

## REPORT

---

### City of Port Moody Final Report

### Bedwell Bay Road Corridor Improvements Transportation Study



JUNE 2022

#### **CONFIDENTIALITY AND © COPYRIGHT**

This document is for the sole use of the addressee and Associated Engineering (B.C.) Ltd. The document contains proprietary and confidential information that shall not be reproduced in any manner or disclosed to or discussed with any other parties without the express written permission of Associated Engineering (B.C.) Ltd. Information in this document is to be considered the intellectual property of Associated Engineering (B.C.) Ltd. in accordance with Canadian copyright law.

This report was prepared by Associated Engineering (B.C.) Ltd. for the account of City of Port Moody Final Report. The material in it reflects Associated Engineering (B.C.) Ltd.'s best judgement, in the light of the information available to it, at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Associated Engineering (B.C.) Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

# TABLE OF CONTENTS

| SECTION  | PAGE NO. |
|--|----------|
| Table of Contents  | i        |
| List of Tables   | ii       |
| List of Figures  | iii      |
| 1 Introduction   | 1        |
| 1.1 Project Objectives   | 1        |
| 1.2 Study Area   | 1        |
| 1.3 Background Information   | 2        |
| 1.4 Site Visit   | 4        |
| 2 Existing Conditions Review   | 1        |
| 2.1 Study Area Roads   | 1        |
| 2.2 Shoulder Widths  | 2        |
| 2.3 Safety   | 4        |
| 2.4 Traffic  | 5        |
| 2.5 Parking  | 8        |
| 2.6 Active Transportation  | 9        |
| 2.7 Transit  | 9        |
| 3 Location Specific Issues   | 11       |
| 3.1 White Pine Beach Road  | 11       |
| 3.2 Tum Tumay Whueton Drive  | 12       |
| 3.3 Floatwalk Access   | 12       |
| 3.4 Bedwell Bay Informal Turnaround Area / Floatwalk Access          | 12       |
| 4 Problem Definition   | 13       |
| 5 Options Development  | 13       |
| 5.1 Improvement Area 1 – Pedestrian / Cyclist Facilities             | 13       |
| 5.2 Improvement Area 2 – White Pine Beach Road Intersection          | 15       |
| 5.3 Improvement Area 3 - Floatwalk Access                            | 17       |
| 5.4 Improvement Area 4 – Tum Tumay Wheuton Intersection              | 18       |
| 5.5 Improvement Area 5 – White Pine Beach Visitation and Circulation | 20       |
| 6 Options Evaluation   | 21       |
| 6.1 Evaluation Framework   | 21       |
| 6.2 Stakeholder Engagement   | 22       |
| 6.3 Option Evaluation  | 22       |
| 7 Recommendations  | 27       |
| Closure  |          |
| Appendix A – Site Visit  | 1        |
| Appendix B - Proposed Option Sketches                                | 1        |
| Appendix C – Evaluation Criteria                                     | 1        |
| Appendix D – Opinion of Probable Costs                               | 1        |

## LIST OF TABLES

|  | PAGE NO. |
|--|----------|
| Table 2-1 Traffic on Bedwell Bay Road Between Crystal Creek Dr. and White Pine Beach Rd, 2020 Two Way Total Volume by Month and Day of Week (vehicles per day) | 5        |
| Table 2-2 Traffic on White Pine Beach Rd, 2020 Two Way Total Volume by Month and Day of Week (vehicles per day)  | 6        |
| Table 2-3 Vehicle Volumes Along Bedwell Bay Road Two Way Total Volume by Day of Week (vehicles per day)  | 6        |
| Table 2-4 Bicycle Volumes Along Bedwell Bay Road Two Way Total Volume by Day of Week (Bikes per day)   | 7        |
| Table 2-5 Vehicle Travel Speeds Along Bedwell Bay Road (85 <sup>th</sup> Percentile Speed)   | 7        |
| Table 2-6 Historic Traffic Volume Trends on White Pine Beach Vehicle Entries by Year and Month (vehicles per month)  | 8        |



# LIST OF FIGURES

|  | PAGE NO. |
|--|----------|
| Figure 1-1 Bedwell Bay Road Study Corridor   | 2        |
| Figure 1-2 Sasamat Greenway Concept  | 3        |
| Figure 2-1 Bedwell Bay Road – White Pine Beach Road  | 1        |
| Figure 2-2 Bedwell Bay Road - Tum Tumay Whueton Drive Intersection                         | 2        |
| Figure 2-3 Parkable, Walkable, Not-Walkable Shoulder Width Classification                  | 3        |
| Figure 2-4 2014-2018 Police Reported Collisions  | 4        |
| Figure 2-5 No Parking Signage on Bedwell Bay Road  | 9        |
| Figure 2-6 Route 181 & 182 Outbound (Left) and Inbound (Right)                             | 10       |
| Figure 3-1 Intersection Characteristics  | 11       |
| Figure 5-1 Option 1A – Bi-Directional Facility (North Side MUP)                            | 14       |
| Figure 5-2 Option 1B – Uni-Directional Facility (Delineated Buffered Shoulders Both Sides) | 15       |
| Figure 5-3 Option 2A – Formalized Transit and Pedestrian Facilities                        | 16       |
| Figure 5-4 Option 2B – Mini Roundabout with Formalized Transit and Pedestrian Facilities   | 17       |
| Figure 5-5 Floatwalk Parking   | 18       |
| Figure 5-6 Improved Wayfinding Signage and Intersection Lighting                           | 19       |
| Figure 5-7 Tum Tumay Wheuton Mini Roundabout   | 20       |
| Figure 5-8 Option 3A – Transit Routing   | 21       |

# 1 Introduction

**Associated Engineering (AE)** was retained by the **City of Port Moody (PoMo)** in partnership with and by the joint funding of the **Metro Vancouver Regional District (MVRD)** to conduct a transportation corridor study for Bedwell Bay Road and 1st Avenue.

Due to the use of Bedwell Bay Road for access to the təmtəx̣ʷtən/Belcarra Regional Park and White Pine Beach, MVRD is a major partner in the project. Specifically, MVRD Parks is interested in improvements to the traffic operations and configuration of the təmtəx̣ʷtən/Belcarra Regional Park entrance intersection to White Pine Beach.

MVRD has also identified the Bedwell Bay Road corridor as part of the Regional Greenway Network in the Regional Greenways 2050 strategic plan. At present, during peak summer usage, the parking demand at the park exceeds parking supply. This parking demand backs up on Bedwell Bay Road and causes significant traffic flow and parking issues during the peak visit periods. Overflow vehicles park illegally along the shoulder for multiple kilometers, and causes safety issues for vehicles, pedestrian, and cyclists.

## 1.1 Project Objectives

The key objectives of this study are to recommend improvements to the intersections and roadways within the study area, specifically:

- Improve the safety of the corridor for all users.
- Develop a permanent solution to the on-street parking issue.
- Address the need for inclusion of active transportation within the corridor.

## 1.2 Study Area

The study area is defined as 1<sup>st</sup> Avenue between the intersection of Ioco Road and Sunnyside Road, and Bedwell Bay Road from Sunnyside Road to the municipal boundary of the Village of Belcarra. **Figure 1-1** shows the study area. Bedwell Bay Road and 1<sup>st</sup> Avenue are classified as a Major Road Network (MRN) and are two lane undivided roadways with a rural cross section and a speed limit of 50 km/h. The roadways in the study area are mainly in the jurisdiction of Port Moody and provides access to the Village of Belcarra, təmtəx̣ʷtən/Belcarra Regional Park at Sasamat Lake and the Village of Anmore.

The study area includes the access points and parking areas that serve təmtəx̣ʷtən/Belcarra Regional Park and Sasamat Lake.

The zoning of the surrounding area is a mixture of M2: General Industrial, A1: Acreage Reserve, and Residential for a short stretch at Crystal Creek Drive. The Bedwell Bay Road study corridor is located in a rural setting in hilly terrain. The corridor is generally heavily forested on both sides with open ditches used for drainage.

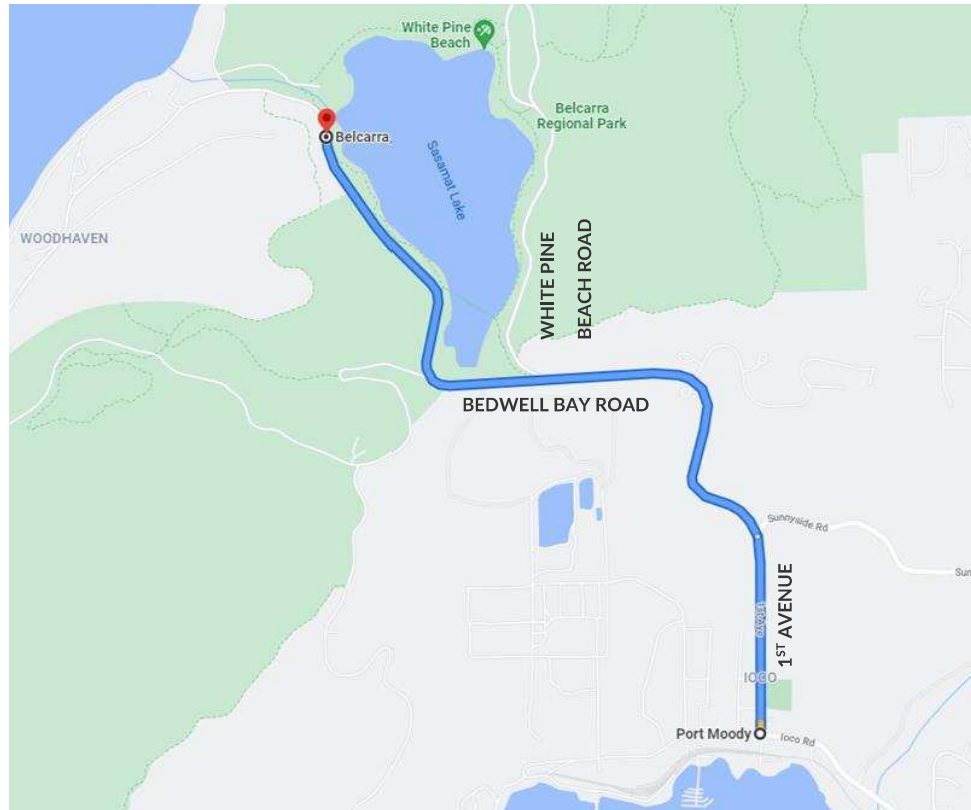


Figure 1-1  
Bedwell Bay Road Study Corridor

### 1.3 Background Information

Several background information documents were reviewed as part of this study. Key information from the background reports are summarized in this section.

#### **Belcarra Electronic Traffic Signboard Standard Operating Procedures, Metro Vancouver, 2021:**

- təmtəxʷtən/Belcarra Regional Park has total of three electronic boards. Two are shared between Village of Anmore, Village of Belcarra, Port Moody and Metro Vancouver to warn motorists when the parking lots are full.
- The third sign board is located at the Bedwell Bay Road pullout west of the Floatwalk to help minimize traffic and illegal parking in Village of Belcarra.
- Includes recommended messaging for sign boards.

**City Council Reports:** At its meeting held on June 13, 2019 City Council carried a recommendation that “plastic delineator posts be installed in the recently signed parking restriction areas along Bedwell Bay Road.” The report to Council indicated that there was poor compliance of the parking restrictions that were put in place in spring 2019. At its meeting held on September 25, 2018, City Council carried a recommendation that parking restrictions along Bedwell Bay Road be implemented to address a number of specific concerns including:

- Vehicles parked on the shoulder edge that protrude over the white edge line limiting sightlines and available travel portion of the roadway.
- Vehicles parked on the shoulder of Bedwell Bay Road that force pedestrians to walk on the traveled portion of the roadway while carrying various large items for park use.

- Unmarked steep slopes adjacent to the road shoulder that can make access difficult and potentially unsafe. Activity in these areas can also increase erosion of steep slopes adjacent to the roadway.
- Vehicles searching for parking spaces that make frequent U-turns on Bedwell Bay Road.

In a prior Council report, dated May 24, 2011, City Council defeated a recommendation to install no parking zones on Bedwell Bay Road and instead carried a motion that staff consult with Metro Vancouver on potential locations within Metro Vancouver lands to increase off-street parking for White Pine Beach/Sasamat Lake.

In a prior closed Council session, concrete barriers were installed in locations along Bedwell Bay Road in July 2021.

**Conceptual Drawings, MVRD, 2021:** Discussion sketches show potential drop-off zone and reconfiguration of the parking lots within White Pine Beach to help with traffic flow.

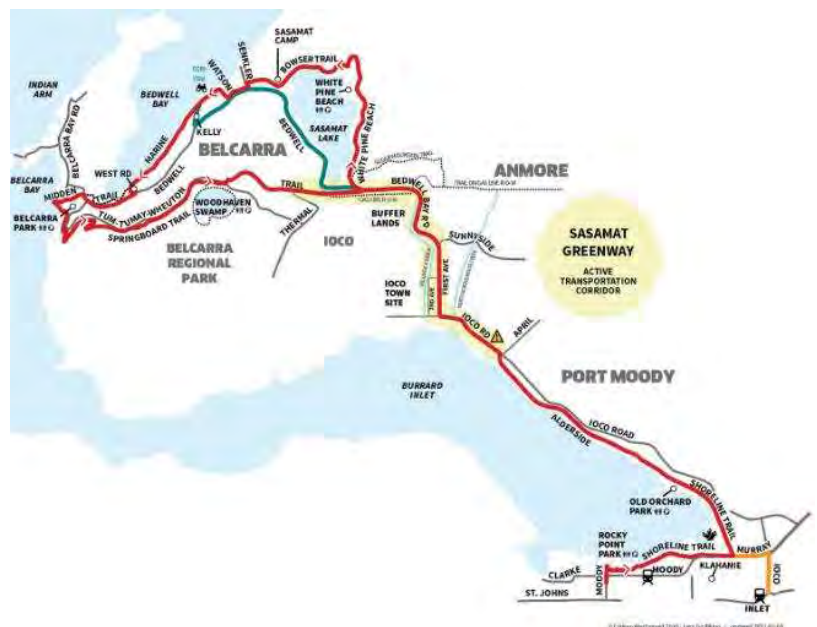
**Metro Vancouver Regional Parks Pay Parking Analysis, G. P. Rollo & Associates, 2020:** Identified that the parking at the Sasamat Lake parking lot appeared to be oversupplied on average. The study also identified the anticipated revenue generated by implementing paid parking and the costs associated with implementation and operation. It also identified that there were 774,915 visits in 2019 and 721 parking stalls located within the park.

**Regional Greenways 2050, Metro Vancouver, 2020:** Identified the Bedwell Bay Road Corridor and White Pine Beach Road as part of the Regional Greenway Network in the 30-year vision for recreational trails. It also identified the corridor's Regional Greenway Network Operational Status as "Planned". The corridor is a proposed future route identified in the existing plans of active transportation development. A planned route will require some combination of conceptual planning, land acquisition, detailed design, funding and construction to transform it into a future greenway.

**Regional Parks – Traffic Management Plan for təmtəx̱'w̱tən/Belcarra Regional Park, Metro Vancouver, 2021:** Identified the amount of parking supply in as well as outlines the traffic management strategy used during peak park demand periods.

**Sasamat Greenway – Safe Active Transportation Corridor, HUB Cycling, 2021:** HUB has requested a safe active transportation greenway or route from April Road to White Pine Beach that is all ages and abilities accessible. The Sasamat Greenway concept would align with HUB, PoMo, and MV long-term priorities. The Sasamat Greenway concept is shown in **Figure 1-2.**

**Traffic Data:** Traffic tube counts and turning movement counts at various locations along the study corridor were obtained by PoMo. MVRD also maintains several magnetic count stations throughout the corridor including two on Bedwell Bay Road, one at



**Figure 1-2**  
**Sasamat Greenway Concept**

the village entrance, one at Crystal Creek Drive, and one on White Pine Beach Road. The findings are discussed in [Section 2.4](#).

**Variable Message Sign Implementation, City of Port Moody Email Discussions, 2018:**

- VMS signs installed at Heritage Mountain Boulevard – Ioco Road and David Avenue and Forest Park Way W
- Both signs indicate when Buntzen Lake and White Pine Beach are full based on observation and phone communications.
- Cost sharing is between multiple agencies including PoMo, MV, and Buntzen/Hydro.  
Sign only used annually from May long weekend to September long weekend. It appears that the VMS signs are having a low impact on travel behaviours.

**White Pine Beach Entrance Improvements Tech Memo, ISL Engineering, 2013:** Recommended traffic and safety improvements at the intersection of Bedwell Bay Road – White Pine Beach Road including extending the existing median barrier and relocating object marking sign, installing a gate device at the east end of the median, relocate delineators to the east, paint new pavement markings, add “local and bus traffic only” sign. Most of these recommendations were implemented and reflect the current configuration of the road.

## 1.4 Site Visit

A site visit was completed along Bedwell Bay Road on November 8, 2021 with representatives from AE, PoMo, and MV. It was noted that there are four key locations where traffic issues occur:

- 1) Congestion at the entrance to the White Pine Beach park.
- 2) Boardwalk trailhead adjacent to Bedwell Bay Road has no formal parking.
- 3) Turn around area towards Belcarra.
- 4) The turn-off to Anmore.

Discussion and observation onsite included the illegal parking and congestion along Bedwell Bay during peak times, no parking signs, white delineators installed in 2019, barrier installation, existing bus stop locations, and intersection operations and sight lines. Full details of the site visit are included in [Appendix A](#).



## 2 Existing Conditions Review

The existing conditions of the roadway are described in this section.

