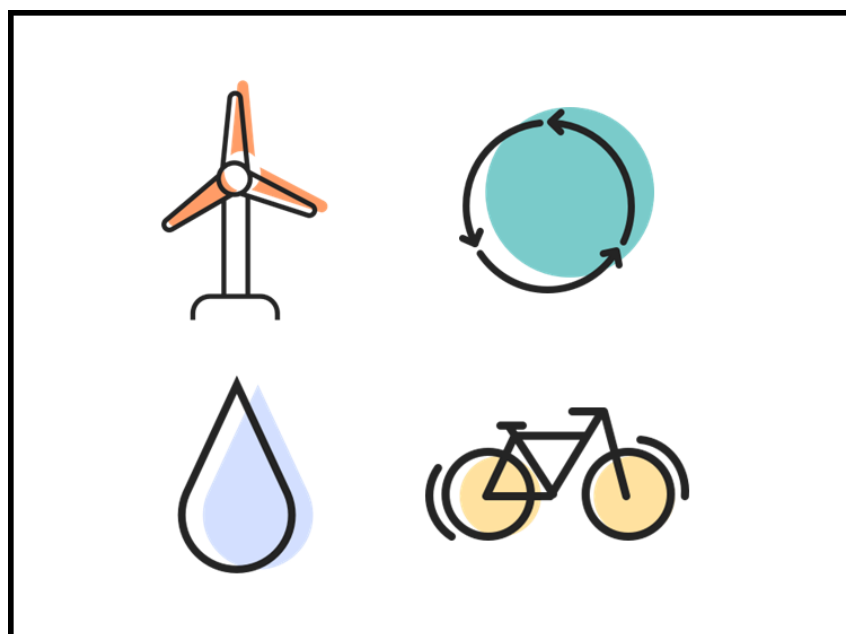


Methodology for Calculating Key Performance Indicators
Fraser Health (FH)
Providence Health Care (PHC)
Provincial Health Services Authority (PHSA)
Vancouver Coastal Health (VCH)



Author: Energy and Environmental Sustainability

This is a 'living' document. The most up-to-date version can be found at <https://bcgreencare.ca/resource/energy-and-environmental-sustainability-ees-methodology-and-context-for-calculating-key-performance-indicators/>

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Introduction

This document outlines the methodology used to calculate key performance indicators (KPIs) as they relate to Fraser Health, Providence Health Care, Provincial Health Services Authority and Vancouver Coastal Health sustainability targets. It is meant to be used in conjunction with progress dashboards and graphs displayed on the [GreenCare website](#) and in the [Climate Change Accountability Reports](#) (CCARs).

This document addresses four focus areas: Energy and Carbon, Materials, Transportation, and Water. For each focus area, you will find the following information:

- KPI(s)
- Objective
- Baseline
- Metric associated with KPI
- Metric calculation methodologies and terminology definitions
- Metric scope
- Relevant background information and context
- Description and explanation of data anomalies and trends
- Applicable Health Organization sites for which the KPI(s) were quantified

If you have any questions about the information below, please contact: info@bcgreencare.ca



Providence
Health Care



Provincial Health
Services Authority

Vancouver
Coastal Health



Energy and Carbon



KPI 1: Total GHG emissions from owned and leased buildings, fleet, paper and refrigerants

Parameter	Description
Objective	<ul style="list-style-type: none"> Decrease total GHG emissions from buildings, fleet, paper and refrigerants
Baseline	<ul style="list-style-type: none"> From 2007 levels Mandated by the Climate Change Accountability Act.
Metric	<ul style="list-style-type: none"> Tonnes of carbon dioxide equivalent per year (tCO₂e/year).
Calculation methodology	<ul style="list-style-type: none"> Annual GHG emissions are calculated from the Clean Government Reporting Tool (CGRT) with emission factors taken from B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions.
Data source	<ul style="list-style-type: none"> The following data is entered into the CGRT: <ul style="list-style-type: none"> Utility provider data Paper Use (supplied from PHSA Procurement) Fuel Oil used in buildings Fleet vehicle use (supplied by third party fleet management company)
Terminology definition & metric scope	<ul style="list-style-type: none"> tCO₂e is a standard unit for quantifying greenhouse gas (GHG) emissions. BC Government legislation mandates public sector organizations to report on their emissions associated with building energy (including fuel combustion and electricity), paper use, fleet vehicles and refrigerants. This excludes other health care emission sources.
Background information	<ul style="list-style-type: none"> The Climate Change Accountability Act (CCAA) has set ambitious emissions reduction targets for public sector organizations and mandates reduction of: <ul style="list-style-type: none"> 40% by 2030 (from 2007 baseline) 60% by 2040 (from 2007 baseline) 80% by 2050 (from 2007 baseline)
Data anomalies and trends	<ul style="list-style-type: none"> Estimated calculations are based on floor area, electricity and/or fuel provided. They are used in the CGRT for facility spaces that do not have utility metered data available. Paper use is determined by the quantity of purchased paper but not necessarily used. Approximately 96-98% of the total GHG emissions are attributed to building energy use. Portfolio growth has a significant impact on building GHG emissions.



