J. Olsen, C. Plant

The meeting was called to order at 1:30 pm.

1. Territorial Acknowledgement

Vice Chair Taylor provided the Territorial Acknowledgement.

2. Approval of Agenda

MOVED by Director Taylor, SECONDED by Director Williams,
That the agenda for the June 16, 2021 Environmental Services Committee meeting be approved.
CARRIED

3. Adoption of Minutes

3.1. 21-504 Minutes of the May 19, 2021 Environmental Services Committee

MOVED by Director Taylor, SECONDED by Director Williams,
That the minutes of the Environmental Services Committee meeting of May 19, 2021 be adopted as circulated.
CARRIED

4. Chair's Remarks

The Chair had no remarks.

5. Presentations/Delegations

5.1. **21-507** Delegation - Geoff Krause; Representing Saanich Inlet Protection Society: Re: Agenda Item 6.3.: Biosolids Management - Response to Peninsula Biosolids Coalition

G. Krause spoke in opposition of Biosolids.

5.2. **21-508** Delegation - Dave Cowen; Representing Peninsula Biosolids Coalition: Re: Agenda Item 6.3.: Biosolids Management - Response to Peninsula Biosolids Coalition

D. Cowen spoke in opposition of Biosolids.

5.3. **21-509** Delegation - Philippe Lucas; Representing Biosolid Free BC: Re: Agenda Item 6.3.: Biosolids Management - Response to Peninsula Biosolids Coalition

P. Lucas spoke in opposition of Biosolids.

5.4. **21-513** Delegation - Nikki Macdonald; Representing Mount Work Coalition: Re: Agenda Item 6.3.: Biosolids Management - Response to Peninsula Biosolids Coalition

N. Macdonald spoke in opposition of Biosolids.

6. Committee Business

6.1. 21-471 Repealing the Capital Regional District Recycling Bylaw (Bylaw No. 2290)

R. Smith spoke to item 6.1.

MOVED by Director Williams, SECONDED by Director Taylor,
The Environmental Services Committee recommends to the Capital Regional District Board:
1. That Bylaw No. 4432, "Capital Regional District Recycling Bylaw No. 2, 1995, Repeal Bylaw No. 1, 2021" be introduced and read a first, second time and third time;
2. That Bylaw No. 4432 be adopted.
3. That Bylaw No. 4434 "Capital Regional District Ticket Information Authorization Bylaw 1990, Amendment Bylaw No. 72, 2021" be introduced and read a first, second time and third time;
4. That Bylaw No. 4434 be adopted.
CARRIED

6.2. 21-486 Cancellation of the Provincial Climate Action Revenue Incentive Program

G. Harris spoke to Item 6.2.

MOVED by Director Williams , SECONDED by Director Taylor,
The Environmental Services Committee recommends to the Capital Regional District Board:
That the Board Chair send a letter to: Premier John Horgan; the Minister of Municipal Affairs; the Minister of Environment and Climate Change Strategy; and

UBCM detailing the impact of cancelling the Climate Action Revenue Incentive Program (CARIP) and requesting that the Province engage local governments on the swift replacement of CARIP with a program that provides consistent, non-application based funding, with first payments received by local governments in 2022.
CARRIED

6.3. 21-503 Biosolids Management - Response to Peninsula Biosolids Coalition

G. Harris spoke to Item 6.3.

Discussion ensued regarding:
- Plant operations
- Contingency planning
- Provincial funding
- Outfall locations
- Water collection systems monitoring
- Flow data
- Project agreement
- Dispute process

MOVED by Director Ranns, SECONDED by Director Williams,
1. That the Capital Regional District support and facilitate, where possible, the business case process the Township of Esquimalt is doing to explore feasibility and gasification of solid waste and kitchen scraps waste management.
2. That the Capital Regional District utilize this process to test biosolids in the gasification process as an option of the final step of biosolids for our region.
CARRIED
Opposed: Blackwell, Windsor

Discussion ensued regarding:
- Long term plan for Biosolids
- Request for Proposal process
- Environmental Impact Study
- Monthly reporting

MOVED by Director Hicks, SECONDED by Director Windsor,
The CRD board request from the Province the end of land application of biosolds on the surface of Hartland Landfill.
CARRIED

MOVED by Director Hicks, SECONDED by Director Windsor,
The CRD provide an environmental impact study with monthly testing and reporting.
DEFEATED
Opposed: Desjardins,Taylor, Blackwell, Helps, Hicks, Orr, Ranns, Williams

R. Windsor left the meeting at 2:37 pm.

MOVED by Director Blackwell, SECONDED by Director Williams,
The Environmental Services Committee recommends to the Capital Regional District Board:
That this staff report be received for information.
CARRIED

7. Notice(s) of Motion

There was no notice of motion.

8. New Business

There was no new business.

9. Adjournment

MOVED by Director Taylor, SECONDED by Director Williams,
That the June 16, 2021 Environmental Services Committee meeting be adjourned at 2:47 pm.
CARRIED

_____
Chair

_____
Recorder

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EEP 21-34

REPORT TO ENVIRONMENTAL SERVICES COMMITTEE
MEETING OF WEDNESDAY, JULY 21, 2021

SUBJECT **Millstream Meadows Remediation Project Update**

ISSUE SUMMARY

To update the committee of the current South Highlands Local Area Planning process, and the potential implications on the Millstream Meadows remediation project.

BACKGROUND

The Millstream Meadows site is a 32-acre property in the District of Highlands (Highlands) that was used for the unregulated disposal of septage and other trucked liquid waste between the early 1940s and 1985 (Appendix A). Since 2005, the CRD and the Government of British Columbia (the Province) have worked cooperatively to investigate and remediate contamination at the property, with the end goal of divestiture. The overall project approach, schedule and budget is managed in cooperation with, and is approved by, the Province.

Upon completion of remediation, the Capital Regional District (CRD) plans to obtain a risk-based, commercial land use Certificate of Compliance to demonstrate compliance with provincial contaminated sites legislation. This provincial certification will confirm that site remediation and the management plan will protect human health and the environment, and will allow the site's redevelopment potential to be fully realized to generate economic development opportunities within the Highlands. Commercial land use was set as the remedial target, in accordance with Highlands' Official Community Plan (OCP).

In 2007-2008, contractors removed 76,000 tonnes of contaminated soil from the site, and although a significant portion of the contamination was removed at that time, soil and groundwater contamination remains. Since 2016, the CRD has implemented a multi-phase Detailed Site Investigation intended to fully delineate the degree and extent of contamination, which is a requirement of the BC Ministry of Environment and Climate Change Strategy (ENV).

In the fall of 2020, the District of Highlands began developing a Local Area Plan (LAP) for the South Highlands, including the Millstream Meadows site, which will ultimately inform an update of its Official Community Plan. Several task force meetings have been held in recent months and the summaries have been uploaded to the District's website. According to published LAP task force meeting minutes, there is a forthcoming proposal for a new "Green Economy Land Use" or "Sustainable Gateway Land Use" designation for the Millstream Meadows site and surrounding properties. The proposed future land uses include: green campus, conservation, eco-industrial, recreation, climate change mitigation/amelioration, carbon off-setting, and community uses. The most recent task force meeting has also proposed alternative land use, "Greenbelt Land Use", which would seek to restrict further development of these lands (i.e., no additional commercial, industrial or residential use), with the objective of allowing the land to passively regenerate over time.

The land use changes, as proposed, would have significant implications on the Millstream Meadows site remediation and the future of the site. The proposed land uses do not align with the remediation target land use for the site (i.e., contaminated sites regulation [CSR] commercial land use). Rather, it aligns more closely with CSR high-density residential or park land uses. Changing the site's remedial target at this stage in the project would significantly increase the overall cost and delay the remedial timeline.

IMPLICATIONS

Financial Implications

The CRD Board has approved an overall project budget of $14.7M. Project costs are shared between the CRD and the province at 61% and 39%, respectively. The CRD's 61% share has been funded through: Municipal Finance Authority debt, requisition, Hartland tipping fees and the septage disposal service capital reserve.

While the financial implications of the proposed change in land use designation at the site have not been formally evaluated, altering the remedial target to a more stringent land use would result in a significant increase in environmental consulting, investigation and remediation costs. The proposed land use changes could also negatively affect cost recovery for the project, if the value of the property is negatively affected by rezoning.

Environmental & Climate Implications

The current remediation will ensure there are no unacceptable current or future risks associated with the site, provided the future land use is for commercial or industrial purposes.

Intergovernmental Implications

In 2019, the CRD reinitiated an application for rezoning to Highlands Industrial Zone (M1). The rezoning is consistent with the Official Community Plan and would maximize potential redevelopment opportunities for the site and land value upon divestment. The Highlands placed a hold on the CRD application, pending the Local Area Plan process. If the zoning, as determined by the Highlands, is inconsistent with the land use assumptions from the site remediation, the property would be at risk of becoming an undevelopable brownfield.

The proposed land use changes are not consistent with the cost-share agreement between the CRD and the Province and will have financial implications on the Millstream Meadow site remediation, and will compromise the future development and use of the site. Staff have committed to meeting with provincial representatives to determine their expectations for cost recovery of remedial funds. The CRD and the Province may be aligned in a position to oppose the potential changes in land use under the OCP.

CONCLUSION

After 14 years, the Millstream Meadows property remediation project is nearing completion, at a total cost of approximately $14.7M. The remedial target of commercial land use under provincial legislation was selected to best reflect the zoning listed in the District of Highlands' Official Community Plan (OCP). Recently, under the local area planning process for the South Highlands,

there is a proposal to alter the land use designation for the Millstream Meadows site and surrounding properties under the OCP. Proposed land use changes do not reflect the agreed-upon remedial target for the site, and will have negative financial implications to the Millstream Meadow site remediation, and will put future divestment of the site at risk.

RECOMMENDATION

The Environmental Services Committee recommends to the Capital Regional Board:

That this staff report be received for information.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

ATTACHMENT

Appendix A: Site Location Plan

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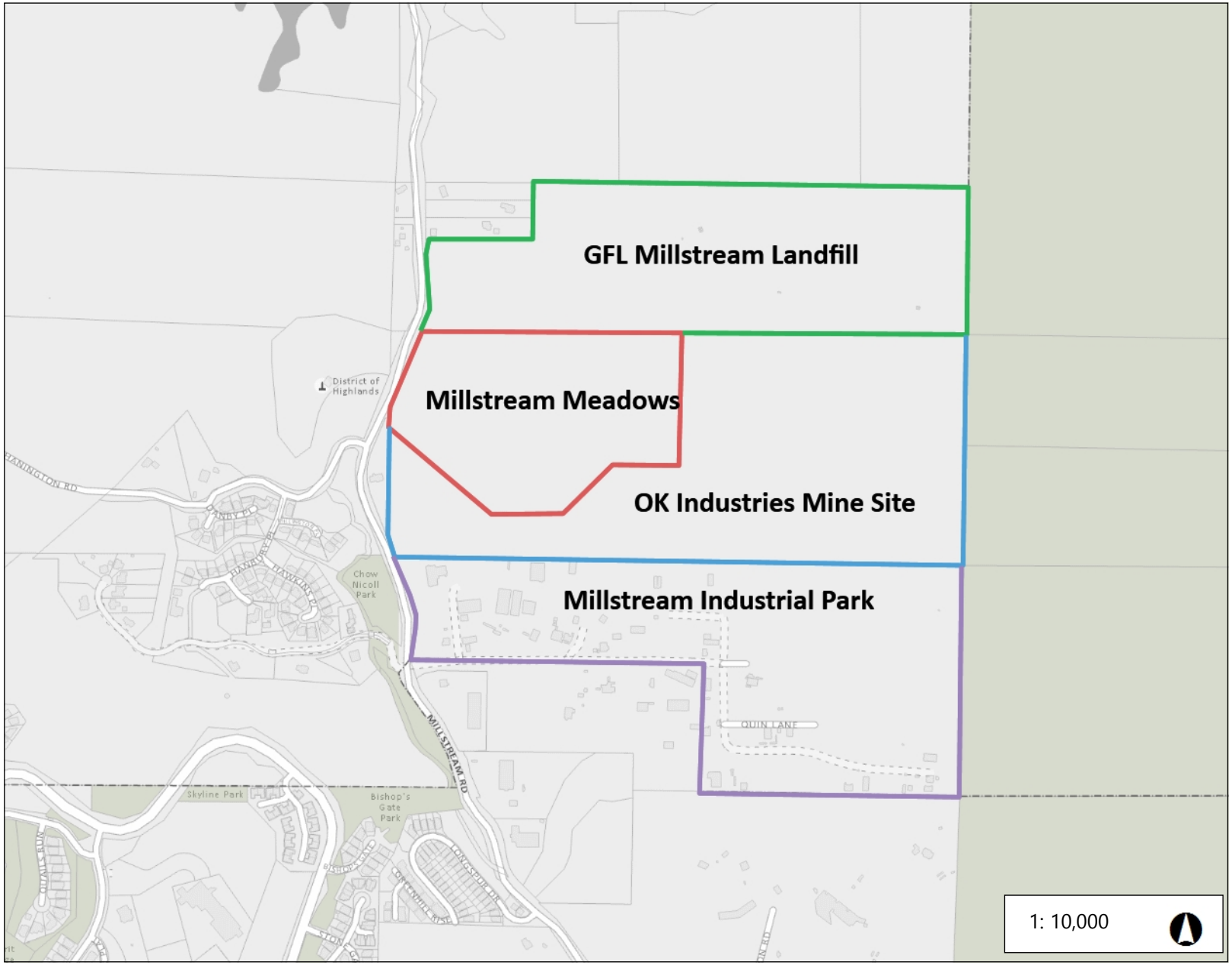
Millstream Meadows and Surrounding Properties



Legend

Notes

508.0 0 254.0 508.0 Meters

NAD_1983_UTM_Zone_10N

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ERM 21-31

REPORT TO ENVIRONMENTAL SERVICES COMMITTEE
MEETING OF WEDNESDAY, JULY 21, 2021

SUBJECT **Recycling Regulation Policy Intentions Paper – Feedback and Next Steps**

ISSUE SUMMARY

To provide the committee with a synopsis of the results of the BC Ministry of Environment & Climate Change Strategy's (ENV) consultation process regarding its September 2020 Recycling Regulation Policy Intentions Paper.

BACKGROUND

On September 12, 2020, the ENV released an Intentions Paper to solicit feedback on expanding extended producer responsibility (EPR) by including more products under the BC Recycling Regulation to ensure these products are managed properly. The Intentions Paper sought feedback on expanding EPR to include:

- Mattresses and foundations
- Additional residual household hazardous waste products, including:
  - pool chemicals
  - fire extinguishers
  - compressed gas cylinders (fuel and helium)
  - flares
  - medical syringes
  - bear spray
  - fertilizer
  - additional paints, sealers and adhesives
  - additional pest control and rodenticides
  - automotive additives
  - veterinary pet medicines
- An expanded range of electric and electronic products, including electric car batteries and charging equipment, solar power equipment and other electric products, such as drones, motorized yard decorations and e-cigarettes.
- Non-residential industrial, commercial and institutional (ICI) packaging and paper products (PPP).

Though not explicitly being considered for EPR, ENV also sought feedback on how to manage lost and abandoned fishing gear. Comments were accepted up to November 20, 2020 and a total of 165 responses from stakeholders and individuals were received. A copy of the Summary of Feedback Report is provided for information in Appendix A.

Approximately 90% of respondents expressed support for adding mattresses and box springs/foundations to the BC Recycling Regulation. There were also suggestions that exemptions be made for contaminated mattresses due to health and safety concerns, as well as for waterbeds and hospital beds that contain electronic equipment.

Approximately 80% of respondents expressed support for expanding the list of household hazardous waste products that would be subject to the BC Recycling Regulation, including all local government respondents. Conversely, none of the responding product sellers indicated support for their products becoming subject to extended producer responsibility (EPR).

About 74% of respondents expressed support for expanding the electronic and electrical product category of the BC Recycling Regulation to include electric and hybrid car batteries and their charging equipment, solar panels, as well as other powered products, including drones, motorized yard decorations and e-cigarettes. Electric car batteries were most commonly suggested as the product type that should be prioritized for EPR, though some concern was raised by industry stakeholders with regard to potential challenges with securing insurance for handling these items.

There was a split in the responses received with regard to including industrial, commercial and institutional (ICI) packaging and paper products (PPP) under the BC Recycling Regulation. Most local government and public respondents indicated support for expanding EPR to include ICI PPP. In contrast, the majority of product sellers expressed opposition to the idea. Of the ICI sources of PPP, food services, sports stadiums, office buildings and medical facilities were identified as those that should be prioritized for EPR first.

Finally, the majority of respondents expressed support for the use of policy approaches to better manage fishing gear. There was general support expressed for the use of EPR or similar policy approaches and some support indicated for the use of alternate forms of management, such as licences.

Respondents indicated that prioritization in order of highest to lowest for the product categories being considered for EPR should be: additional residual household hazardous waste products tied with mattresses, then ICI PPP, followed by expanded range of electric and electronic products and, lastly, fishing gear/marine debris.

Expanded EPR programs are a key component of the new CRD Solid Waste Management Plan. Staff believe this is particularly true with respect to ICI PPP, which comprises an estimated 18% of the waste being received at Hartland Landfill. While ENV has not yet identified any next steps with regard to adding materials to the BC Recycling Regulation, staff will continue to advocate for the continued and rapid expansion of this important regulation, and updates will be provided as additional information becomes available.

CONCLUSION

In September 2020, the BC Ministry of the Environment & Climate Change Strategy released an Intentions Paper soliciting feedback on expanding the extended producer responsibility to include more products under the BC Recycling Regulation. The results of the consultation process have now been released and indicate overall strong support for expanding the BC Recycling Regulation, and particularly for the mattresses and residual household hazardous wastes. Staff support an expansion of the BC Recycling Regulation and believe doing so will be key, particularly insofar as industrial, commercial and institutional packaging and printed products are concerned, to achieve the targets in the new Solid Waste Management Plan. The Ministry has not yet identified any next steps but staff will continue to advocate for the expansion of the BC Recycling Regulation and will provide updates as new information becomes available.

RECOMMENDATION

The Environmental Services Committee recommends to the Capital Regional District Board:

That this report be received for information.

Submitted by:	Russ Smith, Senior Manager, Environmental Resource Management
Concurrence:	Larisa Hutcheson, P. Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

ATTACHMENT

Appendix A: BC Recycling Regulation Policy Intentions Paper – Summary Feedback Report (March 8, 2021)

Recycling Regulation Policy Intentions Paper

Summary of Feedback Report

Final Report

March 8, 2021

Pinna Sustainability

Prepared for: Environmental Standards Branch, Extended Producer Responsibility Section
British Columbia Ministry of Environment and Climate Change Strategy

Prepared by: Pinna Sustainability Inc.

Table of Contents

Abbreviations

EPR	Extended Producer Responsibility
EV	Electric Vehicle
HHW	Household Hazardous Waste
ICI	Institutional, Commercial and Industrial sector
PPP	Packaging and Paper Products
ZEV	Zero Emission Vehicle

A. Introduction

In the fall of 2020, the British Columbia (B.C.) Ministry of Environment and Climate Change Strategy (the ministry) published a Recycling Regulation Policy Intentions Paper to engage with key partners and stakeholders on proposed priorities to regulate more products for recycling and expand Extended Producer Responsibility (EPR).

B.C. currently regulates EPR for many products, requiring producers (manufacturers, distributors and retailers) of designated products to take responsibility for the life cycle of their products, including collection and recycling. This shifts the responsibility from local and Indigenous governments and taxpayers to the producers and consumers of products.

The Recycling Regulation (the regulation) sets out the requirements for EPR in B.C., giving producers the flexibility to find efficient and innovative ways to meet regulated outcomes that prevent waste disposal, improve recycling, and support reuse and resource recovery. New products and packaging are added to the regulation through the addition of new or amended Schedules and associated Product Categories.

The purpose of this engagement was to solicit feedback on expanding EPR by including more products under the regulation and other waste reduction policy approaches to ensure that these items are managed responsibly, including:

- Adding mattresses and foundations as a new product category.
- Expanding the residual product category to include more moderately hazardous products.
- Expanding the electronic and electrical product category to include more items and batteries.
- Expanding the packaging and paper product category beyond residential sources.

Lost or abandoned fishing gear in the marine environment is a significant source of marine pollution in B.C. Given the complex and unique challenges associated with managing lost fishing gear, the Intentions Paper (IP) also provided further opportunity for people to provide feedback on approaches to improve fishing gear collection and management.

How will my contribution make a difference?

The ministry welcomed input regarding potential products for inclusion in the regulation, or other policy initiatives to minimize waste. All consultation comments and feedback will be considered during the development of a multi-year strategy, which may include further outreach on proposed priorities.

Purpose of This Report

The purpose of this report is to summarize the input received in response to the questions posed in the Intentions Paper into a cohesive public report. Contents of this report do not represent the viewpoint of the ministry or the author (Pinna Sustainability Inc.), rather the report aims to represent the breadth and depth of input as submitted by respondents.

Additional clarification on how to interpret this report

The primary focus of the Intentions Paper and engagement was to garner feedback on what specific product types should be added to the Recycling Regulation, along with the priority order in which the different product categories being considered should be regulated, or the rational for possible exemptions. However, numerous submissions included comments that went beyond identifying what

products should be regulated and provided opinions and information on how industry-led EPR programs should be developed, funded, and operated. While obligated producers must have an EPR plan for regulated products approved by the ministry, the day-to-day business decisions, such as contractual relationships with collection facilities, transporters, and processing facilities, are left up to industry. To find out more about the content of EPR plans, refer to the Recycling Regulation, Section 5. Although this additional feedback was beyond the scope of the consultation process, most of the comments have been included in this report for transparency and to help inform future policy review.

