

Cycling Support Services Study Pilot Bicycle Station Implementation Plan



April 2010

Cycling Support Services Study – Pilot Bicycle Station Implementation Plan April 2010

This is document 4 of 4.

Prepared for TransLink by Third Wave Cycling Group Inc., Via Architecture and Halcrow Consulting.

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1 Introduction

1.1 Study Objectives

The objectives of the Pilot Bicycle Station Implementation Plan are to:

1. Recommend a pilot site in the Pacific Centre parkade close to Granville Station for near-term implementation of a bicycle station.
2. Outline the facility requirements and characteristics, including resource needs and key services offered.
3. Develop an appropriate business model, including:
 - Sample operating budget;
 - Preferred operating responsibility arrangements;
 - Potential partners and funding sources.
4. Produce a schematic design of the facility, including:
 - Site plan;
 - Spatial relationship diagram;
 - Principal floor plans;
 - Building sections;
 - Elevations;
 - Outline specifications.
5. Estimate capital costs based on the schematic design and the services offered.
6. Recommend next steps should a decision be made to pursue a bicycle station at this site.

1.2 Study Background

The strategies outlined in TransLink's Transport 2040 include better integration of bicycles and transit and improved facilities to help ensure cycling is safe, appealing, and easy to use. This study is part of the *Cycling Support Services Study (CSSS)*, the component of TransLink's Regional Cycling Strategy covering bicycle parking, end-of-trip facilities and bicycle and transit integration.

Market research undertaken as part of the CSSS confirmed the lack of secure on-demand bicycle parking and bicycle end-of-trip facilities at many locations in the region is discouraging people from cycling more often. It also confirmed that secure bicycle parking at transit stations can increase transit ridership and decrease driving. For instance, before SkyTrain station bicycle locker users began using the lockers, 37% used a private vehicle for some portion of their trip with 24% driving all the way and 15% parking their car at the station.¹

The CSSS Strategic Plan identified bicycle stations as a potential solution in high demand locations near busy transit stations, shopping destinations, and employment centres.

Bicycle Stations

Bicycle stations offer secure staffed parking and a range of end-of-trip facilities and services, including change rooms, showers, toilets, bike accessories, repairs, bike rentals, and retail such as food and beverages. The mix of services offered depends on a variety of factors including demand, trip mix, location and cost. In Europe and Japan, bicycle stations are quite common near rail and transit stations. There are currently eleven Bicycle Stations in the US ranging in size from 80, to 300 spaces and an

¹TransLink Listens Cycling End-of-Trip Facilities Survey, NRG Research Group, Aug. 14, 2009, 9.

additional twenty being considered in North America. The first Canadian bicycle station recently opened in Toronto at Union Station.

As revenues from parking and related end-of-trip facilities typically do not cover operating costs and market rents, it is necessary to consider rent or operating subsidies and bicycle-related profit-generating activities such as bicycle repairs and accessory sales. It is also worthwhile to choose an operator (a profit or nonprofit organization) who has experience in the retail bicycle industry. Table 1 summarizes some of the operations in Europe and North America.

Table 1 - Bicycle Stations Operating Summary²

Station	Year Opened	Space	Average Usage	Operating Subsidy	Funding Agencies	Operator
Münster Radstation	1996	3,300	3,000	Free rent, has shared profit with city since opening	City of Münster, Deutsche Bahn	Hundt of Radstation Münster
Bikestation ® Long Beach	1999	77	75	\$5,000/month	Bay Area Rapid Transit	Bicycle Friendly Berkeley Coalition
Bikestation ® Palo Alto	1999	150	75	Decreasing \$4,000/month ended in mid-2004, free rent	City of Palo Alto, Bay Area Air Quality Management	Palo Alto Bicycles
Millennium Park Bike Station, Chicago	2004	300	75	Free rent, finished space, maintenance provided by the city	City of Chicago, Chicago Department of Transportation, Chicagoland Bicycle Federation, Igo Car Sharing, Cycle Safe, Breezer Bikes, McDonalds	Bike Chicago
Bikestation ® Berkeley	1996	83	35	\$4,000/month	City of Long Beach, Calstart, Long Beach Redevelopment	Bikestation

Pacific Centre Pilot Bicycle Station

The CSSS *Bicycle Station and Enclosure Location Prioritization Study* evaluated over 150 locations throughout Metro Vancouver to determine their suitability for bicycle stations and bicycle parking enclosures based on potential demand, bicycle access, and site availability. Several locations in the region showed sufficient demand to warrant further consideration as the location for a pilot bicycle station. Most are in downtown Vancouver, including Burrard, Granville, Waterfront and Stadium SkyTrain Stations. As the Pacific Centre Parkade has capacity that is not fully utilized and the City of Vancouver has expressed interest in determining the feasibility of using such excess capacity for bicycle parking, Pacific Centre was chosen as the location for this study. For further details on the location assessment, refer to the CSSS *Bicycle Station and Enclosure Location Prioritization Study*.

Those with an interest in establishing a pilot bicycle station at Pacific Centre include the City of Vancouver, TransLink, EasyPark (the operator of the parkade), Cadillac Fairview (the owners of Pacific Center) and the Province of British Columbia. The City of Vancouver has identified a bicycle station in the downtown core as a strategic part of its efforts to encourage more cycling. TransLink currently provides secure bicycle parking at many transit stations and exchanges throughout Metro Vancouver. As part of the Provincial Transit Plan, the Province has committed to help provide secure bicycle parking at transit stations. EasyPark, the operators of Pacific Centre Parkade are supportive of the bicycle station and need to be involved throughout the implementation process, to minimize the impact on their operations. Cadillac Fairview has received requests from its tenants for improved bicycle parking and end-of-trip facilities.

² Bike Transit Centre Implementation Plan, Los Angeles County Metropolitan Transportation Authority (Metro), <http://www.scribd.com/doc/7572256/2004-Bike-Transit-Center-Implementation-Plan>

As part of a rezoning, the City of Vancouver required Cadillac Fairview to undertake a feasibility study for a bicycle station at Pacific Centre. The *Bike Center Pacific Centre Feasibility Study* by Bunt & Associates examined other bicycle stations around North America, to help determine demand, space requirements, operating costs, capital costs, business arrangements, funding sources and possible sites at Pacific Centre. It concluded a bicycle station would break down some barriers to cycling, encourage transportational cycling and that the financial sustainability would be increased by including bicycle repairs and retail. It recommended the station be operated as a public-private partnership and market research be undertaken to determine price elasticity for the bicycle parking.

1.3 Scope of Work

This study expands upon *Bike Center Pacific Centre Feasibility Study* by Bunt & Associates by selecting a specific site within Pacific Centre for the bicycle station, developing a financial model for staffed secure bicycle parking and end-of-trip facilities at this site, drafting a schematic design for the facility and estimating the associated capital cost based on the design. Confirming the results of the Bunt study, this assessment finds that capital and operating costs pose a challenge and recommends a number of ways to address these financial hurdles.

2 Situation Analysis

2.1 Cycling Barriers

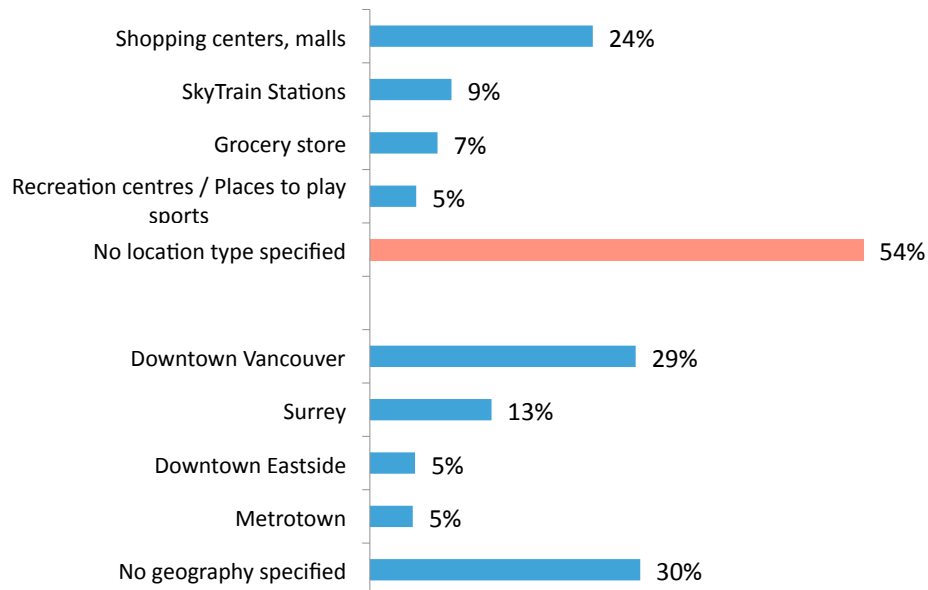
Especially for more frequent cyclists, the lack of secure parking, showers and change rooms are significant barriers that discourage them from cycling more.³

Table 2 - Barriers to Cycling

	Regular	Monthly	Yearly	< Yearly	Potential
Lack of comfortable bicycle routes	36%	28%	26%	19%	15%
Poor weather	24%	18%	14%	8%	6%
Lack of places to store/lock bike	15%	10%	10%	8%	10%
No place to shower/change	6%	10%	5%	4%	2%
Health barriers	6%	10%	9%	19%	16%
Don't own a bicycle	<1%	1%	8%	17%	27%
Bridges are dangerous to cross	7%	5%	3%	0% ²	3%
Poor road conditions/Potholes	5%	4%	1%	2% ²	2%
Cost of bicycle/Maintenance too much	1%	2%	1%	9%	9%

Shopping malls and Downtown Vancouver are the top locations where cyclists have avoided making trips by bicycle specifically due to the fear of bicycle theft.⁴

Figure 1 - Places where cyclists have avoided trips due to theft concerns



³ TransLink Listens Cycling End-of-Trip Facilities Survey, 28.

⁴ Ibid., 31.

2.2 Bicycle Parking Types

Bicycle Enclosures in Parkades

The bicycle enclosures with lock and key or smart card access found in many office building parkades are a good solution for commuters. However, for transit users and shoppers, the lack of visibility from the street of can make enclosures in parkades difficult to locate and decrease perceived security.

Lockers at Transit Stations

The lockers with lock and key access supplied by TransLink that are located near many transit stations are popular with frequent commuters who use transit for part of their commute. However lockers are not very space efficient and thus it would be difficult to site a sufficient supply of them to meet demand in downtown Vancouver. Due to the 3 month rental period, they are also impractical for people who make less frequent trips.

Secure On-demand Parking

Secure on-demand parking combines flexibility with security, accommodating both frequent and infrequent work, transit, entertainment and shopping trips. Solutions include electronic lockers, enclosures with electronic access, bicycle stations and mechanized parking. Electronic lockers and freestanding enclosures require significant sidewalk space or empty surface lots, both of which are in short supply near Pacific Centre.

Bicycle Stations

Staffed bicycle stations with highly visible storefront entrances offer secure on-demand parking and other end-of-trip facilities that will attract users whose final destinations are up to 250m from the station. The significant operating and capital costs of bicycle stations make them best suited for high demand locations near transit stations, employment centres, and shopping destinations.

Bicycle Racks

Bicycle racks are a good solution for short-term parking (less than an hour). For longer durations, people typically want more secure parking.

2.3 Existing Bicycle Parking Facilities

There is a limited range of bicycle parking options in the area around Pacific Centre. These options include secure bike parking in offices within the catchment area for the bicycle station, as well as less secure on-street parking at bicycle racks or other street furniture. Many of the office buildings in the catchment area were built before requirements for bicycle parking were integrated into development bylaws. As a result, there is inadequate bicycle parking to serve current levels of cycling and accommodate future increases in demand. This parking deficit will likely grow as cycling trips increase.

In Pacific Centre, there is currently a bicycle room with space for around 64 bicycles and racks with space for 130-260 bicycles around the site frontages.⁵ The bicycle room is accessed with a smart card via the Howe Street parkade entrance south of Pender Street. The supply of secure bicycle parking in the surrounding buildings has not been inventoried.

In summary, the existing supply of parking is predominantly geared towards long-stay commuters and is restricted to employees of particular buildings. There is currently no secure on-demand bicycle parking within reasonable walking distance of Pacific Centre for transit, shopping or entertainment trips. Although the City of Vancouver recently updated its bicycle parking bylaw to require more secure bicycle parking in new developments and upgrades to existing developments, these changes will likely not significantly increase the supply in the vicinity of Pacific Centre for the foreseeable future.

⁵ Bike Centre Pacific Centre Feasibility Study – Draft Report, Bunt & Associates, 2008, 8.

2.4 Success Factors

The success of the bicycle station can be measured by the utilization of the facility, the increase in trips by current cyclists, the attraction of new cyclists and the ability to operate without on-going subsidies.

Research from Bikestation™ indicates that approximately 30% of demand stems from new cyclists that previously drove, suggesting very significant modal shift behaviour. In addition, 60% of users cycled more often because of the additional convenience, security, and services provided.⁶ In order to achieve positive outcomes, a number of factors that influence the success of such a service need to be taken into account. These include⁷:

- Professional brand identity and experience, targeted at mainstream and new cyclists;
- Operating the service as its own brand;
- The physical presence offered by retail-like buildings;
- First class service that generates positive word-of-mouth;
- Visibility and effective communication of their services.

Highly Visible Site

To be successful, a bicycle station requires a highly visible site such as a retail storefront along a commercial street. Such a site will ensure cyclists and potential cyclists notice the facility and customers are attracted to the parking, retail, and repair businesses. A well-lit storefront in public view on a street with high levels of pedestrian traffic ensures cyclists feel safe using a bicycle station.

2.5 Risk Areas

Risk areas include:

- Construction costs;
- Competition from nearby bicycle parking;
- Perceived safety of cycling connections;
- The possible impact on demand of the proposed pricing for the parking;
- Operator and business model uncertainties.

Construction Costs

There is little experience in constructing a bicycle station in a parkade. In the detailed design or construction phases, issues could be discovered that increase construction cost and time.

