



NOT JUST BIKE RACKS

Informing Design for End of Trip Cycling
Amenities in Vancouver Real Estate



Your **Cycling** Connection



ACKNOWLEDGEMENTS

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HUB Cycling has conducted this research to learn about the dynamics and perspectives of professionals involved in building development. The report findings and recommendations reflect our research focus, and HUB Cycling notes that all recommendations must be considered and implemented in ways which encourage and support more transportation by bicycle.

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INTRODUCTION

Vi flyttar!

ROCK



Introduction

The idea for this project grew out of HUB Cycling’s experience in recent years of being asked by developers to provide advice and insight into how their new building projects could better meet the needs of and appeal to people who ride bikes. At the same time HUB Cycling has been asked by municipal staff how cities can better engage with developers and managers to create more and better cycling amenities in buildings.

Cycling is the fastest growing mode of transportation in Metro Vancouver, and 41 percent of people in the region want to cycle more.¹ Census data shows that commuter cyclists are over-represented in high-skill and high-income professions. Some leading Vancouver commercial property developers are already recognizing the benefits of designing and installing exemplary end-of-trip facilities and are seeing the benefits in lower than average vacancy rates but there are opportunities for the broader development industry to see the value and demand more bike-friendly features from their design teams. To date though, the general approach to designing and outfitting end-of-trip cycling facilities does not reflect increasing demand for quality and range of cycling facilities in Vancouver’s changing housing and workplace real estate markets.

Effective and attractive facilities factor into decisions that residents and workers make about cycling, and this report seeks to better understand how to overcome barriers to providing more and better bicycle parking and end-of-trip amenities. Our findings indicate that developers, depending on the nature and location of their buildings, should demand that their design teams are prepared, informed and well-engaged at key early development stages to integrate exemplary end of trip facilities that are ready to meet growing demand into the future. Our findings also point to the role of municipal staff and partner organizations in providing the most current and useful information about end-of-trip cycling amenities at key early stages of new developments and redevelopments.

Vancouver developers that have approached HUB Cycling often deal with challenges such as constrained sites, lack of information, limited budgets or regulations creating potential hindrances to achieving the best possible bike-friendly design features. Based on that experience and also knowing that lack of adequate secure, safe and well-designed indoor long-term bike parking is a deterrent to cycling, HUB Cycling concluded it was necessary to better understand the perspectives and priorities of the development industry when it comes to creating bike parking and other end-of-trip facilities.

The challenges that cyclists in Vancouver experience when it comes to secure long-term indoor bike parking (often referred to as Class A bike parking) are known and documented. However, solutions that would be welcomed by the development industry – those who actually create end-of-trip facilities – have not. That is the information gap that HUB Cycling



What are cycling amenities?

In this report when we use the term “cycling amenities” in relation to buildings, we are referring to characteristics or features that encourage cycling or that make the building easier, or more pleasant to use by people who ride bikes. Some such features – such as showers in commercial buildings – are required under local bylaws in the City of Vancouver, while others – such as bike repair rooms – are not.

wanted to help fill with this report.

In order to do so, HUB Cycling obtained a grant for this research project from the Real Estate Foundation of British Columbia and matching funding from other public and private sector sources. It then assembled a project team consisting of senior staff, as well as a project coordinator and a project researcher. When this report uses “we” it is referring to the whole project team.

OUR RESEARCH APPROACH

At the outset of this project we did not have a current or precise understanding of the regulatory or policy incentives available in Metro Vancouver to encourage better bike parking and cycling amenities in private buildings. Nor could we find any listing or description of buildings in the urban region which had bike parking or amenities that exceeded minimum requirements. We therefore considered this to be an exploratory research project that would begin to fill those information gaps.

Our early-stage inquiries indicated that there were very few municipal incentives offered in Metro Vancouver with the intent of encouraging developers to exceed the minimum requirements for bike parking and cycling amenities or to innovate in that area. Similarly, our early inquiries about high-quality cycling amenities in buildings indicated that best practice examples were rare. We therefore decided to profile those local examples that we could identify, and to focus on understanding what the development industry considered to be the main policy obstacles to the creation of more and better cycling amenities in private real estate projects.

Scope and limitations

This research focused on the Vancouver real estate development setting, rather than the broader urban region for several reasons. Primarily, the City of Vancouver requested HUB Cycling undertake the research and committed funding to the project.

Our resources permitted a limited scope and thus it made sense to develop the research model in one city before potentially expanding to the rest of the province. We also chose to focus on private development projects, since those make up the majority of the built environment. While public sector organizations such as Vancouver General Hospital and TransLink have created some excellent examples of Class A bike parking for their employees and other bike commuters in the City of Vancouver, those types of projects typically operate under very different parameters and budgets than private sector developments. Further, we chose to limit our scope to new construction, because those are the circumstances that offer the greatest opportunities for creating bike parking and end-of-trip facilities that exceed minimum requirements.

Finally, in carrying out this project HUB Cycling recognized that cycling is only one option in the spectrum of active transportation choices – but it is also one where building-level design features and amenities have the potential to support significant increases in mode-share, and so identifying and better understanding barriers to the creation of those amenities is a worthwhile focus of inquiry

Types of bike parking

In this report, **Class A** bike parking refers to long-term indoor parking, usually provided for the residents or employees of a building.

Class B parking is outdoors and typically intended to serve the needs of people who are using an area or building for a few hours or in some other transient manner. While this type of parking is necessary, the focus of this report is on parking and cycling amenities that are inside or attached to buildings. These parking definitions are based on the ones in the City of Vancouver’s parking bylaw.

within the wider topic of active transportation.

Methods

As we embarked upon the project, our two main research questions were:

- ▶ What changes to existing policies and regulations, or new policies and regulations, do developers and other industry professionals support in order to achieve more and better bike parking and other cycling amenities in new private multi-unit residential, office and mixed-use buildings in the City of Vancouver?
- ▶ What, if any, information are developers and other industry professionals lacking that would help them provide more and better bike parking and bike-friendly design features or amenities in their new private-sector buildings?

We sought to answer these questions through semi-structured interviews with approximately two dozen key informants in the development industry, an informal survey that we developed based on what we heard during those interviews, and site visits to individual projects that we learned about along the way. Also, through HUB Cycling's newsletter we asked subscribers to tell us about any new private residential or commercial buildings that they thought had bike parking or end-of-trip facilities that were high-quality or could serve as examples to others.

For interviews, we sought to speak to those in the development industry and in HUB Cycling's stakeholder network who were knowledgeable, experienced and active in this area.

For the survey, the Urban Development Institute (UDI), a non-profit professional association for the development industry, provided the main distribution channel, supplemented by Planning Institute of B.C. (PIBC), the provincial professional association for planners. Through the UDI, the survey was emailed to approximately 2,800 contacts. Through PIBC, it was emailed to 800 contacts in the association's South Coast chapter. We received 107 responses to the survey, for a response rate of about three percent. We recognize that those who chose to respond to a survey on this topic were a self-selecting group whose views may not be representative of the wider membership of their organizations or the development industry more generally. However, we still considered conducting the survey to be a worthwhile step towards better understanding industry perspectives and priorities when it comes to bike parking and amenities.

We also asked respondents to identify their role in the development process.

- ▶ 43 percent owned, managed or worked in another capacity for a development company.
- ▶ 19 percent were planners or worked for a planning firm.
- ▶ 16 percent were architects or worked for an architectural firm.
- ▶ 8 percent were engineers or worked for an engineering firm.

The remaining approximately 14 percent of respondents had a range of development-related roles, including lenders, appraisers or local government staff.



CHALLENGES WITH SECURE BIKE PARKING

Challenges with secure bike parking in the City of Vancouver

Based on HUB Cycling’s experience and membership feedback, high-quality Class A bike parking is lacking for both Vancouver residents and those who commute to work in the City of Vancouver by bike, but so far there has been more attention toward challenges with residential bike parking. In 2015, researcher Patrick Bell collected residential bike parking stories through an informal survey he conducted as part of a 2015 report for the City of Vancouver’s Greenest City Scholars Program.² Some excerpts from those stories follow:³

▶ “To get to my bike, I go down to P2, and walk all the way to the most removed and secluded corner of the parkade - it is literally a dark and hidden corner at the back of the building.”⁴

▶ “...It is always a nuisance to get my bike out of the locker. There are 2 layers of doors that lead to the parking area, then a separate key is needed to open the bike locker. Then I have to fit the bike in the elevator and then open a 3rd door that leads to the road. The doors are heavy and cumbersome to open especially with one hand.”⁵

▶ “The bike room seemed minimally secure. It was a chain-linked enclosure near the entrance to the parkade. Because there was insufficient space within the enclosed bike room, additional racks were placed outside of the enclosure, with bikes visible from the street through the building’s garage door, enticing thieves.”⁶

▶ “We have one enclosed room for secure bike storage, but it is overflowing.... Now we have bikes chained in the stairwells, which is a fire risk. I park my bike in my bedroom, but it is scratching the paint and makes marks on the floor every time I take it in and out. I am risking my damage deposit every time I move it. It is a huge deterrent to cycling more often.”⁷

The most common bike parking complaints as collected in Bell’s survey are summarized in Figure 1. As it indicates, lack of capacity, as well as poor security and poorly designed bike parking were frequently mentioned. Secure bike parking is a particular concern in the City of Vancouver, which has a substantially higher per capita rate of bike theft than any other large Canadian city.⁸

Figure 1⁹

Most common complaints about Class A residential bike parking



Source: Patrick Bell, *Coming to a Stop: All Ages and Abilities Bicycle Parking in New and Existing Development* (2015) p. 14.

If not addressed, these types of experiences and complaints have the potential to slow or halt further gains in cycling mode-share even as public cycling infrastructure continues to expand. Peer-reviewed research backs this up. A study of Metro Vancouver cyclists by UBC researchers found that the availability of secure indoor bike parking had a significant positive influence on cycling behaviour, ranking 10th out of 36 motivating factors.¹⁰ While it's true that the City of Vancouver's network of bike lanes, routes and paths has grown by about 110 kilometres in the last decade – and that expansion is part of the reason why the city is rightly seen as a North American cycling leader – bike parking, particularly long-term, indoor bike parking and other end-of-trip facilities have not necessarily kept pace with that growth.^{11, 12}

The development context

Given the local popularity of cycling and the city's overall green branding, it's surprising that improvements to the quality and quantity of end-of-trip cycling facilities have been slow here. There are clear commitments to increasing the share of trips made by cycling and walking embedded in city policies such as The Greenest City 2020 Action Plan and Transportation 2040. Thanks to the city's policy leadership, as well as other factors beyond the city's control, such as its mild weather and widespread public concern about climate change, the city has seen the percentage of all trips made by bicycle increase from 5.5 percent in 2015 to 7.0 percent in 2016.¹³ This means the city has met its cycling mode-share target for 2020 ahead of schedule.¹⁴

The rapid growth of cycling would seem to offer a market opportunity that developers would be eager to fill. In addition to the expanding public infrastructure and increasing mode-share of cycling, data from the 2011 Census and National Household Survey indicates that many bike commuters in the Metro Vancouver region are young and educated – two demographic groups that the development and real estate industries often want to target. For example:

- ▶ 29 percent of bike commuters were 25-34 years old
- ▶ 60 percent of bike commuters had a bachelor's degree or higher
- ▶ 86 percent of bike commuters had some level of post-secondary education¹⁵

The largest income group (16 percent of commuter cyclists in the City of Vancouver) had individual (2010) incomes ranging from \$60,000 to 80,000 and the next largest group (13 percent) had incomes of \$100,000 or more.¹⁶

More broadly, as of 2013, 79 percent of British Columbians owned or had access to a bike.¹⁷

Given the expansion of local cycling infrastructure over the last several years, that number is likely to be higher in the City of Vancouver today. Larger societal trends also seem to favour a decrease in the use of private vehicles for commuting and an increase in other modes, including cycling, especially by younger generations living in large cities.¹⁸ Recent U.S. census data also indicates that the percentage of commuters who cycle for transportation is growing fastest among those with higher incomes.¹⁹

However, responses to interviews and the survey conducted for this project indicate that a key factor holding back the development of more and better quality bike parking and cycling amenities in private buildings is the same one that has been identified as undermining the viability of small businesses and making it difficult for employers to attract and retain talent:

unprecedented high land costs.²⁰ In the first half of 2016, average sale prices per buildable square foot for land zoned for residential highrises in the downtown core ranged from \$275 to \$325.²¹ Prices were even higher in Vancouver's west side, ranging from \$300 to \$500 - and these costs have only continued to climb since then. While there may not be an immediately obvious connection between land costs and the creation of cycling amenities, most design features in buildings – whether it's a bike repair room, a separate entrance for cyclists, or wider hallways to allow for easier navigation by bike – require space in one way or another, and so are affected by land costs.

Also, sale prices for condominiums continue to increase, indicating sustained strong demand for that product.²² When it comes to the commercial property market, such as for office and retail spaces, 2016 was a record sales year in the Lower Mainland with 918 recorded transactions.²³ Statistics of this nature indicate a real estate market (or markets) in which builders and property agents have the upper hand and find it relatively easy to sell, rent or lease their properties without offering extra or new types of amenities as incentives. The degree to which the City of Vancouver's extremely high land costs are sustainable is subject to much research and conjecture, but is ultimately unknown. This means that realistic ideas for improving bike parking and cycling amenities in the City of Vancouver should not assume dramatically lower land prices in the foreseeable future.

The pressing question then becomes: Within the existing real estate context, what are some possibilities and innovative solutions to remedy the dearth of high-quality bike parking and cycling amenities? To answer this question, it is important to understand cyclist needs and preferences, but equally so to understand what policy changes, incentives or information would be welcomed and useful to the development industry, because there seems to be little research on that question. That is why the HUB Cycling research team wanted to talk to active transportation champions in the development industry – those who have sought to offer better options to residents and employees who, even in a market climate where they don't necessarily have to.





