

Appendix B. Trip Enhancement Facilities

Trip enhancement amenities (also known as “end-of-trip facilities”) include bicycle parking and other facilities such as showers and clothing lockers for cyclists, and benches, water fountains and landmark indicators for pedestrians. They can be a determining factor in whether someone decides to make a bicycling or walking trip. They enhance the walking and bicycling experience by providing cyclists and pedestrians with somewhere to park, rest, or refresh themselves following or during their trip. Numerous studies have shown the value of these facilities in attracting pedestrians and cyclists to employment and activity centres and in supporting multi-modal trips. The CRD’s *TravelChoices Strategy* supports “integrating cycling with other modes, such as transit, ferries, airports, railways and local waterways through the provision of end-of-trip and inter-modal facilities” and sees it as a key feature in equalizing cycling with other modes.

A coordinated regional approach for trip enhancement facilities for active transportation includes supportive policies, incentives, and proper guidelines. Specific guidelines are provided in the *Bicycle and Pedestrian Design Guidelines*, which integrates regional and international best practices as well as innovative or experimental designs.

- **Bicycle parking** includes both long-term (often referred to as Class A or Class I) and short-term (often referred to as Class B or Class II) parking. These cater to different cycling groups depending largely on their trip duration and desired level of protection from weather and theft. Table 1 compares the typical characteristics of short- and long-term bicycle parking.
- **Other end-of-trip facilities** enable cyclists and pedestrians to freshen up following a trip and can include showers, washrooms, and clothing lockers, but may also include other services such as a laundry or dry-cleaning and bike-related services.



Figure 1. Stationnement de Montreal parking meter retrofit for short term bicycle parking.



Figure 2. Bike lockers provide a longer-term secure parking option.

Table 1. Characteristics of short- and long-term bicycle parking*

Criteria	Short-Term (Class B) Bicycle Parking	Long-Term (Class A) Bicycle Parking
Parking Duration	Less than two hours	More than two hours
Typical Fixture Types	Bicycle racks	Lockers, or racks provided in a secured area
Weather Protection	Unsheltered or sheltered	Sheltered or enclosed
Security	High reliance on personal locking devices and passive surveillance (i.e. eyes on the street)	Restricted access and / or active surveillance / supervision Unsupervised: "Individual-secure", e.g. bicycle lockers "Shared-secure", e.g. bicycle room or cage Supervised: Valet bicycle parking Video, CCTV or other surveillance
Typical Land Uses	Commercial or retail, medical/healthcare, parks and recreation areas, community centres	Residential, workplace, transit, schools

* Source: Association of Pedestrian and Bicycle Professionals (APBP)

Existing Conditions

End-of-trip facilities are currently provided throughout the CRD. Short-term parking is provided using bicycle racks in many public places as well as outside private buildings, while long-term parking and other end-of-trip facilities are provided at some publicly accessible sites but mostly on private property (e.g., as part of an office building).

The provision, design, and placement of these facilities are currently coordinated by the individual municipalities in the CRD or by the individual property owners or managers (e.g., CRD Regional Parks). Issues identified as a result of researching for this paper are described below. Regional best practice, as well as experience from elsewhere, can be used to establish a more coordinated, region-wide approach.

Inventory

Consistent information on the location, type, and condition of bicycle parking and other end-of-trip facilities is not widely available in the CRD. Cyclists, and potential cyclists, would be better informed to make trip decisions with dissemination of this information. New York City, for example, uses downloadable Google maps (also available on PDAs) that show cyclists the location of outdoor, sheltered, and indoor bicycle parking (see Figure 1).

Creating such an inventory is challenging given that much of the supply, particularly for long-term parking and other end-of-trip facilities, is located on private property – often screened from the street. Gathering and maintaining this data would require significant effort but should be coordinated at a regional level with input from the member municipalities. An alternative data collection method is to open up the map to stakeholder groups and or the public, perhaps creating an “open-source” inventory.



*Figure 3. New York City Parking Inventory Maps
Outdoor (left) and Sheltered (right).*

Although an extensive inventory is not currently available, some examples of existing practices in the CRD are provided below.

Bicycle Parking at Transit Exchanges

End-of-trip facilities create connections with transit and increase the reach of these services by making cycling attractive for the “first and last kilometre” of the journey. Bicycle lockers are currently available at two regional transit facilities: McTavish Park and Ride in North Saanich and the Western Exchange Park and Ride in Colwood. Bicycle lockers are rented on a monthly basis (\$10/month), and a \$30.00 refundable deposit is required for the key. Lockers are managed by various Cycling Coalitions in the region, depending on where

the lockers are located. Locker construction is generally funded out of the overall capital budget for each project.

Bicycle Parking in Victoria

The City of Victoria has adopted innovative strategies for providing bicycle parking. This includes providing covered bike racks and, where sidewalk space is limited, placing racks close to the building to accommodate a single bicycle. Each of the four City-owned parkades has a designated area with bike racks that are installed next to or in view of the 24-hour security booth. Each parkade has a *plug-in* facility where electric bicycles can be charged at no cost.

A sheltered bicycle rack that provides weather protection was included at the downtown Victoria YMCA in exchange for a vehicle parking relaxation. The roof of the shelter also acts as a gateway to the building.

Several businesses are experimenting with on-street bicycle corrals in locations with narrow sidewalks. At one particular location, several hundred customers at a local coffee shop signed a petition asking for an on-street corral and raised money through collecting contributions. The City provided a concrete curb extension covering two vehicle parking spaces with coat hanger-style racks.

