



Report Date: February 27, 2025

VanRIMS No.: 08-3000-30

[Submit comments to the Board](#)

TO: Park Board Chair and Commissioners  
FROM: Director, Park Planning and Development  
SUBJECT: Enhanced Accessibility on Seawall Cycling Path – Report Back

### RECOMMENDATION

- A. THAT the Board approve the proposed conceptual designs to enhance accessibility on the Stanley Park Seawall pathways at Lumberman’s Arch, Prospect Point, and Third Beach as described in this report; and
- B. THAT the Board direct staff to proceed with the detailed design phase for the proposed solutions for the Stanley Park Seawall pathways at Lumberman’s Arch, Prospect Point, and Third Beach, and to seek construction funding in the 2027-2030 capital plan.

### REPORT SUMMARY

This report responds to the Board motion entitled Removal of Cyclist Barriers and Implementation of Signage for Seawall Safety. The report summarizes the issues surrounding the existing maze gates, also known as speed gates, at three locations along the Seawall cycling path at Lumberman’s Arch, Prospect Point, and Third Beach. Alternative solutions are proposed to remove the maze gates and enhance accessibility and improve safety for users of all ages and abilities at these locations. Additionally, this report provides the cost estimates and targeted timelines for implementation of the proposed solutions.

### BOARD AUTHORITY, POLICY AND PREVIOUS DECISIONS

On May 6, 2024, the Park Board unanimously approved the [motion](#) named Removal of Cyclist Barriers and Implementation of Signage for Seawall Safety:

- A. THAT the Board directs staff to report back by Q1 2025 on options for enhanced accessibility on the Seawall cycling path at Stanley Park, including consideration of:
  - a. Options for removal of the three barriers which are inaccessible to certain types of active transport (such as hand-cyclists, bikes with trailers, etc.) along the Seawall cycling path at Lumberman’s Arch, Prospect Point, and Third Beach;
  - b. The impact of the recently approved e-scooter and e-bike access on speeds and congestion on the cycling path;
  - c. Potential measures to reduce risks in crowded or high-traffic sections;
  - d. Proposals to engage with Seawall users, including pedestrians, active transport users, seniors and people with disabilities and mobility challenges to ensure that the new measures effectively balance the needs of all Seawall users; and
  - e. The cost and timeline for implementation of the various options.
- B. THAT The Board further directs that all options proposed in A shall be consistent with safety and reduction of Park Board legal liability.

## Relevant Policy

As per the [Vancouver Charter](#), the Park Board has exclusive jurisdiction and control over all areas designated as permanent and temporary parks in the City of Vancouver, including any structures, programs and activities, fees, and improvements that occur within those parks.

On June 8, 2020, the Park Board carried a [motion](#) to direct staff to “explore the long-term feasibility of reducing motor vehicle traffic in Stanley Park...while increasing accessibility for those with disabilities.” This motion led to the establishment of the Stanley Park Mobility Study for which the final recommendations for decision are targeted for Q2 2025. The proposed solutions in this report are aligned with the study’s purpose to explore ways to improve access into Stanley Park and enhance park visitor experiences.

On April 8, 2024, the Board approved an [amendment](#) to the Parks Control By-Law to permit electric motor-assisted bicycles (e-bikes) and electric kick scooters (e-scooters) on designated cycling paths within parks, including the Seawall in Stanley Park.

The objectives for enhanced accessibility on the Seawall cycling path at Stanley Park support the following Park Board and City policies and initiatives:

- [VanPlay \(2019/2020\)](#): VanPlay seeks to create ‘Interconnected Networks’ that connect and integrate parks into the daily lives of Vancouverites. The project supports safety and accessibility for cyclists and park users of all ages and abilities on the popular Seawall in Stanley Park.
- [Climate Emergency Action Plan \(2020\)](#): The project provides improvement to a sustainable, low carbon transportation network that makes it safer and more convenient for people of all ages and abilities to bike across the city. This supports a 50% reduction of the city’s carbon pollution, and active transportation targets for two thirds of all trips in the city to be made on foot, bike or transit by 2030 (Big Move 2).
- [Healthy City Strategy \(2015\)](#): This project supports the strategy’s goals of enabling Vancouverites to “enjoy safe, active, and accessible ways of getting around the city.”
- [Greenest City 2020 Action Plan \(2015\)](#): The project supports the plan’s green transportation goal to “make Vancouver a city where moving on foot or by bike is safe, convenient, and enjoyable.”
- [Stanley Park Cycling Plan \(2012\)](#): This project supports the plan’s vision to “create a safe, comfortable, and convenient cycling network that is both unobtrusive and sensitive to the existing qualities of the park”.
- [Transportation 2040 Plan \(2012\)](#): The project supports the plan’s initiative to “build cycling routes that feel comfortable for people of all ages and abilities.”

## BACKGROUND

The Seawall around the iconic and world-renowned Stanley Park is part of the 28 km-long seaside greenway connecting the Vancouver Convention Centre with Spanish Banks. Much of the 8.8 km-long section around Stanley Park is characterized by separate paths for pedestrians (walking/or in mobility devices) and cyclists (bicycles, scooters, and other recreational devices); however, the sections at Lumberman’s Arch, Prospect Point, and Third Beach are shared among the different users. Tightly spaced maze gates, also known as speed gates, require cyclists to dismount and walk their bikes in these high pedestrian traffic zones. The gates pose significant accessibility challenges, add hazards, and create inequities for certain users.

In July 2024, staff engaged a transportation engineering consultant to review and recommend options to remove the maze gates and collaborated with the City of Vancouver’s engineering staff who have practical experience in this area. Considering industry best practices, innovations and local experience, staff and the consultant team developed a variety of options that enhance accessibility and safety for Seawall path users of all ages and abilities. This detailed report, titled Stanley Park Maze Gate Removal Options, is available in **Appendix A**.

## DISCUSSION

### Existing Accessibility and Safety Challenges

Maze gates significantly impact accessibility and are difficult to maneuver for some active transportation user groups particularly those with adaptive bicycles, hand-cyclists, trailers, or longer bicycles, as shown in Figure 1. Best practices do not recommend the use of maze gates as they hinder accessibility for those unable to navigate them. Instead, alternative design solutions are suggested to slow cyclists, manage conflict areas and encourage desired behaviours.



Figure 1: Example of Accessibility Challenges by Maze Gates on the Seawall

#### a. Options for Removal and Proposed Solutions

The maze gates can be removed and replaced with new features that align with best practices, such as chicanes, vertical deflections, pathway narrowing, textured pavements and materials, landscaping, planters, furniture, visual cues and signs, and interactive feedback displays. The details of these design techniques are provided in Section 4 of the appended report.

Staff are seeking Board direction to proceed with the removal of the maze gates and implementation of alternative solutions to enhance accessibility on the Seawall paths as follows. The proposed solutions utilize cost-effective rapid implementation construction techniques and fit within the Vancouver parks and transportation standards. Conceptual drawings of the proposed solutions are provided in **Appendix B** and described below.

#### *Lumberman’s Arch – Marked Bike Path with Single Pedestrian Crossing*

Planters and lean rails are proposed to create a separate, clearly marked bike path through the area. The path will narrow people rolling to single file ahead of the pedestrian crossing to encourage slow rolling and yield behaviour.

### *Prospect Point – Low-cost Signage and Fencing Changes*

The existing fence with a problematic tight exit for longer bikes can be removed, and is replaced with visual cues, signage and pavement markings to encourage slow rolling through a shared space. A railing can be added to the outer edge of the existing Seawall to allow those enjoying the view to lean on it, thus creating a wider shared space for those passing through.

### *Third Beach - Focused Crossing Area Plus Relocated Bike Parking*

The bike racks can be relocated between the bike path and the pedestrian path creating a chicane where cyclists are encouraged to slow down around the curve prior to the pedestrian crosswalk. A single marked pedestrian crossing point can be created using benches and lean rails to encourage cyclists to ride in single file and reduce conflicts.

### *Archeology and Cultural Sensitivity/Host Nations Referrals*

Works near *Χwáyχway/χwayχwəy* (Lumberman's Arch) and at Third Beach are within recorded archaeological sites and/or in areas of high archaeological potential. Park Board Archeologists have reviewed these locations and have identified archaeological considerations. An invitation for collaboration and involvement, along with the consultant's report, has been extended to *xwəθkə yəm* (Musqueam), *Skwx wú7mesh* (Squamish Nation) and *səilwətaʔ* (Tsleil-Waututh Nation) through a referral process. Initial feedback received suggests support for the accessibility enhancements as proposed, with archaeological considerations that can be addressed.

The Park Board Archeologists will continue to provide feedback regarding design options to limit impacts to these archaeological sites and communicate proposed work plans with the Local Nations' respective archaeology teams, in addition to the referral process.

### **b. Impact of E-Scooters and E-Bikes**

The e-bikes in the city's public bike share system (Mobi by Rogers) have a maximum speed of 25 km/h city-wide including the Stanley Park Seawall. The shared e-scooter pilot's service area does not presently include the Seawall however future expansion phases are anticipated to extend to Downtown and Stanley Park. Park Board and Engineering staff will work with the e-scooter provider (Lime) to implement a geofenced e-scooter slow zone on the Seawall. It is important to note that geo-fencing can be implemented for shared micromobility services but not for personal e-bikes and e-scooters. Consequently, the potential for individuals to travel at higher speeds along the Seawall remains with continued concerns about the management of shared spaces and safety for all park users.

### **c. Potential Measures to Reduce Risks and Legal Liability**

The proposed solutions align with industry safety standards and best practices and are effective in mitigating conflicts between cyclists and pedestrians in high traffic sections. If the concept plans are approved, the construction drawings will be prepared by an independent professional consulting engineer with cycling expertise. Implementation and maintenance of the cycling path features shall be consistent with the Park Board's duty of reasonable care to Seawall users.

### **d. Proposals to Engage**

During detailed design development, staff will seek feedback from interest-holders, including cycling advocacy groups (for example, HUB Cycling, Spinal Cord Injury BC, Power To Be, and BC Wheelchair Sports Association). Staff will also install site signage and share social media posts to inform the public about the proposed accessibility enhancements on the Seawall cycling path, in advance of implementation.



### e. Costs and Implementation Timeline

A preliminary estimate of the costs to implement the proposed solutions is as follows:

Lumberman's Arch - Marked Bike Path with Single Pedestrian Crossing	\$ 179,000
Prospect Point - Low-cost Signage and Fencing Changes	\$ 141,000
Third Beach - Focused Crossing Area Plus Relocated Bike Parking	\$ 100,000
Contingency (40%)	\$ 168,000
Total Construction Costs	\$ 588,000
Design Fees	\$ 90,000
Archaeology (Assessment, Construction Monitoring)	\$ 120,000
Project Management	\$ 30,000
<b>Total Projected Costs</b>	<b>\$ 828,000</b>

Detailed design development costs can be funded from eligible funding in the 2023-2026 capital plan. There is insufficient eligible funding remaining in the current capital plan to support the construction costs outlined above. Subject to Board approval, staff can advance the detailed design phase of the project between Q2 to Q4 of 2025 and seek suitable funding in the 2027-2030 capital plan to support construction in 2027.

### NEXT STEPS

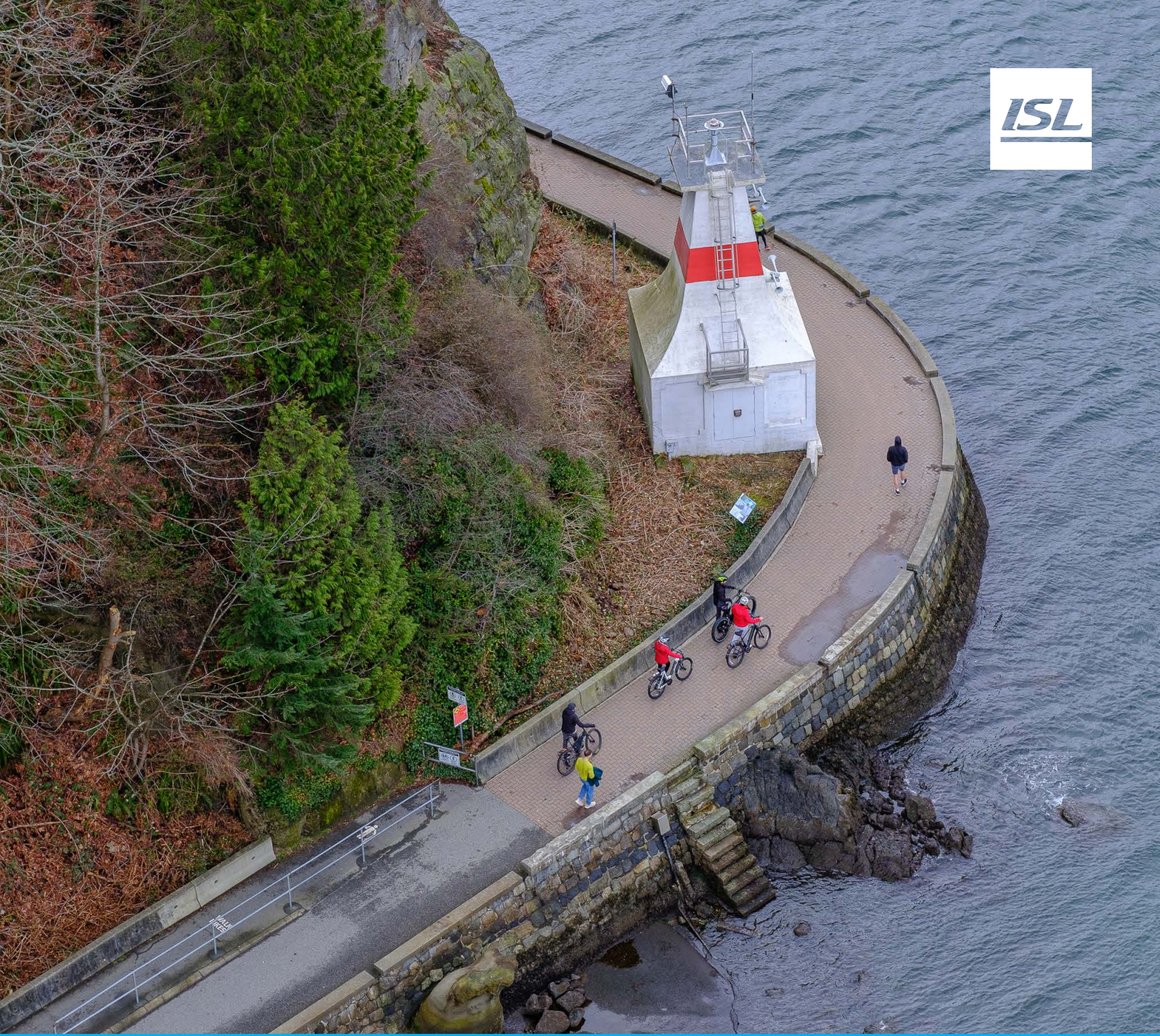
If the Board approves the report's recommendations, staff will proceed with engaging a transportation engineering consultant to undertake the detailed design phase and develop a refined construction cost estimate. Staff will seek funding in the 2027-2030 capital plan to support construction in 2027.

### CONCLUSION

The existing maze gates on the Seawall path reduce accessibility and create inequities for some users. Implementation of the proposed cost-effective solutions will significantly improve safety, promote accessibility and mobility for users of all ages and abilities on the iconic Seawall.

\* \* \* \* \*





# APPENDIX A

## City of Vancouver

### Stanley Park

### Maze Gate Removal Options

Final Report Prepared by:  
ISL Engineering and Land Services Ltd.

February 2025





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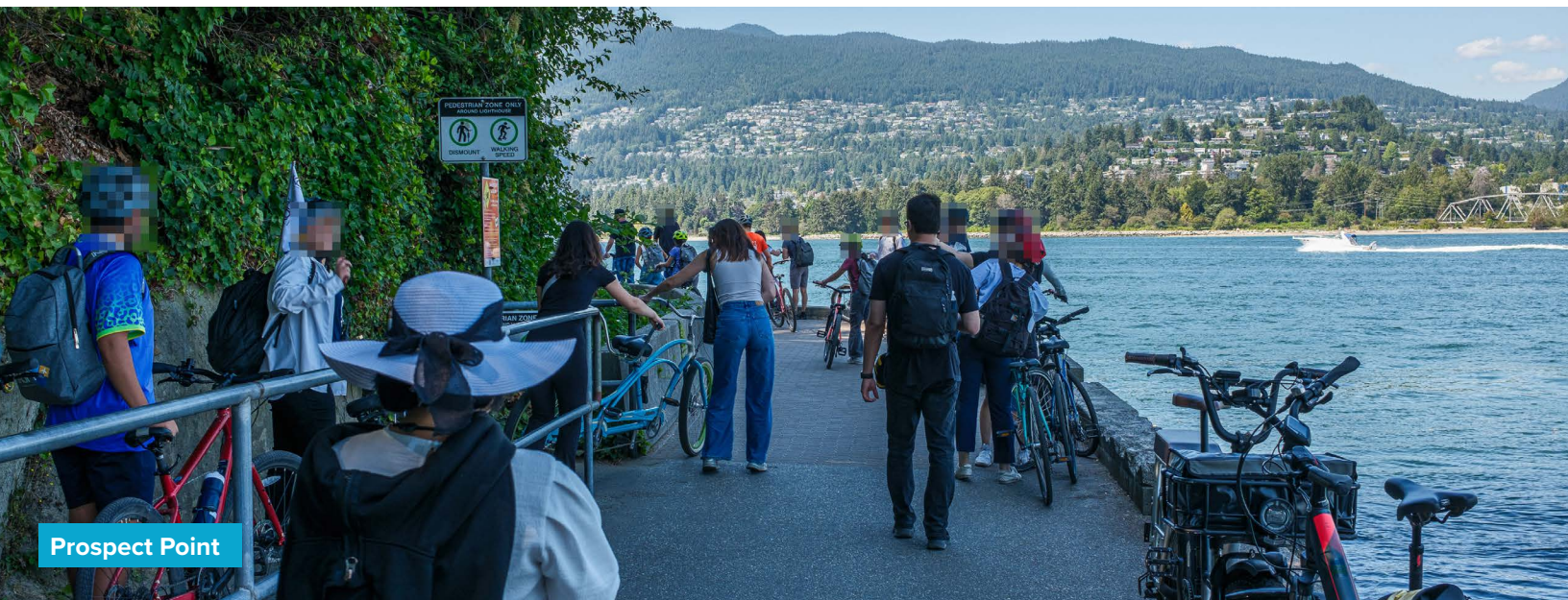
- Roy Symons P.Eng.







Lumberman's Arch



Prospect Point



Third Beach



## Executive Summary

The Park Board has approved the use of e-bikes and e-scooters in Stanley Park and initiated this study to review accessibility issues related to this change, as well as address existing accessibility challenges caused by the tightly spaced maze gates—also known as speed gates—at three locations along the Stanley Park Seawall: Lumberman’s Arch, Prospect Point, and Third Beach. During site visits for the project, it quickly became evident that the existing designs significantly impact accessibility, add hazards, and create inequities for certain users. In some cases, these designs compromise users’ dignity as they struggle or fail to maneuver adaptive bicycles, trailers, or longer bicycles through the maze gates.

Best practices do not recommend the use of maze gates as they hinder accessibility for those unable to navigate them. Instead, alternative design solutions are suggested to slow cyclists, manage conflict areas, and encourage desired behaviors. These include chicanes, vertical deflection, pathway narrowing, textured pavements and materials, vegetation, landscaping, furniture, visual cues and signage, interactive feedback displays, and conflict reduction techniques.

The design team reviewed the Stanley Park Cycling Plan, current City design guidelines, as well as TransLink and provincial guidance for active transportation. Based on this review, seven options were developed across the three locations. A preferred option was selected for each location as follows:

- Lumberman’s Arch Option 2: Marked bike path with single pedestrian crossing
- Prospect Point Option 1: Low cost signage and fencing changes (as an interim strategy)
- Third Beach Option 2: Focused crossings and relocated bike parking

These preferred options were taken forward to the concept design stage to refine the options, determine to what extent they could be implemented using quick build techniques, and determine project costs. The Class D cost estimate, including a 40% contingency, was \$250,012 for Lumberman’s Arch, \$197,400 for Prospect Point, and \$139,496 for Third Beach.

These costs are subject to further detailed design and could potentially be implemented more cost-effectively as pilot projects using materials that may already be available within the City. However, the artistic elements could vary significantly in cost depending on the artistic direction pursued. Depending on the implementation approach, additional studies may be required, including structural and geotechnical reviews of the small retaining wall at Third Beach, arborist reviews of root heave at Lumberman’s Arch, and assessments of the ability to securely mount railings to the existing wall at Prospect Point.