B. Process Overview and Summary of Respondents

Background to the Intentions Paper and Consultation Process

The Recycling Regulation Policy Intentions Paper was published on September 14th with feedback solicited until November 20th, 2020. Comments on the information outlined in the Intentions Paper were submitted by completing an online survey, which repeated the questions listed in the Intentions Paper, or through written submissions emailed to ExtendedProducerResponsibility@gov.bc.ca. Both the Intentions Paper and the online survey listed 13 questions, categorized by relevant topic headings. The online survey also requested identification by means of a self-selected role, and optional contact information if the respondent wished to receive updates on this matter.

Summary of Response Formats and Respondent Background

In total, the ministry received 165 submissions from a variety of individuals, stakeholders, and key partners, of which, 76 responded to the online survey and 89 submitted feedback by email. In some cases, two submissions were received from the same organization/organizational unit and these were combined in the tables below to count as one submission.

Respondents that completed the online survey were anonymous, however, respondents self-identified by selecting from a list of eight options under the question "What role best describes your interest in the topic?" In response, respondents self-identified by the following roles:

- 13 Local governments
- 3 First Nations
- 6 Producers (manufacturer, distributor, retailer) of products outlined in the Intentions Paper
- 6 Recyclers and/or processing facilities
- 3 Waste management companies
- 13 Community or environmental groups
- 16 Interested individuals with no affiliations
- 13 Other

Respondents that submitted email responses included the following, grouped by the author:

- 19 Local governments
- 1 Federal government
- 17 Industry associations
- 21 Producers (manufacturer, distributor, retailer) of products outlined in the Intentions Paper
- 5 Recyclers and/or processing facilities
- 3 Waste management companies
- 11 Community or environmental groups
- 3 Interested individuals with no affiliations

Analysis Approach and Format of this Report

The input summarized in this report is organized in the same manner as the headings taken from the published Intentions Paper, along with the questions asked in the Intentions Paper and online survey. To assist with summarizing the responses, the following groupings were used when counting responses, based on the self-identified groupings outlined above:

- **Local and federal governments**, including municipalities, regional districts, and federal government departments.
- **First Nations**, as self-identified in the survey.[1]
- **Industry – sellers,** including producers, retailers, and relevant industry associations.
- **Industry – service providers**, including collection facilities/depots, recyclers (processors), waste management companies (transportation), and relevant industry associations.
- **Organizations and public respondents**, including community, environmental, Indigenous, and other organizations, and individuals with no affiliations.

For ease of review, the online survey comments that pertained to more than one question or a different question were moved and analyzed under the applicable subject heading. Additionally, a best effort was made to analyze and allocate comments from email responses under the applicable heading and/or question. Comments that do not relate to products explicitly identified in the Intentions Paper are summarized in the "Cross-cutting themes and other product types outside of this consultation" section of the report.

Quotes from respondents are in "*italics and quotation marks*". Note that respondent quotes have not been edited and may include grammar or spelling errors, except to remove a respondent's name. In these cases, the name is replaced with *[respondent]*.

Some respondents provided technical information regarding certain product types or categories that will be reviewed and considered by the ministry.

[1] The online survey included the voluntary question: "What role best describes your interest in the topic?" Therefore, for this report, respondents that self-identified their role as "First Nations" are grouped, although those respondents may represent an individual or an Indigenous government.

C. Summary of Input by Topic Area and Question

This section contains a summary of the responses received during the consultation period, organized using the same section headings and questions as presented in the Intentions Paper, with one additional section to summarize broad EPR-related themes and suggested product types that were outside of the scope of this consultation. The headings and associated questions are as follows:

1. New Schedule for Mattresses: Questions 1-2
2. Existing Schedule 2 – Residual Product Categories: Questions 3-6
3. Existing Schedule 3 – Electronic and Electrical Product Category: Questions 7-9
4. Existing Schedule 5 – Packaging and Paper Product Category: Questions 10-11
5. Marine Debris in B.C. – End-of-Life Management of Lost Fishing Gear: Question 12
6. Implementation: Question 13
7. Cross-Cutting Themes and Other Product Types Outside of this Consultation

1. New Schedule for Mattresses

Question 1: Do you have comments or suggestions on the intention to add mattresses and foundations to the regulation? [82 responses]

Respondents were either supportive of regulating mattresses and foundations, or provided neutral comments. Though no responses explicitly expressed opposition, some respondents raised concerns and identified potential impacts of regulating mattresses.

- **Local governments** (29): most expressed support (26) for inclusion of mattresses, while some remained neutral (3).
- **First Nations** (3): all expressed support.
- **Industry-sellers** (6): expressed support (2), provided neutral comments or concerns (4).
- **Industry-service providers** (8): expressed support (5), provided neutral comments (3).
- **Organizations and public respondents** (36): almost all expressed support (35), provided neutral comments (1).

Supportive comments

- Both local governments and an industry-seller noted that mattresses contain recyclable materials that would be ideal to reuse and divert from landfills.
    - As one local government noted, *"Adding mattresses and box spring foundations to the regulation as an EPR program expands opportunity and creates incentives to capture those used materials for deconstruction and material reuse."*
- Many local governments, and one organization, discussed the cost of recycling mattresses and foundations for local government, both in terms of the recycling itself, and collection of mattresses following illegal dumping.
    - One regional district cited that in 2019, 60,000 mattresses and foundations were collected at facilities and transported to recyclers at a cost of $2.18 million.
    - One municipality noted receiving over 3,500 abandoned mattress calls and collecting about 5,000 abandoned mattresses from lanes and other public spaces each year.

- A few local governments suggested regulating items based on their function as it is easier for the public to understand.
    - As one local government noted, *"The regulation should encompass all forms of mattresses, including waterbeds, mattress toppers, sleeper couches, pet beds, and other cushioned pads, cots and bases intended to provide a surface for sleep. Regulating items based on function provides ease of understanding to the public and helps ensure there are no gaps whereby seemingly similar products are not covered."*
- Several local governments also spoke of the difficulty of managing mattresses at their waste management facilities due to their size and bulk, and hoped this regulation would alleviate the pressure mattresses and box springs were putting on their facilities.
- A recycler expressed their intention to expand their facility allowing them to store and manage more mattresses, followed by installing more machinery to double their processing capacity.

General comments and/or concerns

- A few respondents (including industry-sellers, an industry-service provider, and public respondents) expressed the need to consider online mattress retailers within the regulation to ensure retailers without a physical presence in B.C. are compliant and that B.C. retailers are not left to pay for the end-of-life management costs of products sold by non-compliant businesses.
- Many respondents from across the spectrum (industry, government, public) stated the need to ensure the regulation does not harm local facilities that already recycle mattresses and provide social benefit within communities.
- Several respondents (from recycling facilities and industry) noted the difficulty of recycling mattresses with electric components, as well as plastics from blow-up mattresses or waterbeds.
- Respondents (from local government and organizations) raised specific considerations for rural and remote communities, such as ensuring they have adequate access to collection facilities, and facilities are regularly serviced to prevent product build up.
- Several respondents from local governments discussed health and safety considerations of handling contaminated mattresses and foundations.
- One industry-seller and an industry-seller association requested that reuse and repair be recognized as coequal options during development of an EPR program, along with recycling, to ensure the social and environmental benefits of donating and reusing mattresses are not minimized or lost as a result of regulating.
- Respondents (from local government and an industry-service provider) noted that storing mattresses requires substantial storage space, particularly if mattresses must be kept dry, and should be considered during EPR program development.
- Several respondents (from local government, as well as members of the public) mentioned considering free curb-side pick-up for mattresses and foundations, as well as retailer take-back options when new mattresses are purchased, due to the persistence of illegal dumping of mattresses, and the significant cost this incurs for local governments.
- An industry-seller and association urged that adding mattresses should not disrupt existing voluntary producer-led mattress recovery programs, allowing retailers that already offer consumers a take-back option to continue to do so.
- There was a range of comments related to fees for mattress and box spring recycling:
    - Several respondents (from local government, organizations and public respondents) requested the removal of disposal fees altogether, or provide a few calendar days a year where transfer stations allow free disposal of mattresses.

- Two local governments suggested fees be relative to the size of the mattress or box spring, as well as the materials that make up the items (i.e. coils can be costly to remove and recycle)
- One industry-seller association noted the eco-fees will be significant, and highlighted the concern about 'free-rider' entities that avoid compliance leaving higher fees for those in compliance. *"The result is unfair in two respects: some entities are able to sell their products and packaging without the eco-fee, and, the entities who are participating are left to pay for the end-of-life costs of the products sold by the non-compliant businesses."*
- A few community organizations supported adding a recycling fee at the time of purchase.

Question 2: Are there exemptions to this new product category that you believe should be considered? [55 responses]

Comments on what product types should be exempt

Nineteen (19) respondents made suggestions on exemptions of products types, including: local governments (7), industry-sellers (2), industry-service providers (3), and organizations and public respondents (7). Suggestions included:

- Several respondents from a local government, recycling facilities (2), and organizations and public respondents (4) requested exemptions for plastic mattresses and waterbeds, as these have components that may not be able to be recycled.
  - One recycler noted that inflatable and waterbed mattresses, *"contain vinyl and other materials that are not typically found in regular beds and would not be recyclable at a mattress recycling facility."*
- Several responses from local governments (4), industry-service provider (1), and organizations (2) expressed the need to exempt contaminated mattresses and foundations due to health and safety concerns.
- One industry-seller association expressed the need to exempt hospital beds as they include electronic equipment that are difficult to recycle and environmental handling fees on hospital beds would increase procurement costs for hospitals.
- One local government and industry-seller association recommended a phased approach, for example including only mattresses and foundations in phase 1, then at later phases adding other types of mattresses. The industry-seller association *"advocates gradualism to minimize both market disruption and consumer impact. Creation of a mattress recycling program will itself be a significant undertaking. Adding those other items would create very significant complications."*

Comments opposed to product type exemptions

The majority of responses (35) expressed that they believe no exemptions should be considered at this time, including: local governments (13), First Nations (2), industry-service providers (3), and organizations and public respondents (17). Rationale provided for no exemptions included:

- Having exemptions for product types is the greatest issue for collection facilities, and has created confusion in other EPR programs.
- Several local governments expressed that a comprehensive inclusion is easier to administer and regulate.

2. Existing Schedule 2 – Residual Product Categories

Question 3: Do you have comments or suggestions on the intention to regulate more product types? [71 responses]

Overall, the majority of respondents were supportive of updating the existing residual product category; however, most industry-sellers were not supportive of updating this category:

- **Local governments** (29): all expressed support for inclusion of more products in the residual product category.
- **First Nations** (1): expressed support for regulating more product types.
- **Industry-sellers** (8): expressed concern or disagreement with expanding this category (4), provided neutral comments (3), supported expansion (1).
- **Industry-service providers** (6): expressed support (3), provided neutral comments (3).
- **Organizations and public respondents** (27): most expressed support (23), while some provided neutral comments (4).

Supportive comments

Among those who were supportive (57) of the ministry considering EPR expansion for this category, many (23) stated the rationale behind their beliefs, including:

- Reduce financial and administrative burden on local governments (9): local governments (8), organization (1).
- Encourage proper disposal to prevent potentially dangerous products entering the solid waste stream, and reduce negative environmental impacts (8): local governments (7), organization (1).
- Benefit consumers by increasing disposal options and lessening confusion (4): local governments (3), public respondent (1).
- Provide more options for rural areas without takeback programs (1): local government.
- Regulating these products would provide means to minimize health and safety risk for recycling facility staff, landfill operators and the public (13): local government (11), industry-service provider (1), public respondent (1).

Non-supportive comments and/or concerns

Feedback from respondents who disagreed with expanding this category included:

- Three responses, all industry-sellers, indicated the following:
    - Several products listed in the Intentions Paper have very limited volumes available for collection.
    - Several products listed in the Intentions Paper have different formulations in industrial or agricultural use compared to household products, and that industrial and agricultural products are better managed through existing private collection programs.
- Four industry-sellers suggested the existing voluntary collection system for veterinary pet medications is sufficient and they do not see the need to regulate a product category already being managed voluntarily by industry. Three of these industry-sellers made the same comment regarding medical sharps and the existing industry-led voluntary collection program.
- An industry-service provider suggested the ministry should consult with industry associations, their partners, and the appropriate stewardship organizations to properly define new or existing product categories to *"ensure that any new or existing product categories are properly defined*

and exclude products and packaging that Cleanfarms currently manages. This will ensure that farmers can continue to manage items like empty pesticide and fertilizer containers, and unwanted pesticides and old livestock/equine medications collections through Cleanfarms and minimize confusion for industry."

General comments

- Three responses, all industry-sellers, suggested that the ministry consider five key criteria for the EPR expansion of this category, including:
    - Hazardous or negatively impact the environment unless managed
    - Available in sufficient quantities that need management
    - Managed/manageable through cost-effective solutions
    - In need of management (e.g., there are not already solutions in place)
    - Generally consistent with what is considered household hazardous waste in other provinces: harmonization
- Another industry-seller suggested the following:
    - *"In the interests of achieving clarity for producers on which products and their packaging should be added to Schedule 2 and Schedule 5, we suggest that the Ministry convene a group of appropriate stakeholders (including [respondent]) to develop a plan on products that should be designated and their appropriate Schedule under the Recycling Regulation. Once that work is completed, we suggest that the Ministry also develop a guideline or 'Explanatory Notes' document similar to the one published with the 2020 Amendments to the Recycling Regulation, that sets out example lists of designated items."*
    - Further to this, the respondent stated that based on this document, *"EPR programs can then undertake information campaigns to assist consumers in appropriately disposing of these materials and their empty containers."*
- One industry-seller highlighted that *"costs to municipalities should not be the key driver for inclusion. Recycling policy and regulations should be designed and implemented in an effective and efficient manner, in line with sound environmental principles that are truly protective of the environment. Inclusion of materials should be based on a demonstrated risk to the environment. Criteria for what constitutes an obligated material should be established and clearly communicated to stewards and the public. These criteria should be established using science-based decisions aimed at managing environmental risk."*
- One local government noted the environmental impact of improperly disposing unregulated residual products can be extremely damaging.
- Five respondents highlighted that local drop-off and/or take-back options should be considered for both urban and remote locations, including local governments (2), industry-service providers (2), and an organization (1).
- One industry-seller commented that *"In general, EPR is good policy approach to address consumer products under the residuals product category, that are frequently used but not for commercial/industrial products or products that are infrequently used or only used by a small segment of consumers."*

Question 4: What product types should be prioritized for regulation? [51 responses]

Comments on what product types should be prioritized

Respondents identified the following items to be prioritized:

- Compressed gas in canisters – fuel and helium (29): local governments (15), industry-service providers (3), organizations and public respondents (11). Several respondents suggested specific products under this category including:
  - Propane and butane canisters; especially 1-pound single-use propane canisters
  - Spray foam tanks, aerosol cans and torch canisters
- Fire extinguishers (14): local governments (9), organizations and public respondents (5)
- More paint, sealers and adhesives (17): local governments (11), industry-service providers (2), organizations and public respondents (4)
- Automotive additives and touch-up paint (6): local governments (4), organizations and public respondents (2)
- Pool and spa chemicals (12): local governments (8), industry-service provider (1), organizations and public respondents (3)
- Water testing products (1): First Nation
- More pest control and rodenticides (12): local governments (8), industry-service provider (1), organizations and public respondents (3)
- Fertilizer and weed control (10): local governments (9), public respondent (1)
- Veterinary medicine for pets (3): all local governments
- Bear spray and flares (10): local governments (5), organizations and public respondents (5)
- Medical syringes (8): local governments (6), organizations and public respondents (2)
- Cleaning products (4): local government (2), industry-service providers (2)
- Mercury containing products (3): all local governments
- Diesel fuel, diesel exhaust fluid (DEF), kerosene (5): local governments (4), public respondent (1)

General comments

- A number of responses (16) noted that priority should be driven by waste volume, environmental impact, and/or safety hazard level. Products that are difficult to recycle through conventional recycling programs and, if disposed of improperly, have the highest risk of harm to human health and the environment should be prioritized for regulation. Some respondents also suggested that the ministry should consult with key stakeholders to identify products generated in the largest waste volumes to better inform the prioritization.
- Four responses, local governments (2), industry-service provider (1), public respondent (1), believed that all products listed in the Intentions Paper under Schedule 2 - Residual Product Category should be prioritized.
- One local government stated that *"The program should also include items currently rejected due to missing labels, damaged containers, no tight-fitting lids, not in their original containers, etc."*

Question 5: Do you have comments or suggestions on how to clearly define/classify product categories in the regulation that are user friendly? [44 responses]

Most comments and suggestions to this question focused on two areas: product category definition and classification, and consumer-oriented communication and labelling.

Product category definition and classification

Among those responses that expressed views towards product category definition and classification:

- Fourteen responses, local governments (3), industry-seller (5), organizations and public respondents (6), suggested using clear and simple language and labelling that can be understood by consumers; avoiding technical terms.
- Six responses, local governments (4), organizations (2), suggested that product categorization should be based on product type and its application. Conversely, one industry-service provider stated that *"accepted items should NOT be defined by the intention of use; anything that has its acceptance defined by reasoning beyond labels, is headed for confusion."*
- Five responses, local governments (3), organizations and public respondents (2), suggested that product categories should be inclusive with limited exemptions.
- Four responses, all industry-sellers, highlighted that product definitions should be harmonized with existing programs in other jurisdictions.
- Four responses, local governments (3), public respondent (1), suggested using existing warning symbols already required on product labels (e.g., flammable, corrosive, toxic and explosive)
    - *"Warning symbols provide an easy, pre-existing method of identification."*
- Three responses, local governments (1), organizations (2), suggested collaboration with consumers, retailers and collection facility staff, and utilizing focus group to identify best approaches.
- Two responses, a local government and an industry-seller, indicated that the inclusion or exclusion of products in each category should not be based on chemical properties.
- Two responses, both industry-sellers, suggested the use of a tool, such as the British Columbia HHW (household hazardous waste) Flammables Decision Tree, to help to define these products.
- One industry-service provider stated:
    - *"Improper labelling and complex ingredient mix for hazardous products often cause problems for the collection."*
    - There is a need for the implementation of a *"highly visible classification label and resolution to unaffordable insurance cost for depots due to the collection of hazardous waste before expanding the current program."*
- One industry-seller suggested that residual products packaging should continue to be managed through the Paper and Packaging Product (PPP) program, stating: *"There is no scientific or economic reason to make changes to this effective solution for empty, end of life packaging. Requiring consumers to source-separate some empty packaging from other empty packaging would create consumer confusion and inconvenience. Already-empty HHW packaging is not hazardous and should not be stigmatized as such, and not subject to a costly, third program in parallel to the HHW and PPP programs."*

Consumer-oriented communication and labelling

Comments and suggestions that highlighted consumer-oriented communication and labelling included:

- Five responses, local government (1), organizations and public respondents (4), suggested labels that identify the impact of improper disposal and provide instructions on how to recycle.
- Two responses, industry-seller (1), public respondent (1), suggested displaying informative posters, signs, cards, and stickers at retail locations.
- One response from a local government suggested labelling products with multiple identifiers, such as both text identification and warning symbols.
- Three responses, local government (1), organizations and public respondents (2), suggested standardizing provincial labelling and ensuring consistency with federal labelling.
- Four responses, industry-seller (1), organizations and public respondents (3), suggested developing a mobile application to help consumers identify what product can be recycled and where to recycle them.
- Two responses, a local government and an industry-seller, suggested launching education and communication programs to help consumers manage products that require proper disposal.

Question 6: Are there product types you believe should be exempt from the regulation, beyond products such as cleaners that are intended for use down the drain? [54 responses]

Comments on what product types should be exempt

Several respondents made suggestions on exemptions of products types from the regulation, including: local government (4), industry-sellers (8), industry-service providers (4), organizations and public respondents (6). Suggestions included:

- Fertilizer products (5), all industry-sellers, providing the following reasons:
    - They pose minimal risk to human, animal, and the environment.
    - They normally don't have an expiry date and should be reused rather than recycled.
    - They are not regulated in any other province in Canada, except for Ontario. Ontario is anticipating to remove fertilizer products from their new regulations.
- Additional pesticides and rodenticides (3), all industry-sellers.
    - One industry-seller indicated that designating *"more pest control and rodenticides"* as stated in the Intentions Paper is not needed because the current definition of pesticides within the Residual Products Program is appropriately inclusive and harmonized with other provincial jurisdictions.
- Veterinary medications for pets with existing voluntary initiative to manage the collection and safe disposal of these products (4), all industry-sellers.
- Two industry-sellers are opposed to including any products listed in the Intentions Paper in the regulation, noting:
    - There are existing successful programs in place for the management of certain listed product categories.
    - The inclusion of more products creates a competing market with private waste management businesses and system.
    - Some products are already regulated under other regulatory bodies.
- An industry-service provider suggested exempting material that is not regularly produced or is very industry specific.

Comments opposed to product type exemptions

Several respondents stated there should be no exemptions, including First Nations (2), local governments (14), industry-service providers (2), and organizations and public respondents (14).