### 2.1 Study Area Roads

The project area includes 1<sup>st</sup> Avenue north of Ioco Road and Bedwell Bay Road from 1<sup>st</sup> Avenue, west to the Belcarra municipal boundary. There are several private accesses that tie into the road, and the following intersecting roads:

**1<sup>st</sup> Avenue / Bedwell Bay Road / Sunnyside Road:** Bedwell Bay Road and Sunnyside Road branch off 1<sup>st</sup> Avenue, with Sunnyside Road oriented as the stop-controlled, minor leg of the intersection. At the intersection, Sunnyside Road has narrow shoulders with a pin-on asphalt curb on the eastbound side of the roadway. .

**Crystal Creek Drive / Forest View Lane:** This Village of Anmore intersection has left-turn lanes from Bedwell Bay Road to both side street. North-eastbound has a channelized right-turn lane to Crystal Creek Drive. Forest View Lane is right-out only. The intersection is located on a horizontal curve and may have poor sightlines.

**White Pine Beach Road:** White Pine Beach Road intersects with Bedwell Bay Road at a complex T-intersection. Westbound Bedwell Bay Road has a right-turn only lane with approximately 70 m of storage and barrier separating the turn lane from through traffic. Eastbound Bedwell Bay Road has a left-turn lane into the park access and an acceleration lane that tapers for vehicles exiting White Pine Beach Road. White Pine Beach Road has a vehicle/bus turnaround with a bus stop. Due to the skewed angle of the intersection, vehicles leaving White Pine Beach Road either turn right via a channelized yield, or travel through to eastbound Bedwell Bay Road. **Figure 2-1** shows the existing layout of the intersection.

**Tum Tumay Whueton Drive:** Tum Tumay Whueton Drive intersects with Bedwell Bay Road along a horizontal curve with steep vertical slope on some approaches. The angle of intersection is skewed. These characteristics cause potential sightline issues. The intersection operates as a 3-way stop, with stop signs and bars located at all directions. **Figure 2-2** shows the existing layout of the intersection.



Figure 2-1  
Bedwell Bay Road – White Pine Beach Road



**Figure 2-2**  
**Bedwell Bay Road - Tum Tumay Whueton Drive Intersection**

## 2.2 Shoulder Widths

Bedwell Bay Road has a rural cross section within the study area. The shoulder widths vary throughout the corridor ranging from no shoulder to some shoulder. Shoulder widths are neither consistent through areas nor equal on both sides. AE developed a map of shoulder width classification throughout the corridor and is shown in **Figure 2-3**. For this project, the paved shoulder widths were estimated from Google Earth measurements. Walkable shoulders were classified as paved shoulders between 1.2 m to 2.4 m wide and shoulder widths less than 1.2 m were considered not suitable for walking. A “parkable shoulder” width was considered as a paved shoulder width of greater than 2.4 m. This map indicates that only two short sections have shoulder widths wide enough for vehicles to be safely parked. Likewise, there are a few sections of roadway that have shoulders not wide enough for them to be used for walking at least in single file along the road.

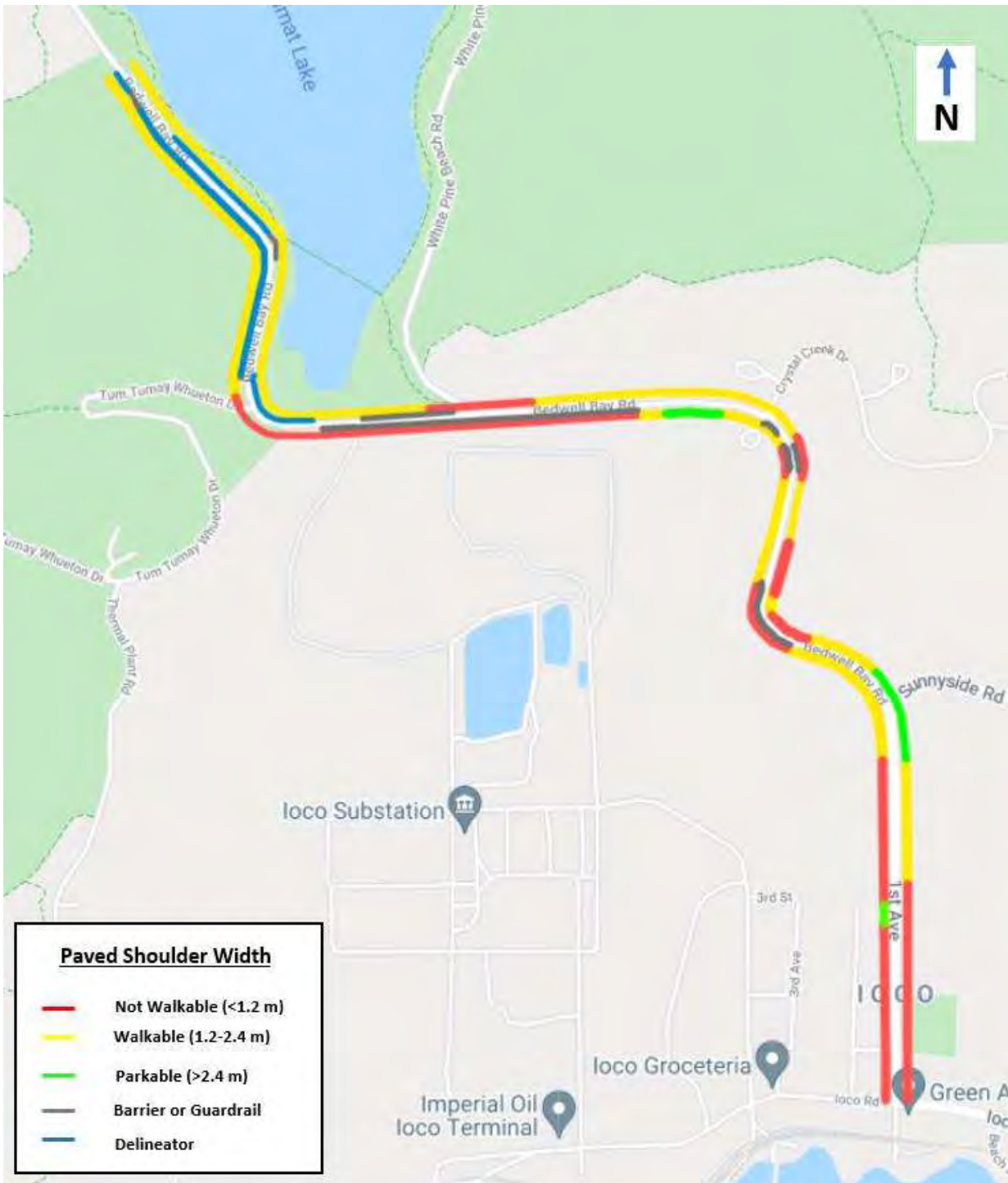


Figure 2-3  
Parkable, Walkable, Not-Walkable Shoulder Width Classification



## 2.3 Safety

The historical collisions taken from the City's Traffic Accident System (TAS) database contains the police-reported collision data. It was summarized for the most recent five years of complete data from 2014 to 2018. The crashes have been mapped in **Figure 2-4**. Nine collisions listed the collision location as 2100 Bedwell Bay Road and there were a further three collisions that were reported on Bedwell Bay Road without a specific location given and not mapped. Collisions at Crystal Creek Drive are in the Village of Anmore jurisdiction and do not appear to be included in the collision data set. No collisions involving pedestrians or cyclists was reported in the data.



Figure 2-4  
2014-2018 Police Reported Collisions

## 2.4 Traffic

Traffic counts were available from a number of sources including permanent count stations operated by Metro Vancouver and Tube Counts arranged by the City.

### 2.4.1 Traffic by Month and Day of Week

A more complete set of the data provided by MV was available from a permanent count station on Bedwell Bay Road immediately west of Crystal Creek Drive. This data, shown in **Table 2-1** shows the significant difference in the amount of traffic throughout the year, ranging from a low of 1,600 vehicles per day on Sundays in January to a high of nearly 12,000 vehicles per day on Sundays in July. This data is indicative of that pattern that the road serves local traffic going to and from the Village of Belcarra throughout the year and accommodates seasonal variations for traffic destined to all parts of t̓əmt̓əx̓w̓t̓ən/Belcarra Regional Park, not just White Pine Beach at Sasamat Lake.

**Table 2-1**  
**Traffic on Bedwell Bay Road Between Crystal Creek Dr. and White Pine Beach Rd, 2020**  
**Two Way Total Volume by Month and Day of Week (vehicles per day)**

| Month   | Mon  | Tue  | Wed  | Thu  | Fri  | Sat  | Sun   | Average |
|---------|------|------|------|------|------|------|-------|---------|
| Jan     | 1650 | 1720 | 1920 | 1800 | 1740 | 1860 | 1650  | 1770    |
| Feb     | 2640 | 1890 | 2070 | 2060 | 2340 | 2570 | 2360  | 2290    |
| Mar     | 2350 | 2240 | 3010 | 2520 | 2890 | 3800 | 3840  | 2940    |
| Apr     | 3120 | 2790 | 2790 | 3150 | 3220 | 4150 | 4020  | 3300    |
| May     | 5340 | 4150 | 4150 | 4480 | 6040 | 5330 | 5910  | 5130    |
| Jun     | 5160 | 3240 | 4020 | 5380 | 4690 | 4950 | 7800  | 4980    |
| Jul     | 8340 | 6300 | 5700 | 3920 | 4160 | 8050 | 11700 | 6660    |
| Aug     | 4890 | 4490 | 4490 | 3540 | 3970 | 5080 | 6680  | 4810    |
| Sep     | 3850 | 3230 | 3450 | 3760 | 3710 | 3190 | 3830  | 3560    |
| Oct     | 2800 | 2560 | 3090 | 2770 | 2710 | 3500 | 2770  | 2900    |
| Nov     | 2200 | 1980 | 2370 | 2180 | 2380 | 3270 | 3280  | 2540    |
| Dec     | 2590 | 2460 | 2390 | 2520 | 2380 | 2990 | 2440  | 2530    |
| Average | 3740 | 3090 | 3290 | 3170 | 3350 | 4060 | 4690  | 3620    |

**Table 2-2** shows the daily traffic volumes on White Pine Beach Road for the same time period as **Table 2-1**. This shows how much of the traffic travels to and from White Pine Beach Rd which is significantly less than the traffic on Bedwell Bay Road.

**Table 2-2**  
**Traffic on White Pine Beach Rd, 2020**  
**Two Way Total Volume by Month and Day of Week (vehicles per day)**

| Month   | Mon  | Tue  | Wed  | Thu  | Fri  | Sat  | Sun  | Average |
|---------|------|------|------|------|------|------|------|---------|
| Jan     | 90   | 90   | 160  | 110  | 100  | 210  | 180  | 130     |
| Feb     | 290  | 110  | 140  | 120  | 250  | 460  | 290  | 240     |
| Mar     | 230  | 220  | 340  | 260  | 340  | 620  | 610  | 370     |
| Apr     | 430  | 380  | 360  | 440  | 440  | 690  | 690  | 490     |
| May     | 900  | 830  | 860  | 910  | 1070 | 800  | 930  | 900     |
| Jun     | 980  | 490  | 750  | 1130 | 990  | 1080 | 1400 | 970     |
| Jul     | 1610 | 1230 | 1160 | 640  | 770  | 1200 | 1500 | 1160    |
| Aug     | 930  | 960  | 860  | 680  | 800  | 890  | 910  | 860     |
| Sep     | 470  | 570  | 660  | 720  | 650  | 560  | 620  | 610     |
| Oct     | 370  | 280  | 410  | 440  | 430  | 590  | 410  | 420     |
| Nov     | 180  | 130  | 240  | 170  | 200  | 510  | 540  | 280     |
| Dec     | 380  | 300  | 290  | 300  | 290  | 460  | 360  | 340     |
| Average | 570  | 470  | 520  | 490  | 530  | 670  | 700  | 560     |

## 2.4.2 Traffic Along Bedwell Bay Road

Table 2-3, Table 2-4, and Table 2-5 provides a summary of traffic data that was collected using tube counters in October and November 2021. This data has vehicle counts, bike counts and vehicle travel speed.

**Table 2-3**  
**Vehicle Volumes Along Bedwell Bay Road**  
**Two Way Total Volume by Day of Week (vehicles per day)**

| Between  | Mon  | Tues | Wed  | Thurs | Fri  | Sat  | Sun  |
|--|------|------|------|-------|------|------|------|
| 1 <sup>st</sup> Ave and Sunnyside Rd (Nov 13 to 19, 2021)          | 2050 | 2800 | 2700 | 2450  | 3000 | 2450 | 1600 |
| Crystal Creek Dr. and White Pine Beach Rd (Oct. 26 to Nov 1, 2021) | 2050 | 1900 | 2100 | 1850  | 2300 | 3700 | 3450 |
| White Pine Beach Rd and Tum Tumay Whueton Dr. (Oct 13 to 19, 2021) | 1900 | 2250 | 1800 | 1750  | 1650 | 1500 | 1600 |
| Tum Tumay Whueton Dr. and Belcarra Border (Oct. 26 to Nov 1, 2021) | 1500 | 1500 | 1600 | 1500  | 1600 | 1700 | 1500 |

**Table 2-4**  
**Bicycle Volumes Along Bedwell Bay Road**  
**Two Way Total Volume by Day of Week (Bikes per day)**

| Between  | Mon | Tues | Wed | Thurs | Fri | Sat | Sun |
|--|-----|------|-----|-------|-----|-----|-----|
| 1 <sup>st</sup> Ave and Sunnyside Rd (Nov 13 to 19, 2021)*         | 2   | 17   | 6   | 0     | 3   | 2   | 0   |
| Crystal Creek Dr. and White Pine Beach Rd (Oct. 26 to Nov 1, 2021) | 4   | 0    | 6   | 0     | 11  | 65  | 63  |
| White Pine Beach Rd and Tum Tumay Whueton Dr. (Oct 13 to 19, 2021) | 17  | 49   | 0   | 1     | 1   | 2   | 4   |
| Tum Tumay Whueton Dr. and Belcarra Border (Oct. 26 to Nov 1, 2021) | 2   | 0    | 1   | 0     | 11  | 25  | 20  |

\*Note: Count volumes are lower due to count being conducted in November

**Table 2-5**  
**Vehicle Travel Speeds Along Bedwell Bay Road (85<sup>th</sup> Percentile Speed)**

| Bedwell Bay between                            | NB 85% SPEED | SB 85% SPEED |
|--|--------------|--------------|
| Belcarra Border and Tum Tumay Wheuton Dr       | 71.5 km/h    | 75.8 km/h    |
| Tum Tumay Whueton Dr and White Pine Beach Road | 82.8 km/h    | 74.1 km/h    |
| White Pine Beach Rd and Crystal Creek Dr       | 67.8 km/h    | 65.5 km/h    |
| Crystal Creek Dr and Sunnyside Rd              | 63.3 km/h    | 66.9 km/h    |

Speeds were observed to be in excess of the posted 50 km/h speed limit at all tube locations. Higher directional travel speed corresponds to the road grade in the location of the loop. For example, for northbound travel from White Pine Beach to Tum Tumay Whueton, Bedwell Bay Road has a steep downgrade of greater than 10%, which may encourage higher travel speeds. High speeds along Bedwell Bay Road support the need for separation between vehicles and people walking and biking, as well as consideration for options that encourage slower travel speeds.

### 2.4.3 Historic Vehicle Volumes

Metro Vancouver provided the data in **Table 2-6** which shows monthly park entries of all parks in the area from January 2017 to August 2021 entering White Pine Beach. According to this data, vehicles entering White Pine was highest in 2021, followed by 2020.

**Table 2-6**  
**Historic Traffic Volume Trends on White Pine Beach**  
**Vehicle Entries by Year and Month (vehicles per month)<sup>1</sup>**

|              | 2017           | 2018           | 2019           | 2020           | 2021           |
|--------------|----------------|----------------|----------------|----------------|----------------|
| January      | 3,900          | 5,040          | 4,990          | 4,090          | 10,290         |
| February     | 4,180          | 5,100          | 5,140          | 7,080          | 9,040          |
| March        | 4,150          | 7,760          | 10,480         | 11,560*        | 12,730         |
| April        | 7,230          | 7,960          | 7,890          | 14,570         | 19,810         |
| May          | 15,460         | 18,110         | 15,900         | 28,020         | 21,590         |
| June         | 18,560         | 16,400         | 19,860         | 26,720         | 33,700         |
| July         | 35,140         | 31,880         | 27,570         | 35,020         | 39,250         |
| August       | 29,800         | 24,230         | 27,780         | 26,890         | 29,260         |
| September    | 13,400         | 8,880          | 10,990         | 18,240         | 13,660         |
| October      | 9,150          | 6,260          | 8,210          | 13,200         | 10,730         |
| November     | 3,660          | 4,740          | 5,940          | 8,570          | 6,910          |
| December     | 3,820          | 3,880          | 5,550          | 10,340         | 5,800          |
| <b>TOTAL</b> | <b>148,500</b> | <b>140,240</b> | <b>150,300</b> | <b>204,300</b> | <b>212,800</b> |

\*Note: The Covid-19 pandemic took place beginning in March 2020 through 2021, which appears to have contributed to higher park usage in the summer of 2020 and 2021.

## 2.5 Parking

The 2018 City Council report identified criteria for allowing vehicles to park along the roadway:

- provide adequate sight distances for vehicles travelling on the roadway at the posted speed limit.
- maximize the amount of on-street parking available for visitors.
- maintain safety for pedestrians and general traffic on the roadway.
- provide minimum 2 m wide paved or gravel shoulder measured from the painted edge line.

