



# DISTRICT OF SQUAMISH ACTIVE TRANSPORTATION PLAN



# ACTIVE TRANSPORTATION PLAN



**URBAN**  
systems

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## 1.0 INTRODUCTION

Squamish is a unique seaside and mountain community with exceptional opportunities for outdoor recreation that draws residents and visitors alike. It is a community that is passionate about environmental sustainability and has a strong sense of community. With a beautiful setting and small town feel, there is a great opportunity to build on the already well-established recreational lifestyle to encourage more walking and cycling for both transportation and commuting purposes.

Promoting walking and cycling as attractive and convenient transportation choices can help reduce automobile dependence, increase physical activity levels, improve public health, reduce infrastructure demands, and create a more livable and vibrant community. Encouraging walking and cycling is a key part of the vision articulated in the District's 2009 Official Community Plan (OCP) to increase transportation choice. More recently, the District has also developed the 2031 Multi-Modal Transportation Plan and Trails Master Plan, both provide further direction to promote walking and cycling. This Active Transportation Plan builds off of these existing documents and the infrastructure that is on the ground today. The Active Transportation Plan is a long-term plan focused on enhancing active transportation in Squamish through policy, education and infrastructure to improve comfort, connectivity and accessibility for people of all ages and abilities within the urban areas of Squamish over the next 20 years and beyond.

## 1.1 Plan Purpose

The purpose of Squamish's Active Transportation Plan is to increase transportation choices within the community and to provide an accessible, sustainable, and efficient transportation system for all users. The Active Transportation Plan outlines a range of infrastructure projects, actions and policies to support and encourage walking and cycling in Squamish over the next 20 years and beyond. The Active Transportation Plan also provides a detailed implementation plan with short, medium, and long-term priorities for walking and cycling. It is important to note that the recommendations in the Active Transportation Plan are largely focused on the urban geographical areas of Squamish and on enhancing active transportation infrastructure primarily for commuter and transportation purposes and less so for recreational purposes.

## 1.2 Plan Process

The Active Transportation Plan was developed over a two phase process, as summarized below:

**Phase 1: Inventory and Preliminary Planning** included reviewing background information, gathering and analyzing existing conditions data, and assessing existing policies and programs as they relate to active transportation. A key component of Phase 1 was to understand what residents and stakeholders believed were the greatest issues and opportunities for walking and cycling in Squamish. Within this phase, a shared vision for active transportation in Squamish was developed. Supporting goals were then established that were in line with District-wide plans and Council's Strategic Plan.

**Phase 2: Development of the Active Transportation Plan** focused on identifying the policy direction and actions for the Active Transportation Plan. During this phase, the walking and cycling networks were finalized based on input received from Squamish residents and stakeholders. Lastly, this phase identified infrastructure project with cost estimates. District staff will work within current budgets to strive to implement proposed changes through a phased implementation process based on available resources in any given budget period.

## 1.3 Communications and Consultation

Representative participation of community stakeholders and residents was critical to the success of the Active Transportation Plan. A range of communications and consultation approaches were used throughout the process to engage community stakeholders and residents, as described below:



- ▶ **Site Visits** were conducted to observe and assess existing walking and cycling infrastructure.
- ▶ **Website and Social Media** content was developed, which included establishing a dedicated project webpage for the Active Transportation Plan. Regular project updates were provided on the District's Facebook and Twitter sites.
- ▶ **A Survey** was made available on-line and through hardcopy for all residents to complete during the month of November 2015. Nearly 300 residents responded to this survey. The on-line survey focused on understanding travel behaviour, identifying walking and cycling issues and challenges, and gauging respondents' interest in active transportation.
- ▶ **Public Event #1** was held on Saturday November 28, 2015. The District hosted the first open public event for the Active Transportation Plan at the Winter Farmers' Market at Squamish Elementary School from 11 a.m. to 3 p.m. Approximately 150 people stopped by and engaged with the project team. The event included informational display panels and was a chance for participants to identify walking and cycling issues and opportunities on a map. Members of the Active Transportation Plan project team were also available for one-on-one conversations with residents about the Plan.
- ▶ **Public Event #2** was held on Saturday, March 12, 2016 at Brennan Park Recreation Centre between 10 a.m. and 3 p.m. Approximately 60 people attended the event, representing different neighbourhoods within Squamish. The event was an opportunity for residents and stakeholders to find out more information about the Active Transportation Plan including the draft Strategies, Directions and Actions that had been developed through the process. The event included interactive activities set up throughout the venue to hear feedback on the implementation and prioritization of different projects and components of the Plan.
- ▶ **Stakeholder Committee Meetings** were held on three separate occasions. The Stakeholder Committee was made up of representatives from a variety of interest groups, committees and organizations, including the Squamish Trails Society, Squamish Nation, ICBC, CN Rail, Squamish CAN, Chamber of Commerce, Clean Air Society, the School District, Vancouver Coastal Health, Squamish Walking Groups, HASTe and a member of the Advisory Design Committee. Each of the different meetings focused on discussing different components of the Active Transportation Plan. The first meeting was held on November 16, 2015 and focused on existing conditions and understanding issues and opportunities. The second meeting was held on January 28, 2016 and focused on network planning. The third meeting was held on April 14, 2016 and focused on implementation and prioritization.

## 1.4 Plan Framework

The Squamish Active Transportation Plan includes a number of recommended improvement strategies to enhance the safety and comfort of walking and cycling within and between neighbourhoods. The improvement strategies have been grouped into five broad Strategies: **Connectivity, Safety and Security, Maintenance and Accessibility, Growth and Amenities, and Education and Awareness**. Within each Strategy, a number of Directions have been identified, along with more specific actions within each Direction. The figure below identifies the five Strategies along with the Directions identified to support each of them. More details about each of these Strategies, Directions and the Actions developed to support them are provided in **Section 4.0**.



### STRATEGY 1: CONNECTIVITY

The recommendations developed under connectivity are aimed at establishing a complete, connected and convenient network of active transportation infrastructure throughout Squamish. The Directions outlined in this strategy will focus on providing infrastructure that is comfortable for people of all ages and abilities and embrace the principles of complete streets wherever possible. The following Directions were identified to improve Connectivity:

**Direction 1A:** Expand and Enhance the Sidewalk Network

**Direction 1B:** Expand and Enhance the Bicycle Network

**Direction 1C:** Complete and Enhance North/South Connectivity for Walking and Cycling

**Direction 1D:** Complete and Enhance East/West Connectivity for Walking and Cycling



### STRATEGY 2: SAFETY AND SECURITY

The real and perceived concerns for both safety and security are important factors that influence whether people choose to use active transportation for moving around Squamish. People engaging in active transportation are considered 'vulnerable road users', as they are subject to higher risk of injury from traffic collisions than people driving or riding transit. Personal safety concerns arising from insufficient lighting, visibility or poor design of public spaces can also deter people from using active transportation. The following Directions were identified to improve Safety and Security:

**Direction 2A:** Improve Road Safety

**Direction 2B:** Address Barriers to walking and cycling

**Direction 2C:** Improve Personal Safety



### STRATEGY 3: MAINTENANCE AND ACCESSIBILITY

The way communities are designed and maintained can have a significant influence on the walkability, bikeability and accessibility of an area. In particular, there are many ways in which the District can promote universal accessibility through infrastructure design and maintenance that promotes walking and cycling for people of all ages and abilities. The following Directions were identified to improve Maintenance and Accessibility:

**Direction 3A:** Provide Accessible Infrastructure

**Direction 3B:** Maintain the Sidewalk and Bicycle network



### STRATEGY 4: GROWTH AND AMENITIES

This strategy focuses on ensuring that active transportation infrastructure and amenities are considered as Squamish grows and new developments are built. This strategy also focuses on ensuring that existing neighbourhoods incorporate amenities that make walking and cycling as convenient and comfortable as possible. Squamish is growing quickly and is expected to continue to grow rapidly over the next 15 years. The following Directions were identified to ensure active transportation is addressed through Growth and Amenities:

**Direction 4A:** Ensure Active Transportation is Considered and Mandated in All New Developments

**Direction 4B:** Provide Amenities to Make Walking and Cycling Convenient



### STRATEGY 5: EDUCATION AND AWARENESS

Increasing awareness, educating residents about sharing the road and providing wayfinding and information can encourage more people to use active transportation more often and build a culture for active transportation. Education and awareness can also enhance bylaw compliance among all road users. The following Directions were identified to improve Education and Awareness:

**Direction 5A:** Enhance Wayfinding, Signage and Trip Planning

**Direction 5B:** Improve Education and Awareness





2.0 WALKING AND CYCLING TODAY



This section describes the context for the Active Transportation Plan, including the community context such as demographics, land use profile and relevant policies and bylaws. This section also includes a summary of the existing conditions for walking and cycling in Squamish. Together, these elements of the community context have shaped the recommended improvement strategies for the Active Transportation Plan. Further details regarding existing conditions for walking and cycling in Squamish are outlined in the **Phase 1 Discussion Paper**.