CYCLING- REQUIREMENTS FOR DEVELOPMENT

Cycling requirements for development in the City of Vancouver

Existing requirements are another important aspect of the development conditions for bike-friendly buildings. In the City of Vancouver, the only cycling-related requirements for residential buildings are for bike parking which include standards for quantity, access and security of that bike parking. For commercial buildings, toilets, sinks and showers are also required and these requirements are contained in the city's building code. Other Metro Vancouver municipalities, which aren't in the City of Vancouver's unique situation of having its own municipal charter, are governed by the provincial building code. While those municipalities don't control the building code, they do have the option of passing their own bylaws to impose requirements that exceed provincial building code minimums.

PARKING BYLAW 6059, SECTION 6

Vancouver's bike parking requirements are contained in section 6 of its parking bylaw, [Parking Bylaw 6059](#) and were last updated in 2008.²⁴ For major multi-unit residential projects, such as most purpose-built rental or condominium projects, the requirement for Class A bike parking, meaning secure indoor long-term parking, is 1.25 spaces per unit. This is the same or higher than all other Metro Vancouver municipalities, with the exception of the City of North Vancouver, which requires 1.5 spaces per unit.

While there are many types of commercial buildings, Class A bike parking requirements for office and most retail or service uses is a minimum of one space for each 500 square metres of gross floor area.²⁵

Some key requirements for Class A bike parking in the City of Vancouver are:

- ▶ Entry doors to bike rooms must be at least 75 cm wide and made of steel.²⁶
- ▶ Bike storage must be located no lower than the first complete parking level below grade and must have direct access to the outside. This requirement applies unless there is an elevator that offers direct access to the outside.²⁷
- ▶ Bike storage areas must be designed to hold no more than 40 bikes, unless the room is divided up into expandable metal mesh compartments that each hold a maximum of 40 bikes and those compartments have lockable industrial-grade doors.²⁸
- ▶ Entrance doors to bike storage areas must be within sight of building or parking security if it exists, or an elevator or entrance.²⁹

THE VANCOUVER BUILDING CODE

Shower and change room requirements for commercial buildings are found in the city's building code and are tied to the required number of Class A bike parking spaces. For example, when 30 to 64 Class A bike parking spaces are required based on the size of the building, then two toilets, one sink and two showers are also required for both men's and women's facilities.³⁰

SUSTAINABLE BUILDING RATINGS SYSTEMS AND CERTIFICATIONS

The Canada Green Building Council and US Green Building Council's Leadership in Energy and Environmental Design (LEED) standard has been a widely adopted certification program across North America.

For commercial or institutional projects the latest version (v4) of LEED requires that the following is provided:

- ▶ short-term bicycle storage (Class B) for at least 2.5 percent of all peak visitors.
- ▶ long-term bicycle storage (Class A) for at least five percent of all regular building occupants.
- ▶ at least one on-site shower with a changing facility for the first 100 regular building occupants and one additional shower for every additional 150 regular building occupants.³¹

For residential projects LEED v4 requires that the following is provided:

- ▶ short-term bicycle storage (Class B) for at least 2.5 percent of all peak visitors (no fewer than four storage spaces per building).
- ▶ long-term bicycle storage (Class A) for at least 30 percent of all regular building occupants.³²

Further, short-term bike storage must be located within 30 metres of any main entrance and long-term bike storage must be located within walking distance of any an entry that is designed to be used by pedestrians and that is open during regular business hours.³³

In practice, these requirements are either equivalent to or less than what already exist in the City of Vancouver's own bylaws.

However, developers do have the option to pursue an additional cycling-related LEED credit for a building's proximity to a "cycling network."³⁴ In order to obtain that credit, a building's entry or bike storage must be within 180 metres from a cycling network.

Also, while they are not required now, other types of green-building standards are gaining popularity. For example, the WELL building standard focuses on the health and well-being of building users and occupants. Meeting its standards for bicycle storage requires providing "basic bicycle maintenance tools, including tire pumps, patch kits and hex keys" on-site or within 200 metres of the building's main entrance.³⁶

What is a Cycling Network?

A cycling network is defined as an area being within 4.8 kilometres of cycling distance to either 10 diverse uses (such as a supermarket, pharmacy, bank, health club, restaurant, child care, or civic and community facilities) or a school or employment centre, or a public transit stop or station.³⁵



A smiling man with long dreadlocks is sitting on a yellow bicycle in a modern, industrial-style interior. He is wearing a patterned shirt, light-colored pants, and white sneakers. The background features concrete walls, a wooden table, and a staircase. A dark blue semi-transparent box is overlaid on the image, containing the text.

CYCLING-RELATED BUILDING REQUIREMENTS & INCENTIVES

Cycling-related building requirements and incentives around Metro Vancouver

While this project focused on the City of Vancouver, we have collected information summarizing the Class A bike parking requirements in selected major Metro Vancouver municipalities.³⁷ As Figure 2 shows, the City of North Vancouver has the highest requirement among these municipalities, at 1.5 spaces per dwelling unit. The districts of North Vancouver, West Vancouver and the Township of Langley do not have a standard per-dwelling-unit requirement for this type of bike parking in multi-unit developments, and the City of Langley requires only 0.5 spaces per dwelling unit.

Most of the other municipalities, including Vancouver, require either 1 or 1.25 spaces of Class A bike parking per dwelling unit. The requirements for commercial office developments vary quite widely among the municipalities, with City of Vancouver's requirements landing on the high end of the spectrum at 1 space per 500 square metres of gross floor area. Some municipalities do not require any Class A bike parking for office developments.

Figure 2 and Table 1 are intended to show the requirements or incentives that are in place in each major municipality for the type of land use indicated, rather than in special purpose zones or individual neighbourhoods or through non-mandatory guidelines. We also learned that various municipalities, including Delta and Surrey, are in the process of or have plans to review their requirements for Class A bike parking.

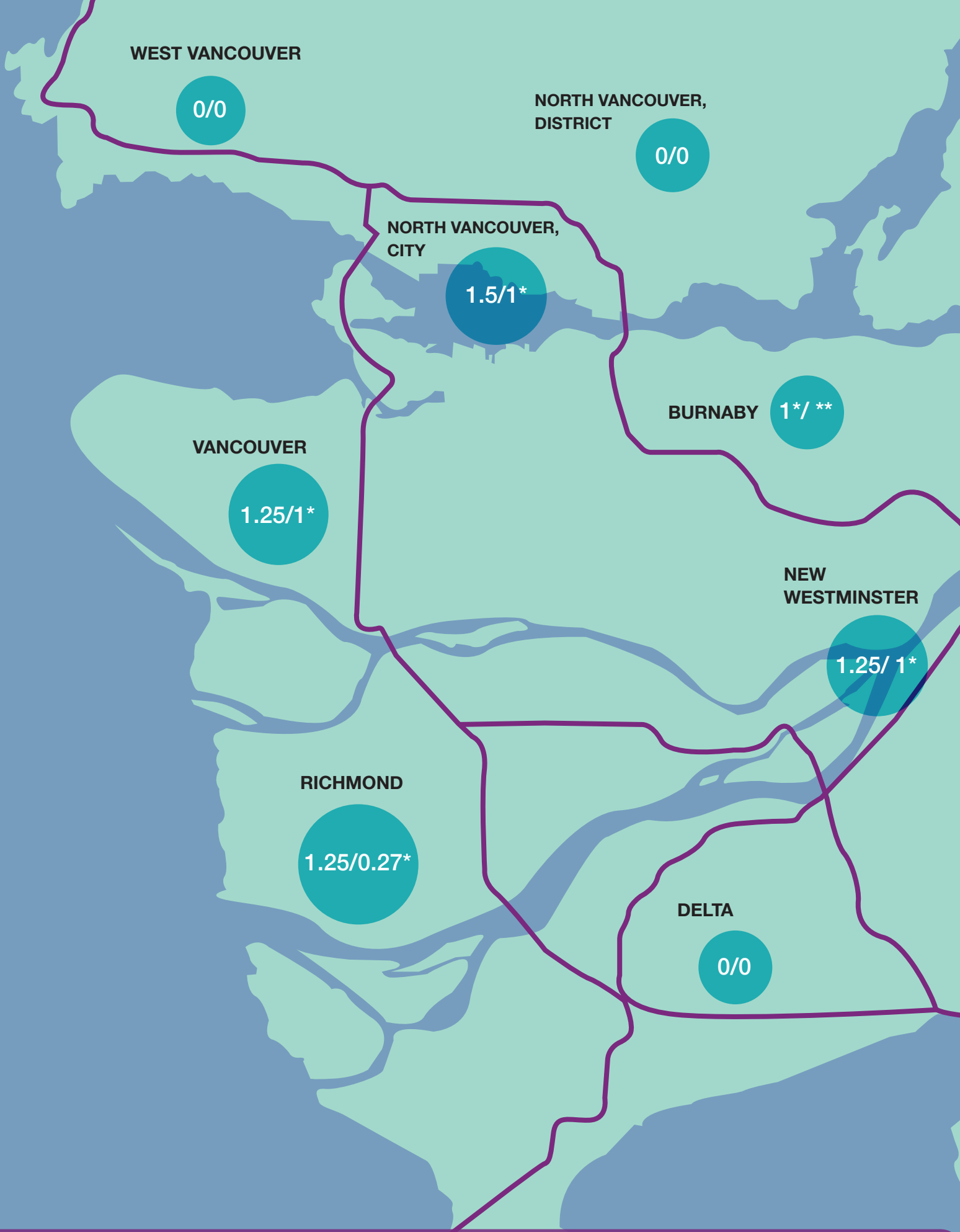
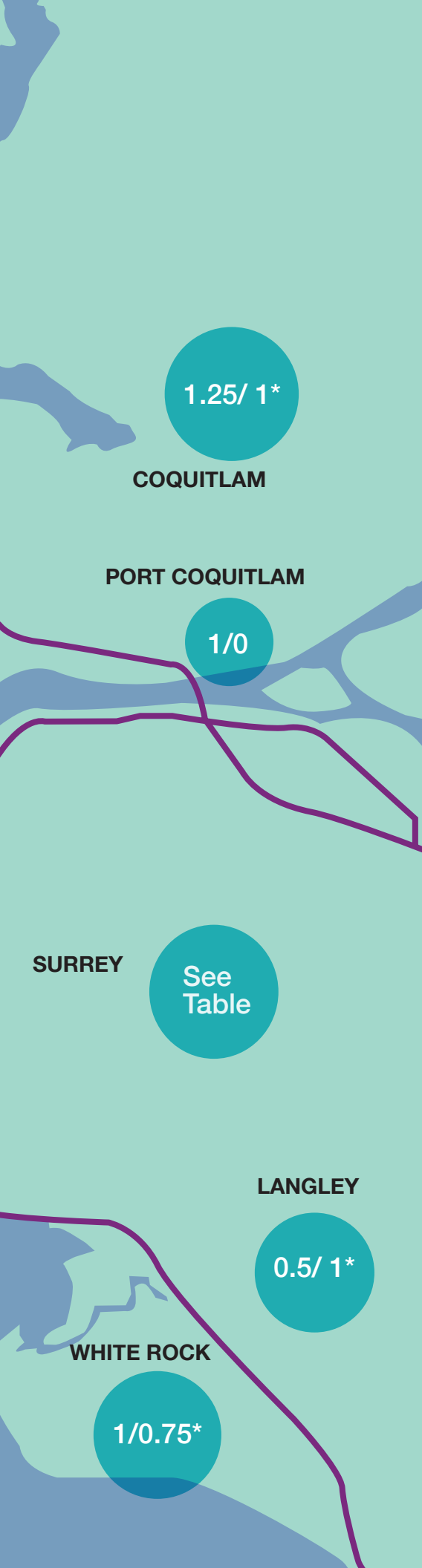


Figure 2: Class A bike parking requirements in selected major Metro Vancouver municipalities for multi-unit residential and office developments³⁸



MUNICIPALITY	Per dwelling unit requirements for Class A bike parking for multi-unit residential developments	Requirements for Class A bike parking spaces for commercial office developments
BURNABY	1.0 for rezonings	**For rezonings: 10% of the number of off-street vehicle parking spaces, with ratio of Class A and B to be determined by planner.
COQUITLAM	1.25	1 per 1,000 s m ² of gross floor area
DELTA	0	0
LANGLEY CITY	0.5	1 per 750 m ² of gross floor area
LANGLEY TOWNSHIP	0	0
NEW WESTMINSTER	1.25	1 per 750 m ² of gross floor area
NORTH VANCOUVER, CITY	1.5	1 per 250 m ² of gross floor area
NORTH VANCOUVER, DISTRICT	0	0
PORT COQUITLAM	1	0
RICHMOND	1.25	0.27 per 100 m ² of gross leasable floor area greater than 100.0 m ²
SURREY	1.2 for non-ground-oriented complexes with 30 or more vehicle spaces	0.06 spaces per 100 sqm of space, when the gross floor area is above 2000 m ² (for general service use)
VANCOUVER	1.25	1 per 500 m ² of gross floor area.
WEST VANCOUVER	0	0

LANGLEY TOWNSHIP

0/0

When it comes to supporting cycling beyond requiring Class A bike parking, the policies of Metro Vancouver municipalities are generally limited to requiring or encouraging the provision of end-of-trip facilities, such as shower or change rooms. Several municipalities have policies that allow for the reduction of vehicle parking in return for the provision of extra bike parking or end of trip cycling facilities. In some cases, the reductions are allowed in return for “transportation demand management” (TDM) features and cycling may not be specifically mentioned. Table 1 shows the major Metro Vancouver municipalities that have policies to encourage the provision of more or better-quality bike parking or end-of-trip cycling amenities and summarizes those policies.

