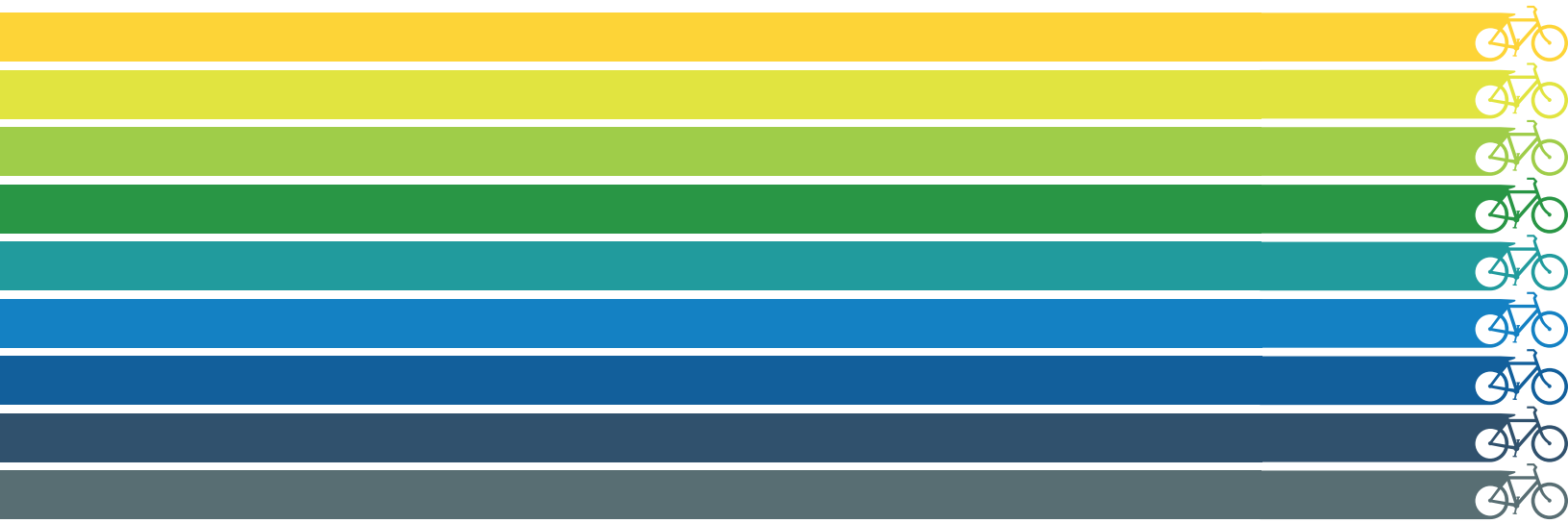

COMING TO A STOP

All Ages and Abilities Bicycle Parking in New and Existing Development

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August 14, 2015

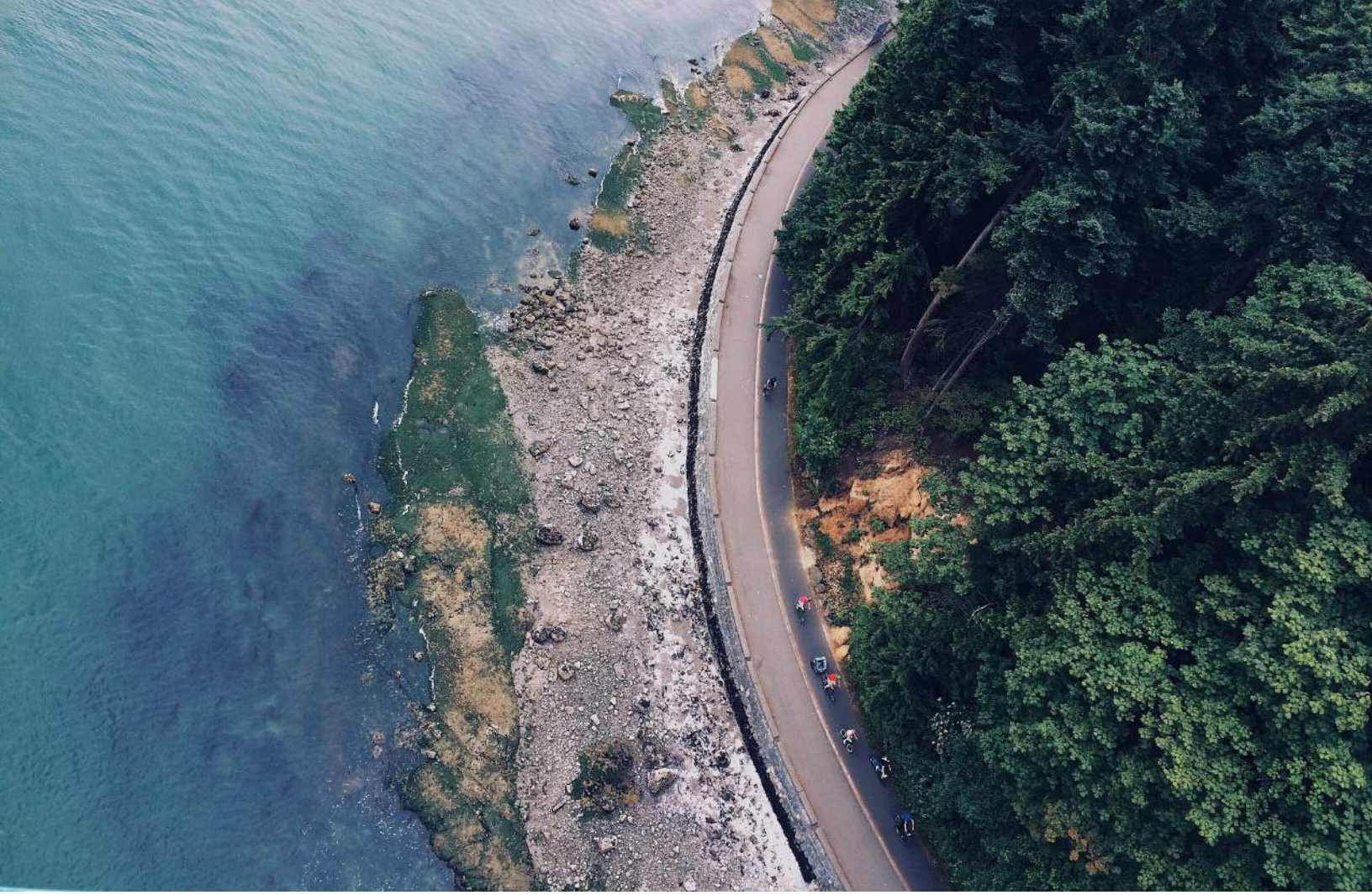

Figure 1: Biking the Seawall

Acknowledgments

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This report was made possible thanks to cycling enthusiasts at the City of Vancouver, the University of British Columbia, and HUB Cycling; survey respondents from around Vancouver; and many planners and engineers from across North America. Additionally, Elco Gauw (Urban Racks) and Adam Kebede (Spoken) provided valuable insight from the bike parking industry, while Will Dunn (City of Vancouver) helped me settle in and kick off my project. Keith Bell, Jean Huang, Erin O'Melinn, and Timothy Welsh reviewed drafts and provided valuable suggestions. Finally, a special thank you to my City of Vancouver mentor, Paul Krueger, who was the creative force behind many of these ideas and who always made sure to ask if I was having fun.

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Bike parking is about providing convenient, safe, secure parking for cyclists. It is not about "how do we fit the most bikes into the smallest space possible."

- Elco Gauw, Urban Racks

Figure 2: Crowded Parking

1

EXECUTIVE SUMMARY

Cycling is gaining speed in Vancouver.

Ridership has increased significantly since 2008, thanks in large part to significant upgrades to the city's bicycle network that have made cycling more safe, comfortable, and convenient. Unfortunately, both official and anecdotal reports indicate that the quantity and quality of bicycle parking has been unable to match this upsurge in ridership. Issues such as bicycle theft, insufficient space, and inconvenient facility locations are frustrating cyclists and threaten to slow the gains in cycling mode share. This report aims to address these issues by focusing on off-street, residential bicycle parking, which is an area of particular concern amongst cyclists.

The Vancouver *Parking Bylaw 6059*, which contains the city's bicycle parking regulations, needs to be updated in order to meet current and future demand. The minimum amount of required secure bike parking in multifamily buildings is insufficient and should be raised from 1.25 spaces per unit to 2 spaces per unit. The location of and access to bicycle parking are also important considerations, as these factors can inhibit users from using the parking facilities. Facilities should ideally be located at grade in a visible, convenient place that allows safe and efficient ingress and egress. Incentives such as density bonuses, expedited permitting, and reduced vehicle parking requirements can help encourage developers to go beyond the minimum and build outstanding bicycle parking facilities. Additionally, issues such as security, monitoring, enforcement, maintenance, and facility management all warrant increased attention in the bylaw.

Many people choose—or are forced—to store their bicycles in their living spaces, which carries a suite of challenges; bicycles are difficult to maneuver, they take up valuable living space, and occasionally, they are banned from elevators and hallways. Upgraded bike parking regulations will hopefully improve this situation, but there will always be people, especially those with expensive bicycles, who choose to store them in their unit. For this reason, the regulations surrounding in-unit storage must be clarified, granting bicycles the same treatment as strollers and wheelchairs when it comes to building access. Additionally, buildings should be designed with bicycles in mind, with sufficiently large hallways and doorways as well as at least one closet that is designed to hold a bicycle.

Figure 3: Biking the beach in Vancouver

Bicycle parking facility design guidelines, which cover details such as bicycle rack type, layout, amenities, and installation procedures, also require updating. This level of detail, however, is likely best explained in a Bicycle Parking Facility Manual with clear and visually appealing graphics, rather than in a dry, text-only bylaw. The City of Vancouver should create this manual and link it to the bylaw, forming a two-document system such as that of San Francisco and Toronto. The manual would provide structure for planners and developers, allowing them flexibility in design yet ensuring that important aspects such as the use of proper materials and the provision of space for non-standard bicycles are considered.

Finally, the City of Vancouver needs to develop a strong retrofit program to facilitate the enhancement of bicycle parking in existing buildings. The first step is creating legislation that enables residents to initiate a retrofit and encouraging the conversion of vehicle parking and other underutilized spaces into bicycle parking. Once legislation is in place, the City should create a web-based program that simplifies the retrofit procedure, including instructions for residents and building management, links to helpful documents, and contact information for City staff and external organizations.

The recommendations in this report are ultimately intended to further the City's goal of providing safe, comfortable, and convenient bicycle parking for people of all ages and abilities (AAA). This goal is part of Vancouver's ambitious plan to become the "greenest city in the world by 2020" (City of Vancouver 2009). If these objectives are to become reality, Vancouver needs to implement bold and forward-thinking regulations that allow the continued growth of cycling and truly set the global standard for green transportation.

Figure 4: Network signage

2

INTRODUCTION

2.1 PROJECT BACKGROUND

The Greenest City Scholars Program is a collaboration between the City of Vancouver and the University of British Columbia (UBC) that supports Vancouver's *Greenest City 2020 Action Plan* (*GCAP*). Since 2010, UBC graduate students have worked with staff mentors at the City on a variety of research projects that correspond to the ten *GCAP* goals. In 2015, there were a total of twenty projects undertaken, making it the largest cohort of scholars to date.

This particular research project, which was initiated by the City's *Transportation 2040 Team*, aims to address the issue of off-street, residential bicycle parking. Vancouver's vision is to make cycling safe, comfortable, and convenient for people of all ages and abilities (AAA), and providing suitable bicycle parking is crucial to making this vision a reality. Often, bike parking is the weakest link in a person's trip, as it can be inconvenient, uncomfortable, and it may not meet demand. The AAA aspect is key, because there are currently many barriers that prevent people from parking their bicycles: not everyone is strong enough to lift a bike onto a vertical rack or down a flight of stairs, not everyone is comfortable being alone in a forgotten corner of a parking garage, and not everyone rides a standard-sized bicycle.

2.2 RESEARCH OBJECTIVES, METHODS, AND LIMITATIONS

The objectives of this project are to (a) recommend updates to the parking bylaw in order to improve bike parking in Vancouver, (b) support the creation of a Bicycle Parking Facility Manual, and (c) design a retrofit program that enables and encourages owners of existing buildings to upgrade their bike parking facilities.

The first component of this research was a literature review to determine common issues and best practices for off-street, residential bicycle parking. This included an examination of reports, journal articles, and bike parking manuals as well as zoning regulations, planning codes, and bylaws from a variety of cities across North America and Europe. The research process also involved reaching out to both City staff and external subject matter experts. A variety of groups and individuals contributed, including *HUB Cycling*, a non-profit created to address cycling issues in Vancouver; Elco Gauw, a bike parking consultant from *Urban Racks*; and Adam Kebede, an independent consultant with *Spoken*. Additionally, a request for information was sent out to the Association of Pedestrian and Bicycle Professionals (APBP) and the National Association of City Transportation Officials (NACTO) e-mail listservs, and planners from Portland, Oregon and Washington, D.C. were interviewed. Finally, an informal survey was conducted via select e-mail listservs and social media (this will be explained further in Chapter 4).

Bicycle parking helps legitimize cycling as a transportation mode by providing parking opportunities equal to motorized modes.

- Association of Pedestrian and Bicycle Professionals 2010

There were a few research limitations of note that influenced this project, the first being the complexity inherent in the topic of bike parking. There are so many detailed and interconnected aspects to consider—location, access, rack type, materials, security, enforcement, etc.—that it is difficult to cover everything in one project, especially one that is limited to 250 hours of work as per the Greenest City Scholars contract.

This leads into the next limitation, which was the examination of bike parking in other cities. These cities were chosen for a variety of reasons, including degree of similarity to Vancouver, reputation as a progressive cycling city, and recommendations from knowledgeable professionals. However, given time constraints, it was impossible to discover all progressive bike cities or to read through every bylaw and zoning code that may have been relevant to the project. Additionally, accessing European legislation proved challenging due to language barriers and diverse legislative systems. Some European content was reviewed, but the extra time considerations involved led to a greater focus on North American cities.

Figure 5: Bike Vancouver

The final challenge was that in the North American context, Vancouver is already considered to be a progressive cycling city, with many other cities using Vancouver's bylaws as positive example. That is not to say that improvements cannot be made, but many of the regulations that were examined were outdated compared to Vancouver. This meant that a very detailed examination was required in order to identify novel and innovative approaches to bicycle parking, adding to the complexity of the project.

2.3 REPORT STRUCTURE

The next portion of this report provides context for this project, including the growth of cycling in Vancouver (Chapter 3) and specific bike parking issues (Chapter 4). Chapter 4 also includes a collection of "residential bike parking stories" from Vancouver residents, with the full survey results available in Appendix B. Chapter 5 contains recommendations for updating the Vancouver parking bylaw. These recommendations are summarized in Appendix A, while detailed examples of legislation from other cities can be found in Appendix C. Chapter 6 contains recommendations for the creation of a Bicycle Parking Facility Manual, which would supplement the updated parking bylaw. Chapter 7 explains the current retrofit process in Vancouver and proposes a new retrofit program. Chapter 8 contains the summary and closing remarks, followed by references, image credits, and the appendices described above.

This report should be read with an open mind and an eye to the future. Currently, the quantity and quality of bike parking in Vancouver is inadequate. It is not enough to simply catch up to current demand, though; the City of Vancouver needs to be proactive and create positive spaces for both current and future residents. It may be the case that not every recommendation in this report will be feasible in the current political or economic context, but they are still worthy of careful consideration.

3

CONTEXT

3.1 RELEVANT POLICY

Vancouver, British Columbia is a vibrant city of over 640,000 people nestled between ocean and mountains on Canada's west coast (BCStats 2014). The city is part of the Greater Vancouver Regional District (or Metro Vancouver), which has a population of 2.4 million (BCStats 2014). According to the *Greenest City 2020 Action Plan* (*GCAP*), Vancouver's mission is to become "the greenest city in the world by 2020," a lofty goal that sets the tone for planning and decision making throughout the city (City of Vancouver 2009). The *GCAP* goal most relevant to this project is "Green Transportation," which aims to improve transit, walking, and cycling.

The *Transportation 2040* plan, which was influenced by the *GCAP* and approved in 2012, also contains many actions geared towards cycling, including the following:

- C 2.1 *Provide abundant and convenient bicycle parking and end-of-trip facilities.*
    - C 2.1.1. *Periodically review policies for new developments to ensure abundant and conveniently located secure bicycle parking and end-of-trip facilities. Minimum requirements should support long-term mode share targets and ownership levels, and include convenient parking for visitors.*
    - C 2.1.2. *Develop a retrofit program to make it easier to add bicycle parking and other end-of-trip facilities to existing buildings.*

Another key document is the Vancouver *Parking Bylaw 6059*, with Section 2 (Definitions), Section 3 (Administration), and Section 6 (Off-Street Bicycle Space Regulations) being of particular importance to this report. The *Vancouver Building Bylaw* also plays a role in bike parking, as it controls aspects such as hall width, closet size, and shower facilities.

3.2 GROWTH OF CYCLING IN VANCOUVER

Using the *GCAP* and *Transportation 2040* plan—and building off of a superb natural setting, a mild climate, and a relatively simple grid network—Vancouver has become a Canadian leader in sustainable and active transportation. In 2014, Vancouver met its 2020 goal of achieving 50 per cent mode share by green transportation (City of Vancouver 2015b). Currently, only a small portion of that—about 5.5 per cent—can be attributed to cycling (City of Vancouver 2015a). The City of Vancouver is targeting seven per cent cycling mode share by 2020 and twelve per cent by 2040.

Based on the growth in cycling over the past few years, these targets are attainable. According to data from TransLink Trip Diaries, cycling volumes grew over 40% between 2008 and 2011, and are likely even higher today (City of Vancouver 2013). This growth is likely due to a number of factors, including new and improved infrastructure, education and promotion, and cultural shift.

While the City's focus on cycling network infrastructure has been fantastic, there needs to be an increased focus on bicycle parking if these facilities are to keep up with increased demand and help meet the *GCAP* and *Transportation 2040* goals. Effective bicycle parking is "part of a complete, multimodal transportation system," and "[t]he provision of good parking facilities directly encourages people to use their bicycles as a means of transportation" (Arlington County Commuter Services 2014).

Improved parking leads to more cycling, which is a recipe for a healthy, happy, and sustainable city.

4

PARKING PROBLEMS

Bicycle parking is an important component of a comprehensive system of cycling infrastructure. It is especially critical for people living in multi-unit residential buildings, where the availability and quality of bicycle parking can be a significant determinant of bicycle ownership and cycling activity.

- Riekko 2013

4.1 BICYCLE PARKING BASICS

Before digging deeper into Vancouver's bicycle parking issues, it is important to briefly discuss bicycle parking in general. There are three broad categories of bike parking: short-term (two hours or less), long-term (more than two hours), and event (limited duration for special events) (Alta Planning + Design 2013). Many cities, including Vancouver, also use the terms Class A (or Class 1) and Class B (or Class 2) bike parking. In this case, Class A is referring to secure, long-term parking for residents or employees, whereas Class B refers to transient, short-term, or visitor parking (City of Vancouver 2014a). Bike parking can also be categorized as on-street and off-street. On-street is typically short-term, although outdoor public bicycle lockers would be an example of on-street long-term. Off-street can be either short- or long-term.

This report is focused on off-street, residential, Class A bicycle parking. In the context of this report, *residential buildings* generally refers to multifamily buildings such as apartment buildings, condominiums, and co-op housing. Due to a lack of available land and soaring housing prices, there is increasingly limited detached home ownership in Vancouver. Additionally, Riekko (2013) notes that there "has been less focus (or even an absence of regulation) on lower-scale residential buildings" such as detached houses, duplexes, and townhouses because residents of these buildings are typically able to find adequate bike storage without government intervention. In these housing types, there is more flexibility to use garages or sheds, and residents have more control over living spaces, allowing them to make bicycle-friendly modifications (Riekko 2013).

Apartments and condos, on the other hand, face a number of challenges when it comes to bicycle parking: floor space is limited, modifications are difficult or simply not allowed, accessing a unit with a bicycle can be challenging, and building management can ban bicycles from elevators, hallways, and balconies (Riekko 2013). Additionally, Riekko explains that most developers are not very keen to construct bike parking:

> *Developers may not consider bicycle parking a priority among competing interests for common space in a building; parking spaces for cars represent a viable market for developers in major cities, whereas bicycle parking spaces are typically not as marketable. Prospective condominium purchasers or tenants of rental buildings may not consider bicycle parking during their housing search, especially if they don't own a bicycle. Other considerations such as price, state of repair, unit size, building amenities, and vehicle parking are often more important considerations.* (Riekko 2013)

These challenges need to be addressed; as mode share continues to increase, more and more bike parking will be required. If parking is insufficient, gains in mode share may begin to slow, as people are less likely to purchase a bicycle if they have no place to store it (Riekko 2013). On the other hand, quality bicycle parking can help to legitimize cycling, "signaling to cyclists that they are invited and welcome" (Baerg 2012; Association of Pedestrian and Bicycle Professionals 2010). It is important to get it right in the first place, as bike parking retrofits can be very difficult and expensive. However, Riekko (2013) also cautions that "measures be reasonable, balancing these future needs without placing an undue burden on current residents."

4.2 OVERVIEW OF ISSUES

In 2008, the City of Vancouver reviewed bike parking and ownership in order to assess compliance to—and the effectiveness of—Vancouver's *Parking Bylaw 6059*

(Macdonald and Memon 2008). When it came to residential buildings, the report found the following:

- Our survey of multiple residential developments confirmed that bicycle ownership is approximately 1.25 spaces per dwelling unit which is our by-law requirement.
- Most bicycle storage facilities were significantly underused. Overall less than half the provided spaces were used and only 28% of the vertical spaces used.
- Initially none of the bicycle storage areas fully met the City's security requirements.
- Five facilities had been retrofitted to improve security.
- People with high priced bikes generally would prefer to not use their current bicycle storage areas due to theft concerns.

Although nearly a decade old, these findings are a useful benchmark for today's bike parking issues. It is highly likely that the rate of bicycle ownership has increased since 2008 (See Chapter 5, Section 5.4 for details). Even if bicycle ownership has not increased in the years since 2007, policy should be based on *future* mode share projections, not the current numbers. It is likely that the second point regarding underused bicycle rooms is also outdated, as crowded bike rooms are now a significant issue in Vancouver. Where underutilized bicycle parking remains, the Danish Cyclists Federation (2008) has an explanation: "[e]mpty stands may be a sign that there are enough stands. But it may also be a signal from users that the parking solution does not work!"

The final three points—that the bicycle storage rooms were not meeting security requirements, that they were in need of retrofitting, and that cyclists refrain from using these rooms due to theft concerns—remain highly relevant. A recent Metro Vancouver study found that "a sizable proportion of bicycle owners surveyed are frustrated by the lack of secured and sufficient-sized bicycle parking facilities in their buildings" (Metro Vancouver 2012). When survey respondents who owned bicycles were asked if they used their buildings' bicycle parking facilities, a staggering 75 per cent answered "no" (Metro Vancouver 2012). The top three reasons for not using it were: (1) there is no bike facility; (2) bike facility is not trustworthy and/or they were unwilling to store an expensive bike with others; and (3) there was no more space in bike facility (Metro Vancouver 2012).

4.3 "YOUR RESIDENTIAL BIKE PARKING STORY"

The studies described above provide a general overview of the city's bike parking problems, but they fail to convey the true impact of this issue on the daily lives of Vancouverites. For many people, cycling is one of the most enjoyable activities in Vancouver, as it allows people to experience the city's many sights and sounds in an intimate and engaging fashion. For a growing number of people, cycling is also a primary mode of transportation. This means that bike parking problems can be a major disruption to citizens' enjoyment of the city and their daily working lives.

Storytelling was used to better understand the most pressing issues for cyclists in Vancouver. This can be a powerful technique as it allows real people to express themselves, revealing the nuances of a situation. In this case, an informal survey was used to elicit these stories, simply asking respondents to provide their "residential bike parking story." This question struck a chord: there were 93 responses, many of which contained evident emotion as people expressed their frustrations. There were positive tales of bicycle parking as well, but the overwhelming sentiment was that improvements are badly needed.

The survey was not intended to be representative of the Vancouver population; rather, it was simply meant to provide a small sample of real-life bike parking experiences. 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 (UBC). The following two pages contain select stories that were particularly revealing or that represented a common issue. Appendix B contains the original survey and the complete set of responses.

There isn't enough parking of any kind at my apartment building—not enough for the cars and certainly not enough for bicycles. Instead, the landlords rent out the parking stalls to a valet service for neighbourhood restaurants. We have one enclosed room for secure bike storage, but it is overflowing. Tenants have asked to rent and pay for an entire parking stall to use for more bicycle storage, but the landlords have turned them down as the valet is more lucrative. 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.**

- Christine

Not much to say and no complaints, but the bike storage is crammed. I am on the strata council and we just conducted a bit of bike room housekeeping (tag your bike or it gets tossed), thinking that the bike room cram was a result of old tenants/owners that had long since moved. Nope, still just as crammed. Basically means everyone is riding (or at least owns) a bike which is great, but **we need higher density storage.** Guess what the topic for the next meeting is?! Are you saying we get a grant for that?

- Keith

RESIDENTIAL BIKE PARKING STORIES

From Actual Vancouverites

I live in a building in the Broadway Cambie area. In my building the storage area closes from midnight to 5am. Also my building does not allow bikes in the elevator. So **if I come home late I am not able to store my bike without breaking a strata rule**.

- Nick

My co-op turned an empty parkade room into bike storage. It is WAY too small for our building. We waited years to get a spot and I can barely fit my bike in it. **We recently got a long tail cargo bike** because we want to be able to transport our kids easily by bike **but there's no way we can park it in the secure bike room** so instead we park it in our parking stall, lock it to other bikes, and cross our fingers. I hope that the COV takes into consideration that bikes come in many shapes and sizes and that bike rooms will have a place for cargo bikes, too.

- Carrie

I live in a large condo tower downtown. The building was built in the late 1990s. The building has wonderful amenities (such as a gym, hot tub, and well appointed interiors), but bike parking is definitely not one of them. Although the building has an underground, secure bike room with bike racks, **getting in and out of the room is very difficult**. Although connected to the main ramp of the underground parkade, a narrow staircase with a tight 180 degree angled landing makes getting bikes in and out very difficult. Perhaps the current bike parking area was converted to its current use later in the building's history. The room is also overcrowding with bikes, and my partner and I have to double up and stack our bikes on the rack. Meanwhile, there are always many empty spaces in the parkade for automobiles. Our unit came with two parking space for automobiles, but we don't own a car and have difficulty renting out these spaces; the parking spaces can only be rented out to residents of the building. Condo bylaws also prohibit the use of these parking spaces for bikes or storage. Bikes are also banned from all the other public areas of the building (such as hallways and elevators).

- Jim

We live in a new (2010) condo building in the Olympic Village. We found out after we moved in that they converted the secured rooms in the parkade that were intended for bike parking into extra personal storage rooms that won't accommodate bikes... 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**. Then I use a building key to get into the room, turn on the light, and unlock my bike. Then I ride my bike across P2 and up two sets up ramps to the street. My bike doesn't trigger the safety stop-go lighting that is in the parkade for cars, so I often am confronted with a big SUV coming down a ramp straight towards me with a driver who is surprised to see me there. The gel-coat on the parkade ramp is also crazy slippery when wet which adds another hurdle in the rainy months...

- Alex

I live in an apartment building with two large parking garages that sit half empty due to the fact that we are downtown. Our building policy is that we must keep our bikes either in our apartments or on our deck. Had two bikes stolen off my car in the garage. **I gave up my car to live downtown and at times feel that I might want to give up my bike to enjoy my living space.**

- Brian

See Appendix B for full list of responses.

For 5 years, I lived in a high-rise tower in Downtown Vancouver. The strata had a no exceptions policy that all bikes were required to be kept in the bike room, and that bikes were not to be brought up to units. The elevators had cameras, and fines were in place for offenders. 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. As avid mountain bikers, my girlfriend and I had a bicycles worth several thousand dollars. After being caught bringing the bike up to my unit and issued the warning, we followed the rules and left the bikes in the bike room. Sure enough, a break-in occurred, and our two nice mountain bikes were selected for theft among a bike room full of beater bikes and inexpensive commuters. Following the theft, the building management was quite unhelpful. Although they had required us to keep our multi-thousand dollar bikes in a facility that was clearly insecure, they took no responsibility for the loss and required us to use our own insurance. To make matters worse, the strata was unwavering of prohibiting bikes from going up to our unit once we sourced replacements. The building manager was sympathetic and turned a blind eye as we snuck our bikes into the elevator through the parkade, but a self-righteous unit owner tattled to the strata, and we were reprimanded. **We spent the duration of our lease sneaking the bikes upstairs in giant bags, then moved out to a more bike-friendly building.** It was inappropriate for the building to require us to leave such expensive bikes in such an inadequate storage facility, and they should have taken more responsibility following the theft given that we had followed their rules.

- Daniel

4.3.1 Story Analysis

While these stories reveal a wide array of issues, some clear patterns emerged upon coding the results. Figure 6 breaks down how many times each issue was mentioned in a story (note that individual responses often mentioned multiple issues). By far, the most common issue was the lack of available bicycle parking—34 people mentioned an overcapacity bike facility, while in 13 cases, there was no Class A parking in the building. Crowded and messy bicycle facilities were seen as problematic, with 20 complaints of abandoned and unused bicycles. Bicycle parking was also difficult to access (16) and insecure, with 22 mentions of theft. Thirty-one respondents indicated storing a bicycle in their unit, often because the bicycle was expensive and they did not trust the parking facility. In 14 cases, bicycles were banned from hallways, elevators, and/or balconies.

There were a few other notable patterns as well. Ten people owned more than one bicycle, some of which were non-standard designs such as cargo bikes and trailers. Seven stories indicated that there were unused vehicle parking spots at their buildings that could be used for bike parking, while four respondents noted that their building had already undergone a retrofit (although in some cases, additional parking was still required). Other stories mentioned inadequate guest parking, residents fighting over parking spaces, a facility that is not accessible 24 hours a day, and a woman who felt unsafe in her parking garage.

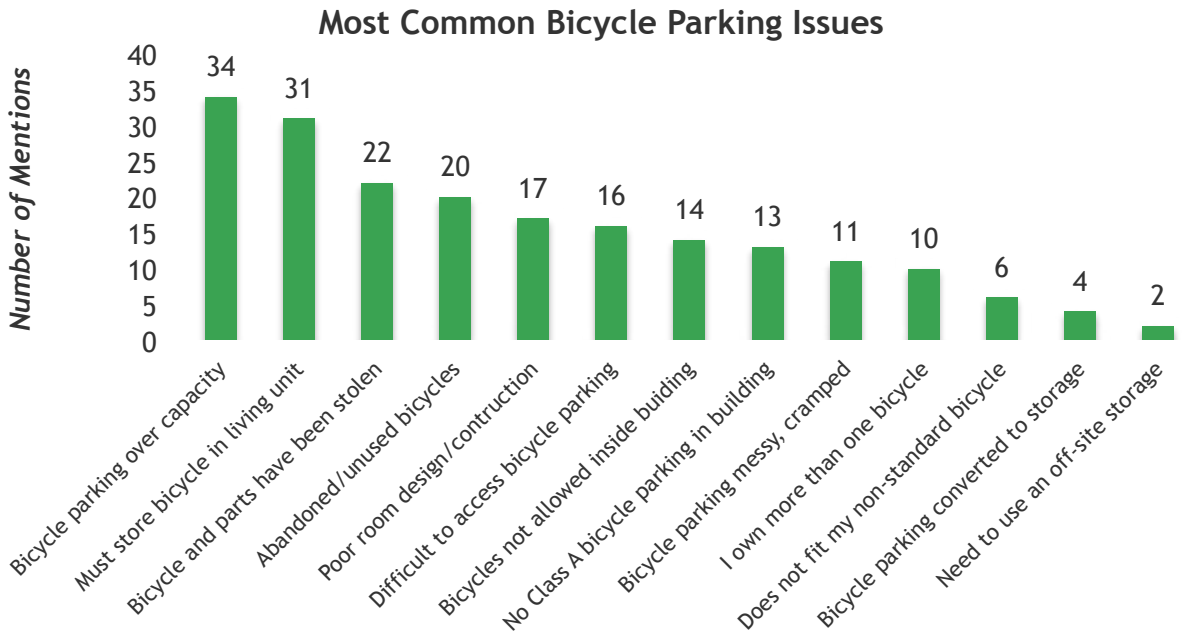
A small portion of respondents indicated being satisfied with some or all aspects of their bicycle parking. Ten respondents mentioned good security, six had adequate space, and five were able to easily access their parking. Only two people mentioned having access to some kind of amenity like a bike pump or work bench. A survey like this presents an excellent chance to air frustrations, which could partially explain the low number of positive responses. In this case, however, this is likely indicative of the generally poor quality and quantity of bicycle parking in Vancouver.

