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## **Integrated Protection Services**

### **Transportation Demand Management & Commuter Services**

### **Design Guidelines – Bicycle Parking Facilities**

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# Introduction

## Who We Are

Integrated Protection Services (IPS) – Commuter Services is responsible for the Transportation Demand Management (TDM) programs for Fraser Health, Providence Health Care, Provincial Health Services Authority and Vancouver Coastal Health. This includes the development, implementation and evaluation of the active and clean transportation programs by assessing, improving, implementing and tracking commuter service best practices, conducting detailed studies and comprehensive surveys, and recommending changes to current practices to ensure compliance with sustainable transportation regulations and/or legislation.

Commuter Services works with internal stakeholders and community partners to help reduce single occupancy vehicle use by staff, thereby freeing up parking for patients and visitors and curbing expense for parking construction, as well as promoting a healthy workforce.

## General Active and Clean Transportation Premise

Each new construction, redevelopment or major renovation project needs to create a TDM plan that will entail two requirements:

- Outline specific actions, goals, monitoring, and proposed reporting schedule that the Lower Mainland Health Care Organization (LMHO) is undertaking concerning TDM. This includes measures to reduce motorized vehicle trips by staff to and from the site.
- A 'TDM: Staff Health and Wellness' letter outlining mechanisms/strategies for reducing vehicular travel to and from the new site, including measures to increase cycling, walking, transit use, carpooling, carsharing and electric vehicle use to date is required. Included in this letter are any other strategies to reduce overall CO<sub>2</sub> pollution from staff vehicles that travel to and from the new site.

## Purpose

IPS Commuter Services, with the help of various key stakeholders who have expertise on bicycle parking systems and secure bicycle storage facilities, intends to have standardized design guidelines for bicycle parking infrastructure throughout the system. This is to ensure that optimal security for bicycle and cycling accessories at LMHO premises are being provided and that unnecessary expense for replacement, reconstruction, reconfiguration and rectification of bicycle parking facilities post installation is avoided.

These guidelines are also intended to provide convenient, well-organized and efficient bicycle parking facilities to cyclists that can ultimately increase the attractiveness of cycling.

## Intended Audience

This guide is intended for anyone involved in planning, design and construction of any new building, redevelopment and renovation projects at LMHO-owned, P3 and leased facilities to help design and build functional and secure bicycle parking facilities.

- Lower Mainland Facilities Management
  - Facility Planning and Project Delivery – to incorporate cycling facilities in project planning, design and construction
  - Energy and Environmental Sustainability – to advocate for active and clean transportation facilities within LMHO facilities and work with Commuter Services for the annual Carbon Neutral Accountability Report and Environmental Performance Accountability Report
  - Real Estate – to include secure cycling facilities as part of terms of lease agreements
- External contractors not directly reporting to or working with LMFM who are involved in planning, design and construction projects at any LMHO owned, leased and P3 facilities
- Integrated Protection Services
  - Business Initiatives and Systems Integration – to provide current security systems specifications

## Bicycle Parking

### Minimum Requirements

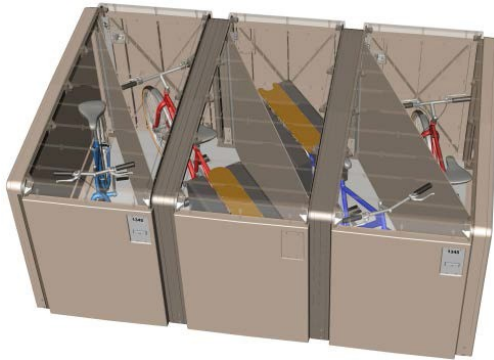
Each project needs to follow the 1) minimum bicycle parking design guidelines below; 2) LEED v4 SSc4.2: “Alternative transportation – bicycle storage and changing rooms” methodology for alternative transportation from LEED HC 2009; and, 3) minimum requirements by the governing city, municipality, district or township where the facility is located.