## 2.1 Community Context

This section includes a summary of the key demographic, land use, transportation, and natural characteristics of Squamish that influence active transportation, as well as the key District policies and plans that have influenced the Active Transportation Plan.

### 2.1.1 Demographic Profile

Demographics play an important role in influencing transportation choices and travel patterns. This section summarizes key demographic characteristics of Squamish residents that will be used as a basis to inform the direction of the Active Transportation Plan.

- **A Rapidly Growing Municipality.** The current population of Squamish is approximately 19,000 residents. Between 2006 and 2011, Squamish's population grew by approximately 30% and growth is projected to continue in the coming years and decades.
- **A Young Population.** The median age of the population of Squamish is approximately 36 years of age, which is young compared to many other cities within British Columbia. The median age for the population of British Columbia is 42 years of age. Approximately 35% of Squamish's population is under 30 years of age.
- **Employment Distribution.** Squamish has historically been a resource-based economy. However, in more recent years, there has been a shift to an economy more directed towards tourism, "rec-tech", and other opportunities. Employment centres are located throughout Squamish and within different neighbourhoods. This reiterates the importance of having an active transportation network that provides strong north-south and east-west connections.
- **A Recreation Culture.** Squamish is known for being a destination for outdoor recreation and prides itself on providing opportunities for recreation. While the Active Transportation Plan focuses primarily on infrastructure and policies that will promote more commuter walking and cycling, it also recognizes the important role recreational walking and cycling play within the community and will provide connections to those pursuits.

### 2.1.2 Land Use Profile

Squamish's land use and development patterns are shaped by its road and rail transportation network, which is critical in supporting the local and regional economy. A map of the existing land use in Squamish can be found in **Figure 1** below.

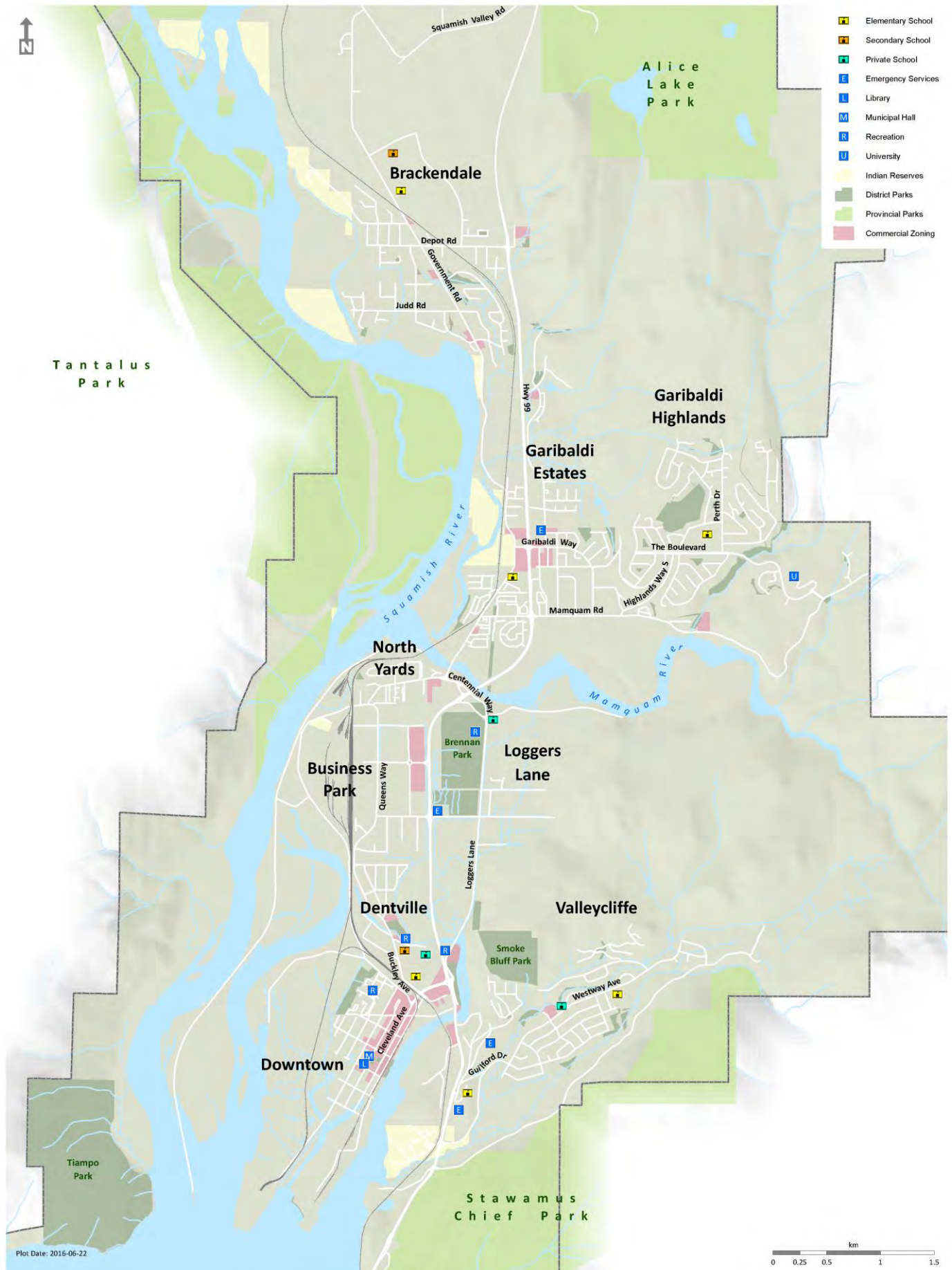
- **Downtown.** Downtown Squamish has historically been the centre of the community and is expected to be the location of significant new development in the coming years with a number of proposed projects. It is also an important destination within Squamish.

- **Neighbourhoods.** Squamish is made up of a number of unique neighbourhoods and communities that have varying access to existing active transportation infrastructure and geography. As outlined in **Figure 2**, residential density is disbursed throughout the District. The areas with the highest residential density include downtown Squamish, north of Mamquam River by Mamquam Elementary School and North Yards. Providing active transportation connections between these neighbourhoods and to other important commercial and economic destinations within Squamish will be an important consideration of the Active Transportation Plan.
- **Highway 99.** Highway 99 a major highway travelling in the north-south direction for the entire length of Squamish. Intersections along Highway 99 are controlled by the BC Ministry of Transportation and Infrastructure (MoTI). East-west connectivity is also accommodated by three overpasses and two underpasses. However in general, east-west travel is restricted for all modes, including walking and cycling because of Highway 99.
- **Community Facilities and Parks.** There are a number of important community destinations in Squamish including the Squamish Public Library, Municipal Hall, the Squamish Adventure Centre, Brennan Park fields and arena, Smoke Bluff Park, among others.
- **Schools.** There are eight public schools in Squamish, including six elementary schools and two secondary schools. There are three private schools located in different neighbourhoods within Squamish. Squamish is also home to Quest University.