KPI 2: Total GHG emissions from owned and leased buildings

Parameter	Description
Objective	<ul style="list-style-type: none"> Reduce total GHG emissions from owned and leased building
Baseline	<ul style="list-style-type: none"> From 2010 levels Mandated by the CleanBC plan (part of the BC climate change legislation).
Metric	<ul style="list-style-type: none"> Tonnes of carbon dioxide equivalent per year (tCO₂e/year).
Calculation methodology	<ul style="list-style-type: none"> Annual building GHG emissions are calculated from the Clean Government Reporting Tool (CGRT) with emission factors taken from B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions.
Data source	<ul style="list-style-type: none"> Utility provider data (i.e. natural gas and electricity) entered into the CGRT.
Terminology definition & metric scope	<ul style="list-style-type: none"> tCO₂e is a standard unit for quantifying greenhouse gas (GHG) emissions. Building energy use is one of the current legislated emission sources and consists of scope 1 (direct i.e. natural gas use) and scope 2 (indirect i.e. electricity use) emissions.
Background Information	<ul style="list-style-type: none"> Target mandated by the CleanBC plan (part of the BC climate change legislation). The CleanBC plan is the pathway to achieving a 50% reduction in emissions for public sector buildings by 2030, compared to a 2010 baseline.
Data anomalies and trends	<ul style="list-style-type: none"> Estimated calculations are used in the CGRT for building spaces that do not have utility metered data. Approximately 96-98% of the total in-scope GHG emissions come from building energy use. New health facility construction has a significant impact on building GHG emissions.



KPI 3: Amount of GHG emissions generated per floor area (m²) of owned and leased buildings

Parameter	Description
Objective	<ul style="list-style-type: none"> Reduce GHG emissions generated per floor area from owned and leased buildings
Baseline	<ul style="list-style-type: none"> From 2010 levels Mandated by the CleanBC plan (part of the BC climate change legislation).
Metric	<ul style="list-style-type: none"> Kilograms of carbon dioxide equivalent per square meter of facility per year (kgCO₂e/m²/year).
Calculation methodology	<ul style="list-style-type: none"> Annual building GHG emissions are calculated from the Clean Government Reporting Tool (CGRT) with emission factors taken from B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions. For intensity, the annual GHG emissions is divided by the square metre of usable facility space¹ for all owned and leased buildings.
Data source	<ul style="list-style-type: none"> Utility provider data entered into the CGRT. <ul style="list-style-type: none"> Useable building space (square meters) is obtained from the ARCHIBUS Software (an internal health authority resource for space analytics).
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as GHG emissions intensity (GHGI) for buildings. tCO₂e is a standard unit for quantifying GHG emissions. Building energy use is one of the current legislated emission sources and consists of scope 1 emissions (direct i.e. natural gas use) and scope 2 emissions (indirect i.e. electricity use). <ul style="list-style-type: none"> This represents the emission intensity average across all owned and leased sites (as defined by the Climate Change Accountability Act).
Background Information	<ul style="list-style-type: none"> Target mandated by the CleanBC plan (part of the BC climate change legislation). The CleanBC plan is the pathway to achieving a 50% reduction in emissions for public sector buildings by 2030 compared to a 2010 baseline.
Data anomalies and trends	<ul style="list-style-type: none"> Estimated calculations are used in the CGRT for facility spaces that do not have utility metered data. Approximately 98% of the total GHG emissions in this portfolio come from building energy use. Building new low carbon emission buildings will support the trend to meet the GHG emissions intensity target.