These guidelines must be observed by off-street onsite bicycle parking projects at all LMHO-owned and public-private partnerships (P3) facilities. Leased sites must have a stipulation in the lease contract for both onsite short-term and secure long-term bicycle parking spaces for health care employees via the real estate and leasing department, with at least the minimum bicycle parking space requirements below.

### Types of Bicycle Parking

Each facility must have both short and long-term secure bicycle parking facilities of sufficient quantities.

- **Long-Term or Class A:** intended for long-term use, consists of individual bike lockers and/or inverted U bike racks embedded on the concrete ground surface in a secure, enclosed, lockable space and access restricted to health care employees only. Such spaces should also consist of bike repair tools and bike lock storage bars affixed to a permanent concrete wall.



*Bike Locker sample illustration only. Image credit to Cycle-Safe.*



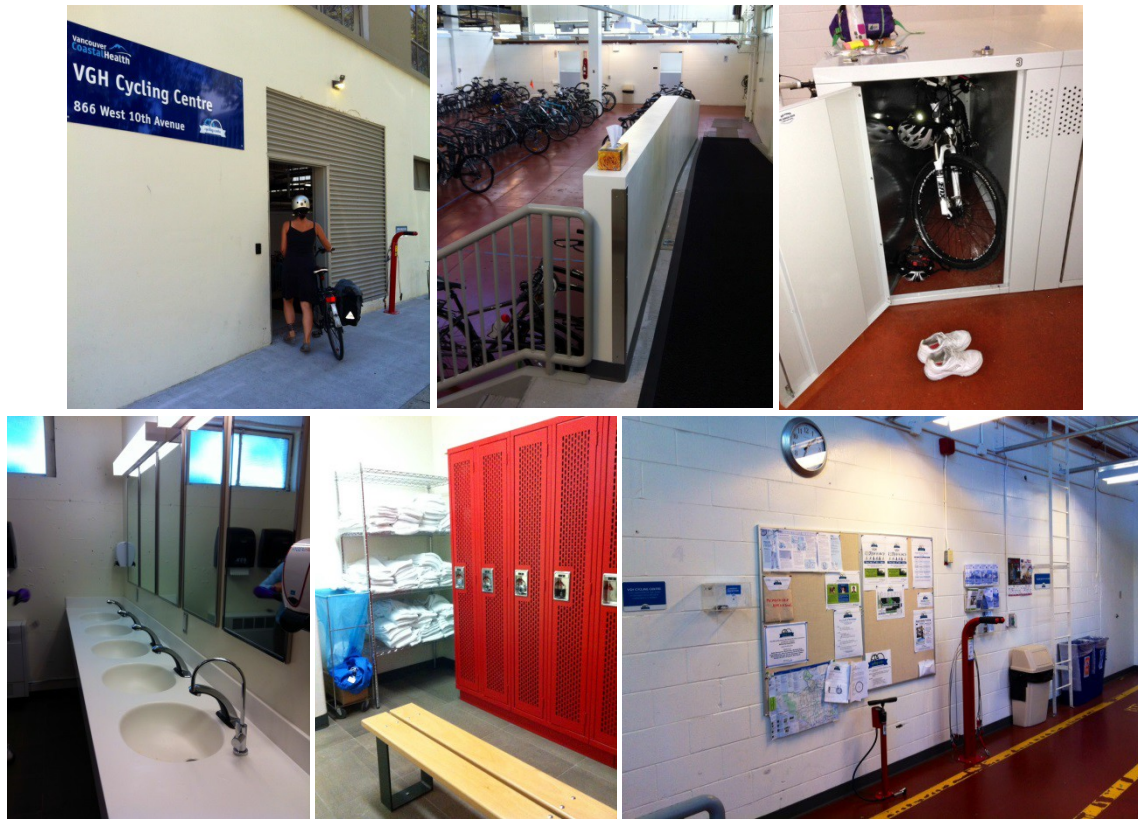
*Eagle Ridge Hospital Bike Cage During Construction*