At the time, the intention was to only remove the unsafe parking which reduced the parking supply from 380 on-street parking stalls to approximately 260 on-street parking stalls to be available to visitors along Bedwell Bay Road. During the site visit, it was indicated that City Council prohibited parking on all of Bedwell Bay Road and have installed multiple no parking signs including large signs such as that seen in [Figure 2-5](#).

<sup>1</sup>Belcarra traffic counts 2017-2021.xls provided by Metro Vancouver. Volumes represent White Pine (inbound) vehicle occupants.



**Figure 2-5**  
**No Parking Signage on Bedwell Bay Road**

White Pine Beach parking lots have a total of approximately 412 parking stalls. Parking demand on peak days exceeds the available parking and has been a historical ongoing problem for many years. The reduction in parking without a replacement elsewhere has exacerbated the problem and may have contributed to the undesirable driving behaviour and illegal parking as people may not know where to park when the park gates are closed. Park staff and bylaw enforcement had noticed that park demand increased in 2020 and 2021 which was corroborated by the traffic count data. Based on the park usage data, it may be that a combination of increased parking restrictions, newly installed barriers and increased travel to the park contribute to the anecdotal deterioration of driving behaviour. Associated Engineering did a cursory assessment of which portions of the road are parkable based on whether the paved shoulder width is 2.4 m or greater. This width was selected as the target width for paved parkable shoulder based on the TAC<sup>2</sup> minimum width guidelines. As shown in **Figure 2-3**, there are few areas considered to be parkable. A parkable shoulder should provide enough space to safely park a vehicle completely outside of the travel lane with enough space to enter/exit the vehicle and for pedestrians to walk from their vehicles to their destination without needing to walk in the travel lane. Another consideration is whether pedestrian foot traffic or vehicles will erode the banks of the open ditches found along Bedwell Bay Road.

## 2.6 Active Transportation

Currently, the Bedwell Bay corridor has no formalized accommodations for people walking or biking other than roadside shoulders, which is common for rural settings. The two modes may share the shoulder space, however this becomes impractical when space is constrained or when vehicles are parked and occupying the space. As shown in **Figure 2-3**, there are several areas along the corridor where the paved shoulder width is below 1.2 m and considered to be too narrow to be walkable.

## 2.7 Transit

Currently, there are two year-round bus routes and one seasonal bus route that operates along Bedwell Bay Road by TransLink and Coast Mountain Bus Company (CMBC). Route 181 and Route 182 are shown in **Figure 2-6**.

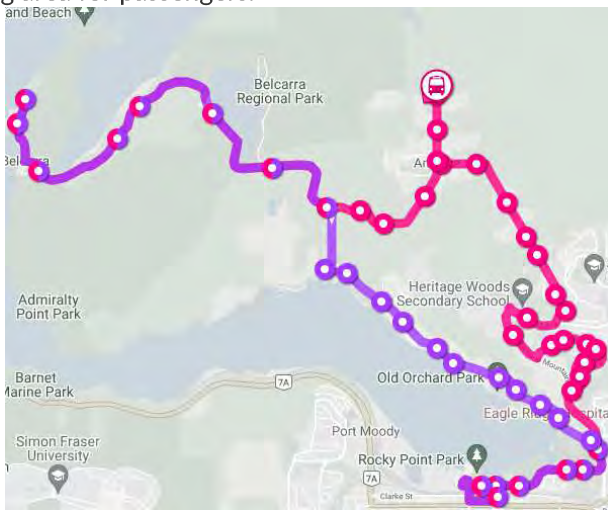
**Route 181** is a community shuttle route that connects Port Moody to Belcarra and Anmore via Bedwell Bay Road and Sunnyside Road. The inbound route runs northbound 1<sup>st</sup> Avenue, right onto northbound Sunnyside Road to Anmore and turns around. It travels southbound on Sunnyside Road. The outbound route travels east on Bedwell Bay Road to southbound on 1<sup>st</sup> Avenue into Port Moody to Moody Centre Station.

<sup>2</sup> TAC Geometric Design Guide, Section 4.3.2.4, Parking Lanes: Width is generally 2.4 m.

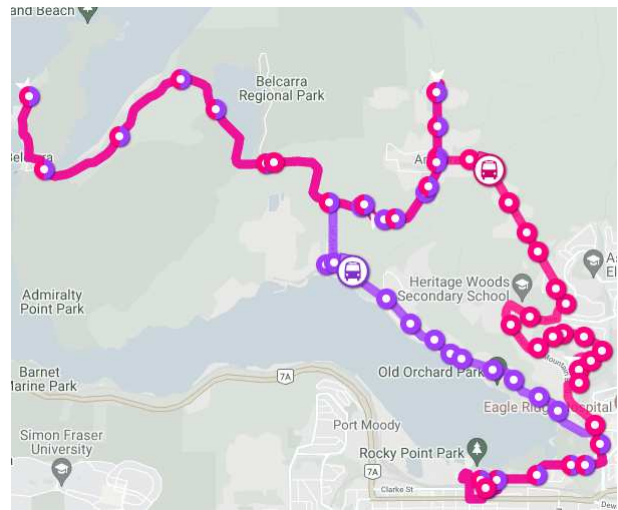


**Route 182** is also a community shuttle route that travels from Moody Centre Station to Belcarra. The bus travels inbound northbound to Anmore, and travels southbound along Sunnyside Road to Bedwell Bay Road where it travels to Belcarra. The outbound trip travels east from Belcarra and north along Sunnyside Road to Anmore where it routes into Port Moody.

Coast Mountain Bus uses a “flag stop” system for Route 181/182 along Bedwell Bay Road except at White Pine Beach. In the westbound direction there is a stop located in the intersection turnaround area. In the eastbound direction a temporary stop was constructed opposite to the park entrance, however there is no formal crossing and no waiting area for passengers.



Note: Route 181 shown in purple; Route 182 shown in pink.



Source: <https://tripplanning.translink.ca/#/app/nextdepartures>

**Figure 2-6**  
**Route 181 & 182 Outbound (Left) and Inbound (Right)**

**Route 150** is a well-utilized summer shuttle from Coquitlam Centre SkyTrain station to White Pine Beach. The route utilizes an articulating bus and drops / picks up passengers inside the park before heading back into Port Moody. The bus stops along Bedwell Bay Road have minimal infrastructure. Generally, they are identified with only a bus stop sign on the side of the roadway shoulder. The only bus stop with a more robust stop is the White Pine Beach bus stop at the bus turnaround.

CMBC identified their concerns along the corridor during a discussion on December 7, 2021. They identified high ridership on all routes for access to the park during peak times. The main issues they identified are:

- The Route 150 bus stop at the White Pine Beach entrance needs improved facilities for waiting passengers. There is no bus stop pad and a lack of space for waiting passengers.
- There are no formalized bus stops along Bedwell Bay Road for Route 181/182 and instead passengers can flag the bus down at any point in the corridor.
- The temporary eastbound stop constructed in 2021 is not in an ideal location for passenger waiting and loading/unloading. Bedwell Bay Road has roadside barrier in the eastbound direction at White Pine Beach Road and passengers must either climb over them or wait in the travel lane for the bus. No crosswalk is provided and the bus is required to stop in the travel lane which impedes traffic.
- Location of the Route 150 stop inside the park for accessibility.

## 3 Location Specific Issues

### 3.1 White Pine Beach Road

The White Pine Beach Road and Bedwell Bay Road intersection was identified as a key area of interest for this study because it is the location that is affected the most by the travel demands and lack of parking supply at White Pine Beach. The problem statement for the intersection is stated below:

***White Pine Beach Road Problem Statement: Peak parking demand exceeds capacity for the parking lot, causing cars to illegally park on the shoulder of Bedwell Bay Road. Pedestrians walk from their parked cars to the park in the travel lane which is a safety issue. Vehicles cannot turn around at the intersection when vehicles block the turn lanes. The roadway has observed speeding concerns and the intersection skew causes visibility concerns.***

Error! Reference source not found. shows photos from the site visit of the intersection characteristics.

Metro Vancouver operates the park and administers traffic control at the park entrance. Paid parking is used for demand management. When the parking lot is full, an operator closes the entry gate and only allows entry of transit, emergency, taxi and local vehicles. Park gates are reopened when 50 parking spaces become available. Metro Vancouver wants to encourage parking turnover and reduce resources needed for traffic control.

The specific issues for the intersection are:

- Cars illegally park on the shoulder and in the turn lane of Bedwell Bay Road at the intersection
- Some people use belligerent behaviour towards park operators and traffic control personnel.
- Traffic on Bedwell Bay Road gets impeded by vehicles stopping to access the park when the parking lot is full.
- By law enforcement and the police find a high level of non-compliance to the parking bylaws, even with high amounts of ticketing and towing.
- Route 182 uses a “flag stop” system, which means that people can stand anywhere on the side of the road to flag down a bus to pick them up. Coast Mountain Bus has added a temporary bus stop that is not ideal because it is on a grade, narrow shoulders and insufficient space for transit users to wait.



White Pine Beach Road / Sasamat Lake  
Entrance



Bedwell Bay Road facing west  
towards Belcarra



Bedwell Bay Road facing east  
towards IOCO townsite

Figure 3-1 Intersection Characteristics



### 3.2 Tum Tumay Whueton Drive

The Tum Tumay Whueton Drive and Bedwell Bay Road intersection was identified as a key area of interest for this study. The intersection is currently an all-way stop controlled intersection. The problem statement for the intersection is stated below:

***The intersection of Bedwell Bay Road and Tum Tumay Whueton Drive is a skewed angle intersection located on horizontal and vertical curves. Low traffic control device compliance was observed with cars failing to come to a complete stop at the intersection. Police have recently indicated to the City at least one rollover collision has occurred, although the collision data does not show an excessive number of collisions at this location.***

The intersection skew and curve can cause driver confusion to identify which road is Bedwell Bay Road and which is Tum Tumay Whueton Drive when approaching the intersection. It may appear that Bedwell Bay Road continues onto Tum Tumay Whueton Drive. The official route to access parks west of Belcarra is along Tum Tumay Whueton Drive, however unclear signage does not convey this to people approaching the intersection. There is some directional signage for the westbound approach but not on all approaches. The intersection does not have street lighting, which is typical for a rural intersection. Bedwell Bay Road has more traffic than Tum Tumay Whueton Drive and cars on Bedwell Bay Road destined for Belcarra were observed to be rolling the stop sign instead of fully stopping.

### 3.3 Floatwalk Access

The Boardwalk Walk Access point serves a secondary area of the park and provides an alternate entry point for individuals desiring access to Sasamat Lake generally. The problem definition statement is as follows:

***Parking is not supplied for the secondary park boardwalk area access causing cars to illegally park on the shoulder of Bedwell Bay Road where there is not enough space. Pedestrians walk from their parked cars to the boardwalk entrance in the travel lane which is a safety issue.***

There is a secondary consideration for this access point as Port Moody Police are often deployed to patrol this area of the park. There is currently emergency vehicle only parking near the park entrance.

### 3.4 Bedwell Bay Informal Turnaround Area / Floatwalk Access

The informal turnaround point is located at the northern end of the study corridor near the Belcarra border and the west Floatwalk access. The area has a wide unpaved shoulder where there is currently an informal bus stop. The problem statement for the turnaround is as follows:

***There is a lack of turn around opportunities on Bedwell Bay Road. An informal turn around location is not well defined or paved and cars must cross a double solid yellow line to turn around.***

People walking on the road are mostly park goers walking in groups and carrying beach equipment. Parked vehicles are hazardous due to the narrow road and shoulder width. Cars have been observed parked on shoulder on top of delineators.

Issues related to park going activities requiring police presence in the boardwalk entrance.

Turn around opportunities are limited even after entering Belcarra. Drivers who are not familiar with the area may find this confusing especially when the road is busy.

## 4 Problem Definition

The root issue is that there is a greater demand than supply for parking inside the White Pine Beach on peak demand days. MV closes the park gates when the parking lots are full to keep its internal road system clear and in case of an emergency. This has impacts on the operations and safety of the roadway and intersections. The following problems occur on Bedwell Bay Road when the parking lots are full (and the park gates are closed):

- People walk along the middle of the road.
- People riding bikes do not feel safe riding along the corridor due to vehicle speeds and lack of separated bike facilities.
- People park their vehicles illegally and unsafely.
- People illegally stop on the side of the road to wait to be allowed into the park and block Bedwell Bay Road and/or the White Pine Beach Road access for emergency vehicles, transit, and other vehicles.

There is opportunity to better utilize the corridor to encourage White Pine Beach to be an active transportation destination. Providing adequate facilities to allow people to visit the area by bus, bike, or walking will help vitalize the area.

## 5 Options Development

Conceptual options have been developed to address key issues along five key improvement areas within the study area. The concepts were developed with considerations of affordability and value, environmental impact, effectiveness, physical constraints, and technical feasibility. The five key improvement areas are:

- **Improvement Area 1: Pedestrian / Cyclist Facilities along Bedwell Bay Road**
- **Improvement Area 2: White Pine Beach Road Intersection**
- **Improvement Area 3: Floatwalk Access**
- **Improvement Area 4: Tum Tumay Wheuton Drive Intersection**
- **Improvement Area 5: White Pine Beach Visitation and Circulation**

The groups of options have been developed and are detailed below. Full detailed sketches of the options are included in **Appendix B**.

### 5.1 Improvement Area 1 – Pedestrian / Cyclist Facilities

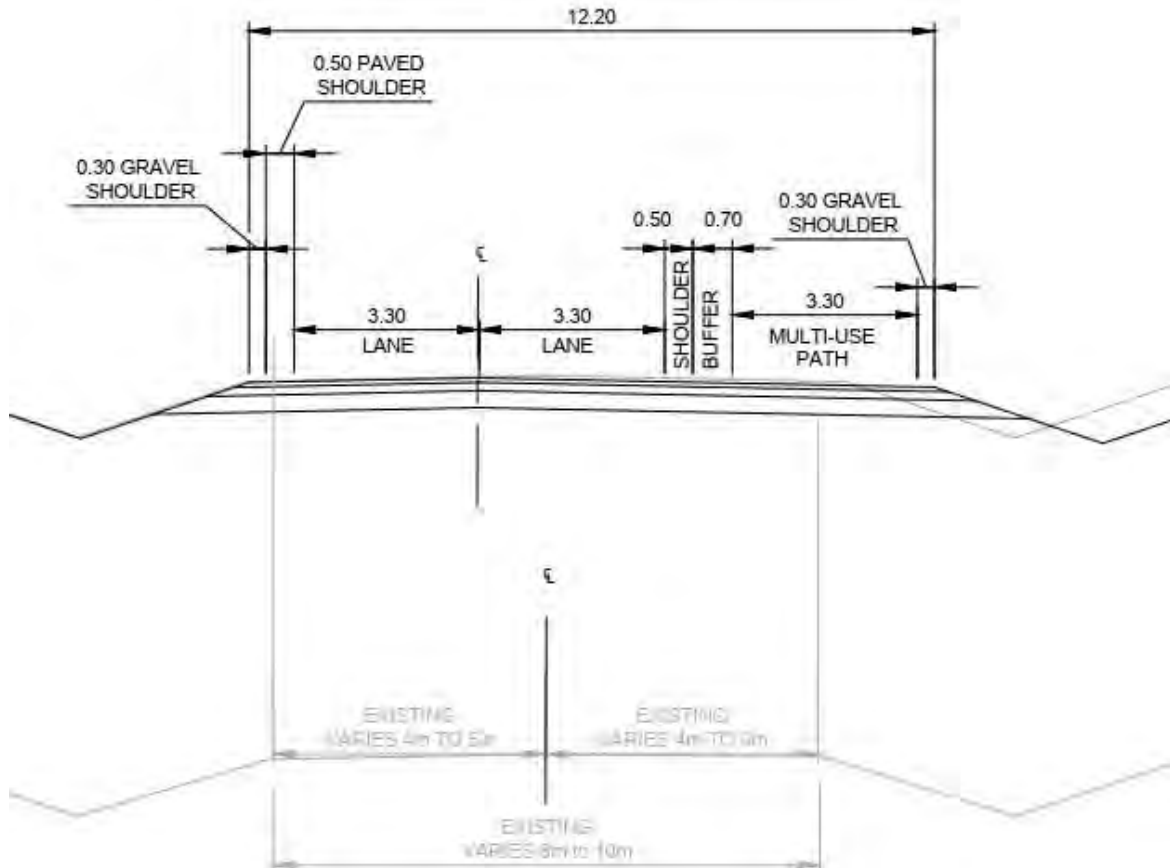
This group of options provides a dedicated active transportation connection between White Pine Beach and the loco Townsite to help address an existing safety issue and encourage a mode shift to cycling. Options are intended to provide a facility for cyclists and pedestrians to travel along Bedwell Bay Road.

Most of the people who are walking along the corridor are walking between their parked cars and White Pine Beach. With this option, people can park at the loco Townsite and either walk to White Pine Beach or ride transit to the site. There is currently a SB bus stop on 2nd Avenue to service Route 181 and a NB bus stop on 1<sup>st</sup> Avenue for Route 150 and 181. Updating the bus stop locations at the Townsite at 1<sup>st</sup> Avenue – loco Road would create transit connections to/from White Pine Beach and the townsite.

### 5.1.1 Option 1A – Bi-Directional Facility (North Side MUP)

In this option, the cross section of Bedwell Bay Road will be widened to include one 3.3 m vehicle travel lane in each direction and a 3.3 m bi-directional multi-use path separated by 1.2 m continuous concrete barriers on the north side. 3.3 m is the minimum width to accommodate transit on an MRN route<sup>3</sup>.

The clear separation of this facility through the use of continuous, concrete barriers will also eliminate illegal parking along the corridor. This option requires roadway widening, including adding retaining walls where steep slopes exist and rock blasting where rock outcroppings cause a width restriction. **Figure 5-1** shows this option.



