

Improving Bicycle and Scooter Parking at Elementary and Secondary Schools in Vancouver

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Disclaimer

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This project was conducted under the mentorship of City of Vancouver staff. The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of the City of Vancouver or the University of British Columbia.

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Executive Summary

Active transportation's role in improving public health, reducing congestion, and lowering emissions is undeniable. It is especially important in the context of elementary and high schools when children are still developing travel habits. The City of Vancouver and all levels of government have aspirational goals of mitigating climate change and improving public health. In response, the City of Vancouver has delivered the School Active Travel Program (SATP) in partnership with the Vancouver School Board (VSB) and other school institutions to encourage walking, biking, rolling and transit among youth and caregivers.

As cycling culture grows, so does the demand for infrastructure. Recent data shows that bicycle and scooter parking at school and transportation safety are key barriers to cycling as identified by children and caregivers in Vancouver. The state of cycling infrastructure on our roads and end-of-trip facilities in our residential buildings is well known, while less is known about parking at elementary and secondary schools. This report aims to improve our knowledge in this area and support decision-making across various organizations.

Context

By 2030, the city aims to achieve 70% of all trips to and from elementary schools by walking, cycling, rolling, and transit. This goal aligns with the broader objective of having two-thirds of all trips city-wide made by sustainable modes of transportation. To meet city and other regional, provincial and national climate goals, communities across Canada are investing in cycling infrastructure and encouragement programming.

The security of parking bicycles and scooters has been seen as a barrier for those who want to use them in Vancouver. In 2023, Vancouver students cited bicycle theft concerns as a barrier to cycling, while both students and parents identified more bicycle infrastructure, secure parking, and end-of-trip facilities as key motivators for cycling to school.

New schools and schools undergoing redevelopment are required to provide a minimum number of Class A and Class B bicycle spaces for the staff and students. **Class A** bicycle parking refers to secure indoor bicycle rooms or cages for the long-term use of students and employees with optional amenities such as outlets and maintenance equipment. **Class B** bicycle parking is characterized by racks typically placed outdoors to serve people using an area or building for a few hours.

British Columbia has a variety of public and independent elementary, secondary, and blended schools. The VSB oversees public education in Vancouver, managing a wide range of

responsibilities, including facilities, curriculum, and other administrative functions. Independent schools, which are more decentralized, typically charge a tuition fee and have had less involvement in the SATP. Historically, the VSB has received donations and have typically been involved in prioritizing and installing racks. However, information about the condition and presence of these amenities has not been collected or analyzed until recently.

Purpose

The **key purpose** of this report is to:

- 1) Understand the local context of bicycle parking at schools
- 2) Identify best practices and regulatory requirements
- 3) Assess the existing conditions at Vancouver's schools within the context of the School Active Travel Program¹
- 4) Explore and learn about how other communities fund and deliver bicycle parking
- 5) Make recommendations based on findings

The executive summary provides the reader a short summary of key highlights. More information is included in the main body of the report.

Evaluation of Bicycle/Scooter Parking

Bicycle and scooter parking was evaluated based on 1) supply or quantity and 2) quality of Class B bicycle parking facilities. Quantity is assessed based on the number of spaces available relative to targets set in the City of Vancouver's Parking By-law for off-street bicycle parking. Quality is based on four factors, these include 1) accessibility, 2) coverage, 3) condition and 4) efficiency.

It is worth noting that schools built prior to the inclusion of off-street bicycle parking in the City of Vancouver's Parking By-law are not required to comply. For the purposes of this study, the Parking By-law was used as a target for schools to achieve conditions that could satisfy modest levels of demand.

Using the above criteria, **Class B or short-term parking** exists at most elementary and secondary schools in Vancouver. However, the quantity and quality of parking vary greatly across the city (see **Figure E1** below).

¹ Schools with less than 50 students or primarily focused on pre-kindergarten and adult education were not considered as part of this study.

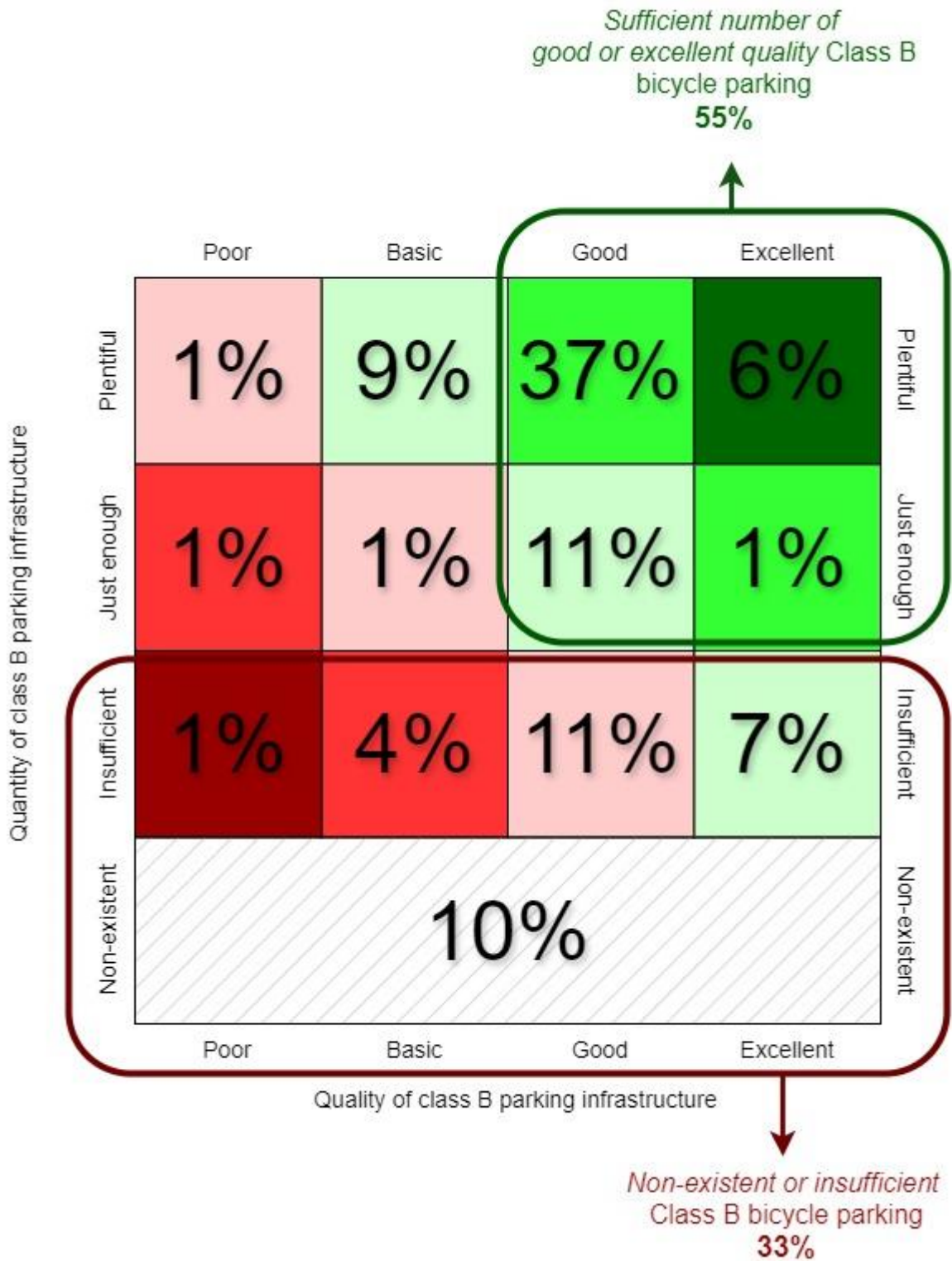
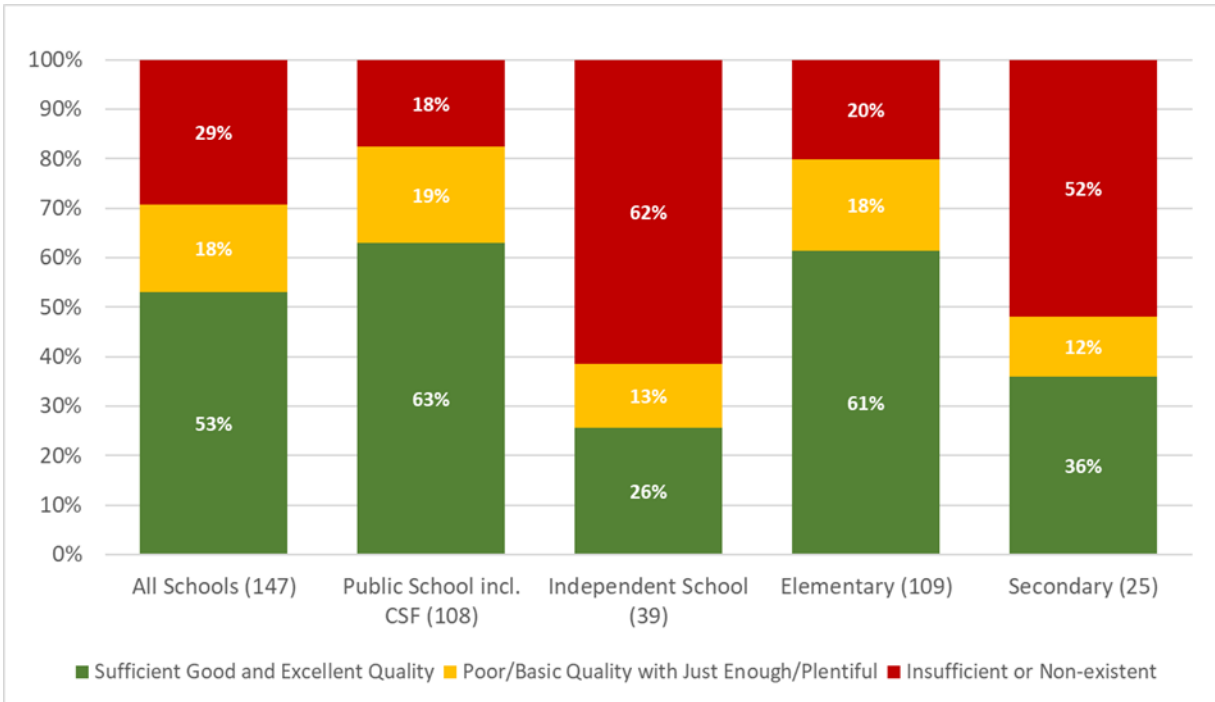


Figure E1: State of Class B bicycle parking at elementary and secondary schools in Vancouver.

Many public schools have sufficient and good-quality bike racks, while many independent schools have poor-quality racks with low supply or no racks at all (see **Figure E2** below for more details).

Figure E2: State of Class B bicycle parking by school type and grade range.



Class A or long-term/secure parking is non-existent at most elementary and secondary schools in Vancouver, except those built or reconstructed between the early 2000s and the present day. Therefore, Class A bicycle parking was not fully evaluated as part of this research project.

Financial Gap

An analysis was completed to determine the number of bicycle racks required to meet Class B bicycle parking standards at all schools. Approximately 135 new seven-ring hangar racks would be required, including 51 racks for public schools and 84 racks for independent schools. The estimated cost for purchase, delivery, and installation will vary based on the supplier.

In contrast, there is an oversupply of racks at many schools in Vancouver – likely due to inconsistencies in measuring supply previously and/or growing demand. Based on Vancouver standards, approximately 206 racks could be reallocated, which would satisfy the deficit. However, more investigation is required to determine existing rack utilization and the cost of relocation before pursuing this option.

Future work could be done to understand cost and feasibility of installing Class A bicycle parking at existing high schools.

How Bicycle/Scooter Parking is Funded at Schools

Several funding pathways and programs were identified in Canada and around the world. Jurisdictions found include Edmonton, Peel Region, Toronto District School Board and Winnipeg in Canada and Scotland, Western Australia, Minnesota US, and the Republic of Ireland.

Key trends from peer jurisdictions:

- Programs often focus on delivering racks, while leaving installation to the schools.
- In Canadian cases, the focus has been on Class B parking while in international cases both Class A and B were implemented.
- Funding sources are varied for bicycle parking retrofits, including sources across federal (national), provincial (state-level), regional and municipal governments and non-profits.

Recommendations

Several near- and long-term recommendations were developed based on this research. Various public sector agencies and independent schools and boards are identified as potential leaders or actors. The near-term recommendations focus on quick, feasible improvements that can be implemented with minimal resources and effort. Key **near-term recommendations** include the following:

- **Recommendation #1:** Public sector agencies across all levels of government (e.g. City, TransLink, Vancouver School Board, province, etc.) and independent school authorities could prioritize any new funding that becomes available for bicycle parking at schools with poor-quality, non-existent, or insufficient Class B bicycle parking facilities. Consideration should be given to areas and schools with higher equity-seeking populations.
- **Recommendation #2:** City staff should communicate deficiencies and share resources to identified staff at independent schools to encourage site-level improvements where appropriate.
- **Recommendation #3:** School boards and independent school staff should maintain an inventory of parking facilities and track utilization of existing racks. If appropriate, and feasible, the Vancouver School Board (VSB) could consider a reallocation policy (informed by utilization) to achieve minimums outlined in the City of Vancouver Parking By-law.
- **Recommendation #4:** The city, VSB and independent schools and boards could explore other capital grants offered by jurisdictions like the Ministry of Transportation and other agencies to help finance bicycle/scooter parking retrofit initiatives.
- **Recommendation #5:** The VSB and independent schools could explore implementing a controlled access system for existing bicycle cages and rooms for staff and secondary school students to enable Class A security.

