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Provincial Health Services Authority

Vancouver CoastalHealth

Regional Electric Vehicle Charging Station Framework

VERSION 1.0 MAY 2024

GreenCare

Table of Contents

Revision History

DATE OF REVISION	NATURE OF REVISIONS	REVISIONS MADE BY

1.0 Introduction

Fraser Health (FH), Providence Health Care (PHC), Provincial Health Services Authority (PHSA), and Vancouver Coastal Health (VCH) have collaborated to create the Regional Electric Vehicle Charging Station (EVCS) Framework. The framework is intended to support a collaborative approach for implementation of charging stations at the four Health Organizations (HOs).

The provision of EV charging stations will support the uptake of electric vehicles (EVs) and decreased green house gas emissions[1]. The transition to EVs is supported by the Federal Government and the Government of British Columbia. Federally, target for zero-emissions vehicles (e.g., EVs) are set up in the *2030 Emissions Reduction Plan*[2] and supported by *Canada's Action Plan for Clean On-Road Transportation*[3] published December 2022. The Government of B.C. has a cleanBC Roadmap to 2030. The Canadian and B.C target for 2035 is to have 100% of sales on new light-duty vehicles to be zero-emission vehicles.

The framework supports the EV requirements within the proposed Climate-Ready & Environmentally Sustainable Health Facilities Policy[5]. A brief outline of EV benefits is outlined in Appendix A.

Terminology will align with the EV Ready Building Standard within the Environmental, Social Governance Framework (ESGF) for CleanBC Objectives. Once the ESGF is finalized, definitions will be added to Appendix B.

- Electric Vehicle Supply Equipment (EVSE) or Electric Vehicle Charging Equipment (EVCE)
- Electric Vehicle Charging Station (EVCS)
- Electric Vehicle Energy Management System (EVEMS)
- EV Ready
- Fleet Vehicle

Key HO departments and teams that are referred to in this document and their roles and responsibilities are summarized in Table 1. The details of roles and responsibilities in pre-operations and operations are described within the process sections of this document (i.e., Section A and B, respectively).

[1] EV product does have environmental impacts and emissions do depend on how the power source for charging is generated. EV use is preferred to gas or diesel vehicles, however the first preference is to support active transportation (e.g., walking or biking) that has generally less environmental impacts and increased health benefits.

[2] 2030 Emissions Reduction Plan: Clean Air, Strong Economy - Canada.ca

[3] Canada's Action Plan for Clean On-Road Transportation

[4] Cleanbc_roadmap_2030.pdf (gov.bc.ca)

[5] Draft policy as of January 2024

TABLE 1

HO department or team and their summarized roles and responsibilities.

DEPARTMENT	TEAM	HO SUPPORTED	SUMMARIZED ROLES AND RESPONSIBILITIES
Facilities Management	Asset Risk and Quality: Technical Services (ARQ:TS)	FH	Owns and updates FH Technical Design Requirements.
	Energy and Environmental Sustainability (EES)	FH, PHC, PHSA, VCH	Supports project intake for EV requests, details of design, electrical upgrades and provides knowledge on funding partnerships, rebates and subsides. EES leads opportunities from external partners (pre-operations).
	Facilities Infrastructure & Risk	VCH	Owns and updates Owner Project Requirements
	FH, PHSA, and VCH Facilities Maintenance and Operations (FMO)	FH, PHSA, VCH	Collaborates on site selection for EV chargers, understanding electrical feasibility, site specifics for approved projects, details of design, procurement, electrical upgrades and capital projects (pre-operations).
	PHC Facilities Maintenance and Operations (FMO)	PHC	Leads by facilitating EV station request process for PHC in collaboration with FMO/EES. Collaborates on project initiation and management, site investigation and collaborative engagement, details of design, and charging station procurement and installation (pre-operations). Leads operations of EV Chargers at PHC (operations). Collaborates on site selection for EV chargers, understanding electrical feasibility, site specifics for approved projects, details of design, procurement, electrical upgrades and capital projects (pre-operations).
	FH Planning and Projects, PHC Design and Project Delivery, PHSA Planning and Development, VCH Facility Functional Planning	FH, PHC, PHSA, VCH	Supports decision-making process for project intake requests. Once project intake requests are approved, Project Managers (PMs) will be assigned from Planning and Projects. PMs will lead project initiation and management, site investigation and collaborator engagement, details of design, charging station procurement and installation, and Pre-installation electrical upgrade (as needed) (pre-operations).
Integrated Protection Services (IPS)	Parking, Access, and Commuter Services	FH, PHSA	Leads by facilitating EV station request process for FH and PHSA in collaboration with FMO/EES. Collaborates on project initiation and management, site investigation and collaborative engagement, details of design, and charging station procurement and installation (pre-operations). Leads operations and management of EV Chargers at FH and PHSA (operations).
People	VCH Transportation Services (VCH TS)	VCH	Leads by facilitating EV station request process for VCH in collaboration with FMO/EES. Collaborates on project initiation and management, site investigation and collaborative engagement, details of design, and charging station procurement and installation (pre-operations). Leads operations and management of EV Chargers at VCH (operations).