- Several respondents, local governments (3), industry-service provider (1), and organizations and public respondents (4), suggested that products such as cleaners that are "down the drain" should not be exempt from the regulation, as opposed to what was stated in the Intentions Paper. These respondents highlighted that "drown the drain" products have detrimental human health and environmental impacts and the exemption encourages contamination of waterways.

3. Existing Schedule 3 – Electronic and Electrical Product Category

Question 7: Do you have comments or suggestions on the intention to regulate more electronic and electrical products, including batteries? [74 responses]

Overall, the majority of respondents were supportive of regulating more electronic and electrical products, including batteries, according to the following breakdown:

- **Local governments** (27): support (22) for inclusion of more electronic and electrical products, including batteries, neutral (5).
- **First Nations** (2): all expressed support.
- **Industry-sellers** (10): support (4), neutral (4), concern or disagreement specifically about electric vehicle batteries (2).
- **Industry-service providers** (10): support for certain categories (6), neutral (2), concern or disagreement with one or more categories (3).
- **Organizations and public respondents** (25): support (21), neutral comments and considerations (4).

Several respondents expressed broad support for EPR for this category (37), but did not provide specific comments on specific product types. The following section outlines reasons for support, dissent and additional comments by category listed in the Intentions Paper:

Electronics and other batteries

Supportive comments

- Several local governments explicitly expressed support for accepting all electronics and batteries (15), and three more expressed general support for expanding Schedule 3 categories.
- One industry-service provider stated that *"generally electronic collection programs (without batteries) can be easily added to the collection mix of a depot,"* but warned about issues with accepting batteries (see non-supportive).
- A local government noted this as an opportunity to improve safe collection, storage and dismantling of batteries and increase diversion of these products from landfills where they pose a significant fire risk.
- Another local government highlighted the opportunity to incentivize producers to make batteries easier to disassemble for recycling and reuse and creates a more level playing field.
- One industry-seller supports the inclusion of printer cartridges in order to *"level the playing field with 'Clone' or 'New Build Compatible' cartridges,"* which are typically not taken back and are more difficult to recycle.
- Numerous local governments, organizations and public respondents requested that all electronics be accepted – anything with a cord or battery (10), and a few also suggested the scope of products accepted should be broad and simple to enhance participation and provide flexibility to capture future products (3). Specific recommendations included:
    - Suggestion to use two broad categories: one for anything with batteries and one for all other electronics.
    - Clear and broad categories may improve education, and reduce unsafe disposal in the blue box program and at landfills.

Non-supportive comments and/or concerns

- One industry-service provider noted concern that requirements to accept batteries at current depots are problematic and stated four key reasons:
    - that insurance coverage is difficult to get if accepting batteries,
    - that current fees do not cover the costs of handling these materials,
    - that current facilities may not be able to accommodate large items, and
    - that these may trigger additional WorksafeBC concerns.
- An industry-service provider opposed to regulating ink and toner cartridges highlighted there are limited downstream processing options for these products, noting they are being shipped to a California waste-to-energy facility. The respondent suggested the following alternative policy approach:
    - *"Allow landfilling of Ink and Toner Cartridges. The carbon footprint of transporting and incinerating the material in California is most certainly higher than the environmental cost of landfilling the material in BC."*
- An industry-service provider noted that battery-containing devices cannot be handled with current processing technologies and that hand dismantling is required, making it unfeasible based on the fees collected.

General comments

- One industry-seller noted that *"e-cigarettes, vaping products and motorized yard decorations can be successfully managed under one of the nine existing plans for electronics."*
- One industry-service provider recommended the following considerations when establishing EPR for more electronics:
    - clearly establish the primary function of products to help identify obligated producers, determine whether products should be repurposed or recycled at end-of-life, stipulate clear consistent reporting requirements, and provide clear guidance for adding new products to existing EPR program plans.
- One local government expressed support for expanding the category to accept all electronics and batteries, but also expressed concern about the way the current system is operated. They *"would propose creating an umbrella program for all electronics - to bring these programs together rather than continue to operate them separately."*
- One local government recommended *"EPR for any gas-powered counterparts to the electrical or electronic equipment covered in the Recycling Regulation, since these products can also be recovered in circular models, and doing so would increase convenience and reduce confusion for consumers."*

Electric and hybrid vehicle batteries

Supportive comments

- Of respondents that specifically addressed electric or hybrid vehicle batteries (17), supportive comments were provided by local governments (12), industry-sellers (2), industry-service providers (2), and a public respondent (1).
- One industry-seller expressed general support for *"well-crafted"* EPR programs, stating that *"any framework that regulates the management of battery waste must provide flexibility to suit the needs of a broad range of battery types, sizes, weights, applications and users."* The seller also made five recommendations:
    - *"Establishing a landfill ban for industrial batteries.*
    - *Collecting EV batteries through the safest and most practical channels.*
    - *Taking the residual value of industrial batteries into consideration.*

    - *Mandating industrial battery producers to take back the EV and residential batteries they produce on request when the market does not otherwise respond.*
    - *Should not prescribe collection rates for industrial batteries."*
- Another industry-seller stated *"there is a need for an Extended Producer Responsibility Program for ZEV lithium-ion batteries,"* but also requested more consultation (see general comments below).
- One industry-service provider stated *"I have direct experience with handling / processing / commercializing these vehicles at end of life, and based on this I am a strong advocate for EPR in this application."* This respondent noted the metal recycling business is the appropriate destination for EV and hybrid batteries, and that EPR would ensure this entrepreneurial sector would respond to the economic incentive provided through EPR.
- Local governments noted that they anticipate a significant increase in electric vehicle batteries, in line with local climate action strategies being adopted. *"There is already an existing need for end of life management of electric vehicle batteries and this need will only increase as more BC residents transition to electric vehicles in place of their traditional fossil fuel powered vehicles."*

<u>Non-supportive comments and/or concerns</u>

- Of respondents that specifically addressed electric or hybrid vehicles, non-supportive comments included two industry-sellers and one industry-service provider.
- One association representing industry-service providers expressed that the aftermarket electric vehicle industry is not sufficiently mature for EPR regulation. Key challenges include identification of battery chemistry, need for safety protocols for safe dismantling and storage, insufficient capacity in current system and inability to track electric vehicles moving out of province.
- An industry-seller stated *"British Columbia should not regulate electrified vehicle batteries until a full assessment, involving all key stakeholders, is conducted to identify management practices in place in the province and to determine the current demand for EV battery recycling."* And that *"from the perspective of manufacturers, all efforts are being made to capture spent batteries at their end of life for either refurbishment, recycling, or research purposes. While we acknowledge that no province-wide system is in place to manage this material, the Ministry offers no evidence that the current demand for EV recycling is not being met."*
- Another industry-seller noted that early use of the regulation may risk disrupting the development of a nascent circular economy for electric vehicle batteries, may add costs to electric vehicles and hamper their uptake, add administrative burden to original equipment manufacturers (OEMs), and more.

<u>General comments</u>

- One recycler made several recommendations to consider when including electric vehicles and other alternative-fuel vehicles at end-of-life (e.g. facility certification, training, sufficient financial incentive, public awareness campaign) and requested additional consultation on the matter. This respondent emphasized the importance of accepting all alternative-fueled vehicles (e.g. hybrid and liquified natural gas (LNG)-fueled vehicles), not just electric vehicle batteries.
- One industry-seller who is supportive noted that the regulation needs to be carefully timed in consultation with industry to ensure sufficient end-of-life batteries to enable industry to invest, while not being too slow and potentially losing to other jurisdictions.
- One industry-seller who is supportive recommended *"If British Columbia elects not to create a new regulation for industrial batteries, an alternative, but suboptimal approach would be for BC*

to exclude all industrial batteries from the Recycling Regulation and manage EV batteries through the Vehicle dismantling and recycling Industry Environment Planning Regulation."

- Although e-bicycle batteries are included in existing EPR regulation, three local governments highlighted that these should be added.

Solar panels

Supportive comments

- Of respondents that addressed solar panels, all were supportive (12). This includes eight local governments, two industry-service providers, and one public respondent.
- One industry-service provider noted that solar panels are an excellent candidate for EPR and highlighted several options for end-of-life collection, including expanding the current depots, to using local government landfill sites for collection, to modelling after Alberta's approach.
- Another industry-service provider expressed that EPR would provide clarity on who is responsible for funding the recycling.
- One local government noted that standardizing and centralizing solar panel recycling makes sense as they often contain valuable components.

Non-supportive comments and/or concerns

- No respondents expressed opposition to the proposal to regulate solar panels.

General comments

In addition to the responses about product types, other key themes that emerged across the responses included the following:

- The regulation should seek ways to support a circular economy that increases reparability and right to repair, while reducing planned obsolescence. This was cited generally by several respondents and specifically by industry members in relation to electric vehicle batteries, and in particular that the regulation should consider the residual value of these batteries.
- Adding products to EPR supports expansion of a B.C.-based recycling system.
- Anticipated increase in use of electronics in all categories, with particular emphasis on electric vehicles and solar panels, will require a program to manage this waste stream safely and effectively.

Question 8: What product types should be prioritized for regulation? [52 responses]

Comments on what product types should be prioritized

Respondents identified the following items be prioritized for regulation:

- Electric vehicle batteries (21): local governments (12), industry-service provider (1), organizations and public respondents (8)
- Solar panels (13): local governments (6), industry-service providers (3), organizations and public respondents (4)
- All batteries, with several noting lithium-ion batteries in particular (12): local governments (5), industry-service provider (2), organizations and public respondents (5)
- E-cigarettes and vaping products (5): all local governments
- Printer ink cartridges and paper shredders (4): local governments (2), industry-seller (1), public respondent (1)

- Several other product types were suggested by individual respondents, such as, but not limited to: large drones, yard decorations, motorized furniture, extension cords, wind turbines and energy storage equipment, and materials of the electrification of the power grid and transportation.

General comments

- Rather than listing specific products to prioritize, a number of responses (11) noted that priority should be driven by factors rather than specific products, including:
    - Environmental impact, containing heavy metal
    - Safety hazard level, higher risk of landfill fires
    - Waste volume
    - Those often subject to illegal dumping
- One local government suggested that the ministry should reach out to the e-waste transporters and processors to identify non-program items in the collection stream.

Question 9: Are there product types you believe should be exempt from the regulation and may be better managed through alternative policy approaches? [40 responses]

Comments on what product types should be exempt

Fourteen respondents made suggestions on exemptions of products types from the regulation, including: local government (1), industry-sellers (6), industry-service providers (2), and organizations and public respondents (5). Suggestions included:

- Electric vehicle batteries (4): industry-sellers (3), industry-service providers (1)
- Electric vehicle charging equipment, general: industry-seller (1)
- Level 3 electric vehicle charging equipment (1): an industry-seller respondent, however, the respondent supports the inclusion of level 1 and 2 charging equipment
- Large imaging equipment, such as Magnetic resonance imaging (MRI), X-Ray and Ultrasound devices / medical devices (2): industry-seller association (1), local government (1)
- Large-scale electronics purchased through lease or monthly fee (e.g. photocopiers) (1): local government
- Ink and toner cartridges (1): industry-service provider
- Fixed installation building components (2): organizations and public respondents

Comments opposed to product type exemptions

The majority of responses (25) believed that no product types should be exempt from the regulation or being managed through alternative policy approaches, including: local governments (9), First Nations (2), industry-service providers (3), and organizations and public respondents (11). Some local governments provided rationale behind their beliefs, including:

- Exempting products types from the regulations could cause consumer illegal dumping.
- Having exemptions for product types is the greatest issue for their local government facilities.
- None should be exempt, but some could be considered as second tier products in the regulation, including vape pens, e-cigarettes and gadgets like singing balloons and electronic lawn ornaments.

4. Existing Schedule 5 – Packaging and Paper Product Category

Question 10: Do you have comments or suggestions on EPR or alternative policy approaches that address the need for greater diversion from landfills and to better manage ICI materials? [89 responses]

There was a diversity of responses to this question, ranging from full support for EPR regulation, to partial support, to disagreement with using EPR but offering alternative policy approaches. The following outlines the general sentiments of respondents:

- **Local Governments** (28): most expressed support for EPR regulation (21), though there were differences in both the level of support and the reasons provided, while some provided neutral comments (7). Neutral comments towards EPR regulation generally cautioned that the ministry be flexible and explore solutions that do not disrupt existing market-based systems.
- **First Nations** (2): respondents provided comments about improving management of this material but did not specify support or opposition for EPR or alternative policy approaches (2).
- **Industry-sellers** (21): most respondents expressed opposition to EPR regulation for this sector (13), while some expressed support (3), and some were neutral or provided alternative policy approaches for consideration (5).
- **Industry-service providers** (9): expressed support (4), expressed neutral comments (2), and expressed opposition (3).
- **Organizations and public respondents** (29): most expressed support (19), while several provided neutral comments and considerations (10). None expressed opposition to EPR regulation for this sector, though some supportive comments were general in nature.

Supportive comments – EPR and/or better waste management

Supportive comments of EPR that related to specific topics are provided in groupings (rural and remote communities, sub-sectors) after these general points. Many respondents (30) gave general reasons, including the following:

- Many local governments acknowledged the complexity of this category, but expressed support for EPR because *"Though very complex, this category is the broadest in scope and impact if implemented. It is past the time for the ICI sector to be added to the recycling regulations. Switching to Recycle BC's residential collection has vastly increased recycling rates in many communities as allowable contamination rates were stringent. It has also had the co-benefit of resiliency (NA processing) as foreign markets shut down."*
- Another local government stated *"We see a significant amount of PPP entering our landfills from the commercial sector and feel that expanding EPR for PPP into the commercial sector would be a good approach to diverting recyclable material from landfill."* Several organizations and public respondents expressed similar concerns.
- Some local governments, organizations and public respondents noted that a large portion of this waste stream is similar to residential packaging and should be treated in the same manner.
- One industry-seller highlighted this as a high priority, believing this will play a major role in making progress towards a circular economy.

Supportive comments – EPR in rural and remote communities

Numerous respondents (22) discussed the need for EPR for ICI waste in smaller, rural, or remote communities. For example:

- Several noted that any community outside of Metro Vancouver would benefit from EPR for the ICI sector, as recycling services are more limited. For example, *"It is understood that some ICI PPP materials, such as cardboard, have been successfully managed through the private sector in higher density population areas of the province, like the Lower Mainland. However, these collection models are not feasible in less populous areas of the province where lower material volumes and longer shipping distances significantly reduce the potential profitability of private recycling services."*
- Some local governments from outside the lower mainland highlighted that landfill tipping fees are lower than recycling options, so haulers choose to landfill this waste.
- One local government and an industry-service provider noted that EPR would be beneficial because current transportation costs are too high to support recycling businesses in these regions.
- Two local governments and an organization highlighted that some local governments currently fund programs to collect and transport ICI PPP to increase diversion from landfill, but at much higher costs than landfilling, which increases the local tax burden.
- One local government *"believes managing all ICI PPP as Extended Producer Responsibility materials through the Recycling Regulation is the most reliable way to ensure all areas of the province receive equitable access to ICI PPP end-of-life management."*
- One public respondent noted that businesses want to recycle in these communities, but have no place to bring their recycling.

Supportive comments – Regarding ICI sub-sectors

Some respondents specifically referred to the applicability of EPR to sub-sectors as follows:

- Small businesses: Several respondents (15) from local governments, industry-service providers, and organizations highlighted that currently small businesses have limited to no option for recycling their waste, and stated that adding this sector to EPR could improve this. One industry-seller is opposed to broad application of EPR to the ICI sector, but acknowledged it may be appropriate for some small businesses:
    - *"We recognize that some ICI "sectors" are analogous to the residential retail economy. For example, some small businesses buy their office supplies exactly as a household does and are effectively indistinguishable from residential consumers. In this narrow set of cases, EPR may be appropriate."*
- Office buildings: Some respondents noted that waste from office buildings would be well suited to EPR.
- Food services: One local government in favour of EPR regulation noted that materials from *"large volume food operations (food services sector, hotels, cinemas and sports stadiums) should be collected and processed separately due to the higher contamination rates experienced at those types of locations."*

Non-supportive comments and/or concerns on EPR

Many respondents, including industry-sellers (14) and industry-service providers (2), expressed concern about applying EPR to the ICI sector. Reasons included:

- Industry respondents described the existing system as efficient, cost-effective, and supplying local jobs. Concerns were that EPR would increase complexity, disrupt supply chains, and shift from local jobs to larger firms.

- Several noted their strong opposition and provided alternative suggestions (see section below). For example, one industry-seller association stated: *"To be clear up front, our industry is strongly opposed to the obligation of commercial packaging and paper products under the Recycling Regulation. Our view is that there is a much better and less disruptive alternative available."*
- One industry-service provider expressed concern that *"EPR for this sector will eliminate local jobs, and consolidate the industry into large companies managed out of province."*
- One industry-seller noted *"These levels of increases are unrealistic and unsustainable and will ultimately impact consumer affordability, selection and availability of goods in the B.C. market."*
- Another industry-seller noted that it could disrupt innovation in the sector: *"If extended producer responsibility regime were to include ICI, their efficiencies, competitiveness, and their self created green economies would be lost. We highly discourage the inclusion of ICI sector under the Recycling Regulation."*
- Concern that EPR would lead to more contamination – that the current market-based approach ensures clean and marketable ICI waste streams.
- Several noted concern that generators, not producers, should be responsible for the waste in this sector, stating that it is much more complex than the residential sector, and that producers have no influence on how the waste is managed.
- One industry-seller association noted this move would be punitive for industry leaders that are already managing and reducing their waste – raising their costs to pay for those lagging in their waste management efforts.
- Two respondents speaking about agricultural waste noted the CleanFarms voluntary initiative is effective and should be consulted before considering including this part of the sector.

Comments regarding data, tracking and reporting

Many respondents (12) highlighted the need for better data, tracking and/or reporting of the collection and ultimate destination of recycled materials in the ICI sector. Seven of these respondents were opposed to EPR for this category and suggested the ministry focus in this area as an alternative policy approach, including industry-sellers (6) and industry-service provider (1). Four were neutral to EPR regulation, including industry-sellers (2) and organizations and public respondents (2). One local government made suggestions in this area and was supportive of applying EPR to this category. Comments included:

- There needs to be a better understanding of where waste is going before applying EPR, with one industry-seller association stating they understand that there is currently a 75% diversion rate for paper products among members and that EPR would not provide much benefit, only costs.
- An industry-seller stated their support for ministry to improve understanding of how these products are managed, but suggested that more research is needed to understand the system, and that industry plans to do a research project on this subject in 2021.
- An industry-service provider noted *"We acknowledge the value of and need for more transparent tracking and measuring of materials collected and diverted through the ICI service provider sector, and would support efforts to establish such requirements."*
- An industry-seller noted support for an alternative policy approach that introduces ICI environmental performance standards, with mandatory reporting for collectors and processors.
- An industry-service provided indicated that the current ICI system works well, but is missing tracking and reporting. Regulation and policy should focus on this.
- One local government stated that better understanding the destination of this waste is important to increase transparency for businesses wanting to understand how their waste is managed.

Comments on alternative policy approaches

Several (9) respondents provided a mix of alternative policy approaches for consideration, including those opposing EPR for this category (6), those providing neutral comments (2), and those supporting (1).

- One industry-seller stated *"Our view is that there is a much better and less disruptive alternative available: requiring that businesses ensure end-of-life materials are appropriately managed – be the result reuse, recovery or recycling, and whether those materials are products or packaging."* And continued by stating *"The alternative government should use is to obligate industrial, commercial and institutional entities to manage their waste appropriately and undertake compliance or enforcement action against those who do not do so."* Other industry-sellers concurred with this point.
- An industry-service provider *"recommends that the provincial government adopt a model similar to existing regulations governing contaminated soils and hazardous waste for the BC IC&I sector. This outcomes-based approach would be focused on diverting and beneficially repurposing as much material before disposal. Under this approach there are no prescribed source separation technologies, but rather, given the volume and diverse composition of materials that are generated by the IC&I sector, there could be a wide range of diversion and recycling technologies employed."* Two industry-sellers made similar statements, noting this approach would have the benefit of not burdening regional districts or taxpayers.
- An industry-seller recommended the ministry increase enforcement, fines, and penalties to ensure compliance with existing framework.
- One local government suggested an alternative would be to establish processing requirements, for example, requiring waste to go through a material recovery process before disposal.

General comments

- Several expressed that stakeholder consultation with various industry groups is needed to develop innovative solutions that incorporate circular economy principles, with several noting that generators should be the focus of consultation.
- One local government suggested expanding EPR to this sector, but extending the current allowance for producers to opt out as long as they provide their own recycling for end-of-life management.
- One local government suggested moving forward with expanding EPR to ICI, but excluding cardboard, since this seems to be most contentious and is delaying moving forward with other important categories.
- Currently, the Recycling Regulation dictates that producers are responsible for determining how to collect and manage their products; however, several respondents, including two local governments, an organization, and an industry-service provider suggested that the existing industry-led EPR program for residential PPP should also manage ICI PPP materials.
- One local government stated *"It should also be noted that all approved stewardship plans should also include verifiable strategies for the packaging materials used in the recycling process. For example, shrink wrap, pallets and bulk packaging containers need to be recycled or reused as well."*
- One local government highlighted challenges with multi-family buildings and stated *"A province-wide program that is consistent and efficacious across all sectors will be easier for the public to participate effectively in and will likely result in higher recovery and lower contamination rates."*

- An industry-seller noted that fees on single-use items would steer consumers and retailers towards reusables. Several organizations and public respondents also expressed support for the concept as it would incent more innovation in package design.