In contrast, **long-term recommendations** address more complex and resource-intensive changes which require significant planning, investment, and time to accomplish. These include:

- **Recommendation #6:** The City of Vancouver could revisit supply requirements outlined in the Parking By-law to ensure adequate supply of bicycle parking is provided for new developments and major reconstructions.
- **Recommendation #7:** The Ministry of Education could consider including new upgrades and maintenance of bicycle and scooter parking as an eligible cost in the Annual Facility Grant or other programs such as the Carbon Neutral Capital, and School Enhancement Program.

- **Recommendation #8:** PSOs could consider launching a bicycle parking retrofit program similar to the Fleet Charging Program offered by the province or the Heat Pump Water Heater Top-Up offered by the City of Vancouver.

Introduction

Active modes of travel like cycling and micromobility devices like scooters are a crucial part of Vancouver's transportation system. Active travel is one of the tools for overcoming key challenges in the transportation sector, including public health, air pollution, congestion, climate change, and energy consumption. In response, government organizations like the City of Vancouver have developed transportation plans and policies to help increase the share of active travel and lessen the reliance on automobiles. Actions in support of these goals are as important in the context of school travel.

Numerous benefits come with using more active travel modes. These benefits are especially important for children because they are at an age when habits are first being formed (Smart & Klein, 2018). Children who choose to walk or cycle more to school early on in life may eventually carry these lifestyle habits into adulthood. These healthy habits may create opportunities to foster a generation of adults with active lifestyle choices.

Based on feedback collected from children and caregivers in Vancouver, the most important factor to promoting the use of active travel among children is enhancing safety on their routes to and from school (R.A. Malatest & Associates Ltd., 2023; HUB Cycling, 2023). The combination of students walking and cycling near vehicles, coupled with the growing trend of larger and heavier cars (often referred to as "autobesity"), has further contributed to unsafe and unfriendly environments (Edwards & Leonard, 2022). By reducing, slowing, and limiting automobile traffic around schools, we can decrease children's exposure to dangerous interactions with motor vehicles, fostering a more comfortable, appealing, and secure environment.

A reduction in school trips by automobile decreases congestion, frees up space for other road users, and consequently enhances overall road safety, improves public health, and reduces emissions. This year's [ParticipACTION Report Card on Physical Activity for Children and Youth in Canada](#) reported that only 39% of youth, ages 5 to 17, get the recommended 60 minutes of moderate to vigorous physical activity every day (resulting in a score of D+). The report recommends increased government investment in school active travel as well as encouraging parents to consider allowing their children to use active travel for destinations within a few kilometres of home (ParticipACTION, 2024). Moreover, driving is a primary contributor to greenhouse gas emissions; therefore, it is paramount that society works to decrease its driving and move towards active modes.

In the 2023 active travel education survey of grade 6 and 7 students in Vancouver, some students reported that they "worry [their] bike might get stolen" as barriers to cycling (HUB

Cycling, 2023). Furthermore, in a survey of 135 junior secondary school students, the two most reported motivators for cycling to school were “more bike lanes” and “more bike parking” (Bull et al., 2023). In response to what would encourage your children to bike to school in Vancouver, parents reported the existence of “secure and sheltered bicycle parking” as the top motivator (R.A. Malatest & Associates Ltd., 2023). Building and maintaining a safe and connected network of cycling infrastructure, multi-use paths and end-of-trip facilities were top concerns in the same survey. End-of-trip facilities include parking, showers, and maintenance equipment.

Furthermore, it is known that many older residential buildings are also lacking good quality bicycle parking facilities (HUB Cycling, 2022). While this phenomenon is well documented for older residential buildings, less is currently known about the state of bicycle and scooter parking at elementary and secondary schools. Given the positive impact of active travel on public health, road safety, and environmental sustainability, it is crucial to ensure that schools are equipped with high-quality, secure, and accessible parking facilities. By addressing these gaps, we can better support the adoption of active travel among students, making it a more viable and appealing option for families.

This report aids in our understanding of bicycle and scooter parking at schools in Vancouver by identifying requirements for new buildings and evaluating these qualities at existing schools. Baselines are developed based on standards for Class A facilities, which are characterized by secure indoor bicycle rooms or cages for long-term use with optional amenities, and Class B facilities, which are characterized by racks placed outdoors to serve people those using an area/building for a few hours. While compliance to these standards is not required, these standards provide a foundation for cycling where schools do not have facilities. Data is summarized relative to these minimums and potential options for implementation are explored through an international peer review of retrofit programs.

Purpose

Removing barriers to bicycle and scooter parking is crucial to promoting active travel by safeguarding valuable belongings and reducing the perceived risks of theft. There is currently a lack of information about bicycle and scooter parking conditions at elementary and secondary schools in Vancouver. This study attempts to improve our understanding to assist in decision making for various government organizations in British Columbia. The purpose and content of this report includes:

- 1) **Understanding the local context of bicycle parking**, including policy targets, existing programs and trends among youth in Vancouver,
- 2) **Identifying best practices and regulatory requirements** to set a precedence for evaluating the quality and quantity of bicycle and scooter parking at Vancouver schools,
- 3) **Assessing the existing conditions at Vancouver's schools** through data collection, research and evaluation,
- 4) **Exploring and learning about how other communities fund and deliver bicycle parking** across Canada and the world and
- 5) **Recommending actions** the city and other government institutions could make to address gaps.

By reviewing policies and best practices, surveying current parking situations, analyzing funding and implementation strategies, and drawing lessons from other regions, we can help develop targeted recommendations to enhance bicycle and scooter parking in Vancouver.

Context

As background, this section examines the landscape of education institutions in Vancouver, including details on cycling mode share and the motivators which could increase it. It also reviews the policy landscape in Vancouver, highlighting relevant local, regional, and provincial policies that impact active transportation at schools. Finally, it introduces the School Active Travel Program implemented by the City of Vancouver, which aims to encourage cycling and other forms of micromobility through various initiatives.

Schools in Vancouver

In British Columbia, there is an array of public and independent elementary, secondary and blended schools serving different age groups. Elementary schools, also known as primary schools, serve students from kindergarten (ages four and five) through grade seven (ages 11 and 12). After completing elementary school, students move on to high schools, also known as secondary schools, which serve students from grade 8 to grade 12 (EduCanada, 2018). Students typically start secondary school in grade 8 (ages 13 or 14) and finish in grade 12 (ages 17 or 18 years old). Many independent schools enrol students from kindergarten to grade 12. There is no age limitation for children to bike or use their scooter to school independently in British Columbia (Ruiz-Casares & Kilinc, 2021).² Moreover, children age 14 and older can ride an electric bicycle to school (Ministry of Transportation and Infrastructure, 2024).

Vancouver School Board (VSB) plays a key role in Vancouver's public education system, accounting for the majority of students across the community. The VSB is responsible for managing the administration of curriculum, support services for a variety of needs, maintenance and development of facilities, budgets, reporting to the province and many other responsibilities. The VSB has worked closely with the city to improve and encourage sustainable transportation among students.

Independent schools are governed differently and have less coordination and participation with the city's transportation programs. Independent schools are less centralized than the VSB, making it more challenging to deliver programming at scale. These schools are comprised of secular and religious private and specialized programs, usually at an additional cost to the caregiver; however, tuition costs can vary greatly.

² Legal age of leaving children alone is 12 in Manitoba and New Brunswick, and 16 in Ontario. BC does not have an age limit.

This report focuses on schools with an enrollment of 50 or more students. It excludes schools located within the University of British Columbia or University Endowment Lands, schools primarily catering to the pre-kindergarten curriculum (such as Strong Start Centres), continuing education for adults, alternative programs / distributed learning centers, and provincial resource programs. Based on this criterion, there are 110 elementary schools with an average enrollment of 302 students each, 13 combined elementary and secondary schools with an average enrollment of 515 students each, and 25 secondary schools with an average enrollment of 932 students each. A map is provided in **Figure 1** showing the locations of schools relative to the bicycle network, including routes classified as comfortable for All Ages and Abilities (AAA). Of these schools, 103 are public schools under the Vancouver School Board, 39 are independent schools (including private, religious, Montessori, and other types), and 6 are Francophone schools (**Table 1**). Furthermore, elementary and secondary schools are combined, and schools have a grade range of K-12.

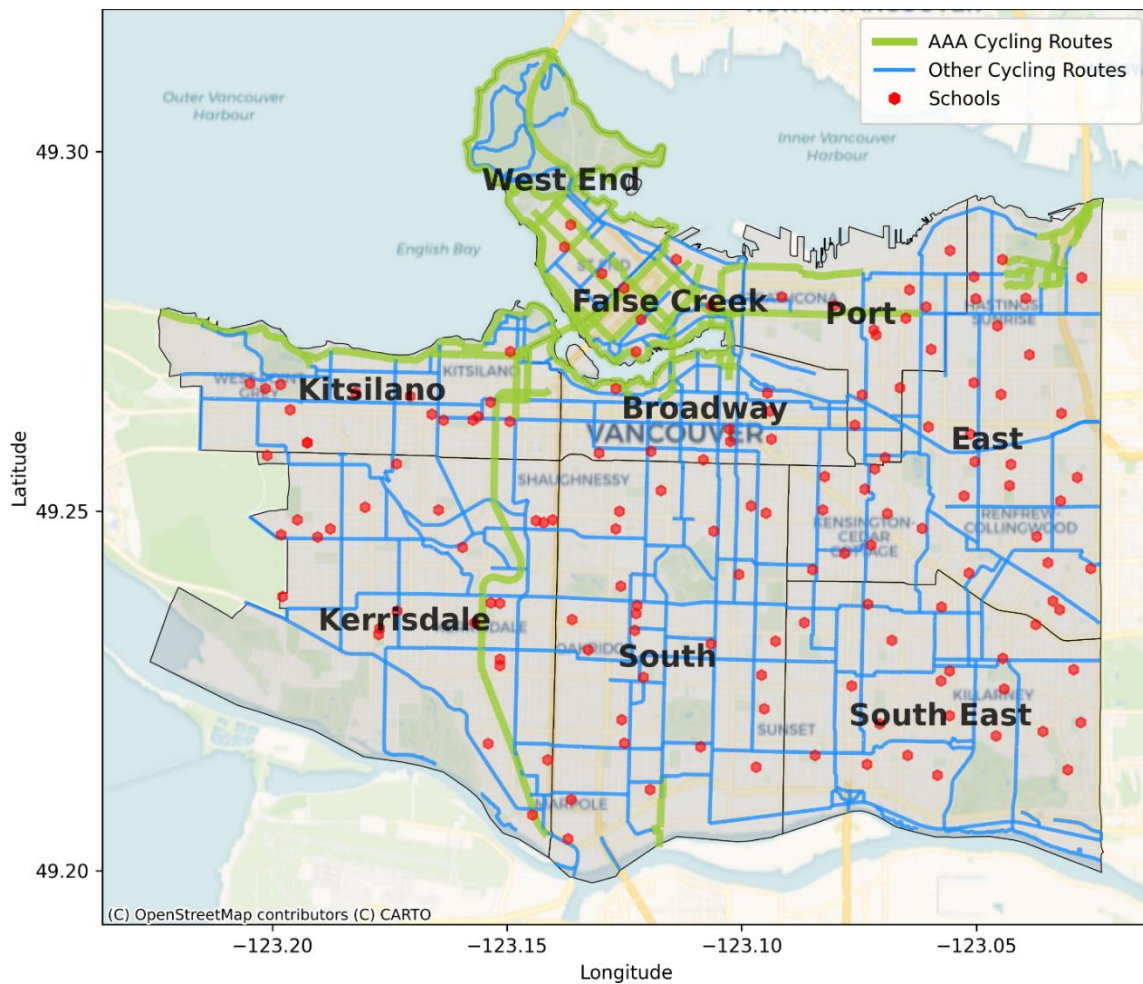


Figure 1. Map of Vancouver schools with network of AAA and non-AAA cycling facilities

Table 1. Distribution of Vancouver schools among administrative and grade categories

School administrative categories	Count	School grade categories	Count
Francophone School	6	Elementary	110
Independent School	39	Elementary and Secondary	13
Public School	103	Secondary	25
Grand Total	148	Grand Total	148

Cycling Mode Share

According to the 2022 Vancouver Travel Survey, parents reported an 8% bicycle and electric mobility mode share among children aged 4-12 to school (R.A. Malatest & Associates Ltd., 2023). However, this mode share can vary significantly between 0 -18% among elementary schools, as reported by grade 6 and 7 students in 2022 and 2023 during a hands-up survey for active travel education (HUB Cycling). A province-wide study found that while only 2-3% of students use a bicycle, skateboard, scooter, or rollerblade to get to school in BC, 14-21% surveyed wished to use these modes more; highlighting the importance of removing barriers to cycling (UBC Human Early Learning Partnership, 2020).

Policy Context

The importance of bicycle and scooter parking facilities is well documented in policy both at a local and regional level (see **Figure 2** for examples). The City of Vancouver's [Transportation 2040 Plan](#) is the long-term strategic vision for the city's transportation decisions. This document provides direction for cycling initiatives that extend to bicycle parking. These directions include providing abundant, covered, and conveniently located bicycle parking at schools in partnership with the school boards (City of Vancouver, 2012). Moreover, the city's [Climate Emergency Action Plan](#) aims to meet the target of cutting Vancouver's carbon pollution by 2030, specified by the following:

- Two thirds (67%) of all trips in Vancouver be made by active transportation and transit (sustainable modes),
- 70% of trips to and from elementary school by sustainable modes in Vancouver,
- 50% of kilometres driven on Vancouver's roads will be by zero emission vehicles, and
- To support the above targets, encouraging active travel modes is a theme under the package of actions including the development of a new Transportation Demand Management Plan (Vancouver City Council, 2020).