4.4 WHY ARE THESE ISSUES OCCURRING?

4.4.1 Inadequate Regulations

Vancouver's *Parking Bylaw 6059* is meant to ensure a high standard of bike parking, but its provisions lack clarity, precision, and foresight. In the field of bike parking, "the devil is in the details," and unfortunately, the bylaw leaves too much up to interpretation, allowing savvy developers to get away with ineffective bike parking. Developers are not purposely undermining cyclists for the fun of it; they are sim-

Figure 6: Coded survey results



ply trying to save money and maximize profits, and because the current regulations allow it, bike parking is often relegated to small, leftover spaces in a building. On the other hand, the bylaw can at times be unnecessarily constrictive—if a building contains underused automobile parking and residents wish to convert some of it to bicycle parking, this process can be tremendously arduous (see Chapter 7).

One major issue is that bylaws are generally based on minimums, which are in reality "the beginning of inconvenience" (Elco Gauw interview 2015). Minimums, such as the minimum amount of required bicycle parking or the minimum aisle width in a bike room, are often treated as "recommended standards"—only the most bike-friendly developer would consider exceeding these base requirements. Worse yet, developers and contractors often take shortcuts, lowering expenses by cutting into these minimums. As a result, users often end up with uncomfortable, insecure, and inadequate bike parking. In order to avoid this issue, minimums need to be set high enough so that even when shortcuts are taken, an adequate experience is guaranteed. Developers are like highway drivers; if regulators want cars to travel no faster than 120km/h, the safe choice is to set the speed limit at 110km/h, not 120km/h (Elco Gauw interview 2015).

4.4.2 Poor Design

Inadequate regulations are partially to blame for poor facility design, but it also comes down to the choices made by planners, developers, and contractors. Designing high quality bicycle parking requires thoughtful consideration of a number of elements: rack type, aisle spacing, enclosure type, door construction, facility location and access, etc. As soon as one element is designed inadequately, the entire facility can become compromised.

Vancouver's bicycle theft epidemic is evidence of this. Between 2008 and 2012, auto theft, robberies, and break-and-enters all dropped significantly, yet bike theft rose from 1,179 to 1,812—a 50 per cent increase (Skelton 2014). This spike in thefts mirrors the increase in cycling mode share, and without better design, this trend is set to continue.

Figure 7: Bicycle theft

4.4.3 Lack of Monitoring and Enforcement

Even the strongest regulations and most progressive designs can be useless if there is no monitoring or enforcement. Monitoring is necessary to ensure that policies and regulations are achieving their intended results. Enforcement is crucial to ensuring that the provisions in the bylaw are being followed. To be effective, these must be done on a regular basis, which is a significant challenge due to a lack of resources. However, it is no use updating bylaws and developing progressive design standards if there is no enforcement to back it up.

4.5 THE STATUS QUO

The problems described above will not be news to planners and developers—bike theft, crowded bike rooms, and disputes between occupants and building management are known problems for Vancouver's bicycle scene. The question is whether or not planners and developers are learning from these problems. An increased focus on bike parking is evident in some new developments, especially on the commercial side—the Microsoft Vancouver Development Centre is a positive example. However, even at a time when cycling is becoming more and more popular, many new developments are still providing sub-par bicycle parking facilities due to a combination of inadequate regulations and poor design. The following case study is a prime example of this.

5

BYLAW UPDATES

Recommending updates to bicycle parking regulations requires [not only] an assessment of existing conditions, but also the application of policy, forecasting trends in bicycle ownership, and good planning judgement.

- Riekko 2013

5.1 HOW TO READ THIS CHAPTER

Chapter 5 makes up the bulk of this report as it contains all recommended updates to the *Parking Bylaw 6059*. Some of the recommendations are general in nature, while others constitute fine details. In order to make this information digestible, this chapter has been divided into twelve sections that correspond to various aspects of the bylaw. Each section contains (a) a brief explanation of the problem, (b) discussion, and (c) recommendations. These recommendations are summarized in Appendix A.

Additionally, the sections may reference snippets of bylaws or regulations from other cities. These external examples are important because they show the specific wording used in other cities. However, in order to preserve readability and not have lengthy pieces of legislation in the middle of this report, these examples have been placed in Appendix C. Hyperlinks join text in Chapter 5 to the corresponding example, and clicking the arrow button (↖) next to the example in Appendix C allow readers to jump back up to the correct section of Chapter 5.

Note that these recommendations were made primarily with **off-street, Class A, residential bicycle parking** in mind. Many other general suggestions are also included, but this is not a comprehensive review. Further research is required for short-term, special event, commercial, and institutional bike parking.

5.2 STATEMENT OF PURPOSE

Problem

As Chapter 4 illustrates, the parking bylaw does not seem to be fulfilling its purpose. This statement is misleading, however, because it is currently unclear what constitutes the parking bylaw's purpose. There is no context or introduction provided in the bylaw.

Discussion

Many cities, including Portland, Oregon and Cambridge, Massachusetts, begin their bicycle parking regulations with a statement of intent or purpose. This section can be brief, but it is important in setting the stage for the regulations that follow. If a clear purpose is articulated, it can also be used to defend various pieces of the bylaw if they come under question from planners, developers, or the general public.

The City of Vancouver should emphasize that the purpose of the parking bylaw is to ensure safe, comfortable, and convenient bicycle parking for people of all ages and abilities. It could also discuss the importance of bicycle parking in the overall bicycle network, as well as the *GCAP* goal of making "walking, cycling, and public transit preferred transportation options" (City of Vancouver 2009).

Recommendations

- That the bylaw begin with a statement of purpose or intent that would provide context for the regulations that follow.

5.3 CLARITY AND READABILITY

Problem

The parking bylaw has been criticized for being unclear or difficult to understand. When a bylaw is confusing, it will not be implemented or enforced correctly, leading to inadequate bicycle parking facilities.

Discussion

The first step in making a bylaw clear and understandable is to explain all key terminology. Section 2 of Vancouver's bylaw contains all parking-related definitions. The only bicycle-specific terms, however, are "bicycle space," "bicycle space, Class A," and "bicycle space, Class B" (City of Vancouver 2014a). There are many other terms that should be defined in order to clarify Section 6.

The bylaw differentiates between a "bicycle room" and a "bicycle compound" but fails to define them,

which could cause confusion. The City of North Vancouver and City of Victoria each offer good but contrasting definitions of these terms; in North Vancouver, a bicycle room has opaque walls, but in Victoria, bicycle rooms "are locked rooms or cages" (City of Victoria 2011). This illustrates the potential for confusion. Other terms to define include "bicycle locker," "bicycle corral, "expanded metal mesh," and "non-standard bicycles." Davis, California provides a simple definition for alternative bicycles. Expanded metal mesh would be best described with images in a separate bike parking facility manual (see Chapter 6).

After definitions, the document needs to flow logically and be divided into clear sections. The current bylaw is divided into sections for Class A and Class B parking, but within these sections, it jumps from topic to topic. There are many small subsections that contain minimum measurements for aisle width, rack spacing, etc., which seems disorganized. In order to be effective, a bylaw needs to be rigorous, but if it contains too much detail, it can become both challenging to understand and overly constricting. There needs to be a fine balance between providing structure and allowing flexibility. This can be achieved in part by moving much of the specific measurements and design aspects to a stand-alone facility manual, which will be discussed in Chapter 6.

One final point is that the *Vancouver Building Bylaw* contains a small segment on bike parking (Item 3.7.2.12. *Bicycle Parking Facilities*) that describes the requirements for water closets, washbasins, and showers in non-residential buildings. This segment is referenced in the parking bylaw, but for clarity, it would be much simpler to move this item from the building bylaw into the parking bylaw. That way, developers and planners would not have to flip back and forth. Toronto is an example of a city that lists shower requirements in their bicycle parking bylaw.

Recommendations

- That the bylaw provide definitions for the terms described in Section 5.3 of this report.
- That the bylaw be reorganized to increase its clarity and effectiveness.

5.4 BICYCLE PARKING RATIOS

Problem

The *Transportation 2040* calls to "[p]rovide abundant and convenient bicycle parking and end-of-trip facilities," stating that "minimum requirements should support long-term mode share targets and ownership levels, and include convenient parking for visitors" (City of Vancouver 2010). As Chapter 4 explained, the minimums listed in the parking bylaw (Item 6.2: Table or Number of Required Off-Street Bicycle Spaces) are not meeting current requirements, let alone supporting long-term mode share targets.

Discussion

This is one of the most important sections of the parking bylaw because it dictates the availability of bicycle parking and shapes all future construction. Therefore, it is absolutely critical that the bike parking minimums are in line with future mode share targets, as called for in the *Transportation 2040* plan. Vancouver's minimum of 1.25 Class A spaces for each dwelling unit in multifamily dwellings is inadequate for current demand, yet it is one of the highest ratios in North America. Many cities have much lower ratios of Class A spaces per dwelling: New York (0.5), Seattle (0.75), San Francisco (1), and Los Angeles (1) are just a few examples (City of New York 2015; City of Seattle 2015; City and County of San Francisco 2013; City of Los Angeles 2015). European ratios were more difficult to determine, as some are calculated in different ways or based on of national standards. For example, residential buildings in Denmark normally require two to 2.5 bicycle spaces for every 100 square meters of floor area (Bølling-Ladegaard and Celis 2008).

In North America, only Portland, Oregon and Boulder, Colorado were found to require more bike parking than Vancouver. Boulder requires two spaces per dwelling, but only 75 per cent of those need to be Class A, meaning that their ratio is actually 1.5 spaces per dwelling (City of Boulder 2015). Portland has a "Central City Plan District" (explained here) in which it requires 1.5 Class A spaces per dwelling (City of Portland 2015). Outside of the Central City, the requirement drops to 1.1 per dwelling. While Portland's ratio of 1.5 appears to be the joint-highest in North

America, developers and architects in the city are worried that it is not sufficient for the demand in certain projects (see Hassalo on Eighth case study below).

The issue of bike parking ratios in residential buildings is directly tied to the question of bike ownership, but unfortunately, there are no current, reliable numbers for Vancouver. A 2008 survey conducted by the City indicated that bicycle ownership was approximately 1.25 bikes per unit, but given the increased mode share, this number has likely risen. Metro Vancouver conducted a survey in 2011 that indicated 68 per cent of households own one or more bicycles, although this sample included an unspecified number of UBC residents who are not technically part of the

5.4.1 Hassalo on Eighth Case Study

Hassalo on Eighth is a 21-storey, three-building apartment project in Portland, Oregon that will provide more long-term bike parking than any other project in the United States (Andersen 2014). The development is promoted as an "eco-community" for people who walk and bike—one building is even named the "Velomor," which "combines 'velo' with 'amore' to form 'love of biking' — celebrating Portland's biking culture" (American Assets Trust Inc. 2015). It is located in the Lloyd District, which falls within the jurisdiction of Portland's Central City plan and thus requires 1.5 bicycle spaces per unit.

Hassalo on Eighth contains 657 dwellings and will provide the minimum requirement of 990 Class A bike spaces plus an additional 115 Class B spaces, resulting in a total of 1,105 bicycle parking spaces (Andersen 2014). Five hundred and forty-seven of the Class A spaces will be provided in the "Bike Hub," a massive underground valet parking complex (Andersen 2014). Project architects, however, are concerned that the bicycle parking will be insufficient for demand based on the bike-friendly location of the development and the expected demographic—young, urban professionals with families (Andersen 2014). Designer Scott Mizée explains that two bicycles per unit is a realistic estimate for demand in the area and that for family units, "special attention needs to be paid to cargo bikes and trailers" (Andersen 2014). Mizée explains that planners and developers cannot "over-estimate the need for cargo bike and larger city bike spaces in large residential developments in central Portland," a statement which applies to Vancouver as well (Andersen 2014).

Figure 9: Velomor, which is marketed towards cyclists, is part of the Hassalo on Eighth development.

City of Vancouver (Metro Vancouver 2012).

It also appears to be common for people to own multiple bikes in Vancouver, although again, there are no reliable statistics on this at the moment. Vancouver is a world-class mountain biking destination; many people commute and ride recreationally on road bikes and hybrids; families increasingly rely on bike trailers and cargo bikes for transporting children and goods; and electric bicycles are rapidly growing in popularity. One City staff member indicated that his two-person household owned seven bikes; another owned ten bikes for a family of four, with more bikes to come. While these cases likely represent the exception rather than the norm, it is worth further investigating how many bicycles exist in Vancouver.

Denmark and the Netherlands are two of the most cyclist-friendly countries in Europe, so it is worthwhile referencing their bicycle ownership statistics. Nine out of ten Danes own a bicycle, while in Copenhagen specifically, four out of five households have access to a bicycle (Cycling Embassy of Denmark 2015; City of Copenhagen 2014). Seventy-three per cent of people in Amsterdam own a bicycle, while ownership is 88 per cent nationally (Ministerie van Verkeer en Waterstaat 2009). The Netherlands is also the only nation in Europe with more bicycles than residents—on average, the Dutch owned 1.11 bikes per person in 2004 (Ministerie van Verkeer en Waterstaat 2009). This is an important finding because it shows that even though bicycle ownership is only 88 per cent, the average number of bicycles is greater than one per person. Clearly, enough people own multiple bicycles to make up for the 12 per cent who do not own one.

Another reasonable benchmark would be to say that every Vancouverite should have access to a bicycle. Vancouver is not yet at the stage where bicycles outnumber people, but a ratio of one to one is a good place to plan for—even if ownership levels are not quite there yet, there is a good chance that this will occur in the near future. Assuming this one bike per person ratio, occupancy then becomes important. The average number of persons per household in Vancouver in 2011 was 2.2 (Statistics Canada 2011).

In order to truly become the greenest city in the world, Vancouver needs to ensure that its regulations are bold and progressive enough to match its ambitious goals.

However, looking only at apartment buildings (which is the focus of this study), the average goes down to 1.7 per household (Statistics Canada 2011). One bike per person times 1.7 persons per household means that there would be 1.7 bicycles per household. When compared to the current ratio of 1.25 Class A spaces per dwelling, there is a clear mismatch: 0.45 bikes per household are without secure parking.

Unit size is another variable worth considering. A Toronto study found, unsurprisingly, that bicycle ownership increases consistently with unit size, going from 0.7 bikes per unit in one-bedroom downtown units to 0.9 bikes per unit in two-bedroom units downtown (Riekko 2013). A study from Eugene, Oregon explains that parking requirements should increase as the number of bedrooms per unit increases, recommending one space per unit for studio, one-bedroom, and two-bedroom units, but two spaces per unit for a three-bedroom unit (Alta Planning + Design 2013).

Increasing the bike parking ratio from 1.25 to 1.7 would just meet demand if an average ownership rate of one bike per person were assumed. Looking forward and considering that there will be (a) future investments in cycling infrastructure, (b) continued normalization and promotion of cycling, (c) a demographic that is less auto-oriented, (d) a culture where many households own multiple bikes for different purposes, and (e) further increase in non-standard bicycle use (e.g. cargo bikes, trailers, etc.) causing more people to own multiple bicycles, a ratio of 1.7 per unit is not progressive enough and is hardly greater than cities like Portland or Boulder.

This report recommends a ratio of two Class A bicycle spaces per unit. This should provide enough spare bicycle parking to adequately future-proof buildings, which is important because retrofits can be extreme-

ly difficult. Consideration should also be given to increasing this ratio for units with three or more bedrooms. The Dutch may have phenomenal ridership, but one look at their sidewalks and plazas—which are often packed to the brim with parked bicycles—shows what can happen when ridership increases without a reciprocal increase in parking supply. Vancouver is at a critical stage where ridership has started to take off, so the City should heed this warning from the Netherlands and plan for the future.

Recommendations

- That the minimum number of required off-street bicycle spaces for multiple dwelling units be increased from 1.25 to 2. Consideration should also be given to increasing this ratio for units with three or more bedrooms.

5.5 IN-UNIT STORAGE

Problem

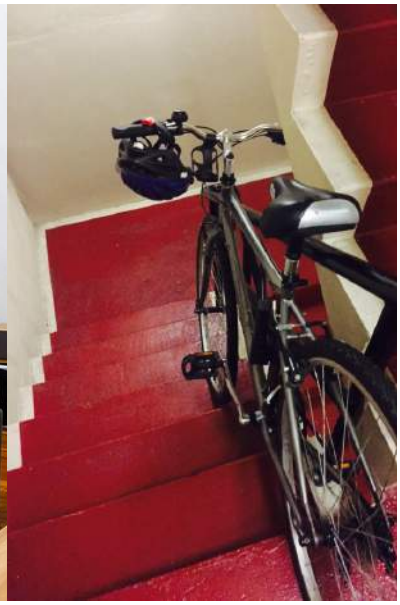
Many building occupants choose—or are forced—to store bicycles in their living units, often due to a lack of available parking space, a fear of theft, or both. Unfortunately, storing bicycles in units can be very difficult due to a lack of space within the unit or an inability to access the unit with a bicycle, either due to building design or because of regulations banning bicycles from hallways, elevators, lobbies, and/or balconies.

Discussion

When living units are being designed, bicycle parking is not typically a consideration. However, as the stories in Chapter 4 express, storing a bicycle in a small dwelling unit is a challenge that many Vancouverites encounter. The City should focus first and foremost on ensuring that adequate bicycle storage is available outside of dwelling units, but there will always be circumstances that require in-unit storage—someone who owns two or more bikes, for example, will likely need to store one or more of them in their unit, especially if these bicycles are extremely valuable.

Reminding architects and developers about the needs of cyclists is a good place to start, as they may come up with solutions on their own. However, the City could also actively encourage—and perhaps require—each unit in a new development to contain at least one interior closet or storage area that is large enough to store a bicycle. This could mean designing a front closet that is deep enough to fit a standard adult bicycle when hung vertically, while still allowing the door to close. Occupants who do not store their bicycle in their unit would of course be free to use that space for other purposes (and would likely be excited to have a larger storage area). Additionally, ensuring that hallways and doorways are wide enough to allow the passage of a bicycle without damaging

Figure 10: Bicycles in a living room
Figure 11: Clug bike clip, a Vancouver invention
Figure 12: Bicycle parked hazardously in a stairwell



walls may convince more strata councils and building managers to allow bicycles inside buildings.

The issue of bicycles being banned from hallways, elevators, lobbies, and/or balconies seems to be fairly widespread. Strata councils, landlords, and building owners establish these regulations in order to protect buildings from damage, to keep them clean, and sometimes for aesthetic reasons (bikes on balconies are often considered an eyesore). These building managers are motivated to keep maintenance costs low, but for the most part, bicycles are unfairly targeted. Is a muddy bicycle tire any different than muddy boots or sports equipment? Is the risk of a bike damaging an elevator or hallway any greater than the risk posed by a bulky stroller or wheel chair? For whatever reason, bicycles have developed a stigma and are often treated unjustly.

A simple way to solve the problem of wet and muddy bicycles is for both new and existing developments to provide bike washing and drying stations outside of buildings (Timothy Welsh [Hub Cycling] interview 2015). If cyclists are able to quickly clean off dirt and grime before entering the building, conflict could be greatly reduced. Additionally, interior walls should be coated in mark-resistant finishes that are easy to clean (Timothy Welsh [Hub Cycling] interview 2015).

Both New York City and San Francisco have passed laws requiring that tenants be allowed to bring bicycles into commercial buildings. Tenants in each city simply need to request bicycle access, at which point management must either provide a bicycle access plan outlining which elevators or hallways are appropriate for use or request an exemption for safety reasons (New York City Department of Transportation 2015; City and County of San Francisco 2012). In San Francisco, the building must either provide secure bicycle parking or allow bicycles in the building (City and County of San Francisco 2012).

New York's approach is particularly impressive, as the city has set up a web-based program called "Bikes In Buildings" in order to help implement their "Bicycle Access to Office Buildings Law" (New York City Department of Transportation 2015). The program explains the law to tenants, employees, and building owners, making implementation of the law relatively simple for all parties. Neither New York nor San Francisco have extended this law to residential buildings, but nonetheless, these regulations provide a powerful precedent that Vancouver should build on.

Recommendations

- That the City of Vancouver encourage or require every unit in all new developments to contain at least one interior closet or storage area that is large enough to store a standard adult bicycle. The City should also ensure that hallways and doorways are wide enough to allow the passage of a bicycle without damaging walls.
- That the City of Vancouver create a law that requires building owners and managers to allow bicycles in residential buildings. This legislation could be modeled on of New York's and San Francisco's recently established laws.

5.6 LOCATION AND ACCESS

Problem

The location of bicycle parking in Vancouver is often inconvenient, uncomfortable, or unsafe. Bike parking is frequently a poorly thought out, last-minute addition to a building plan, getting relegated to one or more otherwise unusable spaces. Often, it ends up in underground parking garages, which causes a number of issues. As a result of these poor location choices, accessing bike parking can be uncomfortable or even impossible, depending on a cyclist's fitness, comfort levels, or bicycle type.

Discussion

Section 6.3.6 of Vancouver's parking bylaw states the following in regards to access and location:

> *The bicycle room, compound, or lockers shall be located no lower than the first complete parking level below grade and shall have direct access to outside, except that a location more than one level below grade may be permitted where an elevator is supplied offering direct access to outside. There shall be*

> *no stairs on the access route, except that the Director of Planning may allow stairs provided a wheel ramp of a minimum width of 150 millimetres is provided without cutting into the stair tread.* (City of Vancouver 2014b)

Furthermore, Item 6.3.8 states that "[t]he entry door to a bicycle room or bicycle compound, or bicycle lockers, shall be within sight of building parking security, where such exists, an elevator, or an entrance" (City of Vancouver 2014b). This wording is fairly standard when compared to other North American bylaws and zoning codes, and many improvements are possible.

First of all, the bylaw should require that bicycle parking be located in a "safe, comfortable, and convenient location." The National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) sample ordinance requires that parking be "safely accessed by bicycle and by foot in a way that minimizes conflicts with motor vehicles," while San Francisco requires "safe and convenient access to and from bicycle parking facilities" and requiring it to be "at least as conveniently located as the most convenient nondisabled car parking" space (City and County of San Francisco 2013; National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012). Making bicycle parking as convenient as motor vehicle parking would prevent bicycle cages from being located in the furthest depths of parking garage, where there is little surveillance or safety. San Francisco's code is extremely detailed when it comes to access and location—potentially too detailed, as the code segment is quite lengthy. However, it serves as an excellent example of legislation that the City of Vancouver should examine more closely.

Secondly, the bylaw seemingly assumes that bicycle parking will be located in a parking garage. While this is the case in most buildings, it is by no means an ideal solution—locating bike parking in garages "requires riders to ride up ramps designed for cars, which can prove to be a disincentive for using such spaces" (City of Los Angeles 2015). There are also safety concerns, especially for women, which will be discussed in Section 5.7. The City should outline a clear hierarchy of bike parking locations, making it clear that while a parking garage can be an acceptable location, it should not be considered the *default* location.

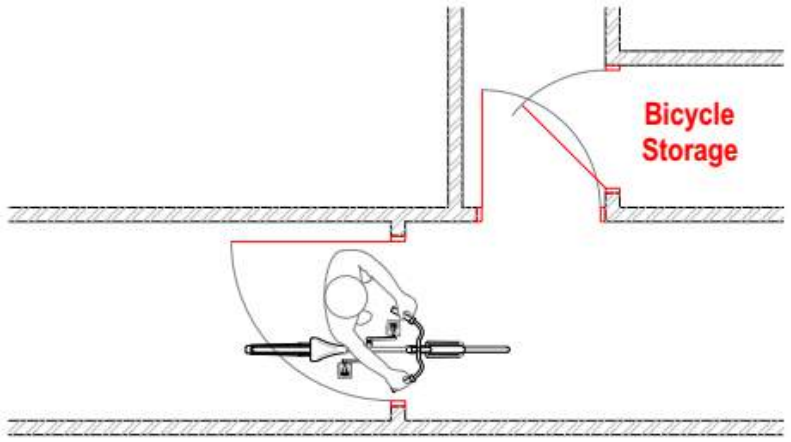


Figure 13: An example of a facility with poorly designed access; the doors and tight turning radius make it difficult to maneuver.

Best practice dictates that secure bicycle parking be located at grade and have a dedicated entrance for cyclists (Bølling-Ladegaard and Celis 2008; City of Toronto 2008). Any access hallways should be sufficiently wide to allow two cyclists to pass one another and easily navigate the space, and constriction points should be minimized (San Francisco Planning Department 2013). Any doors should be located and designed so that it is easy for a cyclist to open and move through—automatic doors are preferred, but they should at least have a slow-closing mechanism that gives cyclists time to enter (Cambridge City Council 2010). The Vancouver General Hospital (VGH) Cycling Centre is a fantastic local example of these best practices. These design details are likely better suited for a separate bicycle parking facility manual rather than the bylaw (see Chapter 6).

In cases where these best practices are not possible, the following standards should be met. If the parking is located above or below grade, a dedicated access ramp with a width of three meters is preferred, as this minimizes conflicts with motor vehicles (City of Toronto 2008). If a dedicated ramp is not possible, the ramp should be sufficiently wide to provide safety for cyclists—"[s]ingle lane ramps shared with motor traffic with a width of between 2.75m and 3.25m

should be avoided" (Cambridge City Council 2010). If the ramp is bidirectional and uses sensors to indicate the right of way, these sensors need to be sensitive enough to pick up cyclists so that they do not meet oncoming traffic when using that ramp. In all cases, the maximum inclination of an access ramp should be no more than five per cent (City of Cambridge 2013; Bølling-Ladegaard and Celis 2008; City of Victoria 2011). Cambridge, Massachusetts has particularly strong regulations regarding access ramps.

Stairs and elevators are sometimes used as means of access to bike parking, but this should be avoided if possible—ideally, a cyclist should be able to ride to the entrance of the parking area (San Francisco Planning Department 2013). Stairs should not be considered appropriate means of access in any situation, but in the case of a retrofit where it may be the only option, wheel ramps can be installed that allow the simpler transportation of a bicycle (City of Toronto 2008). The use of elevators as means of access should be minimized, but they should still be designed to fit bicycles as cyclists may wish to bring bikes to their units (City and County of San Francisco 2013). San Francisco and Cambridge each describe minimum elevator sizes in their municipal codes. If elevators are used as the primary means of access, they should be safe and convenient, providing direct access to bicycle facilities as opposed to serving multiple building areas and users.

Recommendations

- That the bylaw outline a hierarchy of bicycle parking locations, with best practice, at-grade facilities as the preferred option and parking garages as the least desirable option.
- That the bylaw require that bicycle parking be located in a "safe, comfortable, and convenient location." This should include a statement requiring that bicycle parking be at least as conveniently located as the most convenient nondisabled motor vehicle parking space.
- That the bylaw set a maximum access ramp inclination of five per cent.
- That the bylaw refer to a separate bicycle parking facility manual that specifies finer details, such as minimum elevator size, minimum access hallway widths, access door standards, and other best practices (see Chapter 6).

Figure 14: Parking garages are rarely designed with cyclists in mind, leading to hazardous conditions.

5.7 SAFETY AND SECURITY

Problem

Residential bicycle parking is often seen as unsafe, not only for the bicycle but also the cyclist. A City of Vancouver report illustrated this perfectly:

> *Many residents surveyed expressed frustration that their bicycle parking security is not adequate, particularly when they first move into a new building. As a result, owners are required to pay additional costs for security upgrades within the first year of moving in. Even with upgrades, none of the surveyed bicycle parking facilities met all of the by-law requirements.* (Macdonald and Memon 2008)

Discussion

As discussed in Chapter 4, bicycle theft is a major problem in Vancouver and is one the primary reasons that many residents store bicycles in their living units. The parking bylaw already contains fairly detailed security standards regarding the type and construction of enclosures, doors, and bicycle racks, but based on the rates of bike theft, more needs to be done. Many thefts are a direct result of facility design, which the City can, in part, influence. However, a number are the result of user error (e.g. using an insecure lock, improperly securing a bicycle, or leaving a door open).

The City should create an educational brochure that explains best practices for securing a bicycle, including how to select and use a lock as well as what to do in the event of a theft. This could be based on the Surrey Bikes brochure (see Figure 15) and should be placed in all bicycle parking facilities in the city (Erin O'Melinn [Hub Cycling] interview 2015). Additionally, the City should require that all residents are given bicycle parking orientation manuals upon moving into a building (Erin O'Melinn [Hub Cycling]interview 2015). This orientation manual would provide a map showing the location of bike parking spaces and amenities, the anti-theft information mentioned above, and any facility regulations (e.g. the abandoned bicycle removal policy). The City should create an orientation manual template to simplify this process for strata councils and building managers.

Bicycle room and cage design is key to ensuring its security. The bylaw requires the use of expanded metal mesh for bike compounds, but fails to define this material—expanded metal mesh comes in different sizes and designs, so it is important to be more specific (see Chapter 6 for details) (Urban Bicycle Parking Systems Inc. 2014). Many instances of theft result from thieves cutting through enclosures made from regular chain link fencing. Bicycle facility doors should be self-closing and -locking, eliminating the user error of failing to secure the door (Cambridge City Council 2010). Surveillance is another important issue: when parking cannot be located within sight of security personnel or an entrance, security cameras should be installed (City of Portland 2014). The basic requirements of rack design are covered in Vancouver's parking bylaw, but details will be discussed in Chapter 6.

Items 6.3.5 and 6.3.16 of the parking bylaw require that no bike compound or room shall provide over 40 bicycle spaces, with an option to increase this amount by compartmentalizing a room into a maximum of three enclosures of 40 bicycles each. In theory, "[k]eeping the number of available bicycle spaces below 40 helps lower the incentive and likelihood for theft" (Macdonald and Memon 2008). A few other cities do this as well, with size limited to 40 spaces in North Vancouver and 50 in Cambridge (UK) (The Corporation of the City of North Vancouver 2015; Cambridge City Council 2010). The Victoria bike parking guidelines also suggest that "several small compounds or rooms provide more security than one larger room, as the number of people who have access to each compound or room is reduced" (City of Victoria 2011).

However, there are a number of counterpoints to this argument that make these sections of the bylaw unnecessary. First, by limiting the size of a room, there is a greater chance that multiple rooms will be required and that these rooms will be scattered throughout the building in inconvenient locations (Elco Gauw interview 2015). Developers will often use leftover space for these rooms, resulting in unsafe and inconvenient

Figure 15: Surrey Bikes anti-theft brochure

RECORD IT

Recording your bike's information is the most efficient way to retrieve your bike if stolen.