Bicycle Parking at the Airport

In preparation for the Pro Walk – Pro Bike Conference held in Victoria in 2004, conference organizers worked with the airport management to provide a place to re-build bikes that had been transported in boxes, and to install bicycle lockers at the airport. These amenities are still provided for traveling cyclists.

Change Facilities

Health and fitness clubs can offer an alternative to providing end-of-trip facilities within each building by building a dedicated ‘bike station.’ Most clubs already offer these facilities as member services and can also provide them to the general public as an extension of their business, all the while increasing their advertising. Any centralized end-of-trip facility needs to be well thought out and should be located sufficiently close to desired destinations, such as office buildings in a downtown location.

Policies

The practice of specifying short- and long-term bicycle parking requirements for new construction and redevelopment through municipal bylaws is well established and ensures that key destinations provide cyclists “somewhere to park.” Typically, these bylaws specify the amount of parking required depending on the land use as well as sometimes providing guidance on placement and incentives. Some municipalities in the CRD also require other end-of-trip facilities. Existing bicycle parking standards in the Region are summarized in Table 2.

Table 2. Comparison of Bicycle Parking Standards

Jurisdiction	Bicycle Parking			Showers, Lockers, etc.		
	Required	Recommended	Optional	Required	Recommended	Optional
Core Region						
District of Oak Bay		x				
City of Victoria	x					
District of Saanich	x				x	
Town of Esquimalt	x		x**		x	x**
Town of View Royal	x*			x*	x	
West Shore Region						
City of Langford			x**			
District of Sooke		x			x	
District of Metchosin						
District of Highlands	x					
City of Colwood	x					
Peninsula Region						
District of Central Saanich	x					
District of North Saanich						
Town of Sidney	x					

* Only required for certain land uses

** To be provided with reduction in motor vehicle parking

Some examples of the policy language currently used in the region include:

- Town of Esquimalt: End-of-trip facilities for cyclists such as secure bicycle parking/storage, lockers, change rooms and showers, should be provided to encourage cycling as a viable form of transportation. (OCP; 2.3.2 General Commercial – Mixed Use Policies).
- Town of Esquimalt: Motor vehicle parking may be reduced in cases where two or more secure bicycle parking spaces are provided, shower and change rooms are provided within the building, 6 visitor bicycle parking spaces are provided on-site, and the building is located within 200 metres of a regional bus route. (Parking Bylaw No. 2011, 2003, Section 13 (5)).
- City of Langford. The City Planner may vary off-street parking by up to 10% of the required off-street parking if the owner of the above described property provides five secure bicycle storage or bicycle parking spaces for each off-street vehicle parking space waived (Zoning Bylaw No. 300, 1999 Section 6.51A.09)

- District of Saanich: Require bicycle parking/storage, and encourage change and shower facilities where appropriate, in commercial, institutional, public, recreational, and multi-family residential buildings. (OCP Bylaw 8940; 4.2.9 Mobility Policies).
- District of Sooke: Provide bicycle facilities (e.g. secure storage, change rooms, showers) and racks throughout the community ... in particular at Edward Milne Community School, the town centre area and SEAPARC. (Sustainable Development Strategy; Strategy #2 - Key Tasks & Catalyst Projects).
- District of Sooke: Make cycling more attractive to District employees by providing secured bike storage and showers at District Hall. (Sustainable Development Strategy; Strategy #2 - Key Corporate Tasks; Encourage alternatives to the vehicle).
- District of Sooke: The District should investigate opportunities to implement a bylaw that requires all retail and office with more than ten (10) employees to provide a shower facility for employees. (Transportation Master Plan, 5.3 Bicycle Shower/Change Facilities).
- Town of View Royal: The inclusion of bicycle parking areas and facilities such as showers, lockers, and change rooms shall be encouraged at commercial, institutional, public, recreational, and multi-family residential development sites. (OCP Bylaw No. 361; 3.4.1 Transportation – Policies).
- Town of View Royal: End-of-trip amenities for cyclists, including, but not limited to, showers, change rooms and temporary bicycle storage must be provided for the convenience of customers and employees in Comprehensive Development (Business Park)_ Zone CD-7 (Land Use Bylaw No. 35, 1990, Zone Table Comprehensive Development (Business Park) CD-7)
- District of Oak Bay: Recommends increased numbers of bicycle racks in high density public areas to “encourage more people to consider cycling as a means of transportation.” (OCP Bylaw No #3943; 28.3; Objective 2).
- Town of Sidney: In conjunction with local community groups, the creation of bicycle parking facilities downtown and in other high-density areas will be encouraged and supported where appropriate and the demand is sustainable. (OCP Bylaw No. 1920; Cycling and Pedestrian Transportation; 17.3.9).

Further details about the regulatory tools used to regulate bicycle parking, such as zoning bylaws or traffic bylaws, are included in the Bylaw Review.

Bylaw Bicycle Parking Rates

Bicycle parking rates for a number of municipalities are compared in Table 3. For the most part, these are fairly consistent across the region with some variation in the amount (with requirements tending to be higher in higher density areas) and the mix of long-term and short-term parking.

Beyond off-street requirements, the Victoria Corporate Strategic Plan 2007-2009 also recommends on-street bicycle parking rates depending on the adjacent land use. In general, regional and neighbourhood centres, as well as regional facilities such as hospitals, schools, recreation, and community facilities, are high bicycle parking generators.

The City of Victoria has a cost-sharing program to split the cost of on-street bicycle parking with local businesses, primarily in the downtown core and in major commercial centres. This is a practice adopted in many places to encourage retrofit of the existing system.