TABLE 1: MUNICIPAL POLICIES IN METRO VANCOUVER THAT ENCOURAGE THE PROVISION OF BIKE PARKING OR OTHER CYCLING AMENITIES.³⁹

Municipality	Policy
Burnaby	Commercial: For rezonings, end-of trip facilities (shower, locker, change room and wash basins) are required in office and employment developments greater than 4,000 m ² .
Coquitlam	Residential and commercial: At Evergreen Line core and shoulder station areas (within 800 m of a station), off-street vehicle parking spaces can be reduced by up to 5% in exchange for transportation demand measures, or between 5% and 10% if at least \$20,000 per reduced space is provided in transportation demand management amenities. For lots within the Evergreen core area, reductions may be as high as 15%.
New Westminister	Commercial and mixed use: Allow 5% reduction to required non-residential parking in downtown area if mens and women’s showers and lockers provided.
North Vancouver, City	<p>Residential: 1 vehicle parking space can be reduced for for every six required secure bicycle spaces provided. Within this, the required vehicle visitor parking can be reduced by a maximum of 50%.</p> <p>Non-residential: 1 vehicle parking space can be reduced for every 3 required secure bike parking spaces. Also, an additional vehicle parking space can be reduced for every 3 bike spaces required above the required amount of bike parking, up to a maximum reduction of 20% of the minimum parking requirement.</p> <p>Also, all new non-residential buildings that require secure bike parking must provide end-of-trip facilities including wash basins, showers, grooming stations and lockers. The city’s “Sustainable Development Guidelines” encourage developers to provide “end-of-trip bicycle infrastructure beyond zoning requirements.”</p>

Municipality	Policy
Richmond	Up to 10% of vehicle parking spaces can be reduced in return for the provision of a variety of TDM measures, including enhanced end-of-trip facilities for cycling.
Vancouver	Office, retail or service: Allow the reduction of 1 vehicle space for every 5 additional Class A bike spaces provided above the required amount, to a maximum of 1 bike space for each 300 m ² of gross floor area. The city's building code requires the provision of end-of-trip facilities (e.g. showers and change rooms) in commercial developments. The "Rezoning Policy for Sustainable Large Developments" requires a "green mobility plan," that describes how the developer will prioritize "walking, cycling, and public transit over automobile use." It states that the main purpose of the plan is "to identify and evaluate opportunities to support sustainable transportation choices" in ways that go beyond the minimum requirements in the city's zoning, building and parking laws.
White Rock	Various uses: May allow for 10% reduction in vehicle parking spaces, in exchange for transportation demand management measures, but bike parking or amenities not explicitly mentioned.

A woman with long dark hair, wearing a light grey sweater and a colorful patterned scarf, stands in a modern glass door entrance. She is holding a yellow bicycle with a blue basket. The door is open, and she is looking out. The background shows a modern building interior with a glass ceiling and a brick wall on the left. A dark blue semi-transparent banner is overlaid on the image, containing the text.

GOING ABOVE & BEYOND: BUILDINGS THAT EXCEED REQUIREMENTS

Going above and beyond: buildings with bike-friendly features that exceed requirements

We found very few examples of cycling amenities in completed new private residential or commercial buildings that exceeded minimum requirements within the City of Vancouver, although there were a few more buildings at various stages in their development process with the potential to surpass requirements. This absence was somewhat surprising given the well-established popularity of cycling in Vancouver, and the survey we conducted sheds light on the reasons for that. Also, the baseline requirements for bike parking in the City of Vancouver are higher than many other North American cities, so developers that wish to exceed those minimum requirements have further to reach than in other jurisdictions.⁴⁰

People who cycle in Vancouver and live in recently built multi-unit projects are served by the requirement for 1.25 spaces per unit as well as other design specifications that contribute to the security, accessibility and safety of bike parking spaces. But as documented in the *Coming to a Stop* report and our own research, there is much room for improvement when it comes to Class A residential bike parking, and the same is true for tenants of commercial buildings.

In the following section we profile some examples of new private buildings where the developers or owners have exceeded the city's minimum requirements – whether by providing more than the required number of bike parking spaces or by creating non-required end-of-trip facilities or design features. There may well be other such examples in the city or region that we didn't identify. Taking a more comprehensive approach to identifying, documenting and updating a public list of new developments with noteworthy bike parking or other design features could be worthwhile goal of a future region-wide research project.

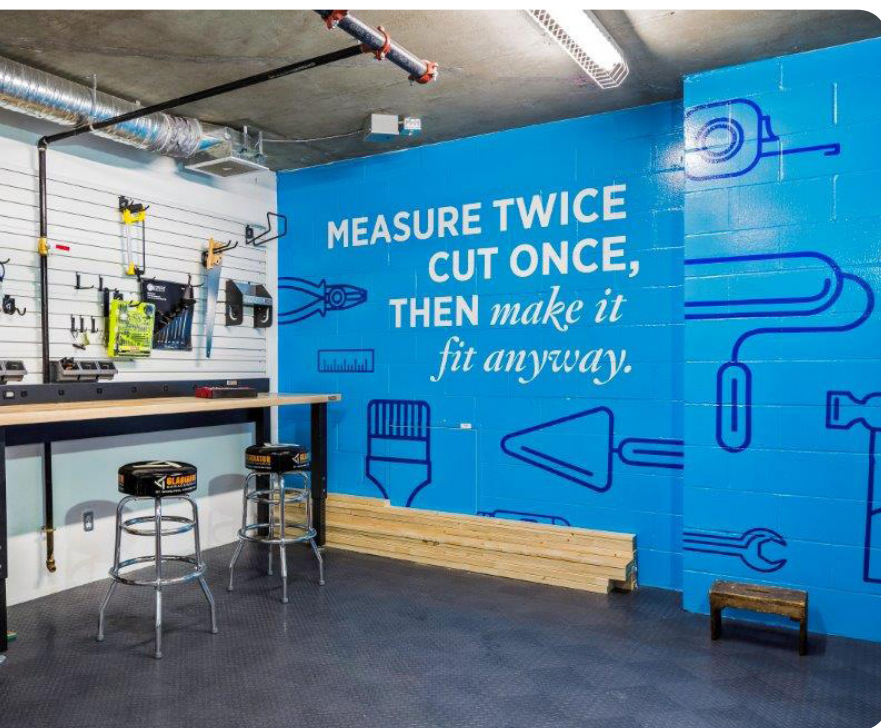
RESIDENTIAL

Bosa-Blue Sky Properties: Chinatown

- ▶ 183 E. Georgia
- ▶ <http://bosa4rent.com/chinatown/>

This purpose-built rental building in Chinatown was completed in 2016. Just two blocks from the popular east-west Adanac-Union bike route and a few blocks away from the seaside bike path, its location means it's perfectly situated to appeal to both commuter and recreational cyclists.

In addition to the required bike parking, lockers and shower for commercial tenants, the building's cycling-friendly features include a bike repair room and bike-wash station, both located on the first floor of the parking garage. Bosa has also created its own internal bike-sharing system. Other building amenities include a fitness centre, pet-wash station, garden plots and a shared entertainment kitchen and dining room. As with many residential buildings, bikes are not allowed in hallways and elevators.



BIKE WORKSHOP

The bike workshop, or repair room, is spacious, well-lit and attractively painted in the same colours used to identify other bike features in the underground parking. Bosa invested \$750 in a set of bike repair tools when the building first opened, on the

Building type:

Mixed use - purpose-built rental with commercial

Completed:

2016

Rents:

\$1,700 to \$2,800

Number of units:

192 rental units, plus a grocery store, bank and coffee shop

Total square metres:

12,961

Number of bike parking spaces:

240

Number of lockers:

48

LEED level:

Gold

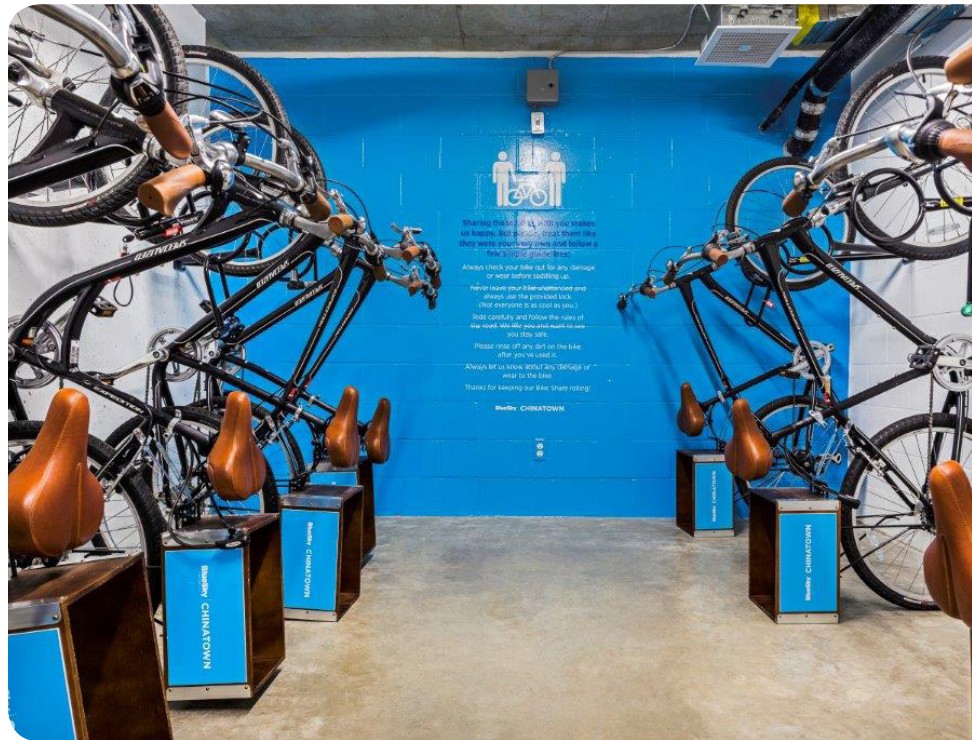
Bike-friendly features:

Bike repair room, bike wash station, bike-sharing system, extra bike lockers

Nearby bike routes or paths:

Adanac-Union bike route, Seaside bike path

understanding that use of the tools was on the honour system. There is no charge to use the space. The locked room is accessible by fob from 6 a.m. to 11 p.m. A framed poster hanging on the wall sets out the terms of use in plain language and a friendly tone: “If anything needs attention in the workshop, let us know so we can fix it. Please clean up after yourself and leave the space in order for your neighbours.” Given that the building is only a year old, it is a bit too early to fully evaluate the success of the bike repair room and determine whether tool theft will prove too costly. Building management expects residents are to ask before using tools in their own suites and before using their own tools in the bike repair room. They do not allow soldering in the bike repair room.



BIKE-SHARING SYSTEM

BlueSky has provided more than a dozen hybrid city bikes that residents can use for free after signing a liability waiver. Different frame styles are available. Locks are attached to bikes and each bike features a rear basket advertising the name of the building. Residents must sign the bikes out and in with the on-site building manager. Unsurprisingly, the shared bikes have been most heavily used in the spring and summer. Bluesky has arranged with a local bike shop to maintain the bikes.

BIKE-WASH STATION

Yet another bike-friendly feature of the Chinatown building is a bike-wash station. The decision to include a bike-wash station evolved out of BlueSky's desire to distinguish itself in the rental

marketplace by allowing tenants to have pets in some of its new buildings. Bosa Bluesky installed pet-wash stations in the buildings that allow pets – both as a way of appealing to pet owners and as a strategy for minimizing the additional wear and tear that pets can create. It seemed like a natural extension to also provide a bike-wash station in its Chinatown building for similar reasons. The bike-wash station is located in the same underground room as the pet-wash station. It was custom-built using the pet-wash station as a model.

Canvas by Onni

- ▶ 396 E. 1st Avenue and 417 Great Northern Way
- ▶ <http://www.onni.com/canvas/>

Canvas was completed in the summer of 2016 and will soon be a neighbour to the relocated Emily Carr University of Art & Design. Canvas consists of two separate buildings with a common courtyard between them. Onni's Nic Jensen said that Canvas' location directly on a well-used east-west bike path was the main factor leading to the company's decision to include a bike repair space in the building's amenity mix. "We knew that would certainly influence some of our buyers," he said. Other Canvas amenities include a fitness centre and a courtyard that features a fire pit and garden plots.



space free of charge, using their fob for access. Onni provided two repair stands for the space that each have a set of ten attached tools. The stands have a secure compartment to lock tools in at night. These racks are available from Urban Racks, a local supplier. They cost about \$980, not including installation.

Building type:

Condominium

Completed:

2016

Number of units:

209

Total square metres:

14,247

Number of bike parking spaces:

189

Number of lockers:

45

Bike-friendly features:

Workshop with space for bike repairs, lockers

Nearby bike routes or paths:

Great Northern Way and East 1st Avenue, both of which are on the Central Valley Greenway.

BIKE REPAIR SPACE

The bike repair area at Canvas is located in a larger common workshop where residents can do woodworking and similar projects.

Any resident of the building can use the

BIKE PARKING

The bike parking rooms at Canvas are spacious, clean and well-lit, with solid walls and a mixture of horizontal and vertical racks.



COMMERCIAL

Oxford Properties Group: Oxford Place

- ▶ 1055 West Hastings Street
- ▶ <http://www.oxfordproperties.com/leasing/en/office/property/guinness-tower>

The four-tower office complex known as Oxford Place sets a high standard for bike parking and cycling amenities - and intentionally so. Derek Page, the Oxford Properties Group's vice-president for real estate management in Vancouver, explained that the cycling and other types amenities available to the tenants of Oxford place (for example a yoga room, gym and bouldering wall) reflect the company's philosophy and commitment to wellness. "We really wanted to create the best amenities of any office complex downtown and that would include not only cycling, but fitness and healthy foods and so forth. We wanted to create a place that people can really achieve all their goals in their work-day and have that extend to their life." On a more practical level, Page noted that "We like to have full buildings with quality tenants and I think the numbers speak for themselves."

"Our tenants are not only willing to pay for the level of amenities at Oxford, they demand them. What we're finding is that it's increasingly part of the package that tenants are looking at when they're deciding where to locate their business. They want to make sure that their workers will be attracted to working in that complex, because one of the hardest things is attracting good staff and retaining them."

—Derek Page

The tenant mix in Oxford Place includes firms involved in real estate, law, accounting, and mineral exploration, among other areas. These tenants, Page said, are not only willing to pay for the level of amenities that Oxford provides, but "they demand them. What we're finding is that it's increasingly part of the package that tenants are looking at when they're deciding where to locate their business. They want to make sure that their

Building type:

Offices, four highrise towers joined underground: Oceanic Plaza, MNP Tower, The Marine Building and Guinness Tower

Completed:

Final tower (MNP) completed in 2015

Total square metres:

92,903

Lease rates:

\$35-\$50 per square foot net

Number of tenants:

7,231 full-time equivalent employees

Facility users:

About 700 registered for electronic access to bike parking rooms

Bike parking spaces:

178 secure indoor spaces

LEED level:

Gold

Nearby bike routes or paths:

Painted bike lanes on Georgia and Burrard streets, shared use lane on Pender St., protected bike lane on Hornby Street, seawall bike path



All Oxford Place tenants have access to free bike parking. All walls are solid, full height and with no openings. Doors open by registered key card and lights are motion-activated. Several security cameras are located throughout the bike areas and security staff patrol the space about once per hour on weekdays.

workers will be attracted to working in that complex, because one of the hardest things is attracting good staff and retaining them.”