Other Parking Facilities

Bicycle enclosures in existing structures such parkades are relatively inexpensive (\$1,000-\$2,000 per space) to construct. Such facilities could be constructed by businesses to attract employees or by building owners to attract tenants within the catchment area of Pacific Centre. While many cyclists indicate a preference for bicycle stations, many are also attracted to free or low cost facilities closer to their destinations. While these facilities would likely only serve commuters, not transit users or shoppers, the bicycle station business model in this location financially depends on commuter business that may be attracted to other options nearby.

Bicycle Connections

Bicycle connections to the Central Business District (CBD) are less than ideal in terms of network continuity and perceived safety. While the City of Vancouver is planning to improve these connections, until and unless these connections are implemented, demand for the services and facilities offered by the station could be limited.

⁶Intermodal Infrastructure for New Transportation Realities, Bikestation™, 31.

⁷Andrea White, Bikestation™, interview by Rob Macdonald, Vancouver, BC, September 2008.

Price Elasticity

While the proposed pricing for the parking is similar to that of other bicycle stations, it is above the levels suggested by the regional market research. While it is likely that locations downtown will accommodate higher prices, this is not certain. If prices are lowered or demand suffers due to high prices, it is less likely that the bicycle station will be financially viable.

Operator

Experience in the bicycle industry does not guarantee success in the operation of a bicycle station. An operator could encounter financial problems that could impair their ability to successfully operate the bicycle station.

Bicycle Repairs and Accessories

In the proposed business model, the bicycle station depends in part on the bicycle repair and accessory sales business to remain financially viable. With any such business, there is a significant risk that it may underperform financially, especially during the startup years.

2.6 Motor Vehicle Parking Pricing and Supply

The automobile parking rates for the Pacific Centre Parkade are \$5 per hour, \$20 per day for weekdays, \$4 per day for weekends, \$275 per month and \$375 per month reserved.⁸ There are 1,528 parking spaces in the parkade. During peak periods in January, the utilization rate is around 70%.⁹ EasyPark has indicated that the parkade is 100% utilized on some days, typically during the Christmas shopping season. Initiatives that increase the price or decrease the supply of parking near Pacific Centre could increase the success of the bicycle station. For instance, the parking tax collected by TransLink will increase the cost of automobile parking and thus may encourage more people to cycle downtown and park at the station. The higher price of parking may also allow higher price points for paid bicycle parking, improving financial performance.

2.7 Trends in Utilitarian Cycling

The Cycling in Cities Research by UBC indicates a strong preference by experienced and inexperienced cyclists for bicycle routes separated from traffic. Vancouver City Council has stated that going forward, separated bicycle facilities are a priority. Bicycle traffic on Burrard Bridge increased 25% after the installation of separated bicycle lanes. Electric bicycles are rapidly gaining in popularity, making distance and hills less of a barrier to cycling.

2.7.1 Cycling Connections

East-west bicycle routes close to the site include Dunsmuir Street and shared bus/bike lanes on Pender Street. North-south routes include Richards, Homer, Burrard and Hornby Streets. With the exception of the westbound bike lane on Dunsmuir, all the other bicycle routes require potential bicycle station customers to ride at least two blocks on roads where cyclists have to share lanes with motor vehicles. While such connections are adequate for experienced cyclists, less experienced and new cyclists will not likely use them.

The City of Vancouver has implemented a two-way separated bicycle path on the Dunsmuir Viaduct and is planning separated bicycle lanes connecting the CBD to the separated bicycle facilities on Burrard Bridge and the Dunsmuir Viaduct. Such facilities are more likely to attract new cyclists to the bicycle station and encouraging existing cyclists to use the bicycle station more often.

2.7.2 Cycling Education and Promotion

Promotion and education play an important role in encouraging cycling. Bicycle use on the Central Valley Greenway increased by around 60% following the grand opening and associated media and promotional

⁸ <http://www.easyparkvancouver.com/EasySearch.aspx?LotID=8&Sub=1>

⁹ Bike Centre Pacific Centre Feasibility Study – Draft Report.

activities. Bike to Work Week attracted 3800 new commuter cyclists in Metro Vancouver from 2007 through 2009. TransLink advertises bike lockers at transit station on transit vehicles, on the lockers, in newspapers and on its web site, with on-site signage playing the largest role in raising awareness among users.

3 Markets and Demand

3.1 Target Markets

The primary target markets are cyclists and potential cyclists who are commuters or transit users. Shoppers and entertainment venue customers who cycle are secondary target markets. Experience from other bicycle stations indicates people are willing to walk up to 250m from a bicycle station to their final destination.¹⁰

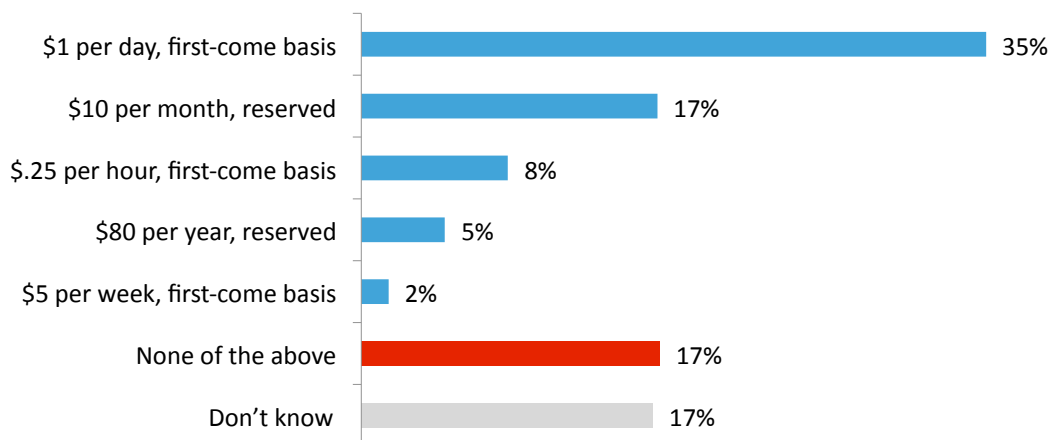
Commuters who work in office towers likely wear business attire and thus need change rooms, showers and lockers. Longer distance commuters are more likely to require showers due to increased physical effort. Commuters who work in retail business are less likely to need to wear business attire but still have to appear presentable on the job so they may require change rooms, lockers and showers. However, due to lower wages, they will probably be less likely to use the bicycle station facilities and services.

Transit users are less likely to require showers but still may take advantage of some of the other facilities and services such as lockers and bicycle repairs. Some may cycle to the bicycle station, shower, and then take transit to their final destination.

Shoppers and entertainment customers typically want more secure bicycle parking if they are at their destination for longer than one hour. They may use lockers to store their helmets and other bicycle gear. Late-night access to the bicycle parking will likely be required by entertainment customers dining or going to clubs and events downtown.

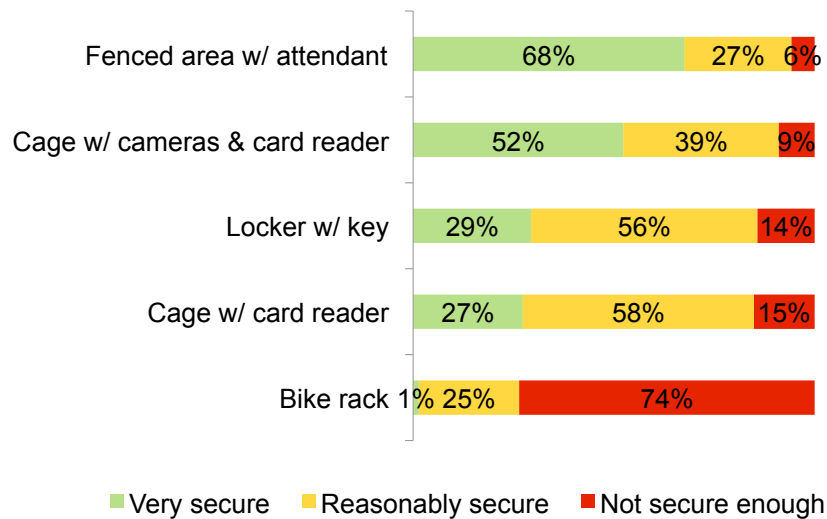
As detailed in the following two figures, the market research indicates significant demand for on-demand and staffed bicycle parking.

Figure 2 - Rental Period and Payment Preferences¹¹



¹⁰Bike Centre Pacific Centre Feasibility Study – Draft Report.

¹¹TransLink Listens Cycling End-of-Trip Facilities Survey, 46.

Figure 3 - Perceived Security of Parking Types¹²

3.2 Market Size

Cycling accounts for 2.1% of the 128,600 commuting trips to the CBD during weekday mornings. Between 7am and 10am, this amounts to a total of 2,700 trips.¹³ The 250m catchment area includes 44% of CBD office space and 33% of the retail space in Downtown Vancouver. The site is also near the Granville entertainment district, several hotels and UBC Robson Square. The current supply of secure parking within the catchment area is unknown. However, as detailed in Figure 1, the market research indicates a significant lack of secure parking in downtown Vancouver and near Granville Station.

3.3 Pricing

In the market research, 86% of current cyclists indicated that \$1 a day was about right or too low for lockers while only 39% felt that \$3 a day was about right¹⁴. Current locker users felt \$10 a month was a good value, while 64% indicated they would prefer to pay \$80 a year. Current cyclists favoured attended parking at \$15 dollars a month (22% very likely) over a locker with keys at \$10 per month (5% very likely).¹⁵ As well, one-half of cyclists (52%) said that the bike stations would make them somewhat or much more likely to cycle than other forms of secure bicycle parking.¹⁶ This may also indicate a willingness to pay more for parking in a bicycle station.

Round-trip transit fares are \$5.00 for one zone if the trip duration is longer than 1.5 hours. A monthly one-zone pass is \$81.

Since parking prices for automobiles are higher downtown than the regional average, it is likely that people, especially drivers who may consider switching to cycling, have an expectation of paying significantly more to park downtown than the rates identified in the market research for bicycle parking.

Bicycle station parking rates in other cities can also be used to guide pricing levels.

¹² TransLink Listens Cycling End-of-Trip Facilities Survey, , 49

¹³ Bike Center Pacific Centre Feasibility Study – Draft Report, Bunt & Associates, 2008, 8.

¹⁴ TransLink Listens Cycling End-of-Trip Facilities Survey, 50.

¹⁵ Ibid., 55

¹⁶ Ibid., 60

Table 3 - Sample Bicycle Station Parking Rates

	Day	Month	Year
Toronto	\$2	\$20	\$180
Chicago		\$25	\$149
Seattle ¹⁷	\$2	\$15	\$130
Bike Stations - Washington DC, Claremont, Covina, Long Beach, Palo Alto, and Santa Barbara ¹⁸	\$1	\$12	\$96

Giving the above, the proposed pricing is as follows:

Table 4 - Proposed Bicycle Station Parking and Shower Rates

	Hour	Day	Month	6 Month	Year
Parking	\$0.5	\$2	\$20	\$100	\$150
Reserved Parking			\$50	\$130	\$180
Shower and Parking ¹⁹		\$7	\$50	\$170	\$270
Change Room		\$1			
Locker	\$0.25	\$1			

These rates are in addition to the yearly administrative fee of \$20, which is typical for bicycle stations in the United States. The intent of the relatively high 6-month rate is to encourage people to buy parking for a year instead. Longer commitment to parking space may encourage cyclists to continue commuting cycling longer into the winter months. Market research to measure price elasticity for bicycle parking within the catchment is recommended.

At this point, it is not clear whether the parking tax collected by TransLink will apply to paid bicycle parking. If it does, this could impact the viability of the bicycle station. A 21% tax on the projected parking revenue of \$170,000 would amount to \$36,000 per year. If this is added onto the price of the parking, the rates would be near the \$3 per day level that the market research indicated is too high and thus demand could be negatively impacted. If parking rates are reduced to compensate, this would decrease the financial performance of the station and thus, a higher rent or cash subsidy would be required.

3.4 Expected Demand and Usage Rates

TransLink's market research indicates that there is likely significant demand for secure bicycle parking near Pacific Centre. As detailed in the following figure, 26% of cyclists indicate they would be likely to use secure parking at Granville and Vancouver City Centre Stations.²⁰

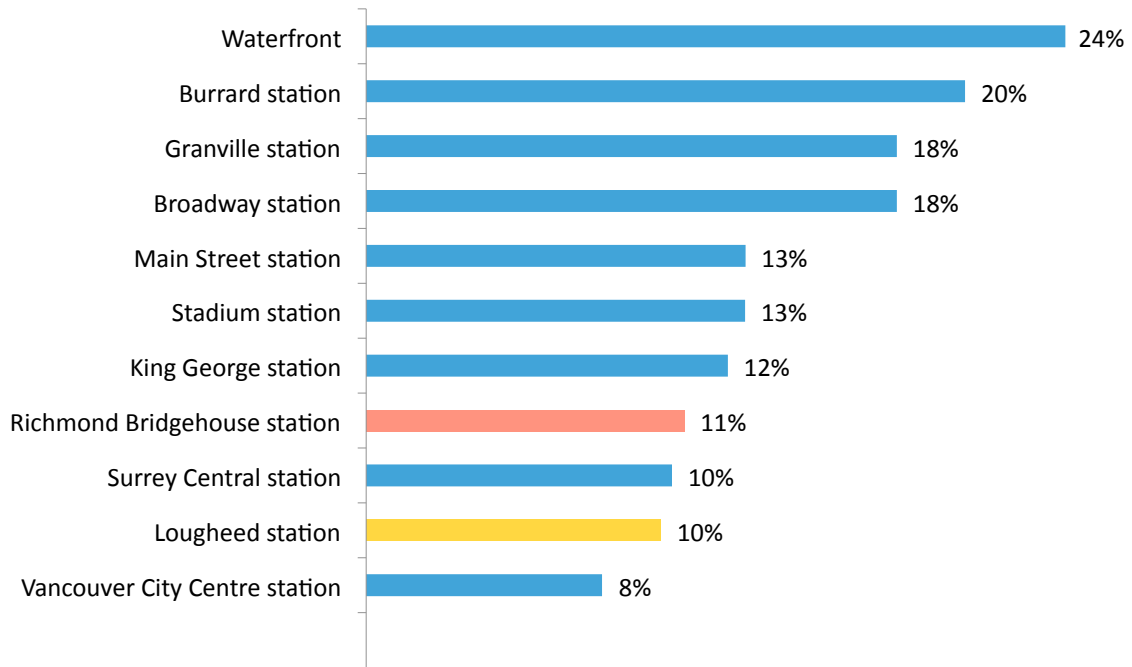
¹⁷ Seattle may be increasing rate to \$190 per year.