*Surrey Memorial Hospital – Critical Care Tower Bike Room*

- **Cycling Centre:** is another type of long-term secure bicycle parking facility that is intended for sites with over 50,000 m<sup>2</sup> gross floor area or with over 1,000 employees in a maximum work shift, whichever comes first, and complemented with individual bike lockers, inverted U bike racks embedded on the concrete ground surface, self-serve bike repair station, air pumps, bike lock storage bars, perforated clothing lockers, shower rooms, change rooms, water closets, wash basins, hair dryers, benches and a lounge area. Provision of additional amenities, such as towels, to increase cycling rate is strongly proposed.





VGH Cycling Centre

- **Short-Term or Class B:** intended for transient or short-term use, consists of inverted U bike racks bolted to the ground, in a highly-visible/traffic, well-lit and weather-protected areas, close to building entrances, on a cement concrete surface, with curb letdowns for accessibility.



Lions Gate Hospital – Robert HOpe Centre Entrance



BC Children's Hospital near Emergency Entrance

## Location

Each project must be easily accessible, strategically placed within the facility, and does not impede patient access.

- **Short-Term Bicycle Parking:** within 15 meters from the facility entrances, on or accessible from ground level, well distributed, weather-protected, easy to use, in areas of high pedestrian activity and allows informal surveillance in well-lit area to discourage theft and vandalism
- **Long-Term Secure Bicycle Parking and Cycling Centre:** located on or accessible from ground level such as ramps (ramp preferably bike-dedicated, with 6-7% gradient and must be at least three meters wide). If in parking garage/lot, must be on first/street level.

## Capacity

The following numbers may only be superseded if the minimum calculations for the facility are higher than the local governing body's minimum requirements. Both current and projected trend and demand must be considered to avoid unnecessary expansion costs.

- **Long-Term Secure Bicycle Parking Stalls:** One bicycle parking stall for every five employees on a maximum work shift to address current and future cycling demands.
- **Short-Term Bicycle Parking Stalls:** A minimum of six parking stalls for every facility entrance.