The company’s move to substantially upgrade the bike parking and cycling amenities at Oxford Place was a product of its decision to add a new tower to the downtown complex. The rezoning process to create the new building required a specific amount of amenity space a condition of approval. The company had seen its existing bike parking overflow over the previous several years, partly as a result of new downtown bike lanes created by the City of Vancouver. The new building offered an opportunity to better meet their tenants’ cycling needs. Oxford’s corporate leadership includes several avid cyclists, and their first-hand experience provided a starting point when it came to the design of the upgraded facilities. The company also engaged a team of designers familiar with LEED requirements.

The resulting facilities not only exceed city requirements on various counts, but also provide an end-of-trip mood and aesthetic experience several notches above what’s available in bike rooms and changing facilities in more typical office or commercial projects.

The company has two more downtown projects in progress and plans to bring the same approach and high standards to its cycling facilities in those buildings.

Dryers are available in men’s and women’s change rooms

Bike friendly features:

Change rooms with towel service, dryers and locker access available on a standalone monthly fee basis or as part of gym cost. Cedar lockers where both bikes and clothing can be stored together in a locked room are also available for an extra monthly fee. One of the bike rooms includes a stand for doing repairs and a tire pump. Basic tools such as allen keys are available from the concierge. Oxford Properties also hosts a public Mobi bike-share station.

Awards:

2016 LEED EB:OM gold certification by the Canada Green Building Council, 2016 Building Operators and Managers Association (BOMA) best level 3, 2016 Gold Bikeability Award from HUB Cycling



Vancity Credit Union Head Office

▶ 183 Terminal Avenue

While not a new development, VanCity's bike room was renovated and expanded in 2014, so we included it as a useful example of what can be achieved in an existing commercial building.

The head office of VanCity Credit Union is in a prime bike-friendly location, right across Quebec Street from the Seaside Greenway bike path and a couple blocks from the northern start point of the Ontario Street bike route. The headquarters has had dedicated bike parking ever since the office tower was constructed in 1995, but back then it only had room for 15 bikes. VanCity expanded the bike parking space in 2014 and another expansion is in the works to better accommodate bike trailers and cargo bikes. "We want our staff to be able to cycle to work through all stages of their life," Anthonia Ogundele explains. "For some people that means picking up and dropping off kids before or after work."

VanCity surveys its employees every year about their transportation choices. Based on that information they know that about six percent of their workforce province-wide cycles to work. Ogundele believes that providing ample safe, secure and convenient bike parking for employees is key to increasing mode share, which is part of why she wants to see the existing facility expanded. VanCity took over two vehicle parking spaces to allow for the 2014 expansion, and now they're considering installing high-density racks, as they've already done at one of their branch locations, to create more bike parking spaces. The solid walls that surround the bike parking space allow for the installation of power outlets for the use of employees who

Building type:

Office

Completed:

Bike room first built in 1995 with original building, expanded in 2014.

Number of tenants or employees:

600

Total square metres:

10,219

Bike parking spaces:

15 in 1995, 50 as of 2014

Bike friendly features:

Bike room that includes electric-assist bicycles for shared use by staff, bike tools, and storage space for personal belongings



want to charge bike lights or electric-assist bikes, and also allow for the widest range of rack choices. One challenge thus far has been managing the bikes that staff sometimes leave overnight, which Ogundele believes indicates that the staff bike parking VanCity provides is better and more secure than employees have at home. Instead of installing signs admonishing staff for leaving their bikes, Ogundele says they've simply designated long-term bike parking areas with specific time limits for their staff. Ogundele also proudly notes that they have never had a bike stolen from their bike room, which she attributes to Vancity's staff culture, but also features such as controlled electronic access to the bike room and the installation of security cameras.



PROJECTS IN PROGRESS

Through our research and HUB Cycling's previous consultations with developers we learned about a handful of other in-progress projects where developers have taken a creative approach to resolving challenges posed by site constraints and bike parking requirements. The Smithe is one such example.



The Smithe

- ▶ 885 Cambie St.
- ▶ <http://boffo.ca/thesmithe>

The Smithe is a mixed-use 27-storey development by Boffo Developments Ltd., with 94 two and three-bedroom condominiums. The project is currently in the pre-construction phase.

The small size of the downtown site has posed various design challenges, including where and how to fit in the required number of long-term indoor bike parking spaces and lockers. The city's default preference is to have these on the first level of underground parking (P1), so that cyclists have quick and easy access to their bikes. However, given the size of the site and the other mechanical, access and exit issues that developers must also provide for on P1, locating all the bike parking there required Boffo to commit to an extra level of underground parking and excavation. Instead, Boffo proposed to locate the bike parking on the lowest parking floor (P6) and to provide a dedicated bike elevator for access as well as other cycling amenities, such as a bike repair room. When the city declined this initial proposal,

Building type:

Mixed use – condominium with office and retail

Completed:

2020 target date

Number of units:

94

Total square metres:

15,875

Bike parking spaces:

118 to 143 residential spaces

LEED level:

Gold

Bike friendly features:

Bike repair room, bike parking space with automatic doors, with all-horizontal racks, extra racks, wide aisles and bike elevator accessed via dedicated lobby at lane, extensive security measures with all FOB control and security cameras.

Nearby bike routes or paths:

Within one to four blocks of Beatty Street, Cambie Bridge, Richards and Homer streets, Pacific Boulevard and with easy access to the Seaside Greenway

preferring the typical P1 location for the bike parking, Boffo Developments approached HUB Cycling for guidance on how to best accommodate bike parking on P6.

Knowing that theirs was an unconventional proposal, Boffo vice-president Jim Ellis and architect Robert Toth did their best to think through all the reasons why putting the bike parking on P6 wouldn't work and then address them thoroughly. Ellis notes that, "We always start with the premise, 'if this was for me, if I had the bicycle, if I had to commute everyday, what would I want? What would raise my level of confidence and enjoyment?'" Boffo returned to the city with a refined proposal that included a separate cyclist elevator lobby and a dedicated bike elevator designed to allow two cyclists to enter and exit without repositioning their bikes. The proposed elevator lobby also has monitors that show the bike parking area on P6, allowing cyclists to see if anyone else is in that area before heading down. Users will also have the added sense of security knowing that only registered cyclists will have fob access to the bike lobby, elevator and other bike facilities .

For the office users, the end-of-trip facilities, consisting of change rooms and showers, are located on Level 2. There is hope that providing inviting facilities will in turn increase ridership.

Ellis and Toth suggest that any inconvenience created by storing bikes on the lowest underground level rather than the first is outweighed by the benefits of having cyclists separated from car traffic, the avoidance of steep parkade ramps necessitated by the small site, and by the bike-friendly design features they were able to create in the greater space afforded them on P6.

In addition to exceeding the minimum number of required bike parking spaces and lockers and providing wider navigating aisles for easier access, these features will include a bike repair room. Boffo Developments also chose to provide only horizontal racks, instead of the usual mix of horizontal and vertical racks that the city's bike parking requirements allow for. Many people find vertical racks harder to use because they require riders to lift the front of their bikes off the ground instead of allowing them to simply roll into a space. Doors to the bike area will be operated by button for ease of access. "We have tried to elevate the cycling facilities to the same level of convenience and comfort as other building amenities," Toth said.



Boffo Developments has targeted The Smithe at the mature segment of condo buyers ("empty nesters") who are downsizing from houses to enjoy the benefits of downtown living – and is hoping those potential customers will be enticed by the amenities they offer to take up cycling again. They want to make the P6 bike facility not only convenient and safe to access, but also a place where residents can build community as they repair their bikes and perhaps also learn how to maintain them themselves through on-site seminars. "I think what we have is well ahead of the city's minimum requirements," said Ellis.

HOW AND WHY BETTER BIKE AMENITIES ARE CREATED UNDER EXISTING RULES

In the previous section of this report we saw that despite the City of Vancouver's challenging market environment for creating high-quality bike parking and amenities, there are some building projects where developers and building owners have chosen to exceed city's baseline cycling requirements.

The existence of these noteworthy examples raises the question of how and why these types of projects happen. In looking at the three completed new developments with bike-friendly design features that exceed the requirements alongside the other projects in progress we learned about, we noticed they generally have the following things in common. They are:

- ▶ located in or adjacent to the downtown core
- ▶ located on or near at least one popular bikeway
- ▶ a product of rezoning applications
- ▶ relatively large projects in terms of unit size
- ▶ conceived or carried out by well-established developers

Additionally, we found that in most of the projects with bike-friendly design features that have either been built or are in progress, senior members of the development or design team were themselves avid cyclists and brought that insight to the process. Therefore, if the past is any guide to the future, we are most likely to see bike parking and amenities that exceed existing requirements in projects that share some or all of the above conditions.

The existence of projects where developers have exceeded the minimum requirements also raises the question of how the City of Vancouver treats these types of unusual or innovative projects when they're proposed. In discussions with city staff, we found that The existence of projects where developers have exceeded the minimum requirements also raises the question of how the City of Vancouver treats these types of unusual or innovative projects when they're proposed. In discussions with city staff, we found that there are several possible situations:

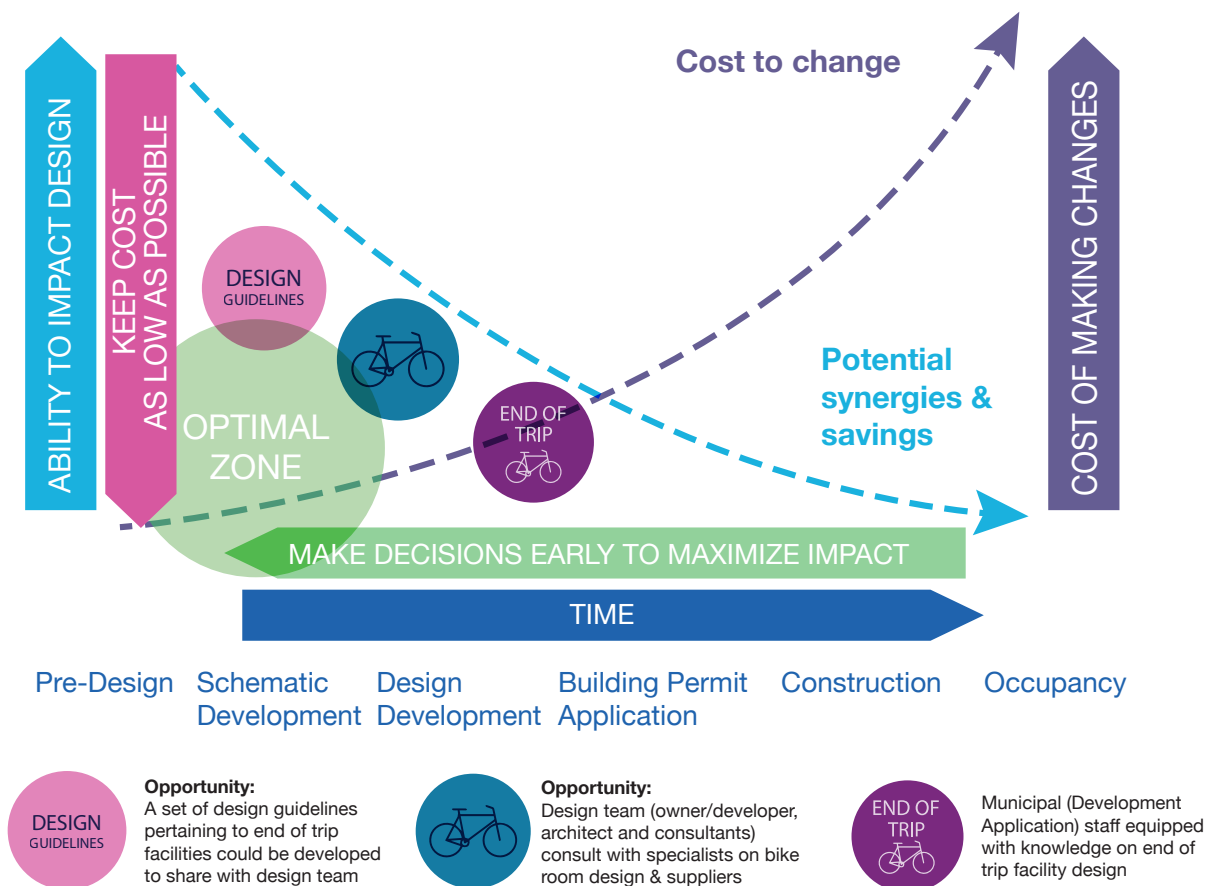
- ▶ All development is generally expected to meet the bylaw requirements.
- ▶ The city encourages providing bicycle parking over and above the bylaw requirements for any development.
- ▶ Where additional bike parking is proposed in exchange for relaxations (for example to vehicle parking requirements as is often the case), these requests are dealt with on a case by case basis.
- ▶ Where unusual or untested treatments are proposed to meet the bylaw requirements, the city looks for strong supporting evidence that the proposals will meet the needs of users now and in the future.

When relaxations are requested, developers are asked to present a strong case that the amenity or design feature they're proposing supports the achievement of various city policies and goals.

Generally, the more unusual or complex an idea for an amenity or design feature is, the more important and advantageous it is to include that idea as early as possible in the design process. For example, if space is available, allotting some of it for a bike repair room is quite straightforward, because much like a storage space it does not require special servicing, aside from being well-lit and ventilated and having electrical outlets. Providing a bike-wash station is slightly more complicated because it requires plumbing and drainage. Features such as dedicated bike elevators or wider hallways are more complex again and will affect many other aspects of the design, so must be included from the beginning in order to avoid extra costs and delays.