*Note, additional teams will be added as needed.

How to use this Document

An EV collaborative approach is envisioned as a process where lessons learned, and best practices are shared among HOs. HOs may collaborate on processes and may have different approaches on implementation. The collaborative process has been facilitated by the Regional EV Steering Committee (EVSC) and resulted in the synthesis of the Regional EVCS Framework. In the application of the Regional EVCS Framework, it is expected that the unique situations of sites and differences between HOs will be considered alongside the framework information to create a site-specific approach.

The framework supports two phases for EV chargers:

1. **Pre-operational Process:** all work implemented prior to an EV charging station being operational.
2. **Operations:** occurs once chargers are installed and ready to supply power to users.

Supporting information and documents are included as appendices.

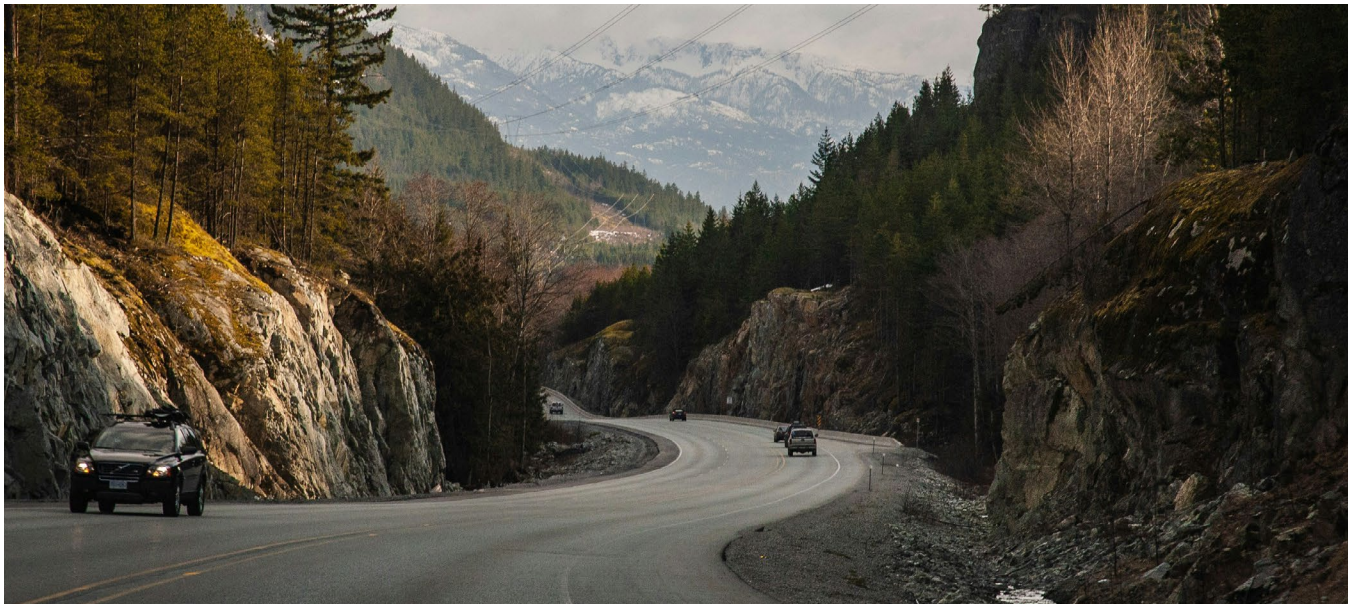
Scope

The draft Regional EVCS framework considers two types of sites to be out-of-scope:

- Leased sites
- Facilities operated by other health organizations

The draft Regional EVCS Framework focuses on EVs and does not currently consider:

- Fleet electrification
- E-motorcycles and moped-type vehicles
- Micromobility (i.e., vehicles that typically operate at a speed below 25 km/hour; e.g., e-scooters, e-bikes)



Acknowledgements

This framework was developed by the Regional EVSC. Member are listed in Table 2. Executive sponsor for the EVSC was Scott MacNair, Executive Vice President, Business Operations, PHSA. The Committee began meeting in June 22, 2022 based on a recommendation from the document, *Electric Vehicles in Fraser Health, Providence Health Care, Provincial Health Services Authority, and Vancouver Coastal Health a Baseline Study and Analysis for a Regional Strategy.* A series of formal discussions has been conducted by the Committee to support collaboration and share expertise. The committee is co-chaired by Robert Bradley (EES) and Dave Brown (IPS).

TABLE 2

List of EV Steering Committee members and their departments/teams.