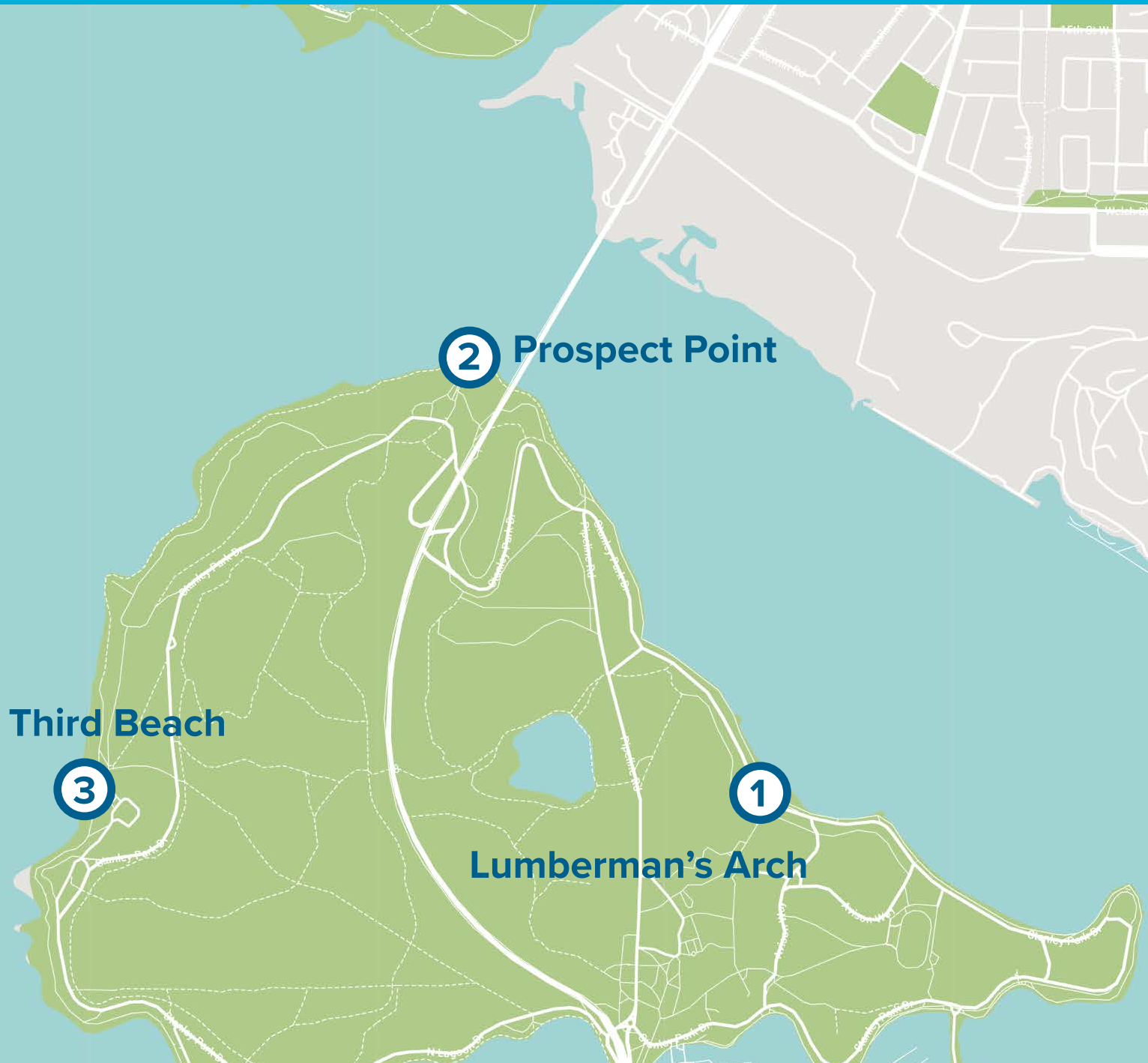




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Third Beach

2 Prospect Point

1

Lumberman's Arch

3

1

## Project Background

This project focuses on three areas around the Stanley Park Seawall where conflicts are present and where speed management in the form of maze gates have been installed. However, these measures reduce accessibility and have equity impacts for some people using the Seawall.

## 1.1. Locations and Challenges

The majority of the Seawall features separate pathways for pedestrians and cyclists. However, there are sections of the Seawall, including 1) Lumberman's Arch, 2) Prospect Point, and 3) Third Beach, where paths are shared among different users. These areas experience high pedestrian traffic, particularly among seniors, children, and people with disabilities or mobility challenges. Additionally, the Park Board recently amended the Parks Control Bylaw to permit the use of motor-assisted cycles and e-scooters on the Seawall.

Maze gates are installed on the Seawall at Lumberman's Arch, Prospect Point, and Third Beach to enhance safety by requiring cyclists to dismount and walk their bikes in these high pedestrian traffic zones. However, this requirement is often ignored by cyclists. The gates also pose accessibility challenges for certain active transportation groups, such as hand-cyclists, bikes with trailers, and cargo bikes.

In response, the Park Board passed a motion on May 6, 2024, directing staff to review options to improve accessibility on the Seawall and facilitate smoother pedestrian and cycling traffic flow. Staff have been tasked with reporting back on these options by Q1 2025. Specifically, the motion states:

(A) THAT the Board directs staff to report back by Q1 2025 on options for enhanced accessibility of the Seawall cycling path at Stanley Park including consideration of:

- a. Options for removal of the three barriers which are inaccessible to certain types of active transport (such as hand-cyclists, bikes with trailers, etc) along the Seawall cycling path at Lumberman's Arch, Prospect Point, and Third Beach
- b. The impact of the recently approved e-scooter and e-bike access on speeds and congestion on the cycling path
- c. Potential measures to reduce risks in crowded or high-traffic sections;
- d. Proposal to engage with Seawall users, including pedestrians, active transport users, seniors, and people with disabilities and mobility challenges to ensure that the new measures effectively balance the needs of Seawall users; and
- e. The cost and timeline for implementation of the various options.

(B) THAT the Board further directs that all options proposed in A shall be consistent with safety and reduction of Park Board legal liability.

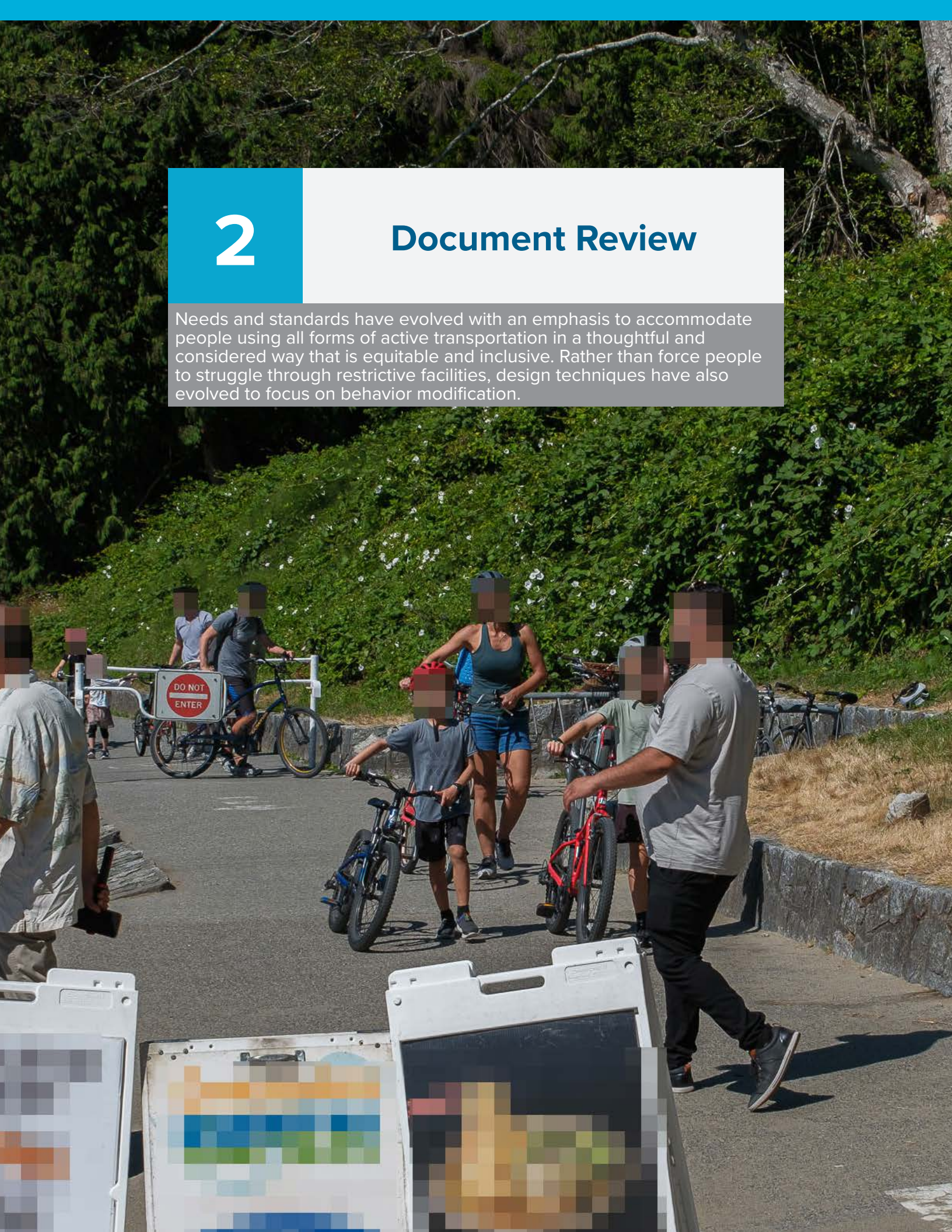




# 2

## Document Review

Needs and standards have evolved with an emphasis to accommodate people using all forms of active transportation in a thoughtful and considered way that is equitable and inclusive. Rather than force people to struggle through restrictive facilities, design techniques have also evolved to focus on behavior modification.





## 2.1. Stanley Park Cycling Plan (2012)

The Stanley Park Cycling Plan offers recommendations to improve cycling infrastructure and safety within the park. It addresses the diverse needs of cyclists, pedestrians, and other park users by proposing updates to pathways, signage, and traffic-calming measures. The plan focuses on enhancing connectivity and safety, reducing conflicts among user groups, and ensuring a positive experience for all visitors.

While maze gates are not explicitly mentioned, the report highlights dismount areas and baffles, which are known to cause significant congestion and long line-ups for cyclists. Many cyclists opt to ignore these dismount zones and continue riding, exacerbating the issues.

The recommendations include using textured paving and advance warning signage to clearly mark the beginning and end of dismount areas at all three locations. Additionally, at Prospect Point, a pathway widening was proposed by cantilevering an extension onto the existing path. At Lumberman's Arch, a bypass option was suggested that would re-purpose a vehicle lane on Stanley Park Drive, eliminating conflicts with pedestrians entirely.

## 2.2. Park Board Decision on E-bikes and E-Scooters

In a report presented to the Vancouver Park Board on April 8, 2024, recommended amendments to the Parks Control By-Law were proposed to permit electric motor-assisted bicycles (e-bikes) and electric kick scooters (e-scooters) on designated cycling paths within parks. This change aligns with recent amendments to the City of Vancouver's Street & Traffic By-Law and supports broader sustainability and active transportation goals outlined in city and provincial initiatives. The recommendation also includes the use of geo-fencing to control speeds where necessary.

It is important to note, however, that while geo-fencing can be implemented for bike and scooter share services such as Mobi bikes and Lime scooters, it cannot be applied to personal e-bikes and e-scooters. As a result, there remains a potential for individuals to travel at higher speeds along the Stanley Park Seawall, raising concerns about safety and the management of shared spaces.



### 2.3. Stanley Park Mobility Study Update (2024)

The Stanley Park Mobility Study Update, dated April 22, 2024, is a presentation providing an update on the ongoing mobility study for Stanley Park. Its primary goal is to evaluate potential solutions to address traffic congestion, enhance overall park accessibility, and minimize environmental impacts, ahead of the final public engagement sessions still to be conducted.

The study focuses on addressing the long-standing issue of traffic congestion in Stanley Park, which has been a challenge since the 1980s. To tackle this, various options were explored to manage traffic without expanding Stanley Park Drive. A total of 55 options were initially developed, and 21 of these were evaluated using public input, stakeholder feedback, and data collection. This process ultimately narrowed the choices down to seven top options as follows:

- **Option A:** Time-based restrictions for vehicle access during peak periods (e.g., weekends or seasonal events).
- **Option B:** A vehicle time-slot booking system similar to Buntzen Lake Park's model.
- **Option C:** A dedicated transit lane for public transport, shuttle buses, and tour buses on Stanley Park Drive.
- **Option D:** A separated bike lane for active transportation such as bicycles and e-scooters on Stanley Park Drive.
- **Option E:** A car-free Stanley Park Drive dedicated to public transit with limited bike access.
- **Option F:** A car-free Park Drive with priority for cyclists and public transit.
- **Option G:** Complete car-free zones with dedicated lanes for both transit and bikes.

The document outlines a phased, long-term plan that may take between 5 to 30 years for full implementation. Future steps include conducting public engagement sessions, performing further technical analyses, refining the proposed options, and implementing pilot tests. Final recommendations are anticipated to be presented in late 2024.

### 2.4. Park Development Standards

The Park Development Standards serves as a comprehensive guide for the development and maintenance of parks. It includes standard drawings, technical specifications, and Best Management Practices (BMPs), offering a detailed manual for Park Board staff, consultants (such as planners, landscape architects, and engineers), and contractors involved in the planning, design, construction, and maintenance of Vancouver's park system.



While the document primarily focuses on construction details, such as specifications for asphalt or gravel pathways, it is less oriented toward addressing the functional needs of pedestrians and cyclists. For guidance on functional requirements, the City's Engineering Design Guidelines, as outlined in Section 2.5, provide greater clarity and detail.

## 2.5. Engineering Design Guidelines and Construction Standards

The City maintains a hierarchy of modes with walking placed above cycling, which both feature above transit, commercial vehicles, and then private automobiles. This is intended to be used in the decision making process where trade-offs have to be made.

The study areas in this plan could be considered pathways in terms of classification within City guidance. Pathways provide safe, accessible, and vehicle-free corridors for people to walk, run and bicycle.

Accessible pedestrian design is important to the City, and designs should be of a high standard to accommodate people with locomotion, seeing, hearing, dexterity and learning disabilities.

Off-street pathway widths will vary depending on many considerations. In urban areas, where significant through bicycle traffic may be expected, a separate pathway for people walking and biking should be provided. The guide notes that Walking paths shall be a minimum of 1.8m wide but in many cases will need to be wider to account for pedestrian volumes, accessibility and other considerations. For example, the Seaside Greenway walking pathway ranges from a 3.0m minimum width in retrofit areas to a preferred width of 4.5m or wider in other areas.

Off-street bicycle paths are pathways that do not follow the same alignment as a roadway, such as pathways through parks or segments of the Seawall. They are the most comfortable facility for people on bicycles. Off-street bicycle pathways generally should be paved with asphalt. However, paving stones, sawcut concrete, or other special treatments may be considered through parks, plazas, and other context-sensitive areas. While some existing off-street pathways are shared with pedestrians, known as multi-use pathways, in most situations new off-street pathways should be designed with separate walking and cycling spaces. For a one-way bicycle facility, the standards require an absolute minimum of 1.5m, minimum of 2.0m and preferred width of 2.4m-3.0m.



For adequate drainage, the bicycle facility cross fall may be 1-4% with a 2% crossfall preferred. Separation between the bicycle facility and walking path can be as little as a paint line (considered the bare minimum), a 0.15m bevel curb with 50mm elevation difference, or median of some form. Pedestrian crossings at separated bicycle lanes and bicycle paths use modified zebra crossings, typically 3.0m long with 0.3m wide bars aligned with the movement of bicycle traffic. A minimum 0.15m gap (maximum 0.3m) at each edge of the crossing is required so that there is a contrasting strip of asphalt between the concrete sidewalks and the white pavement markings. Tactile Warning surface Indicators (TWSI's) are also desirable at crossings.

## **2.6. TransLinks Rapid Implementation Design Guide for Bikeways in Metro Vancouver**

Design changes can be made at many scales with different costs and aesthetics. Rapid implementation allows for the faster and more cost-effective creation of complete cycling networks. It also offers more flexible infrastructure that can be easily adjusted in response to public and stakeholder feedback, ultimately contributing to a smoother transition toward permanent bikeways.

The approach involves using adjustable materials that are relatively inexpensive compared to typical capital projects. While flexible and adaptable, these materials can be affixed to the roadway, giving them more permanence than those used in tactical or demonstration projects. Rapid implementation projects generally have a lifespan ranging from a few months to several years.

These projects are designed for quick implementation—within days, weeks, or months—rather than years. Since minimal capital construction is required, there is less need for detailed engineering or topographic surveys to address factors such as grade changes, drainage design, or the relocation or removal of utilities, street trees, or other infrastructure. Instead, the design can often be completed using an orthophoto and cadastral data, and the work can be “fit in the field” by construction crews. In many cases, installation is simple enough to be carried out by City crews without the need for a tender process.

Rapid implementation projects are flexible and can be easily modified throughout their lifespan based on issues and user feedback. They may also include placemaking elements such as creative surface treatments, pavement markings, street furniture, and landscaping to enhance aesthetics.

Monitoring before and after implementation is crucial to confirm that the design intent is being achieved and to identify any necessary adjustments. In this study,



success could be measured by improved accessibility for non-standard bicycles, enhanced yielding behavior, and reduced conflicts.

When considering materials and design guidance, the designer should account for available space, drainage requirements, aesthetics, and the available capital and maintenance budgets. Common materials include painted buffers, flexible delineator posts, modular plastic curbs, planter boxes, pre-cast concrete curbs, extruded curbs, and concrete barriers. Activation of spaces can be enhanced through decorative paint and street furniture, such as benches and picnic tables.

## 2.7. BC Active Transportation Design Guide

The document advises against using rigid bollards, maze gates, or other solid barriers at pathway entry points unless there is a documented history of motor vehicle encroachment or collisions. Rigid barriers can pose safety hazards for cyclists by creating confined operating spaces, which increases the risk of conflicts and collisions.

Maze gates, in particular, can obstruct accessibility for a variety of bicycle types such as adaptive bicycles and cargo bicycles and reduce the ease of use for cyclists, especially on cut-through pathways. These pathways should remain accessible to all users unless there is a significant safety concern that justifies imposing restrictions.

Maze gates and bollards are considered unsuitable for controlling bicycle speed due to their potential to create safety risks. Instead, speed control should be achieved through geometric design features, such as incorporating horizontal and vertical curves or uphill grades on approach pathways.

If physical elements are required to control access or speed, flexible bollards are recommended over rigid barriers. This approach minimizes risks to cyclists and allows for safer, more accessible pathway designs.





# 3

## Existing Conditions

It doesn't take too long standing at each location to see that the existing designs impact accessibility, are inequitable to certain users to the point of impacting their dignity as they struggle to maneuver an adaptive bicycle, trailer or longer bicycle through the existing maze gates.





### 3.1. Site Overview

#### Lumberman's Arch

Lumberman's Arch has a problematic entry, with root heave creating an uncomfortable approach to the shared area. However, the addition of asphalt over the root area has somewhat mitigated this by creating a speed hump effect, which helps slow down users approaching the existing maze gates.

The maze gates themselves are awkward for standard bicycles and particularly problematic for unusually sized bicycles or people with less experience. The shared space sees a mix of pedestrians and people rolling, which can make it easier for those rolling to weave around pedestrians, as the area is wide open.

The tunnel under Stanley Park Drive, which leads to a concession and other attractions further within the park, creates both pedestrian and cyclist cross-traffic. Additionally, the washrooms located under Stanley Park Drive creates a crossing demand between the washroom, Seawall, and the splash park.

The point where people walking their bikes are allowed to ride again is located quite far beyond the main conflict area, which leads to poor compliance in the later half of the path.