**Figure 5-1**  
**Option 1A – Bi-Directional Facility (North Side MUP)**

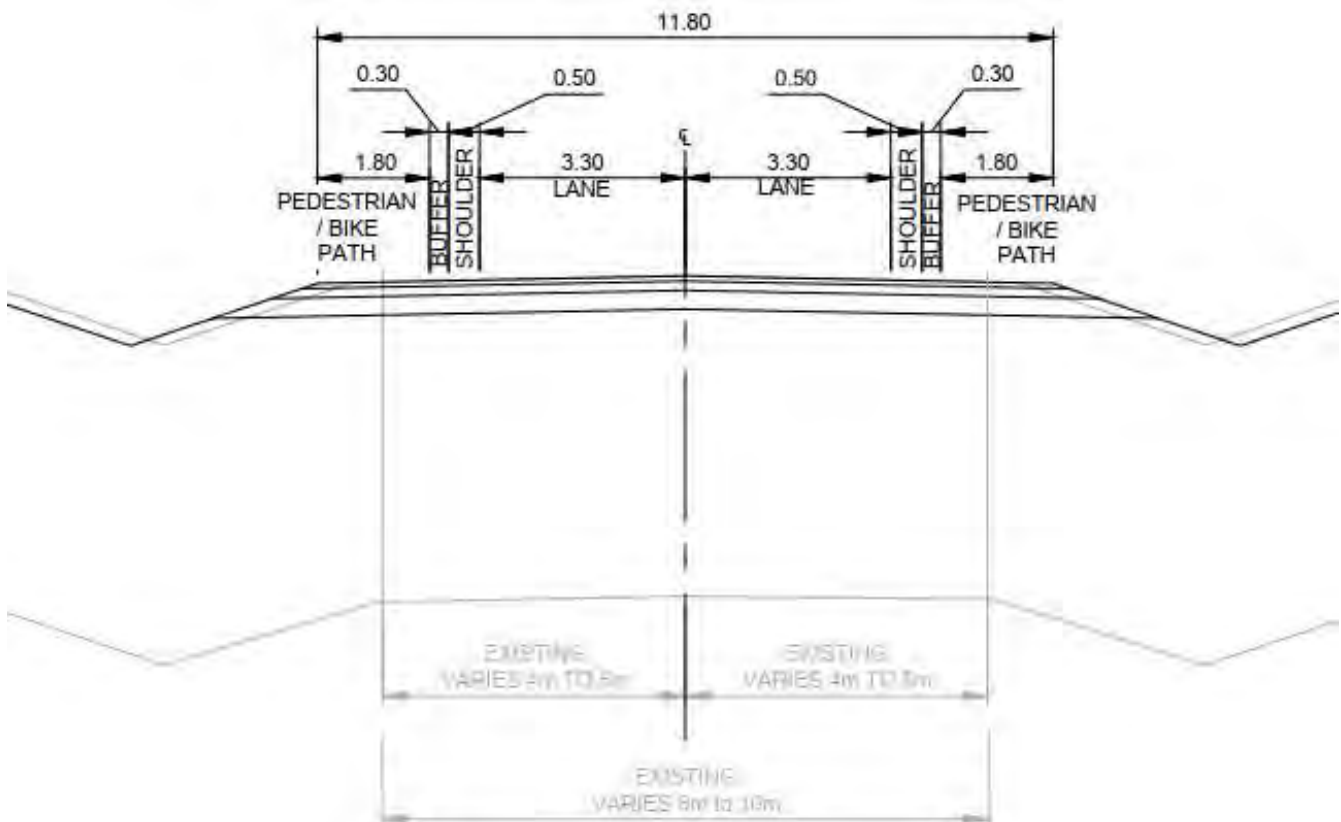
### 5.1.2 Option 1B – Uni-Directional Facility (Delineated Buffered Shoulders Both Sides)

In this option, the cross section of Bedwell Bay Road will be widened to include one 3.3 m vehicle travel lane and 1.8 m unidirectional pedestrian and cyclist path separated by a 0.8 m buffer with on both sides. The overall cross-section width is similar to the width required in Option 1A, and once again while the preferred widths are 3.6 m lane width and 1.0 m shoulder, a reduced cross section is proposed due to the significant incremental cost to further widen the road.

<sup>3</sup> Travel lane width 3.3 m to 3.7 m. Translink Bus Infrastructure Design Guidelines, Section 2.3: [https://www.translink.ca/-/media/translink/documents/plans-and-projects/managing-the-transit-network/bus\\_infrastructure\\_design\\_guidelines-sept\\_2018.pdf#view=fitH](https://www.translink.ca/-/media/translink/documents/plans-and-projects/managing-the-transit-network/bus_infrastructure_design_guidelines-sept_2018.pdf#view=fitH)

Because the barrier/delineation proposed will have gaps, there may be issues with compliance by vehicles, as it is observed today that some drivers drive over or around delineators to park on the shoulder. The configuration of this option encourages people to cycle in the same direction as traffic and having a non-continuous barrier (such as delineators), will allow cyclists to move from the roadway to the path depending on their preference. People walking will have access to either side of the roadway.

This option also requires roadway widening, including adding retaining walls where steep slopes exist and rock blasting where rock outcroppings cause a width restriction. **Figure 5-2** shows this option.



**Figure 5-2**  
**Option 1B - Uni-Directional Facility (Delineated Buffered Shoulders Both Sides)**

## 5.2 Improvement Area 2 – White Pine Beach Road Intersection

The options for the area at Bedwell Bay Road and White Pine Beach Road intersection are intended to improve safety, facilitate transit operations, and enhance traffic operations at the intersection.

### 5.2.1 Option 2A – Formalized Transit and Pedestrian Facilities

In this option, the dedicated eastbound left turn lane will be removed to make room for an in-line bus stop with a passenger waiting area. A pedestrian activated cross walk with a rapid flashing beacon (RRFB) for enhanced visibility, will be placed on the west side of the intersection. Due to the steep grade west of the intersection, the bus stop is located east of the intersection, far enough away to avoid interference with intersection operations.

In the westbound direction, the right-turn lane is removed to make room for a passenger waiting area and pedestrian connection to the bus stop. The bus will no longer need to leave the travel lane, into the intersection bulb-out and back onto Bedwell Bay Road. Space in the bulb-out is maintained to allow for passenger vehicle turn-around in the event that the gate into White Pine Beach is closed.

An outbound bus stop is proposed to be located southbound on White Pine Beach Road for any passengers taking the White Pine Beach shuttle.

Pedestrian crosswalks provide pedestrians with a dedicated and visible place to cross the road and access bus stops. Buses will occupy the travel lane during boarding and alighting of passengers. Removal of the left and right turn bays are not anticipated to have a significant impact on traffic performance during peak hours as the current practice during peak usage is to block the lanes off using traffic cones to control park access. **Figure 5-3** shows this option.

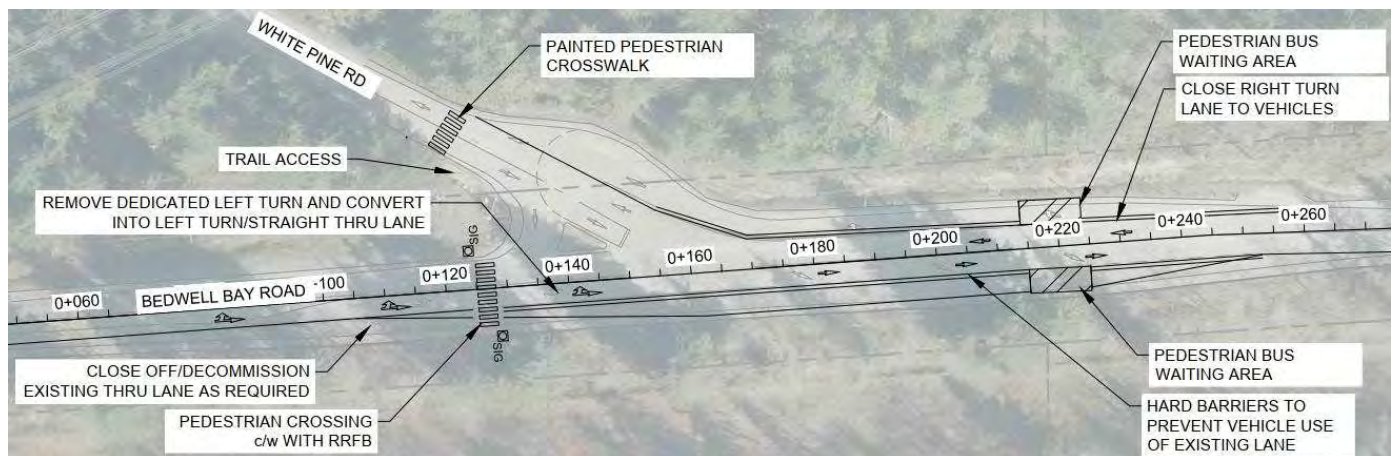


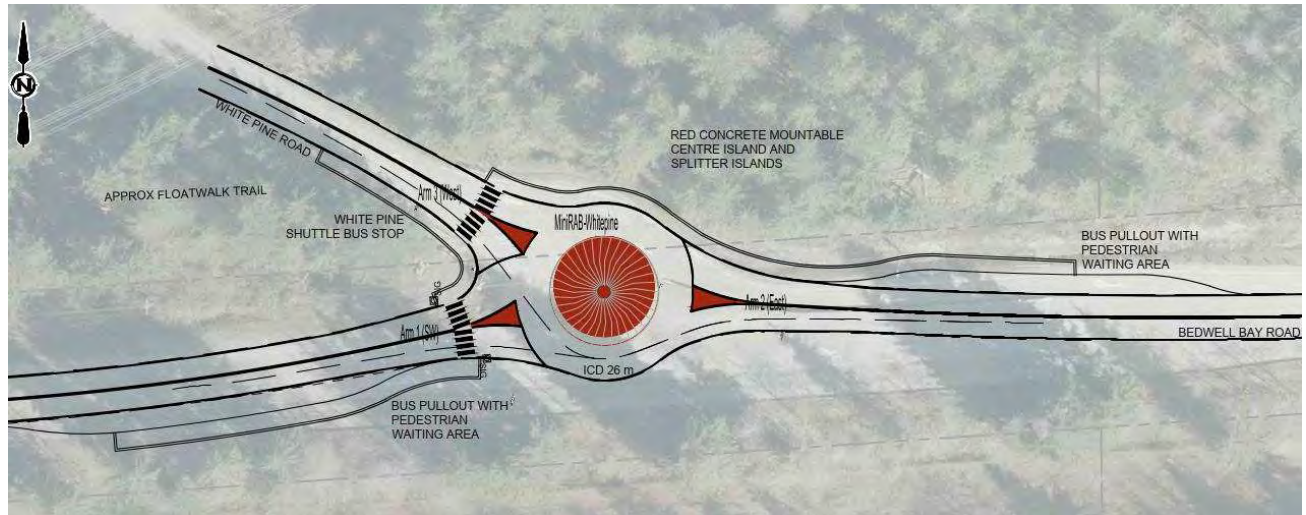
Figure 5-3  
Option 2A – Formalized Transit and Pedestrian Facilities

### 5.2.2 Option 2B – Mini Roundabout with Formalized Transit and Pedestrian Facilities

In this option, the existing stop-controlled intersection of Bedwell Bay Road and White Pine Beach Road will be converted into a roundabout. The selection of a mini roundabout will minimize space requirement and the construction impact during implementation.

A pedestrian cross walk will be placed on the west side of the intersection and will provide pedestrians with a dedicated and visible place to cross Bedwell Bay Road and wait for the bus. Including RRFBs to cross Bedwell Bay Road will further help with pedestrian visibility. The roundabout will reduce the speeds of vehicles as they navigate the roundabout making it safer for pedestrians. Buses will be required to occupy the travel lane when loading and unloading passengers. The roundabout also improves the ease of making a left turn out of White Pine Beach Road. **Figure 5-4** shows this option.





**Figure 5-4**  
**Option 2B – Mini Roundabout with Formalized Transit and Pedestrian Facilities**

### 5.2.3 Ioco Townsite Park-and-Ride

In conjunction with the other options discussed, a park-and-ride facility located in the Ioco Townsite near Ioco Road – 1<sup>st</sup> Avenue could provide an overflow parking solution for vehicles that arrive when the White Pine Beach parking lot is at capacity. Drivers could drop off passengers at White Pine Beach and park at the townsite. The active transportation connection from the townsite to White Pine Beach would provide a connection for people to walk or bike to the beach. Transit stops at the facility would encourage park visitors to utilize transit as a mobility solution for accessing the park during peak times.

The feasibility of a park-and-ride at Ioco Townsite will require additional planning and reviews.

## 5.3 Improvement Area 3 - Floatwalk Access

Parking areas are proposed to be provided north of White Pine Beach Road for people accessing the floatwalk trail system. The roadway terrain will require widening to accommodate a cross-section that includes shoulder parking and a paved pedestrian sidewalk. The shoulder parking width will be enough to provide a buffer for vehicle occupants to open the doors. This option will provide parking for approximately 25 vehicles, with two spaces reserved for emergency service vehicles and one for MV staff. **Figure 5-5** shows the proposed plan and cross-section.

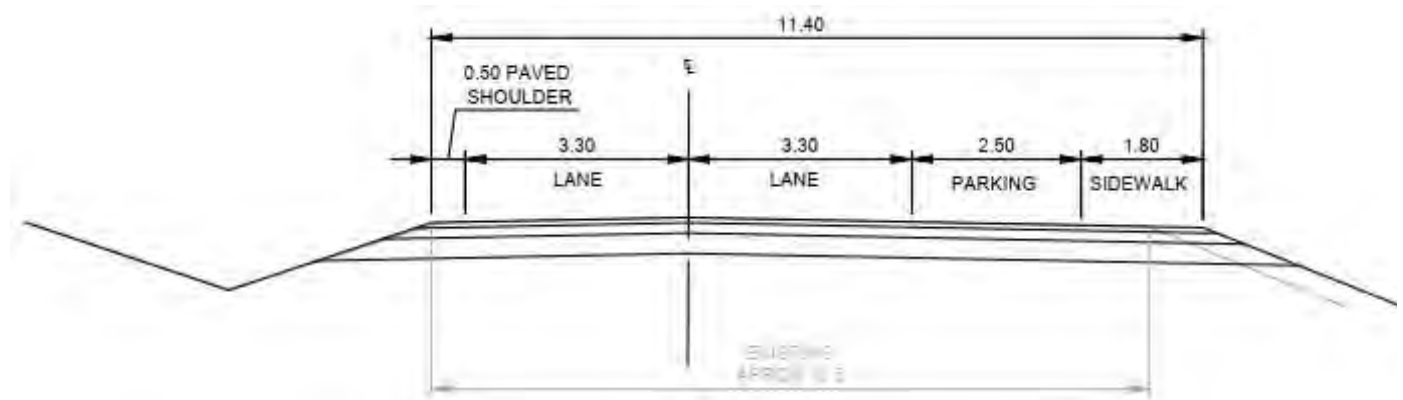


Figure 5-5  
Floatwalk Parking

## 5.4 Improvement Area 4 – Tum Tumay Wheuton Intersection

To improve wayfinding, signage and intersection operations at the intersection of Bedwell Bay Road – Tum Tumay Wheuton Road, two options have been developed.

### 5.4.1 Option 4A - Improved Intersection and Lighting

The current intersection configuration creates a wide, skewed-angle and has some existing westbound wayfinding signage, however, the multiple signs may be unclear. Adding pavement markings will better delineate and tighten up the intersection. Improving the wayfinding sign text and sign location may help drivers identify the correct direction to their destination. The existing stop signs may be difficult for drivers to see. Advanced warning signs and pavement markings would assist in visibility of stop signs and provide warning of the stop-controlled intersection. Adding streetlighting in the intersection will enhance visibility during the night. **Figure 5-6** shows the proposed intersection improvement plan.





Figure 5-6  
Improved Wayfinding Signage and Intersection Lighting

#### 5.4.2 Option 4B - Mini Roundabout

In this option, the existing stop-controlled intersection of Bedwell Bay Road and Tum Tumay Wheuton Drive would be converted into a mini roundabout, similar to the proposed mini roundabout at the White Pine Beach intersection. Using a mini roundabout will minimize space requirement and the construction impact during implementation. A pedestrian cross walk could be placed on the east side of the intersection to provide pedestrians with a marked crossing of Bedwell Bay Road. The roundabout will reduce the speeds of vehicles as they navigate the intersection and help improve sight line restrictions that currently exist due to the skew of Tum Tumay Whueton Drive with Bedwell Bay Road.

Roundabout guide signage can be used in conjunction with the mini roundabout to inform drivers of which route to take into the Belcarra area. Furthermore, the use of a mini roundabout provides an additional turnaround point for drivers who are unable to access White Pine Beach due to parking lot gate closure. The roundabout concept was created to accommodate the swept path of a transit vehicle without mounting the islands. Large vehicles are able to mount the splitter or central islands to navigate the roundabout. **Figure 5-7** shows this option.





Figure 5-7  
Tum Tumay Wheuton Mini Roundabout

## 5.5 Improvement Area 5 – White Pine Beach Visitation and Circulation

MVRD and PoMo use variable message signs to give advance warning that the park is at capacity, however, the inherent problem is that it is unclear what people should do if they arrive at the park and are not allowed in due to the parking lot reaching capacity. With the proposed removal of most parking along Bedwell Bay Road, many visitors have travelled long distances and understandably are determined to park where they can and walk in.

These options are related to improve transit flow and minimize delay within the White Pine Beach parking lot. It is recommended that in addition to potential operational improvements, travel demand solutions such as park permits, parking costs, improved ITS, and park status information should be considered to help inform potential visitors with up to date information.