In all cases, once a development permit or rezoning application has been approved, the ability to vary from the approved plans is reduced. As with any project, the further along in the development process that design changes are made, the greater the financial and time costs of those changes are, as shown Figure 3. Even when it comes to required and relatively simple design features such as bike racks, HUB Cycling has encountered examples in which a lack of early planning or a failure to consult with experts early in the process has led to the selection of poor quality or badly designed equipment that has to be replaced prematurely, leading to unnecessary costs for building owners and inconvenience for users.

Figure 3: The development process and opportunities for change



Source: Image adapted from Jeff Ranson, Sustainable Buildings Canada.



CREATING BETTER BIKE PARKING & CYCLING AMENITIES

Creating better bike parking and cycling amenities: ideas for improvement

The next section of our report summarizes what we heard from our interview informants and through our survey.

In conducting interviews with our informants, some broad themes recurred and emerged along with the more specific suggestions and ideas. Our informants told us they wanted:

- ▶ flexibility on location of bike parking to deal with constrained sites
- ▶ flexibility to allow for higher-quality facilities and to better serve the preferences of buyers and tenants with higher-end bikes
- ▶ inclusion of cycling amenities as part of more family-friendly high-density housing
- ▶ integration of planning for high-quality bike parking and amenities early in the design process
- ▶ easy access to information about best practices on designing secure indoor bike parking
- ▶ integration of cycling amenities with other building features and make better connections with public spaces.

We used those themes and ideas to design our survey and determine the options to include for each of three main questions. The three main questions we asked were about:

- ▶ potential policy changes to encourage the creation of better cycling amenities that the development community would support
- ▶ any information gaps respondents had encountered in creating cycling amenities
- ▶ the types of cycling amenities developers were interested in creating.

What we heard from interview informants and survey respondents in each of those three main areas is the subject of this section of our report.

POLICY CHANGES

In our informant interviews, we asked members of the development community whether there were any policies or regulations they thought stood in the way of them creating better bike parking or other types of cycling amenities. The main responses we heard were that the City of Vancouver should allow for greater flexibility on the location of bike parking, and that above-grade areas used for bike parking or cycling amenities should be excluded from calculations of floor-space ratio. Those two ideas also received among the highest levels of support from survey respondents. Other well-supported ideas were allowing developers to use high-density racks and increasing the allowed percentage of vertical racks, which is currently capped at 30 percent.⁴¹ Both of these initiatives would increase the efficiency of space in bike rooms, which would in turn provide opportunities for developers to use the extra space for other purposes, including those that generate revenue.

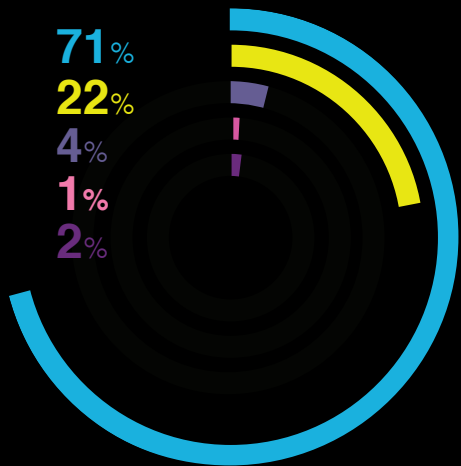
The lowest level of support and the highest level of disagreement was for the idea of increasing the required number of bike parking spaces in multi-unit dwellings from the current 1.25 spaces per unit. This lack of support is predictable as it was not a policy idea that any of our industry informants suggested when we interviewed them. We chose to include this option in the survey because it was recommended in Patrick Bell's report and we wanted to learn whether it had any support from the development industry. Also, the average number of people per household in the City of Vancouver was 2.2 as of 2011, which indicates a potential need for more than 1.25 bike parking spaces per dwelling unit.⁴² About 52 percent of respondents said they supported that idea either strongly (35 percent) or somewhat (17). However, some comments we received also indicated that support for increasing the number of spaces per dwelling unit was conditional on those extra bike parking spaces not being subtracted from the space dedicated to units, as that would undermine the financial feasibility of projects. One respondent suggested that "any increase in the required number of bike storage spaces above the 1.25 per unit would need to be done in conjunction with the other measures outlined in this survey." This option also had among the highest levels of disagreement, with 23 percent disagreeing either somewhat or strongly.

We had expected to hear more support for relaxing vehicle parking requirements in return for providing extra bike parking spaces, especially given the excavation and other costs associated with creating underground parking. However, while 80 percent of respondents supported this idea either strongly or somewhat, those who strongly supported it still ranked it only fifth out of the eight options offered. Responses from interview informants indicate that a vehicle parking space is considered a key feature for both initial sales and resales purposes of condominium units, in part because even those who don't drive themselves can earn money by renting or selling that space.

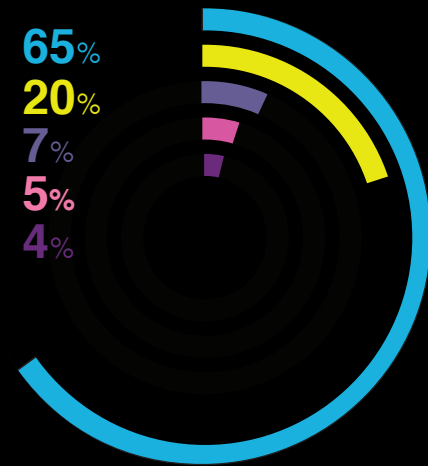
FIGURE 4: Percentage of support or opposition for potential policy changes

STRONGLY SUPPORT **SOMEWHAT SUPPORT** **NEUTRAL** **SOMEWHAT DISAGREE** **STRONGLY DISAGREE**

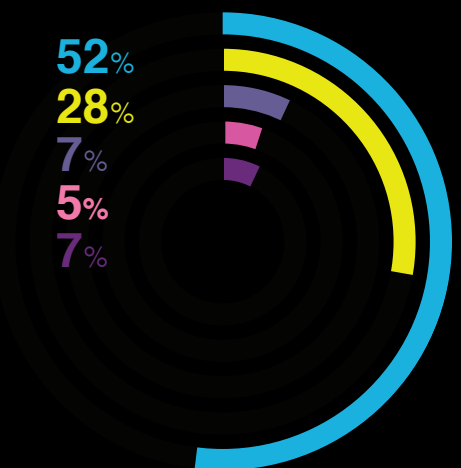
Allow flexibility on location of indoor bike parking if proponent can show that proposed location and access are safe and convenient for cyclists.



Encourage the provision of above-grade bike storage by excluding it from FSR calculations.



Allow relaxation of vehicle parking requirements in multi-unit residential buildings in return for providing more than the required bike parking spaces



Allow for more flexibility on shower and change-room requirements in commercial buildings if developers provide other types of cycling amenities

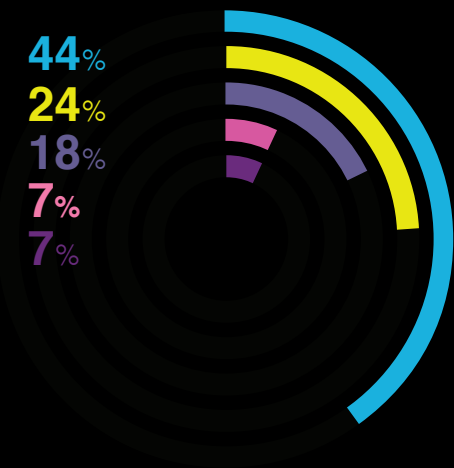
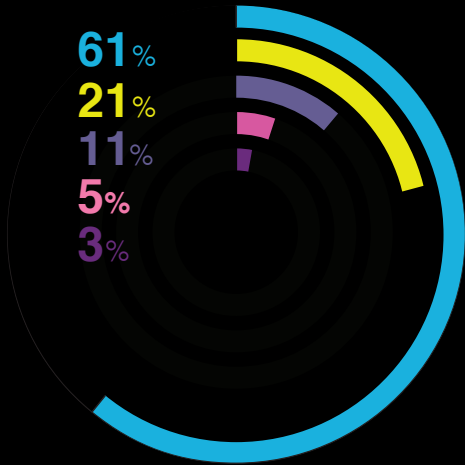


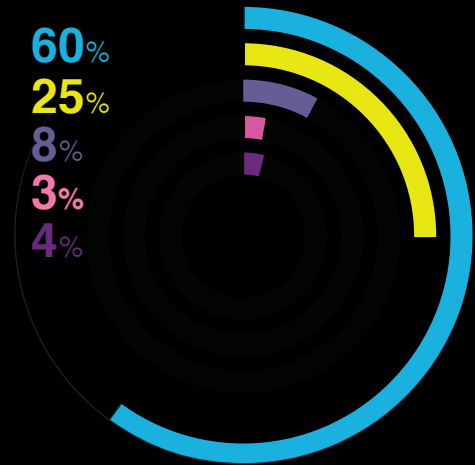
FIGURE 4, cont'd: Percentage of support or opposition for potential policy changes

STRONGLY SUPPORT **SOMEWHAT SUPPORT** **NEUTRAL** **SOMEWHAT DISAGREE** **STRONGLY DISAGREE**

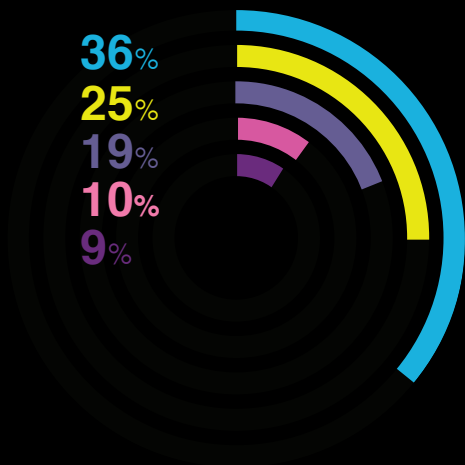
Allow use of double-racking technology or other types of high-density racks in bike rooms without special permission



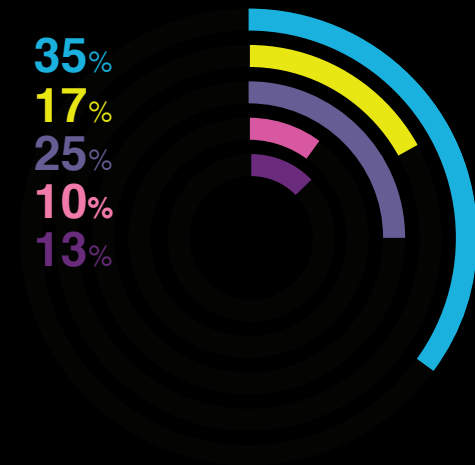
Allow more flexibility on the percentage of vertical racks in bike parking rooms



Allow relaxation of bike parking requirements in return for providing space for public bike-sharing station



Increase the requirements for bike parking to greater than 1.25 spaces per unit in multi-unit dwellings.



As noted, the two ideas for policy changes that received the most support from our informant and survey respondents were to allow for more flexibility on the location of bike parking and to exclude above-grade space devoted to bike parking or cycling amenities from the calculation of floor-space ratio. We have therefore provided some further discussion of those two ideas.

Allowing more flexibility on the location of bike parking

We heard repeatedly about the challenges of developing on small or constrained sites, which are very common in cities such as Vancouver; high land costs and a built-out urban core mean few builders have the luxury of wide open spaces. When dealing with small floor plates, squeezing the required number of bike parking spaces onto the first level of underground parking (P1), as directed by the city's parking bylaw, often conflicts with other requirements. As one developer told us, "Obviously all our mechanical

has to go there, and all our electrical. Then we have some other items, so that gets very cramped, very fast, plus all the bikes have to be on that level, so sometimes it just comes down to what's left over in the P1 floor plate."⁴³ This could go a long way toward explaining why more developers don't provide cycling amenities such as repair spaces or more generous bike parking areas in their buildings on the P1 level: "A lot spaces get sacrificed because there's just no room left."⁴⁴ Another factor is that space for bike parking, which is generally provided free of charge, competes for P1 space with vehicle parking, which typically generates revenue. Developers and building managers usually charge for vehicle parking space on lower levels too, but the highest levels of parking provide the most convenient access and so command a premium compared to lower levels.

"Obviously all our mechanical has to go there, and all our electrical. Then we have some other items, so that gets very cramped, very fast, plus all the bikes have to be on that level, so sometimes it just comes down to what's left over in the P1 floor plate."

— Informant Interview

"If you allow people to be creative, who knows what they're going to come up with."

— Informant Interview

In fact, the City of Vancouver's bike parking bylaw does allow for the developers to locate bike parking on levels other than P1, at the city's discretion, if the developer provides an elevator that allows cyclists

to access that parking. However, we repeatedly heard a desire for more flexibility in the application of this requirement, to allow developers greater leeway to come up with solutions that meet their site and budget constraints while also serving cyclists' need for safe and convenient parking access. "If [the requirements] could be more general to allow the developer to come up with really great creative solutions that still meet the end goal of the cyclist, that would be the ultimate," one informant told us. "That may be a tough one to pull off, but if you allow people to be creative, who knows what they're going to come up with."⁴⁵

We did learn of one project currently in progress, described earlier, where the developer responded to the challenges of a very small downtown site by proposing to locate the bike parking on the sixth floor of underground parking, where it is completely separated from car parking and has its own monitored entrance. The City consented to this arrangement after

the developer modified the initial proposal (with input from HUB Cycling). The end result is that the developer, at least at the pre-construction stage, has exceeded the city's minimum requirements for items such as the number of bike racks, width of aisles in the bike room and percentage of horizontal racks, as well as provided a space for bike repairs. The developer explained that these extra features were feasible on the sixth floor of underground parking rather than on the costlier first floor.

At the same time, putting bike parking on the sixth underground floor could be seen as running counter to the principle of prioritizing active, non-polluting forms of transportation, which is referenced in various city policies. If the city were to consider allowing developers to put parking on levels other than P1 by right rather than at its discretion, the city would likely want to consult the public and cycling organizations as part of that bylaw amendment process.⁴⁶ HUB Cycling recognizes that changes to bike parking requirements should not create additional barriers to regular cycling, such as by impeding the convenience and efficiency of retrieving a bicycle from the secure bike parking area.