- ◯ Take a photo
- ◯ Engrave your bike with a unique ID (such as a Driver's License Number or BC ID)
- ◯ Write a description of your bike below:

MAKE/BRAND

MODEL

TYPE/STYLE

COLOURS

SPEED/GEARS

SERIAL NO.

CONTACT

If a bike is in the process of being stolen:

CALL 9-1-1

It only takes seconds to have a bike stolen.

#LOVEITLOCKIT

To report a stolen bike call:

604.599.0502

(non-emergency RCMP line)

TIPS ABOUT RIDING
www.bikehub.ca

WWW.SURREY.CA/CYCLING

City of Surrey Crime Reduction Strategy

City of Surrey · Royal Canadian Mounted Police / Gendarmerie royale du Canada · Surrey Libraries · HUB · Surrey Bikes

SURREY BIKES

BREAK THE CYCLE OF THEFT

SELECT A LOCK

Typically with locks you get what you pay for, therefore invest in the best lock you can afford.

U LOCK

Made of hardened steel
Locked with a key

CABLE LOCK

Locked with padlock
If used alone, can be easily cut with tools

HOW TO LOCK

01 **Double Lock it, use both Cable lock and U-lock.**

02 **Don't lock your bike to things that can be cut (such as trees, fencing, or wooden railings).**

03 **Position the lock high off the ground to prevent thieves from gaining leverage.**

04 **When locking your bicycle, first make sure to put the 'U-lock' through both the frame and rear wheel and lock it to a post or bike rack. Then use a cable lock to lock the front wheel to a post or rack as well.**

STEPS TO TAKE

- ◯ Record your bike's information
- ◯ Double lock it
- ◯ Park your bike in a high pedestrian traffic area
- ◯ Try not to park your bike in the same location on a regular basis
- ◯ If you see a bike stolen, don't confront the thief, call 9-1-1.
- ◯ If your bike is stolen, report it to the non-emergency RCMP line.

Data show that the countries with the highest ridership rates, such as Denmark, the Netherlands, and Germany, have virtually eliminated, or in some cases reversed, the gender gap. The same pattern occurs across cities: where the gender gap decreases, overall ridership rates increase. This has led some commentators to deem the percentage of women riding as a key indicator of the presence of factors that support bicycling for the general population.

- Zimmerman and Kramer 2013

locations that may have low visibility. One or more larger bicycle rooms are arguably easier to secure, as more effort and resources can be focused on securing one area. Having one bike room can also encourage a sense of community in a building, as it can act as a social area where residents meet one another.

Second, these bylaw requirements apply only to the minimum required parking and not to any additional parking that is being provided. For example, the Vancouver General Hospital (VGH) Cycling Centre contains 162 individual bicycle spaces, which is well over the limit of 40 per room or compound (GreenCare 2015). However, VGH still meets the bylaw requirements by having one or more additional bike rooms with a capacity of 40 or less someplace else in the building. The Cycling Centre was constructed based on best practice standards and is very secure—likely much more secure, convenient, and comfortable than the smaller bike parking facilities in the building. Theoretically, if VGH was a new proposed development and they wanted to build a 200-space facility based on best practices, this would contravene the bylaw. Other than North Vancouver and Cambridge, no other major North American cities were found to have a rule stipulating the maximum number of bicycles to a room. Further research is required to confirm the actual risk of theft when more than 40 bicycles are in a room, but this rule could likely be removed.

Cyclist safety is an even more important issue than bicycle theft, because a safe bicycle facility ensures that riders of all ages, abilities, and comfort levels can ride. This is critical for increasing the number of female cyclists, as "women show higher levels of concern about safety than men" (Zimmerman and Kramer 2013). Furthermore, increasing the number of female riders is one of the keys to increasing overall ridership, as the quote from Zimmerman and Kramer indicates (see box to the left).

The best way to make bike parking facilities safer for women is to avoid locating them in large, dark facilities like parking garages. Such locations "can provide hiding places for miscreants or criminals and are often shunned by female cyclists due to safety concerns" (City of Los Angeles 2013b). The location should not be isolated, but instead offer maximum visibility by both parking facility users and security services (National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012). Bright lights should be installed, and convex mirrors can be used to minimize blind spots (City of Toronto 2008). Both Toronto and Victoria also recommend installing a panic button in parking facilities (City of Toronto 2008; City of Victoria 2011). Finally, some cities in Germany, Denmark, and the Netherlands—where a much higher percentage of women cycle—even offer priority parking for women in a more secure location (Pucher and Buehler 2008).

Recommendations

- That the City create an educational brochure for cyclists explaining best practices for protecting a bicycle. These brochures should be placed in each bicycle parking facility in the city.
- That the City of Vancouver provide a detailed explanation of expanded metal mesh. This should be accompanied by images and specifications in a separate bicycle parking facility manual (see Chapter 6).
- That the bylaw require self-closing and -locking doors for all bicycle rooms and compounds.
- That Item 6.3.5 and Item 6.3.16—the provisions specifying a maximum bicycle parking facility size of 40 Class A spaces—be stricken from the bylaw.
- That increased consideration be given to the

needs of female cyclists. This could include an education campaign for planners and developers as well as requiring increased safety measures such as convex mirrors and panic buttons in bicycle parking facilities. Facilities should be located within sight of security personnel or an entrance, and when this not possible, security cameras should be installed.

5.8 MAINTENANCE

Problem

The proliferation of abandoned, unused bicycles in Vancouver bike rooms is a significant issue, as it reduces capacity and makes maneuvering within the room extremely difficult. Bike parking facilities are also sometimes used to store things that are unrelated to cycling, adding to the clutter and taking away valuable bicycle spaces. Finally, general bike room cleaning and maintenance is often neglected.

Discussion

General maintenance of a bicycle facility is the responsibility of building management. The City should encourage all building managers and strata councils to create a regular maintenance routine in order to ensure that bicycle rooms remain functional and secure. The City could implement such a strategy for all city-owned buildings in order to lead by example. Maintenance also includes the proper inspection of racks, doors, and enclosures to ensure that these elements remain functional and secure. Details regarding these inspections, as well as other general maintenance issues, will be discussed in Chapter 6.

The city should strive to address the issue of abandoned bicycles, because it represents a "low hanging fruit" that could quickly provide extra parking capacity. Some strata councils and building managers have already implemented abandoned bicycle cleanup programs, achieving good results. Standard practice is to provide tenants with at least two weeks' notice by tagging bicycles during a cleanup (Urban Bicycle Parking Systems Inc. 2014). Having residents register their bicycles with the strata council or building manager could speed up this process, as these bicycles will already be identified. Those bicycles that are not

Figure 16: Abandoned Bicycle

claimed within two weeks of tagging are removed.

It is suggested that these bikes then be donated to a non-profit that can reuse them (National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012). The City should provide contact information for local organizations that accept larger quantities of used bicycles in order to maximize their reuse and simplify the removal process for stratas and building managers. Proper signage should be displayed in bike rooms informing users of facility rules, including the abandoned bike policy. APBP, Thunder Bay, and NPLAN all provide good examples of the content required for these programs.

Not all bicycles that appear unused are abandoned; there are many people who cycle infrequently but who still need a place to park. This creates conflict with those bike room users who commute or ride their bicycles daily, as the infrequently used bicycle often occupy prime parking spots for weeks or months at a time. This has led to the creation of "premium bicycle parking" in certain buildings—bike rooms that charge a membership fee in exchange for offering a better location, guaranteed space, and other amenities. The membership fee could be just enough to cover construction and operating costs or it could be revenue generating, which would be appealing for building managers and could help offset the cost of losing a revenue-generating vehicle parking spot in the event of a retrofit. Many daily commuters who are

frustrated with their overflowing bike rooms would likely be willing to pay a nominal fee in exchange for a premium parking facility.

If a building constructs premium bike parking, the free, standard bike parking in the building must still meet minimum standards. The location of the premium parking may be superior, but security or capacity should be maintained in the standard bike parking. Another option is to simply reserve the spaces closest to the door for regular commuters. Strata councils and building managers would have to devise a means of enforcing this by using signage or some sort of registration system for commuters and other frequent users.

Recommendations

- That the City create a regular bicycle parking maintenance and inspection strategy for all City-owned properties, and that it encourage building managers to adopt this (or a similar) strategy. This strategy should include an educational component that ensures that bicycle parking facilities remain functional and secure.
- That the City encourage building managers to adopt an abandoned bicycle cleanup policy.
- That the City further examine the concept of premium bicycle parking and consider other means of prioritizing commuter access to bicycle parking without impacting less frequent riders.

Figure 17: Tidy bike rooms are more comfortable and efficient

5.9 FACILITY DESIGN

Problem

Intricate details like aisle spacing, bicycle rack style, and room layout can make all the difference as to whether or not a bicycle parking facility is functional and secure. When bylaws do not regulate these details, they are left up to developer interpretation. Occasionally, this results in a successful space, but often this is not the case, with bike parking becoming an afterthought (Urban Bicycle Parking Systems Inc. 2014). At the same time, it can be difficult to attempt to regulate small details using a bylaw, because it takes detailed descriptions that make reading the document arduous.

Discussion

The solution to this problem is to create a bicycle parking facility manual to accompany the parking bylaw. This manual would act as an educational tool for planners, developers, building managers, and cyclists, helping them understand bicycle parking regulations. Cambridge, Mass., Toronto, Cambridge, U.K., San Francisco, and Arlington County, Virgina are just a few of the many cities that already have bicycle parking manuals or guidelines. This document should be clear, concise, and visually appealing; unlike the bylaw, it should contain many images (potentially even engineering standards) showing elements like rack type and layout. Each section of the manual should be clearly linked to a corresponding section of the bylaw so that the two documents can be used in tandem. The bylaw would act as the regulatory base, while the manual would cover the details, assisting during the design phase.

There is a difference between guidelines and regulations. The majority of cities have “bicycle parking guidelines,” which essentially act as recommendations, as they have no regulatory basis. These guidelines are good because they provide recommendations and best practices while still allowing flexibility in the final product. The problem with relying on guidelines, however, is that they can easily be ignored—they are voluntary and non-binding. According to Boyd (2003), guidelines take away responsibility and accountability because they “are interpreted as goals to be as-

pired toward, whereas standards provide certainty because they must be met."

San Francisco provides bicycle parking design and layout requirements in the form of a mandatory zoning administrator bulletin. The city's municipal code states that "[b]icycle parking shall follow the design standards established in Zoning Administrator Bulletin No.9, which includes specific requirements on bicycle parking layout and acceptable types of Class 1 and Class 2 bicycle parking spaces" (City and County of San Francisco 2013). The regulations have many pictures and helpful instructions, but they also use mandatory language, such as "[a]ll bicycle racks *shall*…" (San Francisco Planning Department 2013). This makes San Francisco's approach far superior to that of other cities.

Like San Francisco, Vancouver should adopt a bicycle parking facility manual that is mandatory. Within the manual, many sections could be clearly stated as "suggestions, guidelines, recommendations," etc. in order to maintain flexibility. However, the document as a whole must be mandatory. The would allow the City to set and describe minimum standards for things like aisle width and rack installation while also offering suggested layouts and rack types. Additionally, the City could include a section on "permitted flexibility" based on the Cambridge municipal code, which would help to future-proof both the manual and the bylaw itself (City of Cambridge 2015). Chapter 6 of this report will describe the recommended content for this facility manual.

Recommendations

- That the City create and adopt a Bicycle Parking Facility Manual based on those currently used in San Francisco, Cambridge, Toronto, and many other cities. The manual should be mandatory in nature (rather than guidelines) and should be clearly linked to the parking bylaw, but it could contain sections that are suggestions or guidelines. It should be written in an accessible and visually appealing manner with many images and diagrams. Suggested content for this manual is described in Chapter 6 of this report.

5.10 INCENTIVES FOR NEW DEVELOPMENT

Problem

The current parking bylaw does not incentivize developers to go above and beyond the minimum requirements. Since the bylaw needs to avoid being too restrictive, some aspects must be stated in the form of recommendations and guidelines. There need to be incentives for developers to follow those guidelines.

Discussion

One common incentive used by cities is to allow a certain amount of vehicle parking to be cut back in exchange for increasing the amount of bicycle parking. Vehicle parking spaces can be incredibly expensive to build—parking guru Donald Shoup estimates that the average construction cost of parking space in the USA was $24,000 USD for above-ground and $34,000 USD for below-ground in 2012 (Shoup 2014). This can negatively impact the design and size of a building when a project is on a tight budget, so allowing developers to avoid constructing these spots in the first place can be a strong incentive (Kim 2014). Cities have taken a variety of approaches when it comes to auto parking replacement policies, and these will be discussed further in Section 5.11, as many of them also focus on the retrofit of existing buildings.

Density bonuses are another way that cities can incentivize better bicycle parking. The first step is simply

Figure 18: Underground parking is costly to construct and is often underutilized

to ensure that bicycle parking does not count against a building's floor area. In Vancouver, bike parking is excluded from floor area calculations when it is in an underground parkade, but it counts if it is at grade, encouraging developers to maximize their building size by shoving bikes underground. In Los Angeles and New York, bike parking is excluded from calculations of floor area.

The next step is to offer bonus floor area in exchange for providing better bicycle parking, which could include exceeding the minimum number of spaces, locating the parking in a desirable area (such as at grade), or providing amenities such as pumps and bike repair stations. The Portland municipal code states that "[f]or each square foot of area developed and committed to locker room facilities, a bonus of 40 square feet of additional floor area is earned" (City of Portland 2015). A planner at the City of Portland indicated that this provision is rarely used, and if they were to rewrite it, they would put more emphasis on getting additional bicycle spaces rather than extra locker room space (Scott Cohen [City of Portland] interview 2015). Vancouver developers would likely be highly motivated by a density bonus, as land values are extremely high.

Other cities that offer density bonuses (although not necessarily for bike parking) include Arlington County and Front Royal, Virginia; San Diego, California; Vancouver, Washington; West Jordan, Utah; Marysville, Washington; and Walton County, Florida (National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012). One additional bicycle parking incentive could be expedited permitting, which can provide significant financial benefit to developers (National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012).

Recommendations

- That the bylaw include a suite of incentives for developers to provide improved bicycle parking. Improved bicycle parking could include exceeding the minimum number of required bicycle parking spaces, putting the bicycle parking in a desirable location (such as at grade), providing amenities (such as pumps and bike repair stations), and other ideas. Incentives could include automobile parking reductions, density bonuses, and expedited permitting.

5.11 RETROFIT REQUIREMENTS

Problem

Updated bylaws will help ensure that high quality bicycle parking is provided in new developments, but a larger issue is the stock of existing buildings that have inadequate (or non-existent) bicycle parking. The few retrofit provisions that exist in the current bylaw are not strong enough to improve the bike parking situation in Vancouver.

Figure 19: High quality bicycle parking often includes amenities such as pumps, at-grade access, repair stands, and maintenance supplies.

Item 6.2A states: "[f]or each five Class A bicycle spaces provided on a site in addition to the required number of bicycle spaces…there is to be a reduction of 1 in the number of motor vehicle spaces required on the site" (City of Vancouver 2014b). However, this item does not apply to residential buildings and it is rendered ineffective by restrictive conditions—an office building would have to be extremely large in order to gain a useful amount of bicycle parking. As a result, this provision is rarely evoked. If this item were to be made applicable to residential buildings (and the conditions were relaxed), the current fear is that motor vehicle spillage would occur.

Item 6.3.20 (Conversions in existing buildings) states: "[o]wners of existing buildings may convert motor vehicle parking spaces to Class A bicycle spaces, at the ratio of 1 motor vehicle parking space to 5 bicycle spaces, to the extent necessary to provide the number of bicycle spaces required under this Bylaw" (City of Vancouver 2014b). This provision allows buildings to get up to the minimum, but the minimum has thus far proven to be insufficient. If a strata council in a building that already meets the minimum requirements wants to increase its bicycle parking by removing some unused motor vehicle spaces, the current bylaw would not allow this to occur without a special exemption.

Discussion

The first step in improving the retrofitting capability of Vancouver's parking bylaw is to add a section explaining the applicability of the bylaw, as this would clarify when a retrofit is triggered. Currently, the only action that would trigger a retrofit seems to be if a building manager wanted to convert motor vehicle spots using Item 6.3.20 of the parking bylaw. San Francisco's municipal code, on the other hand, lists six different scenarios that would trigger the requirements of the code, such as the addition of a dwelling to a unit and a "change of occupancy or increase in intensity of use which would increase the number of total required bicycle parking spaces (inclusive of Class 1 and 2 spaces in aggregate) by 15 percent" (City and County of San Francisco 2013). Davis, California has a smaller, more concise applicability section that could also be used as an example.

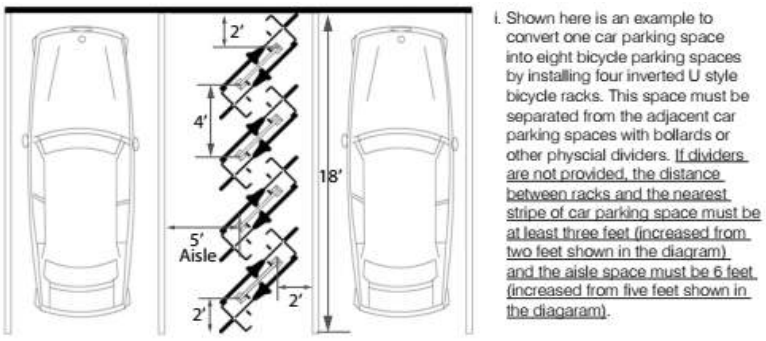


Figure 20: San Francisco example of converting a vehicle parking space into bicycle parking

When retrofits are triggered, allowing a certain degree of flexibility can help keep costs down while still providing an overall improvement. San Francisco requires all city-owned and -leased buildings and garages to be upgraded to meet the minimum requirements of their bicycle parking ordinance (San Francisco Planning Department 2013). This is a significant move that shows excellent leadership, and Vancouver should follow suit. When this occurred, San Francisco relaxed certain requirements, such as allowing existing round-tubed racks to remain in use even though square-tubed racks were required (San Francisco Planning Department 2013). This makes a retrofit much more financially and politically feasible.

As mentioned in Section 5.10, replacing motor vehicle parking with bicycle parking can be a very useful tool, both for new developments and retrofits. A number of cities have provisions that appear to be stronger than those in Vancouver's parking bylaw. Portland's municipal code has a simple but powerful provision allowing bicycle parking to substitute for up to 25 per cent of required parking at a 5:1 bike/car ratio (same as Vancouver) when more than the minimum required bicycle parking is provided (City of Portland 2014). This is superior to Vancouver's provision because it applies to both new developments and retrofits in all building types and is not constrained by any size or occupancy restrictions. Seattle, Toronto, San Francisco, and Minneapolis all have their own motor vehicle substitution provisions with different conditions and ratios that range from 4:1 to 8:1.

Los Angeles and Washington, D.C. have innovative and ambitious retrofit policies that are worthy of

close examination. The Los Angeles provision allows a similar substitution of motor vehicle parking at a 4:1 ratio, but interestingly, developers do not need to build *additional* bicycle spaces on top of the minimum amount in order to take advantage of this provision—Los Angeles simply counts the required bicycle parking and uses that number to calculate motor vehicle space reductions (City of Los Angeles 2015). This is significantly different from other cities and has the potential to eliminate many car spaces. In order to clarify how this provision works, a few examples are show in the box below.

Washington, D.C. also has an aggressive and inno-

Los Angeles' Motor Vehicle Substitution Provision

**Note: Requirements differ depending on the type of project, so it is important to read through the full provision (City of Los Angeles 2013a) in Appendix C.*

EXAMPLE 1: NEW DEVELOPMENT

Part A:

An affordable residential project with 88 units located within 1,500 [feet] of a transit stop.

- *Code required automobile parking spaces:* 176
- *Code required bicycle parking spaces:* 9 (short term) + 88 (long term) = 97
- *Incentive:* 97 bicycle parking / 4 = 24 cars
- *Check:* 24/176 = 13.6% < 15% of total automobile spaces (since it is close to transit, this works)
- *Final requirement for project:* 176 - 24 = 152 automobile spaces and 97 bicycle spaces.
    - Unlike Vancouver or Portland, simply having the required bike parking spaces allows a reduction of car parking.

Part B:

The owner wants to maximize the automobile reduction by 30%, by providing more bicycle parking spaces for the same project instead of one of the existing parking reductions allowed by the density bonus incentive.

- *Maximum reduction permitted:* 30% of 176 = 52.8 automobile spaces (not to exceed 30%)
- *Bicycle parking spaces required:* 52 x 4 = 208 total bicycle parking spaces (instead of 97)
- *Total Required automobile parking spaces after reduction* = 176 - 52 = 124 spaces
- *Required bicycle parking spaces* = 208 (9 short; 88 long; 111 either short or long)
- *Final requirement:* 124 automobile parking spaces and 208 bicycle parking spaces
    - The developer does not have to replace the entire 30% if they wish to provide less bicycle parking spaces. The developer could replace only 20% if they provided 140 bicycle parking spaces.

EXAMPLE 2: EXISTING AUTOMOBILE SPACES

Any bicycle parking spaces beyond the code-required ones can be either short or long term as determined by the business or property owner. The % swapping is the same as mentioned above for replacement except for a smaller site with less than 20 onsite existing automobile parking spaces, up to 4 automobile parking spaces can be swapped. Each automobile parking space shall be swapped with four bicycle parking spaces.

- Change of use of an existing 3000 sf. of retail space to restaurant.
- *Nonconforming required automobile parking spaces on site* = existing automobile parking spaces provided = two on site (shall be maintained)
- *Additional automobile parking spaces due to change of use:* 3000/100-3000/250 = 18
- *Swapping automobile parking spaces using bicycle parking spaces:*
    - *Bicycle parking spaces required:* 4 x 4 = 16 bicycle parking spaces (2 short and 2 long; 12 can be either long or short—with 20 or less provided on site, only 4 automobile parking spaces can be swapped).

vative retrofit provision that cyclists in Vancouver would certainly utilize (District of Columbia Municipal Regulations 2014). The provision states that "[e]ach existing residential building covered by § 1214.1 shall provide a reasonable number of bicycle parking spaces within thirty (30) days after written request from one (1) or more tenants or property owners. A reasonable number shall be defined as the lesser of either: (a) One (1) bicycle parking space for each three (3) residential units; or (b) Enough bicycle parking to meet the requested demand" (District of Columbia Municipal Regulations 2014). By allowing tenants and property owners to trigger a retrofit on their own, this eliminates the problem of building managers and strata councils that are unreceptive to complaints about bicycle parking. In D.C., the District Department of Transportation (DDOT) acts as a moderator between the tenant or property owner and building management, stepping in only in the event of a complaint. Building managers can request exemptions but must provide the appropriate rationale.

This provision had only been in place for about seven months at the time of writing, so its full impact was unclear. There had not yet been any push back from building managers; instead, managers had begun reaching out to DDOT to ask how they could bring their buildings into compliance, preempting a tenant or property owner request (Kim Lucas [DDOT] interview 2015). This provision would be extremely useful in Vancouver and could be adjusted to allow tenants and property owners to request parking in addition to the minimums in the event of an overcrowded bike parking facility. These requests would have to be assessed by City of Vancouver staff in order to determine whether or not the additional parking was warranted.

Aside from offering a motor vehicle to bicycle substitution, there are other retrofit options. An interesting variation is to provide off-street vehicle parking credits (allowing developers to build fewer vehicle spaces) in exchange for the provision of bicycle parking amenities (National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012). NPLAN's sample ordinance uses the provision of showers as an example, but credits could be given out for a number of things, including the provision of a bike repair stand and pump, the construction of at-grade bike parking, or any other amenity that improves a cyclist's experience.

Finally, if all else fails, a monetary grant would both act as an incentive and provide the necessary funds for buildings to retrofit. The City of Vancouver would have to explore various avenues to find a funding source for a grant of this type. Some form of tax exemption on the construction of additional parking would also help building managers deal with this cost, as would the expedited permitting mentioned in Section 5.10. Another solution could be to use revenue from Vancouver's parking permit program to create a "parking benefit district," with funding allocated to local sustainable transportation initiatives such as secure bike parking (Paul Krueger (City of Vancouver) interview 2015). In order to enable buildings to utilize these incentives, the City of Vancouver should create a retrofit program (see Chapter 7).

Recommendations

- That the bylaw contain a section called "Applicability" that explains when the requirements in the bylaw are triggered.
- That the bylaw contain a section dedicated to the retrofit of existing buildings. This section should include a suite of policies that enable a building to undergo a successful bicycle parking retrofit.
- That the City of Vancouver closely examine the retrofit policies from other cities that were mentioned in this report and consider adopting a combination of these policies. The policies of Los Angeles, California and Washington, D.C. in particular are worth further investigation. The City should monitor results in these two cities, as these policies were each implemented fairly recently.
- That the City develop a retrofit program that simplifies the retrofit process (see Chapter 7 of this report).

By regularly assessing the real effects of policies and modifying them to make them more successful, we can learn from experience and more effectively use limited resources to make bicycling a safe, practical, and convenient transportation choice. While all laws benefit from this process, reevaluation and amendment are particularly important to bicycle friendly policy, since our knowledge about what works is still developing.

- Zimmerman and Kramer 2013

Figure 22: Without monitoring and enforcement, bike rooms can be used to store things other than bicycles

5.12 MONITORING AND ENFORCEMENT

Problem

The City of Vancouver currently does not have strong enough monitoring or enforcement programs for bicycle parking facilities. Conversations with internal and external bike experts turned up anecdotal reports of bike rooms being converted into storage and buildings supplying 90 per cent of their bike parking as vertical spots when only 30 per cent vertical is allowed. If there is no enforcement, these types of violations can severely limit the quality and quantity of bicycle parking.

Discussion

Having a monitoring program is crucial because it provides accountability, enabling planners, decision makers, and the public to assess the effectiveness of the bylaw (National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) 2012). The San Francisco Planning Department conducts monitoring every five years at key city-owned sites, surveying the amount, location, and usage of both short- and long-term bicycle parking (City and County of San Francisco 2013). A monitoring report is then created, and if current requirements are deemed inadequate, updated legislation is proposed (City and County of San Francisco 2013). This meets APBP standards, which also recommend that a review take place at least once every five years (Association of Pedestrian and Bicycle Professionals 2010). NPLAN's sample ordinance provides another good example of a monitoring provision.

Monitoring the amount and usage of bicycle parking spaces is one part of the equation, but it is also important to conduct technical inspections of the bicycle facilities themselves, including rack installation and room construction. This type of inspection is typically done prior to occupancy, and follow up inspections and maintenance should be conducted at regular intervals. This is difficult to accomplish, as inspections of bicycle parking facilities are quite detailed and time-consuming (Elco Gauw interview 2015). When inspectors are pressed for time due to an overload of jobs, minor details may be missed—often, these details can make the difference between a functional bike room and a cramped or insecure bike room (Elco Gauw interview 2015).

According to Elco Gauw (Urban Racks), one solution to this problem is to create a bicycle parking facility certification program. The City of Vancouver could hire a third party—HUB Cycling would be a logical choice—to conduct inspections throughout the city

and rate the bicycle parking facilities. These facilities would be rated as platinum, gold, silver, bronze, etc., similar to the Green Building Certification Institute's LEED certification program. If a building does not receive certification, this would trigger further inspections or consultations with the City, helping the building owners improve their bike parking facility.

Not only would a certification program ensure a high standard of quality across all bicycle facilities, it could also turn bicycle parking facilities into marketable commodities (Elco Gauw interview 2015). LEED is a an example of a certification program with huge marketing value—developers strive to meet LEED standards not only because they are environmentally friendly, but because these buildings have higher rental and occupancy rates and greater resale value (Institute for Building Efficiency 2011). With cycling mode share increasing, a building offering "gold-standard certified bicycle parking" could become a desirable selling feature, causing developers to give more consideration to providing quality bicycle parking.

Bicycle infrastructure is already seen as a desirable marketing commodity, although historically this has been more about bicycle networks rather than parking. In Surrey, British Columbia, the value of properties bordering a greenway increased by as much as 20 per cent, while in Apex, North Carolina, homes next to a greenway were quicker selling and cost $5,000 USD more than homes that were not adjacent to a greenway (British Columbia Recreation and Parks Association 2011). A City of Vancouver survey from back in 1999 found that 65 per cent of realtors would use bicycle routes as a selling feature of a home (City of Vancouver 1999).

More recently, developers have begun using bicycle parking to market properties; Vancouver developers have begun contacting HUB Cycling to find out how to create and promote top-class bicycle amenities (Timothy Welsh [HUB Cycling] interview 2015), while a new Portland developers are starting to create bicycle-focused communities (see "Hassalo on Eighth" case study in Section 5.4). Not every development can—or should—be marketed towards cyclists. The City should work to identify projects that, due to their location, expected demographic, and the motivations of the developer or building manager, would be strong candidates for bicycle facility promotion. The City should then work closely with project stakeholders to help them create exemplary facilities that can bring bicycle parking in Vancouver to the next level.

Organizations like the Vancouver Police Department (VPD) and insurance companies like The Co-operators would likely be strong supporters of a certification program, as high-quality bicycle parking facilities would result in a decrease in bicycle thefts. These organizations would also be useful allies in developing a stronger enforcement program. Currently, the vast majority of inspections are complaint-based, as resources are limited and bicycle parking is considered a low-priority issue. The City should clearly inform citizens that they can request inspections and should partner with VPD and insurance providers in order to provide increased service and support. The City should also ensure that the penalties for non-compliance with the bylaw are severe enough to encourage positive action.

Recommendations

- That the City implement a monitoring program that assesses the effectiveness of the City's bicycle parking regulations.
- That the City create a bicycle parking facility certification program.
- That the City put increased resources into the enforcement of the parking bylaw. The City should ensure that the penalties for non-compliance to the bylaw are severe enough to encourage positive action. The City should also ensure that all citizens are aware of their right to submit complaints and request inspections of their bicycle parking facilities.

6

BICYCLE PARKING

FACILITY MANUAL

SPOIL THE CYCLISTS:

Good design and high quality affect our behaviour. That goes for bicycle parking too!

- Bølling-Ladegaard and Celis 2008

While Section 5.9 described the rationale behind creating a bicycle parking facility manual, this chapter will describe its recommended content based on examples from other cities and organizations. There is a heavy focus on facility design—especially bicycle rack type and layout—as these aspects are more easily explained with images and diagrams than with a bylaw. There is also a section on management and maintenance that is geared towards facility users and managers, as well as suggestions for a summary checklist and supporting contact information.

While this report is focused on off-street, residential, Class A bicycle parking, it would be logical to create a manual that covers all aspects of bike parking. Therefore, this chapter takes a more comprehensive approach, describing a manual that would apply to all bicycle parking in Vancouver.

6.1 INTRODUCTION

Just like the bylaw, it is important that the bicycle parking facility manual begin with a brief introduction that provides context to the reader. This introduction should explain Vancouver's *GCAP* and *Transportation 2040* goals and describe to planners, developers, and building managers why bike parking is important (Arlington County Commuter Services 2014; Urban Bicycle Parking Systems Inc. 2014). A small list of key definitions would be useful here, as well as a high-level overview of bicycle parking best practices (Cambridge City Council 2010). The role of the facility manual should then be explained, clearly outlining the manual's relationship to the parking bylaw (San Francisco Planning Department 2013; City of Toronto 2008).

6.2 TYPE AND LOCATION OF PARKING FACILITIES

First, Class A bicycle parking should be explained, including a description of the various facility types—bike room, bike compound, attended facilities, and bike lockers. The Los Angeles Bikeable Design toolkit has a simple and effective summary for long-term bike parking (City of Los Angeles 2013a). For bike lockers, it would be helpful to include visuals, such as Figure 23 (Urban Bicycle Parking Systems Inc. 2014). This section should also discuss the facility's location within the building, recommending that bike parking facilities be at grade whenever possible and be kept away from dark, isolated areas. Arlington County's guide provides a pros and cons list for each facility type and location, which is an effective way to show the differences between them.