Question 11: Are there sources of ICI waste that should be the primary focus for better management, such as food services, office buildings, or sports stadiums? [45 responses]

Comments on what sources of ICI waste should be prioritized

Forty-five responses identified specific sources of ICI waste that should be the primary focus for better management. Priority sources for the identified included:

- Food services (28): local governments (13), industry-service providers (2), organizations and public respondents (13)
- Sport stadiums (14): local governments (9), organizations and public respondents (5)
- Office buildings (19): local governments (11), industry-seller (1), organizations and public respondents (7)
- Medical facilities, such as hospitals and clinics (12): local governments (6), industry-service provider (1), organizations and public respondents (5)
- Educational institutions, such as schools, universities (12): local governments (8), industry-service provider (1), organizations and public respondents (3)
- Various other suggested priority sources were highlighted by one to five respondents, including:
    - Retailers, including grocery stores
    - Shopping centres
    - Public buildings, such as libraries, community and recreational centres, and museums
    - Ferries
    - Hotels
    - Ski resorts
    - Campgrounds, work camps, and mines
    - Airport and cruise terminals

General comments

Four local government and one public respondent stated that sources generating the most volume of ICI waste should be the primary focus for better management.

5. Marine Debris in B.C. – End-of-Life Management of Lost Fishing Gear

Question 12: Do you have comments or suggestions on policy approaches to better manage fishing gear? [71 responses]

Overall, the majority of responses were supportive of policy approaches to better manage fishing and aquaculture gear according to the following breakdown:

- **Local and federal governments** (24): most expressed support (19) for better end-of-life gear management, while some remained neutral (5) with no unsupportive responses.
- **First Nations** (1): expressed support.
- **Industry-sellers** (5): supportive (4), and unsupportive (1).
- **Industry-service providers** (5): all responses expressed support.
- **Organizations and public respondents** (36): majority of comments were positive (32), while some provide neutral comments (4).

The following section outlines key themes that emerged across the responses to this question.

Supportive comments on EPR and/or alternative policy approaches

Many respondents expressed support for an EPR and/or alternative policy approaches to manage gear (24): local government (6), industry-sellers (4), industry-service providers (2), organizations and public respondents (12). Comments included:

- Seven organizations and public respondents, one local government, one industry-service provider, and three industry-sellers believe that all producers need to participate in an EPR program to ensure financial sustainability, including producers from other jurisdictions selling products into B.C.
- Two local government respondents suggested a hybrid model.
    - *"In a paper published in December 2019,1 the National Zero Waste Council recommends EPR for marine fishing debris delivered in conjunction with senior governments, with immediate priority placed on abandoned fishing nets as a high-ranking problematic ocean plastic. However, the paper acknowledges that while EPR is usually funded entirely by product brand owners, the high cost, low turnover, and small number of fishing net manufacturers will likely require a hybrid model to allow for rapid implementation, possibly with partial funding from the federal government, and strict enforcement of minimum recovery rates. We recommend the Government of BC explore this option with Environment and Climate Change Canada as they consider methods for addressing plastic marine debris through their national plastics plan."*
- Two industry-sellers, one local government, four respondents involved in an organization, and one public respondent felt that development of a program needs to be in consultation with stakeholders.

Non-supportive comments and/or concerns on EPR

Industry-sellers expressed concern about using an EPR approach to manage existing marine and fishing products, with an industry-seller association stating: *"In our view, extended producer responsibility does not form part of a solution for the existing debris because doing so would result in eco-fees on commercial and consumer marine and fishing products that would drive those sales out of our jurisdiction and underground."* The response goes on to state that EPR *"may be an appropriate policy*

option to help prevent new marine debris. However, there is a complete lack of data available about what is happening to that waste at present – which complicates any analysis of a potential obligation of these products."

Comments on labelling systems and tracking devices

Several respondents (13) suggested using a labelling/registration system and tracking devices (potentially GPS) as a means of locating lost gear and connecting it back to its owner: local governments (5) and public respondents (8).

Comments on increasing disposal and recycling capacity

Several respondents (13) suggested expanding recycling options to deal with gear: local governments (5), industry-service provider (1), organizations or public respondents (7). Comments included:

- A local government suggested that fishing stores be collection sites. Another local government suggest that drop-off locations are free, and a public respondent suggested that recycling locations are close to marinas.
- A public respondent shared that the recycling facilities could employ coastal and/or First Nations communities.
- Four respondents shared details on implementation. One organization suggested that eco-fees would support the expansion of recycling for marine debris, and an organization and an industry-service provider suggested recycling capacity would be supported by EPR regulation.
- A local government suggested *"the government should support and promote partnerships between local organizations that collect used fishing gear and businesses that can recycle the waste."*

Comments on fishing licensing requirements

Some respondents (5) provided suggestions about licensing requirements to help fund and improve end-of-life management of lost gear: local governments (2), and organizations and public respondents (3). For example:

- One local government and one organization suggested an increase to fishing licensing fees to fund marine cleanup efforts. One organization did not specify the type of licensing however wanted the funds to support a clean-up fund.
- One local government specified that commercial fishing should require a fee: *"the funds should be directed to clean-up efforts within the region that the activity is taking place, especially when it is a fixed operation like shellfish aquaculture or fish farming."*
- One local government, suggested *"At the point of issuing fishing licenses require submission of a solid waste management plan that accounts for the life-cycle management of the fishing gear used."*
- One local government and one public respondent suggested awareness campaigns or videos as part of the licensing program.

Comments on government-funded programs

Some respondents (3) discussed funding programs: one local government, one organization, and one public respondent. Comments included:

- One local government recommended incentives for removal of ghost gear (e.g., financial incentives to scuba divers to collect waste.)

- One public respondent suggested that funding for cleanup organizations be provided from the provincial government.
- One local government suggested the continuation of the Clean Coast, Clean Waters Initiative Fund after pandemic.
- One local government suggested a deposit disposal fee that is returned to the buyer at time of proper disposal.

Comments on the type of gear

Respondents recommended that the following should be included in a gear recycling program:

- Nets, lines, hooks, buoys, lead weights, hemp fibers, foam floats, foam filled tires, rope, floats/buoys, barrels, fishing line, oyster trays, crab pots, polystyrene encased billets, abandoned vessels, ghost gear, PVC pipes, all netting for fishing and aquaculture, recreational fishing tackle, dock materials.

General comments

Some additional suggestions and comments include:

- Some respondents (5), local government (1), and organizations and public respondent (4), suggested banning marine Styrofoam plastics (polystyrene foam) – including both encapsulated and non-encapsulated foams.
- Ensure policy does not burden local communities with brunt of costs.
- Several respondents noted the opportunity to employ indigenous communities: *"We also encourage the government to direct a portion of the CCCW toward capacity building amongst coastal indigenous communities to carry out cleanups."*

6. Implementation

Question 13: To help inform the development of the multi-year strategy, do you have comments or suggestions on what product categories outlined in this Intentions Paper should be prioritized for regulation? [60 responses]

Fifty-nine responses discussed the product categories outlined in the Intentions Paper that should be prioritized for regulation to help inform the development of a multi-year strategy. Suggested priorities appeared in every topic area. In some cases, respondents specifically noted first and second order priorities, however, these are all combined into the following priority areas:

- Residual product category (27): local governments (18), industry-service providers (3), organizations and public respondents (6)
- Mattress category (27): local governments (16), industry-seller (1), industry-service providers (3), organizations and public respondents (7)
- Packaging and paper product category, from ICI sources (23): local governments (13), industry (3), organizations and public respondents (7)
- Electronic and electrical product category, including batteries (16): local governments (7), industry-seller (1), industry-service providers (2), organizations and public respondents (6)
- Marine debris (14): local governments (6), industry-service providers (2), organizations and public respondents (6)

General comments

- Product category prioritization should be based on waste volume, environmental impact, management cost, and/or safety hazard level.
- A mattress category could be easier to proceed with as other categories would require a longer time to set up an EPR program.
- The ministry should engage stakeholders in identifying and prioritizing product categories.

7. Cross-Cutting Themes and Other Product Types Outside of this Consultation

Several respondents provided comments that were deemed beyond the scope of the information provided in the Intentions Paper, however, this input is summarized below as it raises other potential product categories or considerations brought forward for review by the ministry.

A few themes that were beyond the scope of the questions posed in the Intentions Paper appeared across several different responses, including:

Concerns about regulating and enforcing e-commerce sales

- Industry-sellers, industry-service providers, and organizations and public respondents raised concerns about how EPR can encompass online sales. For example, in reference to mattresses, one industry-service provider stated: *"We are interested because there are several online sellers of mattresses and because the ever-increasing volumes of online sales by non-resident e-commerce sellers is a perennial, and as yet, unsolved, issue for EPR programs in British Columbia, across Canada and around the world. If the Ministry wishes to ensure that mattresses are properly recycled, then it will likely want to legally obligate e-commerce sellers of those mattresses to the greatest extent possible."* Further to this, the respondent: *"suggests that the Ministry may want to consider expanding its scope of obligated parties to include e-commerce marketplace facilitators and marketplace sellers that are resident in BC. While this does not fully address the issue of non-resident e-commerce sellers, it could capture a significant amount of non-stewarded e-commerce packaging currently (and unfairly) being managed by [respondent] members."*
- An industry-seller association provided some suggestions on managing sales from outside BC: *"[Respondent] has previously argued that Government needs to address the substantial 'free-rider' issue by obligating those entities and enforcing that obligation. One direction could be to obligate on- line marketplaces as producers."* And: *"Alternatively, Government could obligate shipping companies as producers to ensure compliance. It would be very unfair to obligate mattresses and foundations if those obligations are not equally spread across all entities selling the products."*

Accessibility

- Ensuring convenient access to recycling services in rural areas appeared in many topic areas, including mattresses, residuals, ICI packaging and paper products, and marine gear.
- In more urban areas, convenient access to depots without the need for a vehicle was highlighted by local governments.

Making recycling easier for consumers

- Another theme that appeared in several questions is the need for clear, consistent messaging about what can be recycled. One local government *"encourages the Province to require that stewardship programs better manage depots and other return collection facilities accepting their products to ensure a consistent standard for accessibility, signage and cleanliness is achieved. This will help maximize participation in the various EPR programs."* While one industry association stated *"you shouldn't require a PhD to know which products are included in BC's recycling programs."*

Regulatory framework considerations

- Improved data and more dialogue with industry stakeholders were common themes from several industry respondents in a few categories.
- Changes to the EPR framework that address existing loopholes were suggested across several categories.
- An industry association strongly urged the province to rewrite the regulation in a more consistent, easy-to-follow manner.
- The need for further clarity around definitions (e.g. producer), and more consistent and easy-to-follow regulations were also recommended.

Full cost recovery

- It was noted in several questions that some product categories have insufficient cost recovery at this time, and that the system should work toward full producer responsibility and full cost recovery.

Circular economy

- Several respondents noted that the ministry should look for ways to foster reuse before recycling, and ensure all regulations support the ultimate goal of a circular economy. One local government states they encourage the ministry *"to pursue new programs and policies that help move producers up the pollution prevention hierarchy towards a circular economy where resources are never tossed, but are reused, repaired and reintroduced in new products. This could include right-to-repair incentives and/or regulatory requirements, formalizing practices for extended producer responsibility programs around reporting on reuse and repair activities; and increased recycled content in products. These new programs and policies could complement the Recycling Regulation and move the province towards a circular economy."*

Other product categories not identified in the Intentions Paper

- Many respondents from local government (12), to industry (1), to organizations and public respondents (4), mentioned the desire to expand the regulation to include large upholstered furniture such as couches and armchairs.
    - One local government stated, *"Consider adding other bulky items (such as upholstered furniture like chairs, couches etc.) that have similar construction and are already recovered in some communities through existing mattress recycling businesses."*
- Seven local governments and one individual highlighted the need to add car seats to the regulation.
- One local government *"recommends consideration of a number of other products not currently included in the Recycling Regulation and not specified in this Policy Intentions Paper, including: the remaining product categories identified in the Canadian Council of Ministers of the Environment Canada-Wide Action Plan on Extended Producer Responsibility, as well as a number of household items such as single use wipes, canning jars, coat hangers, pots and pans (metal), and toys (plastic)."*
- Several others noted the products listed in the Canadian Council of Ministers of the Environment Canada-Wide Action Plan on Extended Producer Responsibility and also specifically listed the need to include:
    - Hard plastic toys, high chairs, strollers, and other toddler equipment.
    - Garden furniture made from PVC and plastics.
    - Carpet, furniture, textiles, building materials.

  - Gypsum and asphalt shingles.
  - Construction and demolition waste.
  - Cigarette butts.
- Textiles that are 100% non-biodegradable, for example, aromatic-polyamides (e.g. Kevlar, Nomex) used in firefighting uniforms.
- Some respondents noted adding recreational boats, marine vessels, docks, recreational vehicles, fifth wheels and trailers.
- One industry-service provider noted the importance of addressing construction waste, including: EPS foam, PVC or ABS pipes, tarps, plastic banding, rigid Styrofoam, carpet, wood pallets, etc.

D. Closing

The ministry would like to thank all respondents for their feedback. All comments will be considered before developing an outreach strategy, amending the regulation, or pursuing other policy approaches.

Making a difference...together

EEP 21-28

REPORT TO TRANSPORTATION COMMITTEE
MEETING OF WEDNESDAY, JUNE 16, 2021

SUBJECT **CRD Electric Vehicle Infrastructure Roadmap**

ISSUE SUMMARY

To provide the results of the Capital Regional District (CRD) Electric Vehicle Infrastructure Roadmap project (Roadmap).

BACKGROUND

Working with Dunsky Energy Consulting, staff recently completed the CRD Electric Vehicle (EV) Infrastructure Roadmap (Appendix A). The purpose of this initiative was to understand future charging station needs and identify the opportunities for regional collaboration. The Roadmap considered municipal EV adoption targets and utilized modelling to identify a regional target of 25% of light duty vehicles to be EVs by 2030. The project team held two workshops and one-on-one interviews with local and provincial governments, BC Hydro, EV Tech companies, potential site hosts, EV infrastructure builders, and large fleet owner representatives.

The Roadmap estimates that, on the region's current adoption trajectory, EVs are expected to reach 11% of total vehicles by 2030, well below capital region and municipal targets. To meet regional targets, charging infrastructure needs to be in place to promote and attract EV vehicle uptake.

The Roadmap focuses on EV charging infrastructure for battery-electric and plug-in hybrid electric light-duty passenger vehicles, including those for businesses and commercial fleets within the capital region. Light-duty passenger vehicles make up more than 90% of vehicles in the capital region and transitioning these vehicles to electric is a key strategy in local and senior government climate plans and related policies. Funded in part from a BC Hydro Sustainable Communities grant, the Roadmap will be used as an input for the CRD Climate Action Strategy update. Results will also be shared with local governments and other regional stakeholders.

The Roadmap identifies that approximately $31 million of investment is needed for public EV infrastructure to enable the region to achieve 25% of EV ownership relative to the total vehicle fleet by 2030. The 25% target reflects the EV adoption goals set by the region's local governments to date, and a moderate level of EV ownership in the region. While it is expected that most future EV drivers will plug in predominantly at home, many other drivers will only have access to public charging. Many fleet vehicles, such as taxis and car-share services, are also expected to rely on the public network. The following table outlines the number of EV public charging ports and their cost to support the region to an EV target of 25% of the light duty fleet by 2030.

Table 1: Forecast number of charging ports and investment needed by port type

Level 2	Direct Current Fast Charging
770 new ports by 2030	132 new ports by 2030
$7.7M total investment	$23.1M total investment

Most of the investment needs to go to DCFC or "Fast Chargers," which are energy and capital intensive. Few non-Tesla fast chargers exist in the region today. Fast chargers are typically "on-the-go" or top-up chargers, but can be the primary mode of charging for those without access to home charging (i.e., residents of multi-unit residential buildings (MURBs)). DCFCs are currently being installed in corridors by BC Hydro but not at commercial community hubs, like grocery stores, or designated "mobility hubs" identified in the CRD Regional Transportation Plan.

A number of public level 2 chargers currently exist in the region (i.e., malls, recreation centres and municipal halls). These are less expensive and the Roadmap envisions these to be installed in greater numbers in long-term (i.e., multi-hour) parking areas that are close to homes, community hubs and recreation sites. The Roadmap also envisions level 2 installations at workplaces to support charging for employees who do not have access to home charging.

Overall, the total number of public charging ports will need to more than quadruple by 2030, according to the Roadmap modelling. While the Roadmap does not recommend that the CRD specifically own and operate an EV network in the region, it can contribute to the EV infrastructure initiative. See Appendix B for regional stakeholder roles.

The Roadmap recommendations include investing in additional coordination support focusing on charger site selection, education and capacity building, data tracking, and the creation of policy and guideline documents (see pages 24-31 of Appendix A). While the Roadmap does not focus on private charging, the recommendations do include supporting and tracking comprehensive EV charging retrofits in MURBS.

ALTERNATIVES

Alternative 1

The Transportation Committee recommends to the Capital Regional District Board:

That this report be received for information.

Alternative 2

That this report be referred back to staff for additional information.

IMPLICATIONS

Environmental and Climate Implications

On-road transportation accounted for 46% of emissions in the capital region in 2018, with light-duty vehicles accounting for more than 90% of that. Transitioning the region's fleet of light-duty vehicles to EVs displaces fossil fuel use and is a key climate priority for the federal and provincial governments and the capital region's municipalities. Achieving regional and municipal targets related to mode-shifting to transit and active transportation are also climate priorities.

Intergovernmental Implications

As per Appendix B, senior levels of government play major funding and policy roles. The provincial government has created the Zero Emission Vehicle Regulation, which supports the EV supply for

the region, as well as the Go Electric BC program that funds publicly accessible EV infrastructure. The federal government has established a national zero emission vehicle target and the Zero Emission Vehicle Infrastructure Program, which also supports publicly accessible EV infrastructure. The Roadmap recommendations are in line with previous regional and municipal governments' responses and create a coordinated infrastructure program instead of the implementation piecemeal projects, which has been the approach to date. The recommendation to create guidelines and policies supports existing authorities of local governments, many of which have created EV-ready development provisions for public charging and residential construction.

Alignment with Board & Corporate Priorities

The CRD embedded the climate emergency declaration and leadership intentions to accelerate the reduction of GHG (greenhouse gas) emissions while working with local governments in the 2019-2022 CRD Board priorities.

Alignment with Existing Plans & Strategies

The Roadmap was created to align with the 2018 Regional Growth Strategy, which would set the region up well to achieve the goal of a 61% emission reduction by 2038. The Roadmap also aligns with the 2014 *Regional Transportation Plan* mobility hub concept and the multi-modal transportation planning context. The Roadmap will also align with the renewed CRD Climate Action Strategy (in development).

CONCLUSION

Transportation is a key component of regional greenhouse gas emissions. The CRD Electric Vehicle (EV) Infrastructure Roadmap identifies that approximately $31 million of investment will be needed for public EV infrastructure to set the region up to achieve 25% of EV ownership relative to the total vehicle fleet by 2030 and support the Regional Growth Strategy target of 61% total greenhouse gas emission reduction by 2038. The Roadmap indicates that the CRD can support regional collaboration and infrastructure investment through coordination, education, tracking, and policy support.

RECOMMENDATION

The Transportation Committee recommends to the Capital Regional District Board:

That this report be received for information.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

ATTACHMENTS

Appendix A: CRD Electric Vehicle Infrastructure Roadmap – Dunsky Energy Consulting
Appendix B: Regional Electric Vehicle Infrastructure Roles

APPENDIX A

Electric Vehicle Infrastructure Roadmap

Transportation electrification for a connected region

Prepared for:

Capital Regional District

Making a difference...together

March 22, 2021

dunsky

Submitted to:

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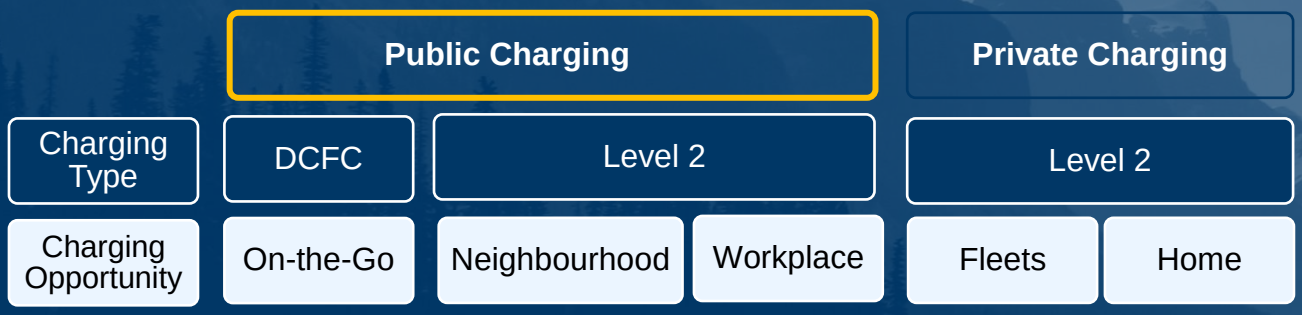
Cover image provided by Plug-in BC

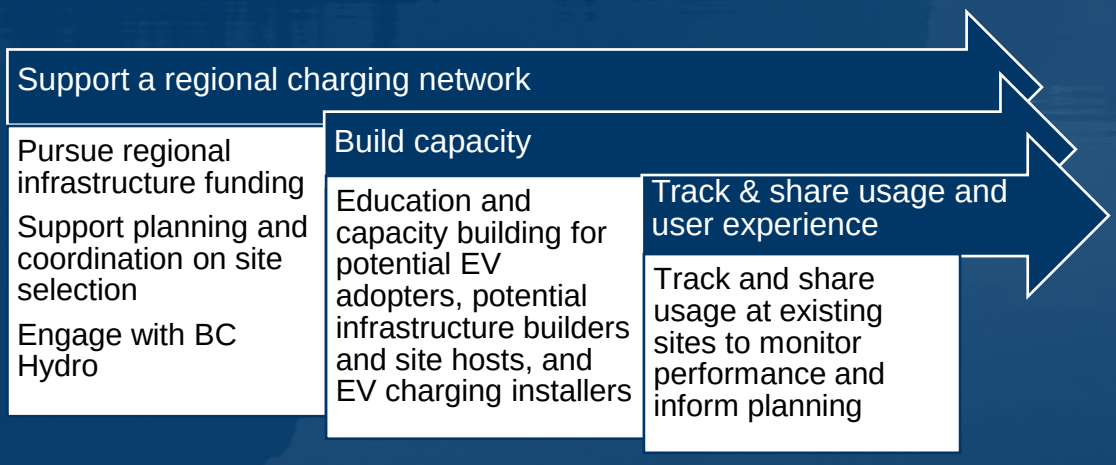
EXECUTIVE SUMMARY

The capital region has experienced record-breaking EV sales over the past several years and has a range of policies and plans in place to support EV adoption. However, to achieve a regional EV goal of 25% of all vehicles, additional charging infrastructure will be required.