MEMBERS	DEPARTMENT / TEAM	HEALTH ORGANIZATION
Rob Bradley (co-chair) **Emily Lomax** **Sonja Janousek** **Jennifer Chapman**	Energy and Environmental Sustainability (EES)	PHC, PHSA, FH, VCH
Dave Brown (co-chair) **Geoff Roberts** **Angela Johnson**	Integrated Protection Services (IPS)	PHC, PHSA, FH
Navdeep Nijjar	Transportation Services	VCH
Rian Dodds	FMO	PHSA
Dave Marier*	FMO	PHC
Martin Wright*	FMO	FH
Leanne Porter*	FMO	VCH
Ashok Mishra	Facility Functional Planning	VCH
Mohammad Rafati **Steven McEwan**	Asset Risk & Quality: Technical Services	FH

*Participating on an as needed basis

2.0 EVCS Framework

Process Tables in this framework outline the leading departments, processes, and key collaborators.

The processes described are considered preferred processes to recognize that sites may choose to tailor the process to fit their needs.

2.1 Pre-operational Process

The pre-operational phase of an EV charging station project includes all work prior to an EVCS being operational. This context is divided into two cases:

i. Existing Buildings
ii. Capital Projects and Redevelopments

i. Existing Buildings

An EVCS request can result from a staff request or an external funding opportunity. Depending on the source of the request there will be a different process that results in either entering the Project Intake Process or discontinuation of the request (i.e., no new EVSC). The process for requests to enter the Project Intake Process is described in Figure 1 and more details are given in the following process table (Table 1).