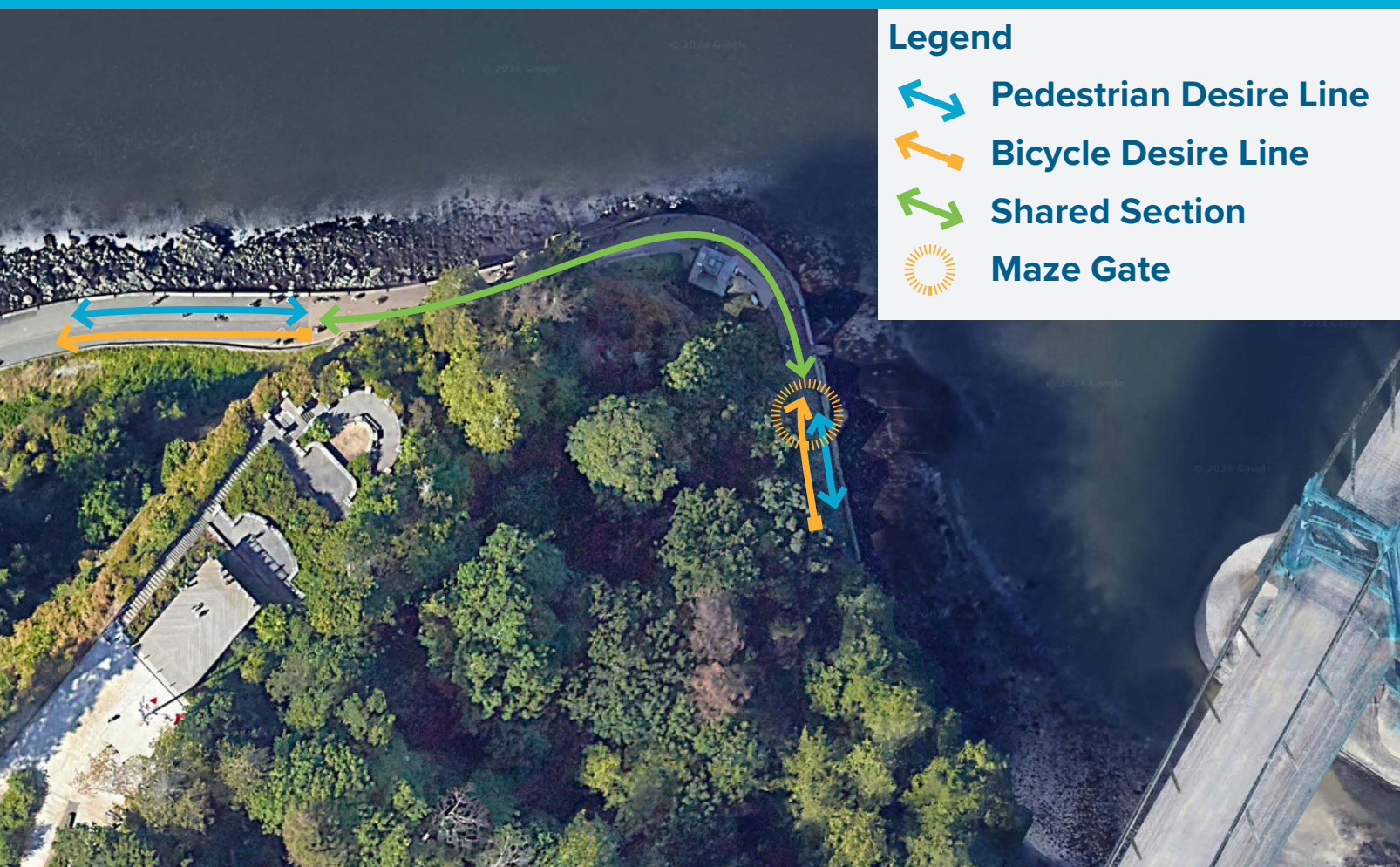


## Prospect Point





Prospect Point is a simpler site in some ways, but the lack of space makes implementing an effective low-cost solution more complex. As the walking and rolling paths merge, a fence appears between them with a tight exit that is effective in slowing people down and encouraging them to walk. While not as difficult to navigate as the maze gates, it still presents challenges for people with larger-than-usual bicycles.

The two pathways merge into a shared area with a textured surface made of pavers. However, this shared area is narrow for the volumes encountered, measuring approximately 3 meters wide. Additionally, people often stop to rest, enjoy the view, or take pictures of the Lions Gate Bridge, which leads them to park their bikes on the side, further narrowing the available width. Whilst stopped, people tend to wait away from the edge of pathway to mitigate the risk of falling into the water.

The point where people rolling are permitted to ride again seems farther than desirable, and many people begin rolling before the separate facilities officially start.



### Legend

-  Pedestrian Desire Line
-  Bicycle Desire Line
-  Shared Section
-  Maze Gate





### Third Beach

Third Beach is different from the other two facilities in that the walking and biking paths remain separate throughout the study area, however people are still expected to walk their bikes through this area. There is a crosswalk over the bike path leading to and from the concession area and car parking, and people also cross the bike path to move between the beach and the bicycle parking. The crosswalk does not align with the steps to the beach, which encourages pedestrians to cross the bike path outside of the marked crosswalk.

A small grade change separates the walking and biking facilities, and a small barrier curb helps discourage cyclists from dropping down to the sidewalk. However, when congestion occurs at the maze gates, cyclists often hop the curb. The maze gates are spaced so closely that it becomes extremely difficult to navigate through with anything other than a regular bicycle.

At the bottom of the steps, a stop sign is placed on a flex post, instructing pedestrians to look both ways, which implies that even though pedestrians have priority, cyclists may not always yield.

Sandwich board signs for the concession are located immediately next to the crosswalk, which somewhat narrows the space for bicycles. Additionally, the bench under the park map was identified as problematic, as it contributes to crossing conflicts in this area.





### 3.2. Permanent Count Data

2022 hourly count data has been provided for numerous locations around Stanley Park. To illustrate overall cyclist volume trends on the seawall, data was analyzed from a counter located approximately 450m south of the Lumberman’s Arch study area.

When interpreting the results, it is noted that Stanley Park Drive had a temporarily bike lane in place during 2022, which would have attracted a significant volume of cyclist traffic away from the seawall. However, the data still provides a picture of volume trends along the seawall.

The twenty-three busiest days at this counter were on summer weekends and statutory holidays. For reference, each mark on the x-axis in **Figure 3.1** represents a Sunday, which closely coincides with most of the peaks.

The average hourly weekday and weekend volumes by month is shown in **Figure 3.2** and **Figure 3.3**. These figures confirm that August is the peak month, followed closely by July. The overall peak hours are consistently 11 AM during weekdays and 3 PM during weekends.

### 3.3. Short Counts

The project scope included several short-term counts at the three locations to better understand existing classifications of seawall users, what level of compliance there is with the requirement to walk their micromobility device through the conflict areas and whether there were issues with people rolling in the pedestrian areas, often as a result of congestion at the maze gates.

Surveys were undertaken at each location during a variety of periods to capture different days of the week and time of the day as follows:

- Survey 1 - Wed Aug 14, 2024 8am-6pm
- Survey 2 - Sat Aug 17, 2024 10am-3pm
- Survey 3 - Thu Aug 29, 2024 4pm-9pm

The highlights of the survey at each location are provided in Section 3.4 to 3.6 on the following pages.

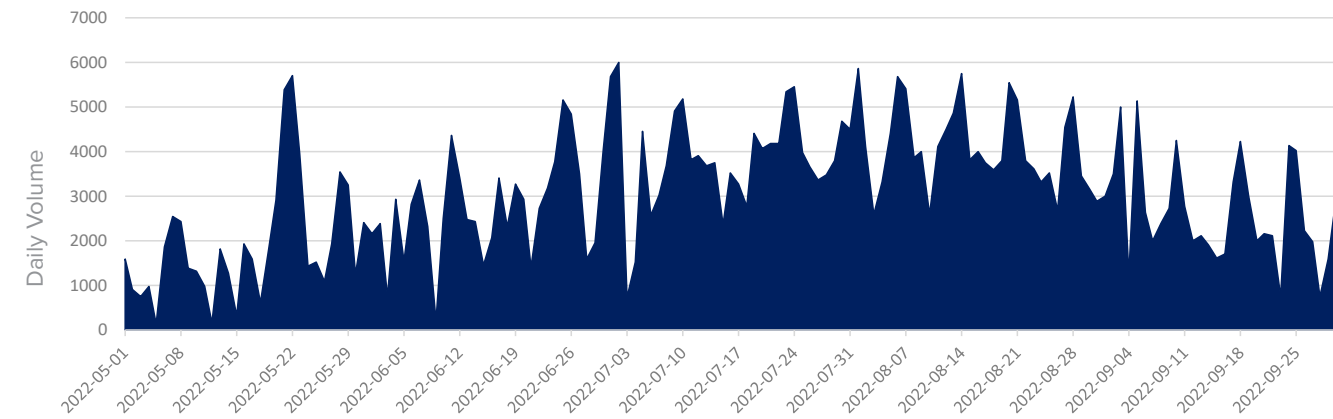


Figure 3.1: Peak Months Daily Seawall Bicycle Volumes

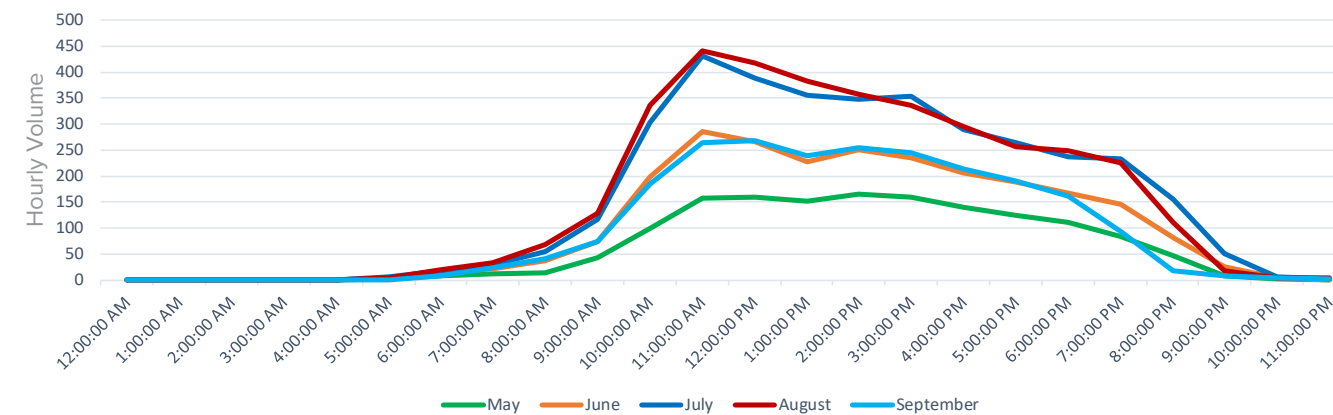


Figure 3.2: Average Hourly Weekday Bicycle Volumes by Month

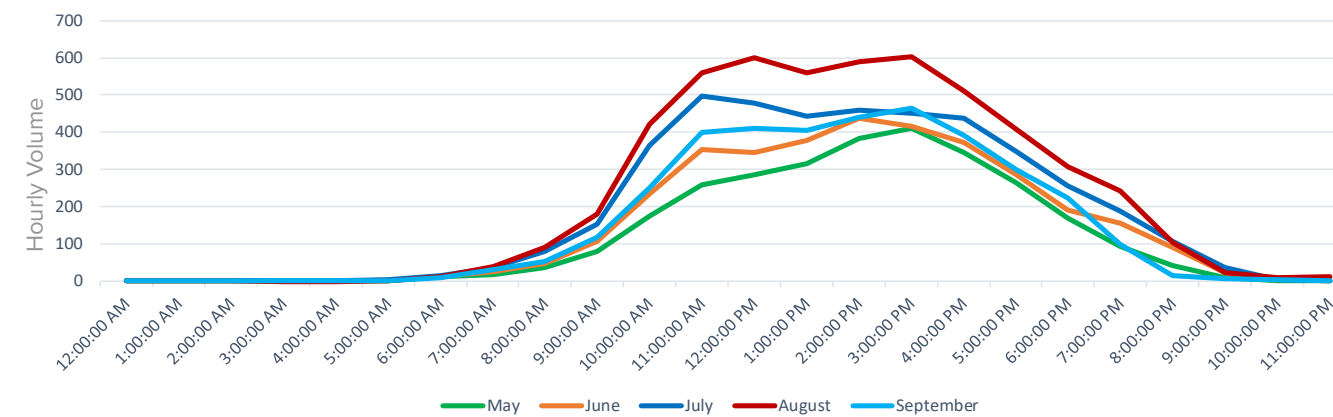


Figure 3.3: Average Hourly Weekend Bicycle Volumes by Month





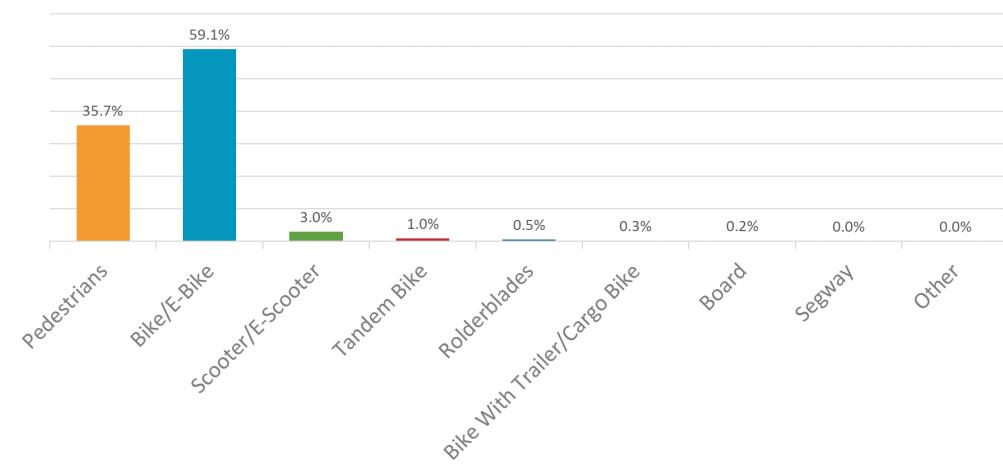
### 3.4. Lumberman’s Arch

At Lumberman’s Arch, over the three days surveyed, 5,736 people are walking, 9,489 people are riding a bike or e-bike, 489 people are riding a scooter or e-scooter, 161 people are riding a tandem bicycle, 52 people are riding a cargo bike or bicycle with trailer, 88 people are using roller blades, 33 people skateboards, 8 people using a segway, and 3 people using a hand bike as shown visually by percentage in **Figure 3.4**. In addition, **Figure 3.5** shows a clear change in mode split on the weekend with much fewer people walking and much more people rolling. It is not clear why this location is different than other locations in this respect.

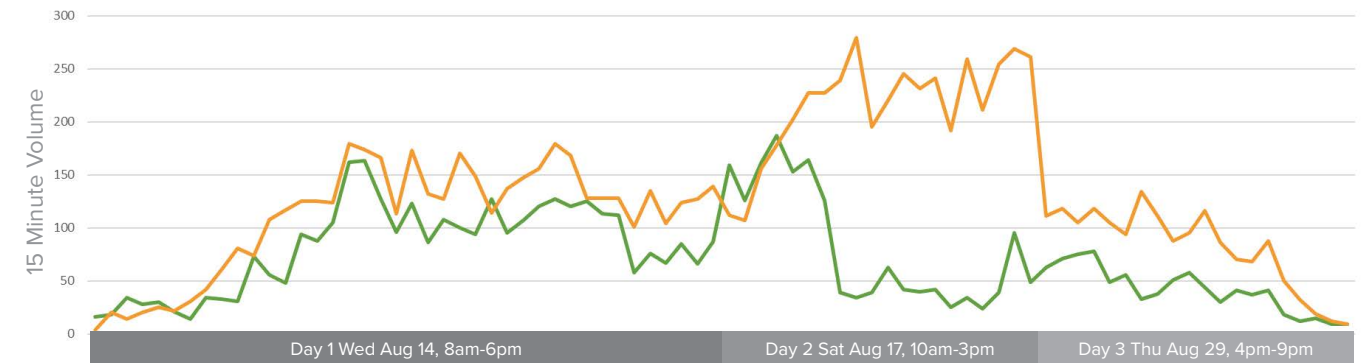
At present, signage instructs all people rolling to walk beyond the maze gate and compliance is known to be an issue. **Figure 3.6** illustrates the total number of people rolling (blue bars) versus the percentage of people rolling through the intended walk area (red line). During the early morning and late evening period, it is clear to see that more people roll through when it is quiet. During the busier daytime hours it was most common for somewhere in the range of 40-60% of people to be rolling through the area, and over the whole three days it averaged out at 54.7% of people traveling along the seawall by some form of micromobility to be walking through the area, while 45.3% of people continued to roll through.

At this location few people rolling use the parallel pedestrian pathway, **Figure 3.7** illustrates that 94% of people rolling along the seawall use the bike path while just 6% use the pedestrian pathway.

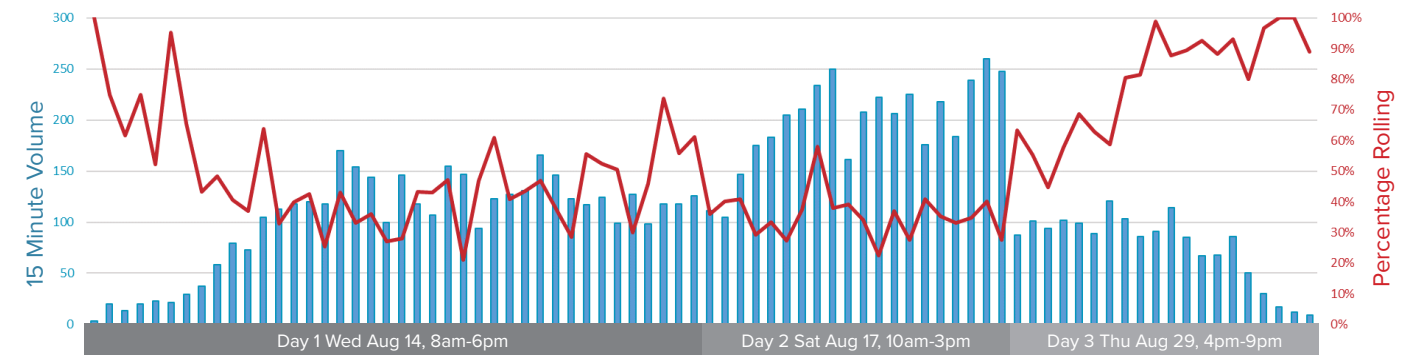
In addition to those traveling along the seawall, there were also 4,970 pedestrians crossing either going to or from the park pathway system or going to and from the concession or washrooms. However, despite a large number of potential conflicts, just one near miss or failure to yield was observed during the surveys.