Although charging at home in a garage or driveway is typically the most convenient option, not all EV drivers can plug in at home. Therefore, investment in public charging, including DCFC on-the-go, and Level 2 chargers in neighbourhoods and workplaces, is critical to ensuring equitable access to charging. This Roadmap estimates that 770 new public Level 2 ports and 132 new DCFC ports will be required by 2030 to accelerate adoption and support EV user needs.



The ramp-up of EV charging represents a significant investment of time and resources by a wide variety of different actors. There are significant opportunities to collaborate and ensure a coordinated approach to infrastructure deployment. The CRD has a vital role to play in leading collaboration opportunities, expanding its role as a trusted reference, and acting as the region's EV infrastructure advocate. To achieve this goal, the CRD should pursue the following collaboration opportunities:



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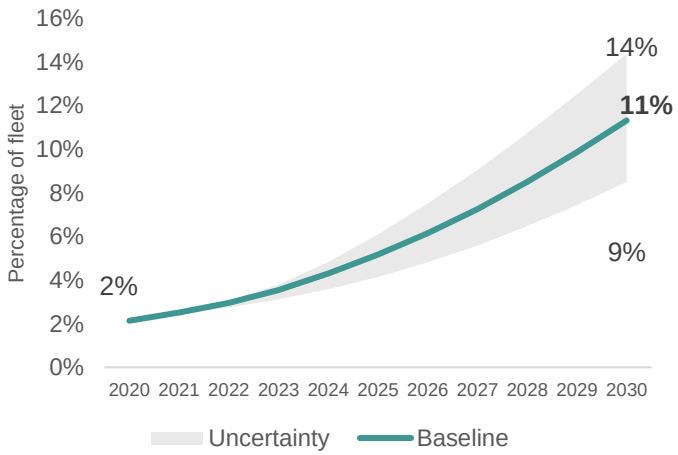
1. Introduction

The capital region of British Columbia's transportation landscape is in transition. The urgency of climate change and the imperative to create healthy, vibrant communities have brought sustainable transportation options like biking, transit, and walking to the forefront.

For remaining trips that can only be served by passenger vehicles, switching to electric vehicles (EVs) offers a significant opportunity for emission reductions. Thanks to supportive provincial, local and regional policies and incentives, and a community committed to climate action, EVs are taking off: in 2020, the region had the highest percent of EV sales in the country.[1] Capital region residents support electrification, with 93% of respondents in the 2018 CRD EV + E-Bike survey indicating it was important or very important that local or regional government promote EVs to reduce community emissions.

To support the acceleration of EVs, more investment in charging infrastructure is required. While some current and future EV drivers can plug in at home, for many drivers, access to public charging may be the only option. If the capital region's EV charging infrastructure remained as it is today, EVs are expected to reach 11% of total vehicles by 2030, which is well below many local EV targets.[2]

Figure 1: Forecast of EV Adoption Based on Current EV Infrastructure



Significant efforts are already underway to plan and invest in more charging infrastructure in the region by local governments, utilities and the private sector. Other key players are also involved in planning and deploying EV charging, such as utilities, building and landowners, large fleet owners, and EV tech and manufacturing companies.

Given the scale of investment required, the diversity of stakeholders involved, and the tight timelines to meet climate targets, deliberate and coordinated charging infrastructure investment is critical. Regional leadership is needed to support the acceleration of EV adoption in the region and address user needs, while supporting complementary priorities around affordability, equity and modal shift.

[1] Statistics Canada. (2021). *Zero-emission vehicles in British Columbia, first half of 2020*. Available online: https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2020076-eng.htm

Purpose

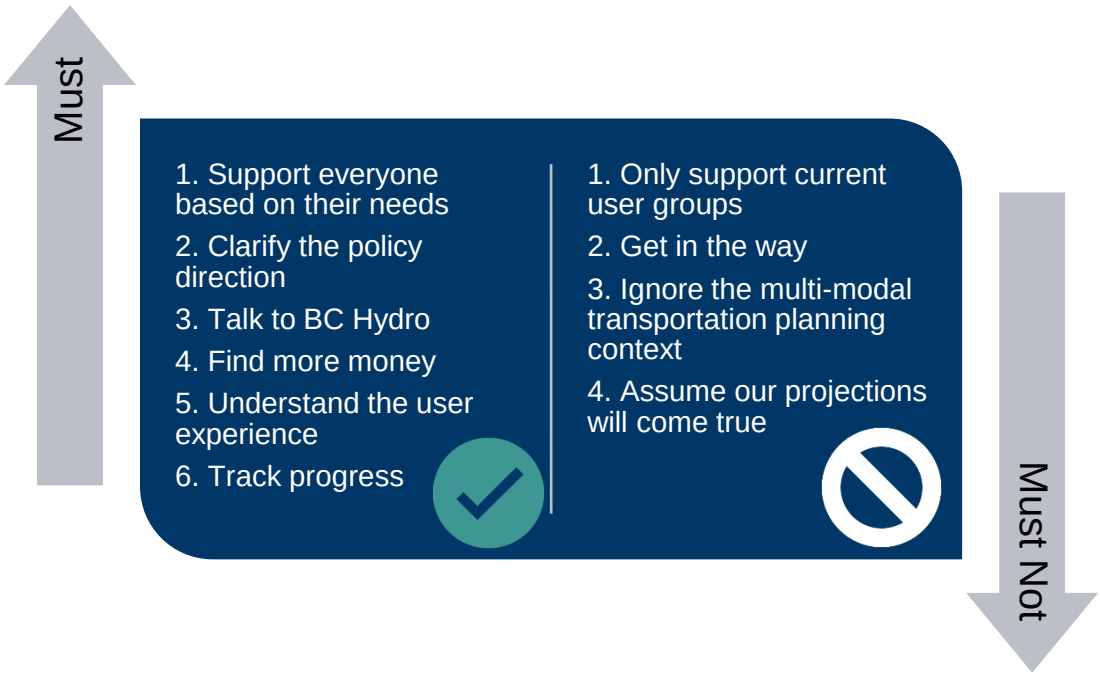
The purpose of this Roadmap is to provide:

- A high-level indication of the scale of EV charging infrastructure required to accelerate the transition to EVs in the capital region,
- An overview of the types of charging opportunities needed to support current and future EV drivers, and
- A summary of collaboration opportunities between key players and actions to support a coordinated approach to charging infrastructure deployment in the region.

The focus of this Roadmap is EV charging infrastructure for battery-electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV), given that the market is more advanced compared to other internal combustion engine alternatives. In addition, this Roadmap focuses on light-duty passenger vehicles, including those for businesses and commercial fleets within the capital region.

Guiding Principles

The Roadmap is guided by the following principles developed by stakeholders during this project's engagement process. Each opportunity has been developed to conform to these principles.



Methodology

The Roadmap was developed by engaging with regional stakeholders, modeling regional EV adoption, and incorporating the on-going work of the regional and local governments on EV policy and infrastructure. The **stakeholder engagement** process included a series of one-on-one interviews led by the CRD and two online workshops. The first defined guiding principles to ensure the Roadmap meets regional needs. The second event assessed regional collaboration opportunities. A summary of the stakeholder engagement process is presented in Appendix A.

Look out for ***stakeholder insights***

Dunsky's **Electric Vehicle Adoption (EVA) model** was used to assess EV charging infrastructure needs and costs required to accelerate regional EV adoption.

2. Current EV Charging Landscape

As of February 2021, there were 240 Level 2 and 28 Direct Current Fast Charging (DCFC) ports located across the capital region (Figure 2). Level 2 chargers are distributed widely, while DCFC ports are located primarily in Victoria, Saanich, and along major routes[3]. Detailed explanations of infrastructure types can be found in the *Capital Region Local Government Electric Vehicle (EV) + Electric Bike (E-Bike) Infrastructure Planning Guide.*

Figure 2: EV Charging Stations in the capital region (by census subdivision), February 2021

Local Government Policy and Infrastructure Plans

Local governments are taking an active role in supporting and deploying EV charging infrastructure by installing many of the charging stations across the region. Furthermore, local governments have been supporting EVs adoption more generally through their policies and planning activities. Many have identified collaboration opportunities with business, community organizations, and other local governments as an important component in public charging infrastructure funding and development in their climate and transportation plans.

Table 1 highlights EV-ready charging policies and municipal EV infrastructure plans as of March 2021.

Table 1: CRD and Local Government EV Policy and Infrastructure Plans

Government	EV Infrastructure Plan

[3] Natural Resources Canada.(2018) *Electric Charging and Alternative Fueling Stations Locator.* Available online: https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation-and-alternative-fuels/electric-charging-alternative-fuelling-stationslocator-map/20487#/analyze.

City of Colwood	The City is considering 100% EV Ready requirements for multi- and single-family homes within its Parking By-law Update.
City of Langford	The City is considering an EV Ready requirement.
City of Victoria	In its 2018 Climate Leadership Plan, the City set a goal of renewable energy powering 30% of passenger vehicles by 2030. The City is currently developing its EV Strategy, which will outline its infrastructure plans. The City of Victoria has adopted 100% EV Ready standards for new multi-family and commercial buildings.
District of Central Saanich	The District outlined that one pathway to meet accelerated Climate Plan is to have 25% of vehicles on the road be zero emissions by 2030, and 100% by 2050.In its 2020 *Electric Vehicle and Electric Bike Strategy*, staff propose the installation of 3 Level 2 charging stations for public use on District properties.
District of Highlands	The District's Climate Leadership Plan outlines a vision where vehicle owners switch to zero-emission vehicles before 2030.
District of Saanich	The District's 2020 *Climate Plan* sets out to expand its municipally-owned Level 2 stations from 24 by 2025, with an interim goal in its 2020 *Electric Mobility Strategy* of 20 stations by the end of 2021. These actions aim to meet their Climate Plan target of 36% of all personal vehicles electrified by 2030, and 100% of personal and commercial vehicles are renewably powered by 2050. The District of Saanich has adopted 100% EV Ready standards for new residential, institutional, commercial and industrial buildings.
District of Sooke	The 2020 Transportation Master Plan indicates that the District has pending plans for 6 additional Level 2 charging stations, but there is no installation timeline. The *Plan* also suggests EV-Ready requirements for new residential and commercial buildings.
Town of Sidney	The Town is in the process of implementing an EV-Ready by-law for new multi-family and single-family homes.
Town of View Royal	The Town Council adopted a Zoning By-law amendment to require EV and E-bike Infrastructure residential and non-residential buildings.
Township of Esquimalt	The Township is in the process of implementing an EV-Ready by-law for new multi-family and single-family homes.
Capital Regional District	The *Capital Region Local Government Electric Vehicle (EV) + Electric Bike (E-Bike) Infrastructure Planning Guide* was developed to inform EV infrastructure planning and design in the region. The CRD also worked with AES Engineering to produce technical standards for a zoning requirement of 100% EV-ready MURB parking stalls, which facilitated a model by-law. The CRD also developed load management best practices.

Key Players

Key stakeholders for the Roadmap include senior and local governments, First Nations and other organizations that are planning and deploying EV charging infrastructure that is wholly or partially available to the public. In addition, there are industry players focused on private fleets and charging (e.g. corporate fleets, taxi companies, and development industry).

Companies involved in EV equipment, installation and engineering also play an important supporting role, such as equipment manufacturers and charging station operators. Some play a key role in supporting EVs through policy and incentives (e.g. federal government) and the EV market (e.g. vehicle manufacturers). BC Hydro is another key player, both as an owner and operator of EV charging infrastructure, as well as through their role in electricity system planning and identifying where future EV infrastructure can be accommodated.

Equity is a critical factor in public charging infrastructure by making EVs more accessible to all residents. Deliberate efforts are required to ensure the infrastructure reduces, not reinforces, inequities for people who have a low-to-moderate income[4]. For example, public charging can support residents without at-home charging or residents for whom upfront infrastructure costs are a barrier to adoption. A strong public network can enable all residents to choose electric if choosing a vehicle.

Table 2 provides an overview of the key stakeholder roles, and example organizations, in EV infrastructure deployment. Understanding and integrating these stakeholders' plans and needs is essential to developing a cohesive regional charging network. The next chapter outlines key collaboration opportunities as well as the role of the CRD in supporting a regional approach.

Table 2: Key players roles and example organizations

Key Player	Role	Example organizations
Infrastructure Builders	Actively deploying charging infrastructure	Local governments, First Nations, utilities, institutions, building developers, private companies
Site hosts	Willing to host but not necessarily own or operate infrastructure	Governments, crown corporations, First Nations, campuses, major transit hubs (e.g. ferry terminals), parking companies, retailers, fuel stations
Financial & policy supporters	Deciding or administrating EV supports	Governments, First Nations, utilities, provincial and federal governments
Utilities	Supplying electricity or building infrastructure	BC Hydro, Fortis
Technology companies	Supplying or operating charging stations or cars	Infrastructure manufacturers, EV software and data companies
Drivers	Fleet owners or EV users	Capital region residents and businesses
Ecosystem influencers	Advocate with or to industry or communities	Academia, business organizations, EV groups, NGO's

[4] ACEEE. (2021). *The State Transportation Electrification Scorecard.* Available online: https://www.aceee.org/research-report/t2101

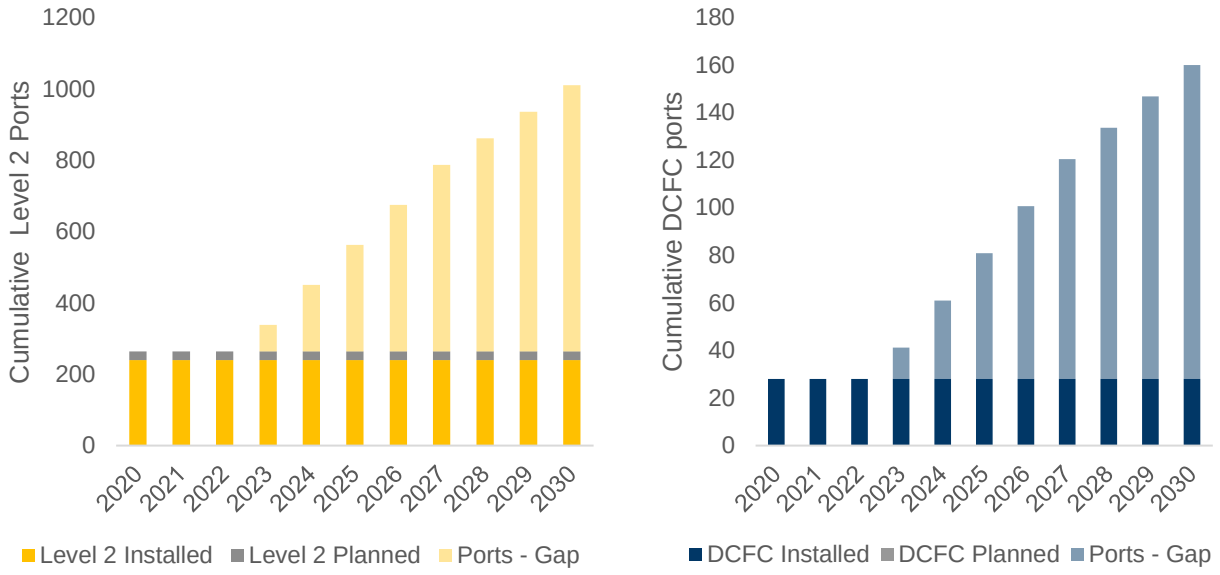
3. Regional Charging Needs

To accelerate the pace of EVs in the region and support municipal EV planning, new investment in private (e.g., at home) and public charging infrastructure is required. The following table outlines the public charging infrastructure that should be deployed by 2030 for EVs to reach 25% of the light duty fleet. This target reflects the EV adoption goals set by local governments to date, and a moderate level of ambition for the capital region.

Level 2	DCFC
770 new ports by 2030	132 new ports by 2030[5]
$7.7M total investment	$23.1M total investment

The **cumulative number of public ports** required for the capital region to accelerate EV adoption is outlined in Figure 3. The graphs show the infrastructure currently installed, the planned infrastructure that has been publicly announced, and the remaining infrastructure gap that needs to be filled. Infrastructure deployment does not start until 2023 to reflect the time required to plan, fund and execute regional charging. A detailed description of the modeling methodology is provided in Appendix C.

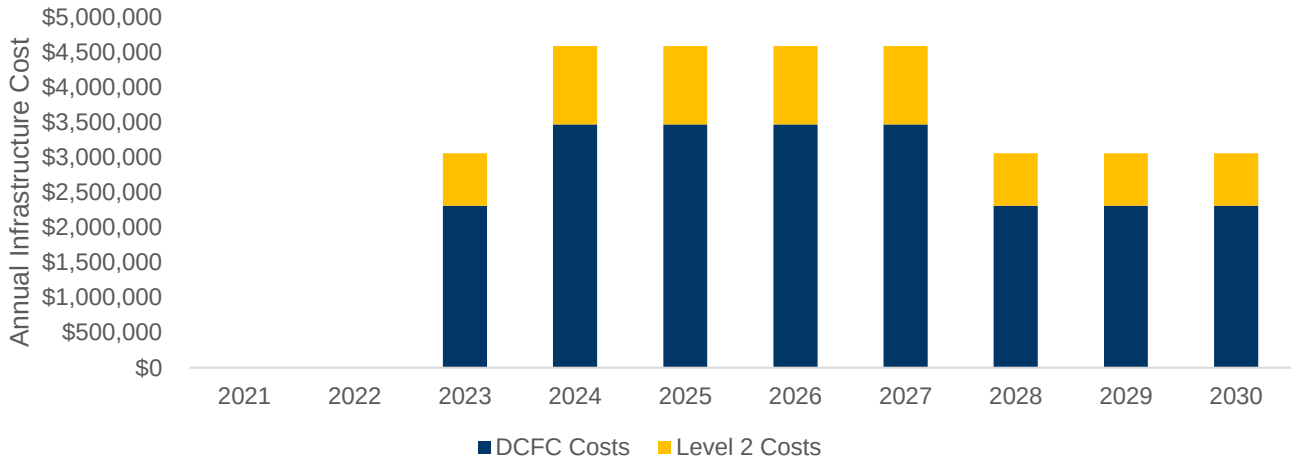
Figure 3 Cumulative infrastructure ports required to accelerate EV adoption in the capital region



[5] The DCFC port number has been updated and refined since Dunsky's 2020 *Contextual Assessment.*

The total cost to deploy the required charging infrastructure is provided in Figure 4.[6] Funding for EV infrastructure can come from both private and public sources.

Figure 4 Annual Infrastructure cost for EV infrastructure



[6] Level 2 and DCFC installations costs vary by location. Level 2 installations in parkades are assumed to be $5,000, while curbside installations are assumed to be $15,000, more expensive due to the complexity of construction in the curbside environment. The average cost used for Level 2 chargers in this analysis is assumed to be $10,000. DCFC installation costs are assumed to be $175,000 per port. Actual installed costs can vary depending on individual site conditions and the installed power capacity. Our analysis assumes an average of 150kW capacity per DCFC port.

4. Roadmap

Ensuring that EV drivers have reliable access to charging is critical to accelerating the pace of adoption. Charging at home is typically the preferred option and relies on **private** infrastructure. However, a complete and equitable charging network should provide a robust **public** charging network with **Level 2 and DCFC infrastructure** to provide options to drivers who cannot easily plug in at home, have long distances to travel, or who are looking for a quick top-up while on-the-go.

This Roadmap outlines **five charging opportunities** that consider the needs of current and future EV users:

"Match charging type with user need"

	Public Charging			Private Charging	
Charging Type	DCFC	Level 2		Level 2	
Charging Opportunity	On-the-Go	Neighbourhood	Workplace	Fleet	Home

For each charging opportunity, we provide guidance on **where and how** they should be installed, as well as technical and design needs. We identify the actions that key players can take to **collaborate** on deployment.