The following options are provided for future study and discussion by MVRD and PoMo, and no further evaluation of the options will be conducted at this time.

### 5.5.1 Option 5A – Transit Routing, Parking Lot A and/or B

In this option, the drop off and boarding location for the transit vehicles will be relocated closer to the park entrance. This will reduce the travel time distance for buses and reduce the opportunity for them to be delayed by other vehicles and pedestrians within the park. Two variations were identified. Either utilizing Lot A as a transit stop and removing the parking spaces or utilizing Lot B as a transit stop and removing the parking spaces. In either of these options, the current transit stop near White Pine Beach would become a pedestrian drop-off/pick-up area.

Currently, CMBC has indicated that using the existing White Pine Beach stop and circulating around the entire loop road is working adequately. However, in the future, these proposed options may provide alternative routes to increase efficiency of the transit route. **Figure 5-8** shows this option.

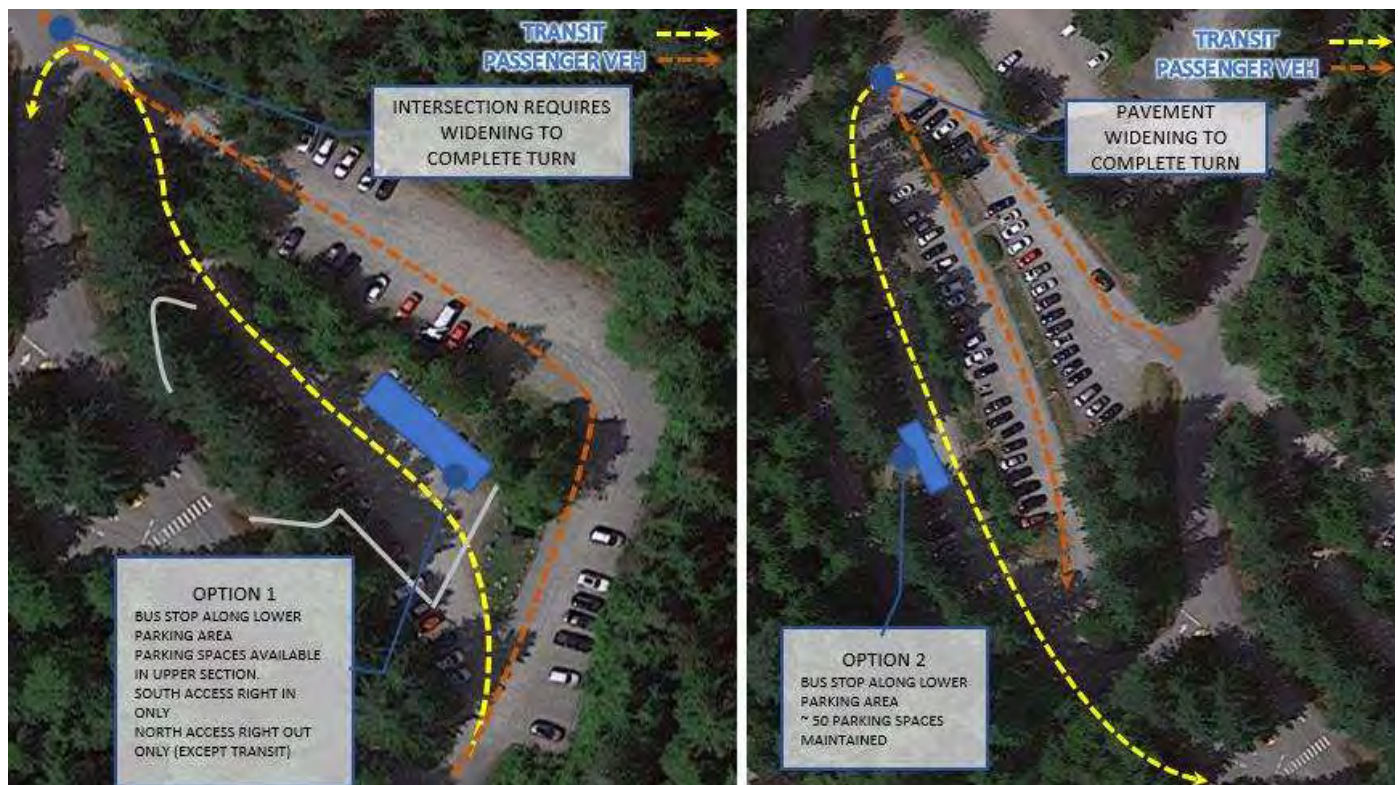


Figure 5-8  
Option 3A – Transit Routing

## 6 Options Evaluation

### 6.1 Evaluation Framework

The options developed in each of the five improvement areas were compared using a qualitative 'stoplight' indicator framework to assist in the options evaluation process. The framework is used to evaluate the intersection improvements using the stoplight indicators; green for good, yellow for neutral, and red for poor. The evaluation completed for this study was preliminary based on the information available and stakeholder engagement. Due to the high-level nature of the study, most of the evaluation was qualitative rather than quantitative. The paragraphs below describe the evaluation criteria that were used in this evaluation. The Option Evaluation Framework is shown in **Appendix C**.

Order-of-magnitude opinions of probable costs (OPC) were prepared as supplementary information for each option but are not included as an evaluation item. They are provided in **Appendix D**.

## 6.2 Stakeholder Engagement

Metro Vancouver was consulted throughout the project as a project partner. Discussions were held with PoMo, MV and AE to identify existing issues and review proposed improvements.

Two sessions were held with CMBC to identify issues related to the transit routes, and to review proposed improvements. CMBC indicated support for the proposed options for Improvement Areas 1 and 2, and provided feedback that was incorporated into the options.

AE and PoMo met with HUB Tri-cities Cycling committee to review the bike improvement options along Bedwell Bay Road and confirm it supports the HUB mission of “to get more people cycling more often”. HUB indicated support for the project and provided their feedback and informal preference for the bi-directional facility.<sup>4</sup>

The HUB committee preference is for a bi-directional facility in Improvement Area 1 as it provides more flexibility with use of space. Single-sided facilities could be too narrow when space is constrained or when traveling downhill at speed. The MUP is also a good solution to restrict illegal parking.

A meeting was held to present the findings of the project to the Village of Anmore and the Village of Belcarra. Multiple other local authorities were also in attendance.

## 6.3 Option Evaluation

The evaluation of each Improvement Area compares options to each other and the existing condition using the evaluation framework to identify the expected performance of each option.

---

<sup>4</sup> HUB April Meeting Minutes, [https://wiki.bikehub.ca/sites/committees/index.php?title=April\\_2022](https://wiki.bikehub.ca/sites/committees/index.php?title=April_2022)



### 6.3.1 Improvement Area 1 – Pedestrian / Cyclist Facilities

| Evaluation Criteria                    | Base Case  | Option 1<br>Bi-Directional Facility  | Option 2<br>Uni-Directional Facility   |
|--|--|--|--|
| <b>Traffic Operations and Mobility</b> | During peak times, pedestrians are walking in the travel lanes after parking their vehicles on the shoulders.  | Provides space to keep pedestrians and cyclists from traveling in roadway. Prohibition of parking reduces congestion.  | Provides space to keep pedestrians and cyclists from traveling in roadway. Gaps in the delineation do not prevent pedestrians and cyclists from entering and/or crossing the road.   |
| <b>Road Safety</b>                     | Vehicles, pedestrians, and cyclists share the same space. No separation.   | 0.7 m buffer is wide enough to accommodate continuous concrete barrier which provides better protection between vehicles and active transportation modes.  | 0.3 m buffers on either side of the roadway are wide enough to accommodate delineator posts. Cyclists can ride on the roadway or the paths in the same direction of travel depending on traffic and comfort level.   |
| <b>Parking Compliance</b>              | Despite targeted enforcement of no-parking signs, vehicles continue to park where prohibited.  | Compliance is more effective when concrete barriers are used to restrict parking along the shoulder.   | Compliance is less effective when delineators are used to restrict parking along the shoulder.   |
| <b>Active Transportation – Walking</b> | Pedestrians walk on shoulder, or on roadway when the shoulder is blocked   | MUP provides separate space from vehicles for pedestrian and cyclists to travel along the roadway. Provides a space for those who want to park at the Ioco Townsite and walk to the park. Wide MUP provides more space for groups to walk together and/or cyclists to pass peds. | Paths provide separate spaces from vehicles for pedestrian and cyclists to travel along both sides of the roadway. Provides spaces for those who want to park at the Ioco Townsite and walk to the park.   |
| <b>Active Transportation – Cycling</b> | Cyclists ride in vehicle lane, or in shoulder if space is available  | MUP separates vehicles from pedestrians and cyclists. During off peak times there is low pedestrian demand and the MUP accommodates cyclists of all abilities. During peak times pedestrian volumes may make it difficult for cyclists to use the facility.                      | Paths separate vehicles from pedestrians and cyclists. During off peak times there is low pedestrian demand and the paths accommodate cyclists of all abilities. Cyclists have the ability to move between the road and path depending on rider comfort level and how busy each facility is. |
| <b>Road Cross-Section</b>              | Two-lane cross-section with painted shoulder spaces. Some roadside barriers due to steep terrain on both sides of ROW. Total width varies from 8-10 m. | Option 1 maintains two travel lanes and separated 3.3 m MUP with a continuous barrier. Total width of 12.2 m needed.   | Option 2 maintains two travel lanes, with uni-directional paths on either side separated by delineators. Total width of 11.8 m needed.   |
| <b>Enviro/Tree removal</b>             | Rural setting in the right of way has steep side-slope grades and heavily treed areas.   | Tree removal may be needed, ditches will need to be rebuilt to accommodate widened cross-section. Continuous barrier may affect drainage pattern.  | Tree removal may be needed, ditches will need to be rebuilt to accommodate the widened cross-section.  |
| <b>Constructability</b>                | n/a  | MUP construction will require retaining walls, re-ditching, and side slope stabilization   | Bike/ped paths will require retaining walls, re-ditching, and side slope stabilization   |
| <b>Totals</b>                          | <b>N/A</b>   | <b>4 Green<br/>2 Yellow<br/>2 Red</b>  | <b>1 Green<br/>5 Yellow<br/>2 Red</b>  |

The recommended option for a pedestrian and cyclist facility is the MUP. While very similar in terms of price and constructability, the MUP provides better safety advantages to pedestrians and cyclists, while providing a better barrier for parking compliance. Based on discussions with PoMo, MV, and HUB, the MUP is the preferred option along the north side of 1<sup>st</sup> Avenue / Bedwell Bay Road.

### 6.3.2 Improvement Area 2 – White Pine Beach Road Intersection

| Evaluation Criteria                          | Base Case  | Option 1<br>Transit Improvements  | Option 2<br>Mini Roundabout   |
|--|--|---|---|
| <b>Traffic Operations, Mobility, Parking</b> | Bedwell Bay Road – White Pine Beach Road intersection is wide, with turn lanes and skew. Two lanes at White Pine allow traffic control personnel to utilize one lane for priority vehicles to access park while passenger vehicles queue in the other. Vehicles queuing for entrance sometimes block travel on Bedwell Bay Road. EB buses utilize flag stop system and may stop in travel lane for passenger boarding. | Left and right turn lanes are removed and buses stop in the travel lanes both EB and WB. Vehicles queuing for entrance into White Pine Beach may also increase delay on roadway in the WB direction. Turn around area is maintained so vehicles can turn around back to loco Park and Ride. WB through traffic may be delayed by vehicles trying to access the park when park gates are closed. | Mini RAB fits within the existing intersection geometry. Mountable islands accommodate large vehicles, while design accommodates transit movements. Buses pull out of travel lane at bus stops and do not block flow of traffic. When the park gate is closed, vehicles have a way to turn around back to the loco Park and Ride. WB through traffic may be delayed by vehicles trying to access the park when park gates are closed. |
| <b>Road Safety</b>                           | Skew and vertical grades may reduce sightlines. Vehicles found to travel at excessive speeds on Bedwell Bay Rd.  | Pedestrian paths and RRFB controlled cross walk help people cross Bedwell Bay Road and access transit more safely.<br><br>Simplified intersection reduces confusion.  | Mini RAB provides an intersection to help reduce speeds along Bedwell Bay Road. RAB eliminates skew angle and reduces the frequency and severity of collisions. Pedestrian paths and RRFB controlled cross walk help people cross Bedwell Bay Road and access transit more safely.  |
| <b>Active Transportation – Walking</b>       | Pedestrians walk on shoulder, or on roadway when shoulder is blocked   | People have dedicated connections to transit stops and paths.   | People have dedicated connections to transit stops and paths.   |
| <b>Active Transportation – Cycling</b>       | Cyclists ride on vehicle lane, or on shoulder if space is available  | No Change   | No Change   |
| <b>Transit</b>                               | This route operates with a flag-stop system. There is one permanent WB transit stop in the intersection bulb-out, and a temporary EB transit stop across from White Pine Beach with no passenger wait area.  | In-lane bus stops with adequate passenger wait areas improve accessibility while reducing delay time for bus. Designated bus stop is better than flag-stop for high passenger-demand locations within the corridor.<br><br>Additional transit stop at floatwalk trail head allows additional passenger pickup location.   | Pull-out* bus stops with adequate passenger wait areas improve accessibility, but may cause delay for buses to return to travel lane. Designated bus stop is better than flag-stop for high passenger-demand locations.<br><br>Additional transit stop at floatwalk trail head allows additional passenger pickup location.   |
| <b>Road Cross-Section</b>                    | Two-lane cross-section with painted shoulder spaces. Some roadside barriers due to steep terrain on both sides of ROW  | Improvements can be achieved with no additional paving needed.  | Mini Roundabout can be constructed within the footprint of the existing intersection.<br><br>Turning radii of transit vehicles were accommodated in the design of the mini RAB.   |
| <b>Enviro/Tree removal</b>                   | n/a  | Construction is within the road ROW. Minimal environmental impacts.   | Construction is within the road ROW. Minimal environmental impacts.   |
| <b>Constructability</b>                      | n/a  | Minimal reconstruction of road required.  | Some roadway adjustments and reconstruction required.   |
| <b>Totals</b>                                | N/A  | 5 Green<br>3 Yellow<br>0 Red  | 6 Green<br>2 Yellow<br>0 Red  |

\*Roundabout design can be modified to include in-lane bus stops if CMBC desires.

The recommended option is the mini roundabout presented in Option 2A. The mini roundabout provides many improvements to pedestrian safety and accessibility while providing improved access to transit and transit operations. Although Option 2A has a higher expected cost, the mini roundabout also has the added benefits of controlling

vehicle speeds along Bedwell Bay Road, simplifying intersection operations while allowing for safe turnaround of would-be park visitor vehicles.

### 6.3.3 Improvement Area 3 – Floatwalk Access

| Evaluation Criteria             | Base Case   | Option 1<br>Floatwalk Parking Area and Pedestrian Access   |
|---------------------------------|---|--|
| Traffic Operations, Mobility    | During peak times, pedestrians are walking in the travel lanes after illegally parking their vehicles on the shoulders.                                     | Pedestrians are no longer walking on the travel lanes.   |
| Road Safety                     | Vehicles, pedestrians, and cyclists share the same space. No separation.  | Pedestrian sidewalk separated by the parking provides a buffer space for pedestrians away from the road travel lane. |
| Parking Compliance              | Despite targeted enforcement of no-parking signs, vehicles continue to park where prohibited.   | Compliance is more effective when dedicated parking spaces are provided.   |
| Active Transportation – Walking | Pedestrians walk on shoulder, or on roadway when the shoulder is blocked.   | Sidewalk <b>separates</b> pedestrians from vehicles and provides access to the trail head leading to the float walk. |
| Active Transportation – Cycling | n/a   | No Change  |
| Transit                         | n/a   | No Change  |
| Road Cross-Section              | Two-lane cross-section with painted shoulder spaces. Some roadside barriers due to steep terrain on both sides of ROW. Total width is approximately 10.5 m. | This option maintains two travel lanes, permitted parking space, and sidewalk area. Total width of 11.4 m needed.    |
| Constructability                | n/a   | Parking and sidewalk will require minimal widening.  |
| Totals                          | N/A   | 5 Green<br>2 Yellow<br>0 Red   |

The parking solution for the floatwalk is recommended as it will provide parking and pedestrian access to the floatwalk trailhead.