¹⁸ Includes the use of a personal locker.

¹⁹ Includes Locker and Change Room.

²⁰ TransLink Listens Cycling End-of-Trip Facilities Survey, 73.

Figure 4 - Transit Stations Where Cyclists Would Likely Use Secure Parking



If Pacific Centre were developed today, the City of Vancouver bylaws would require 573 class A (secure) and 18 class B (bicycle racks) parking spaces.²¹ There is currently a bicycle room with space for around 64 bicycles and racks with space for 130-260 bicycles around the site frontages.²² Thus there are 406 fewer secure bicycle parking spaces than would be required.

Table 5 - Bylaw Parking Requirements

Use	Size ²³	Bylaw Rate ²⁴	Class A Bicycle Parking Spaces
Hotel	376 rooms	1 / 30 rooms	13
Office	165,842 m2	1 / 500 m2	332
Retail	113,660 m2	1 / 500 m2	228
Total			573

TransLink’s market research indicates that a bicycle station is more attractive to cyclists than just secure bicycle parking.

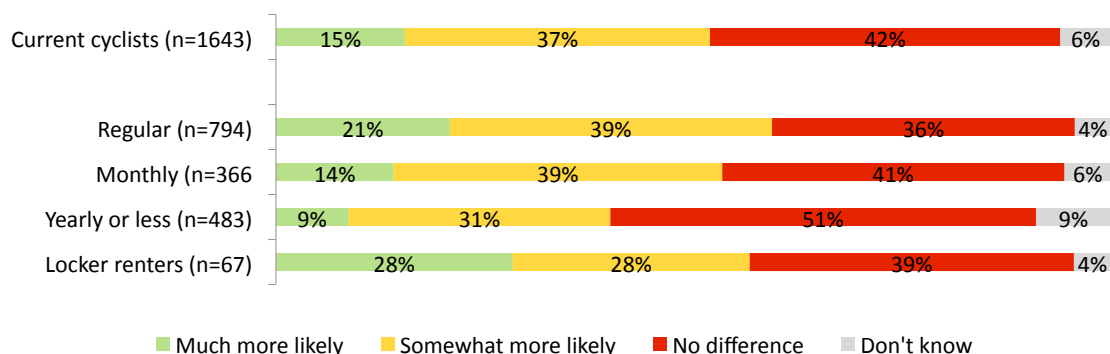
²¹ Bike Center Pacific Centre Feasibility Study – Draft Report, Bunt & Associates, 2008, 8.

²² Ibid.

²³ Ibid.

²⁴ Off-street Bicycle Space Regulations, City of Vancouver, <http://vancouver.ca/commsvcs/Bylaws/parking/sec06.pdf>

Figure 5 - Would a Bicycle Station make you more likely to cycle than just secure bicycle parking?²⁵



The following attraction indices over basic bicycle parking options are based on the US bicycle station experience²⁶. These attraction indices indicate the increase in demand for parking in a bicycle station over other secure bicycle parking.

Table 6 - Bicycle Station Attraction Indices

Trip Type	Attraction Index
Work trips	10-20%
School trips	5-10%
Shopping trips	5-10%
Recreation trips	1-5%

Work/Shopping Demand

Using these attraction indices, the *Pacific Centre Bike Centre Feasibility Study* estimated a peak daily demand of 340 to 681 spaces for work trips and 14 to 32 spaces for shopping trips.¹ As Pacific Centre and Granville Street are shopping destinations where people are likely to park for longer periods of time and thus more likely to use secure parking, the shopping trips are likely to be at the top of the range. These estimates were reviewed and are supported by demand estimates from the *Bicycle Station and Enclosure Locations Prioritization Study* undertaken by TransLink in 2009. Based on trip diary results, shopping demand estimates are 1.9 times (Saturday) and 1.5 times (Sunday) weekday demand.

Transit Demand

The *Pacific Centre Bike Centre Feasibility Study* estimated a demand of 40 spaces for home-based transit-linked trips to Granville Station, based on a percentage of the residents in the West End. However, it did not consider destination-based trips or cyclists riding from the west side of Vancouver. The *CSSS Bicycle Station and Enclosure Locations Prioritization Study* estimated a demand of 32 home-based trips and 19 destination-based cycling trips²⁷ per day to Granville Station. The destination-based trips will likely not increase the need for parking spaces during the day, since the bicycles are parked overnight at the station and picked up for use in the morning. For Vancouver City Centre, 36 home-based and 12 destination-based trips were estimated. It is likely, however, that the less restrictive bicycles on transit policies of the Canada Line and the longer walk to the station from the bicycle station site will somewhat reduce the demand for parking.

There is also demand for secure bicycle parking at other downtown transit stations within a five minute ride of Pacific Centre. Until secure parking is available at the other stations, the Pacific Centre Bicycle Station will be the only option, likely increasing the usage of the facility. The total estimated demand per for parking is 155 for all the downtown Expo Line stations and 119 for all the downtown Canada Line

²⁵ TransLink Listens Cycling End-of-Trip Facilities Survey, 57.

²⁶ Bike Center Pacific Centre Feasibility Study – Draft Report, Bunt & Associates, 2008, 16.

²⁷ Trips where cyclists ride transit from home to a bicycle parked at a transit station and cycle to their destination.

stations. While it is not reasonable to expect that this will translate into that level of demand at the bicycle station, demand in the range of 50 to 100 bicycles per day is reasonable to expect.

Entertainment Demand

As the majority of entertainment trips are in the evening and the parking duration is longer than one hour, there is likely significant demand for secure parking. In Metro Vancouver, 13% of all bicycle trips are made for social reasons²⁸ while shopping accounts for 12%. While entertainment does not account for all entertainment trips in the region, a good portion of social trips to downtown are likely entertainment trips. To err on the conservative side, the estimates used for entertainment trips are somewhat less than shopping trips. The Saturday estimate is twice that of the weekday estimate.

Table 7 – Parking Demand Estimates

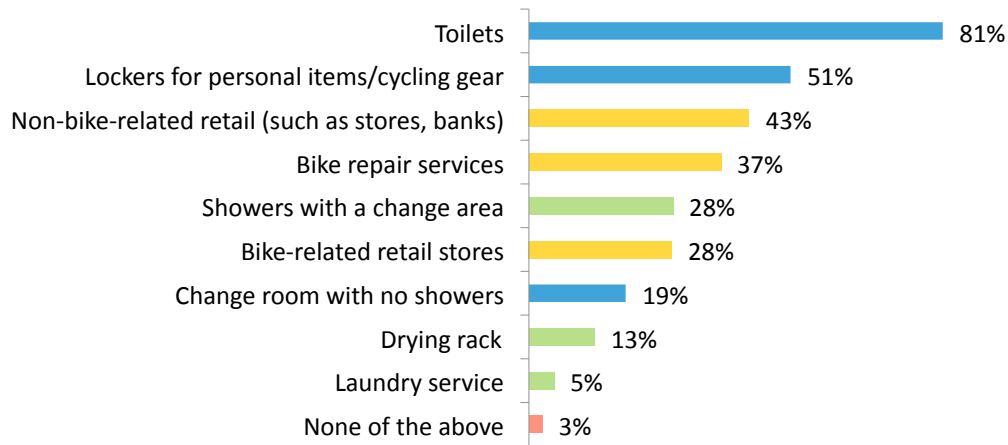
	Weekday		Saturday		Sunday	
	Low	High	Low	High	Low	High
Work	341	681	40	80	20	40
Transit	50	100	40	85	25	50
Shopping	14	32	48	61	21	48
Entertainment	10	20	20	40	10	20

Given that on-going operating subsidies are not desirable, parking revenue will be required to assist in covering operating costs. As demand for free parking can be around double that of pay parking, it is reasonable for the initial supply parking spaces to be near the low estimates.

End of Trip Facilities

The market research indicates the level of demand for other bicycle station end-of-trip facilities and services.

Figure 6 - Facilities That Cyclists Would Likely Use at a Bicycle Station²⁹



²⁸ Adam Di Paula, Richard Elias, Cycling In Cities: Final Report, NRG Research Group, March, 2007, http://www.translink.bc.ca/files/polls_surveys/cust_satisfaction/CyclingInCitiesSurveyReport.pdf, 27.

²⁹ TransLink Listens Cycling End-of-Trip Facilities Survey, 60.

4 Operation Overview

The Operational Overview outlines the recommended site, design, products, services and operation for the bicycle station at Pacific Centre. The objective is to make cycling more attractive to both existing and new cyclists while ensuring the financial viability of the facility.

4.1 Product

4.1.1 Site

The recommended site is located in the heart of Downtown Vancouver across the street from the Granville SkyTrain Station and near Vancouver City Centre Canada Line Station. It is located in one of the most popular malls in Metro Vancouver and the 250m catchment area includes 33% of the retail space in Downtown Vancouver. The site is also near the Granville entertainment district, several hotels and UBC Robson Square. For more details, refer to Appendix 1 - Schematic Design Workbook, page 4.

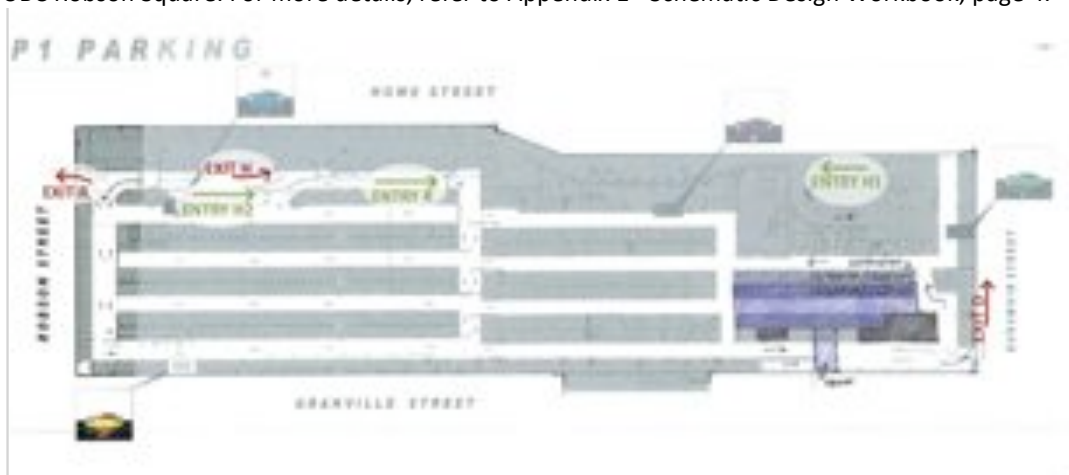


Figure 7 - Proposed Bicycle Station Site

The primary criteria for site selection were:

- Proximity to Granville SkyTrain Station;
- Bicycle and pedestrian access;
- Visibility;
- Constructability;
- Impact on parkade access and operations.

This site meets all the primary criteria. For more details on site selection, refer to Appendix 1 - Schematic Design Workbook, page 2.

4.1.2 Design

The design offers a comprehensive variety of facilities and services that will encourage more people to cycle more often.

The recommended primary access is via a retail storefront on the west side Granville Street that is less than 100 metres from Granville SkyTrain Station. This entrance will be highly visible to cyclists, pedestrians and transit users and thus help ensure the facility is well used, the retail component is successful, and the personal security of the users is protected. The majority of the facility is in the Pacific Centre parkade replacing underutilized automobile parking inventory. A new ramp is required from the

storefront down to the parkade where the majority of the services including the parking, showers and change rooms are located. This configuration combines the benefits of a retail storefront while minimizing the use of costly street-level retail space. A secondary entrance located in the parkade level allows convenient access to elevators to the office tower for commuters and stairs to the mall for shoppers.

The design offers a range of services to make cycling more attractive especially for commuters, including: secure bicycle parking, showers, gear lockers, and bicycle repairs. The repair stations are placed at the bottom of the stairs near the bicycle parking area and the entrance to the parkade. This allows staff to easily monitor people accessing the facility and the parking area, improving the security of the bicycles and customers.

For more details including diagrams, refer to Appendix 1 - Schematic Design Workbook, page 7.

4.1.3 Parking

The design includes a total of 351 parking spaces on the parkade level. The main parking enclosure contains 298 single-level spaces and twelve spaces with hitching posts that can be used for bicycles such as recumbents and tandems that do not fit in the other spaces. Electrical outlets are provided for charging electric bicycles and lights. All parking is single level, as the ceiling is not high enough for double level parking. The single-level racks are space-efficient as every second rack slightly raises the handlebars allowing bicycles to be parked closer together. 41 spaces are in a separate enclosure that can be used for premium priced reserved parking.

While peak demand for parking could exceed 351 spaces, this will likely only occur a few days per year during May, June and September. During these periods, staff could valet park bicycles in storage space or the meeting room, allowing over 400 bicycles to be parked.

The design allows for 24-hour access to the parking using cards or FOBs. If there are security concerns stemming from allowing 24-hour access to the main enclosure, a 24-hour access enclosure could be created by reducing the amount of space allocated to the main enclosure. Market research is recommended to determine the demand for 24-hour access to the parking and identify any security concerns.

4.1.4 End-of-trip facilities

The end-of-trip facilities are on the parkade level. The change rooms and showers could be accessed by card or FOB.

Table 8 - End of Trip Facilities

	Female	Male	Common Area
Showers	10	10	
Toilets	6	3 + 2 Urinals	
Lockers – Full Height	96	96	
Lockers – Half Height			112
Grooming Stations	9	9	
Sinks	3	3	

Showers are required by many commuters, especially those who work in office buildings surrounding the location. As this is a bicycle station focused on commuters, it is highly desirable to have showers, in spite of the capital costs. The number of showers per commuter parking space is consistent with City of Vancouver bylaws. An analysis of peak customer flows indicated that the shower supply is likely adequate.