Table 3. Comparison of Existing Bicycle Parking Guidelines in CRD

	Sidney		Colwood		Saanich		Central Saanich	Highlands	Esquimalt	Sooke1		Victoria		
	Class I	Class II	Class I	Class II	Class I	Class II	Any	Any	Class I	Class II	Class I	Class II	Class I	Class II
Residential														
Multi-Family Residential	0.5 sp / unit	0.25 sp / unit	1 sp / unit	6 spaces	1 sp / unit	6 spaces	1 sp / 10 vehicle parking spaces (all uses)	1 sp / 10 vehicle parking spaces (all uses)	1.5 sp/unit	6 spaces	0.8 sp/unit	0.2 sp/unit	1 sp/unit	6 spaces
Senior Citizen Housing	4 spaces	6 spaces	0.7 sp / 15 units	0.3 sp / 15 units	0.7 sp / 15 units	0.3 sp / 15 units							0.7 sp/15 units	0.3 sp/15 units
Commercial														
Commercial, General	1 sp/125 m ² *						1 space / 10 vehicle parking spaces (all uses)	1 sp / 10 vehicle parking spaces (all uses)	1 sp/10 fulltime employees (1 space min.)	6 spaces			0.5 sp/205 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)	0.5 sp/205 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)
Commercial, Retail		6 spaces	0.5 sp/250 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)	0.5 sp/250 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)							0.25 sp / 200m ² GFA	0.75 sp / 200m ² GFA		
Commercial, Office		1 sp/125 m ² *	0.5 sp/250 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)	0.5 sp/250 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)	0.5 sp/250 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)	0.5 sp/250 m ² GFA (<5,000 m ²), plus 0.5 sp/500m ² GFA (> 5,000 m ²)					0.75 sp / 200m ² GFA	0.25 sp / 200m ² GFA		
Commercial, Shopping Centre			0.3 sp/250 m ² GFA (<5,000 m ²), plus 0.3 sp/500m ² GFA (> 5,000 m ²)	0.7 sp/250 m ² GFA (<5,000 m ²), plus 0.7 sp/500m ² GFA (> 5,000 m ²)	0.3 sp/250 m ² GLA (<5,000 m ²), plus 0.3 sp/500m ² GLA (> 5,000 m ²)	0.7 sp/250 m ² GLA (<5,000 m ²), plus 0.7 sp/500m ² GLA (> 5,000 m ²)							0.3 sp/205 m ² GFA (<5,000 m ²), plus 0.3 sp/500m ² GFA (> 5,000 m ²)	0.7 sp/205 m ² GFA (<5,000 m ²), plus 0.7 sp/500m ² GFA (> 5,000 m ²)
Hotel/Motel	1 sp/500 m ² *		0.6 sp / 15 rooms	0.4 sp / 15 rooms	0.6 sp / 15 rooms	0.4 sp / 15 rooms					0.6 sp/15 rooms	0.4 sp/15 rooms	0.6 sp/15 rooms	0.4 sp/15 rooms, plus 6 visitor spaces (over 75 rooms)
Industrial			0.8 sp/950 m ² GFA	0.2 sp/950 m ² GFA	0.8 sp/950 m ² GFA	0.2 sp/950 m ² GFA			1 sp/10 fulltime employees (1 space min.)					

	Sidney		Colwood		Saanich		Central Saanich	Highlands	Esquimalt		Sooke ¹	Victoria		
	Class I	Class II	Class I	Class II	Class I	Class II	Any	Any	Class I	Class II	Class I	Class II	Class I	Class II
Civic Uses														
Recreational		6 spaces	0.2 sp / 40 seats, plus 1 sp / 5 employees (spectator facilities) 0.2 sp / 80m ² Surface Area (gym, spa)	0.8 sp / 40 seats (spectator facilities) 0.8 sp / 80m ² Surface Area (gym, health spa)	0.2 sp / 100m ² Surface Area (spectator facilities) 0.2 sp / 80m ² Surface Area (gym, health spa)	0.8 sp / 100m ² Surface Area (spectator facilities) 0.8 sp / 80m ² Surface Area (gym, health spa)	1 space / 10 vehicle parking spaces (all uses)	1 space / 10 vehicle parking spaces (all uses)			0.25 sp / 200m ² GFA	0.75 sp / 200m ² GFA		
Cultural	1 sp/250 m ² *	6 spaces	0.2 sp / 100m ² GFA (library/ museum)	0.8 sp / 100m ² GFA (library/ museum) 1/50 seats (church)	0.2 sp / 100m ² GFA (library/ museum)	0.8 sp / 100m ² GFA (library/ museum) 1/50 seats (church)					0.25 sp / 200m ² GFA	0.75 sp / 200m ² GFA		
Educational	1 sp/250 m ² *		1 sp / 10 employees, plus 0.5 sp / 10 students (elementary) 0.5 sp / 8 (junior/ senior) 0.5 sp / 8 (junior/ senior) 0.5 sp / 5 college 1 sp / 4 residents (residences)	0.5 sp / 10 students (elementary) 0.5 sp / 8 (junior/ senior) 0.5 sp / 5 college	1 sp / 10 employees	1 sp / 10 students (elementary) 1 sp / 8 (junior/ senior) 1 sp / 5 college					0.25 sp / 200m ² GFA	0.75 sp / 200m ² GFA		
Day Care			0.2 sp / 80m ² GFA	0.8 sp / 80m ² GFA	0.2 sp / 80m ² GFA	0.8 sp / 80m ² GFA								
Hospitals	1 sp/250 m ² *	6 spaces	0.75 sp / 500m ² GFA	0.25 sp / 500m ² GFA, plus 6 space racks at each entrance	0.75 sp / 500m ² GFA	0.25 sp / 500m ² GFA, plus 6 space racks at each entrance								
Parking Structure											10% of vehicle spaces			
Other Uses											As determined by the District			

* Assessed on 80% of GFA.