Private charging at home and for fleets is also a critical component of the EV charging infrastructure landscape. Workplaces may also have charging stalls for employees that are not open to the public. However, since the focus of the Roadmap is primarily on regional coordination of public charging infrastructure, we have not included infrastructure costs and targets for private charging.

A. On-the-Go

Charging type: **DCFC**
Access: **Public**

"Standards, transparency and support for potential site hosts"

"Install L3 [DCFC] chargers at locations with amenities"

	2025	2030
Cumulative New DCFC Ports Required	53	132

Charging Need Description

DCFC fast charging can support drivers traveling between communities, as well as drivers within the community who are looking for a quick top up while 'on the go.' Fast charging can be the primary option for residents without at-home charging who do not drive very far or often and as a result only need to charge up occasionally.

Location type	Technical considerations
Commuter corridors	Residents or visitors who are traveling between communities in the region may need a quick top-up while on a longer trip, similar to the way highway rest-stops offer gas station refueling with convenient access from highways. These routes could include Highway 17 or the capital region portion of the Trans-Canada
Community hubs	Fast-charging can be located in community hubs with short-stay activities or appointments. These locations could include retail, services or other short-stay locations. Six of the eight DCFC locations currently outlined in the *Capital Region Local Government Electric Vehicle (EV) + Electric Bike (E-Bike) Infrastructure Planning Guide* identified this type of short-stay, highly trafficked public spaces, including parks, libraries, and municipal halls across the region. The California Energy Commission[7] statewide infrastructure usage assessment identified that the majority of DCFC installations should be within communities where residents spend most of their time. While charging along highway corridors is crucial to enabling longer trips, fast charging sites within communities see more frequent usage. DCFC stations generally require a three-phase 480 V supply. The cost of a new electrical service for the high power necessary for DCFC hubs can vary substantially from site to site. The cost of different locations should be considered, and utilities engaged early when selecting suitable sites for DCFC hubs.

[7] California Energy Commission. (2021). *Assembly Bill 2127: Electric Vehicle Charging Infrastructure Assessment.* Accessed online: https://www.eenews.net/assets/2021/01/22/document_ew_04.pdf

Typical parking duration	Dwelling time varies, but in general, around 20-40 minutes.
Example sites	• Grocery stores, libraries, recreation centers (short stays) • Gas stations, rest stops • Retail and dining establishments
User experience and design	To make this charging opportunity attractive to EV drivers, availability and charging time needs to be reliable. Locating multiple chargers in a single hub, providing high charging power levels, as well as parking time limits or time-based usage fees to encourage turnover, can support a larger volume of EV drivers as adoption increases.
Equity	Equity is an important consideration in all charging siting, but especially due to the limited numbers of DCFC stations installed in any charging network. In addition to geographic coverage, the socio-economic conditions of the communities should be assessed when siting DCFCs to ensure equitable access. For example, DCFC ports can be distributed such that there is access across neighbourhoods and communities with varying income levels. Charge station operators should also consider the impact of usage fees on different types of users. In areas with a high percentage of MURBs where DCFC sites are intended to provide a substitute for home charging, typical DCFC usage fees would significantly reduce the opportunity for annual savings compared to a gas-powered vehicle. Alternative fee structures, such as a subscription-based monthly fee with a reduced per-session fee, may be necessary to ensure those who cannot charge at home can benefit from the same financial savings as those who can.
Operations	Due to the high cost of demand charges, the business model for on-the-go fast charging operations may not be profitable in the short-term, despite the high value they provide to the community.

Mobility Hubs

Mobility hubs, as defined in CRD's 2014 *Regional Transportation Plan*, are key locations of regional activity and regional destinations where transportation modes integrate seamlessly and efficiently, and where both the traveler environment and urban form will encourage transit, active transportation, and other alternatives to driving alone. To accommodate a diversity of transportation choice, mobility hubs include access to activity and public transport, and integrate new technologies, such as EV infrastructure. This infrastructure can support vehicle access or integration, including car share and on-the-go fast charging.

"Engage with other transit authorities (transit, ferries, etc.)"

B. Neighbourhood

Charging type: **Level 2**
Access: **Public**

"Lead with a if you build it they will come approach"

	2025	2030
Cumulative New Neighbourhood Level 2 Ports Required	158	394

Charging Need Description

Within a neighbourhood, Level 2 charging can provide an important replacement or supplement to at-home charging. Residents who do not have access to home charging may benefit from long-term (multi-hour) charging **close to home** or at **community hubs**. In the 2018 CRD EV + E-Bike public survey, access to a public charging network was described as very important to owning or purchasing an EV to 51% of respondents and important to 40% of respondents.

Location type	Technical considerations
Close to home: On-street curbside parking	Curbside charging infrastructure can be installed on residential streets using standalone, street-light based, or privately-powered electrical services. Standalone systems can be costly due to the installations requirements. Leveraging streetlighting infrastructure can help to minimize installation costs and reduce the physical footprint in the curbside environment. Streetlight systems must be evaluated for spare capacity, which may already exist or could be made available from LED retrofits. Private residence-powered systems are less common, but some jurisdictions allow them where there is no off-street space in the private lot for infrastructure (e.g. no drive-way). Electricity is fed from the residence and the homeowner owns and operates the infrastructure. This option requires clear policies on allowed uses and payment structures of privately-powered and -owned infrastructure on public curbside, which can including future infrastructure planning and multi-modal considerations.
Community hubs Public parking with longer duration parking (e.g., schools, recreation centres, parks, places of worship, etc.)	Installations can be located on curbsides or in public parking lots (either owned by the municipality or by other entities) at neighbourhood community hubs like schools and rec centres. Local government could invest in level 2 charging at local government-owned parking lots or reach agreements with the owners of privately owned lots to install local government-owned charging infrastructure. Private sector EV charging network operators can also invest in charging infrastructure at these locations, which could be supported by local governments through financial, permitting, or other support.

Typical Parking Duration	Close to Home: 8-12 hours; or Community Hubs: 1-4 hours
Example Sites	• Local services providers (e.g., recreation centres, libraries, parks) (long stay) • Institutions (e.g. schools, health care providers) • Private homeowners (if charging sites are on-street)
User experience and design	*Close to Home* Accessing EV charging close to home, ideally on the same block, can encourage residents without home charging to consider EV adoption. Residents are expected to use these chargers on a regular basis – for some it may be their primary mode of charging. The total availability of both parking spaces and charge ports relative to demand will have a significant impact on the user experience. If there is uncertainty that an EV driver will be able to access a charger when needed due to competition for parking from other users, this can impact the overall convenience of EV ownership and can impede uptake. *Community Hubs* Residents may stay parked for longer periods of time within their neighbourhood, for example when visiting parks, or recreation facilities. Residents are expected to use these chargers on an occasional basis when it is convenient to them but are less likely to rely on them as a primary means of charging. When placed in high visibility locations, these chargers can also raise awareness of EVs and public charging options. The 12 Level 2 locations outlined in the *Capital Region Local Government Electric Vehicle (EV) + Electric Bike (E-Bike) Infrastructure Planning Guide* represent this charging need. The identified locations cover recreation centres, parks, libraries, and municipal hall sites across the region.
Equity	Close to home neighbourhood charging can increase equitable access to EV ownership as it creates options for EV drivers who don't have a garage or driveway. On-street infrastructure should be focused on residential streets with lower curbside activities and demand. It is more challenging to install in urban centres or commercial areas due to the competition for on-street space from transit, active transportation, and vehicle congestion. Pedestrian and bicycle traffic flow should not be impeded by infrastructure. EV infrastructure is one element of a complete street: one which is safe, comfortable and convenient for users of all ages and abilities. The curbside design should take into account current use and any future plans (e.g. bike lanes).

Operations	Standalone systems may be costly due to the installations requirements but service can be provided in areas that rely heavily on on-street parking while ensuring equal access to any residents in the area. Once installed, stations require a dedicated party responsible for operations and maintenance, which may be provided by the municipality, the private business or homeowner where the station is located, a parking management company, or another party. The appropriate party will depend on the context of the specific installation. These stations will be accessible to the public and with high volume, and therefore may require additional maintenance than private or limited access stations. Timely and regular maintenance of the infrastructure and the site should be integrated into operation plans and budgets to ensure reliability and convenience for the user.

C. Workplace

Charging type: **Level 2**
Access: **Public**

"Do make it easy for drivers to use"

"Ensure safety on roads and lots"

	2025	2030
Cumulative New Workplace Level 2 Ports Required	141	352

Charging Need Description:

Workplace charging is an important component of the infrastructure landscape because, second to a residence, vehicles spend most of their time parked at work. This charging access can be the primary charging point that enables EV ownership, or it can supplement home charging. In the 2018 CRD EV + E-Bike public survey, at work charging was described as very important to owning or purchasing an EV to 33% of respondents and important to 39% of respondents.

Location type	Technical considerations
Public or private parkades or parking lots	Parkades likely require electrical system upgrades before infrastructure can be installed. Recent analysis by AES Engineering has determined that the most cost-effective approach for existing buildings is to perform a comprehensive EV-ready retrofit, where energized circuits are provided to parking stalls during a single renovation. EV charging stations can then be easily installed when required. Given that not all EV drivers are likely to depend on workplace charging, not every parking stall is likely to require access to charging. The appropriate target for the percentage of stalls with access to charging will vary by building type, but recent analysis suggests targets of 40% of parking stalls for areas serving as employee parking, and 15% for areas providing visitor parking. Electric vehicle energy management can minimize demand charges and building-side electrical infrastructure costs. This approach – where charging power to each vehicle is reduced during periods of high demand – can minimize electrical system upgrades and is appropriate given that vehicles are expected to stay parked for extended periods of time at the workplace.

Typical parking duration	This charging access should allow for a full charge over the typical employee shift, meaning that the vehicle would be charging between 5 to 8 hours.
Example sites	• Commercial cores with commuter parking • Academic and health care campuses • Park & Rides
User experience and design	Workplace charging includes: • **Public access:** Accessible parking in a commercial area that is open to any EV driver. Use is targeted to commuters because the chargers are in urban centres and commercial areas where workers typically park while at work. • **Limited access:** Infrastructure is only available to employees with permission, which is provided by an employer or building owner. Alternatively, some infrastructure access is limited to the employees within a building. This case supports fewer EV drivers, but the restricted access may provide more certainty of charging access to employees. Parking spaces can be reserved specifically for EV charging, and policies and related signage can be installed to clearly communicate the requirements for charger use (e.g. time limits). Reserving spaces for EV drivers ensures that costly charging infrastructure is utilised. Some users will rely on workplace charging as their primary charging source. Therefore, consistent access to charging stations will require redundancy in the station design to ensure sufficient access.
Equity	Early adopters may drive infrastructure installation in select workplaces. A range of workplace types (e.g. beyond the traditional office building) and geographic locations should be considered for support and/or guidance on charging infrastructure.
Operations	Once installed, stations require a dedicated party responsible for operations and maintenance. This service can be provided by the infrastructure builder, site host, or another party. The appropriate party will depend on the context of the specific installation.

D. Fleets

Charging type: **Level 2**
Access: **Private**

Charging Need Description

Companies and individuals operating light duty EVs for business purposes may need to develop private charging. This section addresses fleets that use private charging on public and private land. For example:

- **Companies** that use EVs in their operations, such as taxis and delivery companies, will typically deploy infrastructure at the fleet's main parking facility.
- **Round-trip carsharing** (e.g. Modo) relies on a home base for the vehicle to park – typically a reserved spot on private or public land. This designated stall creates a natural location for Level 2 infrastructure.
- **Ride sharing and ride hailing** vehicles are individually-owned without a corporate 'home base'. These vehicles rely on the private residential infrastructure of the vehicle owner.

Sometimes fleets also rely on public charging. This is addressed in the text box below.

Location type	**Technical considerations**
Fleet main parking facility	Private facilities will have unique technical considerations due to the diversity of fleet facilities and charging needs based on the fleet make-up and size. Fleets typically have a large number of vehicles charging in one facility, sometimes with similar usage patterns that can exacerbate peak charging loads. EV energy management can be crucial to ensure charging loads are managed in a way that minimizes peak demand, reducing both installation and operating costs.
On-street charging	This style of infrastructure is typically powered from dedicated power sources or by streetlights
Typical parking duration	4 to 8 hours
Example sites	• An EV fleet's main parking facility • On-street parking on public or private land with reserved dedicated parking stalls only accessible to fleet vehicles
User experience and design	Private fleets will generally rely on charging infrastructure in their own facilities and this can be designed to meet their specific needs (e.g. power levels and energy management, usage fees and/or access control). Private charging on public lands (e.g. for round-trip carsharing) needs to be balanced with other user needs and parking types.

Equity	Car sharing, ride sharing, and ride-hailing can all contribute to a mobility ecosystem that relies less heavily on personal vehicles. Cost-effective approaches to charging infrastructure (Level 2 charging instead of DCFC where possible to minimize usage fees and infrastructure costs) can help to ensure these services can transition to an electric fleet while minimizing costs and ensure these services remain affordable for community members that rely on them.
Operations	Private fleets relying on charging infrastructure in their own facilities are responsible for operations and maintenance of the charging equipment. Charging infrastructure on public lands that are intended to support private fleets (e.g. curbside Level 2 chargers for round-trip carsharing) can be installed and owned by the local government and reserved for use by a specific fleet. The fleet owner can compensate the local government through an agreement that may include usage fees. Operations can be managed similarly to other public charging infrastructure, although the agreement between the local government and the fleet may include specific requirements such as minimum response time for repairs and minimum uptime.

Public DCFC charging for fleets

In some cases, fleets will seek to utilise public charging. For example:

- While **business fleets** will generally rely on Level 2 charging infrastructure at dedicated fleet facilities, some particularly high utilization vehicle fleets may also rely on public fast charging infrastructure (e.g., taxis).
- **One-way car sharing** without dedicated parking spots (e.g. a system similar to Evo) rely on fast charging stations for top-ups since they do not typically have dedicated parking areas where Level 2 charging infrastructure can be installed.
- For **ride hailing and ride sharing**, higher than average daily driving distances can require occasional visits to a fast-charging station to have sufficient range for a full shift, especially during winter. Ride hailing drivers are likely to rely on chargers located at airports, ferry terminals, and the downtown core, given that many of their rides are expected to start or end in these locations.

Short charging times will be a priority for these users. Charging stations should aim to provide enough power to allow for a significant charge within the typical visit time.

The use of public charging infrastructure by fleets may create a need for dedicated infrastructure to ensure public stations are not overloaded. For example, in California, the high per day mileage of ride hailing drivers led to increased reliance on public charging infrastructure by these drivers as compared to personal light-duty vehicles [8]. Usage by these types of vehicles should be monitored to ensure proper levels of public access can be maintained.

[8] California Energy Commission. (2021). *Assembly Bill 2127: Electric Vehicle Charging Infrastructure Assessment.* Accessed online: https://www.eenews.net/assets/2021/01/22/document_ew_04.pdf

E. Home

Charging type: **Level 2**
Access: **Private**

Charging Need Description

Home charging is the primary charging option preferred by most EV drivers. Therefore, understanding and enabling residential infrastructure for all housing types is important in the development of an integrated regional network. In the 2018 CRD EV + E-Bike public survey, future-proofing new developments for EV charging was described as very important by 69% of respondents and important to 23% of respondents.

Dunsky estimates that the majority of **single-family dwellings** in the capital region who have home parking (e.g. a garage or driveway) could install a charging station on their own property with relatively simple and inexpensive changes to existing electrical infrastructure. Therefore, most single-family residents can manage their own charging needs. However, fifty-five percent of capital region residents live in **multi-family dwellings**, which generally require more substantial and challenging upgrades to provide access to home charging.

Location type	Technical considerations
Single-family *(garage or driveway)*	Some residents may require more extensive upgrades to electrical systems than others (including panel upgrades).
Multi-family existing buildings *(retrofits)*	Existing buildings require EV Ready retrofits to upgrade the electrical infrastructure to enable installation of charging infrastructure at parking stalls. The cost of retrofitting all stalls at once is significantly less expensive on a per stall basis than retrofitting one or two stalls at a time. EV Energy Management Systems can help to minimize the peak charging load in a building and the cost of the supporting electrical infrastructure.
Multi-family new construction	New construction offers an opportunity to ensure EV Readiness for all parking stalls, enabling charging access and future-proofing developments. 100% EV Ready policies for new construction are implemented or soon to be in some capital region municipalities. As with retrofits, costs can be minimized through the use of EV Energy Management Systems.

User experience and design	Early efforts to support EV charging in existing multi-family buildings has focused on the installation of a limited number of charger(s) to be shared by all EV residents, commonly in short-stay visitor parking. As demand increases, this approach will cause inconveniences and may limit adoption. EV Ready electrical retrofits should be installed at each stall to provide an improved user experience. For new buildings, once EV ready new construction requirements have been put in place, EV drivers will be able to seamlessly install a charging station at their parking stall and plug in with the same convenience of a driver in a single family home with a garage or driveway.
Equity	Accessing EV charging infrastructure has an additional challenge due to the limited control over the building operations and upgrades. Permission and cost-sharing will need to be discussed between the renter and landlord. Targeting rental buildings for EV Ready infrastructure support programs will support equitable access to home charging among capital region residents. In strata buildings, infrastructure planning requires discussion and clarity on of how retrofit and electrical costs are recovered.

5. Regional Collaborations & Actions

Reaching EV targets to meet climate goals requires significant investment of time and money in regional EV infrastructure. During the Roadmap development process, stakeholders indicated an interest and willingness to collaborate on building a regional network but identified a lack of clarity on who should lead EV infrastructure planning and deployment. Many organizations have a 'wait and see' approach and are looking to others to take the first step. The traditional leaders in the space, such as the provincial government and utilities, are not necessarily stepping into this role.

"Everyone wants to do it, but no one has the answers"

"Resources can't keep up with momentum"

Education and capacity building among players involved in charging deployment was also identified by stakeholders as a critical need. Within organizations, particularly local governments, new knowledge bases and skillsets are required across multiple departments to support and build EV infrastructure. However, there is limited funding to support the skills and time required to meet the ramp-up.

The CRD has an opportunity to step into the leadership gap by driving forward collaboration opportunities, working with stakeholders to create a network to share best practices, policy, and planning information and filling gaps in education tools and resources.

The CRD should focus on the following types of collaboration opportunities:

- Coordinate and financially-support a regional charging network
- Build capacity through education
- Track and share usage and user experiences to meet evolving infrastructure needs

In each collaboration, the key players are identified **in bold text**.

Collaboration Opportunities

Coordinate and financially-support a regional charging network

As described earlier in this report, a significant number of Level 2 and DCFC charging ports need to be installed over the decade to meet regional EV adoption targets. This significant ramp-up of infrastructure requires thoughtful placement of charging sites within and between capital region communities to ensure that user needs are met, and access is provided equitably across the region.

"There's a need for regional coordination"

To develop a regional network of Level 2 and DCFC, the CRD should lead a collaboration with other players including **infrastructure builders**, **site hosts**, and **EV tech companies,** who are interested in owning, hosting, and/or operating charging stations. In parallel, local governments may be actively involved in supporting and investing in charging infrastructure within their own communities. The CRD can play a critical role by taking the regional view of infrastructure planning and to use that lens to support coordination.

The key collaboration opportunities that the CRD should pursue in this area are:

1. Pursue regional infrastructure funding

There is significant funding available from the federal and provincial governments to invest in EV infrastructure, including DCFC and L2 charging. The CRD should collaborate with **local governments, infrastructure builders, ecosystem influencers** and other actors to define funding needs and pursue regional funding applications, using the Roadmap as a guideline. Where matching funds are required, the CRD and/or local governments should contribute funding to support the application.

The CRD should apply to the Natural Resources Canada (NRCan) Zero Emission Vehicle Infrastructure Program (ZEVIP) as a regional delivery agent. Funding can cover up to 50% of total costs of Level 2 and DCFC charging in public places, on-street, in multi-family residential buildings, at workplaces or for light duty vehicle fleets. In addition, the delivery organization can spend up to 15% of the funding to cover the cost of managing and delivering the ZEVIP funding.

ZEVIP's "Third Party Delivery" stream is intended to support collaboration between third party "delivery agents" and "ultimate recipients" who receive funding from the delivery agents and are responsible for the actual infrastructure deployment. CRD should apply to this fund to become a delivery agent, securing funding from NRCan and then working with local partners who would become the ultimate recipients of funding responsible for deployment of charging infrastructure. By playing this role, CRD can facilitate greater overall uptake of available NRCan funding in the region, and NRCan allows delivery agents to set their own requirements for minimum project size for ultimate recipients (direct applicants to ZEVIP's other streams must commit to a minimum of 20 ports for each application). NRCan is expected to launch a new RFP for the Third Party Delivery stream in August

2021 with applications due in November 2021[9]. The CRD should aim to submit an application in 2021, whereby confirmation from NRCan would be provided in early 2022, and CRD could begin working with local partners to apply as ultimate recipients.

The BC government has partnered with NRCan to provide additional funding for DCFC projects deployed through ZEVIP for an additional 25% of project costs. Successful applicants to NRCan's program are automatically eligible for funding from the Government of British Columbia. Separately, the CleanBC Go Electric Public Charger Program also offers funding for the deployment of public fast charging infrastructure, although this program is not eligible for stacking with NRCan's program.