If the market research and inventory of existing showers in the catchment area of the bicycle station show a greater demand for showers, the addition of more showers should be considered. This will likely be more cost effective than adding showers in other locations. As more space would be required, the footprint of the facility could be expanded or the number of parking spaces or toilets could be reduced.

For parking, it is much less difficult to add enclosures for commuters elsewhere in the Pacific Centre parkade or in the parkades of other buildings.

For toilets, the number is reduced from twelve specified in the city bylaws. People have the option of using ones in the Mall or in their office. To reduce cost or to save space, the numbers could be reduced further but this is not recommended.

There are 96 full height lockers in each of the change rooms to allow cyclists to conveniently access their clothes while changing. There are 112 half-height lockers intended to be used on-demand to store helmets and jackets while bicycles are parked in the station. On-demand use allows the lockers to be used efficiently and thus, fewer lockers are required. Some of the half-height lockers could be reserved if there is demand.

4.1.5 Support Services

Advice and Encouragement

An advantage of a staffed bicycle station is the one-on-one cycling advice and encouragement that can be offered to people. This includes advice on routes, safety, gear, clothing, finding an appropriate bicycle, and cycling in the rain. Especially for new commuter cyclists, this support can be critical in making cycling an experience that they will continue to enjoy. Comprehensive staff training is essential to providing excellent customer service.

Other possibilities include building support networks and community through a web site, blog, forums, social media such as Facebook, and developing relationships with nearby employers and building managers.

All Season Cycling

The design allows for a variety of facilities and services to encourage all season cycling:

- Showers;
- Well-ventilated lockers so wet clothes can dry;
- A clothes dryer;
- Lights and other safety gear for sale;
- Advice on all-season cycling;
- High-quality raingear for sale;
- Regular maintenance packages including the cleaning and oiling of chains and the checking of brakes and cables;
- A laundry service.

These can all serve to increase business in winter and result in better utilization of the facility and thus, improved financial performance.

Library

The design contains small library area that could contain cycling information and allow for the posting of information cycling and other community events.

4.1.6 Cycling Retail

The cycling retail area is located in the Granville Street storefront level. This highly visible location is critical to the financial success of the retail. This relatively small retail area (35 m²) should focus on offering high margin items that are in high demand. This includes gear for commuter cyclists such as clothes, raingear and safety equipment.

Business wear that is practical for cycling could be featured. One possibility is cross promotion between the bicycle station and clothing retailers in the mall. Station staff should be available to provide practical clothing and fashion advice. Bicycle sales are not recommended, as they require a large amount of floor

space and have low margins. There is potentially 161m² of storefront retail space that could be used if the operator determines there is a business case for a larger retail store.

To help attract customers that are new to cycling, a welcoming retail environment is recommended. This includes a clean non-cluttered sales area with extra stock kept in storage and mannequins displaying clothes and accessories available at the station or nearby retailers in the window.

The nearest bicycle store is Simon's on Robson Street near Granville. The area in the design for cycling retail is limited, so there is little point in carrying low volume products that are available at other bicycle stores. Customers could be referred to other bicycle stores for items that are not carried.

4.1.7 Bicycle Repairs

The design contains a full service bicycle repair shop both as a service to members and to generate revenue to help support other services. The focus should be on offering a high level of service to members and drop-in customers.

Members could be offered regular maintenance packages including chain oiling and cleaning, brake checks, and proper tire inflation. Consistent with providing customers with a high level of service, it is recommended repairs be completed while customers are at work or shopping, or loaner bicycles be available if the customer needs their bicycle before repairs can be completed.

The two repair stations are located on the parkade level near the bottom of the ramp and the entrance to the parkade so that the mechanics can help monitor people accessing the station. The design allows one of the bicycle repair stations to be moved near the Granville Street entrance so the mechanic can also staff the cash register when the station is not busy.

There is also a self-service repair station with air, oil and basic tools included in the design.

4.1.8 Hours of Operation

To cover the demand by commuters during weekdays and shoppers during the evening and weekends, the station could be staffed as follows:

- Monday to Friday (6:00 am to 9:30 pm)
- Saturday (8:00 am to 9:30 pm)
- Sunday (9:00 am to 6:30 pm)

Should there be sufficient demand from entertainment users, the hours on Friday and Saturday night could be extended.

4.2 Marketing and Promotion

A comprehensive marketing campaign is critical to the success of the bicycle station. Such a campaign can require minimal resources beyond staff time and in-kind contributions from TransLink, the City of Vancouver and other partners.

Being the first bicycle station in the region, there is great potential for earned media. Public consultation, funding announcements, the groundbreaking, and opening are all good opportunities for earned media to help build interest in the facility.

TransLink and the City of Vancouver could promote the bicycle station to businesses within the catchment area through their TDM programs. TransLink could provide in-kind advertising in transit stations, on transit vehicles and on racks and lockers and the City of Vancouver could provide in-kind advertising on bus shelters. The bicycle station should be included on printed and on-line transit and cycling maps as well as in trip planners.

Wayfinding guiding users to the bicycle station from transit stations and on the streets around the station can also serve a promotional function. Wayfinding is of particular importance inside the Pacific Centre parkade to ensure cyclists are able to easily access the bicycle station.

Other opportunities to promote usage include:

- Events such as commuter stations, fashion shows and cycling lunch and learns in the surrounding businesses.

- Bike to Work Week and Bike Month publicity and events.

- Working with groups such as the Vancouver Area Cycling Coalition, Better Environmentally Sound Transportation and the Downtown Vancouver Business Improvement Association to both promote the bicycle station and support the objectives of these groups.

- Cross promotion with nearby businesses and attractions.

- Information on EasyPark, Pacific Centre, TransLink and City of Vancouver websites.

- Social media including Facebook and Twitter.

- A web site for the bicycle station.

- Partnerships with nearby employers and building managers.

4.2.1 Branding

Branding has been identified by Bikestation™ as a key factor in their success. Common branding for bicycle stations and parking facilities in Metro Vancouver is recommended to help customers easily identify and find the facilities. This branding could include logos, signage, facility names, facility design, and colour schemes.

4.3 Access

4.3.1 Security and Access Control

The security of the facility and the bicycles can be ensured through staff, a membership system, electronic access control and security patrols. The facility is designed so retail and repair staff can easily monitor people accessing the facility. The cash station is near the storefront entrance while the repair stations are near the bicycle parking and the parkade level entrance.

Membership and Access

To control access to the facility and ensure the security of the bicycles, a membership system using electronic access control is recommended. Such measures are common in bicycle stations around North America. Members should be required to present picture id before they would be issued an access card.

A non-contact proximity access media such as a FOB or a smart card is preferable as they are more convenient for cyclists. Typically in bicycle stations, a \$20 administration fee is charged to cover costs. A digital picture of the user and their bicycle could be stored with account information so that the identity of the user can be confirmed when using the station. A sticker with a unique id or an RFID chip could be placed on the user's bicycle to help identify abandoned bicycles. In the case of an RFID chip, sensors could be installed to automatically ensure that a user is retrieving their own bicycle.

So users don't have to carry around multiple cards or FOBs, the bike station could use the same card or FOB to access other secure bicycle parking in the region. The bicycle station could manage the regional access system or it could be contracted to another organization.

When the facility is staffed, the card could be required to access the bicycle enclosure, showers and change rooms. For after-hours access when there is no staff present, the card or FOB would be required to enter the bicycle station. Requiring a PIN to be entered in a keypad could help prevent access using a lost or stolen card or FOB.

Drop-in users who do not want to become members could have their bicycles parked by staff and be issued tickets. The cost for this valet service could be higher than for members.

Monitoring

Video monitoring of the parking enclosure and facility entrances is recommended. The video could be recorded for playback if a problem occurs. Monitors could be placed by the repair station and the checkout so staff can keep an eye on the facility. EasyPark's security control room is nearby and it is possible that they could help monitor the video and their security patrols could also monitor the bicycle station when the facility is not staffed. This would have to be discussed with EasyPark.

4.3.2 Access Through the Parkade

To allow cyclists to ride through the parkade to access the parkade level entrance, the parkade ramps likely require the application of non-slip surfaces to ensure they do not slip and fall when the ramps are wet. Signage visible to vehicles and cyclists approaching the ramps is recommended to alert motorists to the presences of cyclists and advertise the bicycle station to cyclists and drivers.

Sharrows and coloured surface treatments on the ramps and bicycle station access routes in the parkade are recommended to help guide cyclists to and from the station and alert motorists to the presence of cyclists in the parkade.

4.4 Expansion

It would likely be difficult to expand the bicycle station without impacting parkade access. An enclosure or lockers separate from the main facility could be added by reallocating additional automobile parking spaces. This bicycle parking could be used by cyclists who prefer to cycle through the parkade to access the parking. Staff could also valet park bicycles in a separate enclosure in the parkade during periods of peak demand when the main facility is at capacity.

Parking enclosures could also be built in nearby parkades should the demand for parking exceed the capacity of the bicycle station.

5 Integration with Other Services

The success of the bicycle station depends on the extent to which it is supported and supports other related interests and services.

5.1 Transit

Due to its close proximity to Granville and Vancouver City Stations, the bicycle station would likely be used by a significant number of cyclists parking their bicycles while using transit for the remainder of their trip. A staffed bicycle station is particularly convenient for new users, as they can use the parking without having to register ahead of time. Wayfinding in Granville and Vancouver City Stations could direct people to the bicycle station and transit advertising could be used to promote the station. The bicycle station could sell transit passes to cyclists and the public. The proposed transit smart card could also be used to access the bicycle station so people do not have to carry around a separate card.

5.2 Car Sharing

While car sharing is a service some members of the bicycle station would likely use, it is not a core element of the bicycle station. While there are currently no shared cars in the parkade, there are Zipcars in other EasyPark parkades. EasyPark could be informed if bicycle station members indicate demand for shared cars and then EasyPark could approach Zipcar to negotiate placement of shared cars near the bicycle station. Car sharing could be promoted through the bicycle station and the bicycle station could be promoted by car-sharing operators.

5.3 Bike Share and Rental

The station could support an automated bike share program such as BIXI by promoting the service and by selling memberships and helmets. While bike sharing system and the bicycle station may compete for some customers, experience from Lyon and Paris indicates that bike sharing systems increase the number of people riding their own bicycles and thus could increase demand for parking facilities such the bicycle station.

A staffed bicycle sharing system targeted at transit users such as Dutch Rail's OV Fiets, could be located at the bicycle station. This could be examined more closely when TransLink or another organization is considering operating such a service.

Rental bicycles could also be offered at the bicycle station. Further market research is required to determine the demand. Alternatively, the bicycle station could promote nearby bicycle rental businesses.

5.4 Local Cycling Groups

Discounts could be provided to members of local bicycle groups such as the Vancouver Area Cycling Coalition, BEST, the Vancouver Bicycle Club and racing clubs in return for the promotion of the bicycle station. An area in the station could be provided for membership forms, newsletters, brochures and posters.

5.5 Local Bicycle Retailers

The nearest bicycle store is Simon's on Robson near Granville Street. Direct competition should be avoided where possible. The space in the bicycle station for cycling retail is limited, so there is little point in carrying low volume products that are available at other bicycle stores. Bicycle sales are not recommended due to lack of space. Customers could be referred to other bicycle stores for bicycles and other items that are not carried.

5.6 Private Development Interests and Building Owners and Operators

Developers of nearby buildings could help fund the capital cost of the bicycle station in return for reduced parking requirements or other incentives. Owners and operators of nearby buildings that have insufficient parking and showers could promote the bicycle station to their tenants. This could be encouraged by passing a bylaw requiring that either secure bicycle parking is provided in or near existing buildings or cyclists are allowed to bring bicycles into their offices. Such a bylaw was recently passed in New York City.

6 Financial Overview

The financial overview defines the expenses and revenue sources, provides high-level projections, offers guidance regarding the on-going financial viability of the bicycle station and contains capital cost estimates. It also identifies areas in which more information is needed to refine financial projections. A conservative approach has been taken in estimating revenues and expenses. Specifically, revenue and net income projections are included for the following business lines:

- Parking
- End-of-trip Facilities
- Cycling Retail and Repairs
- Other Retail

6.1 Revenue

Parking

This is the revenue from bicycle parking based on the prices in Table 4 - Proposed Bicycle Station Parking and Shower Rates. See **Appendix 5 - Revenue Modeling for Bicycle Parking**, page 49 for more details.

End-of-trip Facilities

This is the revenue from showers, lockers and change room use based on the prices in Table 4 - Proposed Bicycle Station Parking and Shower Rates. Demand is calculated as the percentage of the parking demand from the market research as shown in Figure 6 - Facilities That Cyclists Would Likely Use at a Bicycle Station.

Cycling Retail and Repairs

This includes the revenue from bicycle repairs, accessory, clothing and bicycle rentals. Based on information from the National Bicycle Dealers Association and the local experience of Reckless Bicycle Stores. Bicycle sales were removed from the average store revenue. The revenue was then adjusted for inflation.

Other Retail

Includes sales of snacks, beverages and bicycle parts via vending machines. Revenue projections reflect the cost of vending machines with a reasonable return on investment.

Rent Subsidies

This is the amount the rents need to be subsidized for the station to be financially self-supporting. As detailed in Expenses, this may not be a cash subsidy but an in-kind contribution from the City of Vancouver, EasyPark or Cadillac Fairview.

Operating Subsidy

The Operating Subsidy is the amount needed to ensure the financial viability of the bicycle station by covering the losses from the operating of the public amenities (parking and other end-of-trip facilities). This does not cover the losses from the bicycle repair and retail business lines which should be covered by future profits to avoid unfairly subsidizing these business lines. The Operating Subsidy thus covers the negative Net Income from the public amenities minus the Parking and End-of-Trip minus the Rent from Retail and Repairs.

6.2 Expenses

Cost of Goods Sold

The cost of bicycle parts, accessories and other retail items sold. Based on information from the National Bicycle Dealers Association and the local experience of Reckless Bicycle Stores.