¹ Based on recommendations in the Sooke Transportation Master Plan – these are not bylaw requirements.

Incentives

Some municipalities provide incentives for a developer to include bicycle parking and end-of-trip facilities beyond the minimum requirements. Esquimalt, for example, offers reductions in off-street motor vehicle parking at commercial and industrial buildings if all of the following conditions are met:

- Two (2) or more secure bicycle storage spaces are provided;
- Shower and change rooms are provided;
- Six (6) visitor bicycle parking spaces are provided; and
- The building is located within 200 metres of a regional bus route.¹

A slight variation from the Lower Mainland is the City of Vancouver's incentive for reduced motor vehicle parking if a developer provides bicycle parking above the minimum required amount. In Vancouver, required rates of motor vehicle parking have already been adjusted (decreased) to encourage walking and bicycling by reducing parking availability.

A number of municipal bylaws allow the collection of payment-in-lieu of parking. These policies were traditionally only applied under certain conditions (e.g., where buildings cannot be altered due to historic value) and only when the funds could be applied to a collective parking facility nearby. However Bill 27 now allows for collection of payment-in-lieu under any conditions with the funds being placed in a sustainable transportation infrastructure fund and used to fund future projects².

Trip Enhancement Facilities Guidelines and Recommendations

This section provides recommendations for developing a coordinated regional approach to end-of-trip facilities for active transportation. Recommendations include sample policies, incentives, and design guidelines. These topics integrate regional and international best practices as well as innovative or experimental designs.

In general, the CRD can encourage municipalities to develop bicycle parking requirements and design guidelines, as part of their bylaws, that would:

- Require bicycle parking and end-of-trip facilities in both newly constructed buildings and redevelopment.
- Consider both long-term and short-term parking requirements.
- Establish standards for the provision of end-of-trip facilities such as showers, washrooms, and clothing lockers.
- Provide incentives to encourage bicycle parking facilities beyond the minimum requirements.
- Provide guidance on the design and placement of these facilities.
- Establish bike rack programs that assist in the location, design, and funding of bicycle racks to stimulate retrofitting short-term bicycle parking in the existing network.

¹ Parking Bylaw 1992, No. 2011.

² Fraser Basin Council (2009). *Transportation Demand Management – A Small- and Mid-Size Communities Toolkit*.

Bylaw Bicycle Parking Requirements

Most municipalities in the CRD maintain a set of bicycle parking requirements that relate the amount of required parking to the size of different land uses. It is recommended that where these bylaws already exist the municipality continue to use those standards.

However, a number of municipalities do not maintain bicycle parking requirements as part of their bylaws, or they base their rates on a percentage of motor vehicle parking required (which is problematic given automobile parking demand is not necessarily an indicator of bicycle parking demand and as alternative modes are encouraged at the expense of driving and parking, this will result in fewer bicycle parking spaces).

Where municipalities do not have existing or appropriate bylaw requirements, the following rates are offered as general recommendations. These are based on existing regional practice and the 2010 *Bicycle Parking Guidelines* produced by the Association of Pedestrian and Bicycle Professionals (APBP) and are included in Table 4.

Table 4. Recommended Parking Requirements, Residential Land Uses

Type of Activity	Long-Term Bicycle Parking	Short-Term Bicycle Parking	Source	Notes
Residential				
Single family dwelling	No spaces required	No spaces required		
Multi-family dwelling				
a) With private garage for each unit*	No spaces required	0.5 spaces / unit, minimum 2 spaces	APBP	
b) Without private garage for each unit	At least 1.0 space/unit distributed at least 50% to long-term		Regional bylaws	
c) Senior housing	0.7 spaces / 15 units, minimum 2 spaces	0.3 spaces / 15 units, minimum 2 spaces	Regional bylaws	
Civic / Cultural				
Non-assembly cultural (library, government buildings, etc.)	0.2 spaces / 100 m2 GFA	0.8 spaces / 100 m2 GFA	Regional bylaws	
Assembly (church, theatre, stadium, park, beach, etc.)	1 space / 10 employees	Spaces for 2% of maximum expected daily attendance	APBP	
Health care/hospital	0.75 spaces / 500 m2 GFA	0.25 spaces / 500 m2 GFA	Regional bylaws	
Day Care	0.2 spaces / 80 m2 GFA	0.8 spaces / 80 m2 GFA	Regional bylaws	
Education				
Elementary	1 space / 10 employees	1 space / 10 students	Regional bylaws	Short-term parking could include a bike compound
Junior/Senior	1 space / 10 employees	1 space / 8 students	Regional bylaws	Short-term parking could include a bike compound