¹ Usable space doesn't include mechanical rooms, interstitial space, elevator shafts and parkades.



KPI 4: Energy use intensity: the amount of energy used per floor area of owned buildings

Parameter	Description
Objective	<ul style="list-style-type: none"> Decrease energy use intensity
Baseline	<ul style="list-style-type: none"> From 2007 levels Selected to align with the Climate Change Accountability Act.
Metric	<ul style="list-style-type: none"> Equivalent kilowatt hours consumed per square metre of facility space per year (ekWh/m² /year). <ul style="list-style-type: none"> ekWh is a unit of energy consumption that is used to convert the volume of an energy source into equivalent energy units.
Calculation methodology	<ul style="list-style-type: none"> Energy use at owned health-care buildings is measured in equivalent kilo-watt hours (ekWh) or giga-watt hours (eGWh) and captures the entire amount of energy used from all energy sources on an annual basis. This is then divided by total building floor area minus underground parking, interstitial space and mechanical penthouses.
Data source	<ul style="list-style-type: none"> Invoices from utility providers and vendors, which are loaded into a utility database management tool (Asset Planner). Square meters come from ARCHIBUS (an internal health authority resource for space analytics).
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as energy use intensity (EUI). Owned buildings are defined as primarily owned health-care buildings that are actively monitored for energy, water and waste data. In some cases, a few leased (i.e. operated but not owned) buildings are included in energy monitoring. Utilities includes electricity, natural gas and fuel oil, and energy purchased from district energy systems.
Background Information	<ul style="list-style-type: none"> Each health organization sets their own target by identifying energy reduction opportunities and taking into account changes in building portfolio.
Data anomalies and trends	<ul style="list-style-type: none"> In 2022, a switch to Asset Planner (a new utilities database management tool) required a different billing period, resulting in minor discrepancies with data reported in previous years. Changes in energy use and intensity are affected by new construction activity and weather temperatures.

Materials

KPI 1: Waste recycled or composted at acute and non-acute care owned sites

Parameter	Description
Objective	<ul style="list-style-type: none"> Increase waste recycled or composted at acute and non-acute care owned sites
Baseline	<ul style="list-style-type: none"> None
Metric	<ul style="list-style-type: none"> Percentage of waste recycled or composted (% recycled, annual average).
Calculation methodology	<ul style="list-style-type: none"> The percentage of solid waste (non-hazardous) which is recycled or composted divided by the total amount of solid (non-hazardous) waste generated. Includes garbage, recycling streams and organics.
Data source	<ul style="list-style-type: none"> Waste hauling invoices Performance reports from waste vendors for their respective streams
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as waste diversion. The recycling rate is the amount of solid (non-hazardous) waste recycled out of the total solid (non-hazardous) waste generated. Bio-hazardous waste streams such as pharmaceuticals, non-anatomical, anatomical, cytotoxic etc are not included in the total waste generated for this metric as these waste streams should not have items which can be diverted in them. Biomedical waste is captured in the waste intensity metric. Recycling streams available vary depending on site and region but generally include mixed containers, paper, batteries, electronics, confidential shredding (shredded as per privacy requirements then recycled), some areas also offer soft plastics, personal protective equipment (PPE), polyvinyl chloride, toner and furniture recycling. Recycling rates are for all owned and operated buildings. Waste management at leased buildings is under the purview of the property management company, and not the health organization. <ul style="list-style-type: none"> The list of sites included are listed in each health organization annual Climate Change Accountability Reports (CCARs), References section.
Background Information	<ul style="list-style-type: none"> Targets were created by the regional Energy and Environmental Sustainability (EES) team, to measure progress on waste management in the absence of mandated provincial targets. Targets were benchmarked on Practice Greenhealth best practice (see Benchmarking report by Practice Greenhealth), past trends and current resourcing. Currently waste reporting is not mandated. This is likely to change in the coming years. Health organizations

	<p>have committed to reducing unnecessary waste so tracking progress enables us to work towards these goals.</p> <ul style="list-style-type: none"> • Recycling rates were first created in 2018, and were calculated using historical data back to 2014, however, 2014 is not used as a baseline year.
<p>Data anomalies and trends</p>	<ul style="list-style-type: none"> • Fluctuations in national and international plastics markets can reduce the value of certain materials, making some plastics no longer viable to separate for recycling. • Contamination in recycling streams can lead vendors to pause service due to concerns about fears of exposure to health-care waste. Reinstating recycling services at a site can be difficult once vendors view materials are considered as higher risk. Impacted streams and buildings are listed in the References section of the Climate Change Accountability Reports (CCAR) for each health organization.