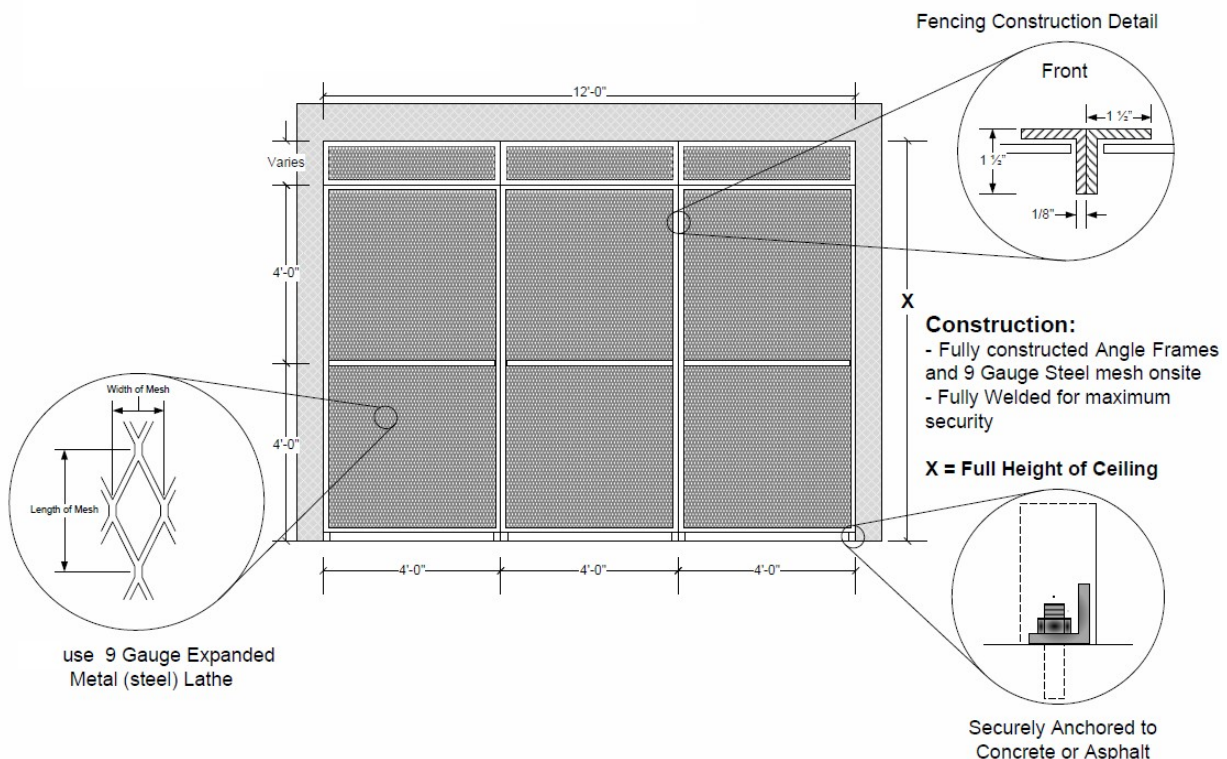
## Infrastructure

These infrastructure design guidelines will cover all types of bicycle parking facilities located inside and outside of a building. All long-term secure bicycle parking and cycling centres in owned and P3 facilities, unless managed by an external party, must have the following features:

### Enclosures for Bike Cages/Rooms

Bike rooms and cycling centres are typically part of the permanent building structure with concrete walls. Bike cages are typically enclosed by expanded metal mesh. For projects that require enclosure other than concrete walls, the following materials must be used:

- **Fence:** At least 9 gauge x  $\frac{3}{4}$ " x  $\frac{1}{2}$ " steel flattened expanded mesh, welded on site for increased security, fully anchored on all sides, without gap openings. Chain links are NOT acceptable.
- **Posts:** 1  $\frac{1}{2}$ " square posts, fastened to ceiling and floor
- **Angle Frames:** 1  $\frac{1}{2}$ " x 1  $\frac{1}{2}$ " x 1/8" angle frames with bracing for increased security



*Bike Cage Enclosure Specifications (by The Garage Door Depot – IPS Preferred Vendor)*

- **Door:**
  - Door Panel: 1  $\frac{3}{4}$ " 20 gauge steel solid panel with honeycomb core, outward swing
  - Hinges: Tamper proof
  - Blocker plates or Astragals: Full length
  - Door Closer: Commercial/exterior Grade 2 minimum surface mounted, overhead (pull or push side) with aluminum store front
  - Door Frame: 3' x 7' 22 gauge steel
  - Door Lever: Commercial building standard lever with shroud for added security

- Locking Mechanism: Heavy duty, high traffic electric strike or electrified lockset with built in request-to-exit sensor (if electric strike)
- **Roof:** Coverage must provide weather protection, fit tightly against the cage walls, and requires minimal maintenance
- **Paint:** Powder-coated finish or finish painted white. If material is exposed to elements, primer or undercoat application is required prior to paint finish application to prevent paint erosion from rust.

### Bike Racks

Bike racks for all projects must be highly compatible with many types of different bicycles. They must provide two secure points for locking with a U-style lock, ideally for both frame and at least one wheel. All racks must be firmly secured and ground-bolted by tamper-proof bolts.

- **Recommended Types** (click on the links for specifications):
  - [Inverted U with horizontal bar \(to support smaller bicycles\)](#)
  - ["Auclair" – stacked alternately to maximize space](#)



- [Double Stacker to maximize space](#)



*(Three types available via Urban Racks – IPS preferred vendor)*

- **Types to AVOID:**
  - Wall hangers, vertical stacking type or any system that requires lifting the bicycle, unless with hydraulic assist, due to poor or zero usage. Vertical bike parking may not count as bicycle parking stalls under some local government bylaw.
  - Front-wheel grips do not provide stability and security and could cause damage to the wheel.