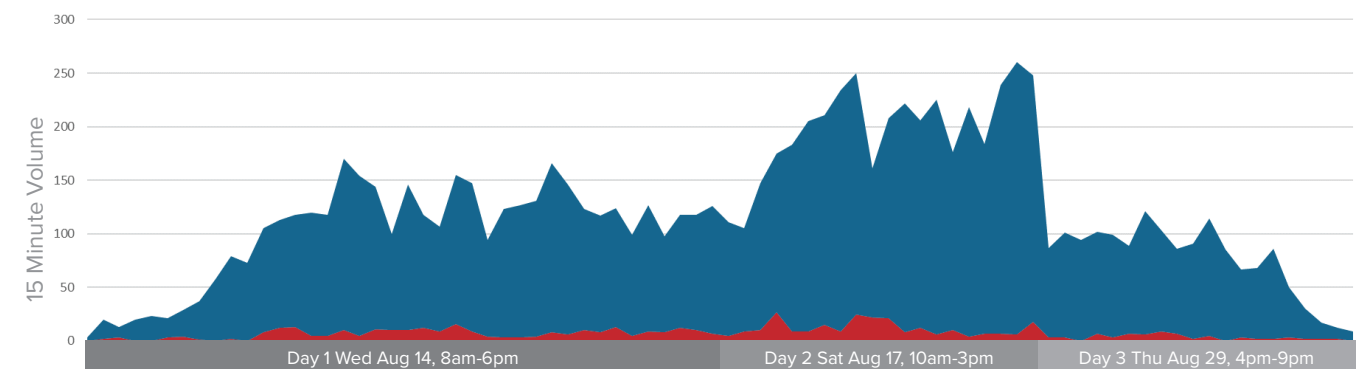
**Figure 3.4: People Rolling by Mode (All Three Days)**



**Figure 3.5: People Walking (Green) v People Rolling (Orange)**



**Figure 3.6: Total Volume of People Rolling (Blue Bars) v Percentage Rolling Through Intended Walk Area (Red Line)**



**Figure 3.7: People Rolling on Bike Path (Blue) v People rolling on Pedestrian Path (Red)**



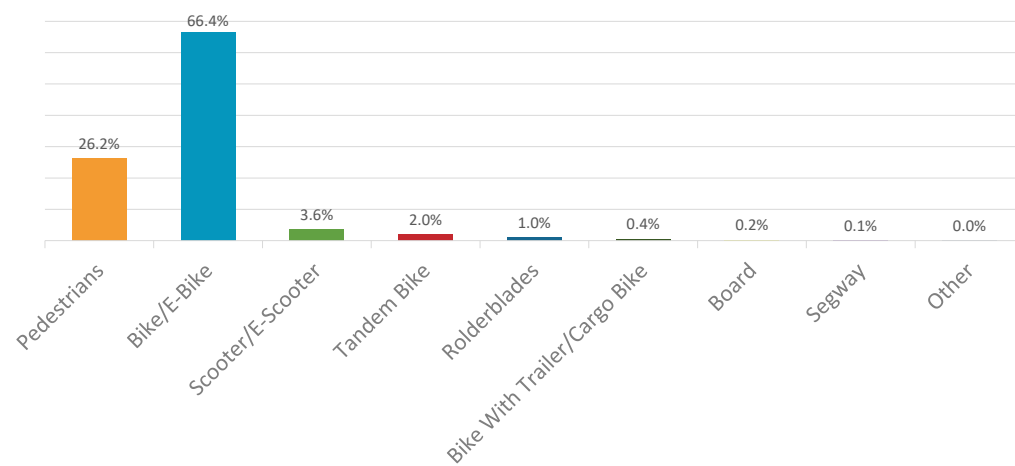
### 3.5. Prospect Point

At Prospect Point, over the three days surveyed, 3,052 people are walking, 7,726 people are riding a bike or e-bike, 420 people are riding a scooter or e-scooter, 232 people are riding a tandem bicycle, 50 people are riding a cargo bike or bicycle with trailer, 117 people are using roller blades, 21 people skateboards, 12 people using a segway, as shown visually by percentage in **Figure 3.8**. The pattern over the duration of the survey is different than that of Lumberman’s Arch, with **Figure 3.9** showing that both people walking and those rolling increased at the weekend.

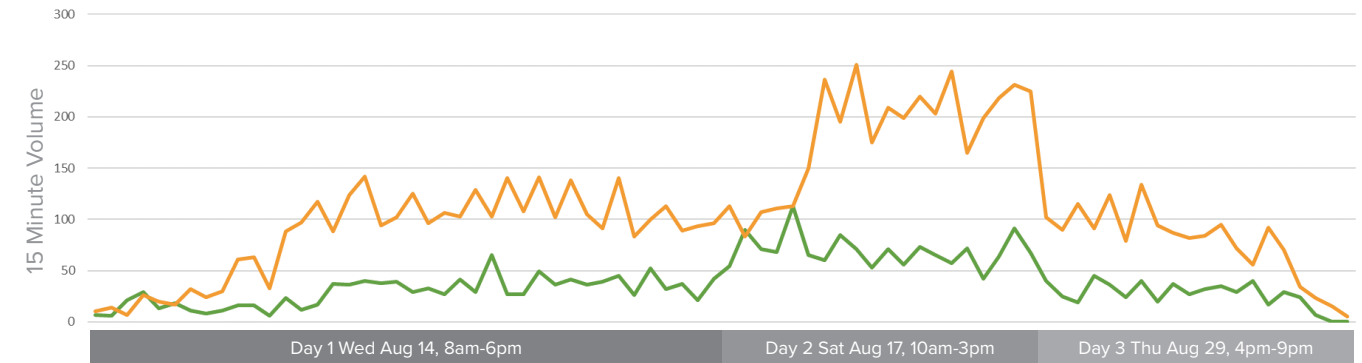
Like Lumberman’s Arch, signage instructs all people rolling to dismount at the maze gate and walk, and as shown in **Figure 3.10**, compliance with the requirement to walk is much better at this location, possibly due to the more constrained nature of this site. At the very beginning and very end of the day, when we have fewer people rolling (blue bars), the percentage of people rolling through the intended walk area (red line) increases. However, in a change from Lumberman’s Arch, during the busier daytime hours it was typical for the percentage of people rolling to be much lower and in the 10-20% range. Over the course of the surveys it averaged out at 75.9% of people traveling along the seawall by some form of micromobility to walk through the area, while 24.1% of people continued to roll through.

In another change from Lumberman’s Arch, we found far more people rolling would enter this area from the pedestrian path, jumping down the curb prior to the fence, rather than negotiating the maze gate. **Figure 3.11** illustrates that 74.2% of people rolling along the seawall come through the maze gate while 25.8% come from the pedestrian pathway.

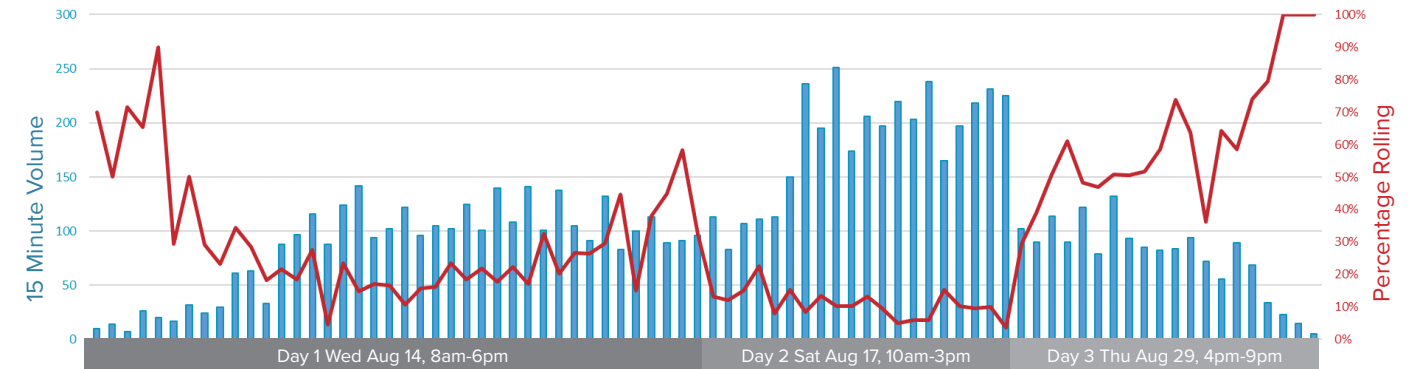
This location did record one collision 5:27 PM on the Wednesday survey, and 22 near misses or failure to yield over the three days, primarily caused by the narrow pathway and requirement to turn at sharply through the maze gate into the path of pedestrians.



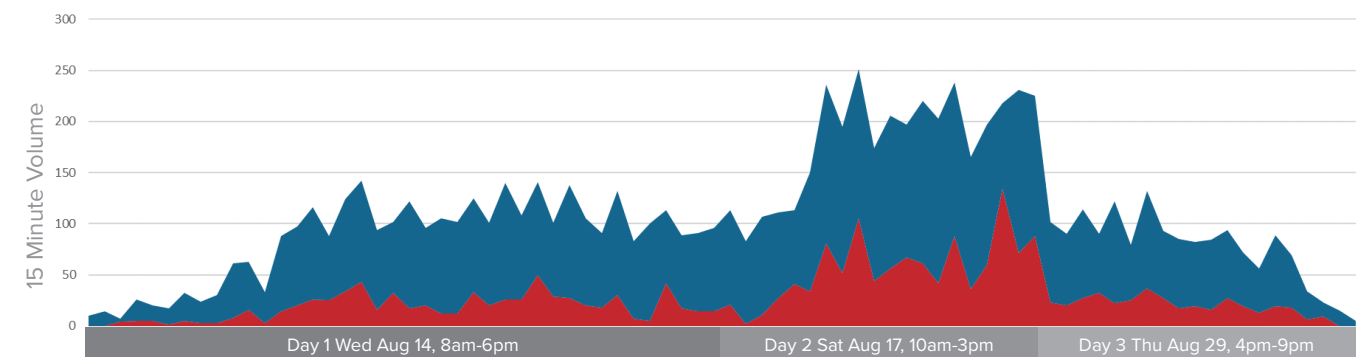
**Figure 3.8: People Rolling by Mode (All Three Days)**



**Figure 3.9: People Walking (Green) v People Rolling (Orange)**



**Figure 3.10: Total Volume of People Rolling (Blue Bars) v Percentage Rolling Through Intended Walk Area (Red Line)**



**Figure 3.11: People Rolling on Bike Path (Blue) v People rolling on Pedestrian Path (Red)**



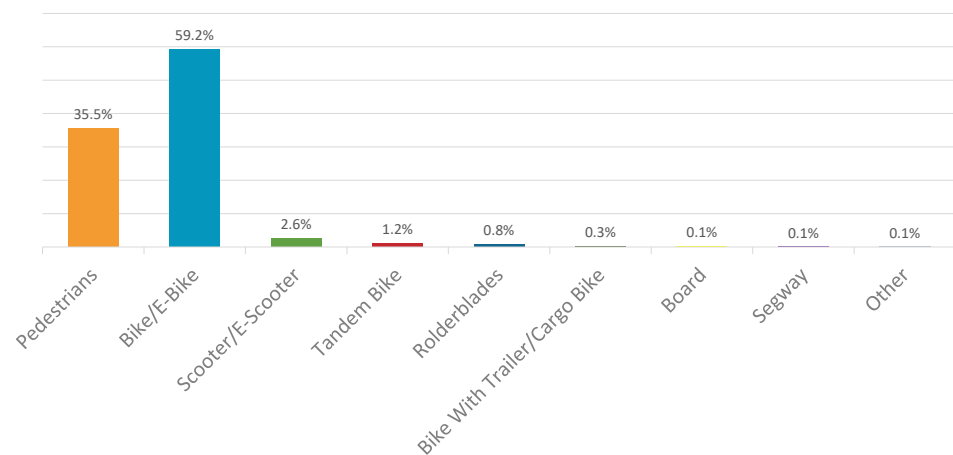
### 3.6. Third Beach

At Third Beach, over the three days surveyed, 4,659 people are walking, 7,765 people are riding a bike or e-bike, 347 people are riding a scooter or e-scooter, 159 people are riding a tandem bicycle, 37 people are riding a cargo bike or bicycle with trailer, 111 people are using roller blades, 14 people skateboards, 12 people using a segway, and 1 hand cycle as shown visually by percentage in **Figure 3.12**. The pattern over the duration of the survey is more similar to Prospect Point than Lumberman’s Arch, with **Figure 3.13** showing that both people walking and those rolling increased at the weekend.

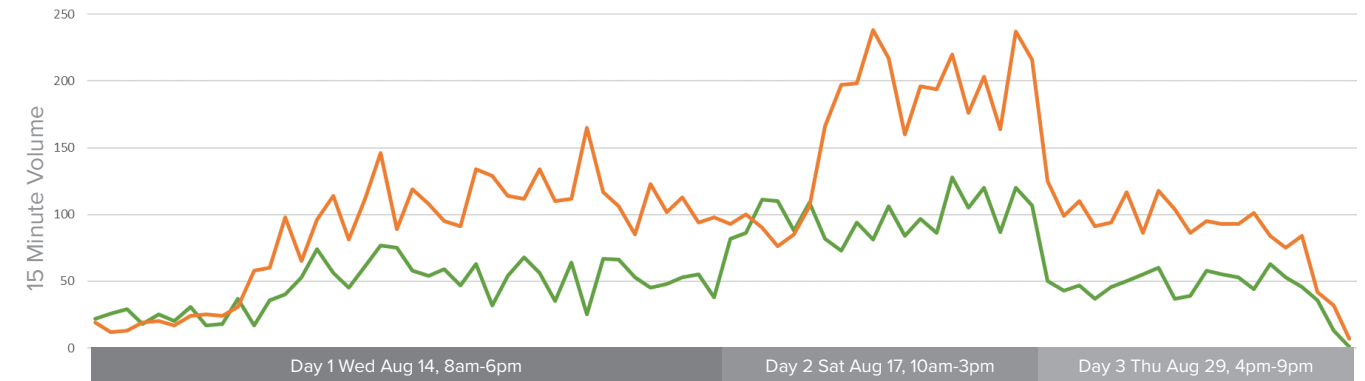
Signage instructs all people rolling to dismount at the maze gate and walk through the crosswalk. As shown in **Figure 3.14**, at the very beginning and very end of the day, when we have fewer people rolling (blue bars), the percentage of people rolling (red line) increases. However, during the busier daytime hours it was typical for the percentage of people rolling to be somewhere between the other two sites in the 20-40% range, albeit when very busy, compliance improved to the 10-20% range at the weekend. Over the three days surveyed, it averaged out at 68.7% of people traveling along the seawall by some form of micromobility to walk through the area, while 31.3% of people continued to roll through.

We found far more people rolling would enter this area from the pedestrian path, and this seemed to occur whenever it would get busier, backed up by site observations that when someone on a tandem gets stuck, people tend to get around the blockage on the pedestrian pathway rather than waiting. **Figure 3.15** illustrates that 88.5% of people rolling along the seawall come through the maze gate while 11.5% come from the pedestrian pathway.

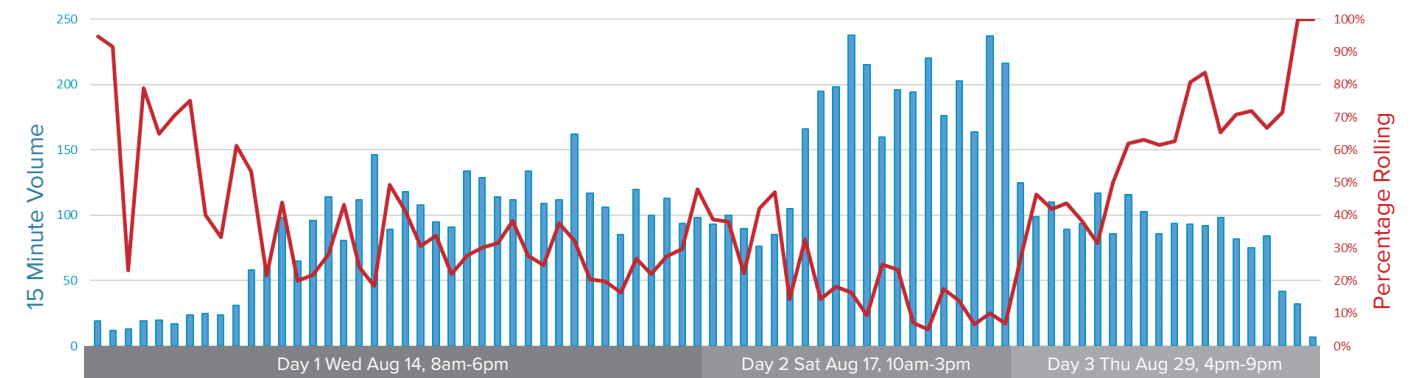
This location recorded 18 near misses or failure to yield over the three days, likely related to conflicts with people crossing between the beach and the concession area at the top of the steps.



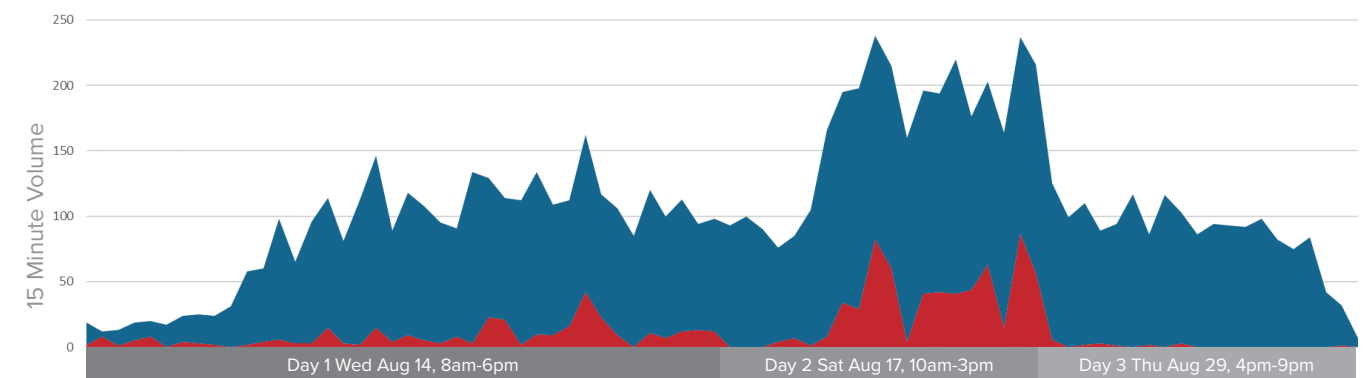
**Figure 3.12: People Rolling by Mode (All Three Days)**



**Figure 3.13: People Walking (Green) v People Rolling (Orange)**



**Figure 3.14: Total Volume of People Rolling (Blue Bars) v Percentage Rolling Through Intended Walk Area (Red Line)**



**Figure 3.15: People Rolling on Bike Path (Blue) v People rolling on Pedestrian Path (Red)**







# 4

## Review of Conflict Management Techniques

This review includes consideration of alternative treatments to maze gates including chicanes, vertical deflection, textured surfaces, narrow pathways, visual queues and signage, landscaping, and interactive signs.



## 4.1. The Challenges with Maze Gates

Maze gates on bike paths are effective at controlling bicycle speed at the entry points to high-conflict areas, but, not beyond, where people can simply continue rolling if they choose. Maze gates also create challenges for people riding certain types of bicycles or those with physical disabilities. Depending on their design, maze gates can make navigation awkward, potentially hazardous and even impossible for some adaptive bicycles. For these reasons, maze gates, also known as speed gates, are specifically identified in the BC Active Transportation Design Guide as a technique that should not be used.

Smooth and uninterrupted paths improve comfort and accessibility for people on bicycles and other forms of micromobility, so having to slow down and navigate awkward, slow-speed turns can discourage riding. For some, such maneuvers may be difficult or even impossible.

There are better techniques available today to achieve the desired outcome of a shared area where conflicts are managed at slow speeds. Several alternatives to maze gates are outlined below for achieving this goal.

## 4.2. Chicanes

Introducing chicanes, or slight, deliberate bends in the path, can naturally slow down cyclists without the need for abrupt stops. These gentle curves make it necessary for cyclists to reduce speed to navigate safely.



**Chicane treatments are not common on bike paths but do exist where bike paths go from behind parking to curb side**



**This chicane created using flexible posts achieves a similar effect to the maze gates but is spaced wider to allow for greater accessibility. It should be noted that this configuration is not well liked by cyclists.**



### 4.3. Vertical Deflection

Low, wide speed humps and raised crosswalks designed specifically for bike paths can slow down cyclists. These should be gentle enough not to cause discomfort while still encouraging slower speeds. In terms of comfort, thought should be given to those with cargo bikes and carrying children on the bike or in a trailer, as well as those using micromobility devices with smaller wheels.



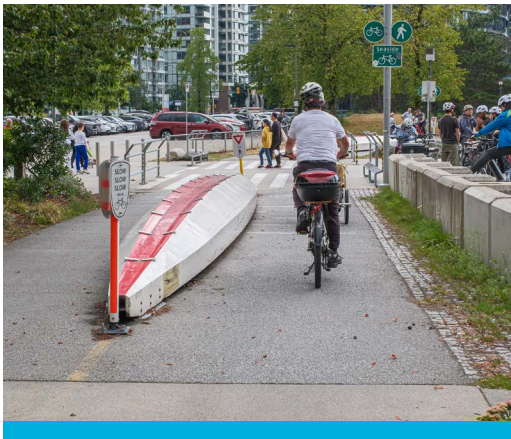
**Spirit Trail speed hump chicane in West Vancouver is universally disliked by people using the pathway and not recommended.**



**Raised crosswalk over a bike path in Nice, France helps improve compliance.**

### 4.4. Narrowing Pathways

Gradually narrowing the bike path at strategic points can naturally slow down cyclists. This design feature forces cyclists to reduce speed to navigate the narrower sections safely.