### 6.3.4 Improvement Area 4 – Tum Tumay Wheuton Intersection Improvements

| Evaluation Criteria                          | Base Case  | Option 1<br>Wayfinding Improvements  | Option 2<br>Mini Roundabout  |
|--|--|--|--|
| <b>Traffic Operations, Mobility, Parking</b> | Intersection has unclear wayfinding signage and stop signs are difficult to see                      | Simplifying and adjusting Updating wayfinding signage and providing warning signs will help clearly communicate to drivers of the intersection ahead.  | Roundabout directional signage will provide information to drivers upon approach to intersection   |
| <b>Road Safety</b>                           | Collisions have occurred at the intersection both during daylight and night.                         | Advanced wayfinding signage will help direct drivers along Tum Tumay Wheuton to the parks at the west end of Belcarra. Increased signage to warn drivers of stop ahead will help with stop compliance.<br><br>Tightening up the intersection geometry using pavement markings will improve sightlines and improve intersection visibility. | Mini RAB provides an intersection to help reduce speeds along Bedwell Bay Road. RAB eliminates skew angle and reduces the frequency and severity of collisions.          |
| <b>Active Transportation – Walking</b>       | Pedestrians walk in shoulder, or on roadway when shoulder is blocked. No formal crossing facilities. | No Change  | Crosswalk on the east leg of mini RAB facilitates pedestrians crossing from Bedwell Bay to access Tum Tumay Wheuton Drive.   |
| <b>Active Transportation – Cycling</b>       | Cyclists ride in vehicle lane, or in shoulder if space is available                                  | No Change  | No Change  |
| <b>Transit</b>                               | Transit bus currently operates as a flag stop along Bedwell Bay Road to/from Belcarra                | No Change  | No Change  |
| <b>Road Cross-Section</b>                    | Wide intersection with legs that intersect at skewed angles.   | Improvements can be achieved with no additional pavement needed.   | Mini Roundabout can be constructed within the footprint of the existing intersection. Turning radii of transit vehicles were accommodated in the design of the mini RAB. |
| <b>Enviro/Tree removal</b>                   | n/a  | Construction is within the road ROW. Minimal environmental impacts.  | Construction is within the road ROW. Minimal environmental impacts.  |
| <b>Constructability</b>                      | n/a  | Minimal reconstruction of road required.   | Some roadway adjustments and reconstruction required.  |
| <b>Totals</b>                                | <b>N/A</b>   | <b>4 Green<br/>4 Yellow<br/>0 Red</b>  | <b>4 Green<br/>4 Yellow<br/>0 Red</b>  |

The recommended option is the low-cost intersection improvement option, as it is sufficient to improve driver expectation and wayfinding and is appropriate for a location with a multi-way stop sign with a low collision history. The proposed pavement markings can improve the skew and space within the intersection. Maintaining a 3-way stop helps control speed along the Bedwell Bay corridor. A mini roundabout helps control speeds along Bedwell Bay Road, addresses the intersection skews and simplifies the intersection operations but at a greater cost.

## 7 Recommendations

The following recommendations are based on the review of the Bedwell Bay Corridor. They have been selected as the recommended options to improve the safety of the corridor for all users, resolve the on-street parking issues and address the need for inclusive active transportation along Bedwell Bay Road.

### **Improvement Area 1 – Bedwell Bay Road Pedestrian / Cyclist Facilities**

- A bi-directional facility along Bedwell Bay Road to provide an active transportation connection for people walking and biking along Bedwell Bay Road from Ioco Road to White Pine Beach. Separation from the travel lanes using concrete barriers will provide separation between active transportation and vehicles while restricting parking along the Bedwell Bay Road.
- OPC \$9.7 mil.

### **Improvement Area 2 – White Pine Beach Road Intersection**

- A mini roundabout at the intersection of Bedwell Bay Road and White Pine Beach Road would improve operations at the intersection, and help control vehicles arriving at White Pine Beach when the gate is closed.
- OPC \$420,000.

### **Improvement Area 3 – Floatwalk Access**

- Additional parking at the south end of the floatwalk would provide parking and pedestrian access to the floatwalk trailhead.
- OPC \$140,000.

### **Improvement Area 4 – Tum Tumay Wheuton Intersection**

- Improving the intersection at Bedwell Bay Road – Tum Tumay Wheuton Road by adding pavement markings and new signage is recommended to direct people driving to t̓əmt̓əx̓ʷt̓ən/Belcarra Regional Park identify the intersection.
- OPC \$50,000.

The conceptual improvement designs provided serve as a basis for the City of Port Moody to further develop designs and obtain funding to improve Bedwell Bay Road.



## CLOSURE

This report was prepared for the **City of Port Moody** and summarizes the current traffic characteristics, operations, and needs for improvement along the Bedwell Bay Road study corridor. It explores improvement options and evaluated based on feasibility to recommend improvement options.

The services provided by **Associated Engineering (B.C.) Ltd.** in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

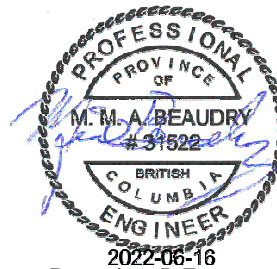
**Associated Engineering (B.C.) Ltd.**  
Engineers & Geoscientists BC Permit Number 1000163

Prepared by:



Breanna Jackson, P.Eng.  
Project Manager  
Traffic Engineer

Reviewed by:



Monique Beaudry, P.Eng.  
Project Engineer

BJ/MB/sn

## APPENDIX A – SITE VISIT



|                      |  |  |   |
|----------------------|--|--|---|
| <b>Date:</b>         | November 8, 2021                       | <b>File No.:</b>                           | 2021-2344-02  |
| <b>Time:</b>         | 13:00-16:00                            | <b>Location:</b>                           | Parkview Meeting Room, Port Moody City Hall and along the study area  |
| <b>Client:</b>       | City of Port Moody                     | <b>Project Name:</b>                       | Bedwell Bay Road Transportation Study   |
| <b>Subject:</b>      | Site Visit Meeting                     | <b>Project Number:</b>                     | 2021-2344-02  |
| <b>Attendees:</b>    | Monique Beaudry (AE)<br>Justin Ng (AE) | Marcel LaBreche (MV)<br>Tyler Courage (MV) | Jeff Little (PoMo)<br>Geoffrey Keyworth (PoMo)<br>Patrik Kolby (PoMo)<br>Stephen Judd (PoMo) (City Hall only) |
| <b>Distribution:</b> | Those Present                          |  |   |

This Record of Meeting is considered to be complete and correct. Please advise the writer within one week of any errors or omissions, otherwise this Record of Meeting will be considered to be an accurate record of the discussions

## Action by

## Discussion:

### 1 BACKGROUND

Study Area is 1st Avenue from IOCO Road to Sunnyside Road, and Bedwell Bay Road from Sunnyside Road to the border of the Village of Belcarra. The meeting started at Port Moody City Hall with a boardroom meeting before a site visit by vehicle.

### 2 BACKGROUND INFORMATION:

- City Council directed that this project be initiated to address the parking issues along Bedwell Bay Road.
- On-street parking on Bedwell Bay Road has existed for an extended period of time prior to current restrictions
- An assessment was previously completed that identified pedestrians walking on the narrow roadway presented a safety concern that needed to be addressed.
- City had previously limited parking in 2019 and placed signage and white delineators.
- In 2020 Council passed resolution to ban parking on Bedwell Bay Road to limit demand for park usage during the early phases of the Covid-19 Pandemic.
- Parking did not become a major issue until Covid-19 Pandemic caused an increase in park popularity and user demand.
- There are hundreds of cars parked along Bedwell Bay Road on peak demand days
- The City has placed no parking signs, delineators and concrete roadside barriers to try and discourage parking along the corridor.
- Sasamat Lake also has an alternate access point via a boardwalk further west of White Pine Beach Road park entrance. MV indicated they haven't experienced problems there.
- There are two user groups of Sasamat Lake. One group are families and people looking to go to the park and beach to relax for a day trip. Second group are a younger demographic

November 8, 2021

City of Port Moody

**Action by**

**Discussion:**

that engages in activity that often requires the presence of the Port Moody Police Department. The latter group usually access the park at the boardwalk entrance. The police sometimes will even have the police boat active at the lake to patrol and police cruisers looking for intoxicated drivers.

- The corridor has four pressure points where congestion builds:
  - Entrance to the park at White Pine Beach Road
  - At the boardwalk which has a trail head next to Bedwell Bay Road but no parking supply
  - At turnaround areas toward Belcarra
  - At the turnoff to Anmore

**3 EXISTING TRAFFIC MANAGEMENT PRACTICES**

- Traffic Management is currently coordinated by Metro Vancouver
- There is a message board operated by Metro Vancouver that indicates the parking lot status for Sasamat Lake and Buntzen Lake at the IOCO town site in the summer.
- Metro Vancouver has signed an agreement with a contractor to administer pay parking at the parking lot. This is MV's demand management tool. Parking is \$2 dollars an hour with an initial three-hour grace period of free parking.
- Traffic cones are set up upstream and downstream of the park entrance to restrict vehicular park access during busy days.
- The parking lot gate is closed once the parking lot reaches capacity and is closed until 50 parking spots are available again. This closing and reopening cycle can take between a few hours in the morning to every 15 to 30 minutes later in the day. In the summer, the park has been full and gates closed by as early as 8:00 AM. People use the taper lane to wait to get in even though they are told not to do that. Some vehicles partially block the travel lane while queuing. A question is whether a queuing lane should be provided.
- Emergency vehicles, residential access, buses, service vehicles and commercial vehicles are allowed into the park when the gates are closed. They need to pull up and signal or speak with traffic control who then opens the gate if access is permitted.
- Some people were parking near the IOCO townsite and taking the bus to the park. Route 181 /182 that comes from Moody Centre Station is a small bus that stops at the park gate. Route 150 is a large bus in the summer months from Coquitlam Central Station to go into the park. The City expects that if a formal park and ride is established at the IOCO townsite that it may overwhelm the area. The City also started encouraging people to use the bus starting in August and that seemed to help some of the parking issues. They also increased the bus service at this time.

**4 EXISTING ENFORCEMENT**

- No parking signs are placed throughout the corridor (with some exceptions) both on sign posts and large overhead signage.
- Parking fines were \$50 to begin with which council has doubled to \$100.

November 8, 2021

City of Port Moody

**Action by**

**Discussion:**

- The City has indicated that the parking tickets were not as much of a deterrent as they would have liked.
- The City has partnered with private towing companies in the past for enforcement. The City had set up a temporary tow yard in the IOCO townsite to maximize the number of vehicles towed and still could not keep up with illegal parking demand.
- The City has reported incidents of people stealing tickets off other vehicles and placing them on their own. This backfires on them because ticketed vehicles are the ones that towed.
- Metro Vancouver and the City mentioned that sometimes drivers will stop in the travel lane and refuse to move their vehicles to allow traffic flow. Metro Vancouver and bylaw enforcement have no authority here. The Port Moody Police would have authority to issue a moving violation.
- Belcarra is under RCMP jurisdiction. City Police and RCMP will cooperate.
- The City does not enforce no parking during off peak periods.

**5      CONSIDERATIONS**

- The City and Metro Vancouver would like a permanent solution that will require less enforcement and human resources.
- The City has had feedback that the parking restrictions in some locations in the corridor negatively impact non-park users in off peak times.
- The City and Metro Vancouver are not expecting the park to return to pre-pandemic usage levels
- MV has noticed that both Buntzen Lake and Belcarra fill up at the same time. That causes additional traffic as people look for alternate places to go once the parks are filled up.

**6      SITE VISIT OBSERVATIONS**

- The bus stop for the southbound direction is temporary. Since there is no layby, it stops in the driving lane for boarding and alighting.
- The furthest point parking is occurring for park usage is at the intersection of Sunnyside Road. Currently, no-parking signs are generally not posted on Bedwell Bay Road between Sunnyside Road and Crystal Creek Drive even though parking is prohibited for all of Bedwell Bay Road.
- Appears that there are more no parking signs on the south side of Bedwell Bay Road than the north side.
- Sight lines may be an issue on the corridor due to both vertical and horizontal curves
- There are multiple pinch points in the corridor restricted by grades and rock outcroppings
- Improvements to the intersection configuration of Bedwell Bay Road and White Pine Beach Road could be considered.



November 8, 2021

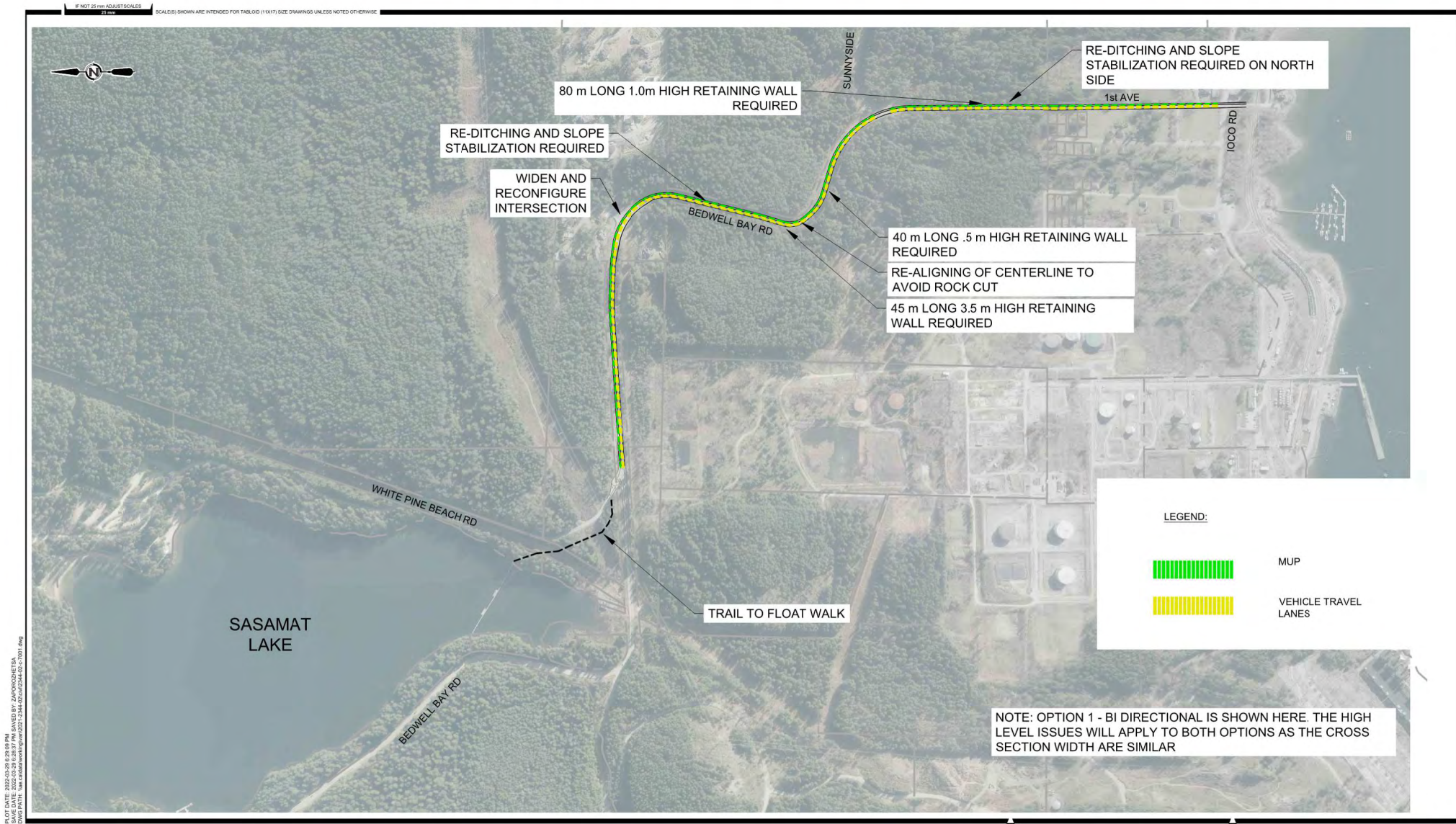
City of Port Moody

**Action by**

**Discussion:**

- Multiple white delineators, installed in 2019, appear to be missing or damaged near the trail head at the boardwalk. The City indicated that most of this was from drivers with off-road type vehicles running them over or parking on top of them.
- Bedwell Bay Road appeared to have more than expected traffic even during off peak times. With cars often coming in waves due to passing restrictions.
- There are limited places for cars to turn around on Bedwell Bay Road.
- Belcarra residents often complain about the delays caused by recreational traffic during peak times. The illegal parking and congestion around the park is affecting their ability to drive through the area when travelling to and from their homes. People who don't get into the park go into Belcarra to turn around which is a nuisance for local residents.
- The intersection of Bedwell Bay Road and Tum Tumay Whueton Drive may have sight line issues and low driver compliance of the 3 way stop controlled intersection as many vehicles were observed to have completed a rolling stop instead of a full stop at the intersection.
- Difficult wayfinding for drivers rerouted to Belcarra.
- Concrete barriers may make plowing more difficult along the corridor.