*Robert HOpe Centre Parkade Level 2*



*Image credit to Century Cycles*

- **Material:** Industrial grade material, smooth-surfaced hot-dipped galvanized steel are recommended for bike racks that are exposed to the elements. Powder-coated racks may be installed in weather-protected facilities. Avoid stainless steel as it does not weld properly.
- **Rack and Aisle Width Spacing:** Follow recommended spacing for specific bike rack type as provided on the links above under "Recommended Types". Provide 18" clearance for the handle bar for outside edge from the obstacle (such as wall) to



allow enough space for the handlebar. Provide all bicycle spaces with a minimum aisle width of 1.2 metres for dedicated bike access.

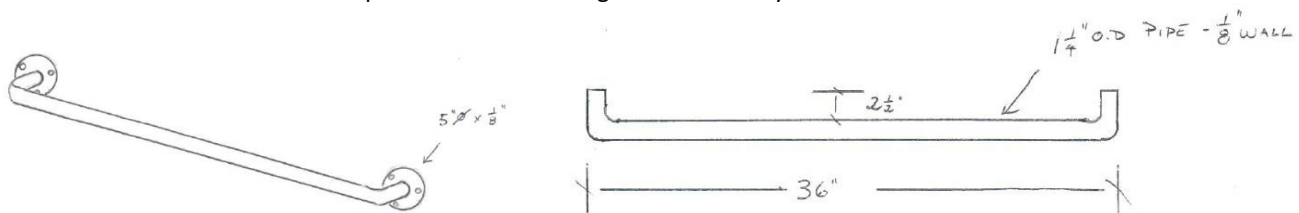
### **Bike Locker**

Bike lockers provide long-term security for the entire bicycle and accessories against theft, vandalism and weather. Choose lockers that provide security to two bikes per locker with two separate access doors, one on each end, with three point rotational locking bars for optimum security to optimize real estate. These may be installed inside the bike cage/room or in an open area on a concrete surface.

Key-based system with master key is ideal for facilities with onsite coordinator to manage the program. Check with Commuter Services prior to installation to ensure onsite management of facilities is available.

### **Bike Lock Storage Bar**

Bars fully welded, constructed, and formed in one piece from 1" Schedule 40 304 stainless steel pipe, 0.125" thick, 36" max in length per bar, 2.5" off-the-wall clearance, welded to 5" diameter stainless steel washers with three 0.25" holes for mounting. Welds must be buffed and no burns exposed. Bike lock storage bars must only be mounted to concrete walls.



*Illustration is from April 27, 2015*

### **Electrical Outlets**

A minimum of one 110 volts electrical outlet per five bicycle parking space is recommended. Such power outlets are intended for electric and electric-assist bicycle battery charging.

## **Cycling Amenities**

Provide end-of-trip amenities to enhance cycling convenience to help encourage higher cycling rate among staff. The table below shows the minimum number of facilities per gender. Minimum requirement set by the local government, if count is higher, supersedes the numbers below.

### **Shower/Change Room**

A minimum of one shower/change room per gender for every 20 bicycle parking spaces and must be built adjacent to the bike cage or inside the cycling centre.

### **Water Closets**

A minimum of one water closet per gender for every 20 bicycle parking spaces and must be built adjacent to the bike cage or inside the cycling centre.

### **Wash Basins**

A minimum of one wash basin per gender for every 30 bicycle parking spaces and must be built adjacent to the bike cage or inside the cycling centre.

### **Hand dryer**

A minimum of one hand dryer per washroom directly associated to the bike parking facilities per gender.

### **Clothing and Equipment Locker**

- Clothing lockers must be provided equal to 60% of the total bicycle parking stalls and must be in close proximity to the bike cage/room and inside the cycling centre.
- Use only heavy-duty, single-tier perforated/ventilated lockers to allow natural air flow.
- If clothing lockers are provided equivalent to 20% of the total bicycle parking stalls in areas not directly associated to the bike cage/room or cycling centre and are restricted to staff working for certain departments, the total number of



clothing lockers to be installed within or adjacent to the secure bike parking areas must be at least 40% of the total bicycle parking stalls.