**Science World seawall pathway example uses upturned canoes to narrow the path and force single file operation before the crosswalk.**



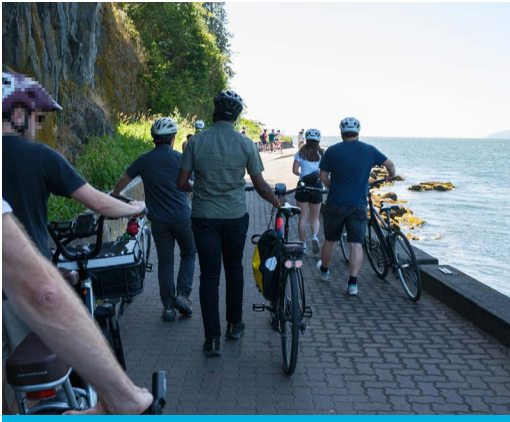
**10th Avenue Hospital Precinct bike path narrowing through conflict area to force single file behaviour adjacent to the passenger zone.**



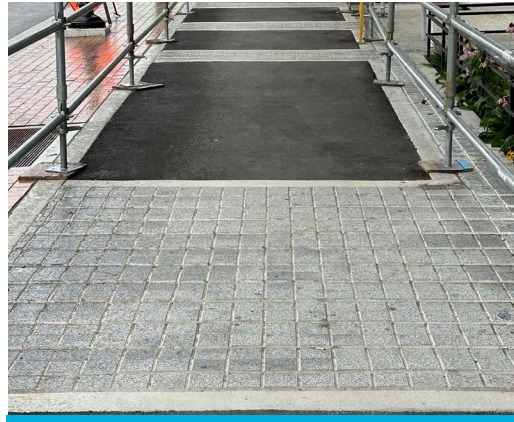


## 4.5. Textured Pavements and Materiality

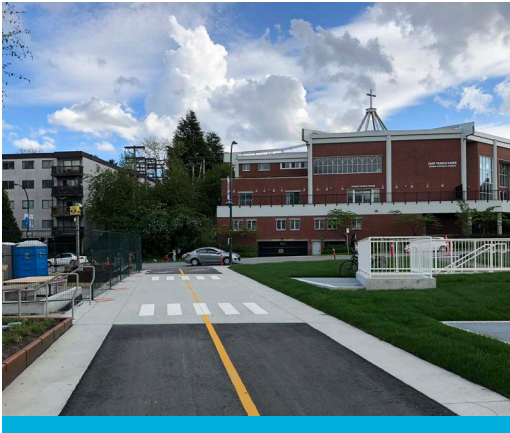
Using different textures or materials on the bike path surface, such as rumble strips or cobblestones, can provide tactile feedback to cyclists, prompting them to slow down. However, care must be taken to consider the impacts such treatments can have on micromobility devices such as skateboards and roller-blades.



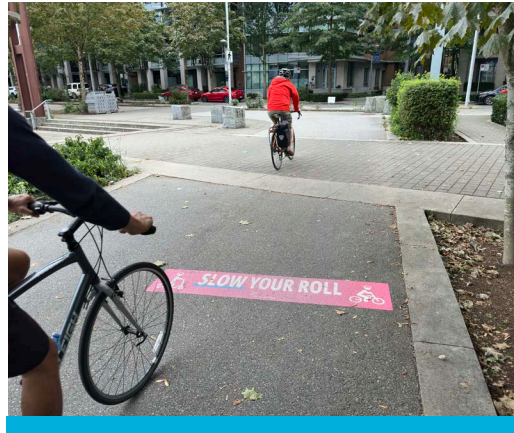
Existing seawall treatment at Prospect Point features pavers through the shared area.



Gilmore Avenue bike path in Burnaby uses pavers at different heights to create a rumble strip effect.



Emily Carr concrete crosswalk area creates differentiation from the asphalt bike path, and in doing so, sends a visual cue to people on bicycles or other micromobility that they should yield.



On the seawall through Olympic Village the plaza treatment extends through the bike path, again, providing a visual cue that pedestrians have priority.





## 4.6. Vegetation, Landscaping, and Furniture

Strategic placement of plants, trees, or planters can create natural barriers that encourage slower speeds. Landscaping can also enhance the aesthetic appeal of the bike path while serving a practical purpose.



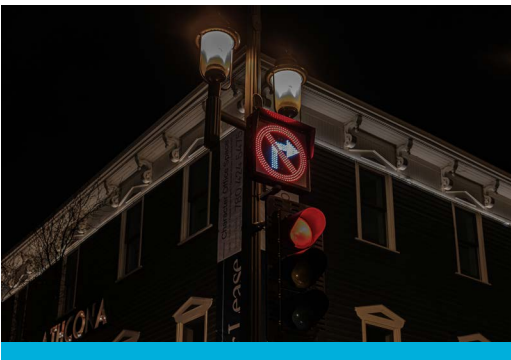
Lean rails placed at the point where people on bicycles are expected to yield help encourage the desired behaviour as you don't have to get off your bike. They also provide a visual narrowing that helps encourage slower speeds.



The Spirit Trail in West Vancouver separates users with planters. While it's possible to walk between, it sends a clear message about the allocation of space when paired with signage and pavement markings.

## 4.7. Interactive Feedback Signs

Installing electronic signs that display dynamic messaging can provide feedback such as “Slow Down”, encourage more responsible riding behavior in some, but maybe the opposite in others, as they try to trigger the sign, and could even be used to convey different requirements at different times, i.e., slow roll at off-peak times or walk your bike at peak times. We're not aware of any examples of such techniques in use.



This No Right Turn on Red Sign in Edmonton only activates during the pedestrian scramble phase. Similar walk your bike signage could activate during peak times.

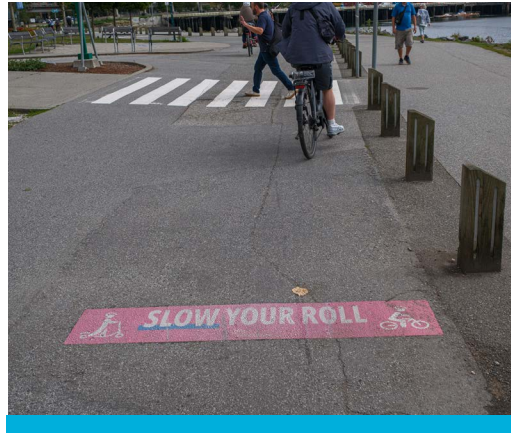


## 4.8. Visual Cues and Signage

Brightly coloured pavement markings, signs, and visual cues can alert cyclists to slow down and to yield to pedestrians. These can include painted speed limits, warning symbols, or brightly colored zones indicating high pedestrian traffic areas. The slow roll zone concept could be applicable here, but equally important is clear instruction to yield to pedestrians.



**'Slow Your Roll' signage example in North Vancouver through Mosquito Creek**



**'Slow Your Roll' pavement marking example on the Vancouver False Creek seawall**



**Yield to Pedestrian Signage at Science World**



**Crosswalk Pavement Markings at Science World**

## 4.9. Conclusion of Review

By incorporating these solutions, bike paths can be designed to maintain flow without the need to walk the bike while improving comfort for all pathway users through separation and intuitive and well managed crossings. Each site has its own unique needs and thus different solutions or combinations of the above may be applicable at each location.



# 5

## Option Development

The project will develop options considering best practices and innovative ideas to improve flow, reduce conflicts, accommodate all micromobility modes, while being cost effective.



## 5.1. Project Objectives

Any changes should be made with clear intentions as to their outcomes. The following project objectives are intended to guide option development:

- **Maintains flow:** Reduces the need for people rolling to stop or walk their bike.
- **Reduce conflicts and reduce conflict area:** Reduces the area in which conflicts are likely to occur.
- **Intuitive design:** Design is intuitive to all users and encourages people rolling to yield to those walking where necessary.
- **Accommodate all users and abilities:** Related to accessibility and equity, the design allows for micromobility of all shapes and sizes (i.e., hand cycles, cargo bikes, and tandems) to pass through without difficulty.
- **Reduces risk:** Risks could include increased risks of collisions, risk with yield compliance, risks related to project budget and implementation.
- **Cost effective:** Can be implemented using rapid implementation techniques such as pavement markings, signage, pre-cast curbs and planters.

## 5.2. Proposed Options Overview

The following options have been identified for each location based on review of previous documents, site visits and existing condition reviews, observations of user behavior, review of best practices and project objectives. They are presented in illustrated form and are intended to inform discussion rather than present to-scale representations.

### Lumberman's Arch

- Option 1: On-road bike path (From Stanley Park Cycling Plan)
- Option 2: Marked bike path with single pedestrian crossing
- Option 3: Marked bike path with double pedestrian crossing

### Prospect Point

- Option 1: Low cost signage and fencing changes
- Option 2: High cost cantilevered boardwalk (From Stanley Park Cycling Plan)

### Third Beach

- Option 1: Focused crossings and narrowed bike path
- Option 2: Focused crossings and relocated bike parking







### 5.3. Lumberman's Arch Option 1: Separated On-Road Bike Path

This option, taken from the Stanley Park Cycling Plan, offers a solution that significantly reduces pedestrian and bicycle conflicts at the existing location where cyclists are currently required to walk their bikes, provided the traffic impacts of reducing one vehicle lane at this location are deemed acceptable. The plan includes a ramp that leads back down to the seawall, that may be challenging for some, merging into the existing bike path at the bottom of the slope. However, it will still require cyclists to cross the pedestrian pathway that provides access to and from the on-street parking located on Stanley Park Drive.

#### Advantages

- Greatly reduced conflicts.
- No need to dismount and walk.
- Opportunity to landscape existing bike path where root heave has been a long standing issue.
- Improves flow for all types of bicycles.

#### Disadvantages

- May increase traffic delays on Stanley Park Drive at peak times.
- May not align with Stanley Park Mobility Plan recommendations that are still exploring the use of this lane.
- Less direct access to washrooms and concession for those on the bike path.
- Requires construction of new pathway increasing cost, possibly including retaining walls or substantial regrading that may have archaeological implications.
- Potential impact to horse and carriage operations, requiring them to merge with traffic.

#### Notes

- Consider products, materiality, pavement markings and signage in concept design phase.
- Consider custom design features that play off the Lumberman's Arch theme.

#### Evaluation

Option 1 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option best maintains flow by reducing conflict with pedestrian entirely - Score 5
- **Reduce conflicts and reduce conflict area:** Removes the conflict area entirely - Score 5
- **Intuitive design:** Not really applicable as the conflict is removed, but should not be penalized for that - Score 5
- **Accommodate all micromobility vehicle types:** Removes the need to traverse through the maze gate. However, does likely add a switch back or steep ramp to get back down to the Seawall that may be harder to negotiate for some - Score 3
- **Reduces Risk:** Risk of collision is reduced in the area by the spray park, however the steeper grades and switch back turns introduce new risks. The vehicle merge (from 2 lanes to 1) creates potential collision risks, albeit likely vehicle damage only given the 30 km/h speed limit on Stanley Park Drive - Score 3
- **Cost effective:** The switch back section could add costs relatively to the other two options through the need for regarding and/or retaining walls - Score 2
- **Total Score: 23**







#### 5.4. Lumberman's Arch Option 2: Marked Bike Path with Single Pedestrian Crossing

This option is similar to the treatment at Science World in that it seeks to narrow people rolling to single file through a clearly defined crossing area. It maintains the existing pathway, where root heave would need to be addressed, removes the maze gates, and introduces a clearly marked bike path through the area. Planters are used to further define the bike path alignment and encourage slower speeds, while lean rails at the crosswalk are intended to improve yield compliance at the single defined crosswalk.

#### Advantages

- Low cost option with primarily rapid implementation techniques.
- Focused conflict area with clear priority.
- No need to dismount and walk.
- Allows flow at off-peak times.
- Better accommodates micromobility desire lines compared with Option 1.
- Improves accessibility for all types of bicycles.

#### Disadvantages

- Still potential for near misses or collisions relative to Option 1.
- Pedestrian desire lines less well accommodated compared with Option 3.

#### Notes

- Consider products, materiality, pavement markings and signage in concept design phase.
- Consider custom design features that play off the Lumberman's Arch theme.

#### Evaluation

Option 2 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option allows people to stay on their bike with the potential need to yield to pedestrians in the one crosswalk area - Score 4
- **Reduce conflicts and reduce conflict area:** With just one focused conflict area, the design can support yield compliance and increase comfort for everybody in the area - Score 4
- **Intuitive design:** The design will be explored in more detail, but the bend out, possibly combined with some narrowing of the pathway can encourage yielding behaviour by slowing people down. It is typically when people on bicycles have to give up momentum that they fail to yield - Score 4
- **Accommodate all micromobility vehicle types:** By removing the maze gate and providing a smooth path for people rolling by various micromobility devices, accessibility is greatly improved - Score 5
- **Reduces Risk:** The risk of collisions remains somewhat similar to today, however with a focused conflict area and clear signage, priority is clear to all users - Score 3
- **Cost effective:** This option can be constructed entirely with quick build techniques if desired - Score 5
- **Total Score: 25**







### 5.5. Lumberman's Arch Option 3: Marked Bike Path with Double Pedestrian Crossing

This option is similar to Option 2, but with two crosswalks instead of one to better align with pedestrian desire lines. It maintains the existing pathway, where root heave would need to be addressed, removes the maze gates, and provides a clearly marked bike path through the area. Like Option 2, this option uses planters to direct pedestrian activity to the crosswalks and encourage slower rolling speeds, while lean rails at the crosswalks are intended to improve yield compliance at the defined crosswalks.

#### Advantages

- Low cost option with primarily rapid implementation techniques.
- No need to dismount and walk.
- Allows flow at off-peak times.
- Better accommodates pedestrian desire lines compared with Option 2.
- Better accommodates micromobility desire lines compared with Option 1.
- Improves accessibility for all types of bicycles.

#### Disadvantages

- More conflict areas than Option 2.
- Potential need for those rolling to stop twice.
- Still potential for near misses compared to Option 1.

#### Notes

- Consider products, materiality, pavement markings and signage in concept design phase.
- Consider custom design features that play off the Lumberman's Arch theme.

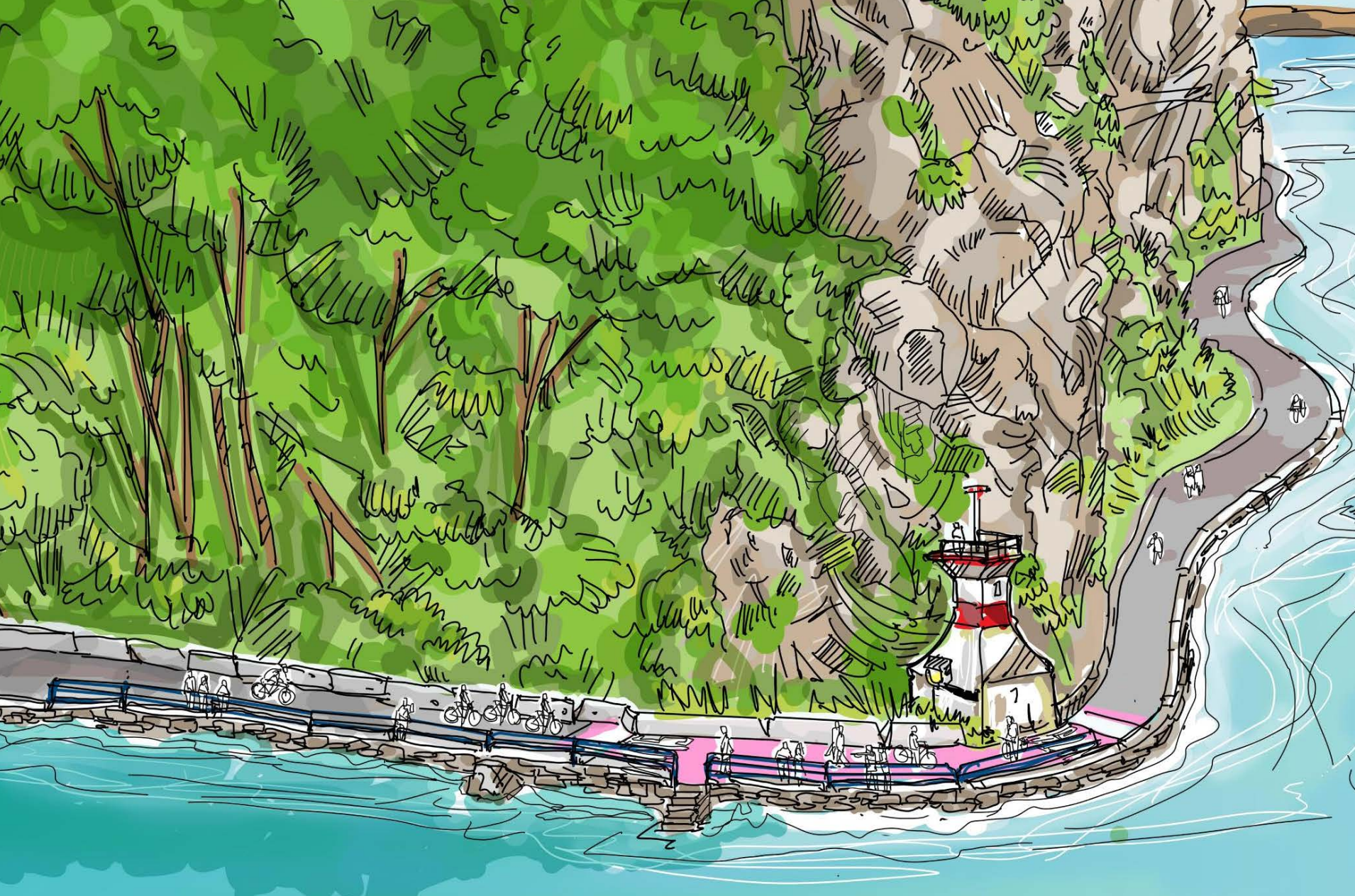
#### Evaluation

Option 3 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option allows people to stay on their bike but there is a potential need to yield to pedestrians in two crosswalk areas, compared to one in Option 2 - Score 3
- **Reduce conflicts and reduce conflict area:** With two conflict areas, this option has more potential for conflict than Option 2 - Score 3
- **Intuitive design:** The presence of two conflict areas has the potential to introduce frustration for people rolling, if they stop at the first and then have to stop at the second, possibly reducing compliance - Score 3
- **Accommodate all micromobility vehicle types:** By removing the maze gate and providing a smooth path for people rolling by various micromobility devices, accessibility is greatly improved - Score 5
- **Reduces Risk:** The risk of collisions remains somewhat similar to today, however with a focused conflict area and clear signage, priority is clear to all users - Score 3
- **Cost effective:** This option can be constructed entirely with quick build techniques if desired - Score 5
- **Total Score: 22**







## 5.6. Prospect Point Option 1: Fence Removal and Railing Addition

This option removes the fencing on the approach that separates people walking and rolling, instead relying on signage and pavement markings to encourage slow rolling. Rumble strips on approach could alert people rolling to the change in conditions, but care is needed to avoid creating a hazard for people with small wheels. Without a railing on the outer edge of the Seawall, people often stop to enjoy the view from further back, constraining the path of people passing by. The intent of adding a railing to the existing seawall is to allow people to lean on it, keeping them closer to the outer edge and creating space for those passing through.

### Advantages

- Low cost option with primarily rapid implementation techniques.
- Improves accessibility for non-standard bicycles.

### Disadvantages

- Still the most constrained area of the Seawall with scope for conflict.
- Still potential for people to roll through.