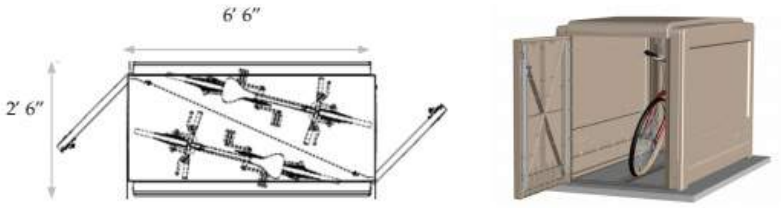


Figure 23: Bike lockers

Next, Class B parking should be explained and best practices for locating racks should be described—see page nine of the Urban Racks guidebook for a detailed example. Graphics such as Figures 24 and 25 can be used to show rack placement. Bike corrals are a special type of short-term bike parking that should be described here.

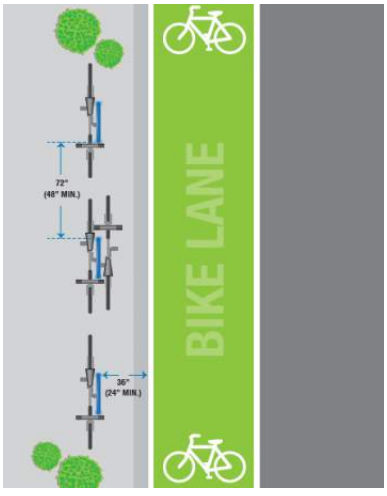


Figure 24: On-street rack placement

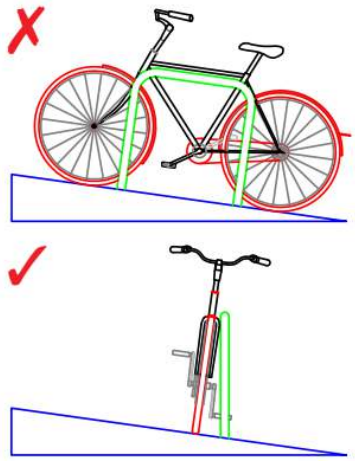


Figure 25: Rack placement on a slope

6.3 RACK DESIGN

6.3.1 General Design

A "one size fits all" approach to bicycle racks does not work, as bicycle parking contexts can vary significantly. Each site has a different set of users who ride a diverse range of bicycle types, be it electric, road, cargo, mountain, tricycle, and more. A baseline definition of "bicycle rack" is necessary in order to ensure a minimum standard of quality. For example, Cambridge, Massachusetts defines it as follows:

> *A Bicycle Rack shall mean a fixed-in-place stand, solidly anchored to the ground or other fixed object, which allows a bicycle to lean against it in an upright position with both wheels on a level surface. A bicycle shall make contact with the stand at two (2) points along the length of the bicycle and shall allow one or both wheels to be locked to the stand by way of a cable, chain, U-lock or shackle. Types of permissible Bicycle Racks include, but are not necessarily limited to, those commonly known as "Inverted U-shape," "Swerve" and "Post-and-Ring" racks. Stands commonly known as "Wave Racks" do not meet the standards for Bicycle Racks set forth herein.* (City of Cambridge 2015)

APBP (2010) has a similar list of bicycle rack criteria, adding that a rack should "[s]upport bicycles without a diamond shaped frame or a horizontal top tube (e.g. women's frames or step through frames)" and should be "constructed of durable materials with scratch- and vandal-proof finishes and few, if any, moving parts." The APBP guide goes on to explain that users should install "fixtures with moving parts requiring maintenance only if they improve security or user convenience," such as in the case of a two-tiered rack in a Class A facility (Association of Pedestrian and Bicycle Professionals 2010). Urban Racks adds three more best practice points: bike parking should be "secured with tamper proof bolts, optimized for ease of access and functionality, and it should look attractive and complement the surroundings," especially for short-term racks (Urban Bicycle Parking Systems Inc. 2014).

6.3.2 Good vs. Bad Racks

Many bike parking guidebooks and manuals include images and descriptions of both acceptable and unacceptable bicycle racks, allowing users to quickly identify the best racks. The Inverted U and Post and Ring racks are the recommended rack types, followed by a variety of other types that vary greatly in effectiveness (Association of Pedestrian and Bicycle Professionals 2010). Some cities, such as Cambridge, Massachusetts, ban certain types of racks outright, while others simply recommend one type over another. Either way, it is useful to describe the pros and cons of each rack type so that users can make an

Figure 26 (left): Inverted-U rack, a good type of rack

Figure 27 (middle): Wave racks are poorly designed, never reaching their advertised capacity

Figure 28 (right): Spiral racks, like wave racks, do not meet the standard rack requirements

informed choice (City of Thunder Bay 2012; Urban Bicycle Parking Systems Inc. 2014).

APBP (2010) describes each rack type in detail and divides them into three categories: "recommended," "acceptable," and "other racks," which fail to meet some of the critical design criteria but may be acceptable in limited situations. Appendix G of Alta Planning + Design's *Regional Bike Parking Study* (2013) contains an excellent description of rack types including images, design specifications, a cost range per bicycle, and information on materials and maintenance. The City of Portland maintains an online handbook of accepted rack types and dealers who sell these racks (Portland Bureau of Transportation 2015). This simplifies the task of selecting an appropriate rack while also encouraging manufacturers to produce high quality racks that will meet the city's standards.

6.3.3 Space-Efficient Racks

Space-efficient racks refer to vertical and double-decker (also known as stacker or two-tier) racks, which are intended for long-term bicycle parking. As the name implies, these racks can save valuable floor space, but they are often expensive, difficult to use, and they may not meet AAA standards. For example, wall-mounted vertical racks and some two-tier racks require the cyclists to lift their bicycles high in the air, which can be difficult for a large segment of society (children, the elderly, etc.). Currently in Vancouver, at least 50 per cent of a building's bike parking must be horizontal and a maximum of 30 per cent can be vertical—a useful rule that promotes the City's AAA objective (City of Vancouver 2014b). The height of a vertical rack is important to consider, because if it is placed too low, it can damage bicycles with fenders, baskets, and other accessories.

The City currently does not allow double-decker racks, but given the large demand for bike parking, the lack of available space, and the high price of land in Vancouver, this type of rack should be allowed. However, the city should be cautious and ensure that any double-decker racks are suitable for riders of all ages and abilities, as rack features vary amongst different manufacturers. The first issue is how high a user needs to lift their front wheel in order to place it in the rack tray (Elco Gauw interview 2015). In the Netherlands, the maximum lift distance is six inches, or about the height of a curb, which is based on the abilities of a 75-year-old rider (Elco Gauw interview 2015). San Francisco's municipal code states that a Class A space "shall not require manually lifting the entire bicycle more than three inches to be placed in the space" (City and County of San Francisco 2013). However, they allow exceptions for vertical and double-decker racks, stating that "[i]n no case shall a bicycle parking space require lifting the bicycle's both wheels more than 12" off the ground" (San Francisco Planning Department 2013).

Figure 29: Double-decker bike parking at a Skytrain station in Vancouver

The angle of the loading tray, as well as the distance a user is required to bend over to lift the tray, are also important considerations. Some brands require that the bicycle be placed in a vertical position, which means increased density at the cost of inconvenience, risk of injury, and/or damage to bicycles (Elco Gauw interview 2015). Additionally, the rack should allow a bicycle to be secured using the same standard logic as a fixed bicycle rack. Some designs provide a cable

that allows only the locking of the wheel or a portion of the frame, rather than being able to secure the frame and wheel with a u-lock (Elco Gauw interview 2015).

Finally, the amount of lift assistance (measured in lbs. or kg) provided by the mechanism is key. Some double-decker racks do not provide any, while others contain some type of pneumatic or mechanical assist for the top-mounted racks (Alta Planning + Design 2013). It can be difficult to determine which rack is best based solely on manufacturing specifications, so City staff should test the actual racks by hand before approving them for widespread use in Vancouver. Double-decker racks are already being used at the University of British Columbia and TransLink's secure bike parking facilities, as well as in cities like Portland, San Francisco, and Toronto, so there are many existing examples to look to.

6.4 BICYCLE DIMENSIONS

Urban Racks (Urban Bicycle Parking Systems Inc. 2014) suggests envisioning the bicycle "as a box that you need to move within the given space," and they provide the basic dimensions of a bicycle and rider (see Figure 30). Cambridge, U.K.'s *Cycle Parking Guide for New Residential Developments* (2010) includes a wonderful series of diagrams that detail the space required for a person with a bicycle to turn and maneuver, which is key when considering how someone moves in and out of a bicycle facility.

6.4.1 Non-Standard Bicycles

Bicycles come in a variety of shapes and sizes, and non-standard bicycles are becoming increasingly common as cycling grows in popularity. It is important to include images and dimensions of these bicycles so that designers can visualize the required rack type and facility layout (Figure 34). APBP emphasizes

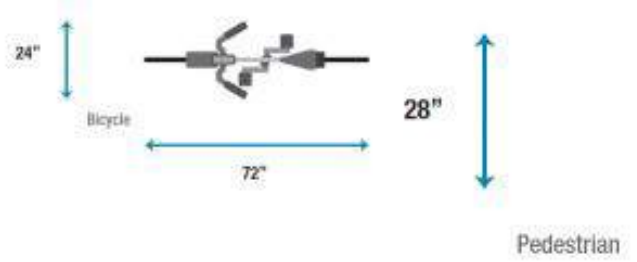
BICYCLE TYPE		DIMENSIONS (FEET) Length	Height	Width
Standard Bicycle		6	4	2
Child Bicycle		5	2-3	2
Tandem Bicycle		9	4	2
Cargo Bicycle		8	4	3
Bicycle+Trailer Bike		10	4	2
Bicycle + Child Trailer		10	4	3
Bicycle and Child Seat		6	5	2
Recumbent Bicycle		7	4	3

Figure 31: Types of non-standard bicycle

that "[m]odern bicycle parking fixture designs and site layouts should strive to accommodate other bicycle types such as recumbents, folding bicycles, adult tricycles, trail-a-bike child carriers, bicycle trailers, longtail cargo bikes, and any number of larger racks and baskets, which are more and more common on utility bicycles" (Association of Pedestrian and Bicycle Professionals 2010). In Copenhagen, 26 per cent of all families with two or more children have a cargo bike or bike trailer—a potential glimpse of Vancouver's future (City of Copenhagen 2014).

Cambridge, Massachusetts requires that "[w]here twenty (20) or more Bicycle Parking Spaces are required, at least five percent (5%) of the required spaces must provide an additional two feet (2') of space parallel to the length of the bicycle to accommodate tandem bicycles or bicycles with trailers" (Figure 32) (City of Cambridge 2015). Land use should

Figure 30: Basic dimensions of a bicycle and cyclist



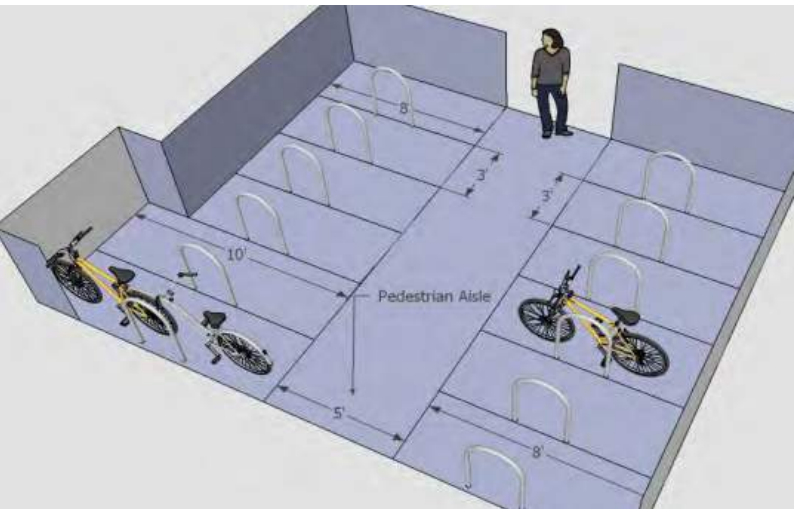


Figure 32: Bike parking facilities should provide spaces for non-standard bicycles

Figure 33: Electric bikes are growing rapidly in popularity

also be considered, as this is often connected to the number and type of non-standard bicycles that are expected to park there (e.g. cargo bikes at grocery stores, child trailers in residential areas, etc.) (Association of Pedestrian and Bicycle Professionals 2010). Alta Planning + Design suggests that in multi-family residential buildings and schools (including elementary, high school, and post-secondary), fifteen per cent of required long-term bike parking spaces be able to accommodate non-standard bicycles, while the requirement should be ten per cent in commercial and office buildings (Alta Planning + Design 2013). Parks and playgrounds should have at least two spaces for non-standard bicycles (Alta Planning + Design 2013). These spaces should always be clearly marked "with a sign, pavement marking, or other identifying feature" informing users that it is a priority spot for non-standard vehicles (Alta Planning + Design 2013).

Electric bicycles (Figure 33) are a type of non-standard bicycle that garners particular attention due to their rapid increase in popularity; this "quiet revolution" is especially evident in the Netherlands, where "one in five new bicycles sold is electric, with 80% of them bought by people over the age of 50" (Bruntlett and Bruntlett 2015). Electric bicycles have the potential to greatly increase ridership in Vancouver and beyond—their "undeniable, unparalleled ability to close both the gender and age gaps, flatten hills, and remove sweat from the equation are seemingly too good to be true, addressing many of the barriers to the mass uptake of cycling as a form of urban transportation" (Bruntlett and Bruntlett 2015).

The current Vancouver parking bylaw states that "[e]ach two Class A spaces must have an electrical outlet" (City of Vancouver 2014b). While electric bicycles can be longer than standard bicycles, it is important to ensure that these outlets are not all clustered in the spots that are already reserved for larger non-standard bicycles, as this would create further competition for these specialized spaces (Urban Bicycle Parking Systems Inc. 2014). Electric bicycle usage should also be monitored in the coming years in order to determine if the current required percentage of outlets is sufficient.

6.5 LAYOUT

In order to create a functional bike parking facility, it is important to consider not only the dimensions of a bicycle but also "the space required by a bike and rider to maneuver around to access the rack, to lock up, and to unload gear" (Urban Bicycle Parking Systems Inc. 2014). Urban Racks reminds designers to "not just provide a theoretical number of spaces but also create high quality, functional, safe, and secure facilities" (Urban Bicycle Parking Systems Inc. 2014). Each bike parking facility will have a unique layout, but there are minimum aisle widths that must be met. The most effective way of describing these minimums is to use diagrams, such as in Figures 34 and 35.

The Cambridge (U.K.) bike parking guide contains a useful section on "consecutive doors and corridors,"

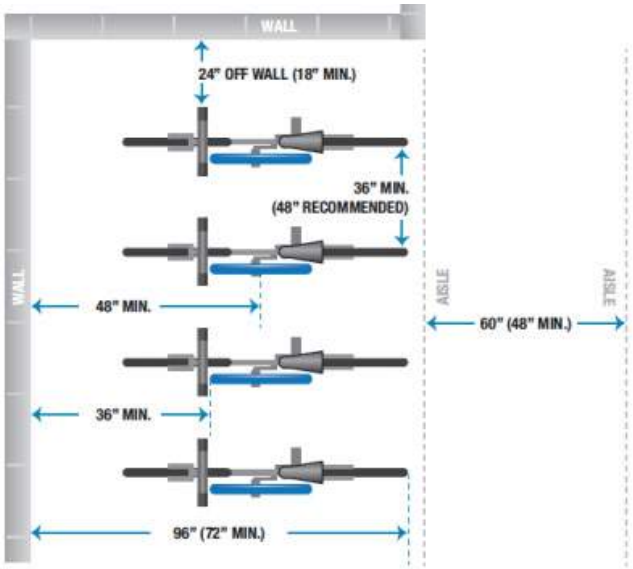


Figure 34: Urban Racks layout example

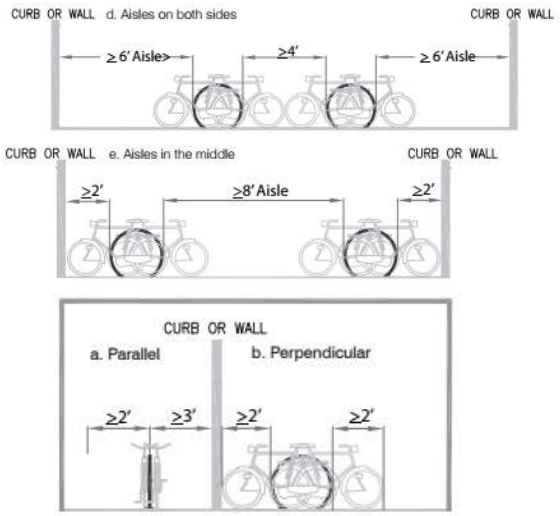


Figure 35: San Francisco layout example

which addresses a common access problem in bike parking facilities (Cambridge City Council 2010). Entering and exiting through doors is challenging for cyclists, so consecutive doors should be avoided and automatic doors should be installed whenever possible (Cambridge City Council 2010).

Providing examples of retrofit layouts would be a useful addition to the bicycle parking facility manual, as this could encourage building mangers to take advantage of underutilized space. San Francisco's bike parking design bulletin references the retrofit section of the municipal code, describes in detail how to convert a vehicle parking spot into a bike parking spot, and provides a diagram with measurements (see Figure 20) (San Francisco Planning Department 2013).

6.6 MATERIALS AND INSTALLATION

The materials used in the construction of a bicycle facility are key determinants of its security, appearance, cost, and required maintenance. The bicycle parking facility manual should explain the pros and cons of each material, as the differences between them may not be readily apparent to those outside the bike parking industry (City of Thunder Bay 2012). This can lead to poor choices based on appearance or price when functional aspects like security and longevity should be the primary considerations.

Section F.2 of Alta Planning + Design's *Regional Bike Parking Study* (2013) does an excellent job of describing the components of a bicycle rack, including base material, rack coating, and shape. Bicycle locker construction is another important consideration, as the choice of material can make a large difference in performance and safety. APBP (2010) provides a detailed comparison of each type of bike locker. Additionally, the guidelines from Thunder Bay, APBP, and Urban Racks all contain detailed information on bike parking materials and installation procedures (Association of Pedestrian and Bicycle Professionals 2010; City of Thunder Bay 2012; Urban Bicycle Parking Systems Inc. 2014).

Once the materials have been described, the manual should explain installation procedures. Racks can be installed on a variety of surfaces, each requiring different techniques and providing a different level of security (City of Thunder Bay 2012). Using tamper-resistant hardware or permanently embedding the rack into concrete can improve rack security (Alta Plan-

A good bike rack installed poorly will compromise user comfort, bicycle security, and/or rack capacity. Well-installed racks, however, can serve their function for many years.

– Alta Planning + Design

ning + Design 2013). Some bike parking guides contain engineering standards that show the installation procedure for bike racks (City of Thunder Bay 2012; Alta Planning + Design 2013; Association of Pedestrian and Bicycle Professionals 2010).

The bike parking facility manual should also define expanded metal mesh, which is the required material for a bike cage. Expanded metal is made from a solid sheet of metal, as opposed to being woven or welded like chain link (Niles Fence and Security Products LLC. 2015). As a result, it can never unravel and offers increased strength. It comes in a variety of metal types and sizes, however, so the City should be more specific than saying "expanded metal mesh." Niles Fence & Security Products explains how to choose expanded metal mesh:

- When choosing expanded metal for your fence application, you will need to determine which style or diamond size is best for your application. Expanded metal designations are indicated by SWD (the measurement on the short way of diamond), while the second number may specify the gauge of metal, the weight per hundred sq. foot, or have some other significance.
- Another consideration when ordering expanded metal mesh panels is the actual metal strand width and metal strand thickness. These are important because they contribute the actual opening size of the diamond and the % open area or visibility through the fence (see Figure 36).
- In addition to the SWD or short way diamond, there is also a measurement known as the LWD (long way of diamond). Expanded metal mesh panels can be hung in either standard or reversed diamond orientation. SECUREX recommends a reversed diamond orientation (Figure 36).
- For fencing purposes, expanded metal is ordered SWD x LWD. Ordered correctly, a 4' x 8' piece of mesh would look like the reversed diamond orientation piece" in Figure 36 (Niles Fence and Security Products LLC. 2015).
- Urban Racks recommends using "expanded steel mesh ¾ #9" (Urban Bicycle Parking Systems Inc. 2014).

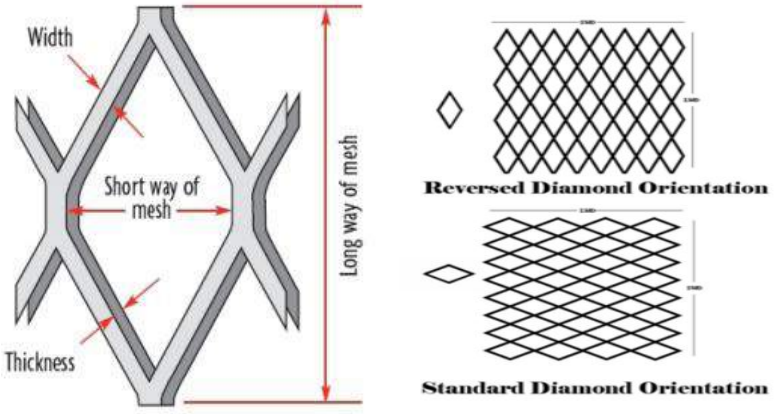


Figure 36: Explanation of expanded metal mesh

6.7 AMENITIES

Amenities such as showers, personal lockers, bike repair stands, and bike pumps "go beyond the basic requirements of a bike room to provide a high quality bicycle parking facility" (City of Toronto 2008). The bike parking facility manual should briefly describe the benefits of these amenities and encourage developers and building managers to consider adding them to their facilities.

Permanent, standalone repair stands with attached tools can range in price from about $700 to $1,500 each, while pumps can range from $200 to $750 (see Figure 19) (Elco Gauw interview 2015). Alternatively, if there is a high enough level of trust and security in a building, an inexpensive workbench, toolkit, and pump could be purchased or donated to the bike room. It is recommended that lockers are full sized because that allows clothing to dry more quickly, which is especially important in a wet city like Vancouver.

There are a number of other amenities that can add an additional level of service and charm to a bicycle parking facility. The VGH Cycle Center contains a "member of the month" board, a lounge with foosball and yoga mats, a comments and suggestions box, a clock, maps, bus timetables, towel service, and even a box of Kleenex for when riders arrive on a wet, chilly day. They also have a lock bar, a simple bar on the wall where users can keep bicycle locks. This cuts down on the clutter caused by cyclists leaving locks on racks (see Figure 37). These amenities would not

Figure 37: Locks left on racks

be necessary or appropriate in all contexts, but they can be a great way to show cyclists that they are a welcomed part of the community.

6.8 SIGNAGE

Wayfinding is another important aspect of bicycle parking, particularly when it comes to public long-term facilities. The City of Los Angeles (2013a) recommends the following:

- Place clear, simple signs at primary building entrances directing users to long-term bicycle parking.
- Place clear, simple signs at the location of long-term bicycle parking directing users to the primary pedestrian entrance of building.
- Communicate the existence and direction of bicycle parking with signage that is visible from a traveling bicycle.
- Place clear, simple signs at long-term bicycle parking areas to direct users to shower and clothing locker facilities.

In order to standardize bike parking signage, San Francisco's design bulletin provides a link to the city's official bike parking sign templates, along with detailed instructions for how to use it (San Francisco Planning Department 2013).

6.9 MANAGEMENT AND MAINTENANCE

This section is meant to provide advice to building managers, as many of them could be unfamiliar with these types of facilities. The manual should encourage building management to introduce routines for cleaning, damage inspection, and the removal of abandoned bicycles (as discussed in Section 5.8). It is important to provide some form of training resource—whether it be detailed instructions or a link to a third party such as HUB Cycling—that explains how to conduct a proper bike parking safety inspection. Toronto's *Guidelines for the Design and Management of Bicycle Parking Facilities* contain detailed management strategies for both short- and long-term bicycle parking and serve as the ideal example for the City of Vancouver (City of Toronto 2008).

6.10 SUMMARY CHECKLIST

The Los Angeles *Bikeable Design* toolkit includes a section on "Key Design Strategies," which is essentially a summary checklist of important things to remember when planning bike parking facilities (City of Los Angeles 2013a). The summary can be used a reference guide for planners and developers throughout the planning process.

6.11 SUPPORT AND RESOURCES

The final portion of the bike parking facility manual should include contact information for the appropriate department or City staff person that manages bicycle parking. A generic e-mail address such as "bike.parking@vancouver.ca" would be more flexible than using an individual staff person's name, as staff may change positions or go away on holidays. This section could also include links to further support options, such as HUB Cycling's Traction Toolkit (HUB Cycling 2015).

6.12 RECOMMENDED EXAMPLES

The following are strong examples of guidelines, toolkits, and manuals from a variety of cities and organizations:

Bicycle Parking Guidelines, 2nd edition
Association of Pedestrian and Bicycle Professionals
http://www.apbp.org/?page=publications

Urban Racks Bicycle Parking Guidelines
Urban Bicycle Parking Systems Inc.
http://www.urbanracks.com/design.html

Regional Bike Parking Study
Alta Planning + Design
https://www.ltd.org/file_viewer.php?id=489

Zoning Administrator Bulletin No. 9: Bicycle Parking Requirements: Design and Layout
San Francisco Planning Department
http://www.sf-planning.org/ftp/files/publications_reports/bicycle_parking_reqs/ExhibitC_ZAB.pdf

Bikeable Design: a toolkit for bike-friendly design
City of Los Angeles
http://urbandesignla.com/resources/docs/BikeableDesignToolkit/lo/BikeableDesignToolkit.pdf

City of Cambridge Bicycle Parking Guide
City of Cambridge
https://www.cambridgema.gov/~/media/Files/CDD/Transportation/Bike/Bicycle_Parking_Guide_20130926.pdf

Cycle Parking Guide For New Residential Developments
Cambridge City Council
https://www.cambridge.gov.uk/sites/default/files/docs/CycleParkingGuide_std.pdf

Guidelines for the Design and Management of Bicycle Parking Facilities
City of Toronto
http://www1.toronto.ca/city_of_toronto/city_planning/transportation_planning/files/pdf/bicycle_parking_guidelines_final_may08.pdf

Bicycle Parking Manual
Dutch Cyclist Federation
http://www.ecf.com/wp-content/uploads/2011/11/Bicycle-Parking-Manual-DCF.pdf

Thunder Bay Bicycle Parking Guidelines
City of Thunder Bay
http://www.thunderbay.ca/Assets/Living/Active+Transportation/docs/Thunder+Bay+Bicycle+Parking+Guidelines.pdf

Arlington County Guide to Effective Bicycle Parking
Arlington County Commuter Services
http://www.commuterpage.com/tasks/sites/cp/assets/file/arlington_bicycle_parking.pdf

Figure 38: Walking and cycling in Vancouver

7

RETROFIT PROGRAM

7.1 CURRENT PROCESS

While updating bicycle parking regulations for new developments is important, the only way to improve the situation for the vast majority of Vancouverites is to develop a strong retrofit program. Currently, the retrofit process is complex and daunting for building managers and strata councils, who often do not have the necessary resources or motivation to follow through with a retrofit. As a result, those retrofits that do occur are sometimes completed without a permit, resulting in safety and liability concerns. Case study 7.1.1 describes a recent retrofit, showcasing the amount of time and effort that is involved in this process.

7.2 PROPOSED RETROFIT PROCESS

In order to simplify this process and make it more accessible, the City of Vancouver needs to create a Bicycle Parking Retrofit Program. The retrofit program would consist of a website that could be linked to the Cycling in Vancouver homepage and based on of New York City's Bikes In Buildings program website. The website would include the following elements:

7.2.1 Program Overview

This section would begin by explaining the importance of bicycle parking and discussing Vancouver's goal of providing safe, comfortable, and convenient bicycle parking for people of all ages and abilities. Next, there would be a summary of the bicycle parking requirements and retrofit policies in the parking bylaw, including a link to the full bylaw text. This would clearly explain what can and cannot be done in a retrofit situation, clearing up any initial confusion and apprehension. Finally, there would be a step-by-step overview of the retrofit process, explaining the role of residents, strata councils/building managers, and City of Vancouver staff.

7.2.2 Residents

Residents would first be instructed to read the relevant sections of the parking bylaw as well as the Bicycle Parking Facility Manual in order to familiarize themselves with the regulations and determine whether or not their building contains adequate bicycle parking. They would then be encouraged to form a small bicycle parking committee in order to assess the situation in their building. The website could provide poster templates for residents to print out and put up in their building, raising awareness about the retrofit process and the committee. An initial Bicycle Parking Inventory would then need to be carried out using a template provided on the retrofit program website—this would include a description of the location of each parking area, the number of short- and long-term spaces, the number of bicycles parked in those spaces, and notes about the condition of the parking facility.

Next, there would be a standardized Bicycle Parking Survey template available for download or online distribution, based on of the survey created by the [name removed for privacy] Bike Committee (see Figure 39). Creating a survey template would save individual residents or committees from having to create a survey from scratch each time a retrofit is required. In addition to the sample questions in Figure 39, the survey should also ask about motor vehicle ownership and whether or not the resident owns and uses a parking spot in the building. This would reveal whether or not there are unused vehicle parking spaces that could be converted into bicycle parking.

The survey would be entered online and a basic summary report would automatically be generated, showing the building's bicycle parking statistics. The report would contain an editable section that asks the resident or committee to indicate the desired amount, type, and location of new bicycle parking. This section would be for feedback purposes only, as ultimately, the building manager, strata council, or planner would have the final say on facility design. Once the report has been completed, it would be sent to the strata council or building manager for review. Having a standard survey and summary report that is supported by the City of Vancouver would add credibility to the report and make it easy for planning staff to examine the results.

7.1.1 Gastown Case Study

This case study involves a ten-storey strata building on the fringe of Gastown and the Downtown Eastside, with retail at grade and 108 residential units above (BC Condos 2015). The building is "a prototype for providing achievable home ownership in Vancouver," with 12 non-market units and 96 affordable market homes (Westbank Projects Corp. 2015). The building was a collaboration between Henriquez Partners Architects, Westbank, the Portland Hotel Society, Habitat for Humanity, and Vancity Credit Union, and it was "[b]ased on principles of inclusivity and doing more with less" (Westbank Projects Corp. 2015).

One of Westbank's affordability strategies was to offer limited motor vehicle parking, with only 18 spots constructed for all 108 units (Westbank Projects Corp. 2015). Unfortunately, the developer did not choose to construct additional bicycle parking to compensate for this loss of vehicle parking. Instead, the building only contains the minimum amount of required bicycle parking, and a significant portion of the Class A spots are located in individual storage lockers that must be purchased separately by residents, meaning that not all units have access to a locker (Bike Committee interview 2015). Furthermore, the racks within these storage lockers consist of hooks in the ceiling that are virtually unusable due to their placement within the locker (Bike Committee interview 2015).

The building has a strata bylaw preventing residents from taking bicycles into elevators, which is problematic for a number of reasons (Bike Committee interview 2015). The secure bike parking room is located one floor below grade and is only accessible by stairs or elevator—there is no vehicle parking in the basement, only storage lockers, therefore there is no access ramp. Additionally, all available (and usable) bicycle parking in the building quickly filled up when the mostly car-free residents moved in, meaning that residents were either forced to carry their bicycles up multiple flights of stairs or park them on the street.