The current [Transportation Demand Management Action Plan 2021-2025](#) provides ten strategies to promote and enable programming to encourage more active transportation and transit use. One strategy is to expand the School Active Travel Program in collaboration with the Vancouver School Board and other educational institutions to build and sustain an active travel culture in schools. Bicycle and scooter parking facilities at schools are not mentioned in the 14 actions under this strategy (City of Vancouver, 2021).

The need for secure micro-mobility parking is also acknowledged in provincial and regional policies. TransLink, Metro Vancouver’s regional transportation authority, lists four strategies for improving the convenience of active modes in the region. Actions under this strategy include providing sufficient levels of secure parking (including racks, lockers, and parkades), charging stations for bicycles and electrified micro-mobility devices at civic locations, including schools (TransLink, 2022). The province of [British Columbia’s Active Transportation Design Guide](#) acknowledges that active school travel has had numerous positive benefits for students’ health and learning. The guide also encourages the installation of secure, short- and long-term parking infrastructure for bicycles. The guide also mentions the importance of other modes of travel, such as inline skates, scooters, and skateboards, and recommends facilitating secure parking for them as well, especially since these devices, although small, are often not allowed inside classrooms (Ministry of Transportation and Infrastructure, 2019).

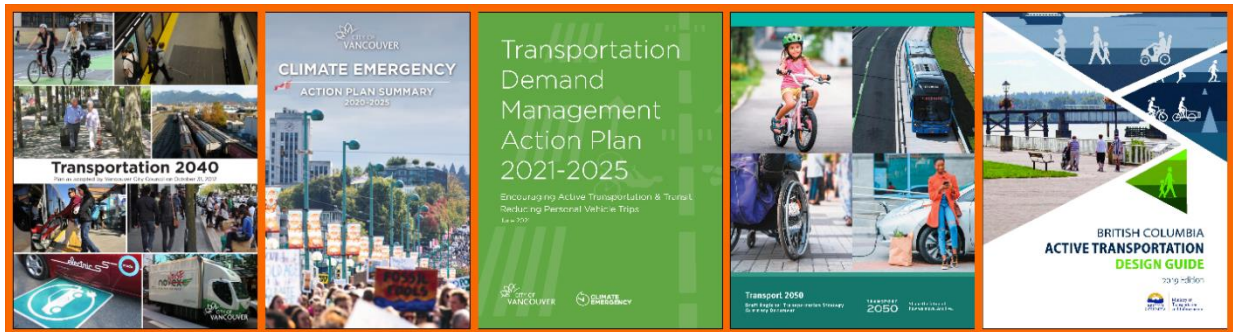


Figure 2. Subset of municipal, regional, and provincial documents which include references to bicycle parking at schools

Since May 2024, the Province of British Columbia updated the definition of “Motor Assisted Cycles” to include light e-bikes as devices with maximum speed 25 km/hr and maximum motor power 250 Watts (Ministry of Transportation and Infrastructure, 2024). With this revision, those aged 14 and older can legally ride e-bikes in British Columbia, which was limited to those aged 16 and older. We can expect students to ride electric bicycles to schools in the near future, strengthening the case for secure bicycle and scooter parking at schools.

School Active Travel Program (SATP)

Vancouver's [School Active Travel Program](#) was developed in partnership with the Vancouver School Board as a direct outcome of the Transportation 2040 Plan and the Climate Emergency Action Plan. The goal of this program is to encourage and promote walking, biking, and rolling to school. The program offers a range of encouragement, promotions and infrastructure programs focused on shifting mode share and improving transportation safety. Some initiatives under this program include School Streets, Walking School Bus, School Travel Planning and Active Travel Education. During the 2023/2024 school year, the City of Vancouver partnered with the Vancouver School Board to identify and upgrade Class B facilities at fourteen schools.



Figure 3. HUB Cycling leads a cycling safety course to students at Nootka Elementary School in April 2022 (Photo by HUB Cycling).

Regulatory Requirements and Best Practices

This section offers a high-level summary of school bicycle parking requirements, starting with a review of Vancouver’s current by-laws and regulations. This section introduces Class A and B bicycle parking and outlines each specific requirement. Following this, the section explores best practices for bicycle parking, focusing on effective design, installation, and maintenance. By integrating insights from this section, the report aims to establish a methodology to evaluate bicycle and scooter parking at schools in Vancouver.

Vancouver Bicycle Parking By-laws

Parking by-laws are regulations established by municipalities to govern the provision and management of parking facilities, ensuring new and reconstructed buildings meet specific standards and serve the needs of the occupants effectively. In the context of this report, Vancouver’s parking by-laws are highlighted as they set a minimum requirement at new or redeveloped schools.



Figure 4. Example of Class A bicycle parking: eastern bicycle cage at Kitsilano Secondary School

Minimum bicycle parking requirements are outlined for elementary and secondary schools in Vancouver’s Parking By-Laws under two categories, Class A and B facilities. While existing buildings built prior to the adoption of such regulations do not require compliance, by-laws set out a desirable target for supply and quality relative to student and staff head counts.

Class A bicycle parking refers to secure indoor bicycle rooms or cages for long-term use of students and employees

with optional amenities such as outlets and maintenance equipment (City of Vancouver, 2024).

Full details on the requirements of Class A bicycle parking are provided in **Appendix A** ; in short, key requirements include:

- ✓ Bike storage areas designed to hold no more than 40 bicycles,
- ✓ Located no lower than the first complete parking level below grade,
- ✓ Direct access to the outside or an elevator that offers direct access to the outside, and;

- ✓ Steel entry doors to bike rooms/cages of at least 75 cm wide within sight of building or parking security if it exists, or an elevator or entrance.

Based on the most current by-laws, the following formula is used to calculate the minimum number of Class A parking spots necessary at new or reconstructed elementary and secondary schools. For elementary schools this equals bicycle parking for roughly 6% of staff, and bicycle parking for 6% of staff and 4% of students at secondary schools.

- **Elementary schools:** 1 space for every 17 employees
- **Secondary schools:** 1 space for every 17 employees and 1 space for every 25 students

Class B bicycle parking is characterized by racks typically placed outdoors to serve people those using an area or building for a few hours. These racks must be constructed of sturdy, theft-resistant material and securely anchored to the ground. In addition, the racks should be placed in a convenient, well-lit location which allows for surveillance by the occupants of the buildings and areas they serve. The following formula is used to calculate the minimum number of Class B parking spots necessary at elementary and secondary schools based on the current by-law. For elementary schools this means bicycle parking for 5% of the students, and for secondary schools, 6% of the students. Full details on the requirements of Class A bicycle parking are provided in **Appendix B**.

- **Elementary schools:** 5 spaces for every 100 students
- **Secondary schools:** 6 spaces for every 100 students



Figure 5. Class B bicycle parking at L'École Bilingue

It is worth noting that due to resource limitations, this study does not evaluate or determine the ideal bicycle parking capacities at schools.

Table 2 presents the bicycle parking requirements listed in Vancouver by-laws. According to these by-laws, 6% of staff and 5% of students are accommodated with bicycle parking (Class A or B) in elementary schools. In secondary schools, 6% of staff and 10% of students are accommodated.

Table 2. Summary of Vancouver bicycle parking requirements

	Bicycle parking requirements					
	Class A		Class B		Total	
	Staff	Students	Staff	Students	Staff	Students
Elementary schools	6%	0%	0%	5%	6%	5%
Secondary schools	6%	4%	0%	6%	6%	10%

Currently, there are no scooter parking by-laws. Vancouver parking by-laws should consider requirements for scooter parking at schools. Previous research indicates that the mode share of scooters to schools can be notably significant, often comparable to that of bicycles (Rothman et al., 2021). While current by-laws do not mandate the installation of scooter parking, some schools have proactively requested and installed scooter racks in response to the demand from students. General Gordon, Simon Fraser, Dr H. N. MacCorkindale, L'Ecole Bilingue, Lord Selkirk, and Lord Strathcona Community Elementary School are among the schools that received one scooter rack from VSB and the City of Vancouver. An example of a scooter rack is shown in **Figure 6**.



Figure 6. Scooter racks at General Gordon elementary school

Bicycle Parking Best Practices

Following best practices for selecting, installing, and maintaining bicycle and scooter parking is crucial for ensuring the safety and security of students' and staff's bicycles and scooters. These practices reduce the risk of theft or damage and may encourage more students to cycle to school. They also ensure the efficient use of space, as properly designed and installed racks can accommodate more devices in less space.

Proper siting also removes potential accessibility issues on school premises. Poorly placed or installed racks can impede those who use mobility aids or paths for other transportation modes. Good quality and correctly installed racks are more durable, requiring less maintenance and lead to cost savings over time.

Guidance is provided at the provincial level through British Columbia Active Transportation Design Guidelines and other sources (City of Coquitlam, 2021; Integrated Protection Services, 2019; Youth en Route, 2022) at regional or municipal level. However, there is limited specific guidance for bicycle and scooter parking at school sites.

The VSB has developed their own comprehensive [bike parking guide](#) for installing and maintaining bicycle parking facilities at district sites. The guide aims to standardize bike rack installations, assist school staff in responding to requests for bicycle parking, and inform schools about the district's procedure for installing a bike rack (Vancouver School Board, n.d.).

The guide emphasizes the importance of access and visibility in bike rack placement. Racks should be easily accessible from the road and school entrances and should not create a tripping hazard or access barrier for others at school. They should also be visible upon arrival at the school and from within the school building. Wayfinding is recommended to assist in locating bicycle/scooter parking. And racks should be secured to hard surfaces to avoid exposure to mud and ensure secure installation. Parking areas should also be well-lit and undercover to protect bikes/scooters from the weather.

The design of the racks is crucial, with inverted U-racks and hanger racks preferred for their security and functionality. The guide recommends that bike racks should be placed at a minimum distance from other racks, walls, or other barriers (depending on rack type). This placement and spacing ensure accessibility from multiple directions and can accommodate the maximum number of micro-mobility devices. For instance, the three gray inverted U racks in **Figure 7** (top) can accommodate six bicycles, while the three black inverted U racks in the same figure (bottom) can only hold four bicycles. The guide also discusses capacity needs for bike racks, suggesting schools aim to provide parking for about 5% of their staff and students.

The types of bike racks that are not recommended based on the above guide include “Wheel Benders,” such as toast bike racks and comb bike racks (**Figure 8**). These rack types rely on the front wheel to stabilize the bike; therefore, they can cause damage to the wheel and are not advised. Lastly, while creativity in design can be appealing, it is not recommended if it interferes with the primary function of the rack.



Figure 7. An example depicting the of importance of rack placement from UBC campus.



Figure 8. Wheel Bender bike racks not recommended for installation in schools (left: toast; right: comb bike racks)

Case Study Review

This section provides a detailed review of four national and four international case studies, offering valuable insights into how different jurisdictions have addressed the challenge of promoting active school transportation by enhancing end-of-trip facilities. The case studies are summarized using information available online and in program reports. Each case study outlines the specific programs, funding mechanisms, and outcomes, offering an overview of efforts made to support cycling and scooting as viable modes of transportation for students and staff. This review also informs potential funding solutions/opportunities for similar programs to improve bicycle and scooter parking at Vancouver schools.

Case Studies at a Glance

While the cases are investigated in further detail in the following subsections, **Table 3** provides a comparative overview of the improvement programs identified. These programs often focus on delivering racks while leaving the installation to the schools. In Canadian cases, the focus has been on Class B parking, while in international cases, both Class A and B were targeted. Funding for these programs was offered at various levels of government, such as federal (national), provincial (state-level), regional, and municipal, and often through advocacy groups.

These case studies can shine a light on best practices and potential opportunities for enhancing bicycle and scooter parking infrastructure at Vancouver schools.

Table 3. Summary of national and international case studies

Case Study	Source of funding	Funding amount	Number of schools	Class A/ Class B
Edmonton, AB	City of Edmonton’s active transportation budget	Total of ~\$75,000 in 2024	39 schools	Class A & B
Peel Region, ON	Peel Region's School Bicycle Parking Program budget	Covers the cost of bike racks only; Total amount not specified	150 schools	Class B
Toronto, ON	Toronto District School Board, City of Toronto, Toronto Hydro, Ontario Municipal Commuter Cycling Fund	\$350,000 (OMCC); \$83,667 (Toronto Hydro); Additional TDSB and City contributions	600 schools	Class B
Winnipeg, MB	City of Winnipeg and Green Action Centre	\$750 per bike rack; Total not specified	Not specified	Class B
Scotland, United Kingdom	Transport Scotland and local authorities	Up to £10,000 per school (covering up to 50% of costs); Total not specified	Not specified	Class A & B
Western Australia, Australia	Western Australia Department of Transport and Department of Education	Total of \$225,000 in 2023; Total of \$577,000 from 2020 to 2022	44 schools (2023); 131 schools (2020-2022)	Class A & B
Minnesota, United States	Minnesota Department of Transportation and various local and federal sources (e.g., federal grants, school bonds)	Total of \$42,740 for Saint Paul Public Schools in 2022; Total of \$378,441 for Minnesota communities in 2024	14 communities and school districts (2024); Number of schools not specified	Class A & B
Republic of Ireland	Department of Transport, supported by the Department of Education	€15 million	154 schools (2023); 761 schools planned	Class A & B

National Case Studies

This section examines the initiatives taken by the City of Edmonton, the Regional Municipality of Peel, the Toronto District School Board, and the City of Winnipeg.