### Notes

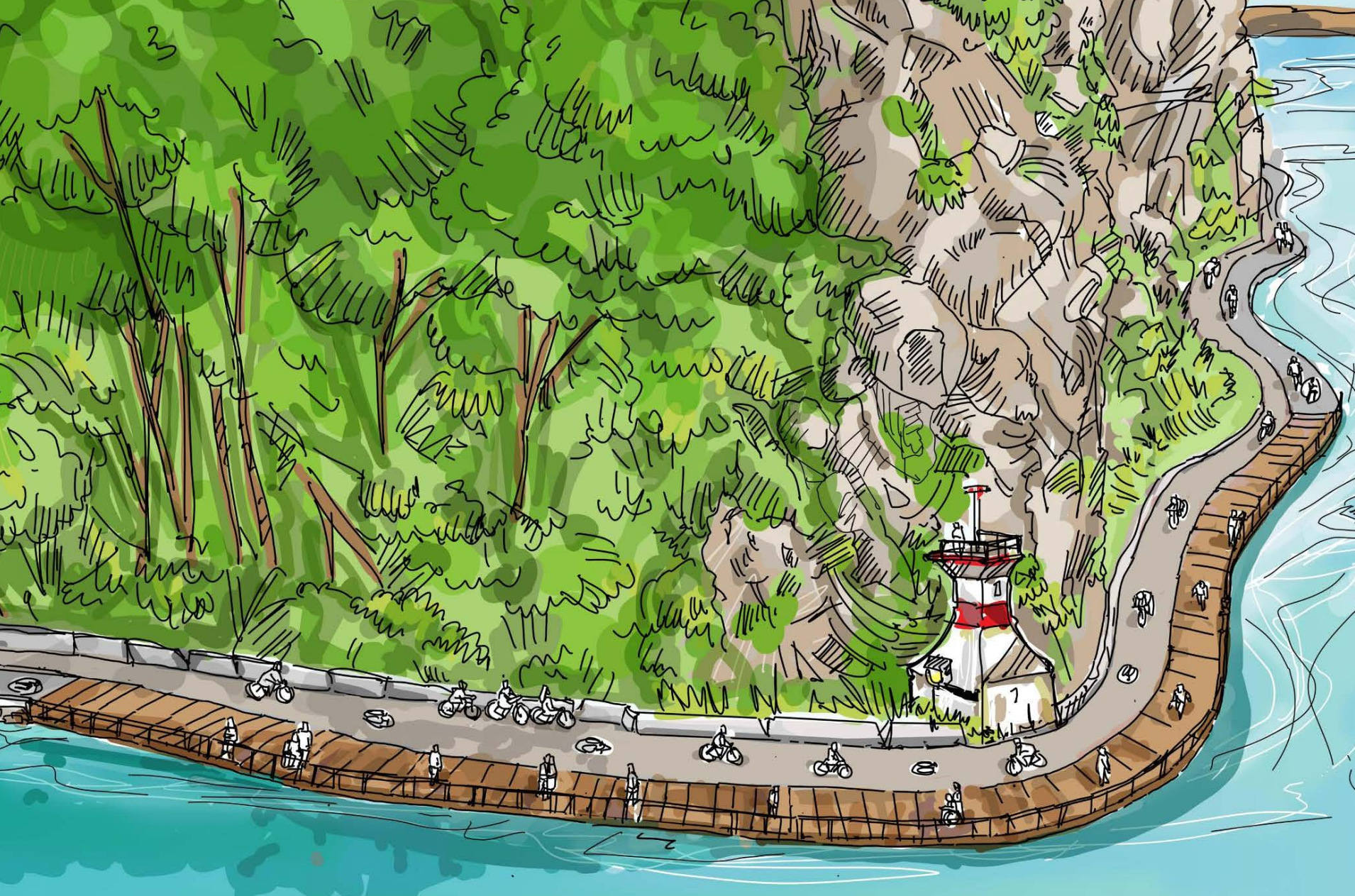
- Consider materiality, pavement markings and signage in concept design phase.
- Consider the access requirements for maintenance vehicles that occasionally need to mount the existing wall to gain access. Example would be urban forestry truck with boom overhang.
- Use a removable fence with flush mounts or outer wall mounts to accommodate vehicle paths and ensure fence is designed for loading from people leaning on it.
- Relocation of concrete barriers was considered and the Park Board were advised against moving them closer to the slope.

### Evaluation

Option 1 was evaluated against each of the project objectives as follows:

- **Maintains flow:** The removal of the fence will improve flow, but there may still be a requirement to slow through the shared space - Score 3
- **Reduce conflicts and reduce conflict area:** This option includes a railing along the outer edge of the Seawall which would hopefully encourage those enjoying the view to position themselves closer to the edge of the pathway, but generally the same conflicts will exist as are present today - Score 1
- **Intuitive design:** New signage will encourage slow rolling, but little difference compared to the present condition - Score 1
- **Accommodate all micromobility vehicle types:** The removal of the fence on approach will make it easier for those on non-standard bicycles to navigate the merge location, but the same issues with the narrow shared space will persist.
- **Reduces Risk:** Remains somewhat similar to today - Score 3
- **Cost effective:** The fence removal and signage will be low cost. Some consideration will have to be given to an appropriate design for the railing which may add cost, including maintenance - Score 4
- **Total Score: 15**





### 5.7. Prospect Point Option 2: Widened Seawall Pathway

This option is taken from the Stanley Park Cycling Plan and is the only true solution to eliminate conflicts in this section of the Seawall. It adds a boardwalk (design to be determined) to create additional width for people walking which would connect into the existing pedestrian pathways at either end. For people rolling, the bike facility would use the existing shared area as an exclusive bicycle facility. This option comes at a much higher cost than Option 1 and cannot be as easily implemented within a short time frame. It would also likely need to consider environmental and archaeological impacts, and any design would have to account for the longevity of a structure exposed to water, as well as the ongoing maintenance required due to weathering and erosion, as well as loading from any maintenance vehicles.

#### Advantages

- The only option that truly separates people walking and rolling and entirely removes conflicts.
- Subject to design, could be a tourist attraction in itself.
- Improves accessibility for non-standard bicycles.
- Improves access for maintenance.

#### Disadvantages

- High cost.
- Ongoing maintenance needs and costs.
- Potential environmental and archaeological impacts and regulations.

#### Notes

- This could be an ultimate option, with Option 1 being a temporary condition.
- Consider the vehicle path requirements for maintenance vehicles that occasionally need to mount the existing wall to gain access. Example would be urban forestry truck with boom overhang.

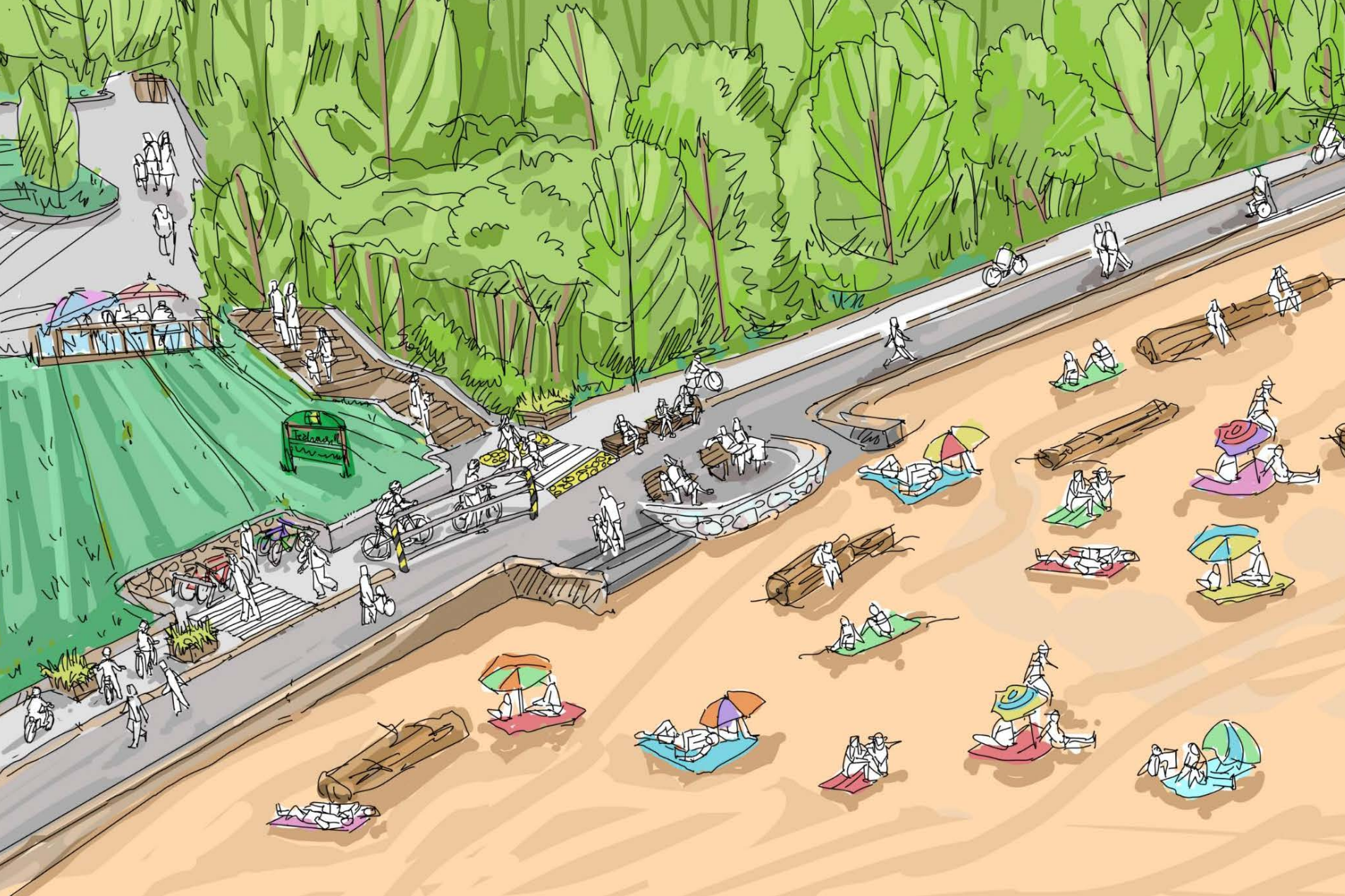
#### Evaluation

Option 2 was evaluated against each of the project objectives as follows:

- **Maintains flow:** Substantial improvement in flow given the separate facilities are provided for walking and rolling, removing all need to slow down - Score 5
- **Reduce conflicts and reduce conflict area:** Separate areas remove conflict entirely - Score 5
- **Intuitive design:** Separate areas remove the need for people to yield and thus for conflict management - Score 5
- **Accommodate all micromobility vehicle types:** The removal of existing fencing and provision of separate space for people rolling supports accessibility for all - Score 5
- **Reduces Risk:** The risk of collisions is greatly reduced by creating separate areas for people walking and rolling. However, new financial risks are introduced in the form of design challenges, environmental regulations, and ongoing maintenance - Score 3
- **Cost effective:** The cost of this boardwalk would be substantial and is the primary challenge of this option - Score 0
- **Total Score: 23**







### 5.8. Third Beach Option 1: Focused Crossing Area

This option takes a similar approach to Science World, as well as Options 2 and 3 for Lumberman’s Arch, by focusing the conflict area and constraining people riding bicycles or other micromobility devices into a single-file configuration through various measures. These could include a chicane formed with planters on approach to the bike parking, as well as the narrowing of the bike path using lean rails to improve yielding compliance. Benches are also added at the exit to reduce pedestrian encroachment and encourage them to cross only at the marked crossings. A second crosswalk is introduced to and from the bike parking area.

#### Advantages

- Low cost option with primarily rapid implementation techniques.
- No need to dismount and walk.
- Allows flow at off-peak times.
- Improves accessibility for non-standard bicycles.

#### Disadvantages

- Still features two crossing points to the concession and bike parking relative to Option 2.

#### Notes

- Consider products, materiality, pavement markings and signage in concept design phase.

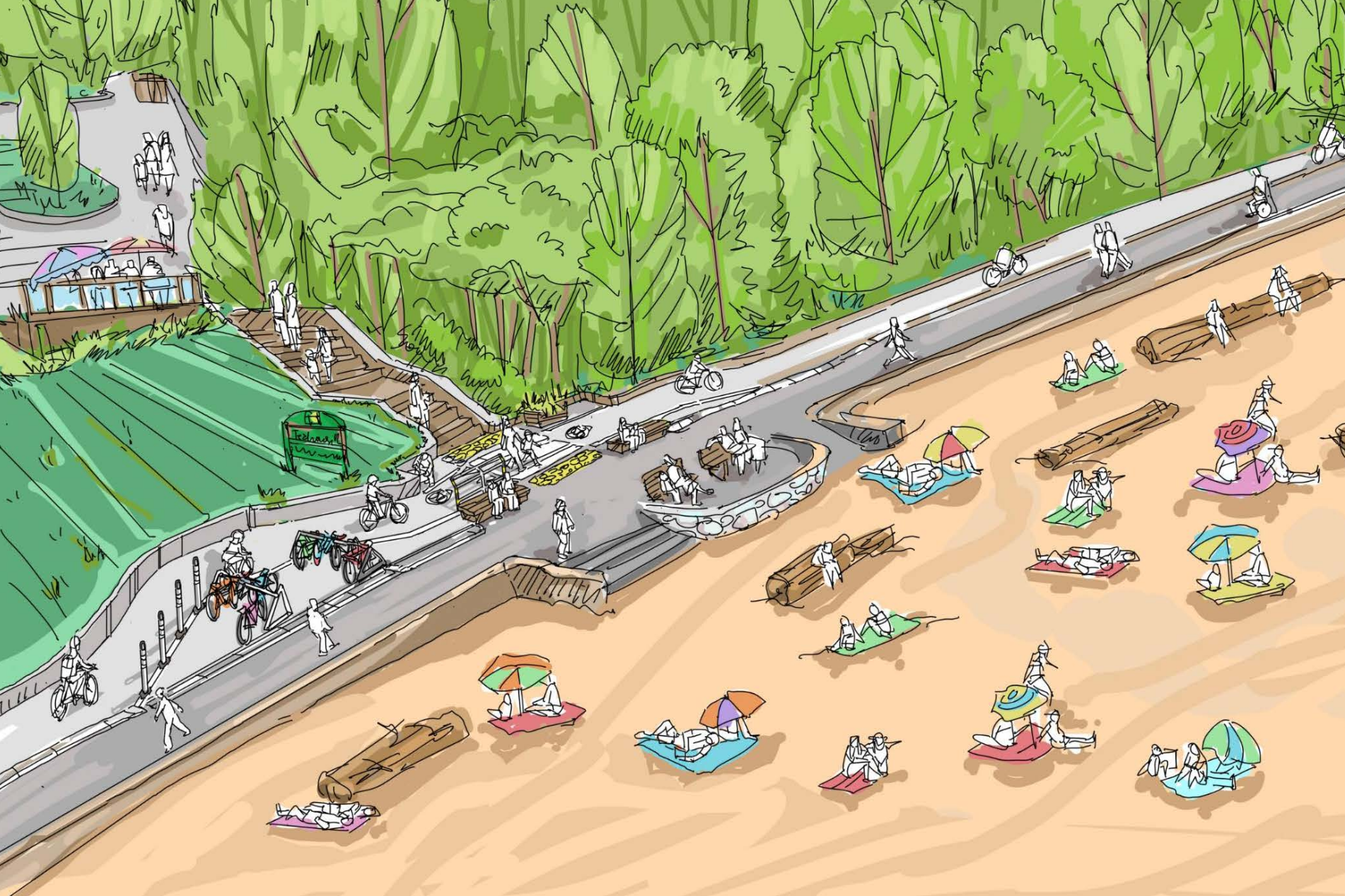
#### Evaluation

Option 1 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option allows people to stay on their bike but there is a potential need to yield to pedestrians in two crosswalk areas, compared to one in Option 2 - Score 3
- **Reduce conflicts and reduce conflict area:** With two conflict areas, this option has more potential for conflict than Option 2 - Score 3
- **Intuitive design:** The presence of two conflict areas has the potential to introduce frustration for people rolling, if they stop at the first and then have to stop at the second, possibly reducing compliance - Score 3
- **Accommodate all micromobility vehicle types:** By removing the maze gate and providing a smooth path for people rolling by various micromobility devices, accessibility is greatly improved - Score 5
- **Reduces Risk:** The risk of collisions remains somewhat similar to today, however with a focused crossing yield compliance will be improved - Score 3
- **Cost effective:** This option can be constructed entirely with quick build techniques if desired - Score 5
- **Total Score: 23**







### 5.9. Third Beach Option 2: Focused Crossing Area Plus Relocated Bike Parking

This option takes a similar approach to Option 1, and like Science World and Options 2 and 3 for Lumberman’s Arch, it focuses the conflict area through the use of benches, constraining people into a single-file configuration through a chicane within the former bike parking area. Compared to Option 1, the bike parking is relocated between the bike path and the pedestrian path, reducing the need to cross the bike path to retrieve a bicycle. The existing bike parking area is then used to create the chicane effect.

#### Advantages

- Low cost option with primarily rapid implementation techniques.
- No need to dismount and walk.
- Allows flow at off-peak times.
- Improves accessibility for non-standard bicycles.
- Removes the pedestrian crossing to/from the bike parking.

#### Disadvantages

- Increased cost to move the bike parking and modify the retaining wall.

#### Notes

- Consider products, materiality, pavement markings and signage in concept design phase.

#### Evaluation

Option 2 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option allows people to stay on their bike, and with bike parking relocated reduces the potential need to yield to pedestrians to just one crosswalk area - Score 4
- **Reduce conflicts and reduce conflict area:** With just one focused conflict area, the design can support yield compliance and increase comfort for everybody in the area - Score 4
- **Intuitive design:** Through the chicane effect created by relocating the bike parking and narrowing of the pathway with the focused conflict area, this design will encourage yielding behaviour. It is typically when people on bicycles have to give up momentum that they fail to yield - Score 4
- **Accommodate all micromobility vehicle types:** By removing the maze gate and providing a smooth path for people rolling by various micromobility devices, accessibility is greatly improved - Score 5
- **Reduces Risk:** The risk of collisions remains somewhat similar to today, however with a focused conflict area and clear signage, priority is clear to all users - Score 3
- **Cost effective:** This option can be constructed mostly with quick build techniques if desired, however there is a need to make adjustments to the small retaining where bike parking is relocated - Score 4
- **Total Score: 25**



## 5.10. Evaluation of Options Against Project Objectives

Each option has been scored based on the project objectives outlined in Section 5.1. For each project objective the option has been given a qualitative score out of 5, with 5 indicating that this option best supports this objective and 0 indicating it provides no support for this objective. The following options are recommended based on the analysis and summary provided in Table 5.1:

- Lumberman’s Arch Option 2: Marked bike path with single pedestrian crossing
- Prospect Point Option 1: Low cost signage and fencing changes (as an interim strategy)
- Third Beach Option 2: Focused crossings and relocated bike parking

**Table 5.1: Maze Gate Alternative Options Multiple Account Evaluation**

Accounts	Lumberman’s Arch			Prospect Point		Third Beach	
	Option 1	Option 2	Option 3	Option 1	Option 2	Option 1	Option 2
Maintains flow	5	4	3	3	5	3	4
Reduces conflicts	5	4	3	1	5	3	4
Intuitive design	5	4	3	1	5	4	4
Accommodates all micromobility devices	3	5	5	3	5	5	5
Cost effective	2	5	5	4	0	5	4
Reduces Risk	3	3	3	3	3	3	4
<b>Score</b>	<b>23</b>	<b>25</b>	<b>22</b>	<b>15</b>	<b>23</b>	<b>23</b>	<b>25</b>





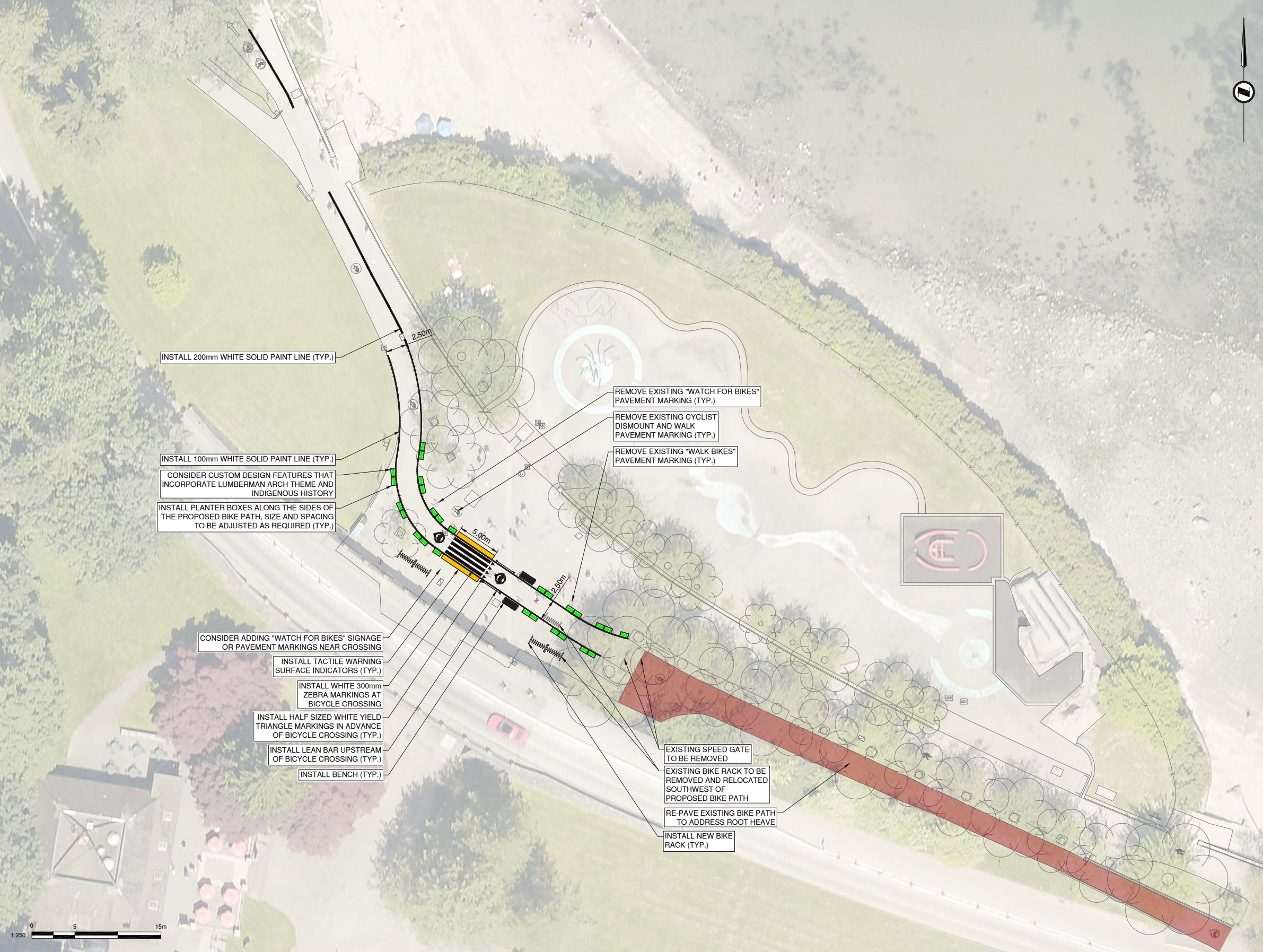


# 6

## Concept Design

Concept development provides refined solutions and Class D cost estimates for the preferred options with a focus on product choice and scale of improvement (as applicable), geometry, functional user needs, behaviour enforcement, cost, and constructibility.