Excluding above-grade bike parking and amenity space from calculations of floor-space ratio

One of the strong themes in our informant interviews, and particularly in those with informants who were known as active transportation champions, was the idea of making bike parking more secure, appealing and accessible by moving it out of underground parking garages entirely. As was documented in *Coming to a Stop* and also found in our own interviews, bike parking, especially in older buildings, is often relegated to the more remote, dark and least pleasant corners of underground parking garages, which are rarely appealing environments in the first place.

Some of our informants were enthusiastic about ways to give residents of multi-family buildings easier and more secure access to their bikes, such as trying to recreate the idea of a front or back porch in a multi-family context. "How do you create a front-porch feel or a back-porch concept in high-density living?" one asked. "And, could you integrate potential

"Could you integrate potential bike parking near your unit, as opposed to in the parkade, where it's tucked away, particularly for people who are keen, avid cyclists and spend a lot of money on their bikes and don't want to leave them in the shared bike area?"

— Informant Interview

bike parking near your unit, as opposed to in the parkade, where it's tucked away, particularly for people who are keen, avid cyclists and spend a lot of money on their bikes and don't want to leave them in the shared bike area?"⁴⁷ Implementing ideas like these could mean, for instance, creating storage spaces attached to, but outside units, for example in widened hallways. Residents

without bikes would have the option of storing other bulky items in the same space, similar to what residents of single-family homes do with their garages or sheds.

Other suggestions and examples we heard involved moving bikes and related amenity spaces to above-grade areas either in common areas on each floor or in bike-sized in-unit storage

closets. While it seems certain that many cyclists would be glad to avoid underground parking garages, developers told us that making these sorts of storage and amenity ideas financially feasible, especially given the city's high land costs, would require the area taken up by them to be excluded from calculations of floor-space ratios (FSR). As one informant told us, "Where space is a lot more constrained, a bike maintenance room just doesn't add up. So, that's where incentivizing a developer to potentially do that through other exclusions is one way to do that, and I think that's why you're not seeing more of it."⁴⁸

"We are very much on board with really enhancing the experience for cyclists, but it can't be done at the expense of the rest of the project and that's always a challenge."

— Informant Interview

Bike parking space that is underground is generally excluded from FSR calculations already. Excluding bike parking and amenity spaces that are above-grade was considered important by our informants and survey respondents because otherwise that space would count toward the total area of the building allowed for by zoning or applied for through rezoning. It would also be included in the area that the city uses as the basis for calculating development cost levies. "We are very much on board with really enhancing the experience for cyclists," one informant told us, "but it can't be done at the expense of the rest of the project and that's always a challenge."⁴⁹

Implementing such a policy change might also prove challenging for the city, for more than one reason. One concern would be that offering relaxations or exclusions can lead to a small minority of developers trying to exploit the system, and use the relaxation in a way other than it was intended. This may include, for example, converting bike parking into general storage. Another reason is that there may be unanticipated secondary effects of some of these potential policies.

Floor Space Ratio (FSR)

is a way of expressing the relationship between the area of a lot and a building's floor area. For example, if a building has an FSR of 1, it means its lot area and floor area are the same. An FSR of 2 means that the floor area is twice the area of the lot. The floor area of a building can be massed in different ways, resulting in different building sizes, heights and lot coverage. The higher the FSR, the larger the area that can be built.

However, there may well be good grounds for this type of change in the city's zoning policies, given the lack of exemplary cycling amenities we have found in the course of our research, the dissatisfaction with existing long-term indoor bike parking documented in *Coming to a Stop*, and the city's long-term active transportation goals. The city may also want to position such policy changes as a benefit to the broader public, rather than just the residents of a particular building with better cycling amenities, since amenities created as a result of policy changes would support the achievement of the city's social, mobility and sustainability goals.

The commercial real estate market may be more competitive than the residential market when it comes to vacancy rates, but given the high costs of land in Vancouver and the continued strength

of condominium sales, it seems unlikely that we will see the widespread creation of better cycling amenities unless developers are provided with some additional incentives to do so.

Information gaps

In our interviews we also asked informants whether they thought a lack of information was impeding the development of more and better-quality cycling amenities and if so, what information was lacking and at what stage in the development process that information would be most helpful. Overall we had a mixed response to this question. While interview and survey responses were less definitive than for the first question, at least 73 percent of respondents either strongly or somewhat agreed that they would like the type of information described for each of the six information gap options we provided. For example, one informant told us, “I think it would be helpful if there was more information more widely available about what people are doing - like if you have a list of good bike rooms that are out there, that was posted or known by the industry, that would be helpful.”⁵⁰ A specific resource that was mentioned as useful was the provincial government’s Building Access Handbook, which “gives users background information on the reasons for certain requirements. It also gives suggestions, through text and illustrations, on how many of the requirements can be implemented.”⁵¹ Some informants and survey respondents indicated they thought that creating good bike parking and other types of cycling amenities was relatively straightforward and well within their internal capacity and expertise, while others were eager for materials such as handbooks and best practices they could adapt for use in their own projects. “When we start out on a project, we often look out for interesting case study precedents and best practices. So if there’s a compilation of really interesting best practices and how projects have made that work, we always look for that type of information...”⁵² In other cases, there was concern that providing information in the form of prescriptive guidelines may be of more hindrance than help. “I think more options and incentives for developers to do things in a more creative way is probably the best way of thinking about it,” one informant told us. “If you make guidelines, people will just do the guideline and that’s it, but if you can incentivize them to do something more creatively, regardless of what the market is, people might actually take that on.”⁵³

“I think it would be helpful if there was more information more widely available about what people are doing - like if you have a list of good bike rooms that are out there, that was posted or known by the industry, that would be helpful.”

— Informant Interview

As Figure 5 indicates, the two options we asked about that received the most support were the suggestions that the City of Vancouver provide clear, easy processes to guide interested developers to create cycling amenities that exceed current requirements and the idea of showcasing successful new approaches that have been taken locally to provide bike parking and cycling amenities. It would be most effective to provide this information to design team members before or during initial design stages, to increase cost-effectiveness and minimize the need for changes at later and more expensive stages of the process.

FIGURE 5: PERCENTAGE OF RESPONDENTS INTERESTED IN DIFFERENT TYPES OF INFORMATION ABOUT BIKE PARKING AND CYCLING AMENITIES

STRONGLY SUPPORT **SOMEWHAT SUPPORT** **NEUTRAL** **SOMEWHAT DISAGREE** **STRONGLY DISAGREE**

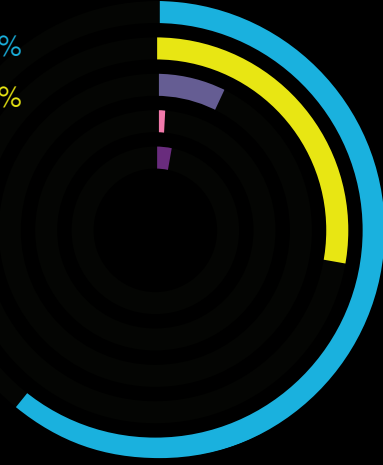
The City of Vancouver to provide easy and clear processes to guide developers who want to provide cycling amenities that exceed requirements

63%
25%
9%
1%
2%



Information about successful new approaches to bike parking and cycling amenities taken by local developers

61%
28%
7%
1%
3%



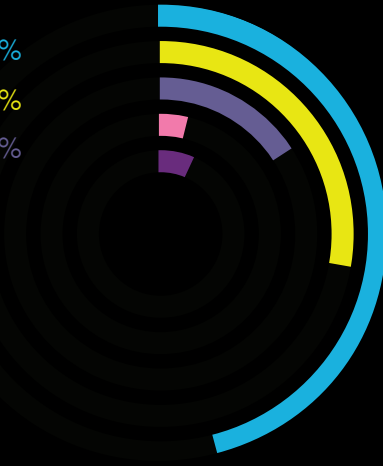
The City of Vancouver to conduct post-occupancy evaluations of bike amenities to determine their level of use and reasons for under-use

52%
27%
9%
5%
7%



A concise set of design guidelines for bike parking and other cycling amenities made available in a graphic format

46%
28%
16%
4%
7%



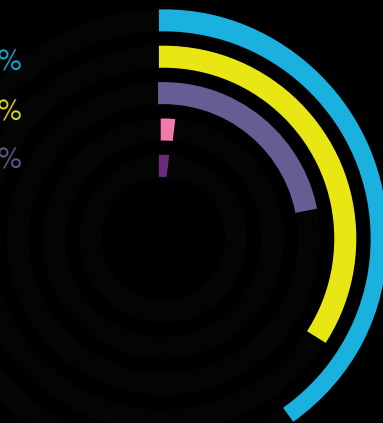
Better information on how to provide other types of functional and appealing cycling amenities, such as bike repair rooms

41%
32%
21%
5%
2%



Better information on how to provide functional and appealing bike parking

40%
34%
22%
2%
2%



An information gap noted by our informants was the absence of post-occupancy evaluations of existing bike parking to determine the level of use and reasons for under-use. Seventy-nine percent of survey respondents indicated they would be interested in this information. The City of Vancouver has actually conducted such evaluations; in 2006, the city interviewed staff at 24 commercial and residential buildings as part of a review of bike parking facilities.⁵⁴ They checked compliance with bylaws as well as demand for space. In 2007, the city reviewed vehicle and bicycle ownership in 50 multi-unit residential buildings. In general, they found that spaces in commercial buildings were well-used, but spaces in residential buildings were under-used. However, as was documented in the Coming to a Stop report, under-used or empty bike parking space does not necessarily indicate that the space is not needed. It could instead signify that the space lacks adequate security features, is inaccessible or poorly designed. Given the significant growth of public cycling infrastructure and cycling mode-share since 2006, the rapid pace of development since that time and residents' complaints about the quality of Class A bike parking, it may be useful for the city to conduct another round of post-occupancy evaluations.

Other obstacles to creating better cycling amenities

In addition to asking about specific policies or information gaps, we also included an open-ended question in our survey asking respondents to name what they thought was the biggest obstacle to the creation of better-quality cycling amenities. Since we already knew that land costs were a challenge and that factor is largely outside of the city's and industry's control, we asked respondents to name other obstacles. We worded the question as follows:

Other than high land costs, what do you see as the biggest obstacle to creating better quality cycling amenities in private multi-unit residential, commercial or mixed-use buildings in the City of Vancouver?

Responses to this question were quite varied but we did note some patterns. A large number of respondents – about 23 percent – referenced financial considerations of one type or another. For example:

- ▶ “The ROI for it is non-existent. It is like green initiatives, everyone loves the idea, but no one wants to pay for it.”
- ▶ “The bike facilities are not monetized to the same extent as a parking stall. Parking stalls provide a return whereas bike parking is generally a cost.”
- ▶ “It's not required and it's costly to create quality amenities. Developers may not see the importance of it.”

Another group of responses, about 19 percent - referenced cultural or perception barriers, particularly regarding the dominance of vehicle transportation as compared to cycling. For example:

- ▶ “Shifting attitudes away from car culture.”
- ▶ “More education for the public and development community on the benefits of cycling and bike commuting to develop greater interest and acceptance of cycling

infrastructure.”

A smaller group of respondents (about 11 percent) used this question to discuss the need for a bike amenity space exclusion from FSR calculations or similar incentives mentioned in other survey questions. For example:

- ▶ “City of Vancouver should provide incentives (i.e. deductions from FSR) to encourage developers to add more amenities for cyclists.”
- ▶ “Restrictive bylaws and FSR limitations prevent developers to appropriate bicycle oriented amenities/features.”
- ▶ “Lack of sufficient trade-offs (i.e. parking reduction)”

Finally, another small group of respondents (about 8 percent) referred to what they perceived as unclear, unfair or rigid regulations. For example:

- ▶ “Lack of clarity over what you are allowed to do to improve facilities vs the City’s requirements.”
- ▶ “Increasing demands on code compliance, bylaws, FSR etc.”
- ▶ “Lack of understanding of cyclists needs; mechanical approach by city and developers.”

“You can require the basics but if you can incentivize best practices, I think more people will probably jump on board. ”

— Informant Interview

Several respondents chose not to answer this question. Among the remaining approximately one-third of responses, other issues raised were security, lack of space and weather.

Interest in creating different types of cycling amenities

We found examples of the following types of amenities in new private buildings in the City of Vancouver.

Commercial buildings

- ▶ Bike repair space and tools
- ▶ Indoor bike parking with extra features
- ▶ Extra change room features (clothes dryers and towel service)
- ▶ Internal bike-sharing system

Residential buildings

- ▶ Bike repair space or room with tools
- ▶ Bike wash station
- ▶ Internal bike-sharing system
- ▶ Extra-durable finishes to decrease impact of bikes in above-grade common areas (in progress)

While one of our main goals was to understand the policy obstacles and information gaps that prevent those members of the development industry who want to improve bike amenities, we also wanted to understand what types of amenities and design features the industry is most interested in creating if conditions were more favourable. Based on the experience of HUB Cycling and our review of industry literature, we developed a list of design features and amenities that promote cycling and have been included in projects that are either completed or in-progress.⁵⁵ In our interviews, we mentioned examples of these types of amenities and asked informants whether they had ever created them, or knew of any buildings in the City of Vancouver or Metro Vancouver that included them. We then included the list in Figure 4 as a way of gauging wider industry interest in creating these design features.

As Figure 6 indicates, the highest level of interest was in bike repair space or rooms, which, aside from the challenges of finding space, may be the most straightforward, low maintenance and inexpensive type of bike amenity. While we heard some concern from residential developers that too few residents would use such a space to make it worthwhile, we also heard of examples where bike repair space had been integrated with general purpose workshop or hobby space to increase use and perceived value. Others were interested in providing such space because of the potential it has to foster social connection among residents.

There was also interest in offering a bike wash station, though in one case, an initial plan to include this feature was later dropped because the developer was concerned about burdening the future strata with maintenance time and costs. “If it’s poorly laid out or it isn’t serviced properly, it’s just a bad reflection on us in general,” one informant noted.⁵⁶ In our survey, we also heard concern that certain features that appeal to cyclists lessen the appeal to other potential buyers or tenants, narrowing the overall market: “On the in-unit bike storage and wider hallways to accommodate bikes, these are both issues that customers that are not bike users find very unattractive. On the items I am neutral on, I would need to see significant customer interest in these before I could justify the cost of providing them.”