City of Edmonton, Alberta

In 2020, the City of Edmonton published The Bike Plan, which presents an aspirational transformation of the city to a place where cycling for “any reason, in any season” is practical (City of Edmonton, 2020). The plan emphasizes encouraging active travel by addressing barriers and fears associated with cycling. End-of-trip facilities, including secure bicycle parking, were identified as barriers to cycling and listed as an area to develop a program, especially for school-age children. In response, the city launched a School Bike Parking Grant (City of Edmonton, 2024).



Figure 9. School bicycle parking grant in Edmonton, Alberta (photo credit: City of Edmonton)

The School Bike Parking Grant’s priorities are to increase secure bike parking solutions and to encourage cycling to and from school, reduce risks of bike theft and address security barriers to students cycling to and from school, and make cycling to and from school possible for more students and administrators in support of Edmonton’s target of 50 per cent of all trips completed by active and sustainable travel.

The funding for this program comes from the \$1 million that has been designated for bicycle parking in the City's budget. This funding comes from a \$100 million budget allocated to active transportation by Edmonton City Council (Querengesser, 2024). In 2024, a \$75,000 was allocated to improve bicycle parking at schools. Schools in Edmonton can apply for the grant and receive up to \$15,000 to develop or improve bike parking facilities. School staff can only request funding through this program once for an amount between \$500 - \$15,000. There is currently no data available about the outcome of the program; however, it is known that 39 schools have applied for the grant this year.

Regional Municipality of Peel, Ontario

The Regional Municipality of Peel (Peel Region) is a regional municipality that consists of the cities of Mississauga, Brampton, and the town of Caledon. Peel Region has run a School Bicycle Parking Program since 2015 to provide safe and secure student bicycle parking and encourage them to bike to and from school more often. Through this program, schools can apply to receive funding for a maximum of four bike racks, each with a capacity for securing eight bicycles. Due to limited funding, Peel Region prioritizes schools that 1) demonstrated bicycle parking demand and 2) participated in programming related to health, sustainability, and active transportation. Through this program, Peel Region only covers the cost of the bike racks and does not cover other expenses, such as installation of the racks (Peel Region, 2024).

Peel Region’s Sustainable Transportation Strategy aims to reach a daily cycling mode share of 5% among students in the region (~12,000 students). It provides direction to “support the provision of bicycle parking and end-of-trip facilities at community destinations (Region of Peel, 2018)”. The document praises the School Bike Parking Program for successfully installing more than 385 racks at over 150 schools between 2015 and 2023. The document recommends that the region continue this program but suggests that local school boards take over the program.



Figure 10. Bicycle parking in a school in Peel Region (photo credit: Regional Municipality of Peel)

Toronto District School Board, Toronto, Ontario

Toronto District School Board (TDSB) is the largest school board in Canada, serving approximately a quarter of a million students in nearly 600 schools (Toronto District School Board, 2024). The school board recognizes that secure bicycle parking for students and staff is an important step in encouraging active travel to school (CultureLink, 2019). In 2013, TDSB's Board of Trustees approved a Charter for Active, Safe and Sustainable Transportation (ASST) and have since been funding and installing bicycle racks at schools to remove barriers to active travel (Toronto District School Board, 2013). In addition, from 2015 to 2019, the City of Toronto donated bike racks to the TDSB. TDSB installed these racks using in-house trades.

Moreover, during the 2014/15 school year, the TDSB participated in Toronto Hydro's "Team Up for Green" campaign, which resulted in Toronto Hydro donating \$83,667 to use towards the purchase and installation of bike racks at TDSB schools. In 2017, the Ontario Municipal Commuter Cycling (OMCC) Fund (\$93 million) was established by the Province of Ontario to support municipalities in building infrastructure that increases bicycle commuting (The Province of Ontario, 2017). The City of Toronto received \$25,639,264 of the fund, of which \$350,000 was used to enter an agreement with TDSB for bicycle parking infrastructure in 2019 (Toronto District School Board, 2021).



Figure 11. Example of bike racks provided to schools by Toronto District School Board (photo credit: Toronto District School Board)

The funds were used to install free galvanized steel bike racks (see **Figure 11**) from the City of Toronto based on school requests, staff needs, and opportunities to expand bike parking as part of a larger design project. The school board recognized that students, particularly at the elementary level, are using scooters to travel to school more frequently; therefore, scooter rack inquiries are considered on an ad-hoc basis.

City of Winnipeg, Manitoba

In a call to action to increase active school travel in Manitoba, the Green Action Center encouraged schools and divisions to support cycling programs with necessary infrastructure, such as bike racks and cages (Green Action Center, 2017). Later, Green Action Centre's Active and Safe Routes to School Program partnered with the City of Winnipeg to offer free bike racks and bike cages to schools in Winnipeg. School staff, administrators, or teachers could apply for the free bike racks, which were locally made in Winnipeg and valued at \$750. The program considered custom-built bike cages, when necessary, on a per-request basis.



**Are you a school in
Winnipeg?
Do you wish you
had a bike rack?
Applying is simple!**

Figure 12. Green Action Center's Active and Safe Routes to School program and City of Winnipeg's poster for application for schools to receive bike racks (photo credit: Green Action Center)

International Case Studies

International programs to improve bicycle and scooter parking in schools can offer diverse approaches and insights. Four programs from Scotland, Australia, the United States, and Ireland have been explored.

Scotland, United Kingdom

Transport Scotland, the national transport agency of Scotland, allocates funding to various partner organizations responsible for delivering walking and cycling infrastructure across Scotland. One of their partners is Sustrans, a United Kingdom-based walking, wheeling, and cycling charity that offers grants for bicycle and scooter parking facilities at schools. Parking facilities include bicycle stands/lockers, shelters, and secure storage (Transport Scotland, n.d.) to encourage young people to cycle or use a scooter to school.



“There is somewhere safe to keep my new bike I got for my birthday. I am really excited to be cycling with my friends (Cycling Scotland, 2023)”

- Lisa (Primary school student)

Through the School Cycle and Scooter Parking grant, Sustrans provides funding to schools that best demonstrate the need for bicycle and scooter parking through an application process. Schools (and nurseries) partnered with local authorities to apply for grants as high as £10,000 per school (with a possibility for more in exceptional cases) to cover as much as 50% of the total proposed bicycle/scooter parking cost. The most common match fund for schools is their local authority’s Cycling Walking Safer Streets budget, with a total funding of £3.7 million allocated to local authorities by the Scottish Government from 2015 to 2020 (Scottish Government, 2019).

This grant provides guidelines for planning, location, security, quantity, and type of infrastructure. The grant explicitly states funding will not be provided for stands that only hold

the wheel since they cause damage to wheels and offer limited security. Further information is also given regarding preferred scooter parking solutions at schools, such as Scooter pods (see **Figure 13**) or additional Sheffield stands to help lock the scooter handle (Sustrans, 2021).

From August 2021 to April 2024, the Scottish Government had a Minister of Zero Carbon Buildings, Active Travel, and Tenant’s Rights. Famous among the cycling community as active travel minister, his appointment promised 10% of the transport budget to be spent on active travel by 2024/25 (up from 3.5%), and improved Safe to School initiatives, so that children can cycle to school safely (Densham, 2021).



Figure 13. Scooter pod at a school in Scotland (photo from Sustrans)

Western Australia, Australia

In 2018, the Western Australia Department of Transport launched a behaviour change program for schools called “Your Move” to help increase active travel, such as riding a scooter and cycling to schools. In this program, the Department of Transport works with Your Move Champions (and their team of parents, teachers, and students) in schools to help students get active through pre-designed activities and classroom lessons. The Champions are encouraged to share stories about their school’s active travel events and activities to earn points and annual accreditation, which are linked to grant funding and redeemed for active travel rewards (**Figure 14**). Depending on the number of points earned each year, schools achieve accreditation levels of bronze, silver, gold, platinum, or double platinum (Government of Western Australia, 2023).



Figure 14. Bicycle and scooter parking at a school in Western Australia (photo from Your Move website)

Schools registered and actively engaged (accreditation level of silver or higher) in the program are eligible to apply for Connecting Schools Grant Funding, an initiative of the Western Australia State Government, led by the Department of Transport (Government of Western Australia, 2023). This initiative is jointly funded by the Department of Transport and the Department of Education in hopes of achieving at least one of the following (Your Move, 2023):

- Improve bicycle access, active transport infrastructure and initiatives supporting increased riding, walking, and scooting to school,
- Build capacity for increased participation in active travel for trips to school,
- Increase the opportunity for schools across Western Australia to have access to high-quality bicycle facilities suitable for all ages and abilities and
- Promote and support a positive culture of active travel.

From 2020 to 2022, \$577,000 was allocated to 131 schools through grants of four sizes: small, medium, large, and major. In 2023, \$225,000 was allocated to 44 schools. Five schools were awarded a major grant, with plans to spend the funding on “bike parking infrastructure.”

Minnesota, United States

Safe Routes to Schools (SRTS) is a concept that was developed in the 1970s in Denmark to improve active travel safety to schools for youth. The idea became popular internationally and soon spread to the United States. SRTS Programs gained momentum in 2000 when the United States Congress funded pilot projects through the National Highway Traffic Safety Administration. In 2005, Congress legislated a \$1 billion Federal-Aid SRTS program (Safe Routes to School Guide, n.d.).

These programs can be implemented at any level of government, such as the Department of Transportation, metropolitan planning organizations, local governments, school districts, or even schools (US Department of Transportation, n.d.). The basic elements of the SRTS programs are education, encouragement, enforcement, and engineering (Figure 15). Funding opportunities for these initiatives can vary. The Safe Routes to School National Partnership, a nonprofit organization, has listed federal and state transportation grants, health grants, physical education grants, local foundations, local business sponsorships, and donations as funding sources for these programs (Safe Routes to School National Partnership, 2018).



Figure 15. Basic elements of Safe Routes to School Program in United States.

Several schools have identified and used various funding sources to improve their bicycle and scooter parking infrastructure. For instance, Roosevelt Middle School in Eugene, Oregon, requested a federal infrastructure grant with the help of a group of Architecture students at the University of Oregon called Design Bridge to purchase and install new staple racks with a capacity of 120 bicycles. Casey Middle School in Boulder, Colorado, received a school bond-funded redesign in which the building contractors installed 50 staple racks shaded by solar-

panelled roofs, leading to a gold-level Leadership in Energy and Environmental Design (LEED) certification. Beach Elementary in Portland, Oregon, received 20 free inverted staple racks from the City of Portland through the help of parent advocates. Without a specific funding stream, schools were encouraged to get creative and use different funding sources for school bike parking. Funding identified includes programs and grants such as SRTS, transportation enhancement grants, other federal funding, mini-grants, city or county programs, foundations whose goals include addressing childhood obesity or active lifestyles and parent-led fundraising efforts (Safe Routes to School National Partnership, n.d.).

In April 2024, the Minnesota Department of Transportation awarded \$378,441 from July 2014 to July 2015 to 14 communities, school districts, and organizations across Minnesota in Boost Grant Funding. Funding was used to enhance existing local programs, such as support for bike fleets and trailers to teach children how to ride and bike parking. This funding aligns with the State's long-standing support of the SRTS Program. Since 2005, the Minnesota Department of Transportation awarded more than \$60 million in federal and State funds to communities to support SRTS. Most of the funding was awarded for infrastructure projects.

The remainder was allocated for programs and planning that promote walkable and bikeable communities (Office of Governor Tim Walz and Lt. Governor Peggy Flanagan, 2024).

Saint Paul Public Schools, Minnesota's second-largest school district, started participating in the SRTS program in 2014. They now have an extensive Safe



Figure 16. Bicycle parking at a school (photo by Eugene Springfield Safe Routes to School)

Routes 5-Year Strategic plan with a vision to enable students to walk, bike, and roll confidently and safely to school and within their communities. One goal in the plan pertains to an audit of bike parking across the district and developing a plan for filling gaps (Saint Paul Public Schools, 2022). In these five years, the school district aims to 1) document existing bicycle parking at all schools, 2) develop a plan that outlines gaps and priorities for filling them, and 3) secure funding and/or partnerships to add and improve bike parking according to the plan. In 2022, Saint Paul Public Schools received \$42,740 in funding from the Minnesota Department of Transportation to improve bicycle parking.

Republic of Ireland

An SRTS program has been active in Ireland since March 2021 through an initiative by the Department of Transport supported by the Department of Education. This program is operated by the Green-Schools Program in partnership with the National Transport Authority and the local authorities in Ireland. One of the main goals of the SRTS program is to deliver secure bicycle parking at schools. This is important because parents identified a lack of secure bicycle parking as a barrier to cycling. One-third of parents reported that improvements to bicycle parking at schools would encourage them to encourage their children to cycle to school (Green Schools Ireland, n.d.).

That same year, an improvement was made in transportation infrastructure with the installation of 2,830 cycle parking spaces and 153 bike shelters across 154 schools (**Figure 17**). In the coming years 761 schools will be included in benefiting from the government's commitment of €15 million (Ireland Department of Transport, 2022). Since 2023, schools have been able to apply for scooter parking; however, the application notes that electric scooter parking is not provided. It is noteworthy that along with the national program, there are other areas such as Fingal County that accept applications bicycle or scooter racks (Ginty, 2024).