Type of Activity	Long-Term Bicycle Parking	Short-Term Bicycle Parking	Source	Notes
Post-Secondary	1 space / 10 employees	1 space / 5 FTEs	Regional bylaws	More long-term parking may be desirable.
Rail/bus terminals and stations/airports	Spaces for 5% projected a.m. peak period daily ridership	Spaces for 1.5% a.m. peak period daily ridership	APBP	
Retail				
Shopping Centre	0.3 sp/250 m2 GFA (<5,000 m2), plus 0.3 sp/500m2 GFA (> 5,000 m2)	0.7 sp/250 m2 GFA (<5,000 m2), plus 0.7 sp/500m2 GFA (> 5,000 m2)	Regional bylaws	
General retail	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	Regional bylaws	
Office	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	Regional bylaws	
Auto Related				
Automotive sales, rental and delivery, automotive servicing, automotive repair and cleaning	1 space for each 1,000 m2 of floor area	1 space for each 1,850 m2 of floor area	APBP	
Off-street parking lots and garages available to the general public either without charge or on a fee basis	1 space for each 20 automobile spaces, minimum 2 spaces – unattended surface parking lots excepted	Minimum of 6 spaces or 1 per 20 auto spaces – unattended surface parking lots excepted	APBP	
Industrial				
General	0.8 space / 950 m2 GFA	0.2 space / 950 m2 GFA	Regional bylaws	

* A private locked storage unit may be considered as a private garage if a bicycle can fit into it.

Anticipating Demand at Transit Stations

Providing parking at transit stations is particularly important and has been given additional consideration. The amount of parking needs to exceed the average demand, as users should be able to depend on facilities being available. Demand determines not only the amount of parking, but the type of facility provided as well.

The following are examples of guidelines used by other agencies around the world:

- Bicycle parking at exchanges should be between one space per 150 entrants and one space per 1,000 entrants, depending on station type and use. (The London Underground)

- Bicycle parking should be 50-80% occupied on average. If parking is at a location that is likely to experience considerable growth or if there are regular overflow periods (e.g., the station would be popular for use during a large event), it should be closer to 50% occupied and built with the ability to expand easily. (*The CROW Design Manual for Bicycle Traffic*)
- The number of lockers provided should exceed the current demand for lockers (measured by counts of bikes parked at racks and the current usage and wait list for locker at a station) by 10% to allow for fluctuations and growth. (Bay Area Rapid Transit [BART])
- Bike stations should be considered when the demand for long-term parking exceeds 100 bicycles. (BART)

Other factors to consider when estimating demand for a new station or for providing long-term parking where it previously did not exist include:

- Demographics of the service area
- Extent of the bicycle network in the area surrounding the station
- Current ridership capacity
- Mode share
- Trip destination
- Planning goals for the area
- Current parking use at the station
- Current use of bike-on-bus racks
- Type of transit service (bus, light rail or commuter rail)
- Presence of employment and/or major employer near exchange
- Projected regional growth
- Projected bicycle ridership levels

Table 5 outlines a series of questions that help determine the type and quantity of parking at a particular transit station.

Table 5. Recommended Adjustment Factors for Estimating Bicycle Parking at Transit

Factor	Adjustment
Results of the bicycle parking demand model	
How many bicyclists are estimated to park at the site?	Facility should provide parking for at least 20% more bicycles than estimated to regularly use the facility.
Will a particular segment of potential market demand be emphasized over others due to the location?	Hours of parking availability should be convenient for workers and students; marketing efforts should be targeted to potential users.
For each station, how reliable is it to find space for bikes at rush hour?	Quantity of parking should be sufficient to meet bicycle-on-bus or -train capacity.
How much does the demand for park-and-ride spaces exceed supply?	In areas where Park and Ride lots are at capacity, improved bicycle parking can capture a proportion of would-be drivers.
Is there evidence of current bike activity (e.g. parked bikes) at the site?	Facility should provide parking for at least 20% more bicycles than regularly use the facility, and more if demand is estimated to increase.
Type of public transportation	
Does the station connect to a bus route?	Parking should be provided to accommodate riders who may not find space for a bike on their connecting bus.
Does the transit short-cut a hill or other barrier to bicycling?	People are more likely to take transit with their bicycles if they can avoid a large hill, or if transit is significantly faster than bicycling. Increased parking facilities should be provided. In addition, the transit agency may want to work with the responsible agency to remedy the barrier.
Does the transit line offer a time savings as compared with bicycling (e.g., connecting distant destinations with few stops)?	Transit lines offering travel time savings over bicycling should provide more long-term parking.
Surrounding employment and commercial density	
How many jobs fall within biking distance of the site?	Accommodate transit users who may be interested in storing an additional bicycle at the non-home trip-end.
Will the number of jobs within biking distance of the site grow in the future?	Ensure that there is space for expansion in locations that are likely to be close to future employment.
Potential to generate operating revenue	
Is there a need for bicycle repair and accessory sales in the immediate vicinity?	People will use the resources available at the bicycle parking if the community does not have them available otherwise; this is likely to increase the use of bicycle parking and bike-to-transit trips.
Is there a need for some other complementary business activity in the immediate vicinity?	It is possible to recoup some of the expenses of providing bicycle parking by linking complimentary uses, such as bicycle rentals/fleets and food sales.

Incentives

There are a number of incentives that can be used to encourage improved bicycle parking and end-of-trip facilities. These include:

- Providing motor vehicle parking relaxations where bicycle parking is provided beyond the minimum requirements.
- Providing motor vehicle parking relaxations where complete end-of-trip facilities are provided, e.g., long- and short-term parking coupled with showers, washrooms, and clothing lockers.
- In space-constrained applications, such as redevelopment of an existing building, allow for the conversion of motor vehicle parking spaces into long-term bicycle parking to meet the bylaw requirement (typically five bicycle parking spaces can be achieved per motor vehicle parking space).
- Extending or introducing payment-in-lieu of parking programs to allow funds to be collected in-lieu of vehicle parking and placed in a sustainable transportation infrastructure fund to fund active transportation projects, which may include a centralized bicycle parking and end-of-trip facility (e.g. a bike station). Note: this should not replace bicycle parking and end-of-trip facility requirements.