# Lumberman's Arch

## Option 2

### Marked Bike Path with Single Pedestrian Crossing

- Removal of maze gate
- Planter boxes, benches, and lean bars to separate people biking and walking
- Bike crossing focused to a single location to reduce conflicts
- Re-paving of the existing bike path
- Opportunity to incorporate indigenous artwork
- Option to replace planter boxes with different types of physical separation
- Tactile strips to mark the crossing for those with visual impairments





# Lumberman's Arch

## Design Rationale

The design for Lumberman's Arch was developed based on a desire to reduce conflicts between people biking and walking. The intent of the design is to separate modes while providing sufficient visual cues to people biking that they need to slow down when approaching the crossing.

Based on preliminary discussions with the City, we assumed that the design is intended to be primarily made up of quick-build components. We included a mix of quick-build options that provide physical separation, such as planter boxes, benches, and lean rails; however, alternative treatments are available depending on the City's preferences. Alternative treatments could include flex posts, concrete curbs, new trees, or custom cultural features similar to the inverted canoes in use at Science World.

We have also included a section of re-paving to address root heave issues on the bike path approaching Lumberman's Arch. Depending on available budget, this paving strategy could be revisited to include different surface treatments for different modes within the project area.

## Considerations for Detailed Design

During detailed design, the project team should consider the following:

- Incorporate indigenous art or other cultural features where possible.
- Consider engaging an arborist to review root heave and tree conditions.
- Review the need for archaeological services (none anticipated at this time).
- Consider pilot projects using different materials and investigate opportunities to re-purpose existing materials
- At 2.5 m wide, the bike path in the design facilitates passing and side-by-side operations. However, the width of the path could be reduced when approaching the pedestrian crossing to further encourage low speeds.
- Supplementary signage and pavement markings may be helpful in further encouraging the desired behaviour ('watch for bikes', 'slow your roll', etc.)
- Shark's teeth (yield) pavement markings are proposed in the design, which we understand come with some concerns around maintenance. While we believe that they help reinforce the yield condition, they are not fundamental to the design, as the yield condition is indicated by the zebra pavement markings.
- Include City Engineering Department in Detailed Design process.





## Class D Cost Estimate

The construction cost for the Lumberman's Arch site was estimated to be approximately \$250,012, including a 40% contingency. The estimate was developed based on preliminary design drawings, comparable costs from recent tenders, project experience, as well as some unit prices from the City. ISL accepts no liability for any variance from the costs and quantities estimated during this project.

Description	Unit	Est. Qty.	Unit Price	Amount
<b>01 52 01 - TEMPORARY STRUCTURES</b>				
Mobilization/Demobilization	Lump Sum	1	\$10,000	\$10,000
<b>01 55 00 - TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING</b>				
Traffic Management Plan	Lump Sum	1	\$7,500	\$7,500
Traffic Control	Lump Sum	1	\$5,000	\$5,000
<b>03 30 20 - CONCRETE WALKS, CURB AND GUTTER</b>				
Tactile Warning Surface Indicator (Warning) - Surface Mount	Sq. Metre	2.4	\$450	\$1080
<b>31 24 13 - ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION</b>				
Common Excavation - Remove Existing Asphalt Pavement, Sidewalks - Including Sawcutting	Cub. Metre	120	\$250	\$30,000
Remove and Dispose of Existing Maze gate	Lump Sum	1	\$2,000	\$2,000
<b>32 01 11 - PAVEMENT SURFACE CLEANING AND REMOVE PAVEMENT MARKING</b>				
Removal of Pavement Markings	Lump Sum	1	\$3,000	\$3,000
<b>32 12 16 - HOT-MIX ASPHALT CONCRETE PAVING</b>				
Machine Laid - Upper Course - 50mm Thick	Tonne	30	\$450	\$13,500
<b>32 17 23 - PAINTED PAVEMENT MARKINGS</b>				
Permanent Thermoplastic Pavement Markings	Lump Sum	1	\$7,000	\$7,000
<b>32 31 13 - CHAIN LINK FENCES AND GATES</b>				
Relocate Existing Bike Racks	Each	2	\$1,000	\$2,000
Install New Bike Racks	Each	8	\$2,000	\$16,000
Install Lean Bar	Each	2	\$2,000	\$4,000
Install New Bench	Each	2	\$2,500	\$5,000
<b>32 93 01 - PLANTING OF TREES, SHRUBS, AND GROUND COVER</b>				
Planter Boxes	Each	27	\$2,500	\$67,500
<b>34 41 13 - TRAFFIC SIGNALS</b>				
Install New Signs	Lump Sum	1	\$5,000	\$5,000
<b>SUBTOTAL</b>			<b>\$178,580</b>	
<b>CONTINGENCY (40%)</b>			<b>\$71,432</b>	
<b>TOTAL</b>			<b>\$250,012</b>	







# Prospect Point

## Option 1

### Fence Removal and Railing Addition

- Removal of existing fence approaching the lighthouse
- Installation of a removable railing along the outer edge of the seawall
- Opportunity to incorporate indigenous artwork as surface treatment in the conflict area
- Signage to instruct people rolling to slow during congested times





# Prospect Point

## Design Rationale

Prospect Point is significantly space-constrained and comes with a different set of challenges than Lumberman's Arch. The primary intent of the design is to remove the existing maze gate and allow people biking and walking to share the constrained space between the seawall and the lighthouse.

To accomplish this, we proposed a railing along the outer edge of the seawall. The intent with this treatment is to encourage people lingering and enjoying the view to lean or stand near the railing, clearing space in the middle of the path for people biking. Discussions with the City indicated that this section of the seawall is occasionally used by a large forest service vehicle that has difficulty making the turn in its current configuration. We proposed a removable railing to accommodate this movement when it happens.

Similar to Lumberman's Arch, we encourage the City to incorporate indigenous artwork in the design. We proposed a pathway surface treatment (as shown on the drawing), but this artwork could be incorporated in other areas, as deemed appropriate by the City's cultural team.

## Considerations for Detailed Design

During detailed design, the project team should consider the following:

- Incorporate indigenous art or other cultural features where possible.
- Review the need for archaeological services (none anticipated at this time).
- Installation of a new railing on the seawall needs to consider the structural impacts to the underlying wall as well as loading from people leaning on the railing.
- If there are plans to structurally upgrade the seawall in the future, we recommend widening this area to accommodate separation of modes as shown in Option 1 (page 29).
- Consider the use of supplementary signage and pavement markings to further encourage slow speeds ('watch for bikes', 'slow your roll', etc.)
- Signage encouraging riders to slow roll at busy times may be helpful to reduce conflicts.
- Include City Engineering Department in Detailed Design process.





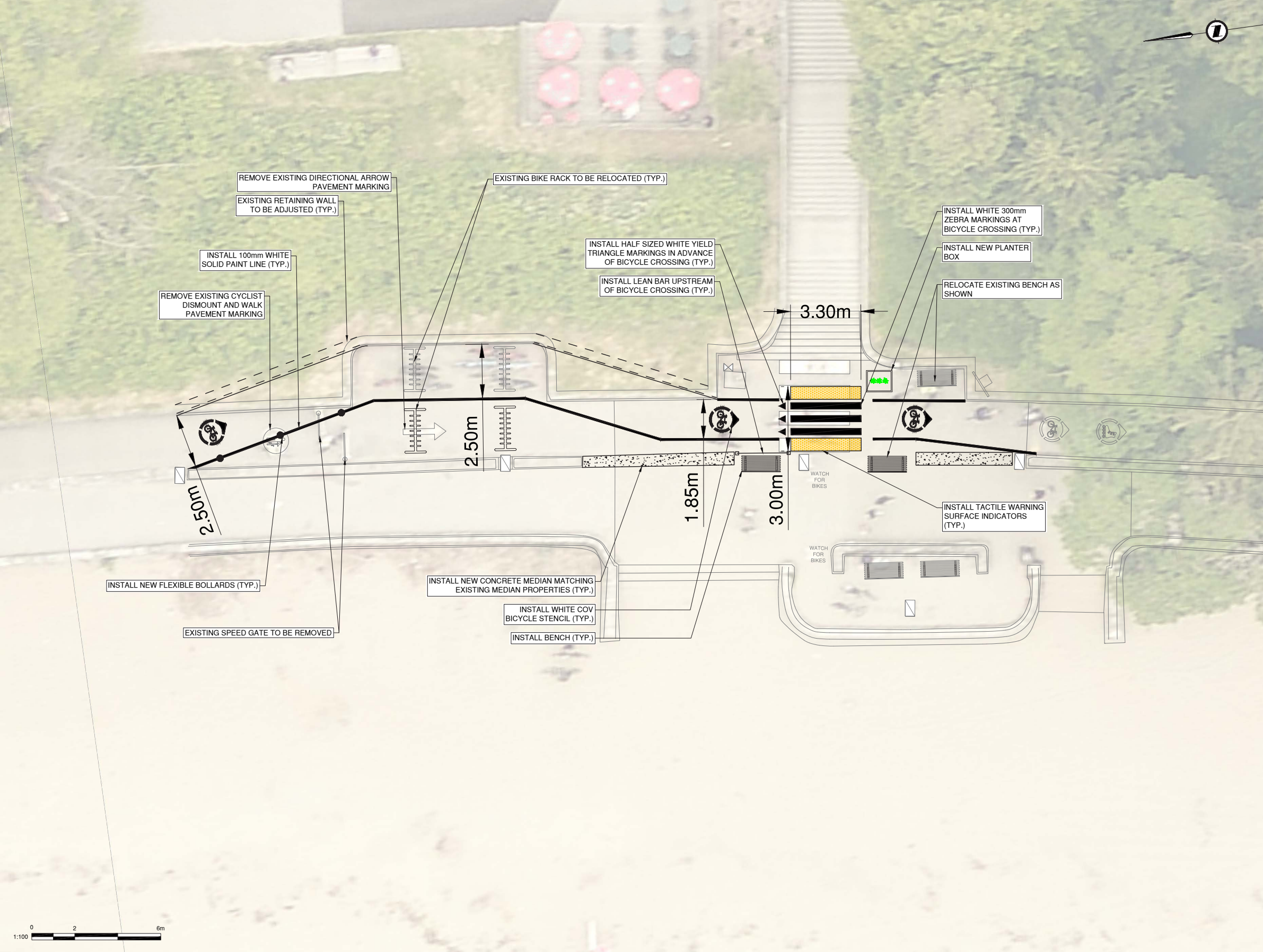
## Class D Cost Estimate

The construction cost for the Prospect Point site was estimated to be approximately \$197,400, including a 40% contingency. The estimate was developed based on preliminary design drawings, comparable costs from recent tenders, project experience, as well as some unit prices from the City. ISL accepts no liability for any variance from the costs and quantities estimated during this project.

Description	Unit	Est. Qty.	Unit Price	Amount
<b>01 52 01 - TEMPORARY STRUCTURES</b>				
Mobilization/Demobilization	Lump Sum	1	\$10,000	\$10,000
<b>01 55 00 - TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING</b>				
Traffic Management Plan	Lump Sum	1	\$7,500	\$7,500
Traffic Control	Lump Sum	1	\$5,000	\$5,000
<b>31 24 13 - ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION</b>				
Remove and Dispose of Existing Fence	Lump Sum	1	\$3,500	\$3,500
<b>32 17 23 - PAINTED PAVEMENT MARKINGS</b>				
Cultural Pavement Art	Lump Sum	1	\$20,000	\$20,000
<b>32 31 13 - CHAIN LINK FENCES AND GATES</b>				
Install Removable Railing	Lin. Metre	45	\$2,000	\$90,000
<b>34 41 13 - TRAFFIC SIGNALS</b>				
Install New Signs	Lump Sum	1	\$5,000	\$5,000
<b>SUBTOTAL</b>			<b>\$141,000</b>	
<b>CONTINGENCY (40%)</b>			<b>\$56,400</b>	
<b>TOTAL</b>			<b>\$197,400</b>	







# Third Beach

## Option 2

### Focused Crossing area with Relocated Bike Parking

- Removal of maze gate
- Relocation of bike racks between pedestrian path and re-aligned bike path, creating a chicane
- Addition of benches and planter boxes as well as extension of concrete median to focus crossing to a single location
- Tactile strips to mark the crossing for those with visual impairments





# Third Beach

## Design Rationale

Third Beach has a similar design intent to Lumberman's Arch, removing the maze gate and focusing the conflict area to a single pedestrian crossing location. The design also proposes relocating the existing bike racks to create a 'chicane' effect, encouraging people biking to slow down to make it around the curve prior to the crossing.

The design proposes using mostly quick-build materials, such as planter boxes and benches to separate the modes. However, we have also included an option to extend the existing concrete median as a longer-term solution. Lean rails are not included on the design drawings but could be incorporated prior to the crossing.

## Considerations for Detailed Design

During detailed design, the project team should consider the following:

- Incorporate indigenous art or other cultural features where possible.
- Review the need for archaeological services when modifying the retaining wall.
- Consider pilot projects using different materials and investigate opportunities to re-purpose existing materials
- Review need for structural and geotechnical review of design for wall changes
- The bike path width starts at 2.5 m and is reduced to 1.8 m when approaching the pedestrian crossing to further encourage low speeds. This width could vary in order to facilitate side-by-side operations.
- Supplementary signage and pavement markings beyond what has been proposed may be helpful in further encouraging the desired behaviour ('watch for bikes', 'slow your roll', etc.)
- Shark's teeth (yield) pavement markings are proposed in the design, which we understand come with some concerns around maintenance. While we believe that they help reinforce the yield condition, they are not fundamental to the design, as the yield condition is indicated by the zebra pavement markings
- Similar to Lumberman's Arch, many of the quick-build features could be replaced with alternative treatments such as bollards, concrete curbs, new trees, or custom cultural features, at the City's discretion.
- Include City Engineering Department in Detailed Design process.





## Class D Cost Estimate

The construction cost for the Third Beach site was estimated to be approximately \$139,496, including a 40% contingency. The estimate was developed based on preliminary design drawings, comparable costs from recent tenders, project experience, as well as some unit prices from the City. ISL accepts no liability for any variance from the costs and quantities estimated during this project.

Description	Unit	Est. Qty.	Unit Price	Amount
<b>01 52 01 - TEMPORARY STRUCTURES</b>				
Mobilization/Demobilization	Lump Sum	1	\$10,000	\$10,000
<b>01 55 00 - TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING</b>				
Traffic Management Plan	Lump Sum	1	\$7,500	\$7,500
Traffic Control	Lump Sum	1	\$5,000	\$5,000
<b>03 30 20 - CONCRETE WALKS, CURB AND GUTTER</b>				
Concrete Medians	Sq. Metre	10	\$250	\$2,500
Concrete Wall	Sq. Metre	10	\$1,000	\$10,000
Tactile Warning Surface Indicator (Warning) - Surface Mount	Sq. Metre	4.2	\$450	\$1,890
<b>31 24 13 - ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION</b>				
Common Excavation - Softscaped Areas	Cub. Metre	10	\$400	\$4,000
Remove Existing Concrete Wall	Sq. Metre	10	\$200	\$2,000
Remove and Dispose of Existing Maze gate	Lump Sum	1	\$2,000	\$2,000
<b>32 01 11 - PAVEMENT SURFACE CLEANING AND REMOVE PAVEMENT MARKING</b>				
Removal of Pavement Markings	Lump Sum	1	\$3,000	\$3,000
<b>32 11 16 - GRANULAR SUB-BASE</b>				
75mm Minus Granular Sub-Base - 200mm Thick (Optional)	Tonne	20	\$200	\$4,000
<b>32 11 23 - GRANULAR BASE</b>				
19mm Minus Crushed Granular Base - 100m Thick (Optional)	Tonne	20	\$200	\$4,000
<b>32 12 16 - HOT-MIX ASPHALT CONCRETE PAVING</b>				
Machine Laid - Upper Course - 50mm Thick	Tonne	5	\$450	\$2,250
<b>32 17 23 - PAINTED PAVEMENT MARKINGS</b>				
Permanent Thermoplastic Pavement Markings	Lump Sum	1	\$7,000	\$7,000
<b>32 31 13 - CHAIN LINK FENCES AND GATES</b>				
Relocate Existing Bike Racks	Each	2	\$1,000	\$2,000
Install Bike Racks	Each	8	\$2,000	\$16,000
Relocate Existing Bench	Lump Sum	1	\$2,000	\$2,000
Install Lean Bar	Each	2	\$2,000	\$4,000
Install New Bench	Each	1	\$3,000	\$3,000
<b>32 93 01 - PLANTING OF TREES, SHRUBS, AND GROUND COVER</b>				
Planter Boxes	Each	1	\$2,500	\$2,500
<b>34 41 13 - TRAFFIC SIGNALS</b>				
Install New Signs	Lump Sum	1	\$5,000	\$5,000
<b>SUBTOTAL</b>			<b>\$99,640</b>	
<b>CONTINGENCY (40%)</b>			<b>\$39,856</b>	
<b>TOTAL</b>			<b>\$139,496</b>	





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## APPENDIX B: PROPOSED SOLUTIONS

### 5.4. Lumberman's Arch Option 2: Marked Bike Path with Single Pedestrian Crossing

This option is similar to the treatment at Science World in that it seeks to narrow people rolling to single file through a clearly defined crossing area. It maintains the existing pathway, where root heave would need to be addressed, removes the maze gates, and introduces a clearly marked bike path through the area. Planters are used to further define the bike path alignment and encourage slower speeds, while lean rails at the crosswalk are intended to improve yield compliance at the single defined crosswalk.

#### Advantages

- Low cost option with primarily rapid implementation techniques.
- Focused conflict area with clear priority.
- No need to dismount and walk.
- Allows flow at off-peak times.
- Better accommodates micromobility desire lines compared with Option 1.
- Improves accessibility for all types of bicycles.

#### Disadvantages

- Still potential for near misses or collisions relative to Option 1.
- Pedestrian desire lines less well accommodated compared with Option 3.