Figure 17. Bicycle shelter at St. Bernadette's Senior School in Ireland (photo from school's website)

Methodology

This section describes how bicycle and scooter parking were assessed and how recommendations for the city and other stakeholders were considered. Accordingly, the methodology is organized into three steps:

- **Setting Evaluation Criteria:** to develop a rubric for assessing conditions of bicycle and scooter parking at schools, supported by regulatory requirements and best practices outlined in previous sections,
- **Understanding the Baseline:** to collect data to assess conditions of bicycle and scooter parking at elementary and secondary schools against set criteria and
- **Developing Next Steps:** identify logical actions the city and other stakeholders could take to address deficiencies in bicycle and scooter parking at schools in Vancouver.

Set Evaluation Criteria

It is important to first identify key standards for bicycle parking before evaluating existing conditions. For the purposes of the evaluation, criteria were set to measure the supply and quality of bicycle and scooter parking. Based on information in the **Regulatory Requirements and Best Practices** section, thresholds for the quantitative assessment of bicycle and scooter parking at schools and factors that constitute good quality were identified.

Measuring Supply (Quantity)

The supply of bicycle and scooter parking at schools was categorized into four categories relative to the City of Vancouver parking by-law. These include:

1. **Non-existent:** in the case where parking does not exist for students or staff,
2. **Insufficient:** if bike parking exists but less than the required amount based on the latest version of the Vancouver parking by-law,
3. **Just enough:** if there is enough bicycle/scooter parking with a margin of error of 10% and
4. **Plentiful:** if more than the required amount of bicycle/scooter parking is available.

It is worth emphasizing that schools built prior to the inclusion of off-street bicycle parking in the City of Vancouver's Parking By-law are not required to comply. For the purposes of this study, the Parking By-law was used as a target for schools to achieve conditions that could satisfy modest levels of demand.

Measuring Quality








For quality, schools were evaluated based on four measures. Schools were measured using binary scores to represent whether criteria were satisfied (1) or not satisfied (0), meaning each measure was weighted equally. The criteria include:

1. **Accessibility:** whether racks were affixed to hard surfaces (asphalt or concrete) or on dirt or grass,
2. **Coverage:** whether racks were covered from rain or snow,
3. **Condition:** whether racks were structurally sound and
4. **Suitability:** how appropriate the rack designs were relative to the ability to meet advertised capacity (efficiency) as presented in **Table 4**. In addition, points were deducted if racks were installed incorrectly.

Based on the summation of measures, the overall quality at each school is classified into four different quality categories:

1. **Poor:** having a score of less or equal to one (≤ 1),
2. **Basic:** having a score of greater than one and less than or equal to two (>1 and ≤ 2),
3. **Good:** having a score of greater than two and less than or equal to three (>2 and ≤ 3),
4. **Excellent:** having a score of greater than three (>3).

Table 4. Various rack types with advertised capacity and estimated potential to reach full capacity (Efficiency).

Bike rack type	Example image	Advertised capacity	Efficiency (%)
Staple Ring and post		2	100%
Enhanced coat hanger		6	90%
Coat hanger		10	80%
Enhanced wheel bender		8	70%
Wave rack		5	60%
U-wall mount		2	50%
Spiral rack		10	50%

Understand Baseline

In partnership with the Vancouver School Board (VSB), data and photographs were collected in 2023, which included details on rack styles and early supply estimates. Furthermore, an online survey was created in 2024 to fill in gaps from the previous year by the Community Transportation team at the City of Vancouver, which expanded to include independent schools. This survey was advertised in collaboration with the Federation of Independent School Associations in British Columbia (the umbrella organization for independent school groups in British Columbia) and the VSB, who facilitated the recruitment process by contacting school administrators and inviting them to participate in the survey. The survey was live from May to June 2024. The full survey instrument is presented in **Appendix C**. Data from the two sources above were validated against an open-data street view platform to ensure accuracy. The validation involved the following steps:

1. **Cross-referencing photographs:** each photograph collected was either previously gathered by the VSB, or the survey was cross-referenced with images available on an open-data street view platform,
2. **Checking for consistency:** the location, type, and supply of bicycle and scooter parking facilities shown in the photographs were compared with the corresponding open data,
3. **Identifying discrepancies:** any discrepancies between the collected photographs and open data were noted. These discrepancies could include differences in the type and number of spaces. In cases where discrepancies were found, the decision to rely on which, and source was made on an ad-hoc basis by the scholar based on the quality and age of the data and
4. **Ensuring completeness:** in cases of missing data from data sources, the validation process acted as a data collection process to provide a complete and accurate picture of the current state of bicycle and scooter parking facilities in Vancouver schools.

This data was used to understand the current condition of the state of bicycle and scooter parking at schools in Vancouver. Using these methods, bicycle and scooter parking at schools was reviewed and coded based on an assessment rubric (explained above) to evaluate the supply and quality of bicycle and scooter parking at schools in Vancouver. The schools were then placed on a map of quantity and quality, as detailed in **Figure 18**.

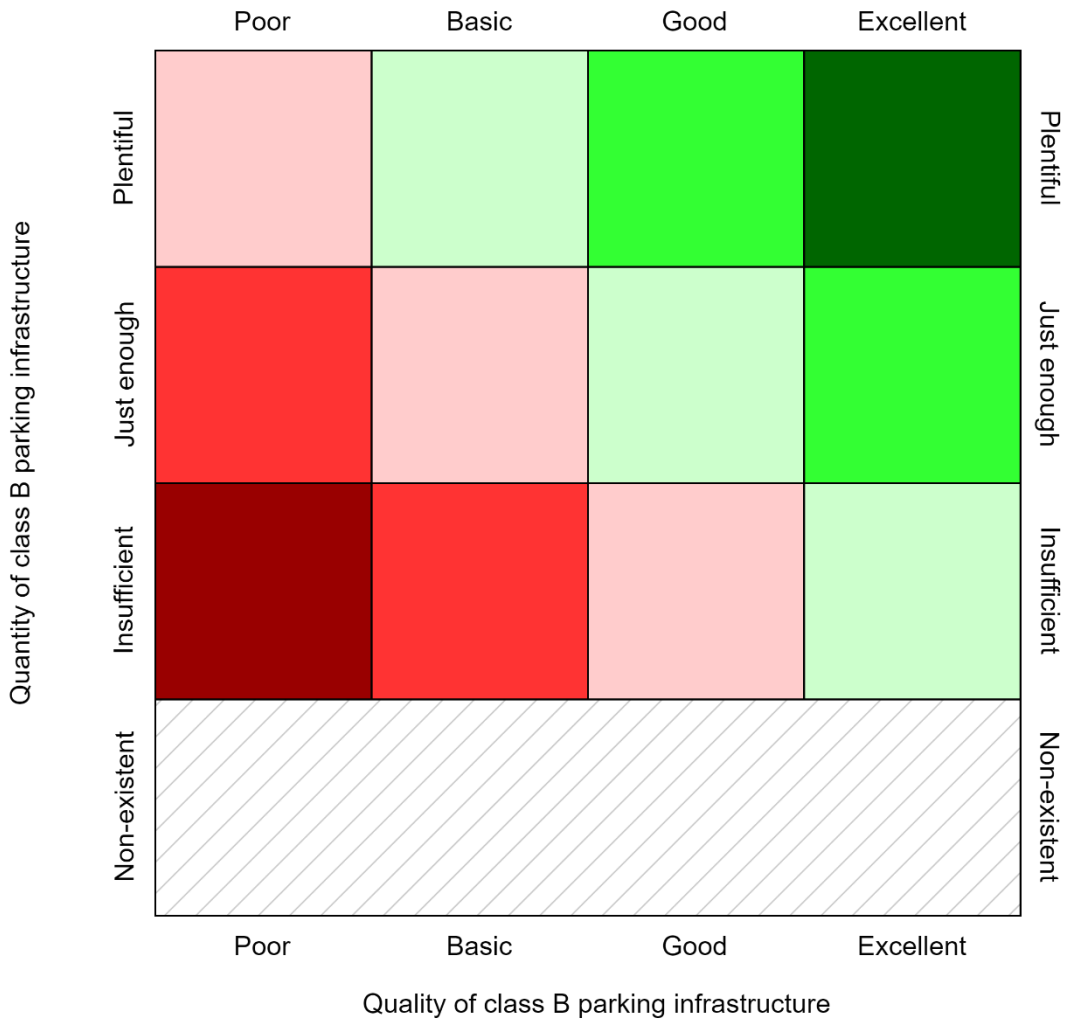


Figure 18. Two-dimensional diagram of bicycle/scooter parking evaluation criteria.

Developing Next Steps

Based on the case studies in previous sections and an analysis of existing conditions, this report seeks to identify actions the city and other jurisdictions could take to improve end-of-trip bicycle and scooter facilities at schools in Vancouver.

Evaluation and Discussion

This section summarizes the existing conditions of bicycle and scooter facilities at schools in Vancouver based on the criteria and methodologies explained in the previous section.

Differences in Bicycle Parking Requirements by School Type

The requirements for bicycle parking vary drastically based on each school's enrolment and staffing needs. Under the condition that schools were reconstructed today, elementary and secondary schools would have drastically different requirements. **Table 5** provides the average requirements for Class A and Class B bicycle parking for each school type in Vancouver. This outcome of the formula in the by-law shows elementary schools having a lower requirement in comparison to secondary schools, which is logical given their size. On average, three Class A and 16 Class B parking spaces are required at elementary schools, while 36 Class A and 48 Class B spaces are required at secondary schools.

Table 5. Average number of bicycle parking (Class A and B) required for each school type

School type	Count	Average enrolment	Average staff size	Average required bicycle parking per by-laws	
				Class A	Class B
Elementary	110	302	35	3	16
Secondary	38	789	71	36	48
All schools	148	427	45	11	24

Class A Bicycle Parking

Class A bicycle/scooter parking is limited at Vancouver elementary and secondary schools. Based on our best knowledge of when schools were built or reconstructed, approximately 16 schools currently have met the full standard for Class A facilities.

In general, most schools do not meet Class A parking requirements. Based on the current by-law, an average of 36 Class A bicycle parking is recommended for secondary schools, where values can range from a minimum of 3 to a maximum of 87 parking spots. Therefore, bicycle cages or rooms could be installed at schools to meet the standards outlined in the current by-law. It is noteworthy that the by-law permits a maximum of 40 bicycle spots in every bicycle cage/room; therefore, 15 secondary schools (representing 60% of all secondary schools) would require more than one bicycle cage/room to accommodate this standard. For instance, Kitsilano Secondary School, which has been recently renovated, installed two bicycle cages to comply with its

requirement of 71 Class A bicycle parking spots. It is also worth noting that Kitsilano Secondary School’s bicycle cages are not fully secure, as a method for controlled access has yet to be installed.

Furthermore, as per article 6.3.13A of the parking by-law, 10% of all Class A parking has to be provided in the form of bicycle lockers for new and redeveloped schools. Therefore, schools could invest in purchasing an average of 4 bicycle lockers for their staff and students. An example of bicycle lockers is provided in **Figure 19**.

Class A parking is less of a requirement at new or reconstructed elementary schools due to by-law requirements and lower on-site staff. The highest number of required Class A parking in elementary schools was five or six, which is observed in two elementary schools (representing 1.8% of all elementary schools). These minimum requirements for Class A bicycle parking could be addressed at elementary schools without installing bicycle cages or building bicycle rooms; instead, using section 6.3.20 of the parking by-law allows conversion of one car parking for installation of up to five bicycle lockers. By implementing this provision and installing a small number of bike lockers in one existing car parking space, all elementary schools in Vancouver could achieve compliance with the current by-laws.

While compliance is not required at existing schools unless they are redeveloped, significant investments would likely be required to meet the minimum requirements set out in the by-law. It is worth noting that the effects of cycling security (i.e. the presence of Class A bicycle parking) on mode choice were not researched as part of this study.



Figure 19. Bike locker with capacity of 12 bikes at University of Washington (photos by CycleSafe³)

³ A private company in US working in bicycle parking products.

Class B Bicycle Parking

In contrast, Class B bicycle parking at schools is aligns more with the current by-law. **Figure 20** shows the distribution of schools on two axes, including the quantity of spaces and quality of the racks and siting. Approximately 68% of the schools have provided Class B parking to the extent required (14% just enough and 54% more than required) in relation to the standards set out in the Vancouver parking by-law.

Further analysis shows that 55% of the schools currently have a *sufficient number of good or excellent quality* Class B bicycle parking. However, 33% of the schools have either *no Class B bicycle parking or an insufficient amount* to meet the requirements of the parking by-laws. **Figure 21** and **Figure 22** present the above percentages at the neighbourhood level in Vancouver. Further maps were created for public and francophone schools, and independent schools, which are provided in **Appendix D** .