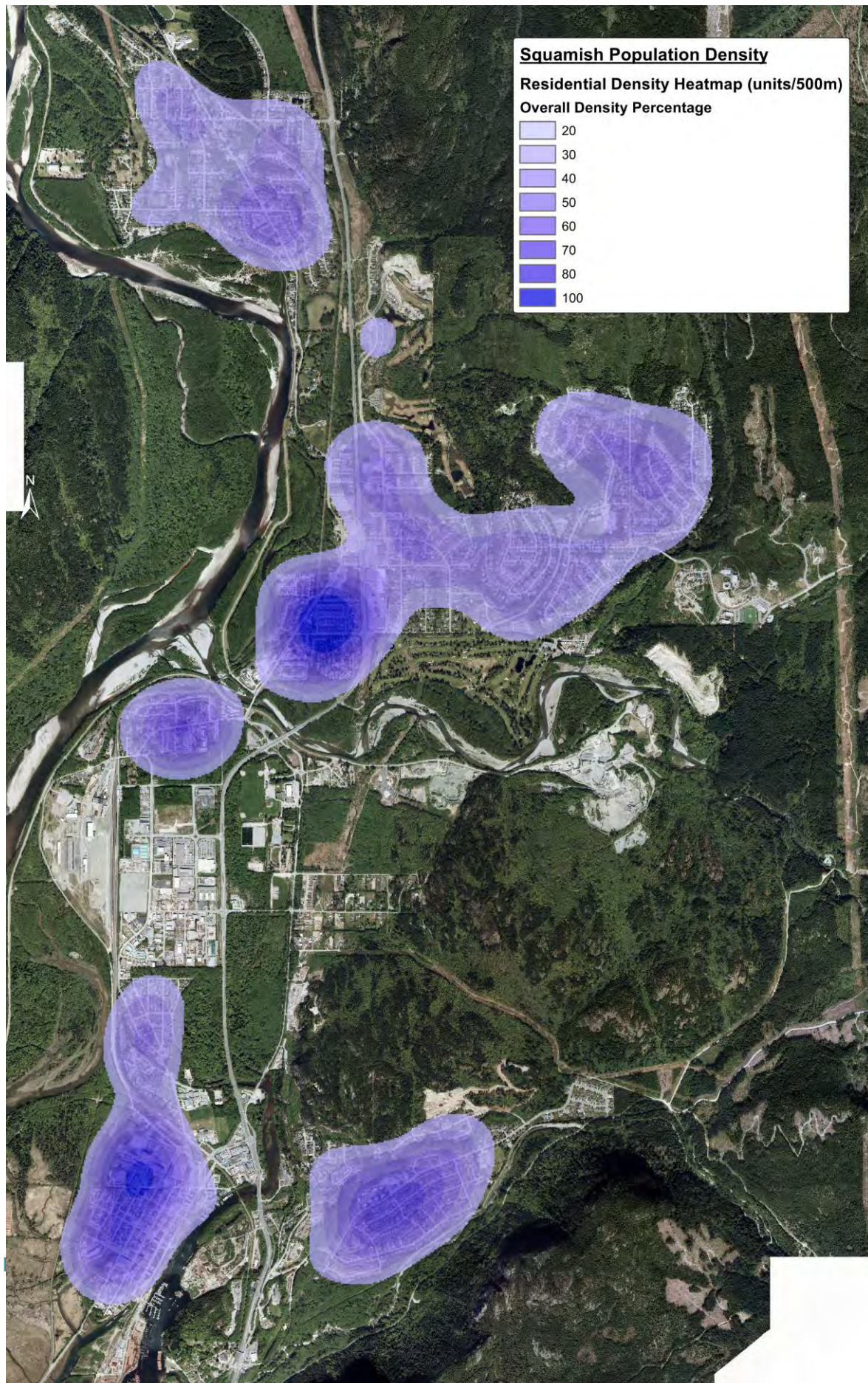


Figure 1: District of Squamish Land Use and Neighbourhoods





**Figure 2: Residential Density Heat Map** Source: District of Squamish





### 2.1.3 Plans, Policies and Bylaws

The Active Transportation Plan is closely linked to, and will be informed by, many of the District's key planning documents that contain pedestrian and cycling-related policies, plans, and goals. Many of these documents include broader aspirations for growth and transportation and provide specific directions on how walking and cycling can become an integral part of Squamish's transportation system. The Active Transportation Plan can reinforce and help further the goals and policies found in other documents and be incorporated into future plans and policies.

This section briefly presents some of the policies, documents and Council Resolutions that have an impact on, and the potential to be impacted by, the Active Transportation Plan. More information about each of these documents was outlined in the **Phase 1 Discussion Paper**. As part of the Active Transportation Plan process, a review of Squamish's policies and bylaws was conducted by looking specifically at their impact on active transportation. Based on this review, recommendations have been provided on how they could be updated. More details about these specific recommendations are outlined in **Appendix A**.

- ▶ **Official Community Plan (OCP), 2009** – The current OCP outlines ten guiding principles that provide the framework for the OCP's objectives and policies. The Transportation guiding principle, which most closely applies to active transportation states:

*The District will work towards providing a balanced transportation system that encourages transit, cycling and pedestrian modes of travel throughout the municipality that minimize greenhouse gas emissions.*

The District is currently in the process of updating its OCP. As the OCP is being updated the long-term Active Transportation Plan should be included as an existing document and the recommendations in the Active Transportation Plan should be incorporated into the OCP. More generally, the OCP update should consider using stronger language to support walking and cycling, including developing a hierarchy of travel modes that prioritizes walking and cycling.

- ▶ **2031 Multi-Modal Transportation Study, 2011** - The Multi-Modal Transportation Study is an integrated transportation plan with the vision for Squamish to offer an array of safe travel options and “encouraging practical, healthful and sustainable travel choices.”
- ▶ **Council Strategic Plan 2015-2018 (2016 Update)**- This Plan identifies both short- and long-term objectives for the four Strategic Priority Focus Areas. The Plan's most applicable component to active transportation is the guiding principle of a “Connected Community”. This principle includes the following areas of focus:
  - Citizens and visitors have a choice of transportation options.
  - Tourism assets, commercial districts, and neighbourhoods should be connected by transit and trails.
  - Active transportation is foundational to all infrastructure decisions.
  - Social inclusion and connectivity is promoted.
- ▶ **Trails Master Plan, 2011** - The Trails Master Plan is a long-term strategy to provide a community-wide recreation trail network. The Plan includes background information, goals, and an inventory and analysis of the trail system. It highlights many of the benefits that trails offer and provides recommendations on policy, trail development

criteria, trail construction standards, and risk management. The Plan also provides an implementation plan outlining the priorities and resource needs.

- ▶ **Downtown Squamish 2031 Transport Plan** - The Downtown Squamish 2031 Transport Plan is a multi-modal transport plan for downtown Squamish that includes ambitious mode share goals, draft roadway classifications (including truck routes), and a pedestrian and bicycle network. The plan identifies Loggers Lane, Third Avenue, Pemberton Avenue and portions of Main Street and Victoria Streets as major bicycle and pedestrian routes within downtown Squamish.
- ▶ **Sustainability Commitment, 2003** - District Council adopted a commitment to environmental, fiscal, economic, and social sustainability that informs the development of local trails. One of the principles of the commitment is that other transportation options besides single occupancy vehicles are emphasized.
- ▶ **Council Resolutions and Recommendations** - District Council has identified active transportation infrastructure and promoting more walking and cycling as one of their priorities. It has been a longstanding interest of Council to provide more bicycle infrastructure within downtown Squamish, including the desire to have designated bicycle facilities within the downtown core. Council has also identified their desire to ensure complete street principles are incorporated into all street designs and that infrastructure for people cycling and walking is improved on the Government Road corridor.
- ▶ **Subdivision and Development Control Bylaw** - This bylaw regulates the subdivision of land and sets requirements for the provision of infrastructure works when the land is subdivided or developed. The Subdivision and Development Control Bylaw requires the provision of sidewalks and safety considerations, such as traffic calming adjacent to subdivisions, trail (including collector and neighbourhood trail) standards, and required road cross sections, all of which include considerations for bicycle users, such as bicycle lanes.

An assessment of this document reveals that there are opportunities to provide enhancements to the walking and cycling facility widths and looking for opportunities to reduce vehicle travel lane widths (where appropriate). More cul-de-sac connections are an important component of making neighbourhoods with cul-de-sacs more walkable and connected. The Subdivision and Development Control Bylaw will refer to the Active Transportation Plan and any follow up actions that come out of it, to ensure that new developments follow the policies and guidelines outlined either by building the required recommendations or by providing cash in lieu.

- ▶ **Zoning Bylaw** - The Zoning Bylaw regulates the type of building and uses or activities allowed on a specific property. It also regulates building size, building siting on the property and parking. The District of Squamish includes bicycle parking requirements (Long Term - Class A and Short Term - Class B) in the Zoning Bylaw.

The District should monitor how the current bylaw is being interpreted and applied to ensure adequate, easy to use, and accessible bicycle parking is being provided in new developments.