Bike Rack Program

The CRD should encourage the municipalities to establish a Bicycle Rack Program that works with interested land owners to supplement the existing supply of bicycle parking. The CRD can provide information on possible vendors as well as rack design and placement as part of these guidelines. Municipalities should be encouraged to set up some form of joint funding arrangement with interested land owners to install bicycle racks.

Increased Awareness

The CRD should raise awareness of the benefits of short- and long-term bicycle parking and end-of-trip facilities to developers, owners, and managers of privately-owned commercial properties. The 2010 report, *Bike Corrals: Local Business Impacts, Benefits, and Attitudes* found widespread support for bike corrals from local businesses. *The Employer Guide to Bicycle Commuting: Establishing a Bike-Friendly Workplace for your Baltimore Region Employees* is a good example of information the CRD could make available to employers interested in encouraging cycling to work. The document compares the initial cost of 12 automobile parking spaces (\$40,000 to \$100,000 USD) to the cost of 12 bike rack spaces and one automobile space (\$4,600 - \$9,600 USD).

Design Principles

This section provides best practices for designing pedestrian amenities and bicycle end-of-trip facilities. Consideration is also provided for proper placement and frequency of amenities.

Pedestrian Amenities

Pedestrians benefit from a variety of amenities, including benches, water fountains, covered areas, street lighting, and street trees, that provide opportunities to rest, replenish, and enjoy the trip. These amenities also provide visual detail that makes a place comfortable and interesting.

Placement

Sidewalks and other walkways should be kept clear of amenities, as well as poles, newspaper racks, and other items in the walkway area. Sometimes this can be done by grouping amenities at a street corner or curb extension. Protruding objects should be minimized and made detectible by pedestrians who are visually impaired.

Recommended locations for placing pedestrian amenities include:

- Transit exchanges
- Major building entrances
- Retail main streets
- Restaurants

While such amenities will likely be installed incrementally along a corridor, a streetscape improvement plan will help give a coherent theme for a corridor.

Benches

A consideration particularly important for elderly pedestrians, benches provide pedestrians with an opportunity to stop and rest before continuing their trip. Street furniture should not block the pedestrian walkway or curb ramps, nor should it create sightline problems. Benches can sometimes be incorporated into building form or landscape features.

Water Fountains

Water fountains provide water for people (and pets, in some cases) and can be attractive landscape features.

Covered Areas

Usually located at a bus exchange, covered areas or shelters provide a place for pedestrians to get out of inclement weather or wait for a bus. Bus exchange accessibility guidelines are provided by BC Transit in the document, *Design Guidelines for Accessible Bus Stops*. These are discussed in greater detail in Appendix C: Active Transportation and Transit Integration.

Street Lighting

Pedestrian-scale lighting improves safety and comfort for pedestrians at night. Lighting improves drivers' ability to see pedestrians, allows pedestrians to see obstacles or uneven pavement on the sidewalk, and increases personal safety. Streetlights should be placed on both sides of arterial and collector streets, and in commercial areas. Crossing areas may benefit from lighting.

Street trees

Street trees provide an attractive cover that calms traffic while shading pedestrians. The appropriate street tree for a particular location depends on maintenance, root growth pattern, foliage texture, growth rate, longevity, canopy spread, resistance to urban pollutants, and tolerance to drought and poor soils.

Trees should not block views of storefronts or impair pedestrian, bicyclist, or driver visibility. They should be spaced so that they provide a continuous overhead canopy when mature – spacing will vary depending on species. A diversity of species can help discourage disease and make an attractive pattern.

Bicycle Parking

Bicycle parking is necessary for all cyclists, regardless of whether they are commuting to work or school, going shopping or running errands, or enjoying a recreational outing. The following guiding principles influence the design and location of all types of bicycle parking:

- **Safety and Security:** Surveillance of bicycle parking facilities helps to prevent theft and vandalism, and also helps cyclists to feel more personally secure when locking or retrieving their bicycle. Wherever possible, bicycle parking should be located within view of pedestrians, retail activity or office windows, or should include other security measures such as video surveillance and street

lighting. Bicycle parking facilities should be designed with high quality, theft resistant materials and be firmly anchored to the ground or building.

- **Convenience and Accessibility:** Bicycle parking should be at least as convenient as automobile parking to ensure cycling is an attractive option. Bicycle parking facilities should be located near building entrances and other attractions. Additionally, facilities should be located along the street or along dedicated bicycle routes. Proximity to pedestrian and automobile traffic should also be taken into consideration so as to avoid conflicts with other modes of transportation. Wherever possible, bicycle parking locations that require cyclists to travel over stairs or hills should be avoided. Finally, bicycle parking also needs to be plentiful. Cyclists need to be confident that they will have a designated place to secure their bicycles once they reach their destination.
- **Visibility and Lighting:** The location selected for short-term bicycle parking should be well-lit and easily identifiable by cyclists as they are riding. A highly visible and well lit location will also help reduce theft and vandalism, both of which are significant deterrents to bicycle usage.
- **Avoiding Conflicts with Both Pedestrians and Vehicles:** The location of bicycle parking should not present a conflict with pedestrians, other cyclists, or automobiles. The design of bicycle parking facilities should avoid any protruding bars that could trip or injure cyclists or pedestrians. Very low, bar-type racks should also be avoided for the same reason. Bicycle parking should be separated from automobile parking areas and from roads by a physical barrier.
- **Quality of Design and Aesthetics:** Where appropriate, the design and aesthetic quality of the bicycle rack should reflect the surrounding neighbourhood and environment, and coordinate with other street furniture. Bicycle parking facilities should receive ongoing maintenance, and any graffiti or vandalism should be cleaned or repaired immediately.