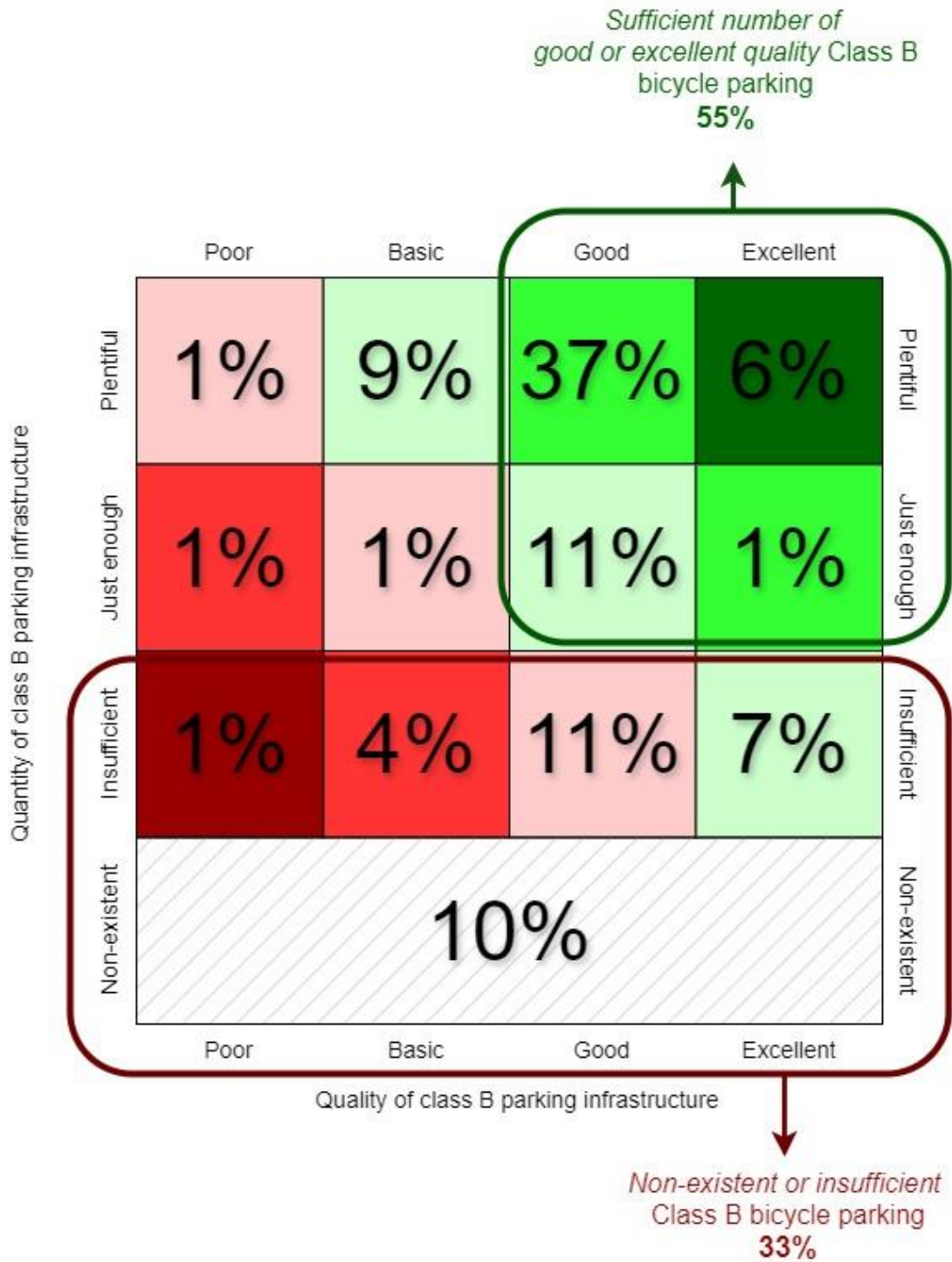


Figure 20. State of Class B bicycle parking at all schools in Vancouver

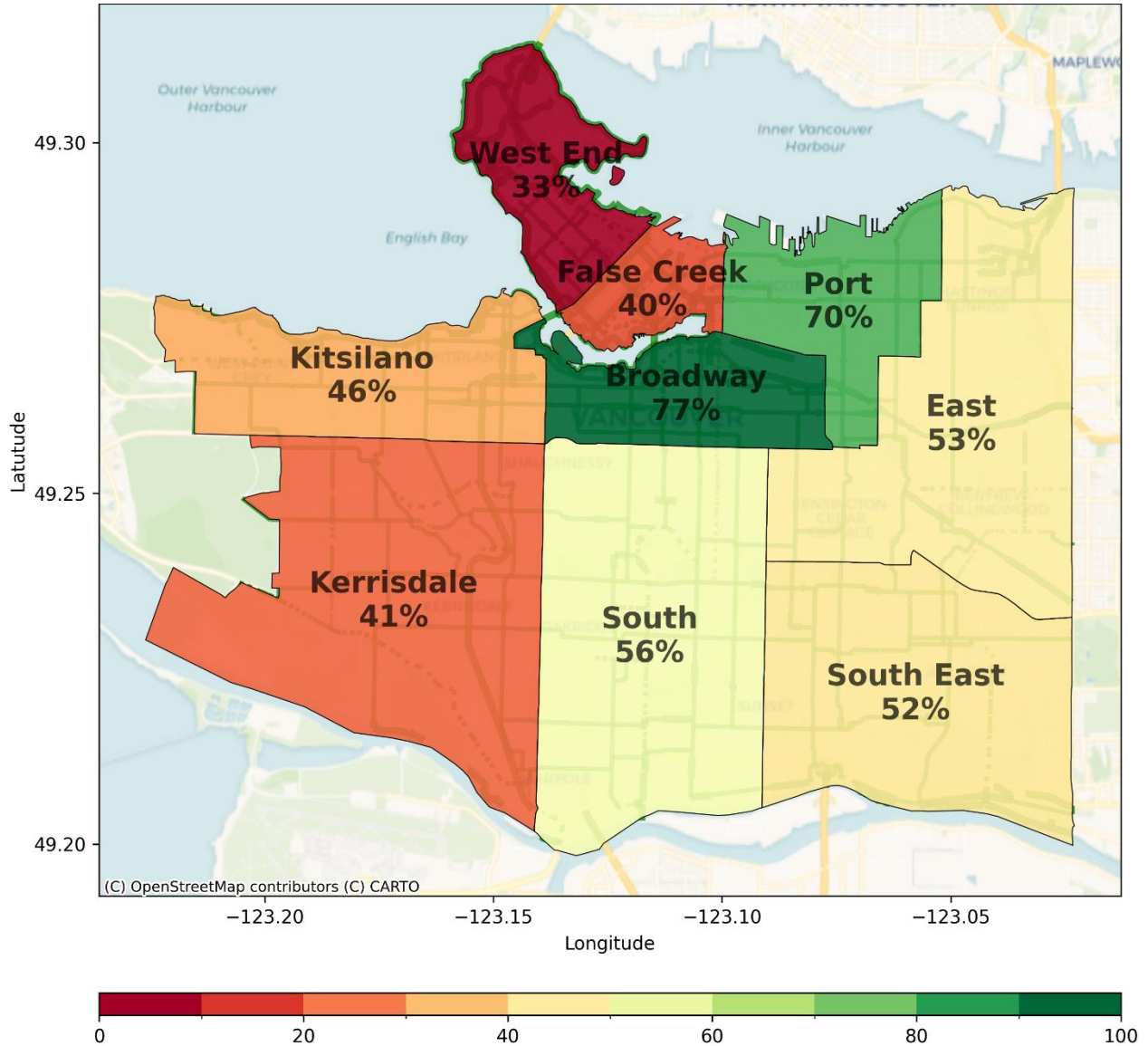


Figure 21. Percentage of schools with good and excellent quality Class B bicycle parking by neighbourhood – All schools

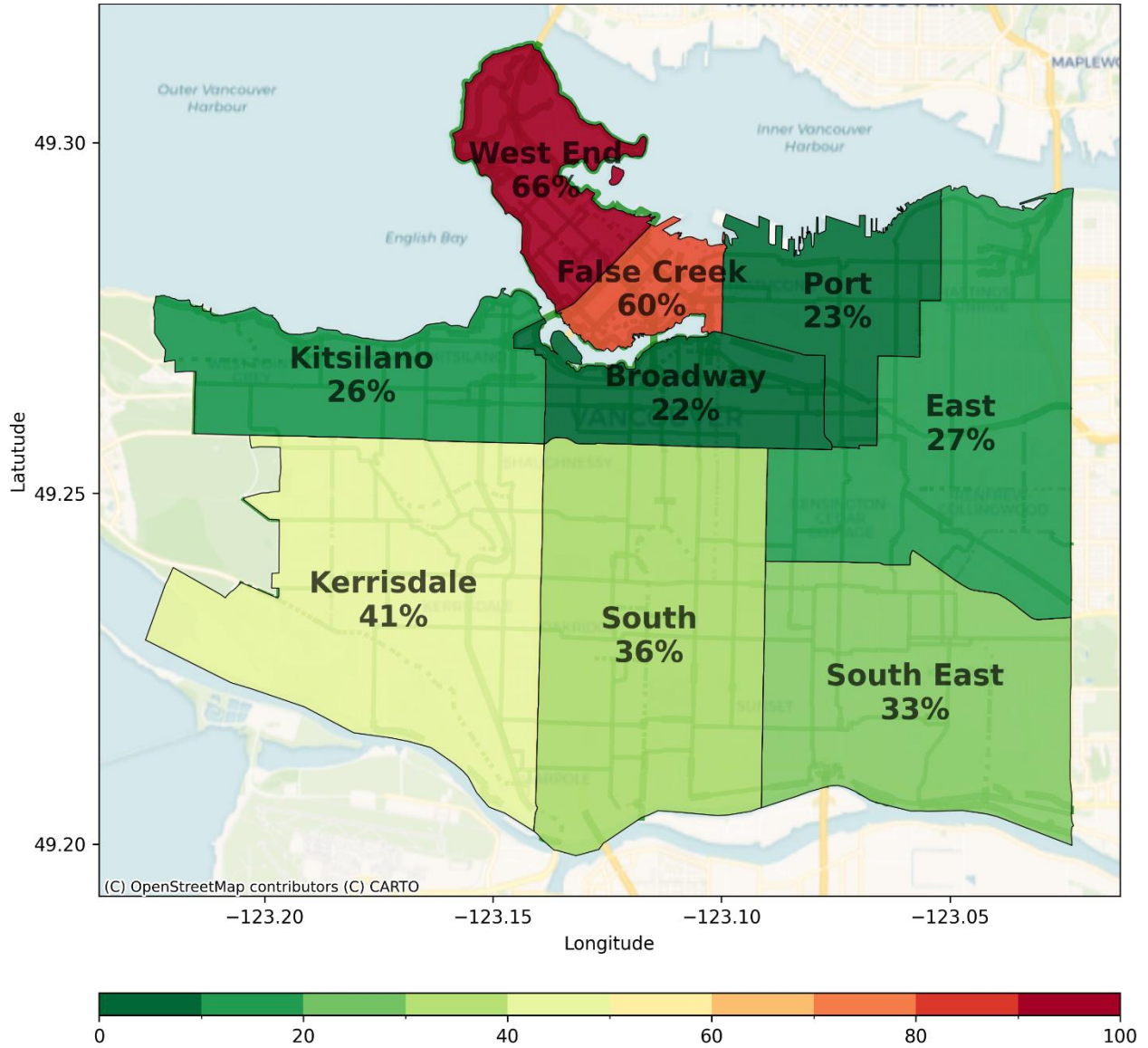


Figure 22. Percentage of schools with a sufficient quantity of Class B bicycle parking by neighbourhood – all schools

The results, summarized in **Figure 23** reveal disparities in the availability of Class B bicycle parking among school types. Independent schools are behind public schools in providing Class B bicycle parking for both students and staff. Public schools have better accommodations for students and staff in the context of Class B facilities. When comparing grade levels, the availability of good quality Class B bicycle parking is lower at secondary schools compared to elementary schools. Across all grade levels, independent schools are consistently worse off than public schools in terms of Class B bicycle parking availability.

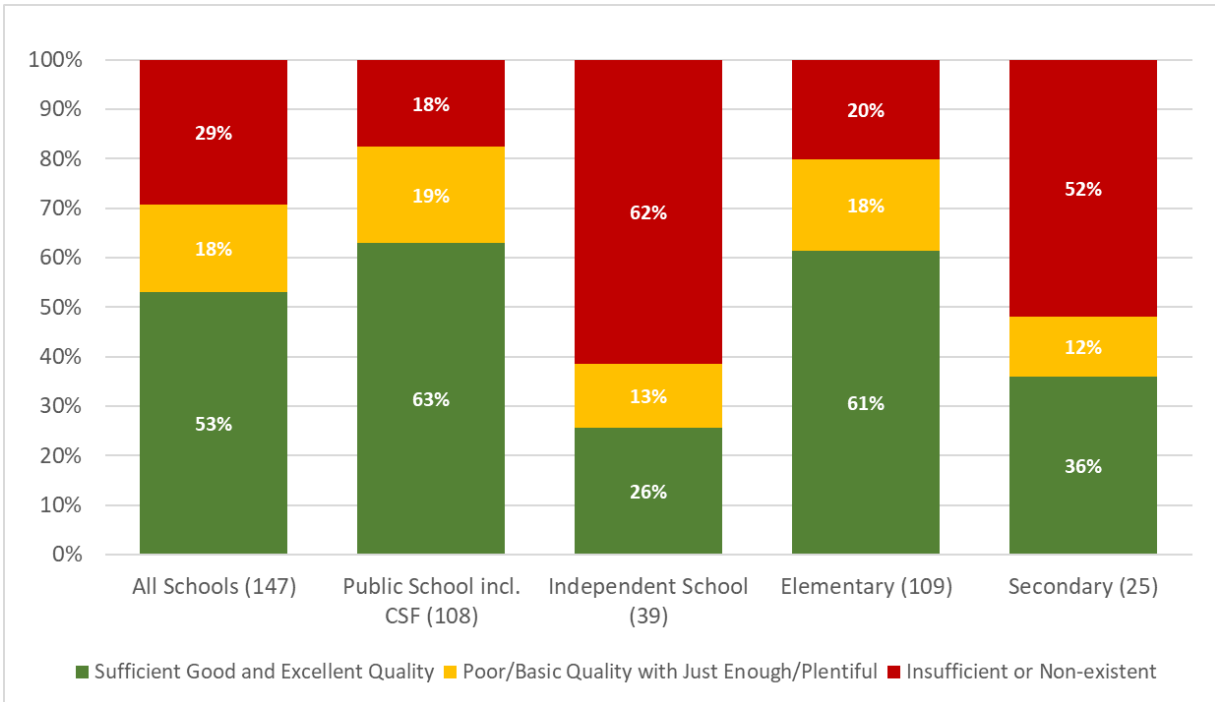


Figure 23. Percentage of schools with sufficient number of good and excellent quality Class B parking and insufficient or non-existent Class B parking

The supply levels are not met at 63 schools, with an average Class B deficit of 13 spaces. In contrast, 85 schools have an average surplus of 19 spots. In total, 797 spots are required to achieve full compliance with by-laws in Vancouver schools, and schools that currently comply have a surplus of 1,625 Class B spots. Considering a Class B bicycle parking requirement of 12%, schools in Vancouver have a surplus of 348 Class B bicycle parking spaces. This suggests that 44% of the current deficit can be addressed through a potential bicycle rack reallocation program across Vancouver schools. However, any consideration of such a program should be preceded by a cost-benefit analysis comparing the costs of reallocating bike racks versus purchasing new ones, as uninstalling and relocating racks can be costly.