Providence Health Care



Provincial Health Services Authority



KPI 2: Waste generated per floor area at acute and non-acute care owned sites.

Parameter	Description
Objective	<ul style="list-style-type: none"> Decrease waste generated per floor area at acute and non-acute care owned sites
Baseline	<ul style="list-style-type: none"> None
Metric	<ul style="list-style-type: none"> Total kilograms of waste generated per square metre of usable facility area² (kilograms/m²/year).
Calculation methodology	<ul style="list-style-type: none"> The waste-intensity rate is calculated by dividing total waste generated including all waste generated in an owned and operated acute/non-acute care buildings i.e. non hazardous waste (garbage, recycling, organics) and hazardous waste (non-anatomical, anatomical, sharps, pharmaceutical, cytotoxic) by the total usable floor area, excluding parkades and stairwells.
Data source	<ul style="list-style-type: none"> Waste hauling invoices and waste performance reports from vendors. ARCHIBUS - facility space provided in square metres.
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as waste intensity. The goal is to reduce total waste volume generated per square meter per year. Each health organization has planetary health or sustainability goals to reduce overall waste generation through reusables, Choosing Wisely and mindful procurement. Includes all owned and operated facilities. Waste management at leased sites is under the purview of the property management company, and not the health organization.
Background Information	<ul style="list-style-type: none"> Each health organization has their own targets which are created internally and are based on health care best practice (see Benchmarking report by Practice GreenHealth). Waste-intensity rates were first created in 2018, and were calculated using historical data back to 2014, however, 2014 is not used as a baseline year in this KPI.
Data anomalies and trends	<ul style="list-style-type: none"> The target for waste generated per usable floor area is increasingly difficult to meet as we add and report new waste streams, sites expand services and care activity levels rise. In 2026, we will review the waste generated per usable floor area metric and re-evaluate the 2030 target.

² Usable space doesn't include mechanical rooms, interstitial space, elevator shafts and parkades.

Transportation



KPI 1: Staff commuting by cycling, walking, rolling and all other active transportation

Parameter	Description
Objective	<ul style="list-style-type: none"> Increase the proportion of staff commuting trips made by active transportation such as cycling, walking, rolling and all other active transportation modes
Baseline	<ul style="list-style-type: none"> 2016
Metric	<ul style="list-style-type: none"> Percentage of staff commutes taken by active transportation modes (annual average per health organization).
Calculation methodology	<ul style="list-style-type: none"> For each health organization, we average the self-reported percentage of commutes for each transportation mode (cycling, walking, and rolling). The sum of these averages represents the active transportation mode share for the reporting year. Rolling includes wheelchair or seated electric scooter use.
Data source	<ul style="list-style-type: none"> Annual and voluntary GreenCare Survey of staff and medical staff; data represents self-reported average commuting behaviour for the previous calendar year.
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as “active transportation” mode share. Mode share represents the percentage of commuting trips taken by each transportation mode over a reporting year. Survey participants self-report the data, which does not account for distance or seasonal variation.
Background Information	<ul style="list-style-type: none"> Target values are developed internally based on historic trends and regional considerations. Transportation data has been collected annually since 2020. Prior to 2020, data was collected every two years.
Data anomalies and trends	<ul style="list-style-type: none"> n/a



KPI 2: Staff commuting by public transit, car share, carpool, low-emission vehicles and hospital shuttle