#### **Bike Self-Repair/ Maintenance**

Bike stand, basic tools and air pump may be provided in bike cages/rooms. Cycling centre, on the other hand, must have these amenities.

#### **Bench**

One bench for every 20 bike parking stalls in a cycling centre.

#### **Lounge**

Cycling centre is preferred to have a lounge area for cyclists. This area may also be used for workshops and other cycling-related activities.

### **Safety, Security and Access**

#### **Access Card Reader**

All new projects in an enclosed area must come with an electronic access reader compatible with the current LMHO access control and badging system. Requests for security systems service must be ordered via

<https://inventory.ipssystems.ca/FraserHealth/CustomServiceRequest.aspx>.

#### **Close Circuit Television (CCTV)**

Must comply with IPS Security standards, provides coverage of entire bike parking area, and connects to site security CCTV system. Requests for security systems service must be ordered via

<https://inventory.ipssystems.ca/FraserHealth/CustomServiceRequest.aspx>.

#### **Lighting**

Energy efficient, evenly distributed white light with 6-8 lux for facial recognition. Lights must be turned on at all times in fully enclosed areas without other source of lighting for security reasons. If CCTV is present, use:

- Monochrome camera – minimum of 5 lux, 40% uniformity, 10 threshold increment, 60 colour rendering index
- Colour camera – minimum of 15 lux, 40% uniformity, 10 threshold increment, 70 colour rendering index

Use energy efficient light fixtures that do not exceed 150 watt per luminaire for standby power. For lights that already exist in the parking lot/facility, ensure above requirements are met when replacing.

#### **Panic Button/Duress Station**

Must be in place inside the bike parking facility and has direct line to onsite security. This feature only applies to facilities with dedicated security manpower. Requests for security systems service must be ordered via

<https://inventory.ipssystems.ca/FraserHealth/CustomServiceRequest.aspx>.

#### **Patrol Verification System**

Electronic patrol monitoring tool for facilities overseen by IPS with dedicated security manpower onsite. Requests must be coursed through the Area Security Lead responsible for the facility. See page 2 of IPS Operations for ASL contact information:

[http://fhpulse/lmc/integrated\\_protection\\_services/Documents/Paladin%20Area%20Security%20Leads.pdf](http://fhpulse/lmc/integrated_protection_services/Documents/Paladin%20Area%20Security%20Leads.pdf)

#### **Convex Safety Mirror**

Intended to minimize blind spots and dark corners to overcome sight restriction problems and avoid collisions with moving and stationary vehicle and/or pedestrian. Road safety and risks audit and assessment of the area must be completed prior to installing a convex safety mirror as distortion or mirror effect on the image can be confusing to users. Ensure the shape of the mirror is applicable for the radius of curvature of the area and the installation, operation and use of such has been fully considered and applied. The mirror must be highly polished stainless steel, weather-resistant if exposed to the elements, sturdy, requires zero to low maintenance and vandal resistant.

## Signage and Wayfinding

All signage must conform to IPS' current bicycle parking signage.

- **Directional Signage:** – Each facility must provide visible directional bicycle parking signage (minimum of 18" x 24" on 3mm aluminum panel sign) at the main entrance of the facility.
  - Long-Term Secure Bicycle Parking
  - Short-Term Bicycle Parking





- **Door:** Every entry door of a bike cage/room must post one HA-specific signage (minimum of 12" x 18" vinyl decal on a 3mm aluminum panel sign) directing users for access requests.



*Illustrations as of August 9, 2017*

- **Bike Cage/Room:** Post at least one HA-specific signage on a 3mm aluminum panel sign.