Other Operating Costs

Other Operating Costs includes various costs of operating the business including property taxes, utilities, insurance, maintenance, security, accounting, office supplies, and legal services based on industry averages for similar retail space. This is estimated to be \$125 per m² per year for the street level and \$90 per m² per year for the parkade level.

Contingency

To cover unanticipated costs and revenue shortfalls, a contingency of 15% is included. The relatively high contingency reflects uncertainty in several areas including parking demand, price sensitivity, rent, and lost parkade revenue. This uncertainty and thus the contingency could be decreased through market research and negotiations. Cost of Goods Sold (COGS) is excluded as this is based on bicycle industry guidelines that have a higher level of certainty. COGS can also be more easily varied according to demand during business operation.

Rent – Parkade Level (Lost Revenue)

The rent for the parkade is based on the potential lost parking revenue from the 64 parking spaces required for the bicycle station. EasyPark has indicated that the parkade reaches capacity a few times a year, most often during the Christmas shopping period. In past years, they indicated that parkade has also been at capacity during a significantly greater number of days. At this point, it is difficult to determine if this decrease in parking demand over the last two years is permanent due to more people using transit as a result of the Canada Line opening or temporary due to the recession. Using information from EasyPark, the lost parking revenue is estimated to be \$42,000. This amounts to \$31 per m² per year. For more

details, refer to **Parkade Lost Revenue**, page 47. This does not account for any reduction in costs that EasyPark may experience due to 64 fewer parking spaces. As a result, the actual loss in revenue to the City of Vancouver could be less.

To better estimate the lost revenue, it would be necessary to determine the approximate number of hours when the supply of spaces in the parkade required to meet demand includes the 64 parking spaces targeted for the bicycle station. This should include any impact that the Canada Line has had on demand.

Rent – Street Level

For the Granville Street retail level, rent cost is \$940 per m² per year including municipal taxes and common operating costs. The rent cost is based experience of local businesses for similar retail space.

The rent for the common areas on both levels including the entrances, stairs, lobby, storage and office is distributed across the business lines reflecting the approximate usage of the space. Bicycle Retail and Repair accounts for 15% of the common area bringing the amount of space used up to the 200m² average for such a business.

Staff

The staffing levels and wages are based on bicycle industry standards and assume the sharing of staff between the different business units as required. For example, a mechanic might help with the parking operations. It is possible that the operator will be able to find further operational efficiencies to reduce staff costs. While staff costs could also be reduced through lower wages, this could impact the quality of service offered by the station and should only be considered as a last resort if the financial viability of the station is at stake and not as a competitive advantage in the bidding process.

Station management level tasks do not require a full time position. Options for this position include:

- Serving part time as a bicycle mechanic or station attendant at the lower hourly rates.
- Serving part time in other businesses that the operator runs.
- An owner-operator who receives any profit from the business.

The benefits are 15% of the hourly wage. The employee expenses are costs such as payroll and office supplies that vary with the number of employees and are estimated to be 15% of hourly wages.

Table 9 - Staffing Summary

	Hourly Wage	Benefits	Employee Expenses	Hours per Week	
				Peak (Apr. -Sept.)	Off-peak (Oct. - Mar.)
Station Manager	\$25.00	\$3.75	\$3.75	10	10
Station Attendant	\$16.00	\$2.40	\$2.40	56	56
Mechanic	\$16.00	\$2.40	\$2.40	46	25
Mechanic - Station Attendant	\$15.00	\$2.25	\$2.25	0	25
Mechanic Assistant	\$12.00	\$1.80	\$1.80	21.5	0
Mechanic Assistant - Station Attendant	\$12.00	\$1.80	\$1.80	34.5	0

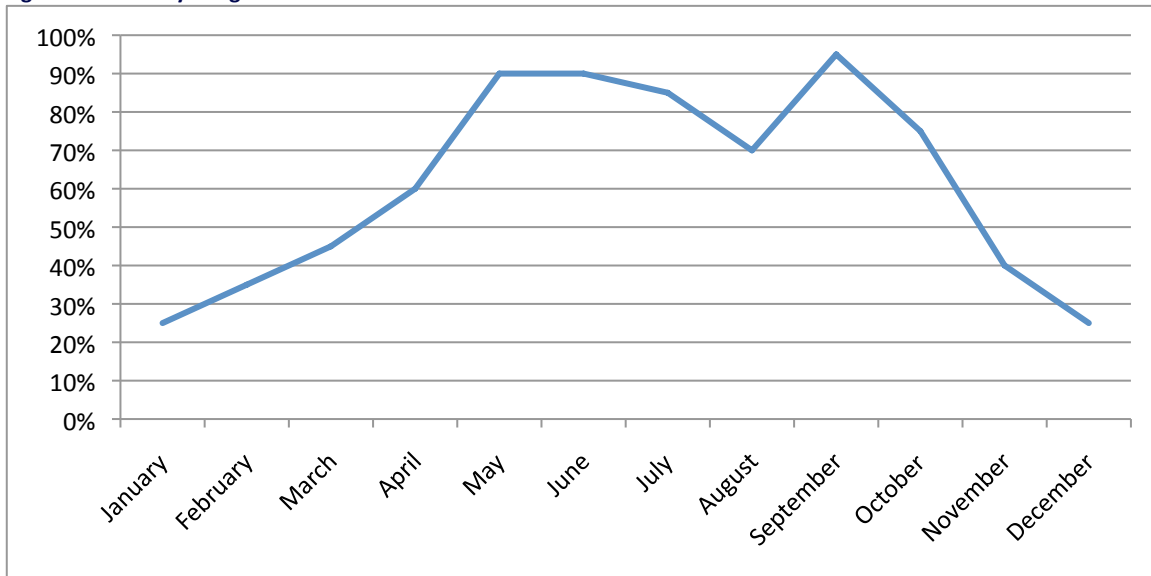
Interest

This is the interest expense due to the financing of working inventory based on industry averages from the National Bicycle Dealers Association. An interest rate of 8.5% is used.

6.3 Seasonal Variation

For the financial projections, the usage of the bicycle station was assumed to vary monthly as cycling levels are affected by weather and other factors including summer vacations. For the peak months, the utilization is not 100% as this is an average across all days of the month. The average for the whole year is 61%. It is recommended that this unitization rate be refined through market research and bicycle counts on routes to downtown.

Figure 8 - Monthly Usage Rates



6.4 Ramp Up

Bikestation™ indicates that there is typically a three-year for their facilities to reach capacity. However, since this bicycle station is significant larger than any of their facilities, it is prudent to assume a longer ramp-up period of five years for the Parking, End-of-Trip Facilities and Other Retail³⁰ business lines. If further market research and an inventory of the bicycle parking in the catchment area indicates a very large latent demand, the ramp up could be faster resulting in improved financial performance. The ramp up values in Table 10 represent the average percentage of the target revenue for each year.

For Bicycle Retail and Repairs business line, the ramp-up is based on a three-year average for bicycle stores combined with the five-year ramp-up for Parking. In year three, the ramp-up reaches 90%, acknowledging that additional growth will likely come in years four and five, as revenues will likely increase as more people park their bicycles in the facility.

Table 10 - Ramp-up

Year	1	2	3	4	5
Parking	25%	45%	65%	80%	100%
End-of-Trip Facilities	25%	45%	65%	80%	100%
Bicycle Retail and Repairs	30%	60%	90%	95%	100%
Other Retail	25%	45%	65%	80%	100%

6.5 Five-Year Income Summary

Table 11 details the financial performance of each of the business lines during the first five years of operation. Expenses including Staff, Rent and Other Expenses have been apportioned between the business lines as appropriate based on anticipated use.

After a startup period of five years, the business is expected to require no ongoing cash subsidy while generating a profit of \$49,000 per year. Depending on the business arrangements, an operating subsidy totaling \$180,000 may be required to cover shortfalls during the first two years. Even with the subsidies, the Net Income is projected to be a loss totaling \$114,000 in the first two years of operation. This loss could be financed by the operator in expectation of profits in following years.

As parking and end-of-trip facilities cannot generate the revenue to fund market rents, an ongoing rent subsidy of \$42,000 per year representing the lost parkade revenue is projected. This does not take into account any cost reductions from the decrease in parking spaces so the net loss in revenue could be less. A rent subsidy for the street level retail is also expected to be required for the first four years of operation.

³⁰ The vending machines are located in the parkade level so revenue will likely depend on parking usage.

Table 11 - Five Year Income Summary by Business Line

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Net Operating Income						
Amenities						
Parking	-\$91,000	-\$58,000	-\$24,000	\$1,000	\$34,000	-\$285,645
End-of-trip Facilities	-\$89,000	-\$67,000	-\$44,000	-\$27,000	-\$5,000	-\$232,000
Net Amenities	-\$180,000	-\$125,000	-\$68,000	-\$26,000	\$29,000	-\$370,000
Retail						
Cycling Retail and Repairs	-\$87,000	-\$39,000	\$10,000	\$18,000	\$26,000	-\$72,000
Other Retail	-\$2,000	\$3,000	\$9,000	\$13,000	\$18,000	\$41,000
Net Retail	-\$89,000	-\$36,000	\$19,000	\$31,000	\$44,000	-\$31,000
Contingency	-\$63,000	-\$63,000	-\$63,000	-\$63,000	-\$63,000	-\$315,000
Interest	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$15,000
Total Net Operating Income	-\$335,000	-\$227,000	-\$115,000	-\$61,000	\$7,000	-\$731,000
Rent Subsidy						
Parkade (Lost Revenue)	\$42,000	\$42,000	\$42,000	\$42,000	\$42,000	\$210,000
Street Level	\$92,000	\$92,000	\$92,000	\$50,000	\$-	\$326,000
Total	\$134,000	\$134,000	\$134,000	\$92,000	\$42,000	\$536,000
Net Income with Rent Subsidy	-\$201,000	-\$93,000	\$19,000	\$31,000	\$49,000	-\$195,000
Operating Subsidy	\$120,000	\$60,000	\$-	\$-	\$-	\$180,000
Net Income	-\$81,000	-\$33,000	\$19,000	\$31,000	\$49,000	-\$15,000

Net Income with Rent Subsidy

The rent subsidies and expenses have been separated out as some or all of the subsidy maybe an in-kind contribution and thus, the expense would not be a cash liability.

Cycling Retail and Repair

In addition to generating a small profit following year two, Cycling Retail and Repair also helps cover the staff costs of the attended bicycle parking and covers the rent and operating costs of a portion of the common areas, thus improving the financial viability of Parking and End-of-Trip Facilities business lines. However, the rent cost is \$19,000 less than Reckless Bicycle Stores indicates would be reasonable for a similar bicycle store³¹. This could be considered a subsidy that other such businesses might perceive as unfair.

6.6 Year Five Income

The following table details expenses and revenues in year five of operation by category. All operating revenue sources vary by year, increasing as the business ramps up. Cost of Goods Sold and Staff expenses increase as the business lines ramp up. All other expenses including Rent, Contingency and Other Operating Costs are assumed to be the same during the first five years of operation.

³¹ \$375 per m² per year.

Table 12 - Year Five Income by Category

Revenue		
Operating		
	Parking	\$169,000
	End-of-trip Facilities	114,000
	Cycling Retail and Repairs	363,000
	Other Retail	45,000
	Total	\$691,000
Subsidies		
	Rent	
	Parkade	\$42,000
	Street Level	0
	Total	\$42,000
	Operational	0
	Total	\$42,000
Total Revenue		\$733,000
Expenses		
Operating		
	Cost of Goods Sold	-\$200,000
	Other Operating Costs	-131,000
	Staff	-153,000
	Interest	-3,000
	Total	-\$487,000
Rent		
	Parkade (Lost Revenue)	-\$42,000
	Street Level	-92,000
	Total	-\$134,000
Total		-\$621,000
Contingency (15% excluding COGS)		-\$63,000
Total Expenses		-\$684,000
Income		
Operating		\$141,000
Net (includes Rent Expense and Subsidy)		\$49,000

6.7 Monitoring Performance

6.7.1 Financial

As ongoing cash operating subsidies are not desirable, the meeting of operating financial targets is key to success. For details on the financial targets for revenue and net income, refer to the previous sections for details.

6.7.2 Increases in Cycling

Customers could be periodically surveyed to determine the increase in the number of bicycle trips by current cyclists and the number of people that have started cycling to downtown as a result of the bicycle station.

Table 13 – Recommended Benchmarks

Indicator	Target
Financial	
Break Even	Year three
Cash Subsidies	None after year 3
Usage	
Peak Month Parking Unitization ³²	Year 1 – 20%
	Year 2 – 40%
	Year 3 – 60%
	Year 4 – 75%
	Year 5 – 90%
New Cyclists	30%
Current Cyclists – Percent who cycle more often	60%

6.8 Capital Cost

The construction cost of the bicycle station is estimated to be \$2.6 million. This class IV estimate is a first-stage estimate for the construction of the schematic design as shown, and does not include several elements, many of which would not be known or resolved until later stages of the design or preparation for construction. A rough estimate for these additional costs is 10% of construction costs. Security and access control equipment is estimated to cost \$43,000 and retail, repair and office equipment is estimated to cost \$37,000. The estimates are as of January 2010. Cost escalation is estimated to be 3% per year. The costs include PST but not GST. As this is a unique project in an existing building with many areas of uncertainty, the contingency is set at 15%. Including GST, the total capital costs are estimated to be \$3.5 million. Assuming the project is eligible for a HST rebate or can obtain a HST exemption, the cost is reduced by almost \$400,000 bring the total to **\$3.1 million**. For more details on the cost estimates, refer to page **Error! Bookmark not defined.**

³² Ramp Up times the peak month average utilization of 90%.