- ▶ **Traffic Regulation Bylaw** - This Bylaw regulates street use and traffic within the municipality. The Bylaw includes restrictions on the use of sidewalks and paths, duty to clear ice and snow, and parking restrictions, explicitly stating that you are not allowed to park a vehicle in the a bicycle lane. An assessment of the Traffic Regulation Bylaw was done to look at how well it addresses active transportation and identified the following opportunities:

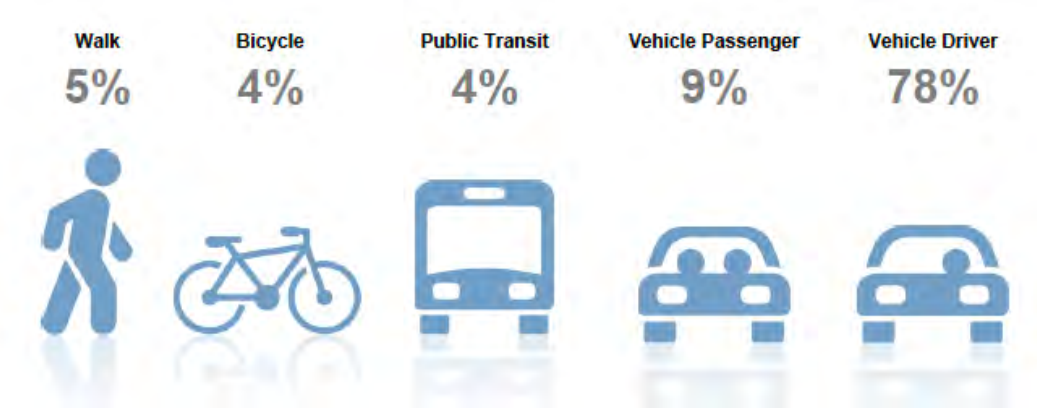


- Define 'promptly' when updating the Snow Removal Policy. In the future the District may want to consider taking responsibility of clearing sidewalks of snow after an event to ensure routes sidewalk accessibility year round.
- Making some consideration for children under the age of 14 that may use the sidewalk for cycling.
- Address situations where it would be appropriate for people cycling to ride in crosswalks and use pavement markings such as elephants feet to indicate locations where this is appropriate,
- Ensure the District's bylaws are being enforced especially for obstructing bicycle lanes or sidewalks.

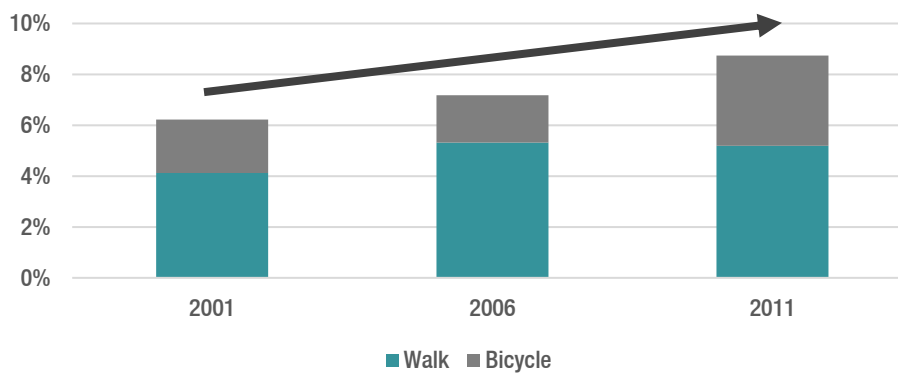
## 2.2 Walking and Cycling in Squamish Today

According to the 2011 National Household Survey conducted by Statistics Canada, over 9% of all trips to work in Squamish are made by walking or cycling (as shown in **Figure 3**). Walking trips account for 5% of all trips to work and cycling accounts for over 4% of the daily trips to work. When looking at the number of walking and cycling trips over time in Squamish, it appears that the percentage of combined walking and cycling trips has been on the rise since 2001, as seen in **Figure 4**.

**Figure 3: Existing Mode Share (2011 National Household Survey)**



**Figure 4: Walking and Bicycle Mode Share Over Time (Statistics Canada 2001, 2006, 2011)**



Results from the Active Transportation online survey, which was completed by nearly 300 Squamish residents, showed that 79% of survey respondents walk at least once a week for transportation purposes and 93% of respondents walk at least once a week for recreation. When asked about cycling, 73% of survey respondents bicycle for transportation purposes at least once a week and 78% of respondents cycle for recreation at least once a week.

## 2.2.1 Walking in Squamish

Walking is the most common form of transportation. If conditions exist within a community – such as having a complete, connected sidewalk network, safe crossings and major destinations within walking distance of residential areas – walking can be suitable for almost all short trips throughout the year. The current conditions for walking in Squamish are summarized in the sections below.

### 2.2.1.1 Existing Infrastructure and Programs

- **Sidewalks.** Sidewalks are located in a number of areas throughout Squamish, including downtown, on Buckley Avenue, along Westway Avenue in Valleycliffe, on parts of Government Road and on Tantalus Road, as shown in **Figure 5**. A number of other streets within Squamish also have sidewalks on one or both sides on the street. However, the majority of streets do not have any sidewalks at all, as seen in **Table 1**. In total, there are approximately 54 km of sidewalks within Squamish as well as approximately 10 km of multi-use pathways along the Corridor and Discovery Trails, and over 600 km of other trails throughout the District. As noted previously, Squamish's Subdivision and Development Control Bylaw states that concrete sidewalks must be provided on roads adjacent to subdivisions. The District is also committed to ensuring that strata-owned developments are also making considerations for people walking and cycling.

Sidewalks within Squamish are made mainly of concrete and many of the sidewalks are in good condition; however, there are some locations in downtown Squamish where the sidewalks are not well maintained and are in poor condition or in poor quality. Many of these sidewalks are quite far setback from the street and are likely not used very frequently as they are not well connected, visible or accessible. In some cases it might be recommended that sidewalks be removed and rebuilt rather than upgraded.

**Table 1: District of Squamish Sidewalk Coverage**

Number of Sidewalks	% of network
0 (No sidewalks on either side)	90%
1 (One side of the street)	6%
2 (Both sides of the street)	4%

- **Crossings.** There are 86 locations within Squamish that have marked crosswalks. These include both intersection and mid-block crossings. Some of these crossings, including the two located on Buckley Avenue in front of Squamish Elementary School, Howe Sound Secondary School and on Government Road near Mamquam Elementary and Brackendale Elementary flash to alert other road users that there is a crosswalk within a school zone. There are 12 signalized intersections, nine of which are located on Highway 99.