The building has been broken into over a dozen times since opening, losses including stolen bicycles and parts, further aggravating the bike parking situation (Bike Committee interview 2015). Finally, a group of frustrated residents formed the "[name removed for privacy] Bike Committee" in order to address these concerns. They began by contacting the City of Vancouver, looking for information about bicycle parking retrofits. The City was helpful, but there was not much information to provide. The committee also attempted to reach out to other building managers and strata councils that may have had a similar experience, but this effort proved unsuccessful.

The committee also put in a Freedom of Information request to obtain the detailed development plans and negotiations regarding the building, as they wanted to find out the reason for the lack of bike parking. This led to the committee hiring Urban Racks to perform a walk-through assessment, who determined that (a) no additional capacity was available in their Class A storage room, (b) the hooks in the storage lockers were incompatible with the locker design, and (c) horizontal racks in the parking garage could be replaced by vertical racks in order to increase capacity (Bike Committee interview 2015).

Finally, the committee created a survey and distributed it to all residents of the building (Figure 39). The survey asked residents how many and what type of bicycles they own, where they store their bicycles, where they would *prefer* to store them, and how satisfied they were with the current bicycle parking situation (Bike Committee interview 2015). The committee then prepared a summary report, which was presented to strata council. There were a number of important findings in the report:

- There were 62 bicycles parked in only 40 spaces.
- Overcrowding resulted in bicycles being parked in suites and hallways, on balconies, unsecured

against walls, and locked to railings.
- There was a shortage of visitor parking because residents used it.
- The lack of parking discouraged two residents from purchasing bicycles, while two others reported selling their bicycles because of it.
- Overall satisfaction with the bike parking was rated at 4.2/10.

Upon receiving this report, the strata council agreed to put funds towards adding bicycle parking. They have since followed through with Urban Rack's recommendation to convert some horizontal spots to vertical spots, which resulted in a limited number of additional spaces. The action with the largest impact, however, was when the strata council agreed to relax (not eliminate) their bylaw that banned bicycles from elevators—more people are now able to access their units with a bicycle. The strata council is also considering implementing a registration program and charging a yearly fee for access to one of the bicycle parking areas, converting it into a bike commuter room.

The Bike Committee's experience demonstrates the arduous process required to initiate a bicycle parking retrofit in Vancouver. It is fortunate that the building had a dedicated group of residents who were able to commit a significant amount of time and effort to this cause, as this is not the case in every building. This case study did not even discuss the process of acquiring a building permit, which includes the presentation of a detailed bike parking plan that explains impacts on storage, vehicle parking, and safety elements such as fire suppression, smoke separation, and sprinkler location (City of Vancouver Building Services interview 2015).

Figure 39: Bike Parking Survey

Bike Committee - BIKE SURVEY

Please place completed surveys in envelopes by elevators on each floor by FRIDAY NOVEMBER 23.

Members of the Bike Committee would like your help in gathering data to improve bike storage in our building. Your accurate responses are important to help us come up with the best solutions possible. This survey is for ALL residents - renters and owners.

We are presenting our proposal to Strata Council mid-December 2012 and subsequently submitting a proposition to the developer, Westbank, to overcome the current bike storage deficiencies.

Please submit one survey per unit - include all residents and bikes in the unit.

General Questions:

This section is for data purposes only - you won't be personally identified in relation to your responses.

1. What floor do you live on? (2-11) _____

2. Do you have a storage locker? ☐ yes ☐ no

3. In total, how many bikes do you store in the building? _____

4. Where do your visitors currently park their bikes when they pop over? *Check as many as apply:*
   - ☐ balcony ☐ in suite
   - ☐ bike room ☐ storage locker-on hook
   - ☐ parking garage ☐ storage locker-on floor
   - ☐ outside of building (e.g. Woodward's, parking meter)

5. How satisfied are you with the current state of bike parking in this building? *Circle one.*

Not satisfied 0 1 2 3 4 5 6 7 8 9 10 *Very satisfied*

Please answer the following questions for each of the bikes you counted in question #3.

6) Bicycle #1:

A) What kind of bike is it? *Check one.*
- ☐ Adult/youth (non-motorized)
- ☐ Child's trike/bike (no lock required)
- ☐ Electric bike
- ☐ Trailer for bike
- ☐ Other (please specify)_____

B) How often do you use this bike?
Check one, and circle frequency if applicable.
- ☐ Every day
- ☐ Weekly 1 2 3 4 5 6 times per week
- ☐ Monthly 1 2 3 4 5 6 times per month
- ☐ Yearly 1 2 3 4 5 6 times per year
- ☐ Spring/summer only

C) Where do you usually store this bike? *Check up to three:*
- ☐ balcony ☐ in suite
- ☐ bike room ☐ storage locker, on hook
- ☐ parking garage ☐ storage locker, on floor

D) Where is your preferred storage space for this bike? *Check one:*
- ☐ balcony ☐ in suite
- ☐ bike room ☐ storage locker, on hook
- ☐ parking garage ☐ storage locker, on floor

more questions on the other side! -->

7.2.3 Strata Councils and Building Managers

Upon receipt of the survey responses and summary results, the strata council or building management would need to prepare a *Bicycle Parking Retrofit Plan*. The retrofit program website would contain practical examples of successful retrofits and would provide a rough cost estimate of standard retrofit solutions, such as the conversion of two parking spots into a bicycle cage. The website should provide a link to the Bicycle Parking Facility Manual, which describes best practice design standards. There should also be money-saving ideas—ideally, this would include activating some of the retrofit incentives recommended in Chapter 5. The City of Vancouver could reduce costs by vetting and suggesting potential consultants and manufacturers, similar to the City of Portland (Portland Bureau of Transportation 2015).

The website would then walk the user through the creation of a *Bicycle Parking Retrofit Plan* step-by-step, using a fillable form with places to attach site images and diagrams. The plan would include a basic building description with demographics, as well as a site plan with the proposed location of the bike parking. Ideally, a time limit would be placed on the completion of this form (i.e. within 60 days of receipt of the survey report) in order to keep the process moving. Once the form is complete, it would be submitted online to the City for review.

Alternatively, if the strata council or building management felt that constructing additional bicycle parking was unnecessary or unsafe in some regard, they could fill out an *Exemption Request Form*. This form would be designed similarly to the *Bicycle Parking Retrofit Plan* and would be submitted online for review by City planning staff.

7.2.4 The City's Role

All *Bicycle Parking Survey* results, *Bicycle Parking Retrofit Plans*, and *Exemption Request Forms* would be sent to the appropriate City department, where they would be verified for accuracy using the original building permit and architectural documentation. City staff would review the plan for feasibility and compliance with the bylaw, and if necessary, conduct a site visit. Ideally, this process would become standardized, allowing applications to be processed quickly and efficiently.

7.2.5 Useful Links

Finally, the retrofit program website should contain a series of useful links, including the following:

- Retrofit Fact Sheet (1-2 page overview of the program)
- Parking Bylaw
- Bicycle Parking Facility Manual
- Examples of successful retrofits
- Contact Information
    - This would include the appropriate City of Vancouver departments as well as external manufacturers or partners such as HUB Cycling, who could assist with this retrofit process.

Figure 40: Vancouver has retrofitted many roadways to make them more bike-friendly. The next step is to oversee the retrofit of bike parking in buildings.

8

CONCLUSION

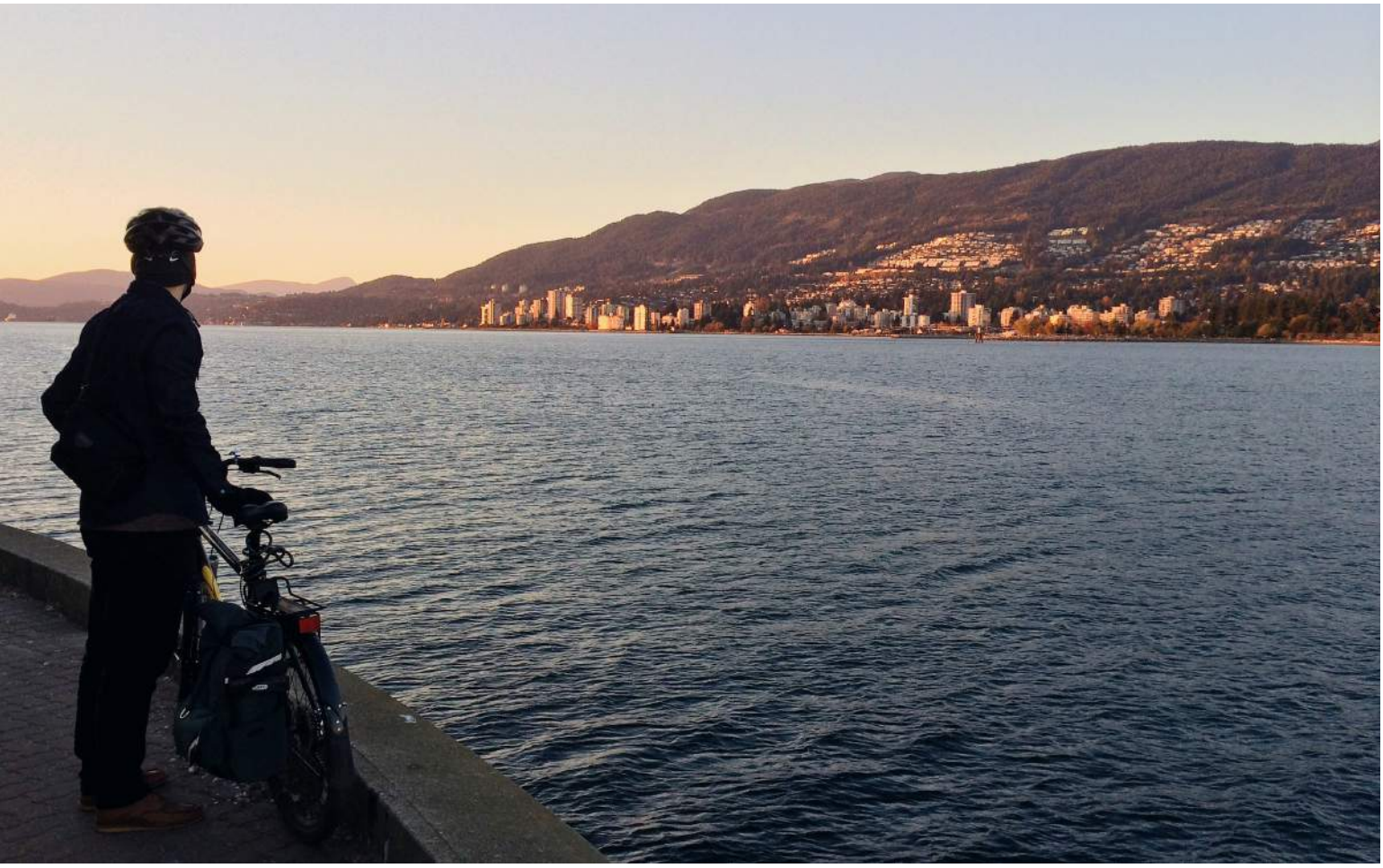


Figure 41: Overlooking West Vancouver

The lack of secure, comfortable, and convenient bicycle parking for people of all ages and abilities is one of the few things preventing Vancouver from becoming a true leader in active transportation. The potential is there, but as the frustrating stories from Chapter 4 indicate, significant improvement is needed in order for Vancouver to achieve its goal of becoming the greenest city in the world.

Adam Kebede, a planning consultant from Spoken, explains that three key factors will shape the future of cycling in Vancouver: gender, technology, and generation (Adam Kebede [Spoken] interview 2015). Women are leading the way in mode share growth, but most bicycle parking facilities have been built with the MAMIL—"Middle-Aged Man In Lycra"—in mind.

At present, many facilities are deficient due to their location and design; they are located in dark, isolated areas, they require cyclists to ride up steep ramps or carry bicycles up staircases, and they contain racks that require significant excursion to lift bicycles into place. These are not the design features that convey safety, security, and ease. As part of the AAA focus, careful consideration must be given to the needs of riders who are uncomfortable in isolated areas and who have less upper body strength.

Technology refers to the vast range of bicycle types that are rapidly revolutionizing the bicycle market. Electric bicycles can increase the range, flexibility, and comfort of a ride, while an increasing number of families are replacing Sports Utility Vehicles with cargo bikes and bike trailers. Bike parking facilities need to ensure that these bicycle types can be stored safely and conveniently, thus encouraging their use.

Finally, a new generation of Vancouverites is spurring a change in perceptions about cycling. Travelling by bicycle is becoming increasingly normalized—cycling is no longer a fringe sport for those willing to risk the roads, but is instead commonplace amongst a variety

of people. The City needs to encourage this trend to continue by implementing bold and progressive regulations.

Updating the parking bylaw to improve the City's bicycle parking regulations is the first step towards improving bike parking in Vancouver. Appendix A summarizes the recommendations made in this report, highlighting some key actions that the City should consider. Creating a Bicycle Parking Facility Manual would bring Vancouver up to par with cities like San Francisco, Toronto, and Los Angeles while helping planners and developers create high-caliber facilities. This would ensure that parking facilities are built correctly in the first place, reducing the need for costly and complicated retrofits. Where retrofits do need to occur, the City should encourage and assist them by creating an easy to use Retrofit Program as described in Chapter 7.

The key to improving bicycle parking in Vancouver is to follow the lead of successful cycling nations such as Denmark, Germany, and the Netherlands by implementing a set of multi-faceted, mutually reinforcing policies and regulations (Pucher and Buehler 2008). These countries implement a variety of pro-bicycle measures, but they also "greatly reinforce their overall impact with highly restrictive policies that make car use less convenient as well as more expensive" (Pucher and Buehler 2008). Pucher and Buehler (2008) explain that "[i]t is precisely that double-barrelled combination of 'carrot' and 'stick' policies that make cycling so irresistible."

While the city of Vancouver does not want to eliminate motor vehicles from its roads, decreasing the number and length of trips, as well as car ownership, would go a long way towards creating a greener—and more bike-friendly—city. Measures like this are necessary in order to see the full benefit of any bicycle parking regulations. City staff must find the right combination of incentives, restrictions, suggestions, and punishments that will enable the creation of AAA bicycle infrastructure and push Vancouver towards a greener future.

Figure 42: Stanley Park

9

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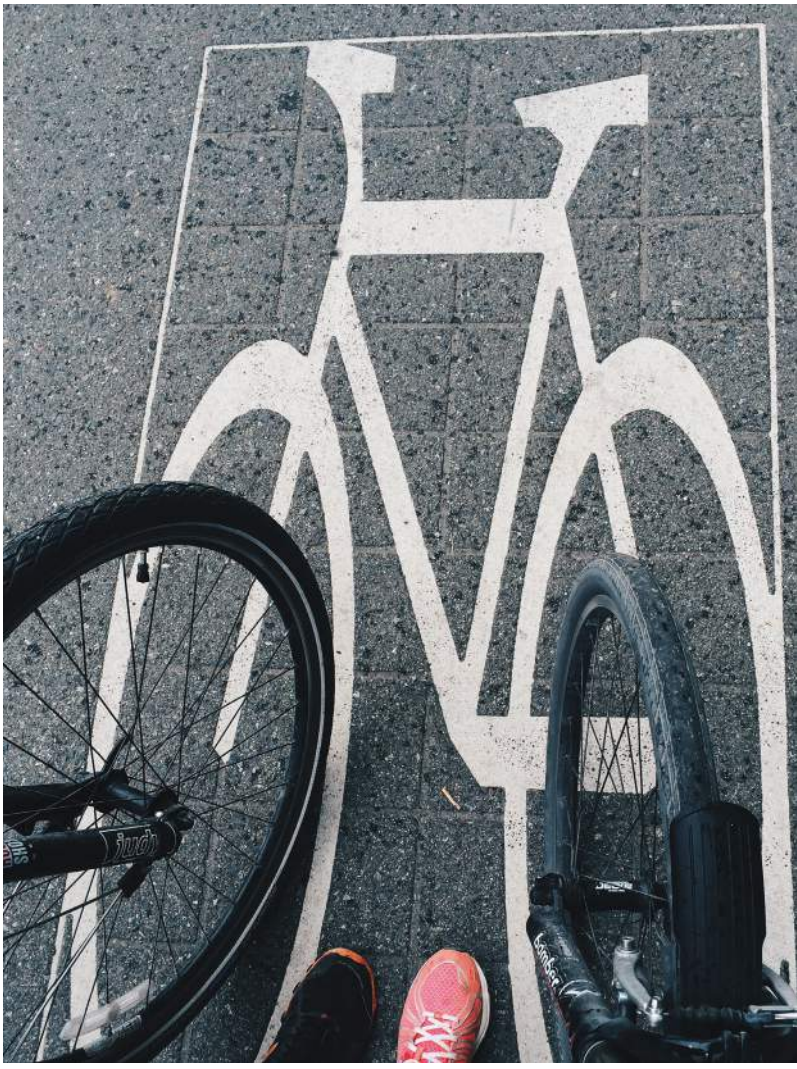
Figure 43: Rubber on the road



APPENDIX A

SUMMARY OF RECOMMENDATIONS

SECTION	RECOMMENDATION
5.2	That the bylaw begin with a statement of purpose or intent that would provide context for the regulations that follow.
5.3	That the bylaw provide definitions for the terms described in Section 5.3 of this report.
	That the bylaw be reorganized to increase its clarity and effectiveness.
5.4	That the minimum number of required off-street bicycle spaces for multiple dwelling units be increased from 1.25 to 2. Consideration should also be given to increasing this ratio for units with three or more bedrooms.
5.5	That the City of Vancouver encourage or require every unit in all new developments to contain at least one interior closet or storage area that is large enough to store a standard adult bicycle. The City should also ensure that hallways and doorways are wide enough to allow the passage of a bicycle without damaging walls.
	That the City of Vancouver create a law that requires building owners and managers to allow bicycles in residential buildings. This legislation could be modeled off of New York's and San Francisco's recently established laws.
5.6	That the bylaw outline a hierarchy of bicycle parking locations, with best practice, at-grade facilities as the preferred option and parking garages as the least desirable option.
	That the bylaw require that bicycle parking be located in a "safe, comfortable, and convenient location." This should include a statement requiring that bicycle parking be at least as conveniently located as the most convenient nondisabled motor vehicle parking space.
	That the bylaw set a maximum access ramp inclination of five per cent.
	That the bylaw refer to a separate bicycle parking facility manual that specifies finer details, such as minimum elevator size, minimum access hallway widths, access door standards, and other best practices (see Chapter 6).
5.7	That the City create an educational brochure for cyclists explaining best practices for protecting a bicycle from theft. These brochures should be placed in each bicycle parking facility in the city.
	That the City require strata councils/building managers to create a bicycle parking orientation manual and distribute this manual to all new and existing residents. The manual should provide provide a map showing the location of bike parking spaces and amenities, the anti-theft information mentioned above, and any facility regulations. The City should create an orientation manual template to simply this process.
	That the City of Vancouver provide a detailed explanation of expanded metal mesh. This should be accompanied by images and specifications in a separate bicycle parking facility manual (see Chapter 6).
	That the bylaw require self-closing and -locking doors for all bicycle rooms and compounds.
	That Item 6.3.5 and Item 6.3.16—the provisions specifying a maximum bicycle parking facility size of 40 Class A spaces—be stricken from the bylaw.
	That increased consideration be given to the needs of female cyclists. This could include an education campaign for planners and developers as well as requiring increased safety measures such as convex mirrors and panic buttons in bicycle parking facilities. Facilities should be located within sight of security personnel or an entrance, and when this not possible, security cameras should be installed.

SECTION	RECOMMENDATION
5.8	That the City create a regular bicycle parking maintenance and inspection strategy for all City-owned properties, and that it encourage building managers to adopt this (or a similar) strategy. This strategy should include an educational component that ensures that bicycle parking facilities remain functional and secure.
	That the City encourage building managers to adopt an abandoned bicycle cleanup policy.
	That the City further examine the concept of premium bicycle parking and consider other means of prioritizing commuter access to bicycle parking without impacting less frequent riders.
5.9	That the City create and adopt a Bicycle Parking Facility Manual based on those currently used in San Francisco, Cambridge, Toronto, and many other cities. The manual should be mandatory in nature (rather than guidelines) and should be clearly linked to the parking bylaw, but it could contain sections that are suggestions or guidelines. It should be written in an accessible and visually appealing manner with many images and diagrams. Suggested content for this manual is described in Chapter 6 of this report.
5.10	That the bylaw include a suite of incentives for developers to provide improved bicycle parking. Improved bicycle parking could include exceeding the minimum number of required bicycle parking spaces, putting the bicycle parking in a desirable location (such as at grade), providing amenities (such as pumps and bike repair stations), and other ideas. Incentives could include automobile parking reductions, density bonuses, and expedited permitting.
5.11	That the bylaw contain a section called “Applicability” that explains when the requirements in the bylaw are triggered.
	That the bylaw contain a section dedicated to the retrofit of existing buildings. This section should include a suite of policies that enable a building to undergo a successful bicycle parking retrofit.
	That the City of Vancouver closely examine the retrofit policies from other cities that were mentioned in this report and consider adopting a combination of these policies. The policies of Los Angeles, California and Washington, D.C. in particular are worth further investigation. The City should monitor results in these two cities, as these policies were each implemented fairly recently.
	That the City develop a retrofit program that simplifies the retrofit process (see Chapter 7 of this report).
5.12	That the City implement a monitoring program that assesses the effectiveness of the City’s bicycle parking regulations.
	That the City create a bicycle parking facility certification program.
	That the City put increased resources into the enforcement of the parking bylaw. The City should ensure that the penalties for non-compliance to the bylaw are severe enough to encourage positive action. The City should also ensure that all citizens are aware of their right to submit complaints and request inspections of their bicycle parking facilities.

APPENDIX B

BIKE PARKING STORY

SURVEY AND RESULTS

Residential Bike Parking in Vancouver

The City of Vancouver is conducting research in order to update the bike parking requirements for both new developments and the retrofit of existing buildings, with the goal of making cycling (and bicycle parking in particular) comfortable, safe, and convenient for people of all ages and abilities. This research is focused on off-street, residential bike parking (i.e. long-term, secure parking, like a bike room or bike locker). This includes anyone living in a multifamily building (ex. apartment, condo, co-op, etc.). Homes with private garages typically do not experience the same bike parking problems.

In order to convey the importance of this issue to the city, I want to use storytelling and showcase a few examples of real people in Vancouver who are encountering difficulties with residential bike parking. Conversely, if you think your bike parking is excellent, I would like to hear about it and use your building as a case study. Your answer may appear in the final project report, which will be presented to City of Vancouver staff and available publicly on the University of British Columbia website: http://sustain.ubc.ca/ubc-sustainability-scholars-project-library

Here are a few things to consider when writing your story:
- Briefly describe the type of building you live in, but refrain from giving your exact building or address for confidentiality reasons.
- What kind of secure, long-term bike parking is in your building, if any? Ex. bike cage in parkade, bike room, bike lockers, etc.
- Do you use the secure bike parking?
- If so, briefly describe what it's like to use it. Do you have any difficulties and/or concerns with this parking?
- Does it feel safe, comfortable, and convenient?
- If you don't use it, why not? Where do you park your bike instead?
- Have you ever tried to do anything to get better bike parking in your building? Ex. complain to building manager.
- What are your suggestions to improve the bike parking in your building (ie. your ideal residential bike parking)?

Thanks for your help on this project. Let me know if you have any questions or concerns.

PJ Bell
Greenest City Scholar, City of Vancouver
M.A. Planning Candidate, 2016
School of Community and Regional Planning, UBC
Patrick.Bell@vancouver.ca

* Required

Do you live in the City of Vancouver? *

This research will inform the City of Vancouver's bike parking bylaws. It does not look at bike parking in other cities in the Greater Vancouver Regional District (Metro Vancouver). However, if you live outside of Vancouver, you are still welcome to comment on your bike parking situation.

◯ Yes

◯ No

What is your "residential bike parking story?" *

In as much detail as you'd like, please tell me your "residential bike parking story." This is informal, and you can use the points in the description above as a guide, but please answer in complete sentences so that I can quote your answers in my report.

OPTIONAL: Are you comfortable being identified by you FIRST NAME only? If so, please type it in the box below.

No personal identifying information will be shared with anyone. However, it is helpful to have a name attached to the stories in order to emphasize that it is a real person with a real problem.

OPTIONAL: Do you have any photographs of your bike room that you would be willing to share?

- ◯ Yes, I will e-mail them to you at the address listed above
- ◯ No thanks!

OPTIONAL: Enter your e-mail address

The report will be completed in mid-August and will posted online for public viewing. If you would like a reminder e-mail from PJ with a link to the report, please enter your contact information below. You will not be subscribed to any listserve.

Submit

Never submit passwords through Google Forms.

Survey Responses

First Name: Alex **Vancouver Resident: Yes**

We live in a new (2010) condo building in the Olympic Village. We found out after we moved in that they converted the secured rooms in the parkade that were intended for bike parking into extra personal storage rooms that won't accommodate bikes. After several months of trying to find parking, and being scolded by the building manager for taking our bikes in the elevator to and from our unit (use the bike parking please!... even if there isn't any) we found a room at the farthest back corner of the lowest parkade level that had racks inside for locking bikes to. We've been using it ever since.

We have never owned a car. I travel almost entirely by bike within the city, with some transit and car-share. My wife bikes occasionally for transport. I'm a trooper so I'm not going to not ride my bike because the parking is inconvenient, but it is pretty damn terrible, especially for such a new building in what is supposed to be a 'green' community. 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. Then I use a building key to get into the room, turn on the light, and unlock my bike. Then I ride my bike across P2 and up two sets up ramps to the street. My bike doesn't trigger the safety stop-go lighting that is in the parkade for cars, so I often am confronted with a big SUV coming down a ramp straight towards me with a driver who is surprised to see me there. The gel-coat on the parkade ramp is also crazy slippery when wet which adds another hurdle in the rainy months.

Other folks seem equally frustrated. Some have locked bikes haphazardly to a piece of chain link fencing that is in the parkade. Others have locked several bikes together and tried to squeeze them into the front of their parking spot or tried to loop a big long chain around one of the concrete poles in the parkade to lock them up. Others with nicer bikes still seem to try to sneak them up to their units when the building manager isn't looking. There are no bicycle racks in front of or around our building. There are on-street vehicle spots right in front of the doors, but no bike racks. Most folks lock in front of the building to the trees (which tramples the planted area) or the street signs.

First Name: Alice **Vancouver Resident: Yes**

My partner and I have been living in this rental apartment building in the West End for over a year. We both commute to work by bike and really enjoy riding around downtown on the weekends. Unfortunately the bike rooms we have in this apartment building are basically unusable, so we store our bikes in our apartment which is not ideal. There are two tiny bike "rooms" in the parking garage. They are narrow and only have hooks attached to the length of the room. In order to store my bike there, I'd have to first find an open spot which rare, hang up my bike by the front wheel and find a way to lock my bike wheel to my bike frame to deter theft. Sometimes my neighbours just push their bikes in and leave them blocking the entry and exit of other bikes. It's so unwieldy that I have never left my bike there.

Ideally, the apartment building manager would covert the car parking spot next to one of the bike rooms into a large bike lock up area. This was what was done at my last rental building two blocks away. But my current apartment manager is not a green person. She resisted my request for a compost/organic bin earlier this year after organically were banned from garbage. When we first moved in, we had suggested that bike spots be assigned but she resisted that as well. It's very frustrating having a building manager who does not care about the environment.

I think that having a building bylaw on bike storage is a fabulous idea. This will move us towards thinking and acting green. There also needs to be more education to raise awareness for example, fun campaigns on Robson and Granville St, cool compost bins and recycling bins to inspire the masses. So much can be done. Countries like Germany have automated recycling sorting machines in every supermarket. New Zealand sends

out warning letters to apartment units and houses that separate their trash wrongly. Japan mandates 5 bins in each household. If Vancouver wants to be the greenest city in the world, we've got to step it up big time.

First Name: Alix **Vancouver Resident: Yes**

My building has secured bike parking accessed by ramp, but it is constantly overflowing with bikes (and two mopeds). Probably 50 spots for 220 units

First Name: Allison **Vancouver Resident: Yes**

I live in a 30+ storey high-rise in Yaletown that is about 10 years old and we have at least 5 bike storage rooms/ cages. They are well lit and easy to access through the secure, underground parkade. Sadly we need more room, but mostly because there are so many un-loved bikes!

Suggest would be to start a bike sharing program among residents for the unused bikes.
I believe at one point they did try to match up owners with bikes, as at least half have some sort of numbered tag hanging from the handlebars. It's also really great that there is above ground bike parking by the front door for guests and quick stops at home. A bike repair room would be an incredible addition. Something simple with an air pump and a stand to repair your bike in a well-lit dry space, as I don't believe we are allowed to take bikes up to suites.

First Name: Amy **Vancouver Resident: Yes**

I park my bike in the underground bike cage in the parkade of my apartment building. It is pretty secure and I have not experienced any thefts. The strata council recently conducted a massive cleaning initiation and removed ghost bikes in the locker so that improved the over-crowding situation drastically. However, 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.

"First-world problem" I know! But it would be nice to just be able to open the garage door and head directly into the streets without going through all that trouble. The garage fob is $80 though so I decided I'd rather spend an extra 5 minutes going through all that than pay $80. It would be nice if the designers of the building put in automatic doors, like those buttons for people with strollers or wheelchairs so I don't have to balance my bike with one hand and open the door with the other. It won't just help people bring their bikes out but also people who have strollers and wheelchairs. Maybe civil engineers should put that requirement in the building code: automatic doors for the parkade.

First Name: Amy **Vancouver Resident: Yes**

I live in a 40-year old condo with approx. 60 units in the Mt Pleasant area. I "own" a car parking spot that sits empty as I can't park my bike there. We have bike racks (no fencing) in the parking lot. Many of the bikes appear to rarely be used. It's overfull and not usable for regular riders. We also have secured, locked bike storage (a former closet? It's a room - not a fenced area), with reserved racks at the cost of $60 a year (and a separate key, so if you don't rent a spot, you have no access). There are about 16 reserved spots (less than 20), and most (14-15?) are taken. These are the spots that are used by the daily commuters (and perhaps those with more expensive bikes). It is safe, dry, and some kind soul has left a bike tire pump in the room that I regularly use. I commute by bike, and I depend on having a reserved spot.

Some of the issues that come up: are some bikes in the general bike racks abandoned? Should scooters be allowed in the locked bike room (in my opinion no - takes up too much room)? In case of a wait list for reserved spots, should owners get preferential treatment over renters? We don't have a wait list now, but in case of a

wait list, should there be turn over? Who didn't lock the door? Most people lock up their bikes in the secure bike room (I do), but a few don't. I have not heard of any thefts in the two years I've lived there and used the secure bike room.

We only recently (last year) got a bike rack (two spaces) outside the building, so that my guests don't have to lock to fence or railing. Buildings should absolutely have bike racks for visitors (but what about when residents park there permanently - this was the case at a friends old condo, resulting in very little space for guests) - a case for having secure bike parking for residents!! I'm happy with secured and reserved space for my bike, but I'd like to be able to use my car parking spot for a bike rack. Seems like a waste of money.

First Name: Anne **Vancouver Resident: Yes**

My family lives in a 20-storey apartment building with one bike room on the 2nd basement level of the parking garage. It is filled with many many dusty bikes and a few bikes that look as though they are used everyday. The room is difficult to access and riding up and down two levels of parking garage is unsafe and a pain in the neck.

We own a big loop style bike rack and have about 7 bikes in regular use (daily or weekly, including a cargo bike, electric bike and kid bikes) so rented a car parking space ($60/month) and installed our rack there. We have to be jerks and not allow anyone else to use the rack since any more bikes would make it difficult to access our bikes. I have suggested that our building install racks and charge $10 per bike per month for use of building bike racks. The building could double the money it makes from parking spots by doing this (if the racks fit ~12 bikes). There must be an easy way to check which bikes have paid up and which haven't, then cut locks as needed. Other thoughts: bike spaces that have room for kids bikes, trailers, cargo bikes is essential, as will be charging stations for e bikes. Thanks for doing this important research.