FIGURE 1

Flow Chart of Pre-operational Request Process

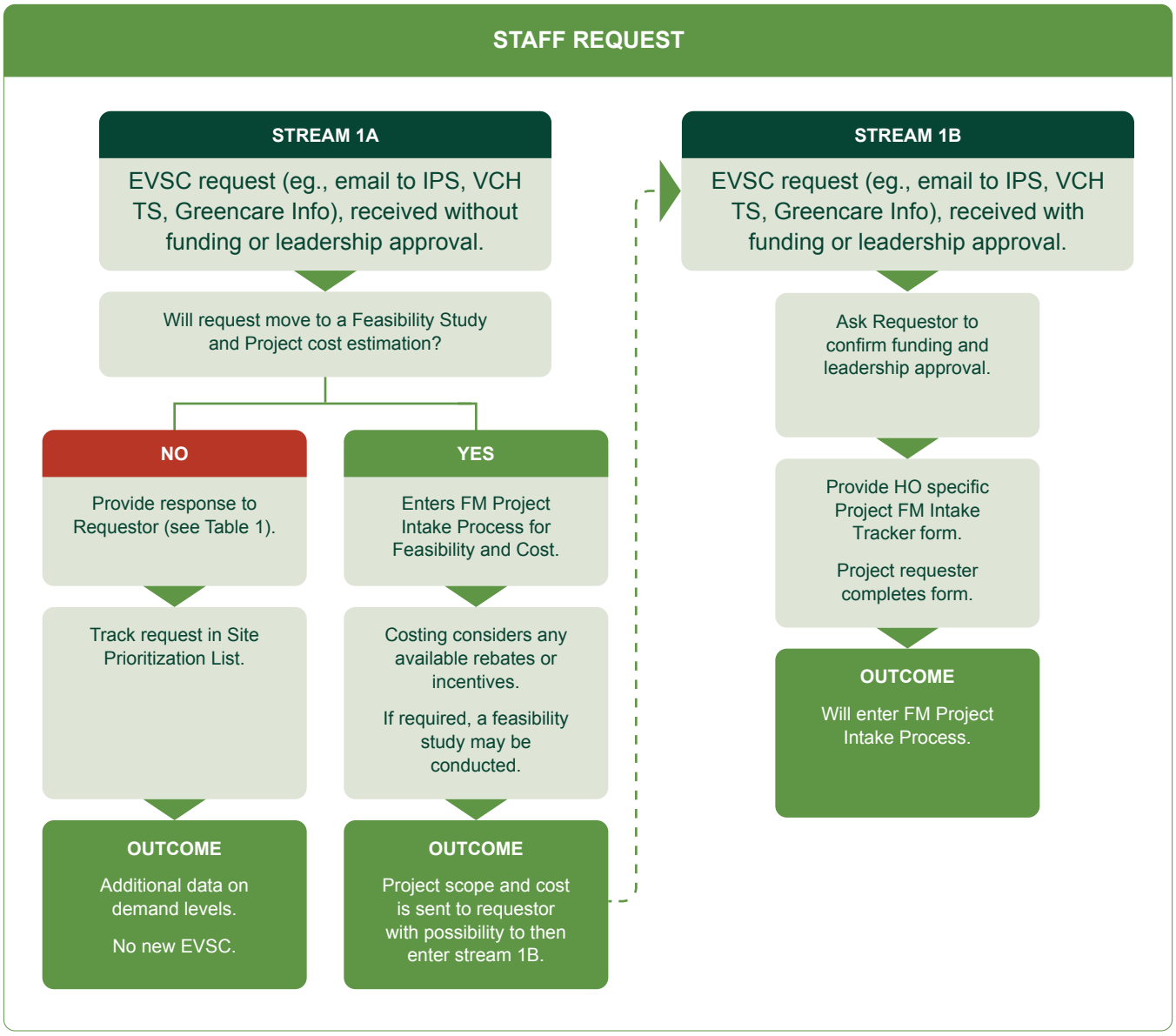
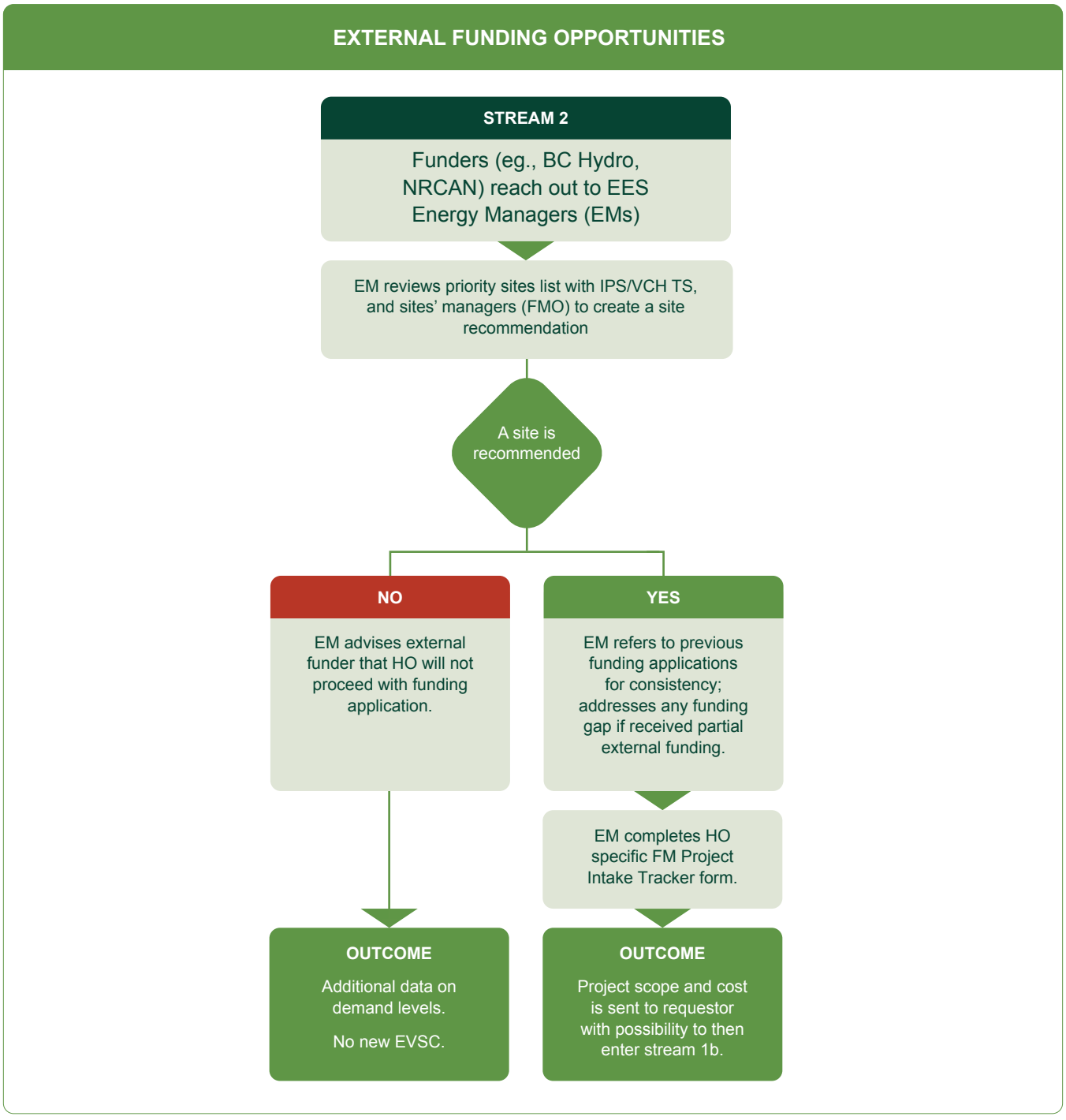


FIGURE 1 (CONTINUED)

Flow Chart of Pre-operational Request Process



Abbreviations

EM: Energy Manager
EVCS: Electric Vehicle Charging Station
FMO: Facilities Maintenance and Operations
FM: Facilities Management
HO: Health Organization
IPS: Integrated Protection Services
NRCAN: National Resources Canada
VCH TS: Vancouver Coast Health Transportation Services

The preoperational process table describes the request process in Figure 1 and the subsequent steps for the preoperational phase. The preoperational preferred process stages described in Table 3 are:

- EV station request
- Project initiation and management
- Site investigation and collaborator engagement
- Details of design
- Charging station procurement and installation
- Pre-installation electrical upgrade (as needed)

TABLE 3

Preoperational Preferred Process.