The maintenance burden and wear and tear costs of allowing bikes in hallways so they could be stored in units was an issue raised by several informants and respondents. In one in-progress building we learned of, an architect had responded to that concern by including extra-durable finishes in common areas in the design, but since that building is not yet complete, it’s not possible to evaluate the success of this solution. Survey respondents were least interested and most opposed to providing robotic or automated bike parking systems, which is unsurprising given the expense involved and that no examples of that type of bike parking yet exist in the city of Vancouver. However, we learned that a local developer is in the early stages of installing that type of system in a major building retrofit. If that installation proceeds successfully, it will likely go a long way toward generating interest among other developers.

FIGURE 6, PERCENTAGE OF RESPONDENTS INTERESTED IN DIFFERENT TYPES OF INFORMATION ABOUT BIKE PARKING AND CYCLING AMENITIES

VERY INTERESTED

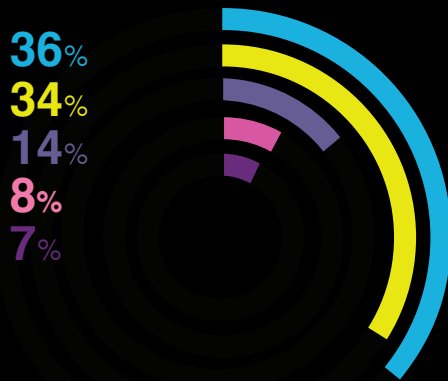
SOMEWHAT INTERESTED

NEUTRAL / N/A

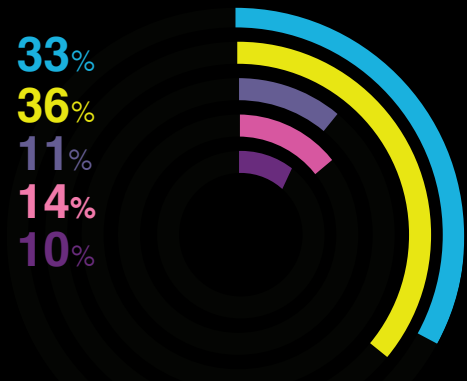
NOT INTERESTED

STRONGLY OPPOSED

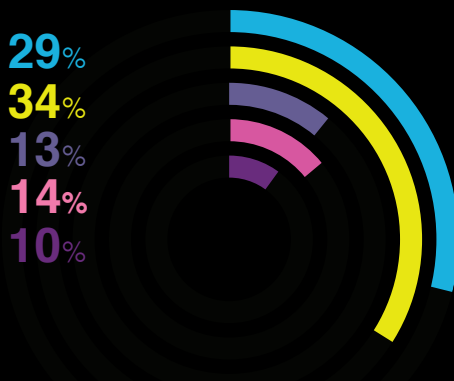
Bike repair room



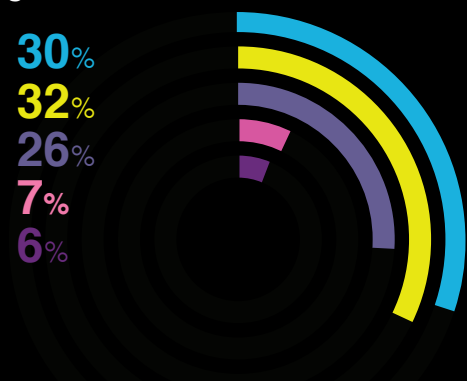
Bike wash station



In-unit bike storage



Bike parking that is separate from vehicle parking



Outdoor bike parking with enhanced weather protection, lighting or security features

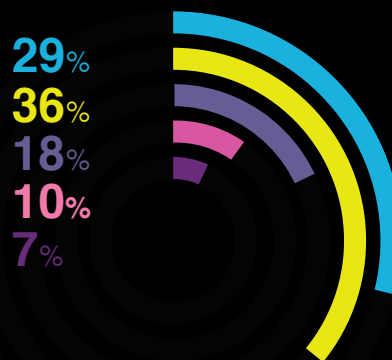


FIGURE 6 CON'T: PERCENTAGE OF RESPONDENTS INTERESTED IN DIFFERENT TYPES OF INFORMATION ABOUT BIKE PARKING AND CYCLING AMENITIES.

VERY INTERESTED

SOMEWHAT INTERESTED

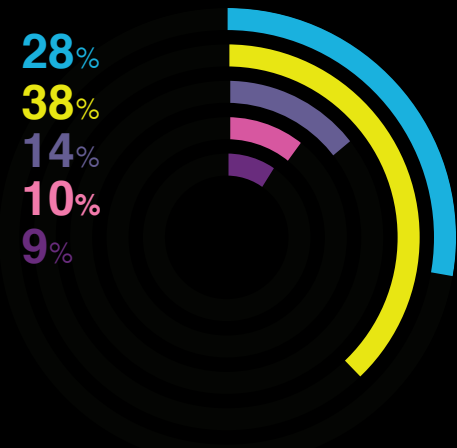
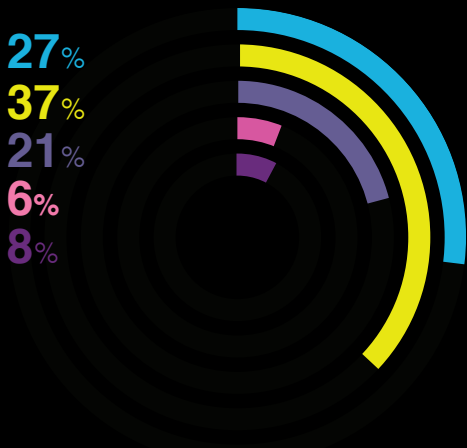
NEUTRAL / N/A

NOT INTERESTED

STRONGLY INTERESTED

Indoor bike parking with enhanced features such as automatic doors or wider aisles

Extra-durable finishes to decrease impact of bikes in above-grade common areas



Wider hallways that can be more easily navigated with bikes

Upgraded change-room features, such as dryers

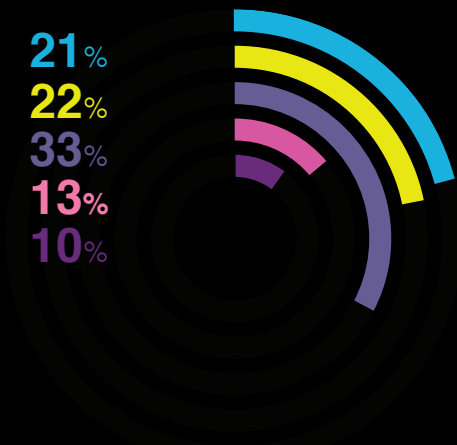
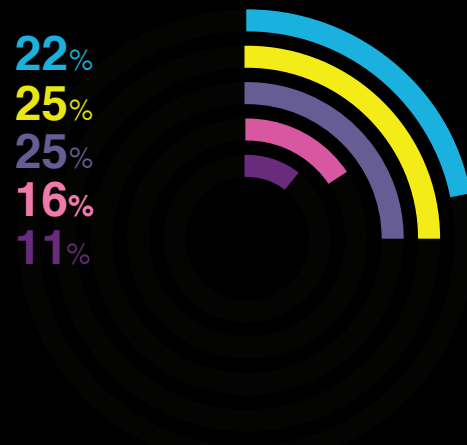


FIGURE 6 CON'T: PERCENTAGE OF RESPONDENTS INTERESTED IN DIFFERENT TYPES OF INFORMATION ABOUT BIKE PARKING AND CYCLING AMENITIES.

VERY INTERESTED

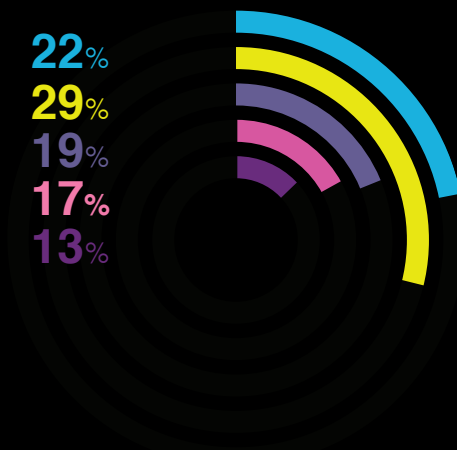
SOMEWHAT INTERESTED

NEUTRAL / N/A

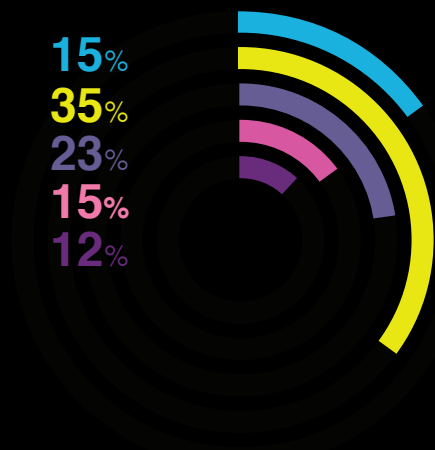
NOT INTERESTED

STRONGLY OPPOSED

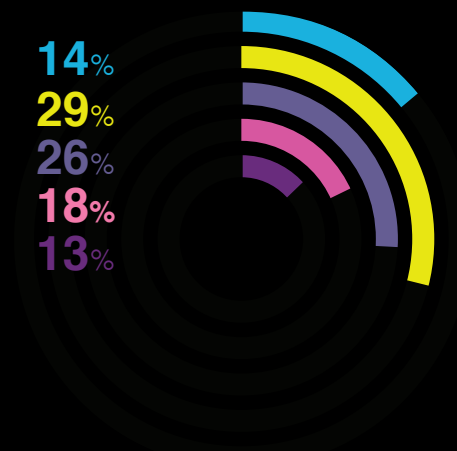
Separate entrances for bikes



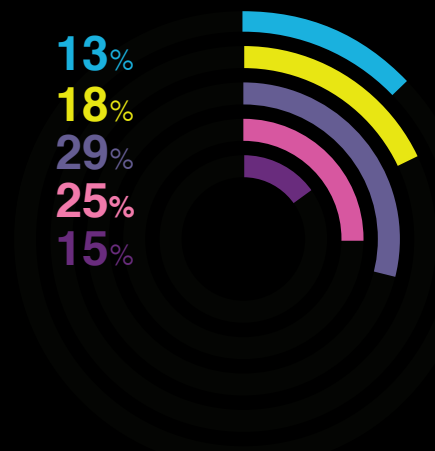
Storage for cargo bikes or trailers



Bike-related information or programming, such as workshops or on-site mechanic



Robotic or automated bike parking system





CONCLUSION

While the City of Vancouver's requirements for Class A bike parking mean that residents and employees of newer buildings are relatively well-served in terms of the amount and functionality of bike parking, quality and innovation are lacking.

This project was intended as a first step toward better understanding the development industry's perspective on bike parking and cycling amenities, and to identify some viable options for improving those features within the city of Vancouver's current real estate context.

We believe that in order to achieve improvements and support the city's future cycling mode-share targets, municipal policy changes are needed. From HUB Cycling's perspective, it remains important that any such policy changes enhance rather than undermine the accessibility of cycling. As such, any changes to the required ratio of horizontal and vertical bike parking should be applied based on the building's context, i.e. who will be using the bike parking and for what types of bicycles? While there are myriad competing factors that make it challenging to identify and implement potentially effective policy changes, we hope that the policy dynamics presented in this research project will help municipal and other policy-makers determine beneficial new approaches.

We therefore suggest that the City of Vancouver and other interested Metro Vancouver municipalities investigate the following ideas:

- ▶ Excluding above-grade space that is designated for bike parking or other cycling amenities from the calculation of floor-space ratios. This would encourage the provision of bike parking in spaces that are more pleasant and convenient than underground parking garages. It would also encourage the provision of space for design features, such as bike repair spaces, that support cycling and help build community in multi-unit residential buildings.
- ▶ Allowing for high-density or double-racks in bike rooms without special permission, as long as the design of those racks is compatible with goal of ensuring that cycling is accessible to cyclists of all ages and abilities.
- ▶ Conducting another round of post-occupancy evaluations of residential and commercial bike parking facilities in new buildings, particularly in areas close to the network of bikeways. Given the recent increases in cycling mode-share and the city's goal of increasing that to 12 percent by 2040, it is important to understand the degree to which existing bike parking facilities are used and under-used.
- ▶ Working with partners to provide best practice resources and bike parking design guidelines to the development industry and ensure this information is made available to developers at the earliest stages of the design process.

We also suggest that the development industry and industry associations consider profiling the market niche, occupancy rates and tenant mix of buildings with high-end cycling facilities so that the industry can better understand the demand for those types of facilities.

In the course of this project, we identified other issues and hindrances to cycling, such as rules set by strata corporations (which are governed at the provincial level) that prohibit bikes from entering common areas. While these issues were beyond our scope, it should be noted that they are also worthy of further research and consideration.

APPENDIX & ENDNOTES

Appendix: Designing great bike rooms

This section is meant to be a quick guide for developers and others who want to design the best possible indoor bike parking spaces in their new buildings. It is adapted from material provided by Urban Racks, a Vancouver-based company that designs bike parking solutions and provides bike parking equipment.

Be sure to consider all of the following questions and factors when designing your secure indoor bike parking.

ASSESS YOUR REQUIREMENTS, RESOURCES AND LIMITATIONS

- ▶ What do your municipal bylaws or building code require when it comes to number of spaces, size of space, lighting, aisle and door widths, building materials and access?
- ▶ What's your budget?
- ▶ What's your timeline?
- ▶ What level is your space on? Are there stairs or ramps to navigate, narrow hallways, sharp corners or small doorways? Can you improve access through better design?
- ▶ What are your walls made of? Are they solid, hollow or mesh? These factors will affect the type of bike racks, electrical outlets and security features you can install.
- ▶ Have you planned to provide electrical outlets so users can charge their bikes or lights?