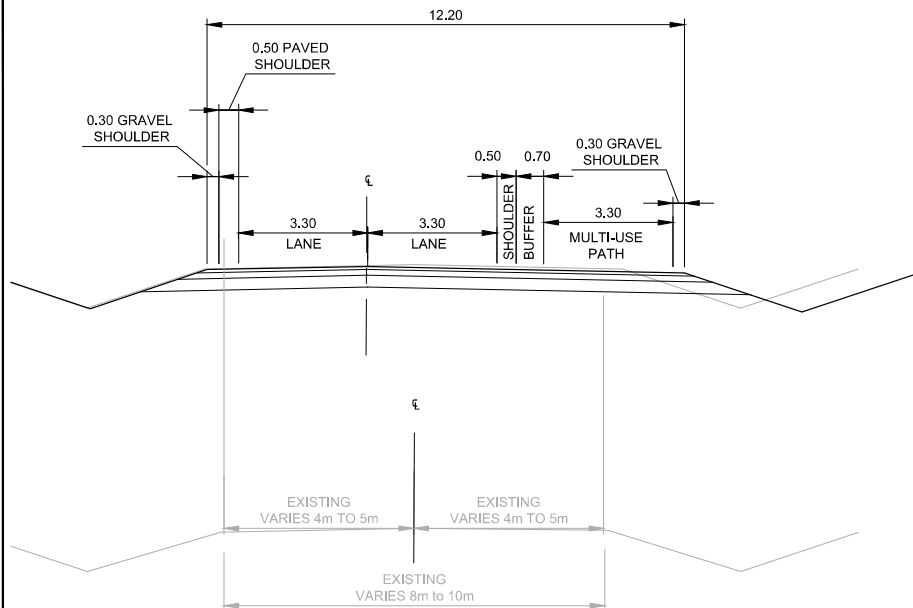
## APPENDIX B - PROPOSED OPTION SKETCHES



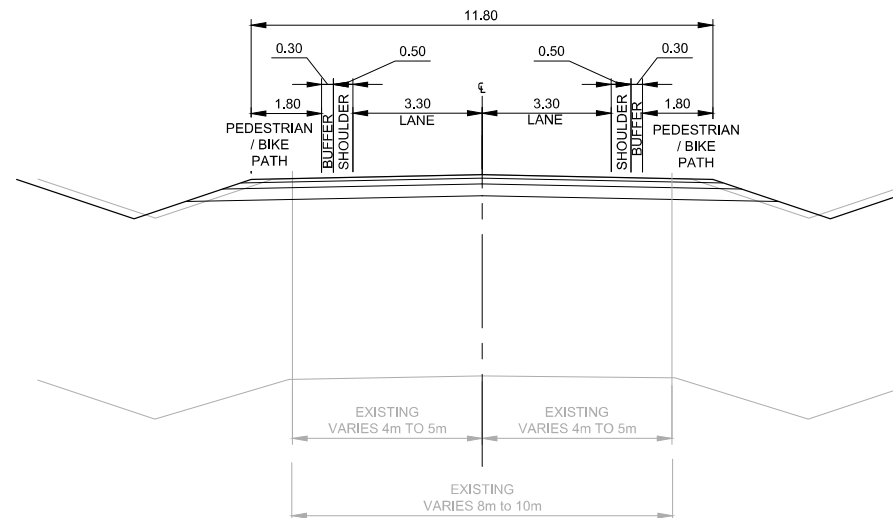
PLOT DATE: 2022-02-28 8:28:09 PM  
DRAWN BY: J. ZAPORZHETS  
CHECKED BY: J. ZAPORZHETS  
DATE: 2022-02-28 8:28:09 PM  
SCALE: 1:7500  
PROJECT: 2021-2234-02

IF NOT 25 mm ADJUST SCALES  
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLING (1:1X1.7) SEE DRAWINGS UNLESS NOTED OTHERWISE



1 **TYPICAL SECTION** NTS  
OPTION 1 - BI-DIRECTIONAL



2 **TYPICAL SECTION** NTS  
OPTION 2 - UNIDIRECTIONAL

PLOT DATE: 2022-04-28 8:32:24 PM  
DRAWN BY: A. ZAPOROZHETS  
CHECKED BY: A. ZAPOROZHETS  
DWG PATH: \\c:\data\work\2021-2344\2021-2344-02\1-2344-02-01.dwg



AE PROJECT No.  
SCALE  
APPROVED  
DATE  
REV  
DESCRIPTION

2021-2344-02  
AS SHOWN  
A. ZAPOROZHETS  
2022APR01  
A  
ISSUED FOR  
INFORMATION

FIGURE 1-2

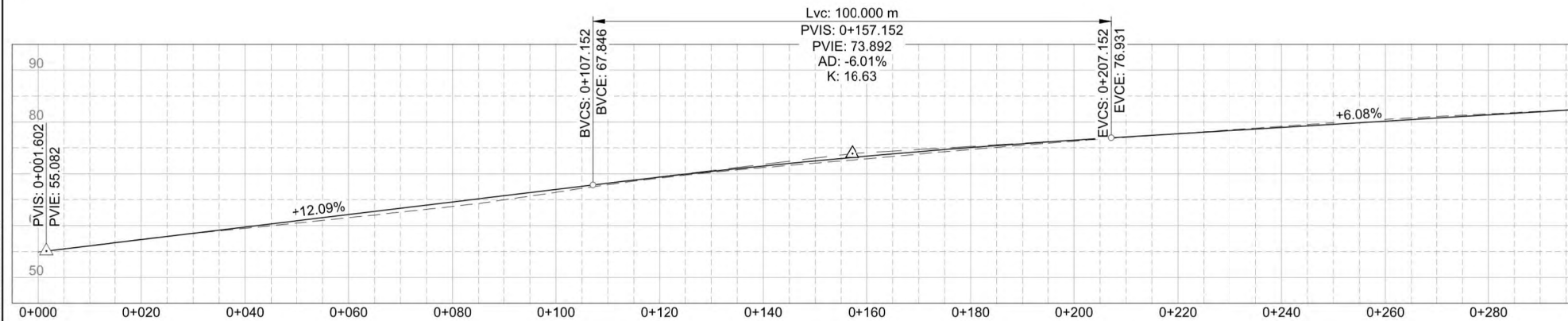
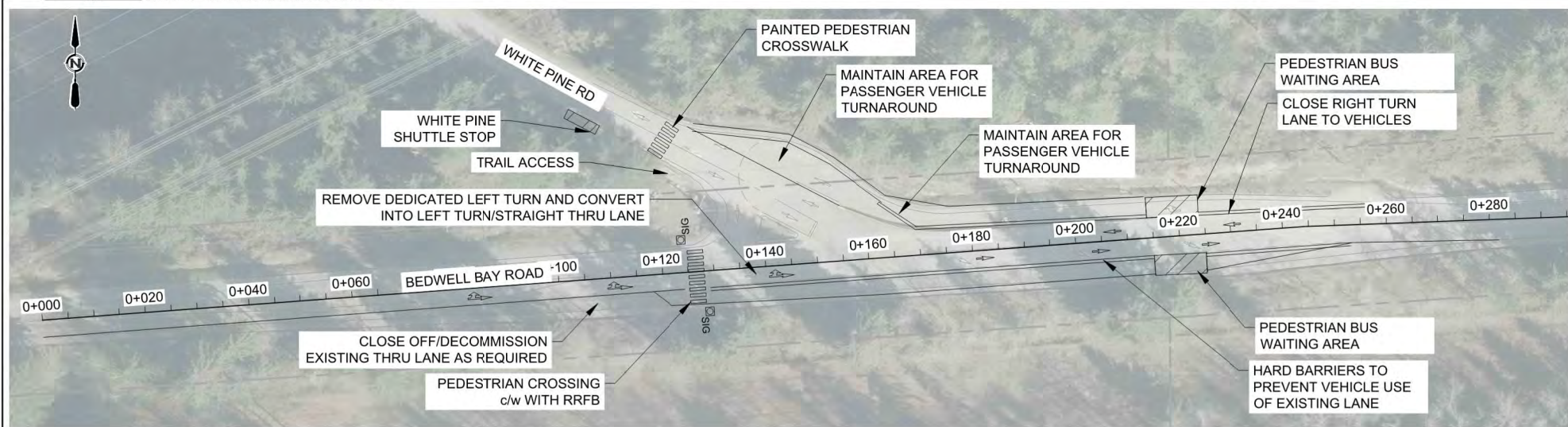
CITY OF PORT MOODY

CIVIL  
PROPOSED CROSS SECTIONS  
AREA 1: TYPICAL SECTIONS



IF NOT 25 mm ADJUST SCALES

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



PLOT DATE: 2022-02-10 9:28:09 AM  
 DRAWN BY: J. ZAPORZHETS  
 CHECKED BY: J. ZAPORZHETS  
 DESIGNED BY: J. ZAPORZHETS  
 PROJECT NO: 2021-2344-02



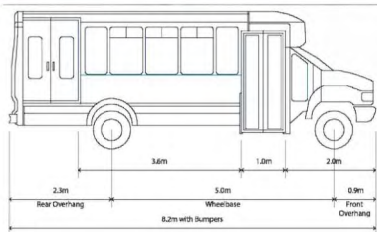
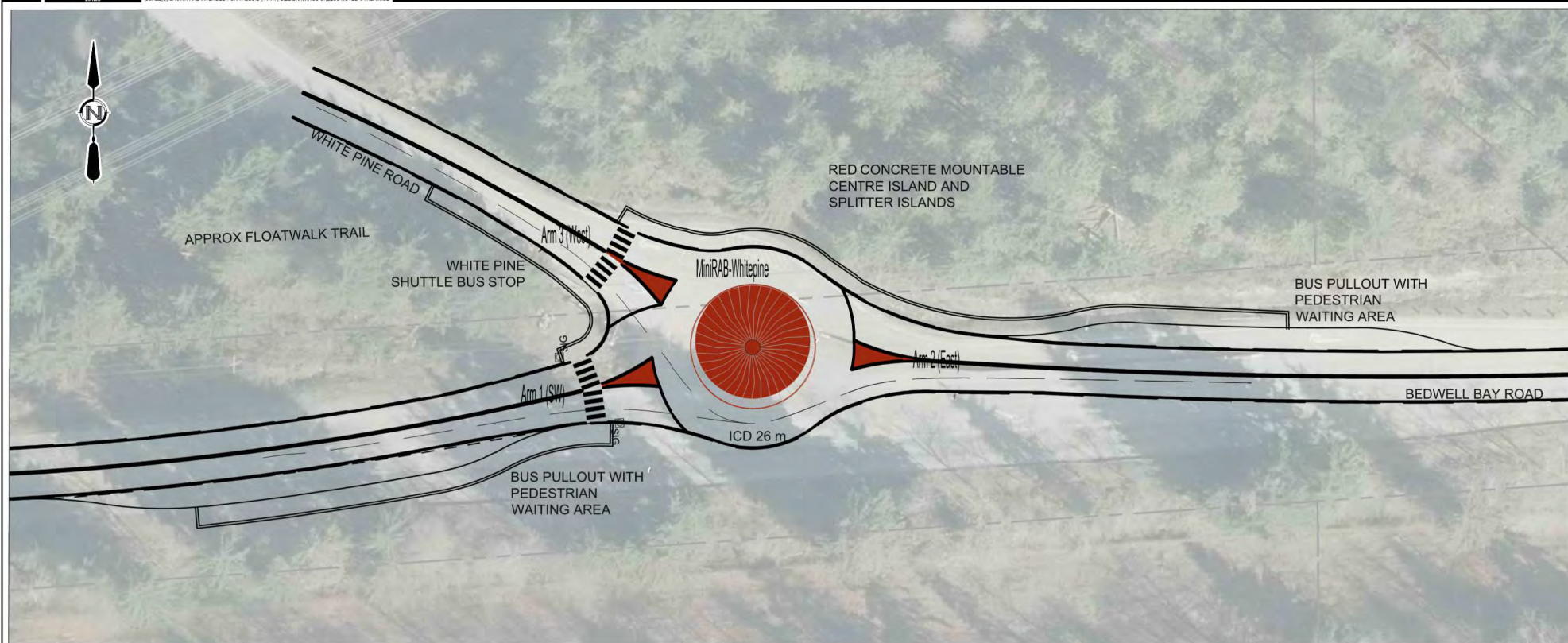
|                |                        |
|----------------|------------------------|
| AE PROJECT No. | 2021-2344-02           |
| SCALE          | 1:750                  |
| APPROVED       | A. ZAPORZHETS          |
| DATE           | 2022APR01              |
| REV            | A                      |
| DESCRIPTION    | ISSUED FOR INFORMATION |

**FIGURE 1-3**  
 CITY OF PORT MOODY  
 CIVIL  
 IMPROVEMENT FOR AREA 2  
 FORMALIZED TRANSIT AND PEDESTRIAN FACILITIES



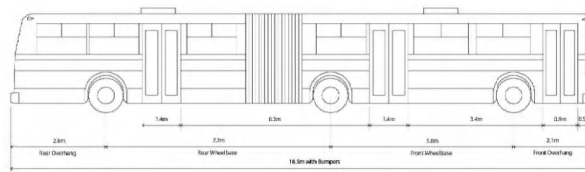
IF NOT TO BE ADJUST SCALES

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



RAB ACCOMODATES SWEEP PATH OF  
TRANSLINK COMMUNITY SHUTTLE  
WB BEDWELL BAY ROAD  
EB BEDWELL BAY ROAD

TRANSIT STOP EACH DIRECTION  
ADJACENT TO ROUNDABOUT LEGS



TRANSLINK NEW FLYER ARTICULATED BUS  
WHITEPINE BEACH SHUTTLE  
WB BEDWELL BAY ROAD TO NB WHITEPINE BEACH  
SB WHITEPINE BEACH TO EB BEDWELL BAY ROAD

SHUTTLE STOP AT FLOATWALK TRAILHEAD

PLOT DATE: 3/25/2022 5:55:57 PM  
DRAWN BY: B. JACKSON  
CHECKED BY: B. JACKSON  
DATE: 3/25/2022 5:55:57 PM



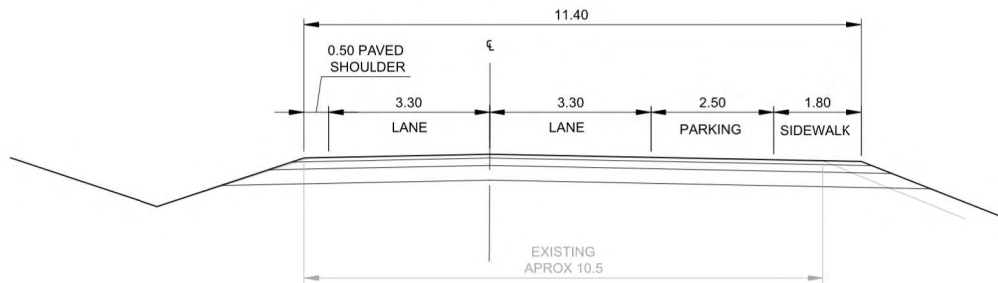
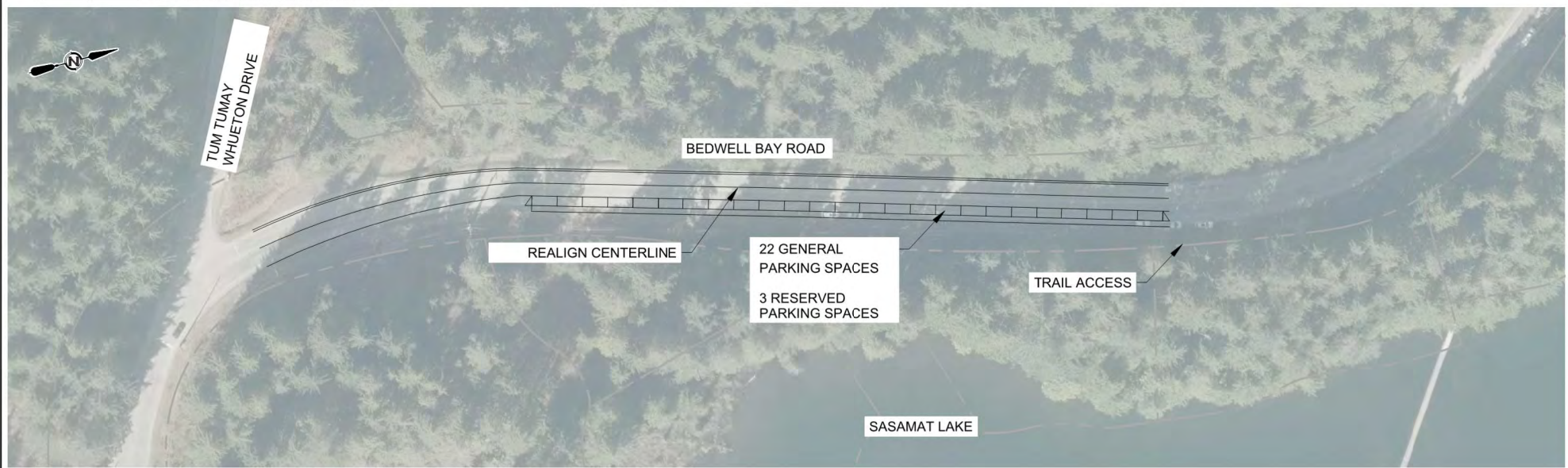
AE PROJECT No. 2021-2344-02  
SCALE 1:750  
APPROVED B. JACKSON  
DATE 2022MAR14  
REV A  
DESCRIPTION ISSUED FOR INFORMATION

FIGURE 1-4  
CITY OF PORT MOODY

CIVIL  
PLAN  
IMPROVEMENT AREA 2  
BEDWELL BAY ROAD - WHITE PINE ROAD  
MINI ROUNDABOUT

IF NOT 25 mm ADJUST SCALES  
2.5 mm

SCALE(S) SHOWN ARE INTENDED FOR TABL00 (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



PLOT DATE: 2022-02-28 9:31:51 AM  
DRAWN BY: J. ZAPORZHETS  
CHECKED BY: J. ZAPORZHETS  
DESIGNED BY: J. ZAPORZHETS  
PROJECT NO: 2021-2344-02