HO SUPPORTED: DEPARTMENT OR ROLE LEADING	PROCESS	KEY COLLABORATORS
Stage 1: EV Station Request (see Flow Chart in Figure 1)		
FH; PHSA: IPS PHC: PHC FMO VCH: VCH TS	**Stream 1a. Site identified by a requester without funding and leadership approval** *Will request move to a feasibility study and cost estimation?* General assessment with criteria to evaluate above question: • Review existing EV charger capacity / strategy • Consider funding availability • Engage FMO on electrical capacity • Engage clinical staff • Engage site admin leads	• FMO • EES
	Stream 1a. Site identified by a requester without funding and leadership approval *Will request move to a feasibility study and cost estimation?* **NO** The following template response can be adapted for response: • Thank you for supporting our transition to more sustainable transportation. • There is high demand for electric vehicle charging, our team is working to address this demand. Your request has been recorded and will be taken into account in our site assessment process. • We can provide additional information if your request has funding and leadership approval[6]. For VCH, direct all emails to: commuting@vch.ca. **Outcome: Additional data on demand levels. No new EVCS.**	• Project-dependant

	Stream 1a. Site identified by a requester without funding and leadership approval
	Will request move to a feasibility study and cost estimation? **YES**
	• Enters project intake process for electrical feasibility and cost
	• Complete FM Project Intake Tracker:
	  • **FH and VCH:** Facilities Management Project Intake Request
	  • **PHC:** PDF (saved here) send to facilities@providencehealth.bc.ca
	  • **PHSA:** Facilities Management Project Intake Request
	• Costing considers any available rebates or incentives. If required, an electrical feasibility study may be conducted.
	Outcome: Project scope and cost is sent to requestor with possibility to then enter stream 1b.
		• FMO
		• EES

Stage 1: EV Station Request – Continued (see Flow Chart in Figure 1)		

All HOs: Project Requester	**Stream 1b. Site identified by a requester with funding and leadership approval**
	• Ensure funding source is established
	• Ensure leadership approval
	• Complete FM Project Intake Tracker[7]:
	  • **FH and VCH:** Facilities Management Project Intake Request
	  • **PHC:** PDF (saved here) send to facilities@providencehealth.bc.ca
	  • **PHSA:** Facilities Management Project Intake Request
	• Electrical feasibility and cost information may be required before project is approved
	Outcome: Will enter Project Intake Process.
		• IPS
		• PHC FMO
		• VCH TS
		• EES
		• FMO
		• Planning and Projects Teams

All HOs: HO Energy Manager	**Stream 2. External Funding Opportunity**
	Energy Manager (EM) identifies a site:
	• EM reviews priority sites list (see Appendix C) with IPS/VCH TS, and sites' managers (FMO) to create a site recommendation, considering electrical capacity.
	• Option 1 – A site is not recommended
	  • EM advises external funder that HO will not proceed with a funding application
	  • **Outcome: No entry to Project Intake Process.**
	• Option 2 – A site is recommended
	  • EM refers to previous funding applications for consistency addresses any funding gap if received partial external funding
	• EM Completes FM Project Intake Tracker:
	  • **FH and VCH:** Facilities Management Project Intake Request
	  • **PHC:** PDF (saved here) send to facilities@providencehealth.bc.ca
	  • **PHSA:** Facilities Management Project Intake Request
	  • **Outcome: Will enter Project Intake Process.**
		• IPS
		• PHC FMO
		• VCH TS
		• EES
		• FMO
		• Planning and Projects Teams

Stage 2: Project Initiation and Management		
All HOs: Assigned Project Manager and Operations Lead	**For approved Projects** VCH, FH, PHSA: • Following submission and approval of the Use Service Request Form a PM will be assigned. PHC: • Following submission and approval of Use Service Request Form to Facilities@providencehealth.bc.ca a PM will be assigned. PM engages with EES for support with funding partnerships, rebates, subsidies, etc.	• IPS • PHC FMO • VCH TS • EES • FMO