For Fraser Health Sites

## WELCOME CYCLISTS!


### Bicycle Storage

- Your bicycle may only be stored here during your work shift. For added security, please lock your bike within the cage.
- Please take your lock with you as you remove your bicycle; locks left hanging may be removed without notice.
- Fraser Health (FH) has the right to remove any unmoved bicycle left for more than two weeks.
- FH is not responsible or liable for any injury, death, property damage, theft or disappearance occurring in, on or about the cycling facility.

### Bicycle Cage Access

- Access to this cage is non-transferable and does not guarantee availability. Use is on a 'first come, first served' basis.
- Concerns? Please report them to:
  - o FH Commuter Services: [Commuter.Services@fraserhealth.ca](mailto:Commuter.Services@fraserhealth.ca)
  - o FH Security Non-Emergency: 8999 or 604.677.3735
  - o FH Security Emergency: 3800 or 604.677.3655

*Thank you for travelling sustainably!*



**WARNING:**  
This premise is under CCTV surveillance  
to enhance your personal safety and security.

Minimum 24" x 36"




## WELCOME CYCLISTS!

### Bicycle Storage

- Your bicycle may only be stored here during your work shift. For added security, please lock your bike within the cage.
- Please take your lock with you as you remove your bicycle; locks left hanging may be removed without notice.
- Fraser Health (FH) has the right to remove any unmoved bicycle left for more than two weeks.
- FH is not responsible or liable for any injury, death, property damage, theft or disappearance occurring in, on or about the cycling facility.

### Bicycle Cage Access

- Access to this cage is non-transferable and does not guarantee availability. Use is on a 'first come, first served' basis.
- Concerns? Please report them to:
  - o FH Commuter Services: [Commuter.Services@fraserhealth.ca](mailto:Commuter.Services@fraserhealth.ca)
  - o FH Security Non-Emergency: 8999 or 604.677.3735
  - o FH Security Emergency: 3800 or 604.677.3655

*Thank you for travelling sustainably!*

Minimum 24" x 30"

For Providence Health Care  
Sites




## WELCOME CYCLISTS!

### Bicycle Storage

- Your bicycle may only be stored here during your work shift. For added security, please lock your bike within the cage.
- Please take your lock with you as you remove your bicycle; locks left hanging may be removed without notice.
- Providence Health Care (PHC) has the right to remove any unmoved bicycle left for more than two weeks.
- PHC is not responsible or liable for any injury, death, property damage, theft or disappearance occurring in, on or about the cycling facility.

### Bicycle Cage Access

- Access to this cage is non-transferable and does not guarantee availability. Use is on a 'first come, first served' basis.
- Concerns? Please report them to:
  - o PHC Commuter Services: [Commuter.Services@fraserhealth.ca](mailto:Commuter.Services@fraserhealth.ca)
  - o PHC Security Non-Emergency: 4777 or 604.677.3734
  - o PHC Security Emergency: 5800 or 604.677.3672

*Thank you for travelling sustainably!*

Minimum 24" x 30"

For Provincial Health Services  
Authority Sites



Minimum 24" x 36"



Minimum 24" x 30"

For Vancouver Coastal Health  
Sites



Minimum 24" x 36"



Minimum 24" x 30"

*Illustrations as of February 3, 2015. Check current contact details prior to printing.*

- **Open Bike Racks:** Each bike rack location must post at least one HA-appropriate signage (24" x 30" vinyl decal on a 3mm aluminum panel sign).





Minimum 24" x 30"

*Illustrations as of February 16, 2015. Check current contact details prior to printing.*

## Appendices

### Appendix A: Lower Mainland Health Care Organizations' Environmental Sustainability Commitment

- A. FH - <http://www.fraserhealth.ca/media/201009PolicyEnvironmentalSustainability.pdf>
- B. PHC - [http://phc-connect/programs/phcnews/Documents/binary\\_91565.pdf](http://phc-connect/programs/phcnews/Documents/binary_91565.pdf)
- C. PHSA - <http://www.phsa.ca/about-site/Documents/al200-environmental-sustainability.pdf>
- D. VCH - [http://vch-connect/programs/green\\_care/Documents/binary\\_93670.pdf](http://vch-connect/programs/green_care/Documents/binary_93670.pdf)
- E. LMHCO - <https://bcgreencare.ca/system/files/resource-files/LMHAEnvironmentalSustainabilityPolicy.pdf>
- F. [Lower Mainland Facilities Management Design Guidelines](#)