First Name: Anne **Vancouver Resident: Yes**

We live on a second-storey balcony. Thinking it was safe, we put a mountain bike out to free up space in our small apartment. It was winter, so we weren't out there much, but at some point, it got stolen by somebody who must have climbed up the fence downstairs and hopped up. We now keep all four of our bikes in our living room.

First Name: Annette **Vancouver Resident: Yes**

I live in the West End in an 11-storey apartment building and bikes are parked in the secure under ground parking lot. The parking lot is monitored by camera and is secure. The bike parking is great, there are just not enough spots. 23 spots but all are taken and some have to keep their bike in their apartment.

There are dual triangle shaped metal pieces for each bike attached to a very long metal strip along the wall. There are also two strips of metal running along the floor. You pop a wheelie and guide the front wheel in between the triangles, then push the back tire over the first strip of metal on the floor. The second floor strip helps to stop the back tire from rolling thus keeping it in the rack. Then use a U lock, cable or other type of lock through the two triangle metal pieces and your front wheel, then around the bike frame. This is a secure bike system and would probably not cost much to make. There are 23 spots for bikes in my building. It is easy to get your bike in and out of the rack. This is an awesome design. I think we need more bike parking and less car parking!

First Name: Brandon **Vancouver Resident: Yes**

We live in a 3-storey walk-up in East Vancouver. The building is +100 years old. There are 25 units in the building, with 1 or 2 adults in each unit. Recently, a room in the basement was retrofitted into a secure bike room. It has three long racks in it, which fit a total of 13 bikes. The landlords only distribute 13 keys to the bike room,

so (in theory) only 13 tenants can keep their bike in the bike room at a time. As such, there is a waiting list for space in the bike room. The landlords are responsive to tenants' needs, and monitor bike room usage to make sure those that are most in need of secure and convenient bike storage have access to the parking. This includes offering spaces to tenants on higher floors first, as the alternative is to carry the bikes up and down the interior stairs to units higher up in the building.

The space is safe and fairly convenient. To access the room, you to go through a series of heavy doors with not much clearance, and up and down two short flights of stairs, so it's a little awkward.
The space would be more functional if we were able to access the room without having to go up and down any stairs. Also, if we had space to work on our bikes, we'd use it!

First Name: Brian **Vancouver Resident: Yes**

I live in an apartment building with two large parking garages that sit half empty due to the fact that we are downtown. Our building policy is that we must keep our bikes either in our apartments or on our deck. Had two bikes stolen off my car in the garage. I gave up my car to live downtown and at times feel that I might want to give up my bike to enjoy my living space.

First Name: Brigitte **Vancouver Resident: Yes**

US:
We are a family of four (37 yo mom, 40 yo dad, 3.5 yo girl and 3 month old boy).

OUR HOME:
We just moved into a large concrete residential complex (192 units) on March 30th, 2015. Our building is located a 3-minute walk to the south west of City Hall.

THE FLEET:
We are avid cyclists and downsized from 8 bikes (which were accommodated in our previous two living arrangements) to five, plus one bike trailer. The fixie, a regular hybrid and a beat-up mountain bike had to go. Our fleet now includes:
- Three road bikes, worth between $3,000 and $8,000 each
- One midtail cargo bike (Yuba Boda Boda), worth about $2,000
- One old mountain bike, probably worth about $300 on Craigslist.

HOW WE USE THEM:
We typically use bikes to get to work (Dad works in Surrey and rides to work and back every day (using the road bikes); Mom used to work at UBC and commuted on her bike as well, with toddler on board), to conduct most errands (taking daughter to various classes and activities, carrying groceries and other purchases) and to visit various urban destinations. We also ride for fun (mostly the road bikes). Sometimes.

BIKE STORAGE:
Our strata bylaws allow us to keep bikes inside our unit (otherwise we would not have bought this place).
We do not have a storage locker assigned to our unit, but some units do.
There are two communal bike rooms (for the 192 units) in the parking lot. They were broken into last year, a few bikes were stolen, and, as a result, their security was increased with the addition of metal plates on the doors and doubled-up chain-link fencing. Bikes in the room must have a sticker indicating what unit they belong to.
There is also one storage room, also in the parkade, that has been "temporarily" assigned to the storage of bicycles because the bike rooms were overflowing. Only some residents have a key to that room, and there are no bike racks in the room, or posts to tie the bikes to. So it's been kind of a free for all.

Recently, a bike room cleanup was called. As a result, about fifteen bikes were culled. The two bike cages remain quite full but no so full that it is absolutely impossible to park in them. It is nevertheless difficult (and disheartening) to have to battle every day to get in and out, between a bunch of bikes that obviously have not been ridden in YEARS but that people keep in the bike room just in case... It is especially difficult to maneuver when a young child is involved, plus two massive panniers with a week's worth of groceries!

OUR STRATEGY
We store the three fancy road bikes in our suite in a 9'X4' storage room, thanks to Clugs. We just wouldn't put our expensive bikes in a communal room. The cargo bike and the mountain bike are stored in the bike cage. We wrestled a key to the "temporary storage" (for the cargo bike) from the facilities manager, who reluctantly gave it to us, but since there is nothing to secure the bike to, we decided to keep the cargo bike in the common bike cage for now. It is a battle to get it in and out of there every time it is used, which to some extent reduces my likelihood of taking the bike for a given errand. For the moment, Mom deals with the newborn a lot, so doesn't get to use the cargo bike much. However this will become an issue once baby is a year old and Mom starts to cycle with both kids to school, daycare, etc. on a daily basis. How to extirpate the cargo bike while keeping a preschooler in sight and holding a 1-year-old, and carrying two panniers and three helmets, preferably without ramming into five other bikes on the way in or out??

NEXT STEPS
The results of the not-so-successful bike cull were discussed at the last strata council meeting, and a bicycle committee was struck. It has not met yet, but we have volunteered to be on it. We are hoping to propose that the "temporary bike room" be transformed into a "bike commuter room" for residents who use their bike on a daily basis. The room of our dreams would include modern bike rack that reduces bike footprint (either by storing the bikes vertically or by providing two-level parking, as in the newer bike rooms at UBC), along with hooks to hang wet bike gear and maybe a little cabinet/locker for bike essentials, pump, etc. We are prepared to pay a monthly fee ($10-30?) to gain access to such a room and we think a few other bike commuters in our building will be interested in doing the same, possibly making the investment cost neutral for the strata. If/Once we get there, we will be asking for help from HUB Cycling to design the facility.

OVERALL ASSESSMENT
Frankly, it's not too bad compared to what a lot of other cyclists we know have to deal with (e.g., no bikes in units). Our strata is generally progressive and the fact that a bicycle committee was created is a great source of hope for us! We totally see how access to appropriate cycling facilities in residential buildings is key to the car-lite lifestyle we want to lead. (We do not have a car and a parking spot in the parkade. As far as I know, we are not allowed to turn the parking spot into bike parking. I have seen some neighbours with a bike on their spot, but it tends to be against a wall or otherwise out of the way.) Thanks for doing this research! It's greatly appreciated. I will email pics on demand.

First Name: Brit **Vancouver Resident: Yes**

Our bike parking is always crowded with dusty bikes with flat tires, there are two or more bikes chained to a single post. There are 3 rooms to lock up your bike in, 1 chain link fenced in "cage" or 2 storage rooms shared with storage lockers for the units in the building. Aside from the chain link bike cage which is on the lower level of the parkade, in order to take your bike out of the secured area you must go through 2 fire doors. If you are carting stuff or kids this makes the procedure for getting in and out...challenging if not impossible. My doublewide Thule chariot does not even fit through the door to any of the lock-ups.

I simply leave my unlocked bike in my parking spot in the parkade with the chariot attached. The neighbours are in their right to complain but none have. I have an agreement with our parking spot neighbour that I will park my bike lying down so that it can't fall and scratch her car. However, I am toying with the idea of building my own bike stand out of wood, this way I can securely park my bike with the chariot and the kids can get in and out much easier. I am also considering buying a cargo bike so I may safely bike my kids to school (since

we were not able to get into our local kindergarten class it is quite the trek away), but since a cargo bike is oversized it too would not fit in our lock-up areas.

Our family of 4 currently has 5 bikes all of which we use on a weekly basis, and we are considering getting a 6th (a cargo bike). We have one additional tricycle in our storage locker. Everyone (including kids) has at least one bike, but only a fraction of these bikes get used on a daily basis, and yet there is no mechanism in condo buildings to accommodate that. Bikes today also come with many attachments for kid and cargo carrying, such as chariots, trail-a-bikes, front cargo bikes, back cargo bikes. Bike lockup are not accommodating for the extra length needed.

First Name: C **Vancouver Resident: Yes**

There is a fenced area in the underground parkade with a few bike racks. It is very full and there is no way of telling whose bike belongs to what unit or even if they still live in the building. The parkade is not even half full of cars but the bike areas is overflowing.

First Name: Carrie **Vancouver Resident: Yes**

My co-op turned an empty parkade room into bike storage. It is WAY too small for our building. We waited years to get a spot and I can barely fit my bike in it. We recently got a long tail cargo bike because we want to be able to transport our kids easily by bike but there's no way we can park it in the secure bike room so instead we park it in our parking stall, lock it to other bikes, and cross our fingers. I hope that the COV takes into consideration that bikes come in many shapes and sizes and that bike rooms will have a place for cargo bikes, too.

First Name: Cassandra **Vancouver Resident: Yes**

I'm not in my new building yet, but it's brand new and has a bike locker for each apartment. The Robert at Carnarvon and Broadway.

First Name: Chris **Vancouver Resident: Yes**

My old building had excellent parking, subterranean but ample nonetheless. My new building has less bike parking availability but is at grade. Basically no complaints over here. New building is 1021 Harwood. It is slightly underground but has access from the street which is nice.

First Name: Christa **Vancouver Resident: Yes**

I've had secure bike parking in all three places I've lived in Van. My biggest complaint, because they are older buildings and making use of the available space, is that there isn't enough room for all the bikes and the rooms are often difficult to access (through multiple doors, down steps). My current place just has some space in the laundry room and it'd be tough to lock bikes up, as there are no racks.

First Name: Christine **Vancouver Resident: Yes**

Multi complex, approx. 15 yrs. old on Broadway in Kits. We have not one, but two secure bike parking rooms with appropriate racks and plenty of space. Even feels safe enough to keep one of our high performance bikes down there. Only downside: not quite street level!! Access through secure pedestrian gate (awkward) and then down a half-floor of stairs. All in all still excellent!

First Name: Christine **Vancouver Resident: Yes**

There isn't enough parking of any kind at my apartment building - not enough for the cars and certainly not enough for bicycles. Instead, the landlords rent out the parking stalls to a valet service for neighbourhood restaurants. We have one enclosed room for secure bike storage, but it is overflowing. Tenants have asked to rent and pay for an entire parking stall to use for more bicycle storage, but the landlords have turned them down as the valet is more lucrative. 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.

First Name: Christopher **Vancouver Resident: Yes**

Harassment...every other balcony has bikes on them.... We are the only ones who get threats from MacDonald Realty. The caretaker has been doing this for 2 plus years. The building is [name removed for privacy]. [Name removed for privacy] is the caretaker...I will not refrain from hiding the truth. I have reported all to city hall. I have 2 account #'s against both parties. Guess what? Mac Donald realty gives more then $2 million to Vision Vancouver and the Mayor. Nothing has happened. Still no storage yet we have a brand new cage protecting the garbage. Good job... gladly supply you with all kinds of pictures. No bike parking at all...

First Name: Colin **Vancouver Resident: Yes**

We live in a 200-unit condo building in Olympic Village and in all the buildings, the required bicycle parking was built, but most were in storage lockers and not in dedicated bicycle parking rooms. The lockers with racks were sold as storage lockers and not bicycle parking. So the reality is that we have bicycle parking that is used not for bicycle parking, but for household storage, which defeats the purpose of having bicycle parking requirements. This has happened in other buildings in the village and not just ours. I have enquired to the city to find out if this is okay and I was told our building is in compliance. I have heard similar stories of other buildings, not just in the village, but in other areas of the city where this has also happened.

The other problem is that I cycle commute every day and I am always afraid that when I come home, there will be no place to park by bicycle. We have one bicycle room that has racks for about 18 bicycles, yet is used by more than double that. Due to the bicycle storage problem, our strata has had to install additional bicycle racks on the wall elsewhere in the building that aren't in secure rooms and are charging an annual fee for the racks. We still have an acute storage problem and no other rooms available for bicycle parking. If we want people to ride for transportation, the bylaws need to be tightened up.

First Name: Daniel **Vancouver Resident: Yes**

For 5 years, I lived in a high-rise tower in Downtown Vancouver. The bike storage room was a fairly small chain-linked cage that was constantly overflowing with bikes in various states of abandonment. The residents that regularly used their bikes had to navigate through a sea of rust, bent wheels and flat tires to fight for a parking space in the densely occupied rack.

On my way in and out of the bike room each day, I noticed one bicycle that had been left for a considerable length of time locked at the end of a rack, partially obstructing the bike room's central aisle. I decided to write a note and tape it to the offending bike, asking the owner to kindly move it into one of the rows. However, as the cobwebs multiplied and the tires grew flatter, it became clear that the owner had no plans to visit his bicycle any time soon. The note sat taped to the bike for approximately 2 years, at which point I moved out of the building.

First Name: Daniel **Vancouver Resident: Yes**

For 5 years, I lived in a high-rise tower in Downtown Vancouver. The strata had a no-exceptions policy that all bikes were required to be kept in the bike room, and that bikes were not to be brought up to units. The elevators had cameras, and fines were in place for offenders. 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.

As avid mountain bikers, my girlfriend and I had bicycles worth several thousand dollars. After being caught bringing the bike up to my unit and issued the warning, we followed the rules and left the bikes in the bike room. Sure enough, a break-in occurred, and our two nice mountain bikes were selected for theft among a bike room full of beater bikes and inexpensive commuters. Following the theft, the building management was quite unhelpful. Although they had required us to keep our multi-thousand dollar bikes in a facility that was clearly insecure, they took no responsibility for the loss and required us to use our own insurance.

To make matters worse, the strata was unwavering of prohibiting bikes from going up to our unit once we sourced replacements. The building manager was sympathetic and turned a blind eye as we snuck our bikes into the elevator through the parkade, but a self-righteous unit owner tattled to the strata, and we were reprimanded. We spent the duration of our lease sneaking the bikes upstairs in giant bags, then moved out to a more bike-friendly building. It was inappropriate for the building to require us to leave such expensive bikes in such an inadequate storage facility, and they should have taken more responsibility following the theft given that we had followed their rules.

First Name: Darren **Vancouver Resident: Yes**

At home, I U-bar & cable lock both my bikes to a padded lumber rack in our building's parkade. At work, I park in a card-access bike cage, same locks.

First Name: Don **Vancouver Resident: Yes**

I live in a co-op with about 52 units equally split between townhouses and apartments. We were built in 1983, and the bike room is part of original plan. Shortly after we were built, we put hooks for bikes on the walls; however, the hooks are largely full and many people, especially regular commuters park on the floor by the door. Bike room has a common key, available to anyone with a bike. In our history, I know of no thefts from bike room until a year ago. I think this happened because The closing mechanism was altered so the didn't always shut properly. The nicest unlocked Bike was taken; however, Maintenance committee was very good about fixing the problem the day after I mentioned it. Also, they frosted the glass on the window. So now, members, generally, lock the bikes stored in bike room. No more thefts reported. Fewer members are using the bike room and storing them in their units, largely because of the theft, I believe. We have been discussing putting a rack in the front for visiting cyclists.

First Name: Ed **Vancouver Resident: Yes**

Strata title buildings with restrictions on bikes are one of the biggest issues I've come across. Sure, your $149 Costco bike can live down in the parking garage, but anyone with anything even remotely expensive or rare usually will only feel safe with it in their own space. 'Common' bike rooms are theft targets and generally not suitable for anything worth more than a few hundred dollars.

While some buildings are fairly tolerant of folks bringing their own property into their own unit, some buildings seem to want to declare all out war on cyclists. A good friend of mine owned a few higher end bikes ($4500-

6500 each). There's absolutely no way he was going to leave them in a dark chain link fenced bike 'corner' in the parking garage of his building. However some of the other folks in the building took to reporting him every time they saw him bring his bike into his unit, resulting in a fine from the strata he had to pay. Despite being fined several times it was still in his best interest to continue to store his bikes in his own space; the cost of the fines was nowhere close to the cost to him to have to replace a bike!

It's important to understand that bikes can be as valuable as a used car, yet they're incredibly hard to trace and are almost never recovered when stolen. Replacement cost insurance is difficult if not impossible to get for bikes of any significant value as well. Bikes are small and easily portable which makes them theft targets, but also means there's nothing really preventing someone from keeping their prized possessions in their own space. Encouraging development that has a 'bike nook' inside the unit (which of course could be used for other purposes if the resident isn't a cyclist) would be a great step forward. Meanwhile ensuring that elevators and hallways are sufficiently large to push a bike through should help alleviate strata concerns (tire marks on walls and the like) while at the same time ensuring wheelchair / stroller accessibility.

First Name: Ellen **Vancouver Resident: Yes**

Comfort and Ease at this time

First Name: Emily **Vancouver Resident: Yes**

I live just off Commercial Drive on 2nd and our mid-size (about 12 units) building has ZERO bike parking. We were keeping our bikes in the hallway until the fire department saw (long story involving some burnt chicken) and issued a warning to my landlord that the bikes had to be removed. We now have to keep them either inside our apartments (yeah right) or off property. Can you PLEASE help do something about this? Every resident of my building rides their bikes almost every day and we really don't know what to do about this, the only other option is the street parking on the Drive (also yeah right). I'm seriously inclined to move…

First Name: Erin **Vancouver Resident: Yes**

My building has locked bike parking cages in the underground. There are quite a few spots, which I appreciate, although they are mostly taken. The majority of the spots you can park your bike on the ground, horizontally, which is much better than the vertical hanging ones which wreck my back fender and stress my front wheel. I often have to search around to find a spot to park when I come home in the summers. Ideally, there could be some designated spots (just like cars) for residents that are frequently using their bikes.

First Name: Faby **Vancouver Resident: Yes**

There is no bike parking option in my building, not indoors or outdoors, so both my boyfriend and I have to keep the bikes in the living room when we are home. It is really inconvenient.

First Name: George **Vancouver Resident: Yes**

My current building has both surface and basement parking, though looking downstairs, I'd say it's pretty over-loaded

First Name: Gwendal **Vancouver Resident: Yes**

Live in a small house <1200 sqft on a small 25' lot with no garage or back alley. We squeeze our bikes under the stairs which provide some shelter but have had bikes stolen as it is not an enclosed space.
We are considering building a small bike shed, currently the city's building code restricts garden sheds to 100

sqft and for the five residents of the house would probably be the minimum amount of space needed for us to store our bikes in a safe space.

First Name: Hannah **Vancouver Resident: Yes**

My issue with 'secure' locked rooms in the basements of these buildings is that usually they're not actually secure. I have a few friends who've had their bikes - usually expensive mountain bikes - stolen from spaces like this. Often they're built out of wood and in a way that anyone with an electric drill can easily remove the lock and/or side panels. Maybe there could be some sort of construction standards that ensure these rooms are actually difficult to break into.

One thought I have on bike parking, I don't know if this has anything to do with encouraging people to use bikes as a mode of transportation but Vancouver is home to world class mountain biking. I know lots of people who have trouble finding places to keep their mountain bikes, because they're often muddy and too big to keep in a little condo. Since bike theft is a bit of an industry in Vancouver storing them somewhere safe is a concern. One option is putting them on balconies which (arguably) looks bad from an aesthetic point of view and I've also heard of bike thieves climbing onto balconies and stealing the bikes by passing them over the railing. I also raised the issue of bike cages being poorly constructed and easy to dismantle. If you needed actual construction suggestions of how to reinforce one, my co-worker Ian is in the process of doing that in the basement of his condo building. He was telling me that you need to install the locks from the inside... etc. (Can't totally remember the details)

First Name: Ian **Vancouver Resident: Yes**

Building has a shared bike room, which is full. Though with better racks many more could be accommodated. The building plans show 2 additional bike rooms, but these were converted to storage rooms instead, and are largely empty. This is in the Olympic Village. Officially my building does not allow bikes in the unit, but I had this stricken from my rental contract because racing bikes and shared bike rooms are a bad fit. Bikes are not allowed on the balcony however.

First Name: Jane **Vancouver Resident: Yes**

We are a couple living in a 3-storey walkup in Kitsilano. We're both daily bike commuters. Our building doesn't have a bike room so we hoist our bikes up the stairs to our 2nd-floor apartment where a wall rack holds 2 bikes in the living room. Luckily this is an older building with very large rooms so there's enough space. In the storage locker room downstairs, various people have left their seldom-used bikes, all with flat tires and gathering dust. These bikes make it difficult to get into our storage locker. I must admit that during 9 months of the year, one of those bikes is my 2nd bike, a "summer bike". In summer I park this bike in the back alley parking area, locked to a rickety wooden handrail alongside the stairs to the building back entrance. I don't ride it in winter because steel wheels don't brake well when wet, so I protect it from rain inside the storage room (guilty as charged!). Finally our building manager is asking people to identify their bikes because of the problem. Not sure what will happen, but I will suggest carving out space for bikes in the "maintenance" room (a ramshackle workshop area). I saw a nice DIY wall rack suggestion online.

In the previous 2 buildings I lived in (also Kits walkups), the few people with bikes kept them in the laundry room. I locked mine to a table leg for security (well, not much security). The only actual bike room I've experienced in a prior Kits walkup was such a tangle of bikes that it was a daily frustration to extricate my bike.

My dream would be a locked room with floor-mounted racks for locking bikes, inverted U racks if possible (all other rack designs suck, frankly), with one rack per apartment & 2 bikes per rack. Enough space to maneuver a bike between the racks. Preferably no stairs on the way to the room from street level/parking level. I don't need a private bike locker, in fact a big room might be easier, and also nice to meet fellow tenants.

First Name: Jeff **Vancouver Resident: Yes**

When we purchased our strata apartment in 2009 we asked about bike storage. We found out that there was a bike room, but that it was overfull of bikes in poor condition and wasn't useful. We are prohibited from bringing bikes through interior hallways to our unit. We had to purchase a private storage locker for our bikes. It works, but there should be a common bike room sized for the needs of residents.

First Name: Jim **Vancouver Resident: Yes**

I live in a large condo tower downtown. The building was built in the late 1990s. The building has wonderful amenities (such as a gym, hot tub, and well appointed interiors), but bike parking is definitely not one of them. Although the building has an underground, secure bike room with bike racks, getting in and out of the room is very difficult. Although connected to the main ramp of the underground parkade, a narrow staircase with a tight 180-degree angled landing makes getting bikes in and out very difficult.

Perhaps the current bike parking area was converted to its current use later in the building's history. The room is also overcrowding with bikes, and my partner and I have to double up and stack our bikes on the rack. Meanwhile, there are always many empty spaces in the parkade for automobiles. Our unit came with two parking spaces for automobiles, but we don't own a car and have difficulty renting out these spaces; the parking spaces can only be rented out to residents of the building. Condo bylaws also prohibit the use of these parking spaces for bikes or storage. Bikes are also banned from all the other public areas of the building (such as hallways and elevators).

First Name: Jim **Vancouver Resident: Yes**

We live in a large multi family development that has numerous 'bike rooms' with secure doors accessed by the same key fobs we use for the front entrance. Inside the rooms are bicycle racks secured to the floors and walls. Lighting in the rooms is adequate, some rooms have separate bike cages in them, but the numbers are limited, so, first come first serve. The cages are simply steel wire and angle iron frames, quite flimsy which I'm sure could be broken into with little effort.

It is my opinion the bike room should house individual structurally secure lockers with two lock hasps per door. There should be 24 hour video monitoring. The lockers should be just large enough for two bikes. The lockers should be assigned to people that need them and USE them, empty lockers would be re-assigned. The developers should be responsible to provide one locker per condo unit, but the lockers shouldn't be attached to any particular strata lot (this will invite sales/ownership problems).

First Name: Jocelyn **Vancouver Resident: Yes**

We bought into a pre-sale condo in Mount Pleasant (bicycle central) that was built with at least 5 or 6 small bike storage rooms on the ground floor. At the time, it seemed like an endless and exciting amount of space, but now it's getting impossible to get your "parking spot" back when you come home from work. Other than the lack of space, the security has been otherwise 99% great (only one break-in that I know of in 4 years) and it's conveniently separated from the car park. We also purchased a bike locker in one of the rooms since we each have a mountain bike as well, and a bike trailer for the kids. It doesn't all fit, though! We usually store the mountain bikes on an offsite storage locker. Additionally, we love the flexibility that comes with a reasonable and intelligent strata council that allows bikes in the elevators and hallways.

First Name: John **Vancouver Resident: Yes**

We live in a sixty-some unit condo built in the 80's. It has three retro fitted chain link cages with racks. Two are OK and one is crammed to the point of insanity. There are also about 30 - 40 individual hanging racks spread out over the four levels of parkade. Recently, the council approved pay as you go racks you can add to your parking space behind the vehicle. The racks each fit two bikes. A recent tire squeeze test revealed that many of the bikes are not active, but no mechanism to remove them seems reasonable. All in all, it's OK, but not equitable. Happily, I have a rack on the first level - handy since I bike to work all year round. Others are not so lucky. I would rate the situation as pretty good for a refit...

First Name: Justin **Vancouver Resident: Yes**

Tiny room, with bars lining the wall (like hand rails) which makes it impossible to lock more than 5 bikes up, and leaves the middle empty. Plus most bikes in there are old abandoned pieces of junk.

First Name: Kara **Vancouver Resident: Yes**

I live in a high rise building in the West End of Vancouver. The bike parking is in the same locked garage as the car parkade. I use the bike parking only because I have an older bike. I have concerns about the parking as there have been 3 bikes stolen in the last 6 months and you cannot use a u-lock to lock your bike because the bar to lock the bike on is too far away from the bike frame. If I had a more expensive bike I would have to keep my bike in my tiny apartment.

First Name: Karin **Vancouver Resident: Yes**

We have bike parking in the underground parking are of our condo,
Bikes need to be registered with the strata council. We used to have a lot of abandoned bikes and registering put a stop to that. I guess with household insurance any thefts will be covered. We also have close circuit cameras in the underground.

First Name: Kat **Vancouver Resident: Yes**

I have two bikes and have for decades now. One is for road riding and one is for commuting. The road bike is never locked up out of my sight or my apartment. The commuter bike is locked all over the city but it is worth $1400 so I still try to protect it.

Recent apartment #1 was a new building in Chinatown with both bike storage lockers and a bike storage room. I didn’t feel safe leaving my commuter bike in that room as the building was big and everyone had access. There were lots of rentals too. Also the spots filled up immediately (largely with un-ridden or abandoned bikes) so there was no room. The strata eventually had to give out spots using a lottery system as there wasn’t enough for everyone and they wanted to discourage abandoning bikes. I stored both bikes locked up on my balcony.

In previous apt #2, (old, low-rise, east-van) I was forced to lock my commuter bike to some pipes in the underground parkade because it didn’t fit in the apartment. One night all the components were stripped from the bike but the thieves didn’t try to get through my immense kryptonite chain lock. All the same it was devastating and cost $$$ for new wheels. I sent my road bike to someone's garage so that I could keep my re-built commuter in the apartment. Very sad.

My new/current building is brand new, low-rise, east-van with bike storage rooms in the basement. I am forced to store my commuter bike in this room because it doesn’t fit in my apartment (because we have two other carbon road bikes in the apartment, can no longer store them in a friends garage). I am very nervous about it

and basically waiting for it to get stolen. Everyone in the building has access and there are lots of rentals in this building.

I work at St. Paul's Hospital and I leave my commuter bike locked up with a giant lock in the locking bike cage in the parking garage. It's very visible and people are in and out all the time. Only those who ride have access with their hospital ID. I feel safer leaving it there for my shift than in my own building storage. I have seen videos of how quickly any bike lock can be cut through with an angle grinder vs. bolt cutters. The only thing stopping someone from stealing my bike in the bike room is the right equipment, as my $200 lock will only stop bolt cutters. Even if it were inside a bike locker the angle grinder would make short work of the flimsy chicken-wire cage they are built out of. The problem is the seclusion. Thieves can spend all night trying to get through your lock. The only solution IMHO is to make bike storage rooms visible (like, glass walls) and in the main foyer or hallway of a building. This way then can be compact, using 2 heights of storage racks. Putting bikes out of sight and underground doesn't actually help.

First Name: Katy **Vancouver Resident: Yes**

The underground parking is not secure where I live. I've had several items stolen over the years including several bike trailers and one bike. Since the bike (my source of transportation) was stolen I carry my bike inside and hang it on a bike rack just inside our front door. My daughter uses an old bike of mine and that one too I bring inside unless she's using it daily (for work in the summer). This one is stuffed in my storage room. I'm used to this situation now after years of using it but it is inconvenient. The storage room is now kind of difficult to navigate and bringing the bikes in in winter dripping and dirty is also challenging.

First Name: Keith **Vancouver Resident: Yes**

Not much to say and no complains, but the bike storage is crammed. I am on the strata council and we just conducted a bit of bike room housekeeping (tag your bike or it gets tossed), thinking that the bike room cram was a result of old tenants/owners that had long since moved. Nope, still just a crammed. Basically means everyone is riding (or at least owns) a bike which is great, but we need higher density storage. Guess what the topic for the next meeting is?! Are you saying we get a grant for that?

First Name: Laure **Vancouver Resident: Yes**

I actually feel lucky as in our small building in the Westend we have a small bike room, with a locked door. It's messy and too small for the amount of bike we all have but it fits. It's just a pain to put and take our bikes in and out. I feel confident there won't be any break in.

First Name: Leonard **Vancouver Resident: Yes**

I give the bike parking in my condo about a 4.5/10. It's a secure, locked room, but it's a pain to get into. Previous tenants also have ditched their old bikes there, so some prime spots are occupied by bikes with flat tires that haven't been ridden in years. My main issue is that the bike room has 2 doors, and only one of them has keyed access. This forces people to open the door, walk to the other end, prop the other door open with a loose brick, and then walk their bike in. My other issue is that there aren't doorstoppers to hold the door open, and since the doors have an automatic closing mechanism, it's a race to get your bike in before the door shuts on you. We emailed the strata about this, but their reaction seems to be lukewarm at best.

First Name: Liliana **Vancouver Resident: Yes**

I am a bit frustrated with my residential bike parking. I really like the building were I live, except for this. They don't have a bike room, so they only two choices is to either leave you bike in your vehicle parking

stall (but you cant really lock it to anything) or in your apartment. Since someone will take it I put it in my apartment (in the balcony). But is very frustrating to take it out of the apartment, into the elevator, pass the entrance door.... also I may scratch my furniture or the walls of the apartment as my place is so small and my bike is a bit bulky. I raised issue with the building manager via email but she never replied back.

First Name: Lisa **Vancouver Resident: Yes**

2006-2008 I owned a condo in Mount Pleasant. The building was three stories, 69 units, with underground parking, built in the early 1970s. A storage room in the parking garage was converted into a bike room before we moved there. It had a heavy door that was hard to get in & out of with a bike, racks bolted to the cinderblock walls & floor. The room was fairly small--maybe 200 square feet--holding 20-30 bikes. At least half the bikes in the room were not regularly used--they had a half-inch of dust on them & flat tires. We complained about this to the strata council. We had to wait over a year to get a space in the bike room which was extremely frustrating for daily cycle commuters like us. Before we got access to the bike room, we brought our bikes into the parking garage, then went up the elevator to our suite & stored them in our dining room, as we weren't allowed to have them outside on our 3rd floor deck.