Stage 3: Site Investigation and Collaborator Engagement		
All HOs: Project Manager	To be determined by PM and partners, based on project and site.	• IPS • PHC FMO • VCH TS • EES • FMO
Stage 4: Details of Design		
All HOs: Project Manager	PM to engage the appropriate consultant for this scope of work. See Appendix D for an example of an electrical feasibility scope of work. • To inform site capacity with different design options.	• IPS • PHC FMO • VCH TS • EES • FMO
Stage 5: Charging Station Procurement and Installation		

All HOs: Project Manager	Select a vendor to implement proposed and approved design from electrical engineer/consultant. Use Facilities Management Procurement (FMP) Prequalified Electric Vehicle Supply Equipment (EVSE) Contractor for charging station procurement and installation. PHC, use internal Prequalified list.
	All chargers are on cellular. A feasibility study is in progress to look at the possibility of having EVs on the HO network.
	Reference wayfinding/signage best practices (See Operational Process)
	The following documents can be referenced for additional information:
	• Technical specifications:
	  • See, Fraser Health Authority Technical Design Requirements in Appendix E and the Lower Mainland Health Care Organizations (LMHO) EV Charging Station Design Specifications in Appendix F
	  • See, Vancouver Coastal Health Electrical Performance Specification For DC Fast Chargers and Level 2 Chargers in Appendix G
	  • See, VCH Owner's Project Requirements Electrical Section, Appendix H
		• IPS
		• PHC FMO
		• VCH TS
		• FMO

Stage 6: Pre-installation Electrical Upgrade (as needed)		
All HOs: Project Manager	Included within the scope of the project. Will be informed by electrical feasibility study.	• FMO • EES

[6] As process is implemented FAQs may be identified to support responding to EV Charger Requests.
[7] Ensure scoping and electrical feasibility is complete and that there is electrical capacity prior to equipment installation.
[8] In development update anticipated for Fall 2024.

ii. Capital Project and Redevelopments

Capital projects and redevelopments must meet the regulatory requirements described in this section. To meet requirements **EV infrastructure planning is to be included in the Business Case phase of projects, where applicable.**

The capital projects and redevelopments are required to meet the EV Ready Building Standard within the Environmental, Social Governance Framework (ESGF) for CleanBC Objectives.The requirements are currently under development.

While requirements are being finalized the suggested ratio of parking stalls that will have infrastructure to support the installation of an EV charging station is:

- 25% of stalls for employee and visitor parking
- 50% of stalls for fleet parking
- 100% of accessible parking stalls
- For ambulance parking, please consult with BC Emergency Health Services (BCEHS) on requirements for these stalls.

The process for capital projects and redevelopments is described in the below Capital Projects and Redevelopments Preferred Process Table (Table 5).

The Existing Buildings section, above, can be referred to for information on:

- Charging station procurement and installation

TABLE 5

Capital Projects and Redevelopments Preferred Process Table.

LEAD	PROCESS	KEY COLLABORATORS	NOTES

Project Manager / Team	Include the EV Ready Building Standard requirements (Table 1) in design of capital projects and redevelopments.	• EES
		• IPS
		• PHC FMO
		• FMO
			The following documents can be referenced for additional information:
			• Technical specifications:
			  • See, Fraser Health Authority Technical Design Requirements in Appendix E and the Lower Mainland Health Care Organizations (LMHO) EV Charging Station Design Specifications in Appendix F
			  • See, Vancouver Coastal Health Electrical Performance Specification For DC Fast Chargers and Level 2 Chargers in Appendix G
			  • See, VCH Owner's Project Requirements Electrical Section, Appendix H

2.2 Operations

Operations are managed by IPS, PHC FMO and VCH TS. Separate operations manuals have been developed by each team. Please, use below contact to request manuals specific to Health Organizations.

- For FH, PHSA: commuterservices@fraserhealth.ca
- For PHC: PHC FMO
- For VCH: commuting@vch.ca

Operations manuals may provide guidance on EV management and include details on:

- Roles and Responsibilities during operation
    - Describes the specific tasks and accountabilities for each team contributing to the implementation and management of EV charging infrastructure.
- Network connection
    - Describes the structure and operation of the EVCS network.
- Data Collection
    - Describes the data collected on EVCS and the application of this information by different teams in decision-making and reporting.
- Enforcement
    - Describes the time limitations on the use of EVCSs and any enforcement strategies and/or considerations. Describes the time, fee restrictions on the use of the EVCSs and any enforcement strategies and/or considerations.
- Revenue and costs
    - Describes revenue streams (i.e., revenue from fees for charging and revenue from selling carbon credits) and requirements for an operating budget to support maintenance and management of EVCSs.
- Emergency procedures
    - Addresses the risk of theft or vandalism and provides contact information for assistance in an instance of theft or vandalism.

As experience is gained, operation processes are being updated and refined to meet the needs of specific HOs and healthcare sites.