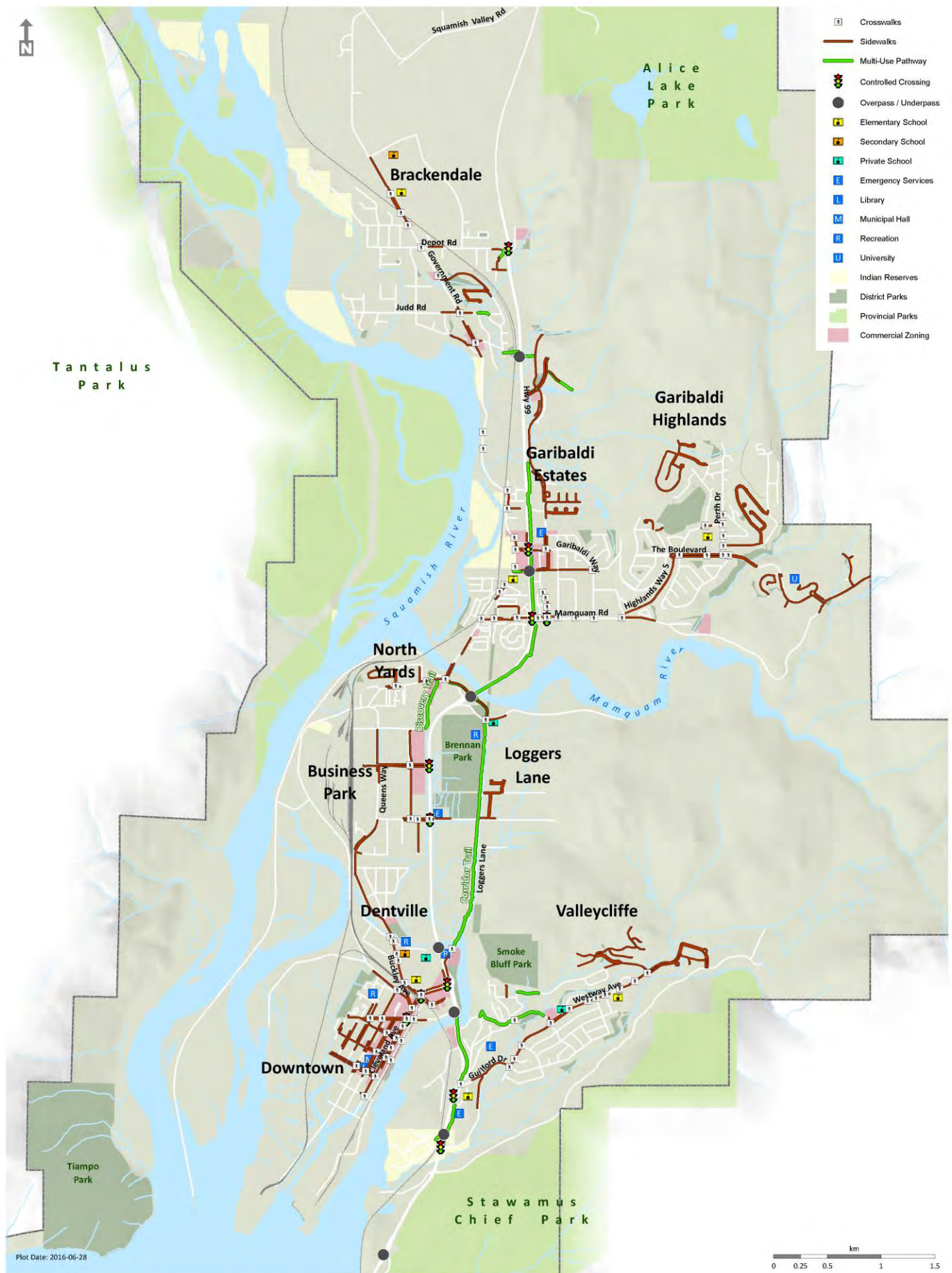


- ▶ **Traffic Calming.** Traffic calming features such as curb extensions, raised crosswalks, speed humps and traffic circles serve to reduce motor vehicle speeds. The District has incorporated traffic calming on a number of streets, including The Boulevard, Cleveland Avenue and Skyline Drive.
- ▶ **Transit Integration.** All transit trips begin or end with a trip by some form of active transportation. Therefore, it is important to consider how well the sidewalk network is integrated with transit services and facilities. There are approximately 120 bus stops in Squamish eight of which have bus shelters. Many bus stops are located on the side of the road with no sidewalks. All BC Transit buses within the District have bicycle racks that carry a maximum of two bicycles at a time.
- ▶ **Trails and Pathways.** The number of off-street trails and pathways located in Squamish is a resource for residents and visitors and presents an opportunity to build off of the high number of people already walking and cycling for commuter and recreational purposes. Within Squamish, there are over 600 kilometres of trails and pathways. There are two main north-south directional off-street pathways: Corridor Trail and Discovery Trail. Corridor Trail is located on the east side of Highway 99, travelling parallel to the highway and Loggers Lane. Currently, Corridor Trail is the only paved and accessible pathway; however, the District is committed to enhancing accessibility of the trail network. Portions of Corridor Trail are lit. The second major north-south trail is the Discovery Trail, which is located on the west side of Highway 99. The Discovery Trail is largely unpaved and has some connectivity issues. Discovery Trail also faces some challenges at locations where the pathway intersects major roads such as Industrial Way and Commercial Way.





Figure 5: Map of Existing Sidewalks, Pathways and Trails





- ▶ **Barriers.** There are several major crossings which act as barriers for people walking and cycling, including Highway 99, the railway corridor, as well as major intersections.
- ▶ **Support Programs** The District has undertaken and supported several policy and program initiatives to facilitate walking in the community including, Safe Routes to School, Be Bright at Night and the Rail Crossing Safety Program.

### 2.2.1.2 Public Input

Through input that was received from residents and stakeholders throughout the development of the Active Transportation Plan, a number of key issues for walking were identified. The key themes are summarized below:

- ▶ **Lack of sidewalks** was identified as making it difficult for people to travel along busy streets with high traffic volumes, such as Government Road and Loggers Lane. The lack of sidewalks can be especially challenging for people pushing strollers and with those with mobility issues. A lack of sidewalks was also noted as an issue at locations near and adjacent to schools.
- ▶ **Insufficient lighting** along major pathways, such as portions of Corridor Trail and the Discovery Trail, and streets such as Depot Road, Westway Avenue, and Highlands Way was a concern for many residents. Poor lighting left respondents feeling concerned for their personal safety and unsafe due to limited visibility and not being able to follow the trail.
- ▶ **Limited direct routes to destinations in Squamish.** While many respondents placed high value on the number of trails and pathways throughout Squamish, they did also note that the lack of direct pedestrian routes was sometimes a barrier to walking. It was also noted that more pedestrian cut throughs could help to make routes more direct.
- ▶ **Traffic safety concerns** including issues at intersections and along major streets, were identified as a barrier to walking by a number of residents. Intersections and midblock locations along Cleveland Avenue, Garibaldi Way, Highway 99, Government Road, and Loggers Lane were identified as some of the corridors of concern.

Residents and stakeholders identified a number of opportunities for improving walking in Squamish, including:

- ▶ **Providing more sidewalks** on streets with high vehicle volumes, and where vehicles are travelling at high speeds and adjacent to schools. It was also noted that some residents would like to see speed limits reduced on local streets.
- ▶ **Improving lighting** on pathways and streets to improve visibility and safety after dark.
- ▶ **Enhancing pedestrian cut throughs** as ways to provide more direct pedestrian routes.
- ▶ **Enhancing trails and pathways** was as a top priority of survey respondents. Maintenance and lighting, in particular, came up quite often, as did providing better connections and wayfinding to trails and better treatments at locations where off street pathways intersect with major roads.
- ▶ **Increasing amenities at bus stops.** Providing more pedestrian amenities at bus stops such as shelters, benches, route information and timetables can help to enhance the experience taking transit and more trips by sustainable modes.

## 2.2.2 Cycling in Squamish

Cycling can be an attractive transportation option, as it is convenient, low cost, and for shorter trips can be a practical alternative to the motor vehicle. Cycling is already a popular activity in Squamish for both residents and visitors. A variety of factors influence an individuals' decision to bicycle, such as neighbourhood characteristics, the quality of the bicycle infrastructure, distance between destinations, and personal preference. The bikeability of a neighbourhood is influenced by a variety of built environment features such as network infrastructure, transportation infrastructure, land-use mix, connectivity, and traffic volumes.

### 2.2.2.1 Existing Infrastructure

- **Bicycle Network.** Squamish's bicycle network is made up of a variety of both on-street and off-street infrastructure, including painted bicycle lanes, shared use lanes, as well as paved and unpaved multi-use pathways (as shown in **Figure 6**). There are nearly 45 km of on-street bicycle routes within Squamish (as shown in **Table 2**).

**Table 2: Existing Bicycle Routes by Facility Type**

Bicycle Facility	Km
Bicycle Lane	18
Bicycle Lane (Highway)	26
Shared Use Lane	1
Corridor Trail	6
Discovery Trail	4
Other Trails	636





Figure 6: Existing Bicycle Routes in Squamish



### 2.2.2.2 Public Input

Through input that was received from residents and stakeholders throughout the development of the Active Transportation Plan, a number of key issues for cycling were identified. The key themes are summarized below:

- ▶ **Lack of dedicated on street bicycle infrastructure.** Similar to walking, the number of trails and multi-use pathways in Squamish is an asset; however, there were a number of comments that stated that more direct on-street routes could help to improve network connectivity and make cycling on-street more comfortable and safe.
- ▶ **Insufficient lighting,** particularly along the Discovery Trail, portions of the Corridor Trail, and along streets such as Government Road, Depot Road, Westway Avenue and Highlands Way. Poor lighting was a concern for many residents, as it left respondents feeling concerned for their personal safety and unsafe due to limited visibility and not being able to follow the trail.
- ▶ **Narrow bicycle lanes and shoulders** were identified by many as a concern on streets such as Government Road. This is particularly an issue at times when vehicles encroach into bicycle lanes or shoulders and when people may be walking in this space due to a lack of sidewalks.
- ▶ **Traffic safety concerns** particularly along major corridors and at intersections was an important issue identified. Safety concerns at intersections and when travelling along streets such as Cleveland Avenue, Garibaldi Way, Buckley Avenue, Valley Drive and Loggers Lane were some of the top locations identified.
- ▶ **Attitudes and behaviours** of all road users was identified through resident and stakeholder feedback as a concern. Parking motor vehicles and leaving garbage bins in bicycle lanes and the aggressive behaviour of some cyclists were identified as issues.
- ▶ **Maintenance and debris** concerns indicate the importance of ensuring that existing bicycle routes and pathways are well maintained and clear of snow and debris was identified as a key priority.