Parameter	Description
Objective	<ul style="list-style-type: none"> Increase the proportion of staff commuting by public transit, car share, carpool, low-emission vehicles and hospital shuttle
Baseline	<ul style="list-style-type: none"> 2016
Metric	<ul style="list-style-type: none"> Total percentage of staff commutes taken by public transit, carpool, car share, low-emissions vehicle, and hospital shuttle.
Calculation methodology	<ul style="list-style-type: none"> For each health organization, we average the self-reported percentage of commutes for each transportation mode (public transit, car share, carpool, low-emissions vehicle, and hospital shuttle). The sum of these averages represents the clean transportation mode share for the reporting year.
Data source	<ul style="list-style-type: none"> Annual and voluntary GreenCare Survey of staff and medical staff; data represents self-reported average commuting behaviour for the previous calendar year.
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as “clean transportation” mode share. Mode share represents the percentage of commuting trips taken by each clean transportation mode over a reporting year. Survey participants self-report the data, which does not account for distance or seasonal variation.
Background Information	<ul style="list-style-type: none"> Target values are developed internally based on historic trends and regional considerations. Transportation data has been collected annually since 2020. Prior to 2020 data was collected every two years.
Data anomalies and trends	<ul style="list-style-type: none"> Across all four health organizations, transit use has generally increased while single-occupancy vehicle use has decreased. The rate of this change varies across the four health organizations.

Water

KPI 1: Amount of water used per floor area in owned buildings

Parameter	Description
Objective	<ul style="list-style-type: none"> Decrease the amount of water used per floor area in owned buildings
Baseline	<ul style="list-style-type: none"> From 2010 levels Selected to align with the start of recorded water meter data.
Metric	<ul style="list-style-type: none"> Cubic water use per square metre of facility space per year (m³/m²/year).
Calculation methodology	<ul style="list-style-type: none"> Water use at owned buildings is measured in cubic metres from water meters per year divided by the total building floor area minus underground parking, interstitial space and mechanical penthouses. Unmetered sites are not included in reporting.
Data source	<ul style="list-style-type: none"> Water utility invoices from various cities and municipalities, which are loaded into Asset Planner (a utility database management tool). Square metres of facility area is obtained from ARCHIBUS (an internal health organization resource for space analytics).
Terminology definition & metric scope	<ul style="list-style-type: none"> This KPI is also known as water use intensity. Owned buildings are defined as primarily owned health-care facilities that can be actively monitored for energy, water and waste data. In some cases, a few operated but not owned buildings are included in water monitoring.
Background Information	<ul style="list-style-type: none"> This is a health organization developed target that is based on past trends, current resourcing (dedicated staff and funding) and potential opportunities.
Data anomalies and trends	<ul style="list-style-type: none"> In 2022, an organizational switch to Asset Planner (a new utilities database management tool) required a different billing period resulting in minor discrepancies with data reported in previous years.

Applicable Health Organization Sites

Health Organization	Health Care Site Name	Owned or Leased Facility	Type of Facility	Useable Facility Area	Energy Metered Sites	Waste Management Contracted Sites	Water Metered Sites
FH	Abbotsford Regional Hospital and Cancer Centre	Owned	Acute	62,258	x	x	
FH	Burnaby Hospital	Owned	Acute	48,089	x	x	
FH	Chilliwack General Hospital	Owned	Acute	30,853	x	x	
FH	Chilliwack Health Centre	Owned	Treatment centre	2,976	x		
FH	Creekside Withdrawal Management Centre	Leased	Long-term care	2,729	x	x	
FH	Czorny Alzheimer Centre	Leased	Long-term care	6,393	x	x	
FH	Delta Hospital	Owned	Acute	14,322	x	x	
FH	Eagle Ridge Hospital	Owned	Acute	24,392	x	x	
FH	Fellburn Care Centre	Owned	Long-term care	4,045	x	x	
FH	Fraser Canyon Hospital	Owned	Acute	7,677	x	x	
FH	Heritage Village	Owned	Long-term care	5,776	x	x	
FH	Jim Pattison Outpatient Care	Owned	Acute	19,941	x	x	
FH	Langley Memorial Hospital	Owned	Acute	42,944	x	x	
FH	Maple Ridge Treatment Centre	Owned	Long-term care	2,323	x		
FH	Mission Memorial Hospital	Owned	Acute	22,064	x	x	