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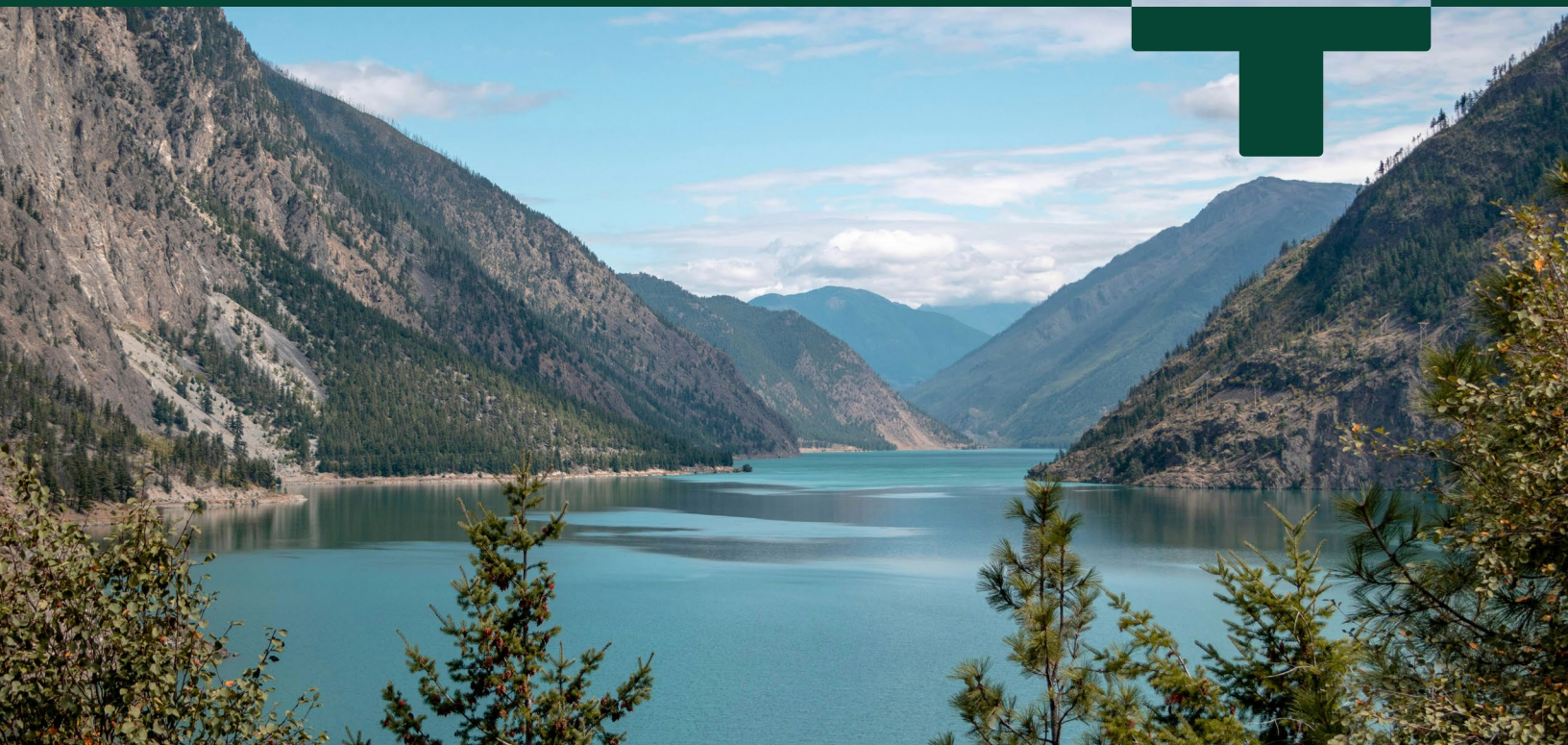
Appendices



A Benefits of Electric Vehicles (EVs) Summary

Transitioning to EVs Benefits Public Health

- Electrification reduces air pollution[10] (assuming electricity is not generated by burning fossil fuels)
- Less exposure to air pollution will support decreasing:
  - Diseases linked to air pollution (e.g., asthma, lung cancer, and cardiovascular disease)
  - Diseases association with air pollution (e.g., pregnancy outcomes, obesity in children, cognitive development, mental health outcomes, dementia, and diabetes)
- Likely to improve the quality and length of life (population level)

EVs will help mitigate health impacts from Climate Change

- Metro Vancouver on-road transportation produces 35% of regional greenhouse gas emissions
- Transportation emissions are contributing to worsening climate change impacts and hazards
- Human health impacts from heat and wildfire smoke seen in VCH region in recent years
- Hazards are expected to worsen including:
  - More extreme heat events;
  - Poorer air quality (increased wildfire smoke, ground-level ozone, longer pollen seasons);
  - More extreme weather events (e.g,. storms, floods, droughts);
  - Increase in infectious diseases; and,
  - Changes to ecosystems and provided food, water, and cultural service.