Table 14 - Capital Costs

Street Level Retail and Entrance	\$233,500
Stairs with Runnel	51,700
Parkade Level	
Structure, Floors, Ceilings	453,000
Ventilation	325,700
Electrical, Heating, Lighting	326,900
Washrooms and Change Rooms	163,600
Toilets	33,900
Showers	103,700
Bicycle Parking	126,900
Bicycle Repair Station	12,800
Lockers	50,700
Office and Meeting Room	3,900
Laundry	5,200
Fire Protection	59,500
Total	<u>\$1,665,800</u>
Miscellaneous	38,500
General Requirements & Fees	<u>218,800</u>
Net Construction Cost	<u>\$2,208,300</u>
Design Allowance	220,800
Construction Allowance	<u>121,500</u>
Total Construction Cost	\$2,550,600
Professional, Municipal and Connection Fees (5%)	127,500
Project Management and Overhead (5%)	127,500
Furnishings, Fittings and Equipment	
Security and Access	43,200
Retail, Repair and Office	<u>37,300</u>
Total	<u>\$80,500</u>
Total Before Contingency	\$2,886,100
Contingency (15%)	<u>432,900</u>
Total Before GST	\$3,319,000
GST (5%)	<u>166,000</u>
Total Capital Cost	\$3,485,000

The cost is in the middle of the \$2.8 to \$3.4 million range for US commuter Bicycle Stations.³³ The cost per parking space compares favorably to the \$4 million for 160 parking spaces at Union Station in Washington DC and the \$3 million for 300 spaces in Chicago. The cost per bicycle parking space could be improved if a solution allowing double level parking is found. As the parkade's ceilings are too low to accommodate off-the-shelf products, either an existing product would have to be modified or a custom rack would have to be designed.

The cost is similar to that of a standalone structure due the cost of ventilation, fire protection and the new structural elements required to transform parkade space into a safe comfortable environment for employees to work in and customers using the showers and change rooms. While ventilation and solid walls are not required for the bicycle parking area, the cost of high quality metal mesh would be similar to that of cinderblock walls. As well, one of the advantages of the current design is that the bicycle parking area is designed to be easily visible to employees of the station. A cinder block between the parking and the rest of the facility would reduce this monitoring of the parking while a wall with fireproof secure glass windows would be rather expensive. The cost estimate includes an allowance of around \$50,000 for ventilation for the bike parking area. As the design process moves forward, it is possible that this ventilation may not be required.

The cost of the parkade level can provide guidance for bicycle stations in other parkades. The cost of the ramp, however is likely site specific.

³³ *Bike Center Pacific Centre Feasibility Study – Draft Report*, 28. Converted to Canadian Dollars at an exchange rate 1.05.

7 Funding and Financing Models

The net income generated will not be able to finance capital costs. Operating revenue falls short of annual costs for the first three years. Thus external funding will be required to cover capital costs and operating shortfalls. The revenue generated will also not be able to cover market rents for storefront retail so an on-going rent subsidy will also be required in the first four years of operation. This rent subsidy could either be in-kind or cash. The rent subsidy required does decrease significantly by year five. If the rent is subsidized at a higher rate in year five and beyond, the excess cash generated by the higher subsidy could be used to payback a loan covering the operating shortfalls in the first three years.

Possible capital funding partners include TransLink, the City of Vancouver, the Province of BC, the Government of Canada, Cadillac Fairview and nearby employers.

Table 15 - Potential Funding Sources

	Capital	Operation Subsidy	Rent Subsidy
Cadillac Fairview	Cadillac Fairview could provide funding as a condition of rezoning or because the facility could prove to be attractive to tenants and increase lease rates.	As government funding will likely be used to add an amenity to their property, Cadillac Fairview could help cover operational shortfalls	An in-kind subsidy of all or part of the rent for the Granville storefront
TransLink	- Bicycle Capital Program		
City of Vancouver	- Capital Plan Funding - Waiving permits and city fees	A grant to cover shortfalls	Lost parking revenue (from EasyPark)
Development-Derived Funding	Contributions could be channeled via either Community Amenity Contributions (CAC's) from rezonings, payments –in-lieu or contributions to allow a developer to reduce the motor vehicle or bicycle parking requirements.		
Province of BC	- Bike BC – A \$31 million 3 year fund to enhance cycling. ³⁴ - HST rebate or exemption	A project-specific grant could be requested to help cover the operating shortfalls.	
Government of Canada	- Building Canada Fund – An infrastructure program for national priorities and local needs. ³⁵ - P3 Canada Fund – A \$1.2 billion fund for P3s	A project-specific grant could be requested to help cover the operating shortfalls.	
Private Operator	It is reasonable to expect the private operator to finance the purchase or lease of the equipment and furnishings that are primarily for retail and repairs	Given on-going rent subsidies, positive cash flows after the 3 rd year could be used to finance initial operating shortfalls.	
Federation of Canadian Municipalities	Green Municipal Fund – A \$550 million fund that provides grants and below market loans to municipalities. ³⁶		
Corporate Naming Rights ³⁷	Would likely only cover a small portion of the capital costs	Not expected to entirely cover revenue shortfalls.	
EasyPark or Cadillac Fairview - Rent Revenue Financing	All or a portion of the net rent (the rent expense minus the rent subsidy) to finance a portion of the capital costs. Before year five, another funding stream would be required. Some organization would have to assume the risk should the bicycle station not be able to cover the rent.		
Nearby Businesses (or TransLink, the City, the Province, EasyPark or Cadillac Fairview)	Businesses could purchase several parking spaces or the right to use the showers as a benefit for their employees. This may prove to be less expensive than other options for providing parking and showers for their employees.	Businesses could pre-purchase multi-year memberships for their employees at a discount rate. This could help provide cash to cover the shortfalls although it would reduce revenue in following years.	
Foundation and Corporate Grants	The funding available would likely only cover a small portion of the capital costs.	Could help cover a portion of the operating shortfalls over the first 3 years	

³⁴ <http://www.th.gov.bc.ca/BikeBC>

³⁵ <http://www.buildingcanada-chantierscanada.gc.ca/funprog-progfin/target-viser/bcf-fcc/bcf-fcc-eng.html>

³⁶ <http://www.sustainablecommunities.fcm.ca/GMF/>

³⁷ Given the current economic environment, corporations may be reluctant to purchase naming rights.

8 Business Arrangement

The two most likely forms of business arrangement for the bicycle station are a public-private partnership or a business unit of a larger organization. As government funding is most likely required to cover the capital costs, any arrangement involving a non-profit organization or a private business in a lead role would essentially be considered a form of public-private partnership. A non-profit organization or a private business could also operate the business under contract from a business unit of a larger organization.

Public Private Partnership (P3)

In this arrangement, the public partner brings experience in arranging funding with other government agencies, managing the construction of the project and leveraging public resources to market the station. The private partner brings in experience operating a bicycle-related business and can be more nimble in initiatives to promote and improve operating procedures in the business. Staff can also be efficiently managed between the various business lines such as bicycle parking and bicycle repairs. The private partner could determine that lower parking prices increases profits by increasing repairs and accessory sales, as well as parking demand.

The most likely candidate for the public partner is the City of Vancouver either directly or through EasyPark. The private partner should have bicycle retail experience and could be an existing bicycle business or non-profit or a new business or non-profit formed to operate such bicycle facilities.

In such an arrangement, there must be clear agreement on the roles and responsibilities of each partner to ensure that the objectives of the public agency are met and that the business remains viable for the private partner. Measures should be included in the operating agreement to ensure the operator is required and encouraged to provide the intended services to cyclists including parking and showers.

One option is requiring the operator to pay all or a portion of the rent and then use these funds to provide the operator performance payments based on considerations such as the number of bicycles parked, the number of subscribers, cleanliness, security, and customer satisfaction. This serves as financial incentive to the operator to provide excellent service to cyclists, while also allowing the operator to generate revenue from other aspects of the business so long as it does not negatively impact the core objectives of the bicycle station.

The private partner could also be required to pay a performance bond or a small portion of the capital cost to ensure that they have significant stake in the success of the bicycle station, thus protecting the public investment in the facility. This investment would then be returned to the private partner over time as performance payments.

Business Unit

The bicycle station could be a business unit of a larger organization. Possibilities for this lead organization include the City of Vancouver, EasyPark, Cadillac Fairview and TransLink. If funding from other levels of government is used, this may require a governmental organization such City of Vancouver or TransLink as the lead organization.

The station could be operated by staff or contracted out in a fee for service agreement with a business or a non-profit organization. Should the staff option be chosen, a manager with experience in the bicycle industry is recommended. Under either scenario, the space for the profit centres, including bicycle retail and repair, could be leased to a business that would pay rent at a fair market rate to subsidize the

operation of the parking and showers. Several bicycle stations in the United States operate under similar arrangements.

As it appears that the bicycle station will produce positive cash flow, the lead organization would likely realize greater returns than with a P3, although greater risk would also be assumed. The disadvantage of this arrangement is larger organizations tend to be involved in many other activities. They may not be able to provide the focus and flexibility needed to optimally operate the facility.

Table 16 - Business Arrangements

	Strengths	Weaknesses
Public Private Partnership (P3)	<ul style="list-style-type: none"> - Access to government capital funding sources - Private partner experience in operating bicycle related businesses and in managing staff - Senior levels of government encourage such projects through funding programs - Less risk for the public organization 	<ul style="list-style-type: none"> - Complicated contractual arrangements - Potentially competing goals of the partners - Business difficulties in other ventures could impact the ability of the private partner to operate the bicycle station - More potential for conflict if financial problems occur
Business Unit of Public or Private Organization	<ul style="list-style-type: none"> - Can leverage the resources and experience of a larger organization - Experience with managing the construction of the project - Leveraging organizational promotional resources - Builds organizational experience that can be valuable in developing other bicycle stations - A greater share of any profits 	<ul style="list-style-type: none"> - A large organization may not be as nimble as smaller organization - Organization may not be focused enough on ensuring the success of the bicycle station - More risk to the lead organization
Non-Profit	<ul style="list-style-type: none"> - Access to government grants to cover capital costs and operational shortfalls 	<ul style="list-style-type: none"> - Limited resources and access to capital and operational financing - Grants are unlikely to cover operational shortfalls - The City of Vancouver may have greater access to capital grants from senior levels of government
Private Business	<ul style="list-style-type: none"> - Experience in operating bicycle related businesses and in managing staff 	<ul style="list-style-type: none"> - Accessing capital and operational grants from government sources maybe difficult or impossible

8.1 Lead Agency

For a P3, the City of Vancouver is well positioned to be the lead agency. For the business unit arrangement, the City of Vancouver, EasyPark or Cadillac Fairview could be the lead agency.

City of Vancouver

The bicycle station fits well with the city's policies supporting cycling facilities. Through the Parks Board, the city operates community centres that are in some ways similar operations. Being responsible for the bicycle station would give it valuable experience that could be used to develop similar facilities elsewhere in the city.

EasyPark

As the operator of automobile parking lots, the operation of bicycle stations would be relatively close to its core competencies. As the majority of the station is within its facility, EasyPark is well positioned to play a leading role in the bicycle station. Its experience in security, access control and payment systems

would be an advantage. Being responsible for the bicycle station would give it valuable experience that could be used to develop similar facilities in its other parkades.

Cadillac Fairview

Cadillac Fairview could consider the bicycle station as a valuable amenity for its tenants that will increase the value of its property and lease rates. Being responsible for the bicycle station would give it valuable experience that could be used to develop similar facilities in its other properties. This option is worth considering especially if the facility is developed as a condition of rezoning.

TransLink

As there are other potential locations in the region for bicycle stations and other parking facilities, TransLink, would gain valuable experience in the operations of bicycle stations and parking facilities.

Table 17 - Potential Roles and Responsibilities

	Potential Roles and Responsibilities
TransLink	<ul style="list-style-type: none"> - Capital funding - Promotion - Ensuring consistent branding with other parking facilities - Ensuring seamless access to bicycle parking facilities throughout region - Integration with regional transit smart card - Operational funding unlikely
City of Vancouver	<ul style="list-style-type: none"> - Lead agency - Capital funding - Promotion - Waiving of development fees - Owner of EasyPark - Operational grant - The forgoing of all or a portion of the lost parking revenue
EasyPark	<ul style="list-style-type: none"> - Lead agency - In-kind rent subsidy for parkade level - Security - Promotion
Cadillac Fairview	<ul style="list-style-type: none"> - Landlord of Granville storefront - Rent subsidy for Granville storefront - Capital funding through rezoning - Lead agency - Promotion to tenants and mall customers
Province of BC	<ul style="list-style-type: none"> - Capital funding - HST rebate or exception - Operational grant
Federal Government	<ul style="list-style-type: none"> - Capital funding - Operational grant

9 Conclusion and Next Steps

9.1 Summary of Recommendations

The recommended Pacific Centre Bicycle Station site is located in the heart of Downtown Vancouver across the street from Granville Station and near Vancouver City Centre Station. The draft design offers a range of services to make cycling more attractive, including 351 secure bicycle parking spaces, showers, change rooms, gear lockers, bicycle repairs, and other bicycle services.

The site is surrounded by office towers and the 250m catchment area includes 44% of Central Business District (CBD) office space, giving a significant number of downtown workers convenient access to the facility. It is located in the most popular mall in Metro Vancouver and catchment area includes 33% of the retail space in Downtown Vancouver. The station is also near the Granville entertainment district, several hotels and UBC Robson Square.

The primary target markets are cyclists and potential cyclists who are commuters or transit users. Shoppers and entertainment venue customers who cycle are secondary target markets. According to TransLink's market research, Granville Station is among the top three transit stations where cyclists would likely use secure bicycle parking. The market research also indicates cyclists often do not make trips to Downtown Vancouver, SkyTrain stations, and shopping malls – due to fear of bicycle theft.

Risk factors include unforeseen construction difficulties, a lack of local experience in the construction and operation of a bicycle station in a parkade, and the typical financial risks associated with a startup business. Key success factors for the bicycle station include the improvement of bicycle access to the CBD, a highly visible entrance to the facility and an effective marketing strategy. An operator with experience in bicycle retail and repair is also recommended.

In the draft design, the majority of the facility is in the Pacific Centre parkade, replacing underutilized automobile parking inventory. The primary access is via a retail storefront on Granville Street. The entrance is designed to be highly visible to cyclists, pedestrians and transit users thus helping to attract customers and ensure the personal security of users. A ramp connects the storefront to the parkade where the majority of the services including the parking and showers are located. This configuration combines the benefits of a retail storefront while minimizing the use of costly street-level retail space.