Providence
Health Care



Provincial Health
Services Authority



Health Organization	Health Care Site Name	Owned or Leased Facility	Type of Facility	Useable Facility Area	Energy Metered Sites	Waste Management Contracted Sites	Water Metered Sites
FH	MSA Cottage & Worthington Pavilions	Owned	Long-term care	4,958	x	x	
FH	Parkholm Place	Owned	Long-term care	3,582	x	x* *included in Chilliwack General Hospital data	
FH	Peace Arch Hospital	Owned	Acute/ Long-term care	49,791	x	x	
FH	PAH Foundation Lodge	Leased	Long-term care	9,613	x	x	
FH	Queens Park Care Centre	Owned	Acute	16,074	x	x	
FH	Ridge Meadows Hospital	Owned	Acute	23,238	x	x	
FH	Royal Columbian Hospital	Owned	Acute	74,248	x	x	
FH	Surrey Memorial Hospital	Owned	Acute	115,112	x	x	
FH	Timber Creek	Owned	Acute	4,539	x	x	
PHC	Holy Family Hospital	Owned	Long-term care	11,230	x	x	
PHC	Mount Saint Joseph Hospital	Owned	Acute	21,245	x	x	
PHC	St. Paul's Hospital	Owned	Acute	102,775	x	x	
PHC	St. Vincent's: Brock Fahrni	Owned	Long-term care	5,860	x	x	
PHC	St. Vincent's: Honoria Conway - Heather	Owned	Assisted Living	5,388	x	x	
PHC	St. Vincent's: Langara	Owned	Long-term care	9,465	x	x	
PHC	Youville	Owned	Long-term care	7,190	x	x	

Health Organization	Health Care Site Name	Owned or Leased Facility	Type of Facility	Useable Facility Area	Energy Metered Sites	Waste Management Contracted Sites	Water Metered Sites
PHSA	BC Cancer – Prince George	Owned	Treatment centre	4,645	x		
PHSA	BC Cancer – Surrey	Owned	Treatment centre	6,700		x	
PHSA	BC Cancer – Victoria	Owned	Treatment centre	11,864	x		
PHSA	BC Cancer – Vancouver	Owned	Treatment centre	29,335	x	x	
PHSA	BC Cancer Research Centre	Owned	Research	21,368	x	x	
PHSA	BC Children's Hospital & BC Women's Hospital	Owned	Acute	209,796	x	x	
PHSA	Forensic Psychiatric Hospital	Owned	Long-term care	19,300	x		
PHSA	Red Fish Healing Centre	Owned	Treatment centre	20,752	x	x	
VCH	Bowling Green	Owned	Child Care	496		x	
VCH	Cedarview Lodge	Owned	Long-term care	6,989	x	x	
VCH	Dogwood Lodge	Owned	Long-term care	4,943		x	
VCH	George Pearson Centre	Leased	Long-term care	17,655	x	x	
VCH	GF Strong	Owned	Acute	19,159	x	x	
VCH	Gordon and Leslie Diamond Centre	Owned	Acute	33,851	x	x* *included in VGH data	
VCH	Kiwanis Care Centre	Owned	Long-term care	11,717	x	x	
VCH	Lions Gate Hospital / Evergreen / HOpe Centre	Owned	Acute/ Long-term care	64,540	x	x	
VCH	Margaret Fulton	Owned	Long-term care	2,442		x	
VCH	Minoru Residence	Owned	Long-term care	11,584	x	x	

Health Organization	Health Care Site Name	Owned or Leased Facility	Type of Facility	Useable Facility Area	Energy Metered Sites	Waste Management Contracted Sites	Water Metered Sites
VCH	qathet General Hospital / Willingdon Creek Village	Owned	Acute/ Long-term care	21,417	x	x	
VCH	Richmond Hospital	Owned	Acute	33,223	x	x	
VCH	Richmond Lions Manor	Owned	Long-term care	4,604		x	
VCH	Sechelt Hospital / Totem Lodge	Owned	Acute/ Long-term care	13,779	x	x	
VCH	Shorncliffe Intermediate Care	Owned	Long-term care	3,062	x		
VCH	Squamish Hospital / Hilltop House	Owned	Acute/ Long-term care	10,697	x	x	
VCH	UBC Djavad Mowafaghian Centre for Brain Health	Leased	Research/ Outpatient	15,772	x		
VCH	UBC Hospital	Leased	Acute/ Long-term care	68,701	x	x	
VCH	Vancouver General Hospital	Owned	Acute/ Long-term care	259,315	x	x	
VCH	Whistler Health Care Centre	Owned	Acute	2,755	x		
Totals:	60 Facilities		sq meters	1,718,189	55 Sites	52 Sites	0 Sites



Providence
Health Care



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