Rack Types

The following list of bicycle parking facility types incorporate a small variation of typical support designs. Bicycle ‘staples’ are the standard two-bicycle racks, which can be placed on- or off-street, as well as in a locked room or parking garage. Bicycle racks are easily adaptable to meet almost any aesthetic purpose so long as it meets the two basic functions of upright support and locking of frame and wheels. Bicycle racks also facilitate the use of ‘U’ type locks and conventional chains or cables. While staple racks can appear similar, there are small differences that can have impacts on usability and security. The following are key characteristics to consider when choosing a bicycle rack:

- **Support:** The rack must keep the bicycle upright without damaging the wheels or the frame. To do so, the rack must support the bicycle upright by its frame at two points in a horizontal plane to prevent the bicycle from falling.
- **Security:** The rack must be able to be used with common bicycle locks, including cable locks or U-shaped locks, and should be designed so that the frame and one or both wheels can be secured. The bicycle rack should be resistant to being cut or detached using bolt cutters, pipe cutters, or other devices, and should be securely anchored to the ground or the building structure to prevent it from being removed.

- **Flexibility:** The rack must accommodate a wide range of bicycle sizes, wheel sizes, and types. The typical dimension envelope for most bicycles is 1.8 metres in length, 0.6 metres in width, and 1.2 metres in height. Most conventional bicycles have dimensions similar to these, and most acceptable bicycle racks and lockers accommodate these dimensions. In addition, site layouts should strive to accommodate other bicycle types such as recumbent, folding bicycles, trail-a-bike child carriers, bicycle trailers, and cargo bicycles.
- **Materials:** The rack should be covered with a material that will not chip the paint of a bicycle that leans against it. The rack should also not have hazards, such as sharp edges, that could damage a bicycle, injure the cyclist, or damage clothing. The materials used should also resist rusting and corrosion.
- **Attractiveness:** The rack should be compact and attractive. The rack should fit in with the surrounding streetscape and urban environment. Bicycle racks can incorporate unique colours or original designs to match awnings, facades, or other street furniture.
- **Simplicity:** The rack should be simple and intuitive to use and as a general rule should avoid having any moving parts.
- **Capacity:** The bicycle rack should be able to actually hold the number of bicycles claimed. Unfortunately, though, this is not always the case.
- **Space and Cost Effectiveness:** The bicycle rack should maximize the use of the bicycle parking envelope and occupy a small footprint in order to not impede other users. The rack should maximize efficiency by allowing more than one bicycle to be secured to the rack. Finally, the rack should not present a hazard to pedestrians.

There are several common types of bicycle racks that meet many of these design criteria including:

- **U-Racks**, common in Victoria, are attractive, simple, and designed to effectively support two bicycles while utilizing very little space. U-racks can also be clustered together in areas of high demand and incorporate unique colours or design features to match the surrounding streetscape.
- **Post and ring racks**, which can support two bicycles, occupy a very small footprint, and can be effectively attached to other infrastructure such as motor vehicle parking meters. Post and ring racks can also incorporate unique colours to match the surrounding streetscape.
- **Coat hanger or spiral racks**, which allow cyclists to lock one wheel and the frame of the bicycle to the rack and can accommodate multiple bicycles. These racks can also incorporate unique colours to match the surrounding streetscape.

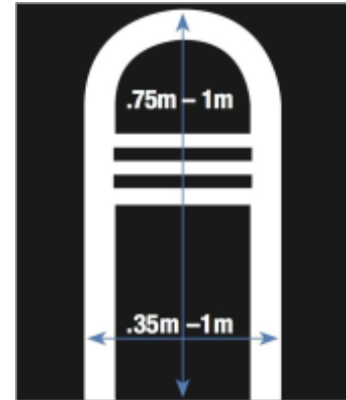


Figure 4. U-rack model dimensions.

Source: Capital Bike and Walk Society: *Bicycles at Rest Best Practices Guide*

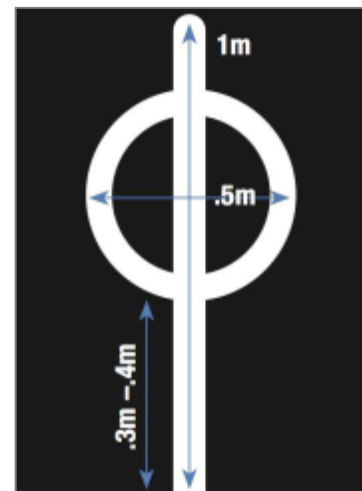


Figure 5. Post and ring rack dimensions.

Source: Capital Bike and Walk Society: *Bicycles at Rest Best Practices Guide*

Racks that do not meet these criteria include:

- **Wheelbender racks**, which consist of concrete blocks slotted for a bicycle wheel. These racks hold only the bicycle's wheel, and do not support the use of a U-shaped lock. They can also cause damage to the bicycle wheels.
- **Comb racks or toaster racks**, which are designed to roll bicycles into wheel slots. These types of racks also lack stable support and can cause damage to the bicycle wheels.
- **Wave racks**, which only provide a single point of horizontal contact and lack stability.

The following lists provide guidance on the placement of bicycle racks.