CONSIDER YOUR FUTURE USERS

- ▶ Do your primary users include seniors, children, or people with disabilities? Adults? Young and/or high income professionals?
- ▶ What types of bikes will those people have? Bikes come increasingly come in different sizes and types – three-wheeled, folding, cargo, electric, new and expensive as well as older or bargain bikes, and bike trailers.
- ▶ Will your users need space to store helmets, gear or other belongings?
- ▶ Will they need room to sit down while they're in the space?
- ▶ How do you want the room to look and feel? What will appeal to your users?
- ▶ Will you provide any features other than parking?

- ▶ Air pumps, a repair stand or tools?
- ▶ A place to wash bikes?

CONSIDER SAFETY AND SECURITY

No matter who you expect to use your space, bike rooms should be secure in themselves. Locked bikes inside a locked room are much safer and riders will feel more confident in using the room.

- ▶ What kind of lighting will you need to ensure the space is safe and secure?
- ▶ What kinds of doors will you have?
- ▶ Will you use keys or an electronic access system? Keys are simple and less costly, but electronic systems allow access to be monitored and adjusted.
- ▶ Will you install security cameras?
- ▶ Will you install lockers? What type?

CHOOSE YOUR RACKS

Horizontally parked bikes are easy to access and the rider doesn't need to lift the bike more than a few inches if at all. This is great for all users, including children, the elderly and people with disabilities. Also, virtually any style of bike can be parked this way. However, racks come in all shapes and sizes and you may need to include some vertical or high-density racks to make best use of your space, as long as your local regulations allow for them.

Be sure to choose racks that

- ▶ can support a bike at two points, preventing the bike from falling over and becoming damaged
- ▶ provide some separation between bikes to help prevent bikes from interfering with each other.

LAY OUT YOUR BIKE ROOM

Once you have a thorough understanding of all the factors covered above, you can plan the layout of your bike room. A planned layout is a must for anything other than very small spaces. It will allow you to check spacing and clearances and to be sure that your room will be highly functional and usable. Most reputable bike parking providers will help you plan your space and many will offer design services and drawings.

Use your drawing to make sure

- ▶ Aisles are wide enough for a user and bike to comfortably walk past parked bikes.

- ▶ Users can still get their bikes out of the room without frustration, even when the bike room is at full capacity.
- ▶ Users can comfortably and easily lock their bikes up when other bikes are parked either side.
- ▶ The design allows for good ventilation to prevent musty odors and moisture buildup.
- ▶ The doors can remain open while users enter and exit the room with their bikes.
- ▶ The design includes lighting that is adequate for the size and nature of the space.

End Notes

¹ TransLink, “Backgrounder #5 - How and Why People Travel”, pg. 2. N.d.

http://www.translink.ca/~media/Documents/plans_and_projects/regional_transportation_strategy/Backgrounders/How_and_Why_People_Travel_Backgrounder.ashx. Also TransLink, “Cycling for Everyone: A Regional Cycling Strategy for Metro Vancouver,” p. 20. June 2011. http://www.translink.ca/~media/Documents/cycling/regional_cycling_strategy/Cycling%20for%20Everyone.pdf.

² Patrick Bell, *Coming to a Stop: All Ages and Abilities Bicycle Parking in New and Existing Development* (2015).

<https://sustain.ubc.ca/sites/sustain.ubc.ca/files/GCS/2015%20Project%20Reports/Coming%20to%20a%20Stop%20-%20All%20Ages%20and%20Abilities%20Bicycle%20Parking%20in%20New%20and%20Existing%20Developments%20GC%20Scholars%202015.pdf>.

³ *Coming to a Stop*, p. 11. The survey was not designed to be representative of the general population. It was sent to City of Vancouver transportation staff, HUB Cycling’s listserv, and the Facebook groups for Bike Vancouver and the School of Community and Regional Planning at UBC. Ninety-three responses were received.

⁴ *Coming to a Stop*, p. 68.

⁵ *Coming to a Stop*, p. 69.

⁶ *Coming to a Stop*, p. 75.

⁷ *Coming to a Stop*, p. 74.

⁸ Matt Robinson, “More solutions sought as Vancouver struggles with bike theft,” *The Vancouver Sun*, June 13, 2016.

<http://vancouver.sun.com/news/local-news/more-solutions-sought-as-vancouver-struggles-with-bike-theft>

⁹ Patrick Bell, *Coming to a Stop: All Ages and Abilities Bicycle Parking in New and Existing Development* (2015) p. 14.

<https://sustain.ubc.ca/sites/sustain.ubc.ca/files/GCS/2015%20Project%20Reports/Coming%20to%20a%20Stop%20-%20All%20Ages%20and%20Abilities%20Bicycle%20Parking%20in%20New%20and%20Existing%20Developments%20GC%20Scholars%202015.pdf>.

¹⁰ Meghan Winters, Gavin Davidson, Diana Kao, Kay Teschke, “Motivators and deterrents of bicycling: comparing influences on decisions to ride,” *Transportation* January 2011, Volume 38, Issue 1, pp 153–168.

<https://link.springer.com/article/10.1007%2F11116-010-9284-y>.

¹¹ *Coming to a Stop*, p. 6.

¹² City of Vancouver, “Current status of capital assets,” n.d. <http://vancouver.ca/your-government/transportation.aspx>.

¹³ City of Vancouver, “Greenest City 2020 Action Plan 2015-16 Implementation Update,” p. 17.

<http://vancouver.ca/files/cov/greenest-city-action-plan-implementation-update-2015-2016.pdf>. Also, *Coming to a Stop*, p. 8.

¹⁴ *Coming to a Stop*, p. 8.

¹⁵ All figures from a HUB Cycling custom data request to Statistics Canada for the Vancouver Census Metropolitan Area, based on the 2011 Census and National Household Survey.

¹⁶ HUB Cycling custom data request to Statistics Canada for the Vancouver Census Metropolitan Area, based on the 2011 Census and National Household Survey.

¹⁷ BC Cycling Coalition, “Cycling Poll, 2013,” April 22, 2013.

http://d3n8a8pro7vhm.cloudfront.net/bccyclingcoalition/legacy_url/233/bc-cycling-poll.pdf?1408764326.

¹⁸ US Census Bureau, “Who Drives to Work?: Commuting by Automobile in the United States: 2013,” August 2015.

<https://www.census.gov/hhes/commuting/files/2014/acs-32.pdf>, page 8

¹⁹ Alison Griswold, “Biking to work is growing fastest among richest Americans,” *Slate*, August 17, 2015.

http://www.slate.com/blogs/moneybox/2015/08/17/census_commuting_report_biking_to_work_is_growing_fastest_among_rich_americans.html.

²⁰ Kerry Gold, “Soaring property values push businesses out of Vancouver’s west side,” July 9, 2016.

<https://www.theglobeandmail.com/report-on-business/small-business/sb-growth/empty-storefronts-crop-up-in-vancouver-s-priciest-neighbourhoods-as-soaring-property-values-push-out-small-business/article30767046/> and Thomson Reuters,

“Vancouver home prices worry businesses as they seek to hire staff,” *CBC News*, July 27, 2016.

<http://www.cbc.ca/news/canada/british-columbia/vancouver-home-prices-worry-businesses-as-they-seek-to-hire-staff-1.2885057>.

- ²¹ Metro Vancouver Landshare Report, Colliers International, First half of 2016.
- ²² CBC News, “Surging sales of Vancouver condos, townhomes edging up real estate prices,” March 2, 2017. <http://www.cbc.ca/news/canada/british-columbia/surging-sales-of-vancouver-condos-townhomes-edging-up-real-estate-prices-1.4007104>.
- ²³ Real Estate Board of Greater Vancouver, “Commercial real estate sales reach a five-year high in the Lower Mainland,” March 20, 2017. <http://www.rebgv.org/news-statistics/commercial-real-estate-sales-reach-five-year-high-lower-mainland>.
- ²⁴ City of Vancouver, “Review of Off-Street Bicycle Parking Requirements,” April 30, 2008. <http://council.vancouver.ca/20080513/documents/tt2.pdf>.
- ²⁵ City of Vancouver, “Parking Bylaw 6059, Section 6 - Off-street Bicycle Space Regulations,” Section 6.2.4 and 6.2.5 <http://bylaws.vancouver.ca/parking/sec06.pdf>.
- ²⁶ City of Vancouver, “Parking Bylaw 6059, Section 6 - Off-street Bicycle Space Regulations,” Section 6.3.4. <http://bylaws.vancouver.ca/parking/sec06.pdf>.
- ²⁷ City of Vancouver, Parking Bylaw 6059, section 6.3.6. <http://bylaws.vancouver.ca/parking/sec06.pdf>.
- ²⁸ City of Vancouver, “Parking Bylaw 6059, Section 6 - Off-street Bicycle Space Regulations,” Section 6.3.5. <http://bylaws.vancouver.ca/parking/sec06.pdf>.
- ²⁹ City of Vancouver, Parking Bylaw 6059, section 6.3.8. <http://bylaws.vancouver.ca/parking/sec06.pdf>.
- ³⁰ City of Vancouver, “Bylaw No. 7481,” See Table 3.6.4.D. <http://vancouver.ca/files/cov/bylaw-7481-building-shower-facilities.pdf>.
- ³¹ USGBC LEED v4 for Building Design and Construction.
- ³² USGBC LEED v4 for Building Design and Construction.
- ³³ USGBC LEED v4 for Building Design and Construction.
- ³⁴ See the U.S. Green Buildings Council’s definition of a cycle network here: “Cycle Network,” <http://www.usgbc.org/glossary/term/5383>.
- ³⁵ USGBC LEED v4 for Building Design and Construction.
- ³⁶ International Well Building Institute, “Active transportation support,” <https://standard.wellcertified.com/fitness/active-transportation-support>. Q2 2017 version.
- ³⁷ We did not seek information from Anmore, Belcarra, Bowen Island, Lions Bay, Maple Ridge and Pitt Meadows due to their smaller size and the fewer number of major developments taking place there. We did request information from Port Moody, but did not receive a response.
- ³⁸ Burnaby: See Bicycle Facility Provision Guidelines for Rezoning, updated January 2009. Coquitlam: Zoning bylaw, Part 7, Off Street Parking Facilities, section 711. Delta: Zoning bylaw 2750: <https://delta.civicweb.net/filepro/documents/38103>. City of Langley: Zoning Bylaw No. 2100, 1996 (December 2016 Consolidation), Part 1, section E, 10. Township of Langley: Zoning Bylaw No. 2500, Section 107 does not contain any bike parking requirements. However, the community plan for Willoughby (where most development is taking place) does include requirements for “adequate” secure long-term bike parking for various types of developments. New Westminster: Zoning Bylaw 6680, 2001, Section 155.2. City of North Vancouver: Zoning Bylaw, 1995, No 6700, Division IV, Parking and Loading Standards, Part 10A. See also figure 10A02. District of North Vancouver: Zoning Bylaw, 1965. Port Coquitlam: Zoning Bylaw No. 3630, Section 10.3. Richmond: Zoning Bylaw 8500, Part 7 – Parking and Loading Requirements. Table 7.14.9.1. Surrey: Zoning Bylaw 12000, Part 5, D – Bicycle Spaces and Secure Bicycle Parking Areas. No requirements for standalone office developments listed here, though there are for “General Service Use and Eating Establishments” and staff indicated that most developments that include offices would also include general service uses, and so the requirement would apply to the entire gross floor area of the development. Vancouver: Parking Bylaw 6059, Section 6.2. District of West Vancouver. No standard requirements – instead are negotiated through each rezoning. White Rock: Zoning Bylaw No. 200, section 4.16.3.
- ³⁹ Burnaby: See Bicycle Facility Provision Guidelines for Rezoning, updated January 2009. Coquitlam: Zoning bylaw, Part 7, Off Street Parking Facilities, section 713. New Westminster: Zoning Bylaw 6680, 2001, Section 150.8.6. City of North Vancouver: Zoning Bylaw, 1995, No 6700, Division IV, Parking and Loading Standards, Part 10A. See 10A07 and Fig. 10A-03. Exceptions apply when there are employee fitness centres that meet the city’s requirements. Also, see the city’s “Sustainable Development Guidelines,” <http://www.cnv.org/-/media/city-of-north-vancouver/documents/development-applications/sustainable-development-guidelines.ashx?la=en>. January 2017. Richmond: Zoning Bylaw 8500, Section 7.4.4. Vancouver: Bylaw No. 7481, See Table 3.6.4.D. <http://vancouver.ca/files/cov/bylaw-7481-building-shower-facilities.pdf>. Also, “Rezoning Policy for Sustainable Large Developments,” Section 4. Last amended December 2014. <http://bylaws.vancouver>.

[ca/bulletin/R019.pdf](#). White Rock: Zoning Bylaw No. 200, section 4.14.3.

⁴⁰ *Coming to a Stop*, 6.

⁴¹ City of Vancouver, "Parking Bylaw 6059, Section 6 - Off-street Bicycle Space Regulations," Section 6.3.13.

<http://bylaws.vancouver.ca/parking/sec06.pdf>.

⁴² City of Vancouver, "Housing Characteristics Fact Sheet," Dec. 31, 2016.

<http://vancouver.ca/files/cov/housing-characteristics-fact-sheet.pdf>.

⁴³ Quote from informant interviews.

⁴⁴ Quote from informant interviews.

⁴⁵ Quote from informant interviews.

⁴⁶ City of Vancouver, Parking 6059, section 6.3.6 says "a location more than one level below grade *may be* permitted where an elevator is supplied offering direct access to outside."

⁴⁷ Quote from informant interviews.

⁴⁸ Quote from informant interviews.

⁴⁹ Quote from informant interviews.

⁵⁰ Quote from informant interviews.

⁵¹ Government of British Columbia, *The Building Access Handbook*, http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/guides/2014_building_access_handbook.pdf, pg. ix.

⁵² Quote from informant interviews.

⁵³ Quote from informant interviews.

⁵⁴ City of Vancouver, "Review of Off-Street Bicycle Parking Requirements," April 30, 2008.

<http://council.vancouver.ca/20080513/documents/tt2.pdf>.

⁵⁵ Urban Land Institute, "Active Transportation and Real Estate: The Next Frontier," March 2016.

<http://uli.org/wp-content/uploads/ULI-Documents/Active-Transportation-and-Real-Estate-The-Next-Frontier.pdf>.

⁵⁶ Quote from informant interviews.



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