STAFF EV NEED

- 12% own an EV
- 40% plan to own an EV in the next 5 years (2023 GreenCare Survey)

Action to Reduce Greenhouse Gas Emmissions is Critical for Mitigating Climate Change Impacts

- To limit global warming to 1.5°C we must[11]:
  - Reduce emissions 45% from 2010 levels by 2030; and,
  - Achieve net-zero by 2050 across all emission sources.
- A regional transition to EVs (light-duty) will have sigificant impact on local emission levels

CleanBC's Climate Action Plan Will Build a Safer Future by Supporting a Low-carbon Economy

- The 2021-22 Mandate Letter directs Health Authorities alignment with CleanBC 2030 targets:
  - 50% reduction in public sector building emisions
  - 40% reduction in public sector fleet emissions
- Key transportation actions include accelerate the switch to zero emission vehicles (including EVs)

The Provinicial Government is Supporting the Transition of Vehicles with the Low-carbon Fuel Standard

- Generates revenue through credits received for offsetting transportation fuel
- More EV chargers increase revenue (can support charger servicing and managing)

[10]Traffic-related air pollution (TRAP) is a complex mixture of substances emitted from motor vehicles such as cars, buses, and trucks. It includes particulate matter, nitrogen oxides, volatile organic compounds, and toxins such as benzene, metals, and polycyclic aromatic hydrocarbons.

[11]Net Zero Coalition | United Nations

B Electric Vehicle Terms and Definitions

The terms and definitions will be adopted from the CleanBC Climate Resilience and Greenhouse Gas Reduction Requirements in Appendix 6 of the Environmental, Social and Governance Framework.

This appendix will be updated with terms and definitions when the Environmental, Social and Governance Framework is finalized.

C Site Prioritization

Priority sites were identified in the Electric Vehicles in Fraser Health, Providence Health Care, Provincial Health Services Authority, and Vancouver Coastal Health a Baseline Study and Analysis for a Regional Strategy (Table C1). For priority sites, accessibility was used as the first indicator by which to identify potential sites for EV charging installations.

Other factors, such as usable facility space, site FTE, as well as engagement with site facilities, maintenance and operations partners should also be considered.

Once a site has been identified as a potential site for EV installation or expansion, an electrical feasibility study needs to be done to understand the site's capacity for an installation.

TABLE C1

Priority Sites.

ORGANIZATION	SITE
FH	• Chilliwack General Hospital • Delta Hospital • Eagle Ridge Hospital • Mission Memorial Hospital • Peace Arch Hospital • Ridge Meadows Hospital • Royal Columbian Hospital • Surrey Memorial Hospital
PHC	• Holy Family Hospital • Mount St. Joseph Hospital • St. Vincent's Langara
PHSA	• Forensics Psychiatric Hospital
VCH	• Berkley Care Centre • Cedarview Lodge • qathet Hospital (complete) • Sechelt Hospital (complete) • Shorncliffe Intermediate Care • Sumac Place • Whistler Health Care Centre

D Electrical Feasibility Study – Scope of Work

1. Conduct load analysis to estimate available capacity of existing electrical distribution system (From BC Hydro data, and data for temporary power meters). Please provide a separate line item in your fee table summary for load analysis (with temporary meters)
2. Provide charging options assessment (where charger can be located, how many can be installed, load sharing availability, etc.)
3. Provide cost estimates for deployment options
4. Provide marked-up electrical drawings
5. Provide support for completion of rebate documentation (list of applicable rebates, as well as support to apply for, if applicable
6. Provide additional information as requested:
    - Total project cost (including infrastructure upgrades)
    - Annual fuel savings (GJ & $)
    - Annual electricity increase (kWh & $)
    - Total annual avoided emissions (tCO2e/year)
    - Persistence (life of assets)
7. Electrical capacity assessment[10]

[10] Internal teams to check on available information.

E Fraser Health Authority Technical Design Requirements

Section 4.6, right, is replicated from the Fraser Health Authority Technical Design Requirement document, please refer to latest revision of FHA TDR as clauses may be updated over time. The excerpt includes requirements for EVs. Refer to online copy of Section 4.6.

F Lower Mainland Health Care Organizations (LMHO) EV Charging Station Design Specifications

Sections 1, 2, and 3, are replicated from the Lower Mainland Health Care Organizations (LMHO) EV Charging Station Design Specifications. The specifications were published in 2017. In the case that more current specification are available, it is advised to apply the most up-to-date guidance.

Refer to online copy of Appendix F EV-Charging LMHO Design-Specifications.

G Vancouver Coastal Health Electrical Performance Specification For DC Fast Chargers And Level 2

Refer to online copy of Appendix G EV Charger Performance Specification.

H Owner's Project Requirements Electrical Section

Refer to online copy at vch.ca/opr.