### Appendix B: External Governing Bodies Requirements

- A. [Leadership in Energy and Environmental Design® \(LEED\) v4 for Building Design and Construction \(Updated July 8, 2017\)](#)
- B. Local Government (the table below only shows cities, municipalities, districts, townships, etc. with bicycle parking-related bylaws available online)

City/Municipality	Link
Abbotsford	<a href="#">Section 150: Off-Street Parking and Loading Regulations</a>
Agassiz	<a href="#">Zoning Bylaw No. 1219, 2001 (Consolidated May 30, 2012)</a>
Burnaby	No provisions for off-street bicycle parking within its zoning bylaw; only guidance (below) for rezoning applications -  City of Burnaby 2009-01-30 - Bicycle
Chilliwack	<a href="#">Zoning Bylaw Section 5 – General Regulations</a> <a href="#">Zoning Bylaw Section 12 – Institutional Zones</a>
Coquitlam	<a href="#">Zoning Bylaw Part 7 Off-Street Parking and Loading</a>
Delta	<a href="#">Zoning Bylaw Off-Street Parking Facilities Bylaw No. 3293, 1981</a>
Gibsons	<a href="#">Zoning Bylaw No. 1065, 2007 (Consolidated December 22, 2016)</a>
Hope	<a href="#">Zoning Bylaw No. 1324, 2012 (Consolidated September 2014)</a>
Langley, City of	<a href="#">Zoning Bylaw No. 2100, 1996 (Consolidated September 21, 2017)</a> <a href="#">Draft Zoning Bylaw 3000</a>
Maple Ridge	<a href="#">Zoning Bylaw No. 4350, 1990, Off-Street Parking and Loading</a>
New Westminster	<a href="#">Zoning Bylaw No. 6680, 2001 (Consolidated November 3, 2014) 100 Introduction</a>
North Vancouver, City of	<a href="#">Zoning Bylaw No. 6700, Consolidated, Divisions I - VI</a> <a href="#">Zoning Bylaw No. 8076</a>  1502256 - Bike Requirements in Zoni
North Vancouver, District of	<a href="#">Zoning Bylaw No. 3210, 1965</a>
Pitt Meadows	<a href="#">Zoning Bylaw No. 2505, 2011</a>
Port Coquitlam	<a href="#">Zoning Bylaw No. 3630</a>
Port Moody	Zoning bylaw being reviewed - <a href="http://www.portmoody.ca/modules/showdocument.aspx?documentid=11952">http://www.portmoody.ca/modules/showdocument.aspx?documentid=11952</a>
Powell River	<a href="#">Zoning Bylaw 2100, 2006</a>
Richmond	<a href="#">Zoning Bylaw 7. Parking and Loading</a> <a href="#">Zoning By-Law 1200</a>
Sechelt	<a href="#">Zoning Bylaw No. 25, 1987 (Consolidated September 2011)</a>
Squamish	<a href="#">Zoning Bylaw, No. 2200, 2011 (Consolidated November 2011)</a>
Surrey	<a href="#">Zoning By-Law No. 12000 Part 5 Section D</a> <a href="#">Zoning By-Law No. 13774</a>
Vancouver	<a href="#">Section 6: Off-Street Bicycle Space Regulations</a>

	<a href="#">Bicycle Parking Design Supplement - Feb 8, 2001</a>
Whistler	<a href="#">Zoning and Parking Bylaw No. 303, 2015 Consolidation</a>
White Rock	<a href="#">Zoning Bylaw No. 2000, Consolidated June 20, 2017</a>