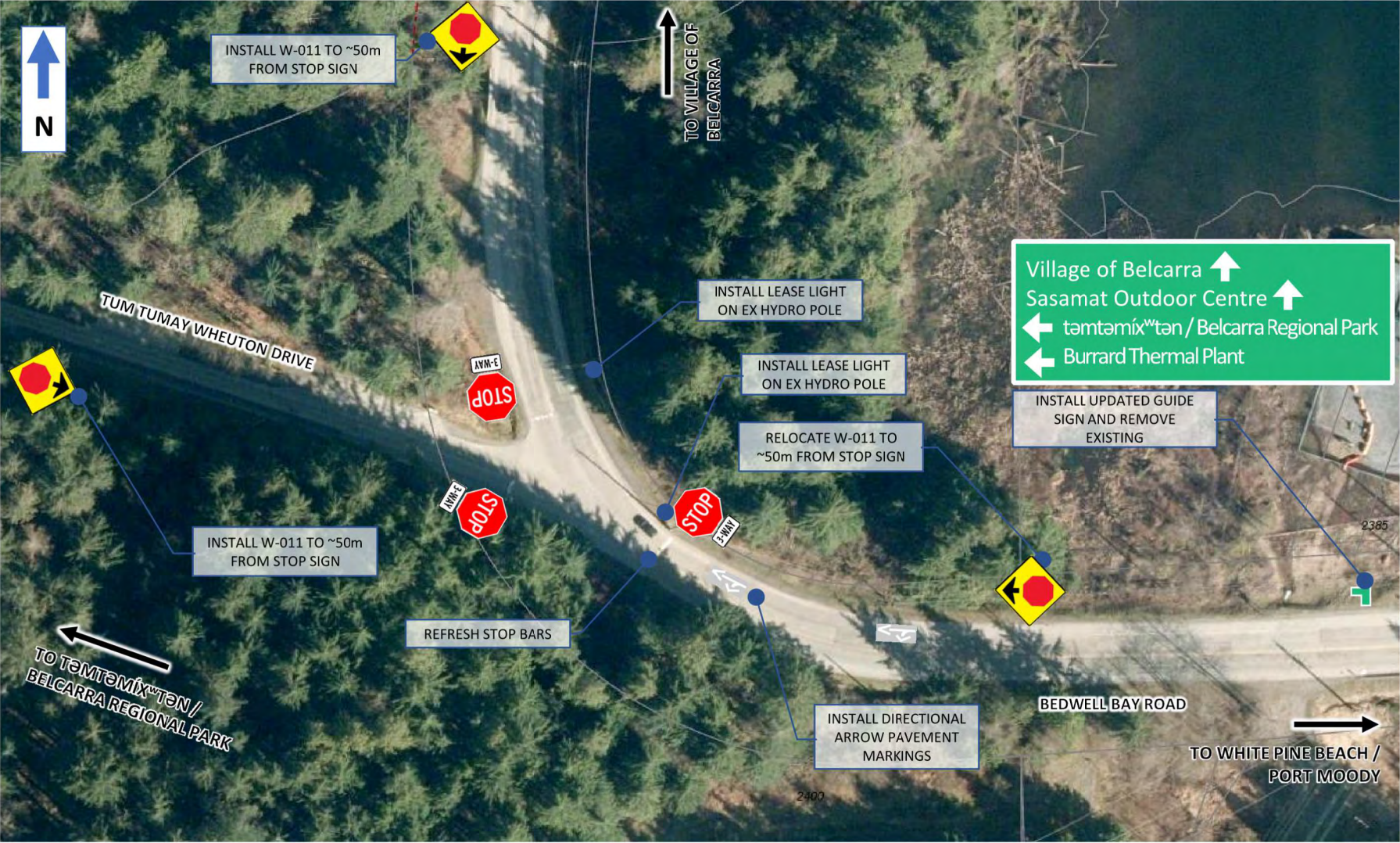
|                |                        |
|----------------|------------------------|
| AE PROJECT No. | 2021-2344-02           |
| SCALE          | 1:750                  |
| APPROVED       | A. ZAPORZHETS          |
| DATE           | 2022APR01              |
| REV            | A                      |
| DESCRIPTION    | ISSUED FOR INFORMATION |

**FIGURE 1-5**

CITY OF PORT MOODY

CIVIL  
IMPROVEMENT AREA 3  
FLOATWALK PARKING AREA



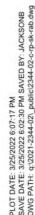


**Figure 1-6**

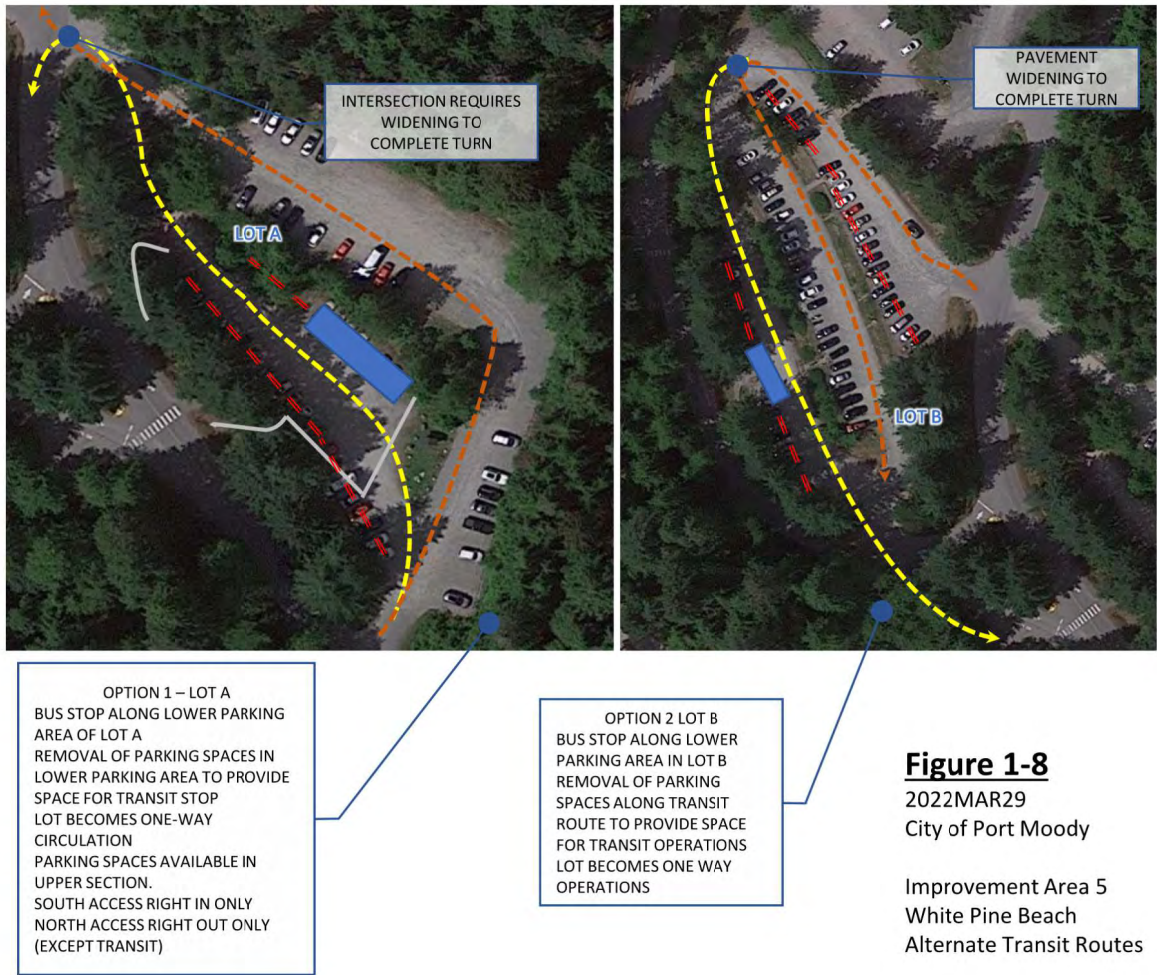
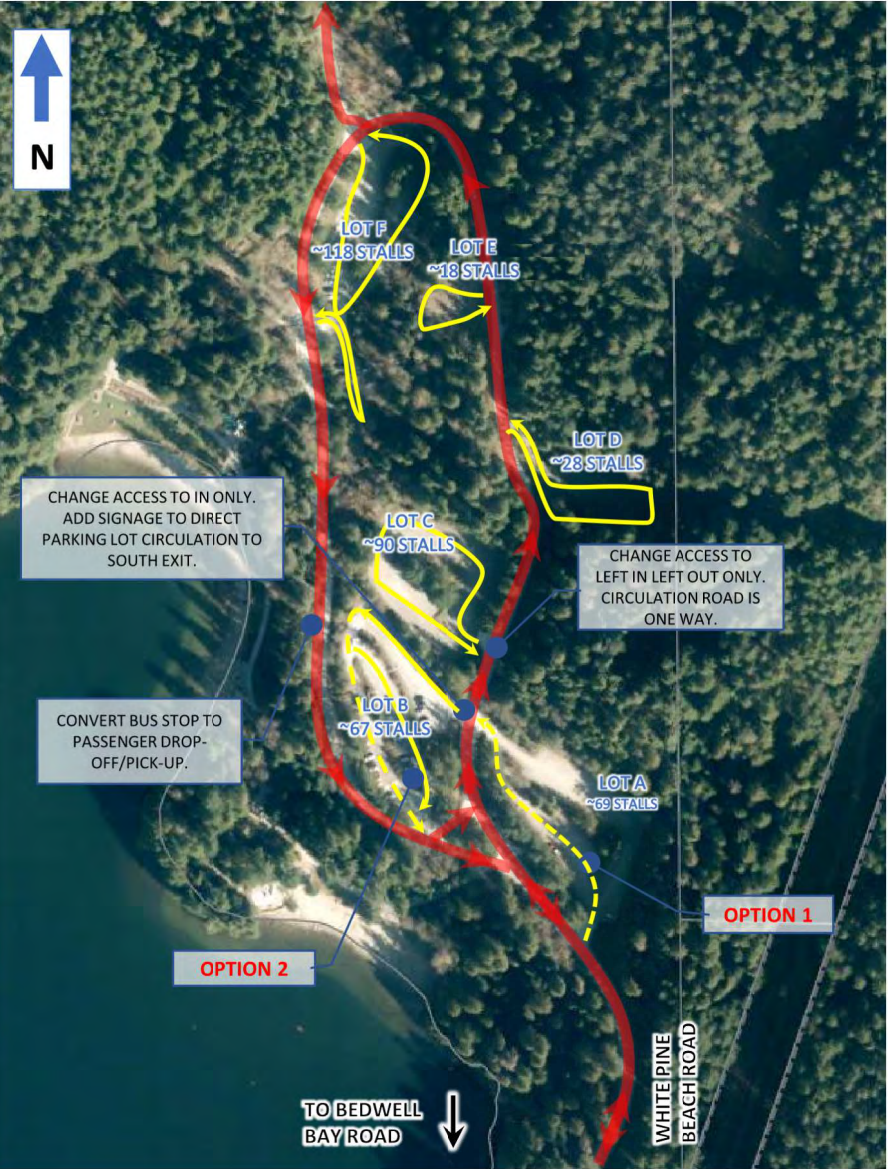
2022MAR29  
City of Port Moody

Improvement Area 4  
Tum Tumay Wheuton Dr  
Improved Signage & Lighting









**Figure 1-8**

2022MAR29

City of Port Moody

Improvement Area 5  
White Pine Beach  
Alternate Transit Routes



## APPENDIX C – EVALUATION CRITERIA

| Qualitative Criteria   | Good   | Neutral / Fair   | Poor  |
|--|--|--|---|
| <b>Traffic Operations, Mobility and Parking</b><br>Identifies the impacts of each option on roadway mobility and the traffic operations and at intersections.      | <ul style="list-style-type: none"> <li>Improves traffic operations</li> <li>Improves roadway mobility.</li> </ul>  | <ul style="list-style-type: none"> <li>It does not impact traffic operations (It does not impact roadway mobility).</li> </ul>   | <ul style="list-style-type: none"> <li>Hinders traffic operations</li> <li>It negatively impacts roadway mobility.</li> </ul>   |
| <b>Road Safety</b><br>Identifies the affects of each option on road safety in terms of perceived safety, incident potential when compared to the base case.        | <ul style="list-style-type: none"> <li>Potential to decrease perceived safety concerns, increase separation between transportation modes, and reduce incident potential.</li> </ul>  | <ul style="list-style-type: none"> <li>Not expected to affect perceived safety concerns, transportation mode separation or reduce incident potential.</li> </ul>   | <ul style="list-style-type: none"> <li>Potential to increase perceived safety concerns, separation or increase incident potential.</li> </ul>   |
| <b>Parking Compliance</b><br>Identifies the impacts of each option on parking, including compliance to parking restrictions and provision of parking alternatives. | <ul style="list-style-type: none"> <li>Improves compliance to parking by improving parking options and alternatives, or better enforcing existing parking restrictions.</li> </ul>   | <ul style="list-style-type: none"> <li>No change to parking operations, configuration or compliance</li> </ul>   | <ul style="list-style-type: none"> <li>Potential to have impact on parking to encourage parking where not permitted.</li> </ul>   |
| <b>Active Transportation - Walking</b><br>Identifies the impacts of each option on walking accessibility, mobility, and safety.                                    | <ul style="list-style-type: none"> <li>Improves active transportation safety and mobility</li> </ul>   | <ul style="list-style-type: none"> <li>No affect on active transportation safety and mobility</li> </ul>   | <ul style="list-style-type: none"> <li>Negatively impacts active transportation safety and mobility</li> </ul>  |
| <b>Active Transportation - Cycling</b><br>Identifies the impacts of each option on cycling accessibility, mobility, and safety                                     | <ul style="list-style-type: none"> <li>Improves active transportation safety and mobility</li> </ul>   | <ul style="list-style-type: none"> <li>No affect on active transportation safety and mobility</li> </ul>   | <ul style="list-style-type: none"> <li>Negatively impacts active transportation safety and mobility</li> </ul>  |
| <b>Transit</b><br>Identified the impact of each option on transit accommodation and accessibility.   | <ul style="list-style-type: none"> <li>Positive affect on transit operations and accessibility for passengers</li> </ul>   | <ul style="list-style-type: none"> <li>No affect on transit operations and accessibility for passengers</li> </ul>   | <ul style="list-style-type: none"> <li>Negative affect on transit operations and accessibility for passengers.</li> </ul>   |
| <b>Geometry/ Road Cross-Section</b><br>Identifies constraints for the project.   | <ul style="list-style-type: none"> <li>No geometric constraints.</li> </ul>  | <ul style="list-style-type: none"> <li>Minor geometric constraints.</li> </ul>   | <ul style="list-style-type: none"> <li>Significant geometric constraints.</li> </ul>  |
| <b>Environmental Considerations</b><br>Identifies the potential environmental impact of each option.   | <ul style="list-style-type: none"> <li>The option has no environmental impact.</li> </ul>  | <ul style="list-style-type: none"> <li>The option has some environmental impacts</li> </ul>  | <ul style="list-style-type: none"> <li>The option has significant environmental impacts</li> </ul>  |
| <b>Constructability</b><br>Identifies the potential construction challenges or benefits of each option   | <ul style="list-style-type: none"> <li>Construction of the option will likely remain within the existing right of way, impact traffic operations (e.g. traffic flow on the highway, access to surrounding land uses, etc.). Minor traffic management is required.</li> </ul> | <ul style="list-style-type: none"> <li>Construction of the option will likely have minor impacts on traffic operations (e.g. traffic flow on the highway, access to surrounding land uses, etc.).</li> <li>Minor traffic delays due to construction.</li> <li>A moderate level of traffic management is required.</li> </ul> | <ul style="list-style-type: none"> <li>Construction of the option will likely have major impacts on traffic operations (e.g. traffic flow on the highway, access to surrounding land uses, etc.).</li> <li>Major traffic delays due to construction.</li> <li>A significant level of traffic management is required.</li> </ul> |

## APPENDIX D – OPINION OF PROBABLE COSTS

Order-of-magnitude opinions of probable costs (OPC) were prepared as supplementary information. Each OPC considered the following:

- Construction costs for each option included estimates for earthworks, pavement structure, pavement, signage and pavement markings, guide signage as needed, barriers, crash attenuators, street lighting, traffic signals and retaining walls.
- Some allowances in the construction OPC were included for rock excavation, utility relocations if known, traffic management during construction and construction contingency.
- 100% contingency which is higher than the 50% contingency typically used for Class D cost estimates due to the high-level conceptual nature of the options and the number of physical constraints in the area requiring further investigation. Construction costs have also been highly variable during this period of inflation related to the Covid-19 pandemic, rising fuel costs and global supply issues at this time.

The following are limitations of the order-of-magnitude OPCs prepared for each option:

- Property costs were not available at the time of this study and property is not expected to be required. Some options may have some impacts to individual properties but these impacts, if any, would be determined during preliminary and detailed design of the project.
- Costs related to geotechnical and environmental assessments have not been included.
- Soil remediation costs and utility relocation costs, if required, have not been included.
- Quantity estimates were based on the terrain model provided by the City.
- No allowance has been made to upgrade utilities, culverts and other infrastructure in the study area that is not affected by the option. Should the existing utilities, culverts and other infrastructure be affected by an option it may need to be upgraded or replaced.
- The long-term effects of the COVID-19 virus and recent global events on construction costs have not been evaluated and have not been included in the OPCs.

**Table D-1, Table D-2, Table D-3, and Table D-4** summarize the opinion of probable costs for each option.

**Table D-1**  
**Improvement Area 1 OPC Comparison**

| Improvement Component                           | Option 1A          | Option 1B          |
|---|--------------------|--------------------|
| Road Widening(MUP/Path) (not including asphalt) | \$2,600,000        | \$2,600,000        |
| Barrier (Concrete/Delineators)                  | \$380,000          | \$150,000          |
| Mill and Overlay Asphalt*                       | \$1,700,000        | \$1,700,000        |
| 100% Contingency                                | \$4,800,000        | \$4,600,000        |
| <b>Total</b>                                    | <b>\$9,700,000</b> | <b>\$9,500,000</b> |

*Note: Mill and overlay along entire roadway to accommodate shift in road centreline.*

Table D-4  
Improvement Area 2 OPC Comparison

| Option  | Order of Magnitude OPC |
|---|------------------------|
| Option 2A – Transit and Pedestrian Improvements | \$100,000              |
| Options 2B – Mini Roundabout                    | \$420,000              |

Table D-3  
Improvement Area 3 OPC

| Option           | Order of Magnitude OPC |
|------------------|------------------------|
| Improvements     | \$70,000               |
| 100% Contingency | \$70,000               |
| <b>Total</b>     | <b>\$140,000</b>       |

Table D-4  
Improvement Area 4 OPC Comparison

| Option                                    | Order of Magnitude OPC |
|---|------------------------|
| Option 4A – Improved Signage and Lighting | \$50,000               |
| Option 4B – Mini Roundabout               | \$300,000              |