While 12% of schools have sufficient Class B bicycle parking spaces, the quality of the racks provided needs improvement. Our observations suggest that significant improvements can be

made with some minor adjustments. Several best practices for bicycle rack installation should be better adhered to. These improvements include relocating racks to hard surfaces like asphalt or concrete, ensuring adequate spacing from walls and other racks, and installing protective coverings to shield the racks from rain. Adopting these measures would greatly enhance both the functionality and durability of the bicycle parking facilities. Additionally, choosing rack types that utilize 100% of their advertised capacity, such as inverted U racks (staple racks), should be prioritized over less efficient options like hanger racks, which are currently more common.

Potential Funding Strategies

There is no single way to fund bicycle and scooter parking at schools in Vancouver. Instead, a multifaceted approach was observed in the case studies, incorporating various funding streams from donations to established funding sources at municipal, regional, provincial, or national (federal) levels. Municipal funding can be allocated specifically for bicycle infrastructure projects, including school bike racks, through city budgets and local grants. Provincial support may come in the form of grants aimed to enhance active transportation infrastructure or dedicated programs that partner with education and transportation departments. At the federal level, grants for transportation improvements and SRTS programs can contribute to these efforts.

School districts may allocate part of their budgets for such projects, while parent and community fundraising can provide further support. Local foundations and nonprofits focused on health and sustainability can also play a role. Furthermore, behaviour change programs and specialized government initiatives related to active transportation and sustainable mobility offer additional funding opportunities. Combining these sources may create a robust framework for improving bicycle and scooter parking at schools across Vancouver.

One significant finding was the role of the Ministry of Education in providing funding for bicycle and scooter parking in Australia and Ireland. This is something that is lacking in British Columbia, where capital programs for school's cover most of the costs of school construction, additions, and renovations. At the same time, no explicit mention of bicycle parking is made. For instance, the Annual Facility Grant is intended for annual facility projects required to maintain facility assets through their anticipated economic life and to prevent premature deterioration of these assets. In this grant, site upgrades such as repairs to parking lots are mentioned as an eligible cost. Notably, site upgrades such as parking lot repairs are listed as eligible costs under this grant, which implicitly assumes the existence of automobile parking while neglecting bicycle parking infrastructure. This reflects a bias in the Ministry of Education towards car-centric school development. Although the acquisition of equipment like bicycle or scooter racks is not currently covered by this grant (the term "parking lot" could arguably be interpreted to include bicycle/scooter infrastructure), it would be beneficial to explicitly include the maintenance of bicycle and scooter parking infrastructure as eligible costs.

Additional programs like the Carbon Neutral Capital Program, Expansion – New School, Addition and Site Acquisition, and the School Enhancement Program could also be considered for funding new bicycle/scooter parking installations.

Funding Opportunities for Class B Bicycle Parking

Based on the Class B bicycle parking capacity shortfall calculated at individual schools, the number of racks and associated costs required to satisfy the City of Vancouver Parking By-law are estimated in **Table 6** below. The rack deficit does not include the number of racks that are currently oversupplied at schools. Independent schools have a higher rack deficit than public schools while accounting for approximately 25% of the elementary and high school population.

Table 6: Rack deficit and estimated costs by school type

School Type	Rack Deficit*	Estimated Cost*
Public Schools (Including CSF)	51	\$49,100
Independent Schools	84	\$80,800
Total	135	\$129,900

* Assuming the purchase of 7-ring racks, including hardware, installation and delivery. Assumes a \$960 per unit cost, excluding administrative costs incurred by school board staff or the cost of concrete surfaces. Costs are based on previous shipments and installations during the 2023 school year. It is also worth noting that costs can fluctuate based on year and supplier.

Based on the estimated rack capacity at schools, there is an oversupply of racks at many schools when comparing the Parking By-law (**Table 7**). While redistribution could be considered to satisfy by-law requirements at all schools, many schools likely have more racks than required due to demand. For example, 201 racks could be redistributed to schools with a rack deficit and still satisfy by-law conditions. Moreover, further research could be done to determine sufficient levels of Class B bicycle parking at locations with an over-supply by measuring existing utilization.

Table 7: Surplus of Bicycle Racks at Schools

School Type	Rack Surplus
Public Schools (Including CSF)	201
Independent Schools	5
Total	206

Recommendations

Based on this research, several near- and long-term recommendations were developed, and various public sector agencies, independent schools and boards were identified as potential leaders or actors. This approach ensures that immediate actions can be taken to address pressing issues while also laying the groundwork for sustainable, long-term improvements.

Near-term Recommendations

The near-term recommendations focus on quick, feasible improvements that can be implemented with minimal resources and effort. Key **near-term recommendations** include the following:

- **Recommendation #1:** Public sector agencies across all levels of government (e.g. City of Vancouver, TransLink, the Vancouver School Board, province, etc.) and independent school authorities could prioritize any new funding that becomes available for bicycle parking at schools with poor-quality, non-existent, or insufficient Class B bicycle parking facilities. Consideration should be given to areas and schools with higher equity-seeking populations. This approach addresses disparities and promotes equity by ensuring that schools with the greatest need for secure bicycle parking receive the necessary resources. By focusing on underserved schools, we can effectively apply a principle of sufficientarianism —striving to ensure all schools that lack resources have access to essential bicycle parking facilities.
- **Recommendation #2:** City staff are encouraged to communicate deficiencies and share resources with identified staff at independent schools to promote site-level improvements where appropriate.
- **Recommendation #3:** School boards and independent school staff should maintain an inventory and track the utilization of existing racks. If appropriate and feasible, the Vancouver School Board could consider a reallocation policy informed by the utilization of existing racks to redistribute supply and achieve the minimums outlined in the City of Vancouver Parking By-law.
- **Recommendation #4:** The City of Vancouver, the Vancouver School Board and independent schools and boards could explore other capital grants offered by jurisdictions like the Ministry of Transportation and other agencies to finance bicycle/scooter parking retrofit initiatives.

- **Recommendation #5:** The Vancouver School Board and independent schools could explore implementing a controlled access system for existing bicycle cages and rooms for staff and secondary school students to enable Class A security.

In contrast, **long-term recommendations** address more complex and resource-intensive changes which require significant planning, investment, and time to accomplish. These include:

- **Recommendation #6:** The City of Vancouver could revisit supply requirements outlined in the Parking By-law to ensure adequate supply of bicycle parking is provided for new developments and major reconstructions.
- **Recommendation #7:** The Ministry of Education could consider including new/upgrades and maintenance of bicycle and scooter parking as an eligible cost in the Annual Facility Grant or other programs such as the Carbon Neutral Capital, and School Enhancement Program.
- **Recommendation #8:** Public sector agencies could consider launching a bicycle parking retrofit program similar to the province's Fleet Charging Program or the City of Vancouver's Heat Pump Water Heater Top-Up.

Conclusion

In summary, promoting cycling among children and adolescents and improving cycling infrastructure, particularly by investing in and improving bicycle parking facilities, is a critical step toward creating a safer, more equitable, and sustainable city. As the feedback from children, caregivers, and parents indicates, these are key factors in encouraging active travel to school. By investing in these areas, we can foster a generation of individuals who prioritize active and sustainable modes of transportation, thereby ensuring a healthier and safer future for everyone.

Through understanding gaps, public sector and independent school authorities have a clearer picture to make impactful decisions.

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Appendices

Appendix A Class A Bicycle Parking Requirements

6.3.1 Application

The requirements of this section 6.3 apply where Class A bicycle spaces are required, and Class A bicycle spaces shall be in compliance with section 6.3.

6.3.2 Bicycle Room Requirement

All required Class A bicycle spaces shall be provided in a **separate bicycle room** located **within a building**, except that

- (a) the spaces can be in a building which provides parking for motor vehicles for one particular residential unit only, instead of in a bicycle room, or
- (b) the spaces can be provided in a building in an expanded **metal mesh compound** which complies with sections 6.3.14, 6.3.15, and 6.3.16 instead of in a bicycle room, or
- (c) the spaces can be provided in a building or private parking area in numbered bicycle lockers which comply with sections 6.3.17, 6.3.18 and 6.3.19 instead of in a bicycle room.

6.3.3 Bicycle Room Security

The bicycle room shall have solid opaque walls, and all solid interior walls shall be painted. All of the interior of the bicycle room shall be visible from the entry door. A motion-activated security light enclosed in a tamper-proof housing shall be provided in each room.

6.3.4 Bicycle Room Doors

Entry doors to the bicycle room shall be a minimum of 75 centimetres in width. Both door and frame shall be constructed of steel. The door shall be hinged on the inside unless hinges are tamper-proof, and shall have a security window constructed of a laminate of tempered glass and polycarbonate in a steel frame for permanent visual access, except that residential developments do not require such security windows. The entry door shall have a separate lock and key or programmed entry system, and the locks shall be high security in nature.

6.3.5 Bicycle Room Size

The bicycle room shall be designed to accommodate a maximum of 40 bicycles, except that:

(a) this number can be increased to 120 if the room is compartmentalized using expanded metal mesh (see 6.3.14.) with lockable industrial-grade doors into enclosures containing a maximum of 40 bicycles; and

(b) this number does not include bicycle lockers.

6.3.6 Bicycle Room, Compound, or Locker Access

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 designed to accommodate the loading and unloading of at least two bicycles is provided, offering direct, convenient access to the 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. Where an elevator is provided to access bicycle parking, a distinct call button for that elevator shall be provided on all levels with bicycle parking and all levels that provide access to the outside. Where an elevator is provided to access bicycle parking for residential uses, it shall not also be normally used for the loading or unloading of goods, for move in or move out activity associated with residential uses, or other activities which may significantly reduce accessibility to the elevator for people with bicycles.

6.3.7 Bicycle Room, Compound, or Locker Lighting

Lighting in the bicycle room, compound, or locker area shall provide vertical illumination at floor level of a minimum level of 160 lux, with true colour and a uniformity ratio of at most 3:1.

6.3.8 Bicycle Room, Compound, or Locker Supervision

The entry door to a bicycle room or bicycle compound, or bicycle lockers, shall be within sight of building or parking security, where such exists, an elevator, or an entrance.

6.3.9 Bicycle Space Size

All required Class A bicycle spaces shall have a minimum vertical clearance of 1.9 metres, shall be a minimum of 0.6 metres in width and shall be:

(a) a minimum of 1.8 metres in length if the bicycles are to be placed horizontally; or

(b) a minimum of 1.0 metres in length if the bicycles are to be placed vertically,

except that a minimum of 5% of the spaces must be oversized spaces of 2.4 metres in length and 0.9 metres in width, and may not be vertical or stacked spaces.

6.3.10 Bicycle Space Access

Except for the portion of the aisle directly in front of each oversized space as referred to in section 6.3.9, which shall be a minimum width of 1.5 metres, all required Class A bicycle spaces shall be independently accessible by means of an aisle of a minimum width of 1.2 metres, except that the Director of Planning, in consultation with the City Engineer, may permit a lesser width, to an absolute minimum of 0.9 metre, where the bicycle spaces served are provided more than the minimum required width. All access shall have a minimum vertical clearance of 1.9 metres. All doors on the route from Class A bicycle parking spaces to the outside shall be fitted with automatic door openers.

6.3.11 Bicycle Rack and Bicycle Locker Requirement

All required Class A bicycle spaces shall require a bicycle rack with individually numbered spaces or a numbered bicycle locker.

6.3.12 Bicycle Rack Design and Security

Class A bicycle space racks shall be constructed of sturdy theft-resistant material and shall have secure theft-resistant anchoring to the floor or ground. The bicycle rack shall support the bicycle frame above the centre of gravity and shall enable the bicycle frame and front wheel to be locked with a U-style lock.

6.3.13 Vertical and Stacked Bicycle Spaces

Vertical bicycle space racks shall support the bicycle without the bicycle being suspended on the wheels. No more than 30% of the required Class A bicycle spaces may be vertical, and in total, no more than 60% of the required Class A bicycle spaces may be vertical and stacked. Stacked bicycle spaces shall be designed to provide access without the need to lift the bicycle entirely off of the ground and must provide convenient access. Where the Director of Planning accepts equipment proposed for providing stacked bicycle spaces, the dimensions required in 6.3.9 may be reduced for those spaces, and the dimensions required in 6.3.10 may be increased.