#### Notes

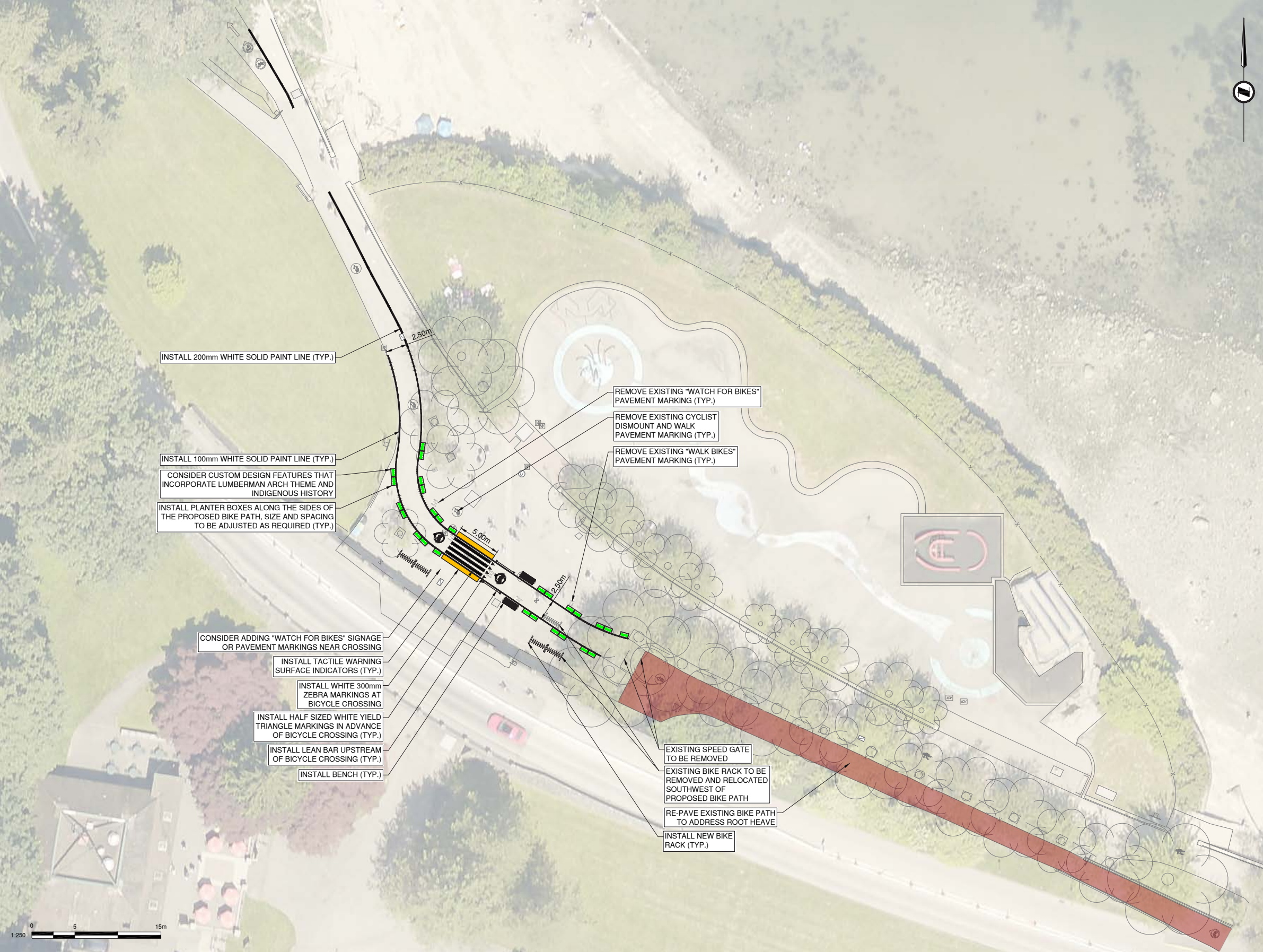
- Consider products, materiality, pavement markings and signage in concept design phase.
- Consider custom design features that play off the Lumberman's Arch theme.

#### Evaluation

Option 2 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option allows people to stay on their bike with the potential need to yield to pedestrians in the one crosswalk area - Score 4
- **Reduce conflicts and reduce conflict area:** With just one focused conflict area, the design can support yield compliance and increase comfort for everybody in the area - Score 4
- **Intuitive design:** The design will be explored in more detail, but the bend out, possibly combined with some narrowing of the pathway can encourage yielding behaviour by slowing people down. It is typically when people on bicycles have to give up momentum that they fail to yield - Score 4
- **Accommodate all micromobility vehicle types:** By removing the maze gate and providing a smooth path for people rolling by various micromobility devices, accessibility is greatly improved - Score 5
- **Reduces Risk:** The risk of collisions remains somewhat similar to today, however with a focused conflict area and clear signage, priority is clear to all users - Score 3
- **Cost effective:** This option can be constructed entirely with quick build techniques if desired - Score 5
- **Total Score: 25**





# Lumberman's Arch

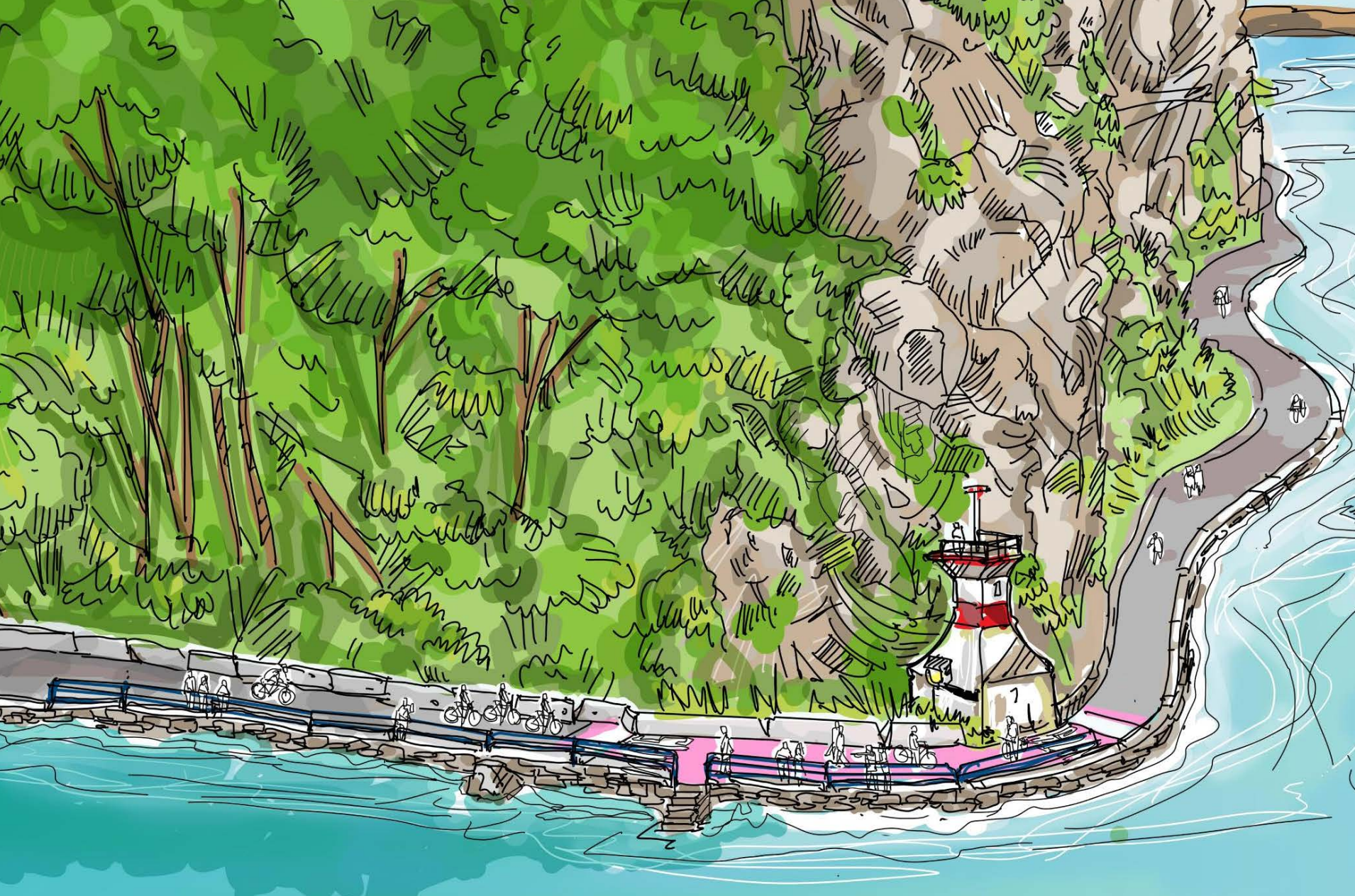
## Option 2

### Marked Bike Path with Single Pedestrian Crossing

- Removal of maze gate
- Planter boxes, benches, and lean bars to separate people biking and walking
- Bike crossing focused to a single location to reduce conflicts
- Re-paving of the existing bike path
- Opportunity to incorporate indigenous artwork
- Option to replace planter boxes with different types of physical separation
- Tactile strips to mark the crossing for those with visual impairments







## 5.6. Prospect Point Option 1: Fence Removal and Railing Addition

This option removes the fencing on the approach that separates people walking and rolling, instead relying on signage and pavement markings to encourage slow rolling. Rumble strips on approach could alert people rolling to the change in conditions, but care is needed to avoid creating a hazard for people with small wheels. Without a railing on the outer edge of the Seawall, people often stop to enjoy the view from further back, constraining the path of people passing by. The intent of adding a railing to the existing seawall is to allow people to lean on it, keeping them closer to the outer edge and creating space for those passing through.

### Advantages

- Low cost option with primarily rapid implementation techniques.
- Improves accessibility for non-standard bicycles.

### Disadvantages

- Still the most constrained area of the Seawall with scope for conflict.
- Still potential for people to roll through.

### Notes

- Consider materiality, pavement markings and signage in concept design phase.
- Consider the access requirements for maintenance vehicles that occasionally need to mount the existing wall to gain access. Example would be urban forestry truck with boom overhang.
- Use a removable fence with flush mounts or outer wall mounts to accommodate vehicle paths and ensure fence is designed for loading from people leaning on it.
- Relocation of concrete barriers was considered and the Park Board were advised against moving them closer to the slope.

### Evaluation

Option 1 was evaluated against each of the project objectives as follows:

- **Maintains flow:** The removal of the fence will improve flow, but there may still be a requirement to slow through the shared space - Score 3
- **Reduce conflicts and reduce conflict area:** This option includes a railing along the outer edge of the Seawall which would hopefully encourage those enjoying the view to position themselves closer to the edge of the pathway, but generally the same conflicts will exist as are present today - Score 1
- **Intuitive design:** New signage will encourage slow rolling, but little difference compared to the present condition - Score 1
- **Accommodate all micromobility vehicle types:** The removal of the fence on approach will make it easier for those on non-standard bicycles to navigate the merge location, but the same issues with the narrow shared space will persist.
- **Reduces Risk:** Remains somewhat similar to today - Score 3
- **Cost effective:** The fence removal and signage will be low cost. Some consideration will have to be given to an appropriate design for the railing which may add cost, including maintenance - Score 4
- **Total Score: 15**





# Prospect Point

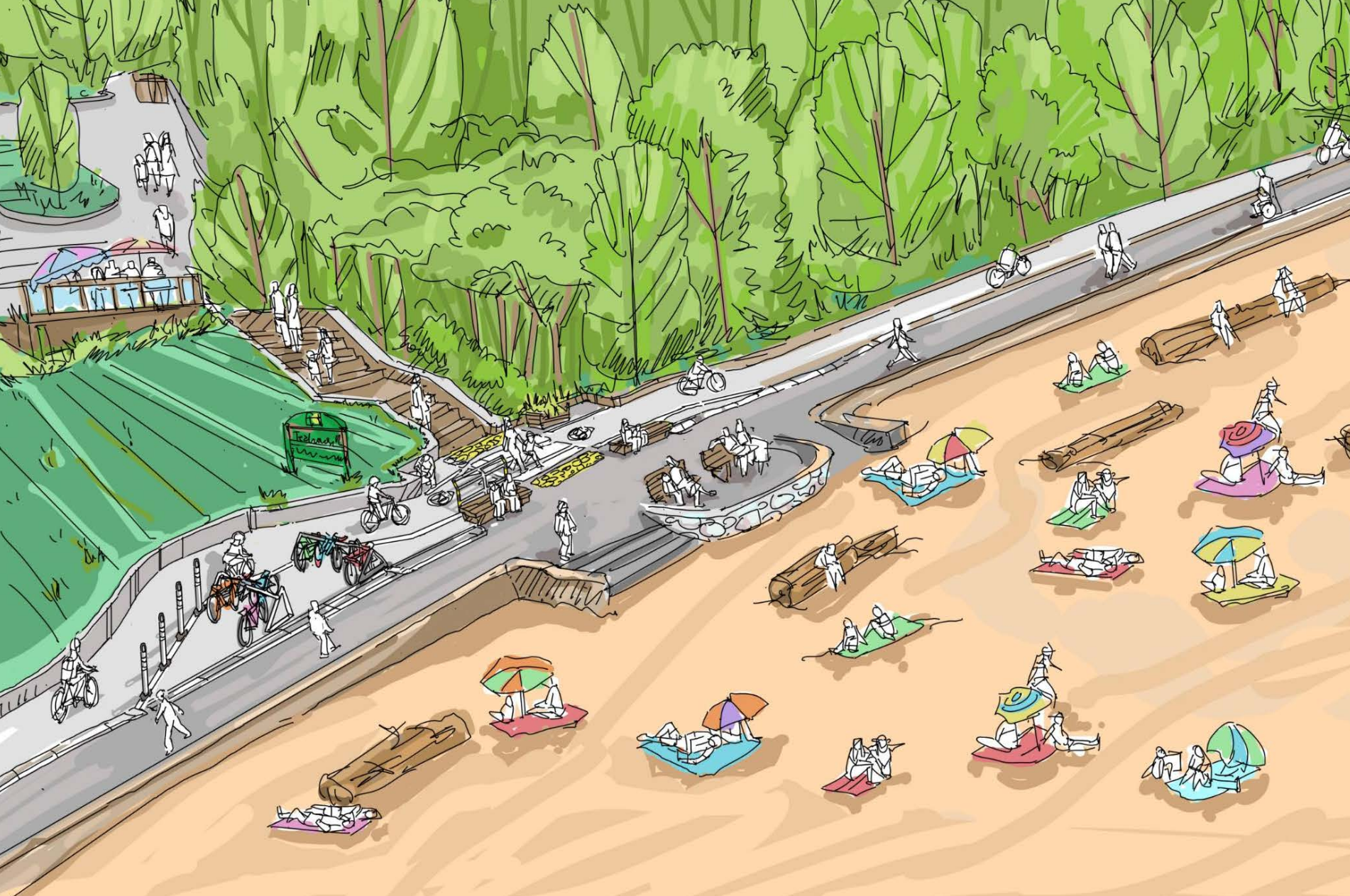
## Option 1

### Fence Removal and Railing Addition

- Removal of existing fence approaching the lighthouse
- Installation of a removable railing along the outer edge of the seawall
- Opportunity to incorporate indigenous artwork as surface treatment in the conflict area
- Signage to instruct people rolling to slow during congested times







### 5.9. Third Beach Option 2: Focused Crossing Area Plus Relocated Bike Parking

This option takes a similar approach to Option 1, and like Science World and Options 2 and 3 for Lumberman’s Arch, it focuses the conflict area through the use of benches, constraining people into a single-file configuration through a chicane within the former bike parking area. Compared to Option 1, the bike parking is relocated between the bike path and the pedestrian path, reducing the need to cross the bike path to retrieve a bicycle. The existing bike parking area is then used to create the chicane effect.

#### Advantages

- Low cost option with primarily rapid implementation techniques.
- No need to dismount and walk.
- Allows flow at off-peak times.
- Improves accessibility for non-standard bicycles.
- Removes the pedestrian crossing to/from the bike parking.

#### Disadvantages

- Increased cost to move the bike parking and modify the retaining wall.

#### Notes

- Consider products, materiality, pavement markings and signage in concept design phase.

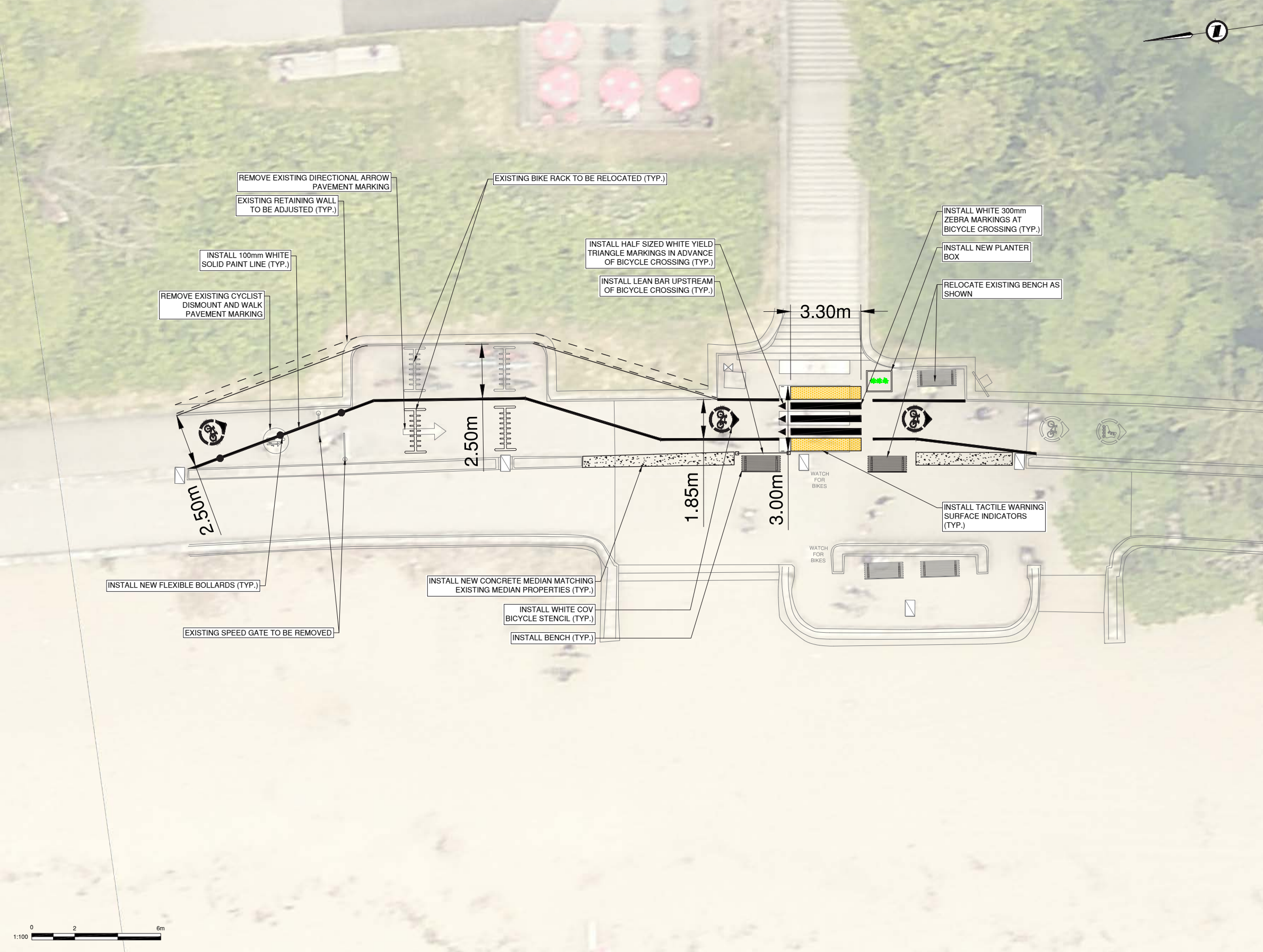
#### Evaluation

Option 2 was evaluated against each of the project objectives as follows:

- **Maintains flow:** This option allows people to stay on their bike, and with bike parking relocated reduces the potential need to yield to pedestrians to just one crosswalk area - Score 4
- **Reduce conflicts and reduce conflict area:** With just one focused conflict area, the design can support yield compliance and increase comfort for everybody in the area - Score 4
- **Intuitive design:** Through the chicane effect created by relocating the bike parking and narrowing of the pathway with the focused conflict area, this design will encourage yielding behaviour. It is typically when people on bicycles have to give up momentum that they fail to yield - Score 4
- **Accommodate all micromobility vehicle types:** By removing the maze gate and providing a smooth path for people rolling by various micromobility devices, accessibility is greatly improved - Score 5
- **Reduces Risk:** The risk of collisions remains somewhat similar to today, however with a focused conflict area and clear signage, priority is clear to all users - Score 3
- **Cost effective:** This option can be constructed mostly with quick build techniques if desired, however there is a need to make adjustments to the small retaining where bike parking is relocated - Score 4
- **Total Score: 25**







# Third Beach

## Option 2

### Focused Crossing area with Relocated Bike Parking

- Removal of maze gate
- Relocation of bike racks between pedestrian path and re-aligned bike path, creating a chicane
- Addition of benches and planter boxes as well as extension of concrete median to focus crossing to a single location
- Tactile strips to mark the crossing for those with visual impairments