2. Support planning and coordination on site selection

Currently, site selection and planning are fragmented and pursued by various actors in silos. This creates a risk of duplication of efforts and gaps in infrastructure deployment, including geographic distribution, charging type and number of chargers required to meet targets. In addition, there is no formal process or structure for infrastructure builders to connect with potential site hosts. Using the CRD Roadmap as a guideline for how many and what types of charging stations are required to support user needs, the **CRD** should collaborate with **local governments**, **site hosts and EV infrastructure builders** to support planning and coordination on site selection.

This could include identifying and working with potential site hosts to develop EV infrastructure plans or form partnerships with EV infrastructure builders. The CRD should focus on strategic site hosts, for example those that have locations across the region or serve as major transportation hubs (e.g. ferry terminals). By playing this role, the CRD can accelerate EV infrastructure deployment, help build knowledge and capacity across the region, and reduce the risk that infrastructure gaps will emerge. For example, the CRD and local governments could provide financial or other support to encourage charging infrastructure in locations with poor business cases but high value due to geographic or equity factors.

To support this collaboration, the CRD should consider establishing an advisory committee or other formal network that would include key players such as local governments, infrastructure builders and site hosts. As part of this network, the CRD could support the site selection and planning process and address current information gaps in EV infrastructure planning by tracking and sharing information related to:

- Planned charging infrastructure in the capital region;
- Infrastructure builders looking for site hosts; and
- Prospective site hosts, including on-street and MURBs, who have expressed an interest in hosting charging infrastructure (but not deploying it)

[9] Timeline of expected future RFP's under NRCan's ZEVIP: https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation-alternative-fuels/electric-and-alternative-fuel-infrastructure/request-for-proposals-calendar/22821

3. Engage with BC Hydro on infrastructure planning

BC Hydro has an important role to play in EV infrastructure collaborations. As an EV infrastructure builder, BC Hydro's mandate is to focus on filling gaps in DCFC fast charging across the province and support regional connectivity. BC Hydro also has a key role in planning the regional charging network because collaborators will seek guidance on potential sites, power demand considerations, and rate structures that enable strong business cases.

The **CRD** should collaborate with **BC Hydro** to highlight and address the needs of **infrastructure builders** and **local governments**, including power capacity, rate structure, and utility infrastructure plans. The CRD can work with regional stakeholders, particularly the leading local governments, to bring regional needs to the utility.

Build capacity through education

"People are looking for best practices"

Education and capacity building among players involved in charging deployment is a critical need. EV infrastructure can be a complex process for residents, businesses, contractors and trades. There is a major opportunity to build capacity across the region to enable any interested party to participate in transportation electrification and the EV infrastructure industry that develops alongside. The CRD can play an important role by acting as a central resource that can leverage best practices tested across the region and avoid duplication. While each community is unique, residents and business will have some common questions, and the CRD can develop regional resources that can be locally adapted.

The CRD should also engage with provincial actors such as BC Hydro and Plug-in BC to coordinate and develop shared education and capacity building materials.

These opportunities include:

4. Education and capacity building with potential EV adopters

Many residents and businesses may be considering EVs, but may not know how to get charging installed at their home or workplace, especially in rental or condo buildings. This group includes employees, homeowners and tenants. The **CRD** and **local governments** can collaborate with **EV ecosystem influencers** and **EV tech companies** to develop educational materials and resources for enable these potential adopters to navigate their infrastructure needs, enabling better adopter advocacy, and increase ease of infrastructure access.

5. Education and capacity building with potential infrastructure builders and site hosts

Regional businesses and organizations may be interested in developing or hosting EV infrastructure. However, for organizations like property management companies, fleet owners and large employers, building EV infrastructure is outside of their expertise. These actors would benefit from capacity building and education on the benefits and the process to seek infrastructure as a site host. The **CRD** should collaborate with **local governments, infrastructure builders** and **EV tech companies** to

develop resources on charging needs and site selection to ensure this interest can be converted in new infrastructure development.

6. Education and capacity building with engineers, electricians, and other trades

There is significant opportunity to grow the workforce involved with this ramp-up of EV infrastructure deployment. As the industry grows to meet the demand, there is an opportunity build the capacities on the technical and design requirements for EV infrastructure across the construction industry. The **CRD** should collaborate with industry, **infrastructure builders, EV technology companies** and **local governments** to encourage or develop guidance and educational materials to ensure quality and reliability across diverse installation sites. Industry stakeholders may develop standards or best practices to support the nascent sector.

Track and share usage and user experiences to meet evolving infrastructure needs

Building out infrastructure is essential to promoting adoption. In early years, charger utilization may be low as infrastructure installations initially outpace demand. Charger utilization is expected to increase over time as adoption and EV driver awareness grows. Infrastructure build out should be informed by regional needs and trends. Leveraging infrastructure data can support future siting and design decisions, to continuously assess and improve the regional network.

"Data integration and information access"

7. Track and share usage at existing sites to monitor performance and inform planning

The **CRD** should facilitate data sharing by acting as regional data repository and defining data needs needed to benchmark the Roadmap. In addition, the CRD should lead or support analysis and share findings to support future infrastructure site planning and design decisions and best practices. Data collection and use is a collaboration because it requires the data owners, whether it be **infrastructure builders, site hosts, EV tech companies**, or **utilities**, to share the data and to design stations to facilitate sharing (e.g. networked stations).

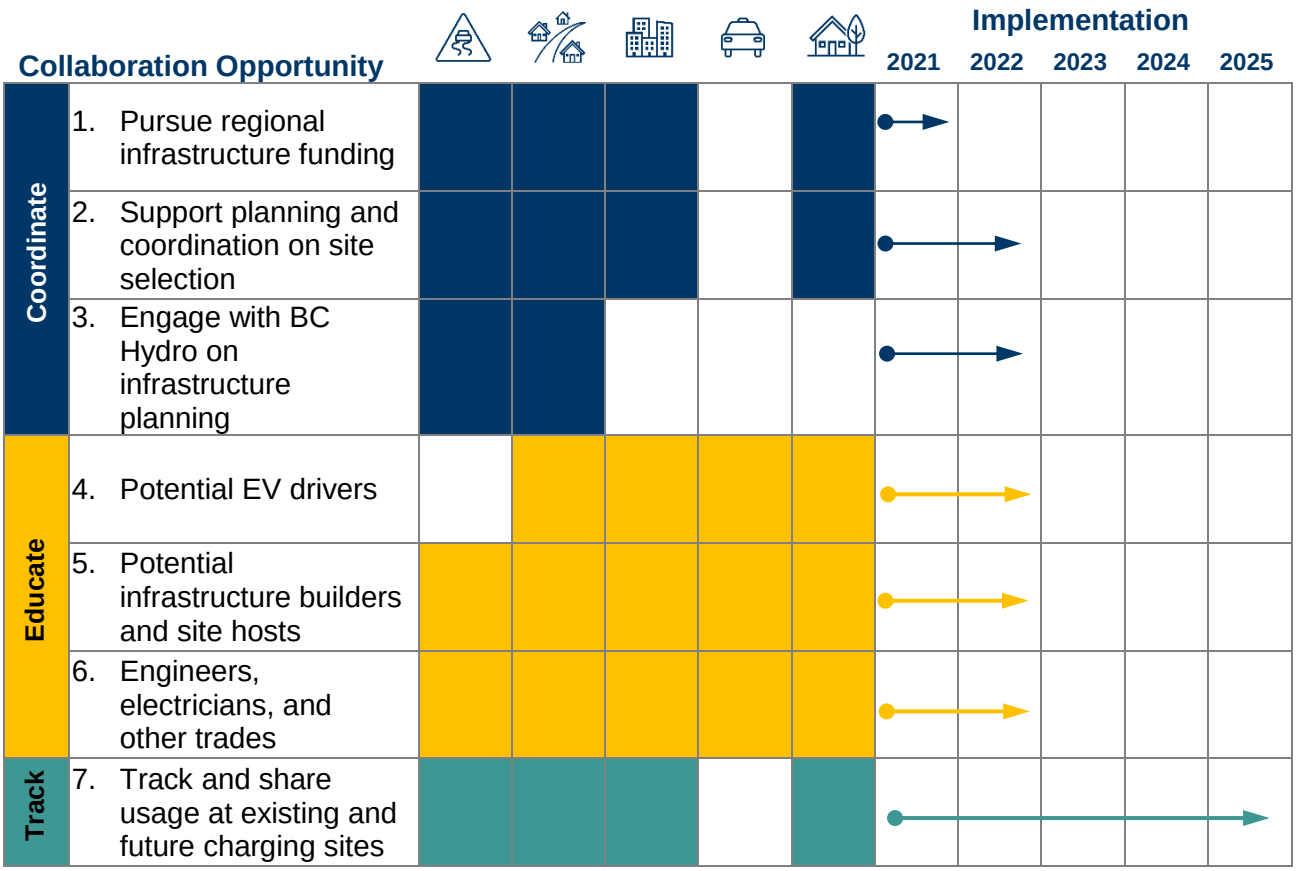
Types of data that should be collected by CRD and regional collaborators includes:

- Site locations, date of installation, port types
- Number of MURB units with EV-Ready spots
- Number of EV-Ready commercial buildings
- For public charging sites, utilization metrics:
    - Total number of charge events and total energy delivered
    - Time-of-use statistics (usage by day of week, hour of day)
- EV adoption metrics: percent of new vehicle sales, percent of fleet, percentage of BEVs vs PHEVs.
- User experience metrics, including trends in timing and geographic use of public infrastructure

The CRD should also explore the option to enhance data collection by conducting a regular (annual or semi-annual) EV user survey to get feedback on wait time, reliability, and convenience of charging locations to inform future infrastructure deployment.

Summary of Regional Collaboration Opportunities

The following chart provides a summary of collaboration opportunities. It identifies the relevant charging opportunities that it supports, as well as the implementation timeline.



Collectively, these actions will support infrastructure deployment across the region. The CRD can take a leadership role by taking a regional perspective and ensuring that deployment planning and siting is coordinated, that education is minimized as a barrier to infrastructure deployment, and that a 'systems' approach is taken to infrastructure usage and data across the whole region, for benefit of all.

Actions

There are key actions that the CRD should take to develop the guidance needed to support local governments and other EV infrastructure players to build out a connected and coordinated regional infrastructure network. While infrastructure actors can provide input, the CRD can independently lead the development of these tools and resources to support regional infrastructure efforts. Alternatively, the CRD could advocate for provincial actors such as BC Hydro or the province to undertake these guidelines to ensure that local governments across B.C. can benefit.

In addition, there are a number of actions that local governments should take to accelerate infrastructure deployment, including planning for and investing in charging infrastructure. Local governments can play varying roles, including hosting, owning, and operating charging stations. Local governments can also introduce or expand EV-Ready requirements for EV ready new construction and support for comprehensive retrofits to shift the market to support an EV network.

The CRD should develop the following guidelines and/or technical standards to address information gaps and encourage consistency across the capital region. Guidelines should be revisited every five years, or more frequently as the regional context evolves. For example, the CRD developed load management guidelines, which should be reviewed and updated in the next several years as technologies evolve.

A. Comprehensive EV Ready retrofits

These guidelines and standards enable local governments and other stakeholders to navigate the process, requirements, and value of comprehensive EV-Ready retrofits.

B. Curbside installations

On-street charging presents a unique opportunity and challenge due to the specified use of this public, multi-use space. Guidelines with regional context can enable local governments and infrastructure builders to navigate the process and ensure long-term, equitable planning in the development process.

C. Site Agreements between charging hosts and owners

Site agreements are critical tools to define how infrastructure collaborations work because they define responsibilities of each actor and define the site access. The **CRD** should develop templates or best practices for site agreements to support the negotiation process.

D. Data sharing, user experience, infrastructure deployment

BC Hydro has developed valuable guidelines to support organizations in the deployment of both DCFC and Level 2 charging infrastructure[10], providing guidance on identifying charging sites, designing the installation, selecting contractors and vendors, and operation and maintenance of

[10] BC Hydro. (2021). *EV resources for industry*. Available online: https://www.bchydro.com/powersmart/electric-vehicles/industry.html

charging equipment. The CRD can build on these documents by establishing regional guidelines to encourage local partners to converge towards common design elements. For example, while the BC Hydro guidelines present a wide variety of options for charging equipment vendors and customer interfaces, the CRD can encourage local partners to agree on a harmonized payment system to ensure that EV drivers in the capital region have a consistent user experience from one charging station to the next. These guidelines can also establish requirements for data collection and sharing for local partners to support ongoing tracking of the regional charging network.

Summary of Actions

The following is a summary of actions that the CRD should pursue in the near term to support EV deployment in the capital region.

Guidelines for:					
A. Comprehensive EV Ready retrofits					
B. Curbside installations					
C. Site Agreements between charging hosts and owners					
D. Data sharing, user experience, infrastructure deployment					

Appendix A. Stakeholder Engagement Summary

Overview

The core focus of the CRD's EV Roadmap is to identify collaboration opportunities to ensure the effective deployment of charging infrastructure in the capital region. Therefore, engaging with stakeholders to understand various actors' interests, needs, and plans for EV infrastructure was a critical part of the Roadmap's development. The CRD led the stakeholder engagement strategy and implementation with support from Dunsky.

This memo summarizes the key themes and takeaways from the two workshops that Dunsky supported. The CRD also held a series of in depth one on one interviews with key stakeholders to gain initial insights. Dunsky will present the final results of the Roadmap in a webinar on March 30. The list of stakeholder organizations is presented in Appendix A.

Our stakeholder engagement plan was structured around four phases:

For each of these phases, we answered the following questions:

- **Participants**: Who is targeted by / included in the engagement strategy?
- **Approach**: When and how groups will be engaged (e.g. format and timing of meetings)
- **Objective**: Why is this group engaged, what are the expected outcomes?

Workshop 1: Developing the Roadmap's Guiding Principles

Feb 4

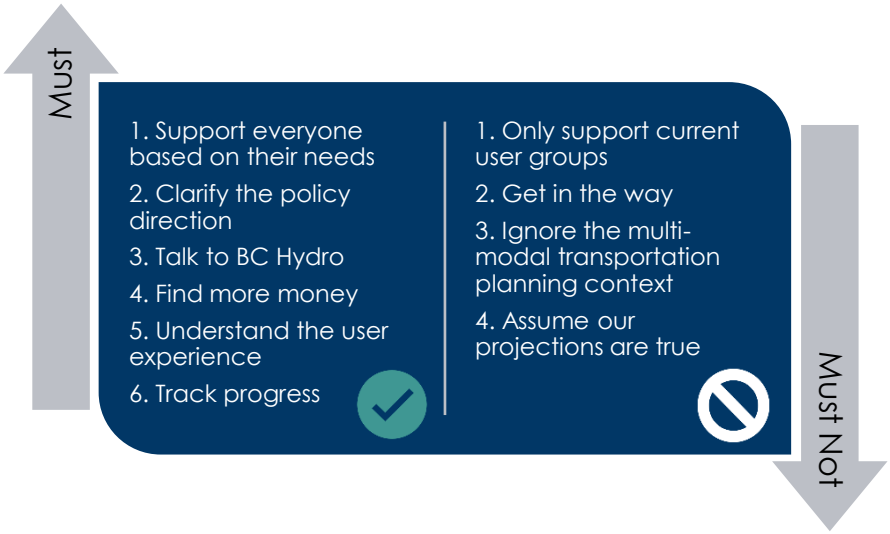
35 Participants
Target: **Infrastructure influencers, builders, & users**
CRD members, provincial government, utilities, institutions, EV and transportation companies, NGOs

Mural, Zoom

Identify the principles by which the Roadmap will be developed.

Key Findings

The main takeaway was the principles that define the Roadmap. These ten principles were developed through the workshop and summarized by Matt Greeno. These principles have and continue to be used to create the Roadmap and shape its recommendations.



As identified in the principles, several key themes emerged:

1. Ensure a data-driven approach

Data should drive decisions in EV infrastructure planning and deployment. Stakeholders highlighted that there is little data available right now and that it will be critical for informed decision-making, defining collaboration opportunities and understanding the region's evolving activity and needs. For example, current EV charging station usage and electricity system capacity to support new infrastructure.

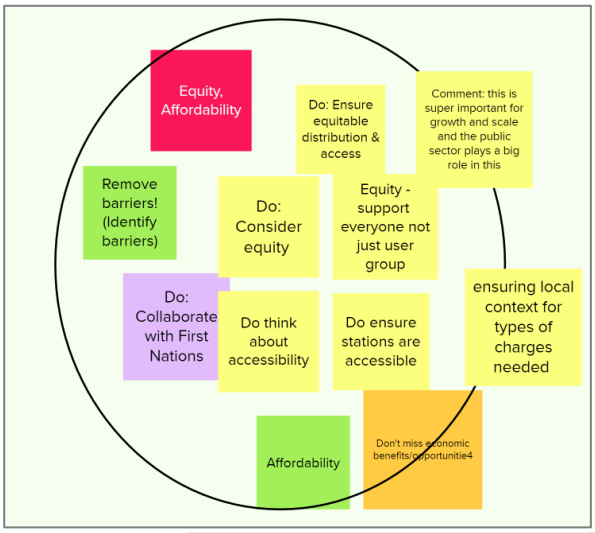
2. An equity lens needed

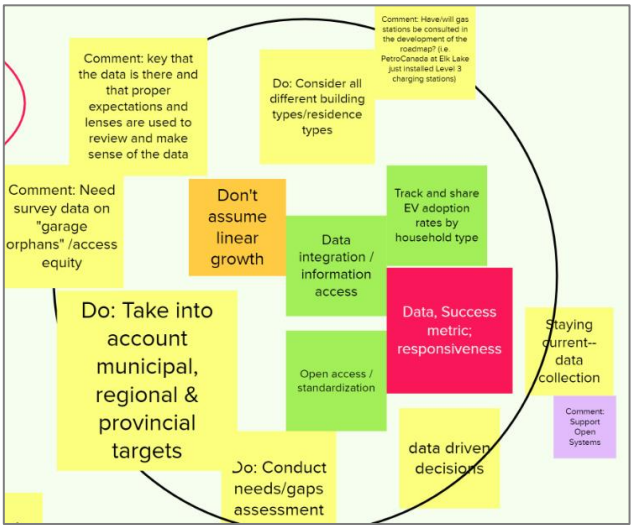
To be successful and gain broad support, stakeholders identified the need to apply an equity lens to infrastructure decisions. This approach will ensure user needs are met (e.g., accessibility, affordability) and that all communities are covered.

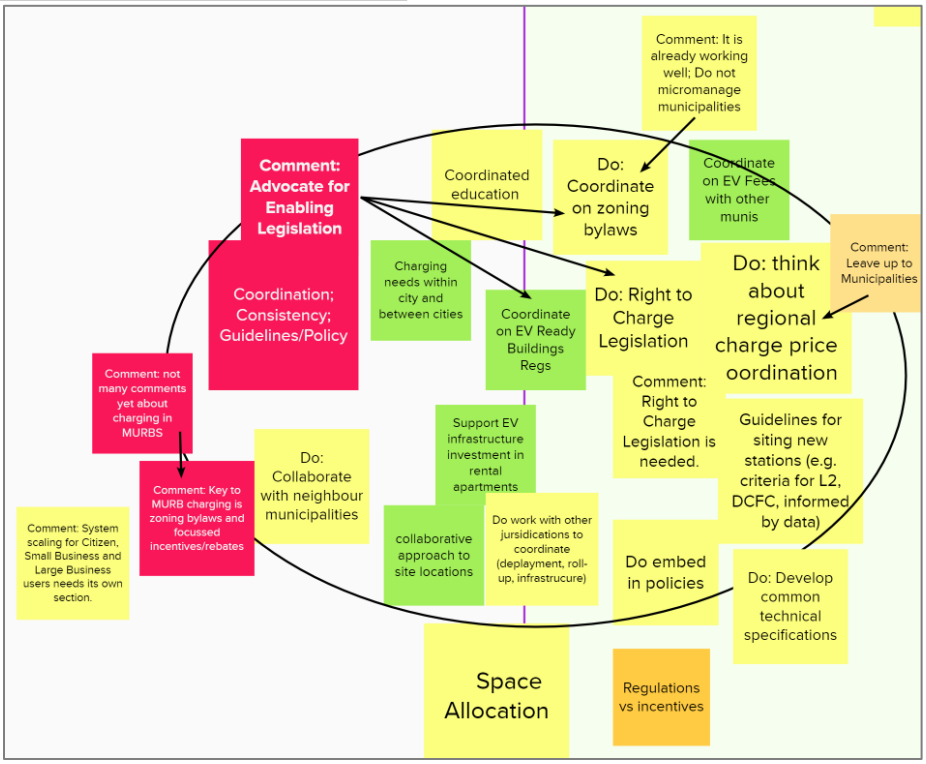
3. A supportive, but not prescriptive, policy landscape

Stakeholders indicated that they need supportive policy and policy supports from all levels of government. At the municipal level, sharing best practices and technical specifications can help move the region forward. However, each local government wants to determine their own policies and infrastructure plans.

Stakeholders expressed their views on guiding principles through an exercise on Mural, an online visual collaboration tool. Here are a few snapshots of sticky notes added to the mural:







Workshop #2: EV Charging Needs and Collaboration Opportunities

Mar 1

17 Participants
Target: **Infrastructure influencers and builders**
CRD members, institutions, school districts, EV and transportation companies

Mural, Zoom

Explore and identify **collaboration opportunities** for public EV infrastructure deployment.