TransLink's market research indicates cyclists have a preference for staffed parking, and that a bicycle station will encourage people to cycle more often. The station could be staffed for around 15 hours per day on weekdays and during peak shopping hours on weekends. The advice and encouragement provided by staff can be especially useful to new cyclists and cyclists wanting to cycle during the winter. Daily twenty-four hour access could be allowed via smart cards or FOBs. While the design contains space for 351 bicycles, during peak days, staff could actively manage the parking allowing over 400 bicycles to be parked.

An operating subsidy totaling \$180,000 (\$120,000 in year one and \$60,000 in year two) is projected to be required to cover parking and end-of-facilities shortfalls in the first two years of operations. This subsidy could be covered by government grants, Cadillac Fairview or EasyPark. Operating shortfalls totaling \$114,000 in the first two years could be covered by a private operator in anticipation of future profits.

To cover unanticipated costs and revenue shortfalls, a contingency of \$65,000 per year is included. This relatively high contingency reflects uncertainty in several areas including parking demand, price sensitivity, rent, and lost parkade revenue. This uncertainty and thus the contingency could be decreased

through market research and negotiations, as detailed in the following section. As the five-year total for the contingency is greater than the operating subsidy, all or part of this subsidy may not be required.

With exception of the first two years, the business is not projected to require any cash operating subsidies, although there will likely be an ongoing rent subsidy in the form of lost parking revenue (an estimated \$42,000 per year) to the City of Vancouver via EasyPark. This estimate does not include any cost savings to EasyPark as a result of the reduction of parking spaces, so the net loss in revenue may be less. For the first three years, a rent subsidy of \$92,000 per year for the street level retail space is projected to be required. For year four, a rent subsidy of \$50,000 is projected. If an in-kind rent subsidy cannot be negotiated with Cadillac Fairview, the cash subsidy would have to be increased accordingly.

The capital cost of the facility is estimated to be \$3.1 million excluding HST. The cost per parking space is similar to other such bicycle stations. As is the case with other bicycle stations in North America, the revenue generated will not be sufficient to finance the capital costs. Possible funding partners include TransLink, the City of Vancouver, the Province of BC and the Government of Canada. Cadillac Fairview or nearby developments could also provide funding as a condition of rezoning or because the facility could prove attractive to their tenants.

Possible business arrangements include a public private partnership with the City of Vancouver as the lead agency or a business unit of a larger organization such as the City of Vancouver, EasyPark or Cadillac Fairview.

Should the construction of the Granville Street entrance prove to be unworkable, other options include siting the station in the parkade near the corner of Howe and Robson or using the parkade's Dunsmuir ramp as the main access.

While focusing on the Pacific Centre parkade, this study also can also provide guidance in the consideration of bicycle stations and parking facilities in other parkades.

9.2 Next Steps

Further steps are recommended – to refine the business case and confirm the viability of the bicycle station with the Granville Street storefront entrance and determine if other options such as the Dunsmuir ramp or the Robson and Howe site should be pursued instead.

9.2.1 Market Research

City of Vancouver, TransLink

Additional market research is recommended to better determine demand and pricing for parking, showers, lockers, and other services. The market research should also include an inventory the supply and usage of class 1 and class 2 bicycle parking and showers within the catchment area. This research should target potential customers, including office workers, transit users, shoppers, entertainment customers, and people who cycle downtown. The research should start by confirming the catchment area. Once the catchment areas are confirmed, the research should be focused within the catchment area. Including both Granville Storefront and the Robson and Howe locations will help determine if the demand is similar at both locations.

9.2.2 Discussions with Cadillac Fairview

City of Vancouver, Cadillac Fairview, EasyPark, TransLink

These discussions should include the location of entrance off Granville Street, whether or not the station could be built as a condition of rezoning and determining the rent and possible rent subsidy for the Granville storefront.

9.2.3 Parkade Issues

City of Vancouver, EasyPark

These discussions should include improvements in bicycle access to the parkade as described in Section 4.3.2 and operational issues that may arise during implementation and operation of the bicycle station.

9.2.4 Determining Lost Parking Revenue

EasyPark, City of Vancouver

To better estimate the lost parking revenue, it would be useful to determine the approximate number of hours when the supply of spaces in the parkade required to meet demand includes the parking spaces targeted for the bicycle station. As well, any cost savings due to the reduction of parking spaces should also be estimated to determine the net loss in parking revenue to the City of Vancouver.

9.2.5 TransLink Parking Tax

TransLink

Verify if the parking tax will apply to bicycle parking.

9.3 Project Tasks

Should the decision be made to proceed with the bicycle station, the following tasks will be required:

- Selection of lead organization
- Initial public consultation
- Confirming of funding partners
- Request for Expressions of interest
- Request for proposals
- Selection of operator
- Contract Negotiations
- Branding
- Draft design
- Public consultation
- Final design
- Confirmation of funding
- Construction
- Operational planning
- Marketing plan
- Grand opening

Appendix 1 – Schematic Design Workbook

Pacific Centre Bike Station Schematic workbook goes here.

Appendix 2 - Alternate Location - Robson and Howe

In this scenario, primary bicycle and pedestrian access to the bicycle station is via the Robson Street parkade ramp that would be closed to motor vehicle traffic. The ramp would allow cyclists to ride directly to the bicycle station located on level one of the parkade. The Robson Street ramp closure during the Olympics provides an excellent opportunity to determine the impacts on the parkade of such a closure.

The ramp would be enclosed in glass with a secure entrance placed near the corner of Robson and Howe at street level. As Robson is one of the premier retail streets in North America, retail at this site could perform better than at Granville and Dunsmuir. The promotional value of a 40m display window visible to people walking eastbound on Robson is likely quite high. Options to capture this value include the selling of station naming rights to a business and/or advertising space.

Capital Cost

As this option does not involve the building of a new ramp, the capital costs will be significantly lower than at Granville and Dunsmuir. EasyPark's treasury will have to be moved at an estimated cost of \$200,000. The cost of building the parkade level of the station will be similar to that of the Dunsmuir and Granville location.

As potential negotiations are not required to secure a storefront location and as less construction is required, a bicycle station could be operational much sooner at this site than at Granville and Dunsmuir.

Operating Costs

As there is no street level storefront required, no expensive retail rent will be required. The value of this rent is estimated to be from \$91,000 to \$210,000 per year. This is significant relative to the estimated parking revenue of \$170,000 per year for the Dunsmuir and Georgia site. If the station is required to absorb all or part of this amount for the Dunsmuir and Georgia site, the Howe and Robson site will likely perform better financially even if parking levels are somewhat lower.

Note that an additional 18 parking spaces will be used representing a rent of around \$60,000. The actually lost revenue from this parking will likely be significantly less than \$60,000.

Staff and other costs are expected to be similar between the two sites.

Demand

This site is significantly closer to Vancouver City Centre Station and as such, more transit users would be likely to park in the bicycle station. It is approximately a 90m walk through the parkade from this site to Vancouver City Centre elevator as opposed to 150m for the Granville and Dunsmuir site. This site is approximately 400m from Granville Station which is too far to generate significant usage. As a result, transit-based parking for the Howe and Robson would likely be around half that of the Granville and Dunsmuir location.

While the catchment area for both locations contains a similar number of jobs, the Howe and Robson location is not surrounded by office towers, meaning most people will have to walk further to their office, likely resulting in a reduction of demand.

Shopping demand could be higher as people can park their bicycles and easily walk along Robson Street. The site is directly across the street from UBC Robson Square and would provide a convenient facility for students, instructors and people attending events.

As with the Granville and Dunsmuir site, market research is recommended to refine demand estimates and determine pricing levels.

Other Entrance Options

EasyPark has suggested another option would be to replace the existing stairs on Howe near Robson with an elevator. Such an option would not be attractive for retail. Typically elevators are not used for access to bicycle parking. No examples of using elevators to access bicycle parking were found during the investigation of best practices.

Appendix 3 - Alternate Entrance – Dunsmuir Ramp

In this scenario, the primary bicycle and pedestrian entrance to the bicycle station is via the Dunsmuir Street parkade ramp that would be closed to motor vehicle traffic. The ramp allows cyclists to ride directly to the bicycle station located on level one of the parkade. The ramp is enclosed in glass with a secure entrance placed at street level.

EasyPark has stated that the closure of this ramp would severely impact parkade access. They have a contract to provide parking for the Four Season's Hotel that would be impacted by this loss of access. Due to one-way streets and the transit mall on Granville Street, using the parkade would require driving several more blocks if the ramp is closed. It is possible that changes in traffic patterns could overcome this issue but further study would be required by the City of Vancouver. One option would be to make Howe Street two-way.

This option improves bicycle access as cyclists could cycle directly to the parkade level on a traffic-free ramp. Conflicts with pedestrians would also be reduced.

Revenue

Retailing revenue maybe less than the Granville storefront location as the retail area would likely have to be at parkade level and thus less visible.

Capital Cost

As this option does not involve the building of a new ramp, the capital costs are likely somewhat lower than Granville Street storefront access. The cost of building the parkade level of the station will be similar to the other access option. Some changes in the design will be required but these changes should not significantly affect costs.

As potential negotiations are not required to secure a storefront location and as less construction is required, a bicycle station could be operational much sooner.

Operating Costs

As there is no street level storefront required, no expensive retail rent will be required. The value of this rent is estimated to be \$91,000.

Demand

As the bicycle access is more convenient, demand could slightly increase. The access time to the Granville Station will be similar and as Vancouver City Centre can be accessed through the parkade, the access time should be the same.

Appendix 4 - Parkade Lost Revenue

If the proposed bicycle station is built in the parkade, 64 parking spaces will be lost. This would likely result in a loss of parking revenue to the City of Vancouver from EasyPark. Information from EasyPark, while not indicating exactly what this loss might be, is used to estimate what this loss might be in a typical year. EasyPark has indicated that in recent years parkade is typically full from December 5 until Boxing Day, so this is the scenario used in the estimation of the lost revenue. Note that EasyPark has also indicated that in some past years, the parkade has been full during some days in other months as well. It is unclear that the current reduction in demand is due to the recession or due to other reasons including the opening of the Canada Line and a general reduction in automobile use in downtown.

Parking demand surveys were conducted by Bunt and Associates for EasyPark in January 2008.

Table 18 - Pacific Centre Parkade Occupancy – January

	Occupied	Occupancy Rate
Mid-day (9:00 – 15:00)	948	71%
Evening (20:00 – 22:00)	356	26%
Saturday (13:00 – 15:00)	978	73%

EasyPark provided the average Daily Spaces Required for transient and unreserved monthly parking. While this information is not enough to determine when the parkade is full, it does allow the monthly rates to be estimated by multiplying the January Occupancy Rate by the ratio of the monthly Daily Spaces Required to January Daily Spaces Required. EasyPark also provided average revenue per stall for weekdays and weekends.

Table 19 - Pacific Centre Parkade Monthly Occupancy Estimates

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Daily Spaces Required	2807	2769	2878	2831	3101	3180	2877	2973	2862	2983	3426	3562	3021
Mid-day (9:00 – 15:00)													
Occupancy Rate	71%	70%	73%	72%	78%	80%	73%	75%	72%	75%	87%	90%	76%
Spaces Available	438	453	411	429	326	295	411	375	417	371	202	150	356
Saturday (13:00 – 15:00)													
Occupancy Rate	73%	72%	75%	74%	81%	83%	75%	77%	74%	78%	89%	93%	79%
Spaces Available	408	423	380	399	292	261	380	343	386	339	165	111	324

While the average Spaces Available never falls below 64 for any month, December is the highest at 90% for weekdays and 93% for Saturdays. This is to be expected as EasyPark has indicated the parkade is not full before the 5th and after Boxing Day.

The Saturday rate is higher than the weekday rate so it is more likely that the parkade is full during the weekends in December before the 5TH. The rate for Saturdays in November is similar that of weekdays in December so it is possible that the parkade is full in some weekend days in November, especially near the end of the month. For the purposes of the estimate, it is assumed that the parkade is full four weekend days in November.

The following table details the number days the parkade is likely full based on the 2009 calendar.

Table 20 - Estimated Lost Parkade Revenue

	Nov.	Dec.	Total
Weekends			
Days Full	4	6	
Revenue per space per day	\$10	\$10	
Loss per day	\$600	\$600	
Loss per month	\$2,400	\$3,600	\$6,000
Weekdays			
Days Full	0	15	
Revenue per space per day	\$38	\$38	
Loss per day	\$2,400	\$2,400	
Loss per month	\$-	\$36,000	\$36,000
Total	\$2,400	\$39,600	\$42,000

Appendix 5 - Revenue Modeling for Bicycle Parking

Demand

For revenue modeling purposes, a relatively conservative approach is used for the demand estimates.

The demand estimates for commuter parking range from 340 to 681 bicycles parked per day.³⁸ There are 64 secure spaces in the parkade and an unknown number of spaces in nearby office buildings. As such, a commuter demand of 300 spaces per weekday is used in the revenue estimates. For Saturday and Sunday, much lower estimates are used to reflect both the decreased demand and that many of the people that work near the station are retail employees with relatively low wages.

The experience at Bike Stations in the United States indicates demand will likely take at least three years to reach the estimated levels. The facility can be expanded or other parking facilities can be built nearby when the facility nears capacity. The additional funding required would likely be better spent on building bicycle parking facilities elsewhere in downtown, the city or the region rather than excess capacity at this facility that would likely not be fully utilized for a number of years.

For transit based parking, the low estimate of 100 users per weekday as the impact of allowing bicycles on transit on the usage of parking is unknown. Estimated Saturday demand is 85% and Sunday demand is 50% of weekday demand.

As both Pacific Centre Mall and Robson Street are large regional shopping destinations, people are more likely to require longer-term secure parking and the demand for secure parking is likely to be on the high side. As well, there is no secure on-demand parking downtown for shoppers, therefore the high estimate of 32 is used. Saturday is the peak shopping day with trips and parking 1.9 times that of weekdays³⁹. For Sunday, as shops tend to close earlier, parking demand is 1.5 that of weekdays.