I think all older buildings need to retrofit secure bike parking to allow for at least two bikes per unit, or more if it's a family building that has 3-4 bedroom suites. There should be preference given to regular bike users, so people who are just storing their bike for YEARS & not using it at all should have another option that's less accessible, rather than taking up space in a bike room. Allowing residents to install bike racks in their parking space would be a less secure option, but better than nothing. Also, with the popularity of cargo bikes on the rise, the bike rooms & racks need to be designed with wider 7-9 foot long bikes in mind. :)

First Name: Lori **Vancouver Resident: Yes**

I lived in a condo building that had two bike areas, one was a bike cage in the parkade, the other was an enclosed bike room on the 2nd floor. For convenience reasons I preferred the one in the parkade, so I would not need to entre the building's small lobby with heavy front door and use the elevator with my bike. However I had two different bikes stolen from the bike cage in the parkade, on two different occasions. This was enough to convince me to use the 2nd floor bike room instead.

Both rooms are uncomfortably crowded, not secure enough (2nd floor room does not have a self-closing door). There are not enough bike racks. Also, vertical racks may be conducive for light-weight road bikes, but they are not good for heavier city bikes or step-through cruisers which are more comfortable for biking to work, especially for wearing skirts, nor for bikes with child-seats, baskets, panniers, or cargo bikes or trailers. All of these are best stored with horizontal bike racks (which do take more space than vertical ones).

First Name: Magdalena **Vancouver Resident: Yes**

No bike parking in my old building. I have to leave my bike in the boiler room (after going through two doors and 3 steps down from the main level) or bring it upstairs with me (there's no elevator)

First Name: Maria **Vancouver Resident: Yes**

I live in the Southeast false creek neighbourhood in a strata building. We have a secure bike room underground but I don't use it - nor do most of my neighbour's who have decent bikes. The room has been broken into a couple of times and bikes stolen or damaged, and although improvements have been made, I don't feel comfortable leaving my bike there where I might not lay eyes on it for a week or more. Instead I store it vertically in my bedroom using a Vancouver invention called a Clug. It's convenient, secure, and effective.

First Name: Mark **Vancouver Resident: Yes**

We live in a downtown condo that has 6 bike rooms -- more than adequate for the 31-storey tower.

First Name: Matthew **Vancouver Resident: Yes**

My building used to have a single cement block with 4 slots and lock points located in a dedicated bike area in the building's secured, underground parkade. This serviced approximately 50 bikes, so the area was a cluster of bikes against walls, locked to each other, etc. Building strata council were pressured to increase bike parking and eventually installed some floor bolted, spiral bike locks that added parking for another 20 bikes. Whereas this is an improvement, the area is still a cluster of bikes against walls, locked to each other, etc., as parking for 24 bikes is still inadequate when the building bike numbers are more than double that at any given point in time.

First Name: Michelle **Vancouver Resident: Yes**

We live in a 12-unit condo building and have a relatively secure underground parkade meant for cars. We also have two bike racks, but there is no space for a bike room or cage. For the most part there haven't been any security issues, but a few bikes have been stolen over the years. A number of owners choose to keep more expensive bikes in their units, which is a pain when you're living in a condo (our units are pretty small). For those of us who cycle as our main method of transportation, and use our bikes everyday, it's much easier to be able to park it in the downstairs parking area. The security of our bike area is directly related to the overall security of our underground parking. We recently switched from an aluminum bar type overhead door to a solid style (thieves had been cutting the aluminum bars and accessing the opening mechanism).

First Name: Michelle **Vancouver Resident: Yes**

It took a long time to get a bike rack installed in our 70's strata building's underground - years in fact. When we finally did, it filled immediately. We got another one, it got filled. Whenever I used my bike, there was always the risk of losing my space. Happened all the time. I've wanted a bike rack in my parking space (which I don't otherwise use), but there's no strata follow through (I would even pay to get an approved one installed). So instead, I park in my suite. It's frustrating.

First Name: Mike **Vancouver Resident: Yes**

First I want to say I live in a laneway home, not a multi-family house as requested. However I think my story on bike parking is a relevant one as many others I know in laneway homes or basement suites regularly bike. When I first moved in there was no secure space to lock my bike. My home is small and there was not space to lock the bikes inside either. I would have to lock the bikes in along the fencing in the yard which was not good for security and maintenance as the bike was exposed to the weather.

After a few months I was able to come to an agreement with the landlord to use a portion of the garage for secure bike parking. I was also able to build a rack to store the bikes and charge lights. This made a huge improvement in the convenience and safety of storing my bike. It would be great if a secure bike space or bike shed was built into new laneway houses or suites.

First Name: Mike **Vancouver Resident: Yes**

I live in a Fairview walkup where the storage room doubles as the bike room. It's fairly crowded since there are no racks and the bikes can make it hard to get in to the storage lockers. I enjoy using it because it's on the ground floor so it's easier than carrying my bike up to my apartment or storing it in an underground parkade. On the other hand, it doesn't feel very secure and there's nothing to lock your bike to inside the room,

so anyone with a key to our building could steal a bike. I usually keep my second more expensive bike in my apartment and leave my everyday bike in the bike room since I'm scared of having it stolen.

I haven't asked the management for better bike parking since our building doesn't have any extra room, and for an older building it feels pretty lucky to have a bike room at all. The only better solution I could imagine would be to build some kind of shed in the alley. My ideal bike storage is a dedicated ground floor bike room with racks that accommodate a U lock.

First Name: Nick **Vancouver Resident: Yes**

I live in a building in the Broadway Cambie area. In my building the storage area closes from midnight to 5am. Also my building does not allow bikes in the elevator. So if I come home late I am not able to store my bike without breaking a strata rule.

First Name: Nicole **Vancouver Resident: Yes**

I live in house converted into three apartments. Our bike storage is under the porch and we lock the door to it with a padlock. It is dark and moldy smelling in there, but it's easier than carrying it upstairs to our apartment where there is little space to store it.

First Name: Peggy **Vancouver Resident: Yes**

I live in a co-op building. Our building has tried both bike cages and open bike lockup areas both in the underground parking. Neither of these two solutions works very well because they get full of bikes that are not being stored long term or abandoned. I do not like to go into the underground parking because it feels unsafe and smells of car exhaust. I prefer to store my bike in the apartment. I think individual bike lockers are the answer.

First Name: Richard **Vancouver Resident: Yes**

Our bike parking is in a locked room that is also the laundry and storage room on the first floor with easy access from the front and alley doors. Two racks hold at least 25 bikes for the 18 units in my building and the building next door. Still, the racks are often full due to bikes from people that are no longer there. Lots of people in the building ride bikes. Bikes are allowed in the units as well (or at least no one has ever said otherwise. The building is in Kits and to my knowledge; there have been no bike thefts in the 15 years I have lived there. There are no bike racks outside and bikes are often parked to trees and poles that are not secure.

First Name: Riley **Vancouver Resident: Yes**

We keep our bikes in our cramped apartment because locks will get cut if we leave them on the racks outside.

First Name: Robert **Vancouver Resident: Yes**

I live in a 24-unit stacked townhouse building with a 1-storey underground parking garage. There are maybe 30 parking stalls, but for the 5 months I've lived here, I've never seen more than 5 cars. There are, however, about 20 bikes locked up to 4 or 5 chains hanging on one wall of the garage. When I moved in, the landlord said they couldn't give me permission to lock my bike there, as they had to check with the owner of the unit I'm renting. That has yet to happen.

In the meantime, I would store my bike on my 2nd floor walk-up porch. I live right on one of the designated bikeways in the city, so having a bike is pretty convenient. Unfortunately, my bike was stolen one early morning while I was asleep. I had my lock on the bike, but it wasn't secured to anything - my bad, here I was

thinking because you couldn't see the bike from the street, it would be safe on my private porch. Would I have used the underground parking garage if I had been given access/permission? Not likely, it would have been once extra step to use my bike. Moral of the story? Lock your bike to something at all times, unless you're currently riding it.

First Name: Ron **Vancouver Resident: Yes**

We live at Marine Court Co-op in Marpole, with 55 other families. As originally built about 30 years ago the co-op had a set-aside 'bike room', but it turned out to be much too small for the demand. We tried an exterior bike cage but the chain-link fencing turned out to not be adequately secure. So we converted two parking spaces in our locked underground parking area to bike use, with the addition of two large CORA racks plus additional rack space. Some light paint on the floor and bottom 3 feet or so of the wall helped both with visibility and recognition as 'bike area'. No thefts or problems in the last 5 years or so. Have also retained the original bike room.

First Name: Rosa **Vancouver Resident: Yes**

My boyfriend lives in a 2008 condo with underground secure bike parking easily accessed from the parking garage ramp. The bike parking looks to be at capacity, and a lot of bikes need to be "doubled up" on one side. These racks are unassigned though, so it's hard to tell how many racks one unit is actually using. There is also room in the bike room for a small bench for people to store some bike tools and air pumps. The bike rack near the front entrance has room for about 4 or 5 bikes, usually with 1 or 2 bikes parked there. There were also a few tenants who locked up their bikes by their personal parking stalls. The strata sent a notice that insurance does not allow other items, including bikes to be stored in the parking stall. I would suggest a review of apartment insurance policies because they heavily influence strata by-laws.

First Name: Ross **Vancouver Resident: Yes**

As a renter, I lived in a single-family house with 3 other renters. There was no secure space to lock a bike except on an exposed balcony that was visible and accessible from the street. Luckily, the landlord allowed me to build a small bike shed under the back stairs that allowed me to have a secure storage space for my bikes. However, the other 2 suites in the house did not have any similar storage. A friend of mine that lived in the house prior to myself used to keep his bike in the living room.

First Name: Ryanne **Vancouver Resident: Yes**

I live in the Co-op in Olympic Village and our bike parking is crazy and the least community friendly reality of this place. The day we moved in we parked our bikes in one of three "community" bike rooms, unassigned according to the Co-op rules and welcome, and one of our new neighbors left a note on our door asking us to please remove our bikes because they were parked in their spot! It was a very unpleasant welcome. Then the co-op put in new racks and we found a spot for our family of bikes two adults and one child bike, I took mine out for a week to ride to work and when I went to put it back downstairs someone have labeled the sport next to the other bikes as theirs!

First Name: Sandy **Vancouver Resident: Yes**

I have two expensive bikes. I have had brakes and other small items stolen, that cost $200 to $1000 plus to repair, but make the bike unsafe to drive without (and sometimes hard to notice until riding your bike that the cable to the break was stolen, or the break pad).

I rather park my bike in my apartment, but my building wont let me. What is the difference between a bike

and a stroller going into an apartment, except that I will keep care of my expensive bike and make sure it does not hit anything because I want to keep my bike safe. Plus, it is easier to fill my tires each time, when my bike and pump is upstairs, rather than having to walk with unsafe clip-on pedal shoes through sloped ground and/or oily floors, and have nowhere for my bike pump. Plus, I can't always get a good safe spot to lock my bike safely, as I have a cruiser (big clunky thing with big handle bars and large frame and large tires - but so safe to ride). Or safe because my other bike is a triathlon bike and I don't want a big stroller or other huge bike smacking into it. I prefer, smaller 5 to 20 bikes per bike room facilities rather than 1 very large bike room for the entire building. With a smaller room, I feel safer and I am guaranteed a spot.

First Name: Sarah **Vancouver Resident: Yes**

Our apartment building has two official "bike rooms" in the parking garage, but they're just corners of the parkade that cars can't use. Neither area has places to lock up bikes. I use a chain and lock mine to a utility pipe, which I know I'm not supposed to do. The bike rooms tend to get cluttered with disused tricycles and they aren't very secure - I had my bike stolen from one of the bike rooms last year, for example. We started looking into getting bike racks installed for a more secure place to lock up but we didn't end up pursuing it.

My ideal bike room would be a cage or locked room off the parkade, with a big door and bike racks - or at the minimum just bike secure bike racks in a well-lit area close to the garage door. I definitely like the convenience of coming and going through the garage door and not through the building itself with my bike. Another idea I've had is having a lockable bike stand included in each parking stall - the stand could be used for bike repairs (maybe only when a car is not parked there, depending on the size of the parking space / configuration of the stand). Many parking spots in our building are not used by cars, so most of the time they could be occupied by bikes.

First Name: Scott **Vancouver Resident: Yes**

We live in a mid 80's mid-rise building in the West End. There is a car basement parkcade with just over 40 spaces of which 7 are empty and not assigned. We have talked in our building for years of taking 2 stalls and making a secured bike cage. Because now bikes are either leaning on walls in parking stalls for those that have cars or there are 2 small racks for a total of 8 bikes with is filled with over a dozen bikes. There are at least a 1/2 dozen residents who keep bicycles on their balconies. We need to take action. Maybe this will help?

First Name: Stacey **Vancouver Resident: Yes**

There is not enough room for our bikes and bike trailer. Trailers in our coop often need to "stand alone" and are at higher risk for theft when not locked to the bike rack.

First Name: Stefanie **Vancouver Resident: Yes**

I live in a 3-storey apartment building, recently renovated, at Fraser and Broadway. We have a locked bike cage in the basement, our parking garage. It is locked with a standard key, and fits about 20 bikes. I use the bike locker regularly, and for the most part, it works okay. However there are some major concerns. As an individual who rides everyday, it's a struggle to fit my bike in the cage. The design is poor, the cage is on an angle and not very space efficient. Due to poor choice of caging and stubborn thieves, we've had at least 2 break-ins in 3 years, with several bikes being stolen. It doesn't really feel safe. It also feels like a dumping ground for derelict bikes, people don't see it as storage for their mode of transit like I (and a select few) do.

I haven't complained about these issues, as I'm just a renter and I don't see the property management group being interested in expanding the locker or making it more regulated. They mentioned expanding when it got broken into, but that never materialized. I think it would be great if we had regulated system organized by unit number. We each had a lock up area designated. Regular checks to ensure bikes are not abandoned,

locked in proper locations. We have people leave bikes unlocked outside the cage - this just entices thieves to try to break in.

First Name: Steven **Vancouver Resident: Yes**

We've been living in a three-storey walk-up apartment building on the 10th Ave bikeway (in Fairview) for six years. When we first moved in the storage locker room on the ground floor doubled as a bike room. However, as more and more people moved into our building with bikes the problem of storage and accessing lockers raised its ugly head. There were also a couple of bikes stolen.

Fortunately, our landlord is quite pro-active and could see the general direction of things and got permission from the building's owners to address the problem. She had a wall knocked down and moved some of the storage lockers to create more space and had hangers hung on two walls to accommodate more bikes. The hangers have space for locks so that we can safely store our bikes in the room, which does require a key to access. It's not a perfect solution, but it's a big improvement. We feel fortunate to live in a building that includes the needs of those of us who get around by bike.

First Name: Tim **Vancouver Resident: Yes**

I live in a 13-storey condo building that is part of the Olympic Village development. There is an unlocked bike cage on the second level of underground parking, and many park their bikes in their parking spots or storage lockers. I carry my bike into the elevator and put it on the patio locked to my BBQ. I would like to have it easily accessible as I just walk in the building but there are trade-offs there as well.

First Name: Undisclosed **Vancouver Resident: Yes**

You can use any of my words but can you cite me as anonymous...I just got on the strata council and don't want to be seen as talking bad about our building to the public. Thanks :)

I live in a new 4-storey condo in Kits. There are about 50 units and 1.5 rooms for bike storage. They are in the parkade off the back alley, down two ramps behind two fob-accessible garage doors. The rooms are locked and all residents have a key to these rooms. One bike room has spots for about 40 bikes--some wall mounted racks some floor mounted and is about 50% full. The "half room" has storage for about 20 bikes (wall and floor stands); the other half of the room has some resident storage lockers. In all cases, we need a proper bike lock to secure our bikes. I do use the bike parking to store my bike. I only ride once in a while but generally feel safe leaving my bike there, although I do check on it at least once a month if I haven't ridden, because some storage lockers have been broken into previously. My biggest concern with parking there is that the back ally is in rough shape (not paved) with lots of traffic so it's dusty and a bit scary to ride into the garage. In addition the lock to the bike room doors is hard to use--it is supposed to be "high-security" but I've cut my fingers on it a few times when trying to unlock the door. My only other concern is that someone has been using about 5 bike racks to store their 2 kayaks for the past year.

Although I feel quite safe storing my bike there, some other residents don't (or perhaps don't find it convenient). This means that there are some bikes stored on people's balconies. I have two problems with this: it looks junky from the street reducing the "street appeal" of our building and this means that people are bringing their bikes through the main building tracking mud onto the carpets, and banging up the walls and doors. The improvements I could imagine for my building are paving the back alley so it is safer to ride into and out of the garage. Also, fob access to the bike rooms would be better than the key because it requires less awkward maneuvering of your bike and could also be used to track who enters the room, in case bikes are stolen or damaged. Finally, routine cleaning of the bike rooms and ensuring that people are not using it for personal storage of other large items, such as boats, would help the bike parking serve its intended purpose more successfully. It might also be helpful to have a couple secure individual cages for rent in case people have very expensive,

customized bikes or don't feel safe storing them with the others. This would allow us to prevent people from bringing there bikes into the main building and damaging the common property.

First Name: Undisclosed **Vancouver Resident: Yes**

We have bike storage in our building but it's too crowded so every time I get my bike it's such a huge hassle and also it's not that safe. Storing my bike is cumbersome. Both my partner and I would cycle more if our bikes were easily accessible.

First Name: Undisclosed **Vancouver Resident: Yes**

Underground in the parking garage is a separate room for the bike lockup. It is huge with two doors and special key to enter. You need to enter from the ramp and a parking gate. I live in a multi-plex building.

First Name: Undisclosed **Vancouver Resident: Yes**

I live in a townhouse complex. Units are multi-storied and have individual, outside balcony doors. The central courtyard is a parking lot (shame - could be a great space for gardens and playgrounds, etc.). I think it's about 30+ years old; the fact that it has bicycle rooms is actually pretty amazing, given the time it was built and everything.

The complex has a couple of bicycle rooms. Two for certain. Possibly three. They are publicly accessible (outside) and the doors are locked. Tenants are given a key. They are jam packed with bikes and it's difficult if you are one of the few everyday users like me to use the space. If you have a convenient spot that allows you to easily access your bike (daily), you need to find a way to keep it, otherwise, you come home and you no longer have a place to keep your bike. It's so crowded, I worried about my bike being damaged. Many other tenants leave their children's bikes outside, and one tenant locks their bike to a tree. Inside, there is one rack on the floor and two rows of hooks on the ceiling for hanging bicycles. This set up makes it extremely difficult to get into the space. The last time I poked my head in there, there were a number of children's bikes in front of the floor rack, right inside the door.

The space is fairly secure - in the 14+ years I've lived here, I've never heard of any thefts from the room(s). Still, I keep two of my bikes in my living room and only one in the outside bike room. I suspect a good number of bikes in the room have been forgotten about and tenants have moved without taking them. That, and people don't ride their bikes. I asked the manager to do something about the room a number of years ago when I was still using it. He tried a numbering system, but nothing ever really came of it (unidentified bikes were to be removed, but there was little change). I was hoping it would clean out all the bikes that are just being stored in there and never used. 10 years later, the same bikes still sit there. Well, to improve things, I guess more space and better layout. You shouldn't have to fight to get your bike out (daily). How can you get your bike out if it's in the second row and surrounded by bicycles! Easy access is what is needed, as well as enough space between bikes so they don't get tangled or damaged.

First Name: Undisclosed **Vancouver Resident: Yes**

We have none, I keep my bike in my closet.

First Name: Undisclosed **Vancouver Resident: Yes**

Our building has a large area for bike storage. Although there are many bikes in the storage areas (which are located on P2 and P3), there is still room for more bikes. All Residents need is a key to the storage.

First Name: Undisclosed **Vancouver Resident: Yes**

I own and live in a condo in southeast false creek a block away from the seawall. Majority of residents have at least one bike, and bikes are not allowed in the lobby or on balcony according to strata bylaw, so the underground bike storage is prime real estate. Bicycle storage rooms consist of freestanding bike racks and limited number of cage bike lockers. The strata has a lottery to determine each year, who gets a cage bike locker, and if you do not get selected then you are on a wait list until a locker becomes available or next year when they get reassigned again. The freestanding bike racks are not secure. The building has had break ins and since then the strata got an engraver from the block watch with the VPD so that residents are encouraged to engrave their ID number onto the bike to prevent theft. I think developers should be required to have enough bike cage lockers for every strata unit to have one cage.

First Name: Undisclosed **Vancouver Resident: Yes**

Our building has a bike room on the P1 level and no bikes are allowed to be stored on the balcony. The bike room is one of the only rooms that is repeatedly the target of break-ins. The strats's response to break-ins is never to increase security to this room but to increase security to the parking levels and residential units. Technically we are not allowed to store bikes on the balcony - which we currently do now as we have two high performance road bikes that are too expensive to replace if stolen. In general, our building has little respect for the need for secure bike parking or residents who primarily rely on bikes. It is a newer development in the Olympic Village.

First Name: Vanessa **Vancouver Resident: Yes**

[My friend] lives in an older apartment building with no bike parking and a sporadically functioning elevator, and hauls her bike up 3 flights of stairs. I would let her tell you her own storey but apparently she can't see this post, as a non member of the group

First Name: Will **Vancouver Resident: Yes**

I bike to work every day. Bike parking where I live—with my partner in a one-bedroom apartment in a nine storey apartment building in Vancouver's downtown south--consists of a small, secure room off a hallway adjacent to the lobby at the building's main entrance on Hornby Street. There is limited space in the bike room, and my partner and I are on a wait list to get access to it. For us to move up the wait list, someone who already uses the bike room has to give up their access. This rarely happens. And the wait list grows. So, like most in our building, we store our bikes in our apartment.

To get our bikes into our apartment, we must enter through our building's main entrance and take one of two elevators up. (The only other way into the building is through the parkade, which is not feasible for people with bikes because it would force them to carry the bike up at least one set of stairs.) The front doorway is narrow and the elevators are small. The elevators are also frequently in use so it's not uncommon for them to be too full for a person with a bike to enter. (A quirk of our building—that explains why our elevators are always busy—is that, if you live above the first floor, you cannot get directly to your apartment by any way other than the elevator.

For example, if you are dead set on taking the stairs to your apartment on the second floor or above, you must enter the building through the main entrance, walk through the lobby and down a hallway, take the fire exit up a set of stairs and into the courtyard, walk through the courtyard and re-enter the building through the second floor lobby, and then walk down another hallway that has access the stairwell that connects the second to ninth floors.) Once we get to our floor, we wheel our bikes down the hallway toward our unit. We store our bikes in our living area, but a number of our neighbours leave their bikes in the hallway, outside their

apartments—perhaps because they lack the room inside. As for my bike parking situation at work? It's $#*%. Absolute $#*%.

First Name: William **Vancouver Resident: Yes**

I have lived in Vancouver for 3 years and have always ascribed to the idea that if you let your bike out of sight, it will disappear. My bike has always lived in my apartment with me as a beautiful object and for the sense of comfort I get knowing where it is. I've never used the dark, dirty bike room filled with rarely used bikes. Since I've lived here three friends have had their bikes stolen.... All from "secure" bike rooms. When the bike room and garage in my building were broken into recently strata council made huge upgrades to security throughout the building, including increasing lock strength and adding cameras. No upgrades were made to the bike room security, yet they still require that residents use the bike room for storage. I quietly continue to carry my bike to my apartment every day hoping I don't get a strata complaint.

First Name: Aline **Vancouver Resident: No**

I'm within Metro Vancouver and between 2 of us, we have 4 bikes (you know, MTB and road). We just moved into a relatively new building (5 years) but all the bike storage space was already taken so we're back to 4 bikes in our little apartment. Kind of a bummer since we're paying for the service with the rent. I also rarely see any other bikes around the building so I don't think that the bikes being stored get taken out much.

Currently I think that a lot of bike storage places are where bikes go to die. So, I'd appreciate better management of the storage locker so that people who would actually use it, can use it. Maybe this could happen just by better oversight from the building manager, or just have a rental fee to encourage more responsible use of the space.

First Name: Allen **Vancouver Resident: No**

I live in a 20+ year old low-rise apartment building on the UBC campus, a four-storey student family housing block. There are a few bike rooms in the building, the biggest of which doubles as a passageway to the back exit. It's probably more secure than the racks outside, since access is through a keyed door, and it's sheltered, which is a big plus. A few families have moved out recently and the racks are a little less crowded than they used to be, but the arrangement is still a suboptimal one for bike parking. In the photos you can see that the racks are double-sided racks but it's annoying that some people don't know how to use them properly (e.g. parking in adjacent slots on the same side) - this is probably more a behavioral issue than a design issue. Also, the large pillars separating the bike racks from the passageway make it difficult to get your bike to the racks - this is exacerbated by the gap between the racks being too small, so it is hard to access rack slots furthest in.

Otherwise, the bike parking is good, and I'm thankful for having indoor, secured, bike parking, especially on the UBC campus. The main concern most residents have is with security - we constantly hear stories of residents leaving their bikes outdoors and having them stolen (though sometimes this is because they do not know how to lock their bikes properly... one neighbour had his bike frame and rear wheel stolen because he had locked his front wheel only, and it was a quick release.). I can't comment on other residential bike parking in Vancouver, but I have had little trouble with on-street parking.

First Name: Anna **Vancouver Resident: No**

I used to live in a 70's condo building with a bike room. There were several problems with the bike room: too small, hard to access (stairs or through dark underground garage, room had no windows and I was always worried getting locked in, bike hooks were way too high and too close to each other. So the room was only useful for storing a bike that gets only every once in a while. For everyday biking it didn't work. A solution would have been to convert one or two car parking spaces into a bike cage, but it would have gone to a strata

vote and most people drove and didn't bike for transportation. So it is really important that buildings are built with plenty of good quality bike parking from the start. The requirements for developers should be based on the assumption that all resident bike, as this could be the case 20 years or so. It is very difficult to add bike parking after the fact, when there is also a shortage of car parking.

First Name: CaroLyn **Vancouver Resident: No**

Hi! I live in Richmond in an old, low-rise apartment building. There is a shared bike storage room, but the door is frequently not closed properly. I've experienced multiple thefts and vandalism events against my bikes in there. I store my important bikes in my unit now. I wish there was a better way to store my bike outside of my wall-to-wall carpeted unit! (I'm not allowed to remove the carpeting due to noise to downstairs neighbours).

First Name: Roy **Vancouver Resident: No**

I moved into my new build apartment (in North Vancouver) June 30, 2015. On the night of July 4, 2015 someone attempted to break into my caged storage locker which contained three expensive mountain bikes. They were unsuccessful, they left the pry bar they had been using to try and break the lock at the side of the locker, they even climbed over the fencing above the lockers and tried jumping in from the top. The only people that could know they were there were a few residents (unlikely to steal from your new neighbours) and the construction crew who were still finishing off parts of the building. My theory is one of them saw it and came back in the middle of the night. The locker room is in a secure parkade, the room itself requires fob access. Somehow they were smart enough to get past that security, yet dumb enough to not be able to break into the locker itself. Still, someone of the criminal persuasion now knows my bikes were there and could well come back with better equipment, our bikes now live in my living room, which is less than ideal, but I can sleep better at night.

Vancouver is world famous for its mountain biking, many people have several expensive bikes, safe storage is a big priority! Ideally all homes would come with the option of a higher security locker option, something with a roller shutter door that hides its contents and is not easily opened or broken into. Ideally it would be big enough for four bikes. My bikes may go back down when the construction crew is finished, they will be locked to something heavy inside the locker as well as the two locks on the door. Even then I will still worry about theft!

First Name: Undisclosed **Vancouver Resident: No**

I lived in Vancouver from 2010 - 2014 during which time I lived in two different walk-up apartments, one in Marpole, the other in Kerrisdale. Both offered "storage rooms" in which we could leave our bikes. The one in Marpole felt utterly insecure, with a pile of mangled bikes stacked towards the back of the entirely too-small room. I was told that leaving my bike in that room would lead to either its outright theft, or at the very least loss of parts someone else wanted. No effort had ever been made to determine who was stealing bikes or parts from a room located entirely within the building (a resident or ex-resident, obviously).

For that reason, the entire time I lived there, I carried my commuter bike up four flights of stairs every time I came home. It really sucked, but I was determined not to drive, so I did it. In the building in Kerrisdale, which was a bit smaller (only three stories, not four), I lived directly above the bike room, and I felt more secure, so I left my bike there, but locked to the chain link dividers between lockers. There was an apparent robbery in the Kerrisdale building while I lived there, but my bike was at UBC with me that day, so it was fine, and I don't think any other bikes were stolen them either (everyone locked them to something) I also knew my neighbours in that building, and liked them, unlike the Marpole building, where the neighbors seemed mostly to hate one another and the foreign company that owned the building. Marpole also had real problems with drugs and property crime, so it just felt less secure. Bike rooms need to actually be secure and have the ability to lock up bikes, otherwise people don't use them.