Recommended Clearance

- If the bicycle rack is located perpendicular to a wall, at least 0.6 metres clearance shall be provided if the rack has single-side access. If the rack has double-sided access, 2.5 metres clearance shall be provided.
- If the bicycle rack is located parallel to a wall, at least 0.45 metres clearance shall be provided.
- Clearance from fire hydrants or bus exchanges should be 1.5 m minimum.
- Clearance from potential points of conflict with other users such as intersections and driveways should be 1.2 m.
- Clearance from obstructions such as street trees, utilities and street furniture, garbage cans, etc. should be 1.2 m minimum. A clear distance of 0.9 m is the minimum standard.

Spacing between Racks

- If two separate bicycle racks are provided parallel to each other, a minimum of 0.7 metres must be provided between the racks.
- A clear aisle width of at least 1.8 metres must be provided between bicycle racks that hold more than two bicycles. For typical bicycle racks, this results in approximately 4.2 metres between bicycle racks.
- If bicycle racks are provided in a parallel series, a minimum of 1.8 metres shall be provided between the racks.

Spacing between Rack Ends

- A clear width of 0.9 metres shall be provided between rack ends to balance maximum bicycle parking capacity with adequate bicycle manoeuvrability.

Cargo bikes, tandems, bikes with trailers, and other less-conventional bicycles are too large to park in a standard sidewalk bicycle rack or corral, and are often too large to bring indoors. Table 6 provides an overview of non-conventional bicycle types and parking implications.

Table 6. Non-Conventional Bicycle Types

Bicycle Type	Notes
Tandem (two inline riders)	Length up to 250 cm; other specs similar to conventional bicycles. Will fit in most outdoor bicycle racks, but may extend into aisles.
Recumbent (feet-first, or with a chair or sling-like seat)	<p>Height of seat back similar to height of conventional bicycles.</p> <p>Front wheels frequently smaller than 66 cm, sometimes also rear wheels.</p> <p>Pedals often elevated, sometimes as much as 45 cm above ground.</p> <p>Several subtypes:</p> <ul style="list-style-type: none"> • Short wheelbase: length < conventional. • Medium wheelbase or compact: length like conventional. • Long wheelbase: length < conventional. <p>If length does not exceed conventional length, a recumbent will typically fit in a bicycle locker. Even if overall length does not exceed conventional length, the distance between tire contact points may exceed the length of guide trays in certain two-level bicycle storage racks.</p>
Adult tricycle	<p>Two formats:</p> <ul style="list-style-type: none"> • Delta (single wheel in front). • Tadpole (single wheel in rear). <p>Two layouts in each format:</p> <ul style="list-style-type: none"> • Upright (similar to conventional comfort of hybrid bicycles). • Recumbent (feet first, similar to two-wheel recumbent).
Cargo	<p>Several subtypes:</p> <ul style="list-style-type: none"> • Longtail (extended length bicycle frames which carry cargo behind the rider). • Cargo trailer (wheeled cart which attached to the rear of the bicycle to carry cargo). • Bakfiets (Northern European-style cargo bicycle which carries cargo in front of the rider, usually in a large basket or wooden cargo hold).

Source: Association of Pedestrian and Bicycle Professionals: Bicycle Parking Guidelines (2nd Edition)

Placement

In order to encourage bicycle use, bicycle parking must be as convenient, if not more so, than motor vehicle parking. The facilities must be located in close proximity to building entrances and elevators. Table 7 provides some general placement guidelines.

Table 7. Bicycle Rack Placement Guidelines

Design Issue	Recommended Guidance
Minimum Rack Height	To increase visibility to pedestrians, racks should have a minimum height of 0.8 metres or be indicated or cordoned off by visible markers.
Signing	Where bicycle parking areas are not clearly visible to approaching cyclists, signs at least 0.3 metres square should direct them to the facility. The sign should include the name, phone number, and location of the person in charge of the facility, where applicable.
Lighting	Lighting of not less than one foot-candle illumination at ground level should be provided in all bicycle parking areas.
Frequency of Racks on Streets	In popular retail areas, two or more racks should be installed on each side of each block. This does not eliminate the inclusion of requests from the public which do not fall in these areas. Areas officially designated or used as bicycle routes may warrant the consideration of more racks.
Location and Access	Access to facilities should be convenient; where access is by sidewalk or walkway, accessible curb ramps should be provided where appropriate. Parking facilities intended for employees should be located near the employee entrance, and those for customers or visitors near main public entrances. (Convenience should be balanced against the need for security if the employee entrance is not in a well-travelled area). Bicycle parking should be clustered in lots not to exceed 16 spaces each. Large expanses of bicycle parking make it easier for thieves to be undetected.
Locations at Buildings	Provide bike racks within 15 metres of the entrance. Where a security guard is present, provide racks behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.
Locations near Transit Exchanges	To prevent bicyclists from locking bikes to bus exchange poles, which can create access problems for transit users, particularly those who are disabled, racks should be placed in close proximity to transit exchanges where there is a demand for short-term bike parking.
Locations within a Campus-Type Setting	Racks are useful in a campus-type setting at locations where the user is likely to spend less than two hours, such as classroom buildings. Racks should be located near the entrance to each building. Where racks are clustered in a single location, they should be surrounded by a fence and watched by an attendant. The attendant can often share this duty with other duties to reduce or eliminate the cost of labour being applied to bike parking duties; a cheaper alternative to an attendant may be to site the fenced bicycle compound in a highly visible location on the campus. For long-term parking needs of employees and students, attendant parking and/or bike lockers are recommended.
Retrofit Program	In established locations, such as schools, employment centres, and shopping centres, the CRD should conduct bicycle audits to assess bicycle parking availability and access, and add additional bicycle racks where necessary.

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