Based on feedback from the survey and public consultation, opportunities to improve cycling including:

- ▶ **Improving network connectivity** to provide more east-west connections over the highway and improved north-south routes was flagged as an opportunity for improving connectivity
- ▶ **More dedicated on street bicycle infrastructure** that provide direct routes to key destinations was identified as an opportunity for improving cycling in Squamish.
- ▶ **Improved lighting** on pathways and streets to enhance visibility after dark would help to improve safety and comfort along many of Squamish's bicycle routes.
- ▶ **Enhancing, maintaining and connecting trails and pathways** such as the Corridor Trail, Discovery Trail and neighbourhood pathways was identified as an opportunity.
- ▶ **Provide more education and enforcement** for both cyclists and drivers on the rules of the road, existing bylaws and how different types of infrastructure should be used by all road users.





## 3.0 VISION AND GOALS



A vision for the Squamish's Active Transportation Plan was developed based on feedback received from residents and stakeholders, and based on the direction from key District documents including the Council Strategic Plan 2015 – 2018 (2016 Update) and the OCP. The vision for Squamish's Active Transportation Plan emphasizes Squamish's role as a vibrant seaside mountain community, with an all ages and abilities walking and cycling network that support the development of a socially, economically and environmentally sustainable community that welcomes residents and visitors. Reflecting these themes, the vision for the Active Transportation Plan is shown below:

*"Squamish is a community where residents and visitors of all ages and abilities can walk and cycle safely and comfortably to all areas of the community.*

*Squamish has developed an active transportation network and programs through leadership and effective partnerships that contributes to the community's social integrity, economic development, health and environmental sustainability."*

In support of the above vision, the Active Transportation Plan has four goals that are intended to provide clear direction to help achieve the vision identified above. Each of the following four goals relate to the goals of the OCP and the Council Strategic Plan 2015 – 2018 (2016 Update).

- ▶ **Goal #1: Build a Culture for Active Transportation**
- ▶ **Goal #2: Make Considerations for Active Transportation through all Infrastructure Projects**
- ▶ **Goal #3: Encourage more Walking and Cycling Trips**
- ▶ **Goal #4: Safe and Accessible Walking and Cycling**

More information about each of these goals is outlined in the **Phase 1 Discussion Paper**. How these goals can be monitored and how they relate to each of the Strategies, Directions and Actions are discussed in detail in the section of the Plan that discusses **Implementation**.



## 4.0 STRATEGIES AND ACTIONS



This section outlines a number of recommendations to improve the safety and comfort of walking and cycling in Squamish. The recommendations in this section have been organized into five key Strategies as shown below. Within each Strategy, the Active Transportation Plan includes a number of more specific Directions and subsequent Action items. The purpose of these Actions is to address a variety of identified strengths and opportunities, challenges and concerns with active transportation infrastructure, policies and standards, and support programs. The implementation of these different Actions will work towards achieving the vision and goals of the Active Transportation Plan.

Strategy 1:		Connectivity
Strategy 2:		Safety and Security
Strategy 3:		Maintenance and Accessibility
Strategy 4:		Growth and Amenities
Strategy 5:		Education and Awareness

## STRATEGY 1: CONNECTIVITY

Providing a complete and interconnected network of walking and cycling facilities is a fundamental part of making active transportation a convenient and attractive travel option in Squamish. As noted above, the District has an existing network of sidewalks, multi-use pathways and trails, and bicycle lanes that provide on- and off-street routes for active transportation. The purpose of this Strategy is to build off of the existing infrastructure that Squamish has today to enhance the connectivity of Squamish's network of pedestrian and bicycle routes. Through the implementation of new routes and enhancements to existing infrastructure, the District can work to improve comfort and safety for users of all ages and abilities. The recommended Directions and Actions identified in this Strategy build off of the directions outlined in Squamish's plans and policies, Council direction, and feedback from residents and stakeholders. In recent years, the District has been focusing investments on providing more walking and cycling infrastructure that improves comfort and safety as a way to promote more commute trips by walking and cycling. The focus of the long-term Active Transportation Plan is on encouraging more walking and cycling for transportation purposes, it also recognizes how important recreational activities, including mountain biking and trail riding, are in Squamish. As a result, an important focus of the network plan is to provide on-street routes that provide direct connections to important community destinations and recreational facilities throughout Squamish. This has been done by taking into consideration population density (**Figure 2**) and the destinations they are travelling to, recognizing that these routes should have the highest quality infrastructure, such as separated bicycle lanes. To help enhance network connectivity the District should ensure that Complete Streets designs are considered in all new development and road projects. More details about Complete Streets and corresponding actions are included under **Strategy 4: Growth and Amenities**.

Four Directions associated with **Connectivity** have been identified to expand the network of walking and cycling infrastructure in Squamish:

- ▶ Direction 1A: Expand and Enhance the Sidewalk Network
- ▶ Direction 1B: Expand and Enhance the Bicycle Network
- ▶ Direction 1C: Enhance North-South Connectivity for Walking and Cycling
- ▶ Direction 1D: Enhance East-West Connectivity for Walking and Cycling

These Directions and the Actions associated with them are described in more detail below.

## Directions and Actions

### Direction 1A: Expand and Enhance the Sidewalk Network

There are a number of different types of pedestrian infrastructure that offer a range of comfort levels for people walking or using mobility aids to travel around Squamish. As seen in **Figure 7**, this type of infrastructure can range from off-street pathways, either exclusively for pedestrians or for multiple users, to sidewalks, and paved shoulders. Pedestrian facilities can range in width, and are often wider in locations where demand is high, such as downtown and commercial areas. Standard sidewalks in Squamish are concrete with a curb, and typically range in width from 1.5 to 1.8 metres. Within the downtown core and on major commercial streets, they are often wider (minimum 3.0 metres). Other types of pedestrian infrastructure include unpaved sidewalks or pathways located at the side of the street, although these can be problematic for people with mobility issues. The purpose of this Direction is to identify Actions that will expand and enhance the network in Squamish for people walking or using mobility aids.