APPENDIX C

EXAMPLES OF LEGISLATION

SECTION 5.2

Topic:	Statement of Intent
Source:	City of Portland (2014)
Document:	Zoning Code Title 33: Planning and Zoning
Chapter, Section:	Chapter 33.266, Section 33.266.200
Link:	https://www.portlandoregon.gov/bps/article/53320
Text:	Bicycle parking is required for most use categories to encourage the use of bicycles by providing safe and convenient places to park bicycles. These regulations ensure adequate short and long-term bicycle parking based on the demand generated by the different use categories and on the level of security necessary to encourage the use of bicycles for short and long stays. These regulations will help meet the City's goal that 10 percent of all trips be made by bicycle. ↖

Topic:	Statement of Intent
Source:	City of Cambridge (2015)
Document:	Zoning Ordinance
Chapter, Section:	Article 6.000, Section 6.11
Link:	https://www.cambridgema.gov/~/media/Files/CDD/ZoningDevel/Ordinance/zo_article6_1363.ashx
Text:	Intent. It is the intent of this Article 6.000 to reduce traffic congestion, noise, vibrations, fumes and safety hazards caused by large commercial trucks, thereby promoting the safety, health and welfare of the public, by establishing requirements for off street parking, bicycle parking and loading and restrictions on the use of City street during the night-time by large commercial trucks with points of origin and destinations outside the City of Cambridge in order to implement the purposed [sic] of the Zoning Act, Section 2A of Chapter 808, and Article 1.000. Section 1.30 of the Cambridge Zoning Ordinance, including: • to lessen congestion in the streets • to conserve health • to conserve the value of land and buildings • to prevent pollution of the environment • to protect residential neighborhoods from incompatible activities, and • to preserve and increase the amenities of the city. The number of parking and loading spaces required herein varies according to type, location and intensity of development in the different zoning districts, and to proximity of public transit facilities. This Article 6.000 requires development of adequate parking facilities to meet the reasonable needs of all building and land users without establishing regulations which unnecessarily encourage automobile usage. The parking and bicycle parking standards contained herein are intended to encourage public transit, bicycle usage and walking in lieu of automobiles where a choice of travel mode exists. It is also the purpose of this Article to allow flexibility in providing required parking through shared or off site arrangements in order to accommodate the automobile in the urban environment in a less disruptive way. Development regulations and design standards have been established to reduce hazard to pedestrians on public sidewalks, to ensure the usefulness of parking, bicycle parking and loading facilities, and where appropriate, to avoid potential adverse impacts on adjacent land uses, and to enhance the visual quality of the city. ↖

SECTION 5.3

Topic:	Definitions
Source:	The Corporation of the City of North Vancouver (2015)
Document:	Zoning Bylaw, 1995, No. 6700
Chapter, Section:	Division I, Part 2
Link:	http://www.cnv.org/~/media/8993D9F691E6414A95F5B279EB8ECD5D.PDF
Text:	Bicycle Room means a portion of a floor with solid opaque walls for Secure Bicycle Parking Use; Bicycle Compound means a portion of a floor without solid opaque walls for Secure Bicycle Parking Use. ↖

Topic:	Definitions
Source:	City of Victoria (2011)
Document:	Bicycle Parking Strategy
Chapter, Section:	Chapter 6
Link:	http://www.victoria.ca/assets/Departments/Engineering~Public~Works/Documents/parking-bicycle-strategy.pdf
Text:	Bicycle Rooms are locked rooms or cages which are accessible only to cyclists, and which may contain bicycle racks to provide extra security against theft. Bicycle rooms are best used in areas where there is a moderate to high demand for parking, and where cyclist who would use the bicycle parking are from a defined group, such as a group of employees. Bicycle rooms are also popular for apartment buildings, particularly smaller ones in which residents are familiar with one another. Bicycle Compounds are fully enclosed, stand-alone bicycle parking structures. Bicycle compounds offer a medium level of security in that while the owner can lock the bicycle within the enclosure, other users also have access to the enclosure. For this reason a level of surveillance should be provided to ensure satisfactory operation. Public lighting is desirable when the compound is located in a public place and used after dark. Bicycle compounds should not only have a locked gate but should also allow for the frame and both wheels to be locked to a rail within the enclosure. Bicycle compounds are recommended for employment or residential bicycle parking areas, ideally equipped with additional security and lighting if the facilities are to be used at night. Bicycle compounds are also suitable for all-day parking at locations such as transit exchanges, workplaces and schools and can be located at street level or in parking garages, including City-owned parkades. Typical surrounding land uses include shopping malls, multi-family buildings, office buildings, recreational facilities and multi-modal transit stations. ↖

Topic:	Non-Standard Bicycles
Source:	City of Davis (2014)
Document:	Ordinance NO. #1-13
Chapter, Section:	Article 40.25A, Section 40.25A.030
Link:	http://bicycles.cityofdavis.org/Media/Default/Documents/PDF/Bicycles/Beyond%20Platinum%20Bicycle%20Action%20Plan/Beyond%20Platinum%20Bicycle%20Action%20Plan%20Appendix%2002-04-14.pdf
Text:	Alternative Bicycle: Non-traditional bicycles with larger parking space requirements, including but not limited to, cargo bikes, bikes with trailers, recumbent bikes, etc. ↖

Topic: Shower Facilities
Source: City of Toronto (2014)
Document: City of Toronto Zoning By-law 569-2013
Chapter, Section: Chapter 230, Section 230.5.1.10 (7)
Link: http://www.toronto.ca/zoning/bylaw_amendments/ZBL_NewProvision_Chapter230.htm
Text: If a building has uses, other than dwelling units, for which a "long-term" bicycle parking space is required, shower and change facilities must be provided for each gender at the following rate:

(A) none if less than 5 required "long-term" bicycle parking spaces;
(B) 1 for 5 to 60 required "long-term" bicycle parking spaces;
(C) 2 for 61 to 120 required "long-term" bicycle parking spaces;
(D) 3 for 121 to 180 required "long-term" bicycle parking spaces; and
(E) 4 for more than 180 required "long-term" bicycle parking spaces. ↖

SECTION 5.4

Topic: Bicycle Parking Ratios
Source: City of Portland (2014)
Document: Zoning Code Title 33: Planning and Zoning
Chapter, Section: Chapter 33.266, Table 266-6
Link: https://www.portlandoregon.gov/bps/article/53320
Text: See full table in link above. ↖

Topic: Bicycle Parking Ratios
Source: City of Portland (2015)
Document: Zoning Code Title 33: Planning and Zoning
Chapter, Section: Chapter 33.510, Section 33.510.020
Link: http://www.portlandonline.com/shared/cfm/image.cfm?id=53363
Text: The regulations of this chapter apply to the Central City plan district. The boundaries of the plan district and its subdistricts are shown on Map 510-1 at the end of this chapter, and on the Official Zoning Maps. The plan district standards for uses, floor area ratio, height, bonuses, transfer of development rights, required residential development, amount of parking, and Central City master plans control when in conflict with any base or overlay zone. For other regulations, in cases of conflict the most restrictive regulation controls. The information depicted on Maps 510-1 through 510-7 is part of the plan district regulations and is subject to the same amendment procedures as amendments to the text of this chapter. ↖

Topic: Bicycle Parking Ratios
Source: City of Boulder (2015)
Document: Municipal Code
Chapter, Section: Chapter 9, Section 9-9-6
Link: https://www.municode.com/library/co/boulder/codes/municipal_code?nodeId=18020
Text: See full table in link above. ↖

SECTION 5.5

Topic: Bicycle Access in Buildings
Source: New York City Department of Transportation (2015)
Document: Bikes in Buildings website
Chapter, Section: N/A
Link: http://www.nyc.gov/html/dot/html/bicyclists/bikesinbuildings.shtml
Text: Bikes in Buildings is a program created to implement the Bicycle Access to Office Buildings Law. The Bicycle Access to Office Buildings Law aims to increase bicycle commuting by providing cyclists with the opportunity to securely park their bicycles in or close to their workplaces. The program allows tenants of office buildings to request bicycle access for their employees. In response to a request, a building owner or manager must either grant access or request an exception from the New York City Department of Transportation. The law only applies to commercial office buildings with at least one freight elevator. It does not apply to residential buildings or any other building that is not primarily composed of offices. More information at the link above.

Topic: Bicycle Access in Buildings
Source: City and County of San Francisco (2012)
Document: Ordinance No. 46-12
Chapter, Section: N/A
Link: http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances12/o0046-12.pdf
Text: Ordinance amending Section 400 and adding Section 402 to the San Francisco Environment Code to 1) require the owners of existing commercial buildings to either provide secure bicycle parking in their buildings or allow their tenants to bring their bicycles into the building.

SECTION 5.6

Topic: Location
Source: National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) (2012)
Document: Model National Bicycle Parking Ordinance: With Annotations
Chapter, Section: Section III, § 4
Link: http://changelabsolutions.org/publications/implementation-enforcement-clauses
Text: 18: § 4. LOCATION: All Bicycle Parking Spaces required by [Section III] shall be located in an area, preferably on the ground floor, that (i) can be conveniently and safely accessed by bicycle and by foot in a way that minimizes conflicts with motor vehicles, (ii) is not isolated, and (iii) maximizes visibility by parking facility patrons and attendants.

Topic: Location
Source: City and County of San Francisco (2013)
Document: San Francisco Planning Code
Chapter, Section: Section 155.1, (b) (1)
Link: http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances13/o0183-13.pdf
Text: 155.1 (b) (1) The location of such spaces shall allow bicycle users to ride to the entrance of the space or the entrance of the lobby leading to the space. The design shall provide safe and convenient access to and from bicycle parking facilities. Safe and

convenient means include, but are not limited to, ramps and wide hallways as described below. Escalators and stairs are not considered safe and convenient means of ingress and egress and shall not be used. Use of elevators to access bicycle parking spaces shall be minimized for all uses and if necessary shall follow the requirements below. Bicycle parking shall be at least as conveniently located as the most convenient nondisabled car parking provided for the subject use. Residential buildings shall not use space in dwelling units, balconies or required private open space for required Class 1 bicycle parking. For non-residential uses, any elevator necessary to access bicycle parking facilities larger than 50 spaces shall have clear passenger cab dimensions of at least 70 square feet and shall not be less than seven feet in any dimension. ↖

Topic: Access
Source: City of Cambridge (2015)
Document: Zoning Ordinance
Chapter, Section: Article 6.000, Section 6.106
Link: https://www.cambridgema.gov/~/media/Files/CDD/ZoningDevel/Ordinance/zo_article6_1363.ashx
Text: 6.106.1 If there is a change in grade from the public right-of-way to the Bicycle Parking Spaces, then the primary access route must have a slope no greater than five percent (5%), or may have a slope of no greater than eight percent (8%) if level landings are provided at every thirty (30) feet of linear distance; or access may be provided by means of an elevator with minimum interior dimensions of eighty (80) inches by fifty-four (54) inches.

The primary access route must not require lifting bicycles over any steps or stairs.
All access routes must be clear of obstructions, which shall include Bicycle Parking Spaces, motor vehicle parking spaces and loading spaces; however, doors or gates that must be opened to access the Bicycle Parking Spaces shall not be considered obstructions so long as they may be conveniently opened and closed by bicycle users.
All access routes, along with the Bicycle Parking Spaces themselves, must be appropriately lighted to allow for safe nighttime use.

6.106.2 Additional Access. So long as there is at least one primary access route meeting the requirements set forth in Section 6.106.1 above, Bicycle Parking Spaces may be accessed secondarily by routes that do not meet those exact requirements, such as parking garage entrance ramps or stairways with adjacent flat stairway channels along at least one edge of the stairway. However, all access routes must be clear of obstructions as set forth in 6.106.1(d) above. ↖

SECTION 5.8

Topic: Abandoned Bicycles
Source: Association of Pedestrian and Bicycle Professionals (2010)
Document: Bicycle Parking Guidelines, 2nd edition
Chapter, Section: 2-55
Link: http://www.apbp.org/?page=publications
Text: Abandoned bicycles (those missing major parts or with flat tires and rusted chains) are a visual nuisance and discourage other cyclists from using the bicycle parking. A typical abandoned bicycle practice involves posting a notice on the bicycle at least two weeks

in advance of removing the bicycle. The notice should state that the bicycle will be removed by a certain date and provide the name and contact information for the person to contact in case the bicycle is mistakenly identified as abandoned. Abandoned bicycles can often be donated to local nonprofits, many of which work with disadvantaged youth on after-school and skills training programs. Jurisdictions with a bicycle rack request process should also integrate requests for abandoned bicycle removal into that process.

Topic: Abandoned Bicycles
Source: City of Thunder Bay (2012)
Document: Thunder Bay Bicycle Parking Guidelines
Chapter, Section: N/A
Link: http://www.thunderbay.ca/Assets/Living/Active+Transportation/docs/Thunder+Bay+Bicycle+Parking+Guidelines.pdf
Text: It is recommended that the City establish a year-round schedule for maintaining, inspecting and conducting repairs to bicycle parking, and removing abandoned and derelict bicycles. Business owners should be educated about and encouraged to follow a similar maintenance schedule. Creating a notice for the removal of abandoned bicycles and incorporating its use into the maintenance routines of both City crews and business owners would standardize the process of dealing with abandoned bicycles. Developing a partnership with an agency who could make use of these bicycles, such as Bikes for Humanity, would provide a positive solution to disposing of the bicycles that are still useable.

Topic: Abandoned Bicycles
Source: National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) (2012)
Document: Model National Bicycle Parking Ordinance: With Annotations
Chapter, Section: Section V, § 3
Link: http://changelabsolutions.org/publications/implementation-enforcement-clauses
Text: On [a quarterly basis], owners of property (or a designee) subject to [Sections II or III of this Ordinance] shall remove, from all Bicycle Parking Spaces associated with their property, including those located on the public right-of-way, bicycles that have been abandoned. A bicycle shall be deemed to be abandoned if it has not been removed after having been tagged with a notice of removal for [2] weeks for Short-Term Bicycle Parking Spaces or [4] weeks for Long-Term Bicycle Parking Spaces. However, a bicycle shall not be deemed to be abandoned if the bicyclist and property owner (or designee) have a written agreement regarding provision of long term storage covering the time period in question. Abandoned bicycles may be donated to non-profits that reuse bicycles or may be disposed of in any lawful manner.

Removal of abandoned bicycles is critical. Not only do they effectively eliminate bicycle parking spaces, but they are also an eyesore, deter bicycle users, and turn others against bicycle parking. Some cities, like Emeryville, California, require property owners to remove abandoned bicycles from short-term spaces on a monthly basis.

In the event that the original owner later disputes the abandonment, the issue of whether the item was “intentionally forsaken,” usually turns on the original owner’s actions and the specific circumstances. Evidence that a bicycle has been neglected for an extended period in a public bicycle parking area, particularly after having been tagged

with an abandonment notice, would provide evidence of abandonment. Jurisdictions can also encourage property owners to post a sign near bicycle parking that notifies bicyclists that abandoned bicycles will be donated or disposed of in a lawful manner, and identifies the criteria for finding abandonment set forth in the ordinance. Such a sign could provide additional evidence of abandonment in the event a dispute arose. As state laws can vary, municipalities should consult their individual state's law on abandonment of personal property to ensure their ordinance is consistent. ↖

SECTION 5.9

Topic:	Permitted Flexibility
Source:	City of Cambridge (2015)
Document:	Zoning Ordinance
Chapter, Section:	Article 6.000, Section 6.105; 6.108
Link:	https://www.cambridgema.gov/~/media/Files/CDD/ZoningDevel/Ordinance/zo_article6_1363.ashx
Text:	Otherwise, flexibility in the design of bicycle parking shall be allowed pursuant to the provisions for modification by special permit as set forth in Section 6.108 below. Such modifications shall allow for consideration of new or innovative technologies that provide equal or greater convenience and accessibility to bicyclists when compared to facilities designed according to the Bicycle Parking Guide standards 6.108 Modification of Requirements by Special Permit: Any requirement set forth in this Section 6.100 may be modified upon the granting of a special permit by the Planning Board. Given that community standards for bicycle use and bicycle parking have evolved and may continue to evolve in the future, the intent of this provision is to provide a mechanism for the review and approval of alternative technologies and methods for providing bicycle parking that may provide equal or greater benefits to bicycle users but may not conform to the exact requirements set forth in this Section. ↖

SECTION 5.10

Topic:	Bicycle Parking Excluded from Floor Area Calculation
Source:	City of Los Angeles (2015)
Document:	Official City of Los Angeles Municipal Code
Chapter, Section:	Chapter 1, Article II, Section 12.21.1
Link:	http://www.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:lapz_ca
Text:	A: Limitations: 5. In computing the total floor area within a building, the gross area confined within the exterior walls within a building shall be considered as the floor area of that building, except for the space devoted to bicycle parking, stairways, elevator shafts, light courts, rooms housing mechanical equipment incidental to the operation of buildings, and outdoor eating areas of ground floor restaurants. ↖

Topic:	Bicycle Parking Excluded from Floor Area Calculation
Source:	City of New York (2015)
Document:	Zoning Resolution: The City of New York
Chapter, Section:	Article II, Chapter 5, 25-85

Link: http://www.nyc.gov/html/dcp/pdf/zone/allarticles.pdf?r=2

Text: 25-85 Floor Area Exemption R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 (R=Residential districts) In all districts, as indicated, space provided for enclosed #accessory# bicycle parking spaces pursuant to the standards of this Section, shall be excluded from the calculation of #floor area#, provided that: (a) the space excluded from #floor area# does not exceed an amount equal to 15 square feet multiplied by the number of required spaces or, if spaces are waived pursuant to paragraphs (a), (b), (c) or (d) of Section 25-811 (Enclosed bicycle parking spaces), the number that would have been required but for the waiver, or, if spaces are not required because the #building# was constructed prior to April 22, 2009, the number that would be required if such #building# were newly constructed; and (b) the #accessory# bicycle parking spaces provided meet the standards for required bicycle parking of Section 25-83 (Restrictions on Operation, Size and Location of Enclosed Bicycle Parking Spaces). Notwithstanding the provisions of paragraph (a) of this Section, for the #uses# listed in the table, the amount of space that may be excluded from the calculation of #floor area# shall not exceed an amount equal to 15 square feet multiplied by the number of spaces set forth in the table.

Topic: Density Bonus

Source: City of Portland (2015)

Document: Zoning Code Title 33: Planning and Zoning

Chapter, Section: Chapter 33.510, Section 33.510.210

Link: http://www.portlandonline.com/shared/cfm/image.cfm?id=53363

Text: C. Bonus floor area options: 8.
Locker room bonus option. To encourage bicycling, projects in the CX and EX zones outside of the South Waterfront Subdistrict that provide locker room facilities and extra long-term bicycle parking receive bonus floor area. For each square foot of area developed and committed to locker room facilities, a bonus of 40 square feet of additional floor area is earned. To qualify for the bonus, the following must be met:

- The locker room facility must include showers, a dressing area, and lockers;
- All tenants of the building must be able to use the locker room facility; and
- At least 110 percent of the required long-term bicycle parking for the site must be provided and must meet the standards of 33.266.220.B., Long-term Bicycle Parking.

SECTION 5.11

Topic: Applicability

Source: City and County of San Francisco (2013)

Document: San Francisco Planning Code

Chapter, Section: Section 155.2, (a)

Link: http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances13/o0183-13.pdf

Text: (a) Applicability. The requirements of this Section apply in all the following cases regardless of whether off-street automobile parking is available except if indicated:

(1) New Building; or

(2) addition of a dwelling unit to an existing building where off-street vehicle parking exists; or

(3) addition to a building or lot that increases the building's gross floor area by more than 20 percent: or

(4) change of occupancy or increase in intensity of use which would increase the

number of total required bicycle parking spaces {inclusive of Class 1 and 2 spaces in aggregate) by 15 percent; or
(5) where DBI determines that an addition or alteration meets the bicycle parking thresholds set in the State Law California Title 24. Part 11. Sec 5.710.6.2: or
(6) addition or creation of new gross square footage or an increase in the capacity of off-street vehicle parking spaces for an existing building or lot, regardless of whether such vehicle parking is considered accessory or a principally or conditionally permitted use. ↖

Topic: Applicability
Source: City of Davis (2014)
Document: Ordinance No. #1-13
Chapter, Section: Article 40.25A, Section 40.25A.020
Link: http://bicycles.cityofdavis.org/Media/Default/Documents/PDF/Bicycles/Beyond%20Platinum%20Bicycle%20Action%20Plan/Beyond%20Platinum%20Bicycle%20Action%20Plan%20Appendix%2002-04-14.pdf
Text: (a) The provisions of this article shall apply to:
(1) All new multiple dwelling developments, non-residential developments, community facilities
(2) Existing developments that involve a change in use (e.g. from retail to quick serve restaurant, and commercial uses set forth in the provisions of this article requiring planning approval or a building permit. or residential to office) requiring planning approval or a building permit.
(3) Existing developments that involve expansion, intensification, addition or any other changes to the site requiring planning approval or a building permit. ↖

Topic: Motor Vehicle Parking Reductions
Source: City of Portland (2014)
Document: Zoning Code Title 33: Planning and Zoning
Chapter, Section: Chapter 33.266, Section 33.266.110 E.
Link: https://www.portlandoregon.gov/bps/article/53320
Text: (1) The minimum number of required parking spaces may not be reduced by more than 50 percent through the exceptions of this subsection. The 50 percent limit applies cumulatively to all exceptions in this subsection.
(3) Bicycle parking may substitute for up to 25 percent of required parking. For every five non-required bicycle parking spaces that meet the short or long-term bicycle parking standards, the motor vehicle parking requirement is reduced by one space. Existing parking may be converted to take advantage of this provision. ↖

Topic: Motor Vehicle Parking Reductions
Source: City and County of San Francisco (2013)
Documentw San Francisco Planning Code
Chapter, Section: Section 150 (e)
Link: http://w.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances13/o0183-13.pdf

Text: Reduction and Replacement of Off-Street Parking Spaces. Notwithstanding subsection (d) above, off-street parking spaces may be reduced and replaced by bicycle parking spaces based on standards provided in Section 155.1(d) of this Code. Once bicycle parking spaces replace an automobile parking space, such bicycle parking shall not be reduced or eliminated. Such bicycle parking spaces may be converted back to automobile parking space, provided that the required numbers of bicycle parking spaces subject to Sections 155.2 and 155.3 of this Code are still met after removal of bicycle parking spaces. New buildings, existing buildings subject to bike parking rules, and existing buildings not subject to bike parking rules can all voluntarily reduce their auto parking for bike parking (155.1 (d)).

Topic: Motor Vehicle Parking Reductions
Source: City of Minneapolis (2015)
Document: Code of Ordinances
Chapter, Section: Chapter 541, Article III, 541.22
Link: https://www.municode.com/library/mn/minneapolis/codes/code_of_ordinances?nodeId=11490
Text: Bicycle incentive: The minimum automobile parking requirement for each non-residential use may be reduced ten (10) percent or one (1) space, whichever is greater, where bicycle parking spaces are provided equal to twenty-five (25) percent of the number of required automobile spaces specified in Table 541-1, Specific Off-Street Parking Requirements, but not less than four (4) bicycle parking spaces. This incentive shall allow for a reduction in the automobile parking requirement of no more than twenty-five (25) spaces on a zoning lot. To qualify for this incentive, bicycle parking shall comply with the standards for required bicycle parking as specified in this chapter. Where the bicycle incentive calculation results in a number less than or equal to the minimum bicycle parking requirement for a use specified in Table 541-3, Bicycle Parking Requirements, the bicycle incentive shall be increased to one (1) space greater than the minimum requirement.

Topic: Motor Vehicle Parking Reductions
Source: City of Seattle (2015)
Document: Municipal Code
Chapter, Section: Chapter 23.54, Section 23.54.020
Link: https://www.municode.com/library/wa/seattle/codes/municipal_code
Text: For new or expanding offices or manufacturing uses that require 40 or more parking spaces, the minimum parking requirement may be reduced by up to a maximum of 40 percent by the substitution of alternative transportation programs, according to the following provisions:

d) For every four covered bicycle parking spaces provided, the total parking requirement shall be reduced by one space, up to a maximum of 5 percent of the parking requirement, provided that there is access to an arterial over improved streets.

Topic: Motor Vehicle Parking Reductions
Source: City of Toronto (2014)
Document: City of Toronto Zoning By-law 569-2013
Chapter, Section: Chapter 200, Section 200.5.10.1 (12)
Link: http://www.toronto.ca/zoning/bylaw_amendments/ZBL_NewProvision_Chapter200.htm

Text: Policy Area 1 (PA1) Parking Space Reduction for Bicycle Parking Spaces: In Policy Area 1 (PA1) the total minimum number of vehicle parking spaces required on a lot may be reduced at a rate of 1 vehicle parking space for each 5 bicycle parking spaces provided in excess of the minimum number of bicycle parking spaces required by Chapter 230 if the reduction of vehicle parking space is not greater than 20% of the total minimum vehicle parking spaces required. ↖

Topic: Motor Vehicle Parking Reductions
Source: City of Los Angeles (2015)
Document: Official City of Los Angeles Municipal Code
Chapter, Section: Chapter 1, Article II, Section 12.21.A.4.4.
Link: http://www.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:lapz_ca
Text: Off-Street Automobile Parking Requirements.(3/13/13): New or existing automobile parking spaces required by the Code for all uses may be replaced by bicycle parking at a ratio of one automobile parking space for every four bicycle parking spaces provided. Notwithstanding the foregoing, no more than 20 percent of the required automobile parking spaces for nonresidential uses shall be replaced at a site. Automobile parking spaces for nonresidential projects or buildings located within 1,500 feet of a portal of a fixed rail transit station, bus station, or other similar transit facility, as defined by Section 12.24 Y., may replace up to 30 percent of the required automobile parking spaces with bicycle parking. For buildings with less than 20 required automobile parking spaces, up to 4 parking spaces may be replaced.

Residential buildings may replace 10 percent of the required automobile parking with bicycle parking. Automobile parking spaces for residential projects or buildings located within 1,500 feet of a portal of a fixed rail transit station, bus station, or other similar transit facility as defined by Section 12.24 Y. may replace up to 15 percent of the required automobile parking spaces with bicycle parking. If a residential building has applied for and received a density bonus under Section 12.22 A.25., 30 percent of the required automobile parking may be replaced. In such cases, the replacement of automobile parking with bicycle parking shall be implemented in lieu of the parking options in Section 12.22 A.25.(d).

Bicycle parking installed pursuant to this Section may be installed in existing automobile parking spaces and shall not be considered to violate the maintenance of existing parking as defined by Section 12.21 A.4.(m). The ratio of short- to long-term bicycle parking provided for pursuant to this Section shall be provided in accordance with the requirements set forth for each use as defined by Section 12.21 A.16.(a). If additional bicycle parking is provided beyond what is required by Section 12.21 A.16., the ratio of short-term to long-term bicycle parking provided may be determined by the business or property owner. ↖

Topic: Motor Vehicle Parking Reductions
Source: District of Columbia Municipal Regulations (2014)
Document: 18-1215: Bicycle Parking in Residential Buildings: Space Requirements
Chapter, Section: Chapter 18, Section 1214
Link: http://www.dcregs.dc.gov/Gateway/NoticeHome.aspx?noticeid=5197471

Text: 1214.1 All existing residential buildings with eight (8) or more units shall provide secure bicycle parking spaces for the storage of bicycles in operable condition.
1214.2 Each existing residential building covered by § 1214.1 shall provide a reasonable number of bicycle parking spaces within thirty (30) days after written request from one (1) or more tenants or property owners. A reasonable number shall be defined as the lesser of either:

(a) One (1) bicycle parking space for each three (3) residential units; or
(b) Enough bicycle parking to meet the requested demand.

1214.3 If a complaint of noncompliance with this requirement is filed with the District Department of Transportation (DDOT) by one or more residents, DDOT shall facilitate discussions between the parties to determine the number of bicycle parking spaces that the residential building will provide. If the resident(s) and residential building cannot reach an agreement, DDOT shall make a determination of the number of bicycle parking spaces that the residential building shall provide. ↖

Topic: Motor Vehicle Parking Reductions
Source: National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) (2012)
Document: Model National Bicycle Parking Ordinance: With Annotations
Chapter, Section: Section II, § 9
Link: http://changelabsolutions.org/publications/implementation-enforcement-clauses
Text: (A) For every [6] Bicycle Parking Spaces provided, the number of required off-street motor vehicle parking spaces (excluding parking spaces for individuals with disabilities) on a site shall be reduced by [1] space.
If a community is concerned about maintaining a certain minimum number of vehicle parking spaces, a provision can be added that caps the available credit, e.g. "The total number of required off-street vehicle parking spaces shall not be reduced by more than [20]% pursuant to this credit."

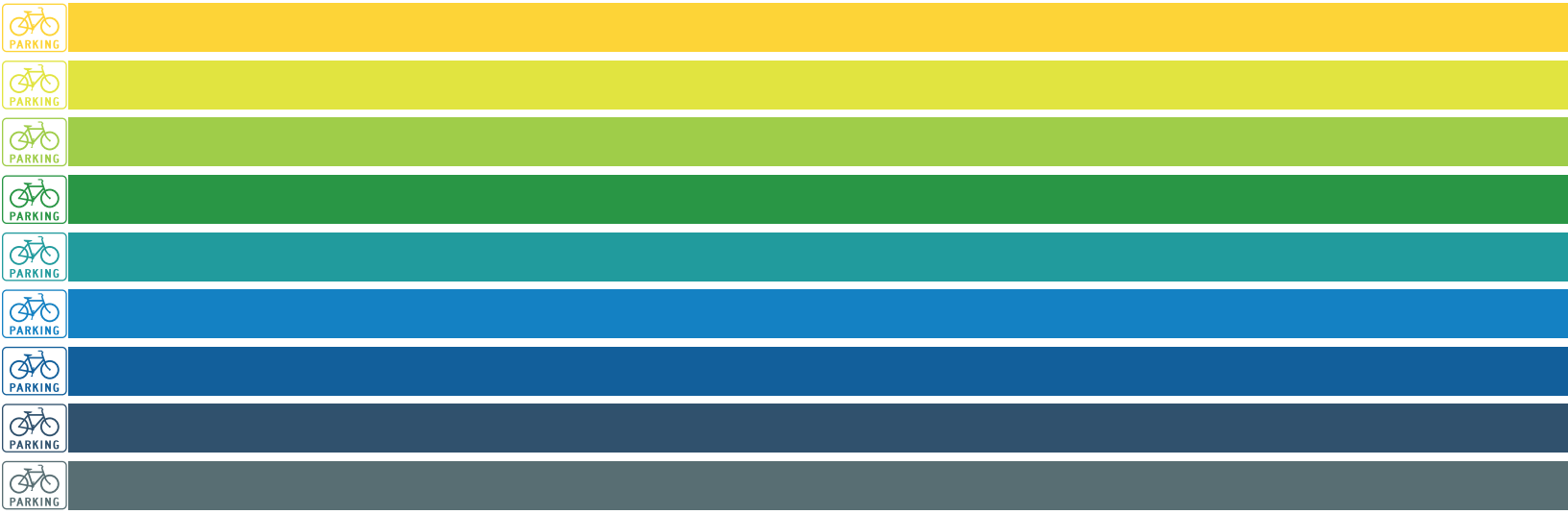
(B) To encourage the installation of showers at non-residential sites, the number of required off-street motor vehicle parking spaces for such sites shall be reduced as follows: A credit of [1] space shall be provided for the first shower installed, with additional off-street motor vehicle parking credits available at a rate of [1] space for each additional shower provided per [25] required Bicycle Parking Spaces. In order to claim these credits, which shall be in addition to the bicycle parking credits provided for in [Section II, § 9(A)], shower facilities must be readily available for use by all employees of the New Development or Major Renovation. . . .Such showers often benefit non-bicycling employees as well, such as those who exercise during lunch or who spend long hours at the office.

If a community wishes to make this a mandatory requirement, the following provision can be substituted: "Non-residential uses shall provide [4] showers, along with [4] clothing lockers per shower, for buildings that are [ ] square feet or more. [Two] additional showers shall be provided for each additional [ ] square feet). An off-street vehicle parking credit of [1] space per shower shall be provided, up to one shower per [25] required Bicycle Parking Spaces. In order to claim this credit, which shall be in addition to the other bicycle parking credits provided for, showers must be easily accessible to all employees of the New Development or Major Renovation." ↖

SECTION 5.12

Topic:	Monitoring and Reporting
Source:	City and County of San Francisco (2013)
Document:	San Francisco Planning Code
Chapter, Section:	Section 155.3 (f)
Link:	http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances13/o0183-13.pdf
Text:	The Planning Department shall, every five years, beginning with 2013, survey the amount, location, and usage of both Class 1 and Class 2 bicycle parking spaces at (A) City Hall, (B) the Main Library, (C) the 25 other City-owned or leased buildings which have the highest square footage as identified in a list published by the City's Department of Real Estate, and (D) City-owned garages in order to report compliance with this Section and to ascertain whether current requirements are adequate to meet demand for such parking spaces. Such survey of usage shall be conducted during the months of March through October and shall document usage on at least two fair-weather non-holiday week days. A report on such findings shall be submitted to the Planning Commission and the San Francisco Municipal Transportation Agency Board of Directors. If current requirements are inadequate, the Director shall draft and submit to the Board of Supervisors proposed legislation that would remedy the deficiency. For the purposes of this subsection, "inadequate" shall mean an occupancy of greater than 85 percent or in cases where bicycles are clearly parked in non-standard locations due to crowding of the provided facilities. ↖

Topic:	Monitoring and Reporting
Source:	National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN) (2012)
Document:	Model National Bicycle Parking Ordinance: With Annotations
Chapter, Section:	Section VI, § 3
Link:	http://changelabsolutions.org/publications/implementation-enforcement-clauses
Text:	The [Planning Director/Zoning Administrator] shall provide an annual report to the [Adopting Body] regarding the implementation of this Ordinance that shall, at a minimum, include the following information relevant to the preceding year: (1) the number of Short and Long-Term Bicycle Parking Spaces created pursuant to [Sections II and III], and the number of events for which special event bicycle parking was provided under [Section IV] ; (2) (if applicable) a brief summary of each request for modification received and action taken in response thereto; and (3) any other information learned that would improve future implementation of [this Ordinance] and its goals. ↖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