6.3.13A Minimum Number of bicycle lockers

At least **10% of the Class A bicycle spaces must be bicycle lockers.**

6.3.14 Bicycle Compound Security

The bicycle compound shall extend from floor to ceiling, and have expanded metal mesh and door with a non-reflective coating. The walls and door shall be reinforced by full-height solid steel bars 13 millimetres minimum diameter or square section, spaced no more than 150 millimetres apart, and welded one to another by at least two crossbars no more than 1,200 millimetres apart, or constructed to provide equivalent or greater security. Supports shall be attached to floor and ceiling with tamper-proof or concealed boltheads or nuts. Industrial grade chain-link shall be No. 7 gauge or heavier.

6.3.15 Bicycle Compound Doors

Entry doors to the bicycle compound shall comply with section 6.3.4., except that no window is required, and the door may be constructed of expanded metal mesh. The lockset or programmable entry shall be placed in a steel plate box welded to the door structure. The supporting post shall be detailed to receive the striker plate. The doorway shall be detailed to prevent access to the latch from lockside with boltcutters.

6.3.16 Bicycle Compound Size

The bicycle compound shall be designed to accommodate a maximum of 40 bicycles.

6.3.17 Bicycle Locker Location

Bicycle lockers shall be located in a private parking area, parking garage, bicycle room, bicycle compound, or as provided for in section 6.3.2.(a).

6.3.18 Bicycle Locker Design and Security

Bicycle lockers shall be constructed of solid, opaque, and theft-resistant material with a lockable door which opens to the full width and height of the locker. Bicycle locker edges shall be secured with no exposed fittings or connectors. Bicycle lockers shall be weather-proof if located where exposed to the elements.

6.3.19 Bicycle Locker Size

Bicycle lockers shall be designed to accommodate a maximum of 1 bicycle, and the minimum inside dimensions of a bicycle locker shall be

- (a) 0.6 metre in width at the door end,
- (b) 0.2 metre in width at the end opposite to the door,
- (c) 1.8 metres in length, and
- (d) 1.2 metres in height.

6.3.20 Conversions in existing buildings

Owners 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 By-law.

6.3.21 Electrical outlets

Each two Class A bicycle spaces must have an electrical outlet.

6.3.22 Bicycle Maintenance Facilities

If 100 or more Class A bicycle parking spaces are required, then a bicycle maintenance facility shall be provided. The facility shall be provided in a designated, secure area within the building with sufficient workspace, and provide the following features: a bicycle stand, a bicycle pump, wrenches, a chain tool, tire levers, hex keys / Allen wrenches, torx keys, screwdrivers, and spoke wrenches.

Appendix B Class B Bicycle Parking Requirements

6.4 Class B Bicycle Spaces

6.4.1 Application

The regulations of this section 6.4 apply where Class B bicycle spaces are required, and Class B bicycle spaces shall be in compliance with section 6.4.

6.4.2 Bicycle Rack Requirement and Space Size

All required Class B bicycle spaces shall be provided in racks which provide a minimum width of 0.6 metre for each bicycle, except as provided for in section 6.4.6.

6.4.3 Bicycle Space Access

All required Class B bicycle spaces shall be independently accessible by means of an aisle with a minimum width of 1.2 metres which is separate from pedestrian access. There shall be unrestricted access behind the space of a minimum length of 0.5 metre. All doors on the route from Class B bicycle parking spaces to the outside shall be fitted with automatic door openers.

6.4.4 Bicycle Rack Design and Security

Class B bicycle space racks shall be constructed of **sturdy theft-resistant material** and shall have **secure theft-resistant anchoring to the floor or ground**. The bicycle rack shall support the bicycle frame above the centre of gravity and shall enable the bicycle frame and front wheel to be locked to the rack with a U-style lock.

6.4.5 Bicycle Rack Location

Class B bicycle space racks shall be provided in a convenient, well-lit location that provides visual surveillance by occupants of the building the racks are intended to serve. If the racks are not readily visible to visitors to a site, directional signage to the racks shall be provided.

6.4.6 Bicycle Lockers

Bicycle lockers can be provided for required Class B bicycle spaces instead of bicycle racks, provided the lockers are numbered and are in compliance with sections 6.3.18 and 6.3.19.

Appendix C Survey instrument

Bicycle and Scooter Parking Usage and Inventory Photo Upload (2024)

Welcome!

1) Which school are you filling out this survey for? _____

2) Does your school have bicycle or scooter parking? (I.e. an area where you can lock up your bicycle or scooter to a rack) Yes No

Photograph Upload and Context Questions

3) Please upload photos of the bicycle/scooter parking area (more than one photo may be required). *Ensure photographs include the following identifiable information (where applicable):*

- *The number of racks and rack styles*
- *Usage (number of bicycles or scooters used during school hours)*
- *Location (context of the surrounding area, e.g. adjacent to the school building/outdoors)*
- *Any major damage to the racks (e.g. rusting)*

4) How would you describe the security of parked bicycles/scooters? (Check all that apply)

Bicycle/scooter parking is clearly visible from inside the school building (i.e. visible through school windows).

Bicycle/scooter parking is contained inside a structure or building.

Bicycle/scooter parking is accessible using a key/lock or electronic POS system.

Bicycle/scooter parking is located inside of the main school building.

Other - Write In: _____

5) How would you describe the quality of bicycle/scooter parking? (Check all that apply)

Some/all racks are not securely fastened to a concrete/asphalt surface.

Some/all racks are in poor condition (rusted, broken etc.)

Some/all racks are difficult to find.

The layout of the bicycle/scooter parking area is cluttered and difficult to maneuver around other bicycles.

Other - Write In: _____

Thank you!

Appendix D Class B Bicycle Parking Evaluations

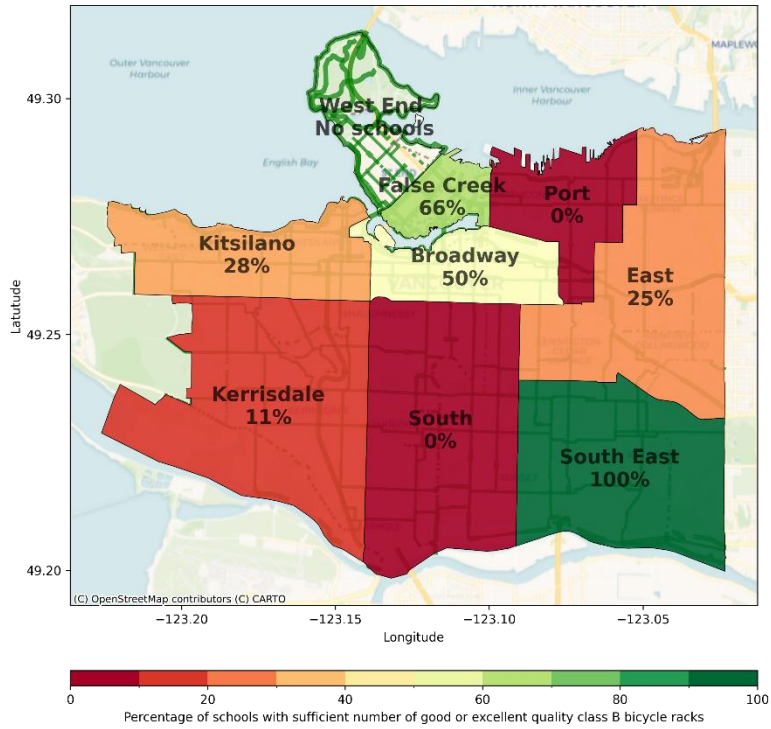


Figure 24. Percentage of schools with good and excellent quality Class B bicycle parking by neighbourhood – Independent schools

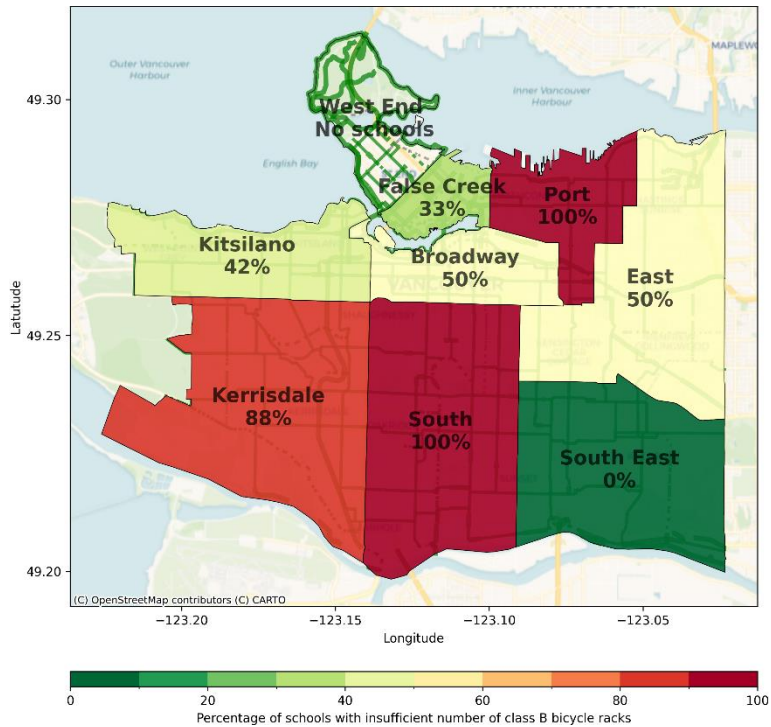


Figure 25. Percentage of schools with a sufficient quantity of Class B bicycle parking by neighbourhood – Independent schools

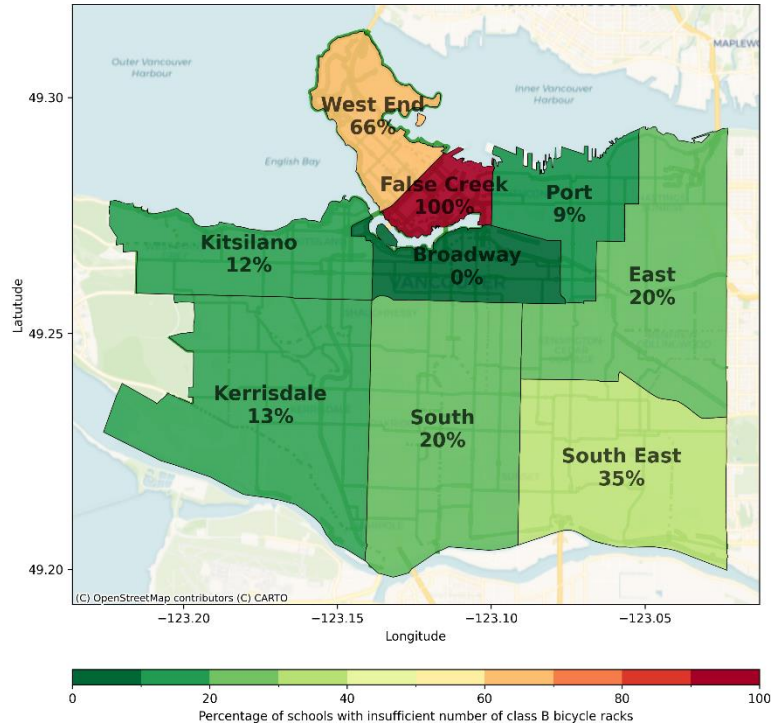


Figure 26. Percentage of schools with good and excellent quality Class B bicycle parking by neighbourhood – Public schools

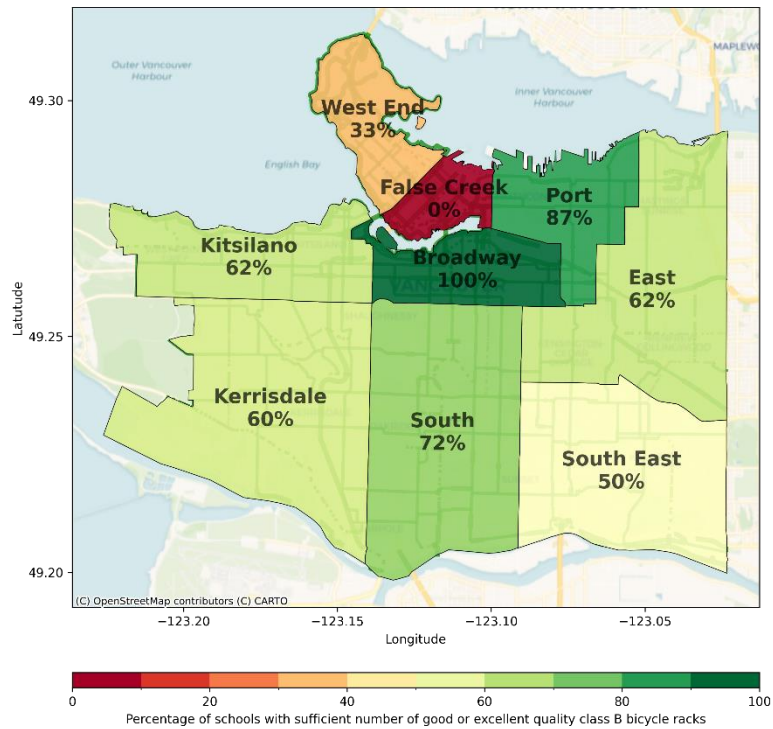


Figure 27. Percentage of schools with a sufficient quantity of Class B bicycle parking by neighbourhood – Public schools