**Figure 7: Pedestrian Facility Examples**





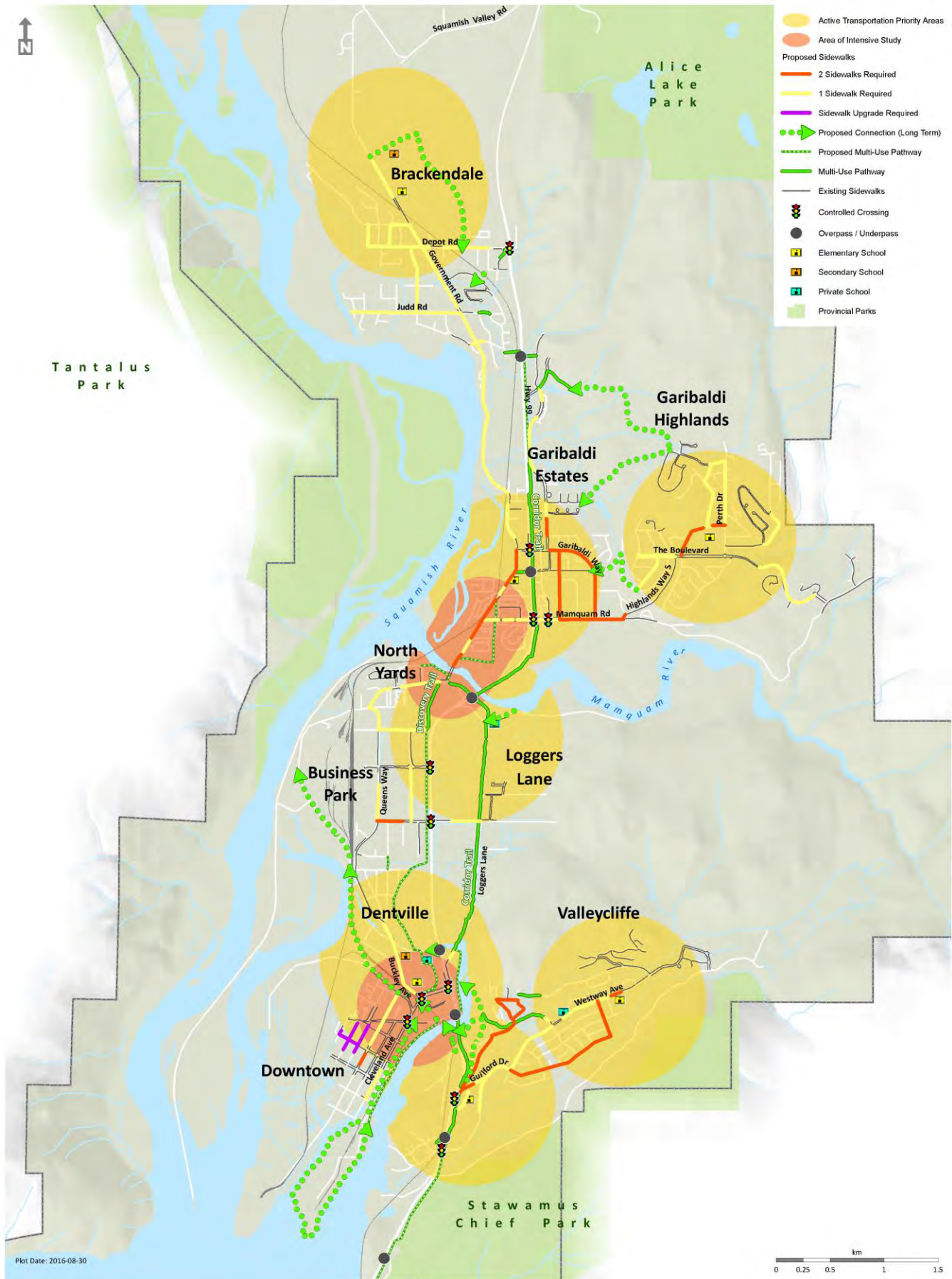
- **ACTION 1A.1: Increase sidewalk coverage on major routes and connections to key destinations, such as schools and businesses.** There are a number of streets in Squamish that have sidewalks on one or both sides of the street; however, the majority of streets do not have any sidewalks at all. On many of these streets, however, paved shoulders are common. In most cases, these paved shoulders become a shared space for people walking and people cycling. On local roads and streets with lower vehicle volumes and speeds, a shared shoulder can be an appropriate facility for people walking; however, on higher volume roads, sidewalks or some type of physical separation between people walking and moving vehicles may be required. This Action recommends that additional sidewalks or other types of pedestrian infrastructure be provided on major streets, streets adjacent to schools, businesses, and streets that are serviced by transit. **Figure 8** identifies the locations in Squamish where additional sidewalk or pedestrian infrastructure are recommended, including 3<sup>rd</sup> Avenue, Government Road, Buckley Avenue, Westway Avenue, and Depot Road.



In addition to the proposed sidewalk network, the map below also identifies a number of other features and important considerations for walking in Squamish.

- **Areas of Intensive Study** – These areas have been identified as locations within Squamish where further study is required. They have been identified as important walking connections to key destinations, but which are also areas where there are a number of different factors that need to be considered before identifying a proposed solution. Some examples of these factors include, development opportunities, planned infrastructure work, important destinations, existing driveways and ongoing discussions with other agencies. Two areas have been identified and include: Mamquam Bridge and the surrounding area and the gateway into downtown Squamish, including Pemberton Avenue, Cleveland Avenue and Buckley Avenue.
- **Active Transportation Priority Areas** – These areas are within close walking and cycling distance to schools within Squamish (800 metres). The District is currently actively participating in Active and Safety Routes to School programming and has identified active transportation infrastructure improvements around schools as a priority.
- **Connections to and within downtown and other commercial destinations.** A major focus of the proposed sidewalk network is to provide better connections to downtown Squamish and other key commercial retail and employment areas in the District.

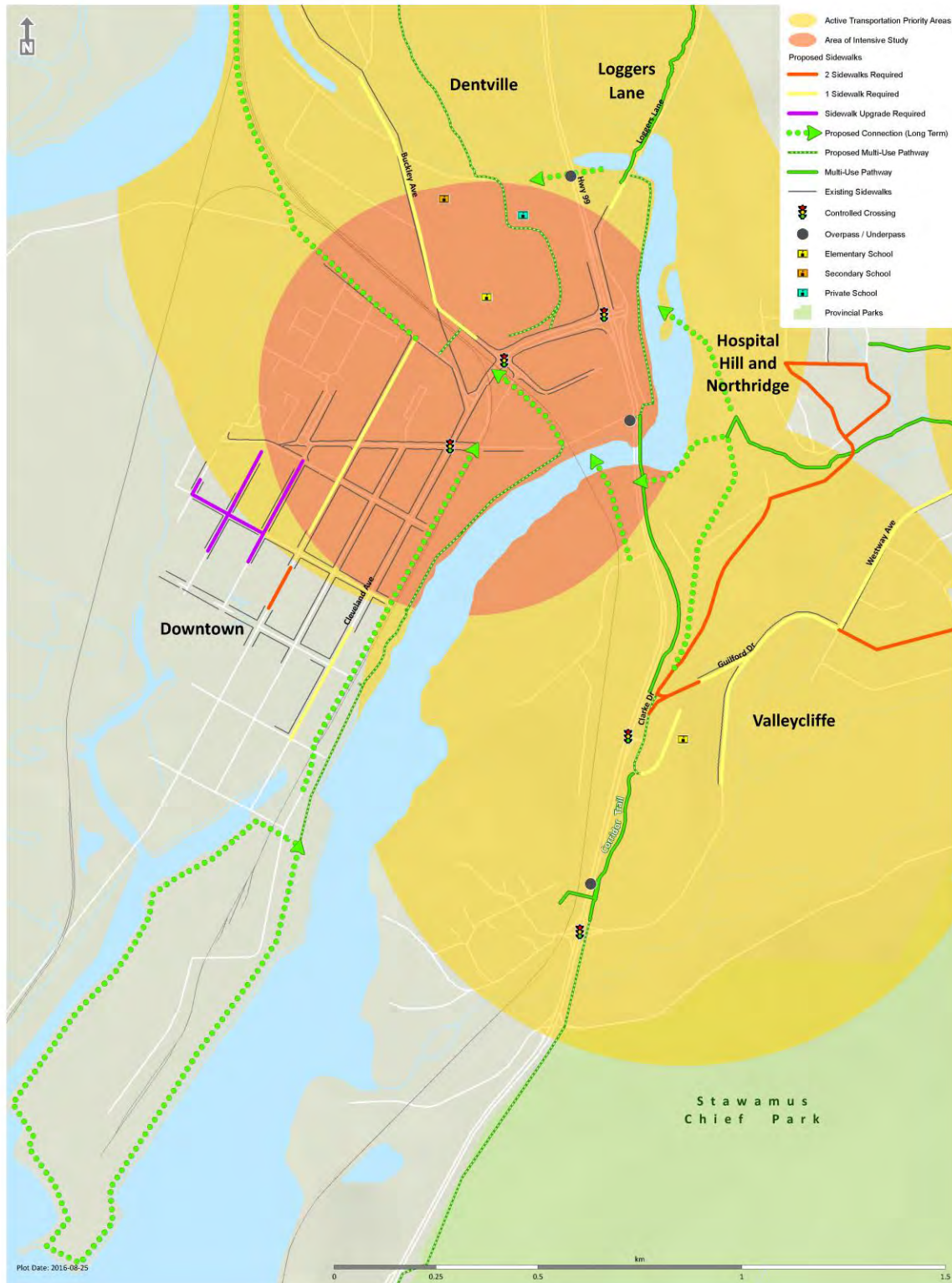
Figure 8: Proposed Sidewalk Network





- **ACTION 1A.2: Upgrade or replace sidewalks that have not been maintained (downtown).** Within Downtown Squamish, there are a number of sidewalks that have not been not well maintained and are in poor condition. Many of these sidewalks are quite far setback from the street and are not used frequently because they are not well connected or visible. These sidewalks are located in a cluster on portions of Victoria Street, 5<sup>th</sup> Avenue, and 4<sup>th</sup> Avenue (as shown in **Figure 9**). It is recommended that the District work to replace these sidewalks to enhance the downtown pedestrian network, ensuring that upgrades provide curb letdowns and connections to intersection crossings to improve accessibility.