Key Findings

The core exercise was to surface interdependencies by making clear requests to other stakeholders and collecting simple responses ("Yes", "No", "I will try", or "whatever" indicating the request was not clear enough to respond). The majority of responses are positive, either "Yes" or "I will try", indicating a broad willingness to collaborate and meet the needs of other stakeholders. However, not all desired stakeholder groups were represented at the session, which limited the applicability of some requests/responses.

1. An infrastructure leadership gap exists

Stakeholders identified that there was a lack a leadership on EV infrastructure planning and deployment. Many organizations have a 'wait and see' approach and look for others to take the first step. The traditional leaders in the space, such as the provincial government and utilities, are not necessarily stepping into this role. This gap presents an opportunity for the CRD to provide regional leadership.

"Everyone wants to do it, but no one has the answers"

2. Capacity building is required

Education and capacity building among players involved in charging deployment is a critical need. Within organizations, particularly local governments, new knowledge bases and skillsets are required across multiple departments to support and build EV infrastructure. Staff time and resources are needed across organizations to facilitate collaboration, recognizing that different organizations are at different stages. This capacity gap has been identified, but there is limited funding to support the skills and time allocation to meet the ramp-up.

Stakeholders identified a need for regional guidance and other resources to cross the capacity gap. This resource discussion included the following concepts:

"Resources can't keep up with momentum"

- A network to share best practices, policy, and planning information, collaboration opportunities. This network could address silos between infrastructure stakeholders across the region.
- Actor-specific guidance on assessing infrastructure opportunities. This guidance would ensure infrastructure aligns with site and user needs (e.g. why are we building it and who is it for?). This guidance could be tailored by the stakeholder's general role and mandate. For example, a school district's infrastructure decisions will look different from those of a local government.
- A holistic approach to transportation decisions. Active transportation, transit, and EV's are not either-or options but rather all part of the transportation ecosystem.

3. A strong interest was expressed in collaboration and clarified roles

Stakeholders identified EV infrastructure deployment is a new an innovative field. While there is a lot of enthusiasm to collaborate, there is not a lot of experience with roles, responsibilities and deployment approaches, making collaboration opportunities more challenging.

"Innovation / turnkey solutions - make the process easier and reduce costs."

To tackle these challenges, stakeholders identified the following concepts:

- Guidance on potential collaboration roles: outlining business models and the roles within them (e.g., who builds, who pays, who operates, etc.).
- Develop a list of businesses and their potential sites interested in being a site host.
- Encouragement to current infrastructure leaders and to spur demand by developing a list of EV-Ready stratas and businesses.

Key themes were identified through an idea board and are noted in the following screenshot:

Stakeholder List

The following stakeholders were engaged during the development of this Roadmap. We sincerely thank them for their input and collaboration.

Organizations interviewed prior to workshops	
BC Ferries	Landlord BC
BC Hydro	Malahat Nation
BC Transit	Modo
Geotab	Robbins Parking
Hansbraun Investments	University of Victoria
Island Health	Westshore Town Centre

Organizations represented at the February 4 workshop	
BC Climate Action	Greater Victoria Harbour Authority
BC Ferries	Greenlots
BC Hydro	Island Health
BC Transit	Leading Ahead Energy
BCSEA	Landlord BC
Capital Regional District	Malahat Nation
ChargePoint	Mogiletech
City of Victoria	Plug n' Drive
Current Taxi	Suncor EnergyTesla
District of Central Saanich	Township of Esquimalt
District of Highlands	Transition Salt Spring
District of Oak Bay	University of Victoria
District of Saanich	Vancouver Island Strata Owners Association
Geotab	Victoria EV Association
Government of British Columbia	

Organizations represented at the March 1 workshop	
Capital Regional District	School District 61
Chargepoint	School District 62
City of Victoria	School District 63
District of Central Saanich	Town of Sidney
District of Saanich	Town of View Royal
Greenlots	Township of Esquimalt
Island Health	University of Victoria
Modo	

Appendix B. Funding Opportunities

Fund Name	Technology	Support Available	Eligible organizations
CleanBC Go Electric Public Charger Program	DCFC	Range: up to $20,000 per <50 kW DCFC, to $130,000 per >100 kW DCFC (for Indigenous communities).	business, not-for-profit, local government, Indigenous community, or public sector organizations
CleanBC Go Electric Public Charger Program	Level 2	up to 50% of purchase and installation costs of Level 2 charging stations (to a maximum of $2,000 per station). Indigenous communities are eligible for rebates of 75% (to a maximum of $4,500). Five hours of an EV advisor for advice and planning assistance from an expert in EV charging and equipment is also available	business, not-for-profit, local government, Indigenous community, or public sector organizations
CleanBC Go Electric Fleets Program	Level 2	zero emissions vehicle fleet advisor support and ZEV training sessions along with financial rebates for fleet assessments, electrical assessments, electrical work, and charging infrastructure	companies registered in B.C, non-profit organizations, and public entities.
CleanBC Go Electric BC Single-Family Home Charging Installation	Level 2	up to 50% of costs, to a maximum of $350.	Single family homes
CleanBC Go Electric BC EV Charger Rebate	Level 2	• For buildings looking to become EV Ready, up to $3,000 or 75% of costs to prepare EV Ready plan by a licensed professional. To implement, buildings can receive a rebate of up to 50% of the infrastructure and installation costs to a maximum of $600 per stall (total maximum of $80,000). Once EV-Ready, there is a rebate of up to 50% to a maximum of $1,400 per charger (and a building maximum of $14,000). • For buildings or individuals looking to install standalone chargers, up to 50%, to a maximum of $2,000 per charging (and a building maximum of $14,000)	Multi-family buildings

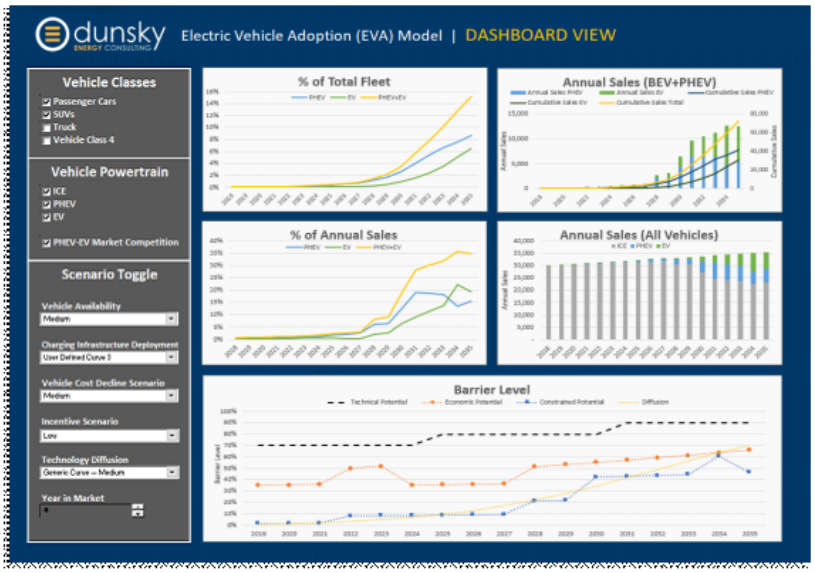
		• Five hours of an EV advisor for advice and planning assistance from an expert in EV charging and equipment is also available.	
Natural Resources Canada Zero Emission Vehicle Infrastructure Program	DCFC	of up to 50% of total project costs , to a maximum of $15,000 per fast-charger for 20kW to 49kW, and up to 50% of total project costs, to a maximum of $50,000 per fast-charger for 50kW and above.	not-for-profit and for-profit organizations
Natural Resources Canada Zero Emission Vehicle Infrastructure Program	Level 2	up to 50% of total project costs, to a maximum of $5,000 per Level 2 connector.	not-for-profit and for-profit organizations with funding for on-street and public places and workplaces, including fleets, multi-family buildings

Appendix C. Modelling Approach

EVA Methodology

Dunsky's Electric Vehicle Adoption (EVA) Model was developed in-house to address a growing need to understand the adoption of electric vehicles in specific jurisdictions. Based on a rigorous review of research from academia and industry, EVA assesses the likely penetration of electric vehicle technology based on several key factors, grouped according to the following four categories:

A. **Technical potential:** The theoretical potential for EV adoption based on the size and composition of the overall vehicle market, as well as availability of different powertrain types (e.g. plug-in hybrid, battery electric) in different vehicle classes (e.g. cars, SUVs, trucks)



Sample EVA Dashboard View

B. **Customer economics:** The unconstrained economic potential based on incremental total cost of ownership of electric vehicles over conventional vehicles, taking into account forecasted energy costs, annual vehicle kilometers travelled, and forecasted battery and vehicle costs

C. **Market constraints:** Accounting for EV-specific barriers including range limitations and access to both public and home charging infrastructure

D. Market dynamics: Incorporating technology diffusion theory and other market factors to determine rate of adoption and competition between vehicle types

By quantifying the impact of these various factors, EVA allows the development of jurisdiction-specific forecasts for EV adoption and the assessment of the relative effectiveness of a range of policy and program options for accelerating EV adoption, such as home retrofits and public charging infrastructure deployment.

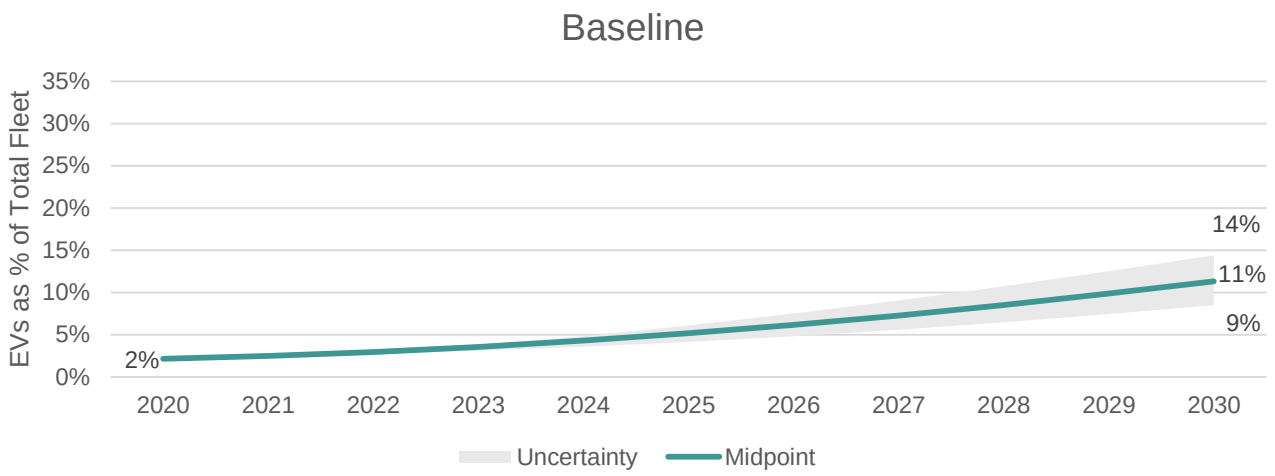
High-Level Results

This study assessed EV adoption in the capital region over the 2021-2030 period and the infrastructure required to support this adoption. First, a baseline forecast was developed to estimate adoption in the absence of further charging infrastructure investments and supporting policies. Next, a scenario forecast was developed by adding public charging infrastructure and increased home charging access to the model such that the adoption forecast reached approximately one quarter of the total vehicle fleet by 2030. The charging infrastructure required to reach this target is the basis for the infrastructure recommendations included in this roadmap.

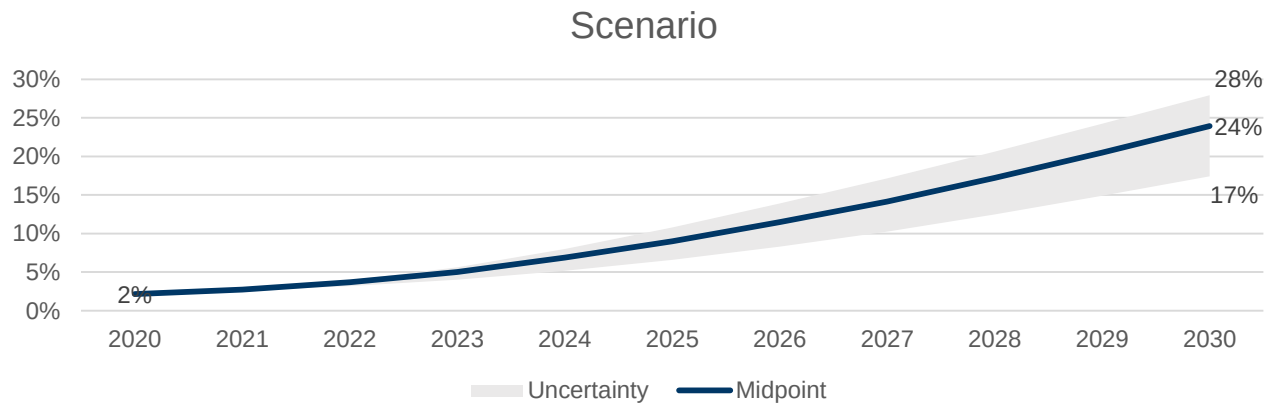
This study includes an aspirational target that approximately one quarter of the light-duty vehicles in the capital region will be EVs by 2030 (with adoption ranging from 17-28%, with a midpoint of 24%). Our modelling shows that this corresponds to a trajectory reaching an annual midpoint EV sales rate of 68% in 2030, which is considerably higher than the provincial government target of 30%. Although the focus of this project was on the public infrastructure required to support this adoption in the capital region, other policies and programs will also be required. The modeling includes the assumptions that upfront purchase incentives are sustained throughout the course of the study (albeit at decreasing levels over time), and that home charging access increases over time as a result of financial and other support for multi-unit home charging retrofits (see 'Other Program and Policy Assumptions' section below). The costs associated with incentives and home charging retrofits are not included in this analysis.

Adoption is also influenced by broader market conditions, including vehicle prices, vehicle model availability, electricity rates, and gasoline prices. In both the baseline and scenario forecasts, high and low bounds were developed for each of these factors and were applied to the scenario to generate a range of uncertainty around the forecast.

Below, high-level results are provided for the baseline and scenario forecasts. Detailed results are provided in the Detailed Adoption Results section that follows.



		2025	2030
% Annual Sales	Baseline – Upper bound	25%	37%
	Baseline – Midpoint	17%	29%
	Baseline – Lower bound	12%	21%
	Provincial target	10%	30%



		2025	2030
% Annual Sales	Scenario – Upper bound	54%	74%
	Scenario – Midpoint	42%	68%
	Scenario – Lower bound	28%	50%
	Provincial target	10%	30%

Market Assumptions

Vehicle Assumptions

Vehicle Market Total Fleet and New Sales Assumptions[11]

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cars	Total fleet	144,483	143,261	141,950	140,549	139,059	137,480	135,811	134,053	132,206	130,269
	New sales	6,498	6,443	6,384	6,321	6,254	6,183	6,108	6,029	5,946	5,859
SUVs	Total fleet	84,577	88,352	92,198	96,115	100,104	104,165	108,297	112,500	116,775	121,121
	New sales	4,840	5,056	5,276	5,500	5,729	5,961	6,197	6,438	6,683	6,931
Trucks	Total fleet	41,353	42,579	43,822	45,084	46,363	47,660	48,975	50,308	51,659	53,028
	New sales	2,873	2,958	3,045	3,132	3,221	3,311	3,403	3,495	3,589	3,684

Electricity and Fuel Price Assumptions

Electricity Price Assumptions ($/kWh)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High	0.122	0.125	0.128	0.132	0.135	0.138	0.142	0.146	0.149	0.153
Mid	0.123	0.127	0.130	0.134	0.138	0.142	0.145	0.149	0.154	0.158
Low	0.124	0.128	0.131	0.135	0.139	0.143	0.147	0.152	0.156	0.161

Gasoline Price Assumptions ($/L)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
High	$1.13	$1.16	$1.17	$1.18	$1.19	$1.21	$1.23	$1.25	$1.27	$1.29
Mid	$1.36	$1.38	$1.40	$1.42	$1.44	$1.46	$1.48	$1.51	$1.54	$1.56
Low	$1.58	$1.62	$1.66	$1.69	$1.70	$1.72	$1.74	$1.78	$1.81	$1.83

Building Stock Assumptions[12]

Forecasted Number of Dwelling Units by Housing Type

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Single detached	70,693	70,709	70,725	70,741	70,757	70,773	70,789	70,804	70,820	70,836
Semi-detached	7,195	7,368	7,546	7,728	7,915	8,106	8,301	8,502	8,707	8,917
Row	11,043	11,216	11,391	11,568	11,749	11,932	12,118	12,308	12,500	12,695
Apartment and other	89,282	91,035	92,823	94,646	96,505	98,400	100,332	102,302	104,311	106,360

Forecasted Cumulative New Construction Units by Housing Type

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030

[11] Total light duty vehicle forecasts were provided by the CRD. To capture the split of cars, SUVs, and trucks within the light-duty vehicle population, historic 2017-2019 ICBC registration data market share trends were extrapolated out over the study period. Annual sales were forecasted using province-wide sales as a percent of fleet data from the Canadian comprehensive energy use database.

[12] To forecast the building stock, growth rate trends were taken from the 2011 and 2016 census. The rate of new construction (as a percent of existing buildings) was developed using the CMHC 'Housing Starts, Completions and Units Under Construction' publication.

Single detached	317	633	950	1,267	1,584	1,901	2,218	2,535	2,852	3,169
Semi-detached	73	148	224	302	383	465	549	635	723	814
Row	51	103	156	209	264	319	375	432	490	548
Apartment and other	1,275	2,575	3,900	5,252	6,630	8,035	9,468	10,929	12,418	13,937

Infrastructure Assumptions

Infrastructure Targets (Cumulative Ports)

	Level 2		DCFC	
	2025	**2030**	**2025**	**2030**
Infrastructure Required	562	1010	81	160
Installed	240	240	28	28
Planned	24	24	0	0
Total Gap	298	746	53	132

Level 2 Charging Infrastructure Assumptions (Number of Ports)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Baseline	240	240	240	240	240	240	240	240	240	240
Scenario	240	240	339	451	562	674	786	861	935	1010

DCFC Charging Infrastructure Assumptions (Number of Ports)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Baseline	28	28	28	28	28	28	28	28	28	28
Scenario	28	28	41	61	81	101	120	134	147	160

Infrastructure Cost Assumptions

Level 2 curbside ($ per port)	$15,000
Level 2 in parkade ($ per port)	$5,000
DCFC ($ per port)	$175,000

Other Program and Policy Assumptions

Upfront Vehicle Purchase Incentive Assumptions (combined federal and provincial)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PHEV	$5,000	$5,000	$5,000	$5,000	$5,000	$2,500	$2,500	$1,250	$1,250	$1,250
BEV	$8,000	$8,000	$8,000	$8,000	$8,000	$4,000	$4,000	$2,000	$2,000	$2,000

Public charging infrastructure serves as more than just a substitute for home charging access. For PHEVs it can maximize the use of EV mode vs. internal combustion engine vehicles, and DCFCs provide additional flexibility for BEVs for longer trips or days where they need a top up for any other

number of reasons. Public chargers also support travellers from out of region. Even if home charging access nears 100%, public chargers still have an important role in a charging network.

The modeling assumes considerable retrofits across the whole region, however there are a number of reasons the following retrofits may not be achieved on the schedule included here. For example, these retrofits require cooperation of building owners and tenants, an adequate workforce, and other factors.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Single Family % Home Charging Access	77%	78%	80%	82%	83%	86%	89%	92%	96%	100%
Multifamily % Home Charging Access	25%	29%	35%	41%	46%	54%	63%	73%	83%	94%

Annual Investment

Annual Total Investment, 2021-2025

	2021	2022	2023	2024	2025
Level 2	$0	$0	$746,000	$1,119,000	$1,119,000
DCFC	$0	$0	$2,310,000	$3,465,000	$3,465,000
Total	$0	$0	$3,056,000	$4,584,000	$4,584,000

Annual Total Investment, 2026-2030

	2021	2022	2023	2024	2025
Level 2	$1,119,000	$1,119,000	$746,000	$746,000	$746,000
DCFC	$3,465,000	$3,465,000	$2,310,000	$2,310,000	$2,310,000
Total	$4,584,000	$4,584,000	$3,056,000	$3,056,000	$3,056,000

REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE ROLES

June 2021

The table below provides an overview of the potential key stakeholder roles, and example organizations, in electric vehicle infrastructure deployment as envisioned in the CRD Electric Vehicle Infrastructure Roadmap. Organizations can take on many roles within the infrastructure ecosystem. Understanding and integrating these stakeholders' plans and needs is essential to developing a cohesive regional charging network.

Key players' roles and example organizations

Key Player	Role	Example organizations
Infrastructure Builders	Actively deploying charging infrastructure	Local governments, First Nations, utilities, other institutions, building developers, private companies (including EV manufacturers)
Site hosts	Host but not necessarily own or operate infrastructure	Governments, crown corporations, First Nations, campuses, major transit hubs (e.g., ferry terminals), parking companies, retailers, fuel stations
Financial & policy supporters	Deciding or administrating Electric Vehicle (EV) supports	Local governments, First Nations, utilities, provincial and federal governments
Utilities	Supplying electricity and/or building infrastructure	BC Hydro, Fortis
Technology companies	Supplying and/or operating charging stations or cars	Infrastructure manufacturers, EV software and data companies
Drivers	Fleet owners or EV users	Capital region residents and all other stakeholders
Initiative influencers	Advocate with/to industry or communities	Academia, business organizations, EV groups, NGO's, local governments