The bicycle station is near the Granville entertainment district and several bars and restaurants. People will likely be more concerned about bicycle theft at night and thus will likely be willing to walk further for secure bicycle parking. Market research will be required for more exact estimates. For the purpose of the revenue estimations, the use of the parking for entertainment trips is estimated to be 10 per day for Sunday through Friday and 20 for Saturday.

Table 21 - Peak Parking Demand per day - Revenue Modelling

	Weekday	Saturday	Sunday	Daily Average	Pay per Use		Term Passes
Shopping	32	61	48	38	70%	27	12
Work	300	40	20	223	20%	45	178
Entertainment	10	20	10	11	70%	8	3
Transit	100	85	50	91	70%	64	27
Total Usage	442	206	128	363	40%	143	220

Term Pricing Memberships

Term revenue for day parking reflects that a significant number of bike station users will not cycle every day of the week. For this study, it is assumed, that on the average, commuters who purchase term passes will use the bicycle station 3 times per week. This is the same rate as SkyTrain station locker users

³⁸ Bunt

³⁹ Based on trip diary results.

reported in the market research. Note that if less frequent users (two days a week or less), buy term passes, financial performance will not be negatively impacted, as the revenue per use will be greater than or equal to that of per use payment.

For commuters, it is assumed that 80% will use a term pass and 20% will pay for each use. In the market research, 88% indicated that they preferred payment terms of a month or longer. However, 18% indicated that they only used it once a week or less. For these users, it would be more cost-effective to pay on a per-use basis. As well, there are likely a significant number of part-time retail employees who work at the mall for whom a term pass would not be cost-effective. Thus, a per-use payment rate of 20% is assumed as there are other secure parking options for some commuters near Pacific Centre,

As transit users, shoppers, and entertainment users would likely use parking less frequently, they are more likely to purchase parking on a per-use basis. The market research indicated 68% of regional cyclists would prefer to purchase parking on a per-use basis. Thus, it is assumed 70% of these customers would purchase parking on a per use basis and 30% would use term passes.

Selling of term pricing beyond the number of assigned day parking spots for term parking seems workable with this frequency of cycling to work. The bike station layout has sufficient capacity for days where the assumed frequency of number of days cycling to work in a week is exceeded. The lower lobby with 115 m² of floor space could be used for parking in these cases, along with the 40m² meeting room, if so needed.

Normal term pricing membership is really discount pricing for using the bike station frequently. 41 spots have been assigned for reserved parking at higher rates. Selling memberships in excess of bike parking spots was set at 60% for both day and night parking. With feedback from bike stations and information available, term pricing usage seems to be about 60% of the day parking spots and 30% of the night spots.

The worst-case scenario with these assumptions would have 100% of all day term users wishing to park their bicycles at the station on the same day. For this scenario, parking demand would exceed assigned term parking spots by approximately 94 or 46% of the day parking spots. Assigned day parking spots should be able to accommodate the demand, as the financial model assumes that a minimum of 96 spots would be available (81 day parking spots, plus an additional 15 spots from maximum 95% utilization rate for peak month). For the few days where parking demand exceeds day parking spots, the lower lobby would serve as an overflow. As a secondary back-up there is the meeting room. Temporarily parking bikes against each other would provide at least 50 spots in the lower lobby and about 30 plus spots in the meeting room.

Pay per Use

As detailed in Table 21, 60% of the parking spots were assigned for term pricing customers. That left 40% of the parking spots available for pay per use. Consistent with a conservative approach, the financial model did not assume a detailed daily pricing and usage estimates and instead assumed a daily revenue stream of \$2.00 per assigned day use bike parking spot. Day revenue is an important factor towards a profitable bike station. Day parking spot turnover rate was not considered as the focus was on daily revenue income per bike parking spot and not on an operating pricing formula. Increases in average day revenue and pass holder average usage rate are interrelated from a revenue stream perspective. If the peak period average use rate of pass holders increases above the 3 times a week indicated in the market research, the resulting decrease in revenues from daily users could negatively impact revenue. Increasing the price of the passes could compensate for this.

Parking Spots Usage Modeling

The parking spot utilization was approached from a conservative approach. The model makes a number of utilization assumptions based on rationales supported by visits to bike stations, articles, and a survey undertaken in North America and Europe.

Levels of utilization factors assumptions:

1. **Average day usage during peak month** – Peak day utilization in peak month was set at 95%. Probability is reasonably high that during peak months there will be a few days where all the bike parking spots would be used. For this analysis, it was assumed that this would occur on 15% of the peak month days.
2. **Monthly usage** – Monthly usage was set reflecting the perceived cycling traffic by month over a year, recognizing weather, daylight hours, and other normal occurrences during a year as detailed in Figure 8.
3. **Annual average usage** – Annual average usage is the average of the monthly usage rates. A rate of 61% was set for annual usage.
4. **Ramping-Up customer demand** – As mentioned, building up a market in this area of bike parking will take time. The financial model assumes a 5 year ramp-up period until a 61% average usage for the year and a 95% peak month usage will be reached.

Appendix 6 - Capital Costs

Construction Costs

Based on the schematic diagrams, a class IV estimate was prepared by BTY Group of Vancouver, BC. This is a first-stage estimate for the construction and does not include several elements, many of which will not be known or resolved until later stages of the design or preparation for construction. These include:

- Land costs - variable with owner and market conditions.
- Professional fees and disbursements - approximately 10% of construction cost.
- Planning, administrative and financing costs - variable with developer and financier.
- Legal fees and expenses - variable.
- Building permits and development cost charges - variable with municipality, district, and project cost, area, elements, etc.
- Temporary facilities - variable with site logistical requirements.
- Removal of hazardous materials - variable with discovery and type (if any).
- Loose furnishings and equipment - variable with sources.
- Works outside of building footprint - variable with project conditions and scope.
- Phasing of the works and accelerated schedule - variable with timing constraints.
- Decanting & moving - variable as required.
- Costs associated with LEED certification - atypical project; registration and certification fees variable with project area and best-fit LEED program (NC - New Construction, CS - Core and Shell, CI - Commercial Interiors); plus additional professional fees associated with project management and administration time and effort on the part of design team consultants.
- Project commissioning - variable with systems and equipment required/installed.
- Erratic market conditions, such as lack of bidders, proprietary specifications - variable.
- Cost escalation past January 2010 - variable with time and inflation.
- Seismic upgrade work (if any) - variable with analysis of existing conditions.
- Unforeseen existing building conditions - variable.
- Code upgrades - atypical project; variable with municipal inspections and interpretations.
- Vending machines, washers and dryers - variable with source.

The following table lists costs from the estimate by bicycle station component.

Table 22 - Construction Costs

	Quantity	Unit	Unit Cost	Total Cost
Street Level Retail and Entrance, Level 2				
Concrete block exterior walls 8" thick with waterproofing membrane & rigid insulation at level 2	3,179	sq ft	\$25	\$79,500
Aluminum frame storefront at level 2	391	sq ft	60	23,500
Hollow metal double doors & frame with electrical door opener	1	pair	11,000	11,000
Security sliding gate to retail area 24' x 8' high	1	ea	15000	15,000
HVAC - Allowance tenant fit out to retail space	2,113	sq ft	15	31,700
Electrical - Modification to existing service & distribution to	2,790	sq ft	7.72	21,500
Demolition of existing light fixtures	2,790	sq ft	1.36	3,800
Electrical - Modification to existing systems & ancillaries to	2,790	sq ft	3.75	10,500
New lighting, devices & heating to	2,790	sq ft	13.26	37,000
Total				\$233,500
Stairs with Runnel				
Allowance for structural steel beams for new stair opening including fireproofing	100	lf	250	25,000
Suspended concrete stairs & ramp from level 1 to level 2 in stair well	40	risr	500	20,000
Painted steel stair handrails	46	lf	39	1,800
Saw cut concrete slab	60	lf	15	900
Remove existing concrete topping with steel decking & associated steel beams to form opening for stair well	200	sq ft	20	4,000
Total				\$51,700

Parkade, Level 1

Structure, Floors, Ceilings

Concrete topping 2" thick with wire mesh to existing floor slab	17,265	sq ft	3.5	60,400
Furring to existing concrete block walls	616	sq ft	5.6	3,400
Concrete block walls 8" thick	9,140	sq ft	15	137,100
Metal stud partition with drywall both sides	5,292	sq ft	9.5	50,300
Interior glazed partitions with tempered glass(assume interior glazed partitions with tempered glass)	680	sq ft	40	27,200
Single door and frame with hardware	15	lvs	1,500	22,500
Double doors and frame with hardware	1	pair	2,600	2,600
Double doors and frame with automatic door opener	2	pair	10,500	21,000
Polished concrete to other areas (except retail areas)	7260	sq ft	4.00	29,000
Suspended acoustic tile & T-bar ceiling to other areas	13,908	sq ft	4.00	55,600
Latex paint to walls	30,037	sq ft	1.10	33,000
Allowance for miscellaneous metals	1	sum	5,000	5,000
Allowance for relocating existing services	1	sum	5,000	5,000
Remove existing precast concrete wheel stops	29	ea	30.00	900
Total				\$453,000

Ventilation

Allowance for HVAC system to finished area	9,307	sq ft	35.00	\$325,700
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Electrical

Electrical - Modification to existing service & distribution to	14,675	sq ft	6.54	96,000
New lighting, devices & heating to	14,675	sq ft	11.50	168,800
Demolition of existing light fixtures	14,675	sq ft	1.36	20,000
Electrical - Modification to existing systems & ancillaries to	14,675	sq ft	2.87	42,100
Total				\$326,900

Washrooms and Change Rooms

Floor - Ceramic tile to washrooms & shower areas	1,304	sq ft	12	15,600
Suspended gypsum board ceiling to washrooms & shower areas	1,304	sq ft	8.5	11,100
Floor - Ceramic tile to washrooms & shower areas 7' high	3,150	sq ft	11.6	36,500
Allowance for rough in for tenant fit out area	5	loc	1,000	5,000
Testing, balancing & commissioning	1	sum	1,991	2,000
As-built drawings	1	sum	2,000	2,000
Seismic restraint	1	sum	750	800
Allowance for core openings to slab	83	ea	250	20,800
Allowance for connecting to existing services	1	sum	5,000	5,000
Allowance for fire stopping and smoke seal	1	sum	5,000	5,000
Allowance for relocation of plumbing	1	sum	6,000	6,000
Washroom vanity	28	lf	165	4,600
Wood bench wall mounted to change rooms & shower area	97	lf	145	14,100
Wood bench floor supported to change rooms	82	lf	200	16,400
Washroom accessories	1	sum	5,500	5,500
Lavatories	6	ea	2,200	13,200
Total				\$163,600

Toilets

Metal toilet partitions	9	ea	700	6,300
Metal urinal screens	1	ea	250	300
WC	9	ea	2,500	22,500
Urinal	2	ea	2,400	4,800
Total				\$33,900

Showers				
Shower cubicles	20	ea	900	18,000
Shower curtain track & drapes	67	lf	55	3,700
Built up shower	20	ea	1,100	22,000
Domestic hot water tank	1	sum	30,000	30,000
Allowance for floor drains	30	ea	1,000	30,000
Total				<u>\$103,700</u>
Bicycle Parking				
Sealer to bicycle parking areas	6,045	sq ft	0.65	3,900
Chain link partition	1,241	sq ft	4.7	5,800
Extra over for sliding gate	2	ea	500	1,000
Josta single tier bicycle racks	339	ea	200	67,800
Allowance for ventilation to bike area	6,045	sq ft	8	48,400
Total				<u>\$126,900</u>
Bicycle Repair Station				
Work bench to repair workshop & self-repair station	34	lf	375	\$12,800
Lockers				
Metal locker (Envoy Series) - single tier	192	ea	200	38,400
Metal locker (Envoy Series) - double tier	112	ea	110	12,300
Total				<u>\$50,700</u>
Office and Meeting Room				
Carpet tile to office & meeting room	603	sq ft	6.5	\$3,900
Laundry				
Laundry sink	1	ea	2,200	2,200
Hook up laundry equipment	4	ea	750	3,000
Total				<u>\$5,200</u>
Fire Protection				
Re & re sprinkler system to changing room and lobby	9,307	sq ft	3.5	32,600
Re & re dry sprinkler system to bicycle room	6,045	sq ft	2.5	15,100
Rough in for retail area	2,113	sq ft	2.5	5,300
Allowance for relocation of existing services	1	sum	2,500	2,500
			1,000.0	
Allowance for shut down and recommissioning	4	sum	0	4,000
Total				<u>\$59,500</u>
Total Parkade Level				<u>\$1,665,800</u>
Miscellaneous				
Allowance for interior signage	1	sum	5,000	5,000
Allowance for controls	1	sum	32,864	32,900
Remove existing double doors & frames	3	pair	200	600
Total				<u>\$38,500</u>
General Requirements & Fees				<u>218,800</u>
Net Construction Cost				<u>\$2,208,300</u>
Design Allowance				220,800
Construction Allowance				<u>121,500</u>
Total Construction Cost				<u>\$2,550,600</u>

Table 23 - Equipment and Furniture⁴⁰

	Units	Cost per Unit	Total
Security and Access Control			
Access System	2	\$9,300	\$18,600
Access Cards	1000	7	7,000
Video Monitoring System	6	1,450	8,700
Security Alarm System	1	6,900	6,900
Monitors	4	500	2,000
Total			\$43,200
Retail and Repair Equipment and Furnishings			
Retail Display Units	2	\$1,500	\$3,000
Retail Wall Displays	2	1,400	2,800
Cash Counter	1	4,600	4,600
Air Compressor and Accessories	2	700	1,400
Work Bench and Tool Chest	2	4,100	8,200
Tools, Repair Stand and Air Pumps	2	1,200	2,400
Vending Machine	2	3,700	7,400
Information Holder	2	300	600
Office Furniture	1	2,300	2,300
Computer	1	4,600	4,600
Total			\$37,300

⁴⁰ <http://www.rideuta.com/files/SLCBikeTransitCenterStudyFinal.pdf>, 31. Converted to Canadian dollars, escalated to 2010 dollars. Includes 7% PST.