**Figure 9: Proposed Sidewalk Upgrades**



- ▶ **ACTION 1A.3: Seek opportunities to implement new sidewalks in conjunction with other projects, plans or developments.** The District should ensure considerations for pedestrian infrastructure are made through the design and implementation of all infrastructure projects within Squamish. This includes new road projects as well as other infrastructure projects that may be able to provide additional pedestrian infrastructure to the active transportation network. This will require the cooperation and integration of different District departments as well as external partners to work collaboratively and share information looking for opportunities to incorporate different components of the Active Transportation Plan where appropriate.

## Direction 1B: Expand and Enhance the Bicycle Network

Cities across North America are increasingly focusing on expanding their bicycle networks as a key strategy to increase levels of cycling. Providing a complete and interconnected network of bicycle routes throughout Squamish is critical to supporting and encouraging more cycling. It is important that bicycle routes are direct and that they provide connections to key destinations within the community. Providing direct routes that connect to key destinations will ensure that cycling travel times are competitive with automobiles. Expanding and enhancing Squamish's bicycle network will require a combination of strategies, ranging from upgrading existing routes to addressing safety concerns, connecting gaps, and providing safe and comfortable bicycle routes. The District should also ensure that Complete Streets designs are considered in all new development and road projects. Complete Streets Policies aim to provide a range of transportation options, including transit, biking, walking and driving an automobile, along a street that is safe and comfortable for all road users. More details about Complete Streets and corresponding actions are included under **Strategy 4: Growth and Amenities**.

Expanding and enhancing the walking and cycling networks will require operating and maintenance budget increases for items such as snow clearing, vegetation management as well as signage and enforcement by Bylaw and RCMP.

- ▶ **ACTION 1B.1: Provide a complete, connected bicycle network through a phased implementation plan.** Developing a complete and connected network of bicycle routes for all users is an important component for encouraging more cycling over the long-term. **Figure 10** presents the long-term recommended bicycle network for Squamish. A well-designed cycling network needs to be visible, intuitive, and provide links between destinations and neighbourhoods. A cycling network should ideally be designed to serve users of all ages and abilities, offering practical route options for those who are interested in cycling, but may not be comfortable riding on busy streets with high traffic volumes and speeds. The network should also provide district-wide coverage, ensuring that all residents are within close proximity to a designated bicycle facility (**Figure 12**). In addition, the network should provide direct routes to key destinations such as downtown Squamish, commercial destinations and community facilities. By developing a complete network in order to make cycling a competitive and viable transportation option. Finally, an important component of improving the connectivity of the bicycle network is ensuring that existing routes are high quality and are well integrated into the proposed network. A key focus of the Active Transportation Plan is to identify opportunities to enhance existing infrastructure to improve comfort, safety and accessibility, such as along the Government Road corridor.

Like the proposed sidewalk network, the map below also identifies a number of other features and important considerations for cycling in Squamish.

- **Areas of Intensive Study** – These areas have been identified as locations within the District where further study is required. They have been identified as important cycling connections to key destinations, but



are also areas where there are a number of different factors that need to be considered by staff before identifying a proposed solution. Some examples of these factors include, development opportunities, planned infrastructure work, important destinations, and ongoing discussions with other agencies. Two areas have been identified and include: Mamquam Bridge and the surrounding area and the gateway into downtown Squamish, including Pemberton Avenue, Cleveland Avenue and Buckley Avenue.

- **Active Transportation Priority Areas** – These areas are within close walking and cycling distance to public schools within Squamish (800 metres). The District is currently in the process of reviewing active travel to schools through the School Travel Planning process and has identified active transportation infrastructure improvements around schools as a priority.
- **Upgrading Existing Facilities** – These are streets with existing cycling infrastructure that can be upgraded to enhance comfort, safety and connectivity. Several routes have been identified for upgrades, including:
  - Corridor Trail (Lighting)
  - Westway Avenue
  - Government Road Corridor
  - Mamquam Road

Upgrades include installing higher quality bicycle facilities such as protected bicycle lanes on routes with existing bicycle lanes, providing additional signage, repainting line work, adding more stencils and bylaw enforcement.

The proposed long-term bicycle network, as seen in **Figure 12**, will ensure the vast majority of residents living in Squamish are within 400 metres of a dedicated bicycle route.

- **Connections to and within downtown and other commercial destinations.** A major focus of the proposed bicycle network is to provide better cycling connections and high quality facilities on routes with access to downtown Squamish and other key commercial retail and employment areas in the District. Protected bicycle lanes have been proposed on 3<sup>rd</sup> Avenue and Pemberton Avenue within downtown Squamish, and they have been identified as short-term priorities.

Figure 10: Proposed Bicycle Network

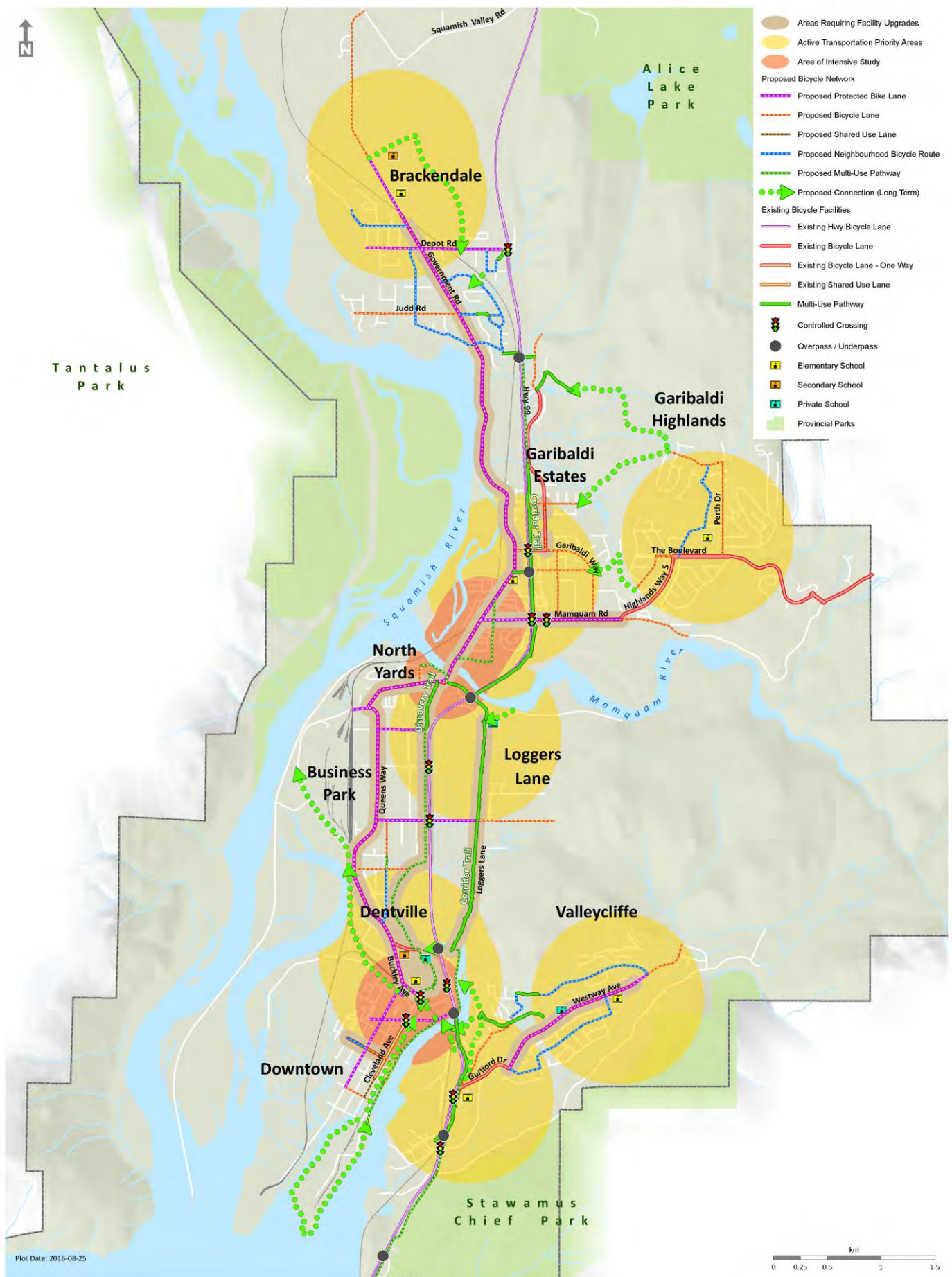




Figure 11: Proposed Bicycle Network (Downtown)

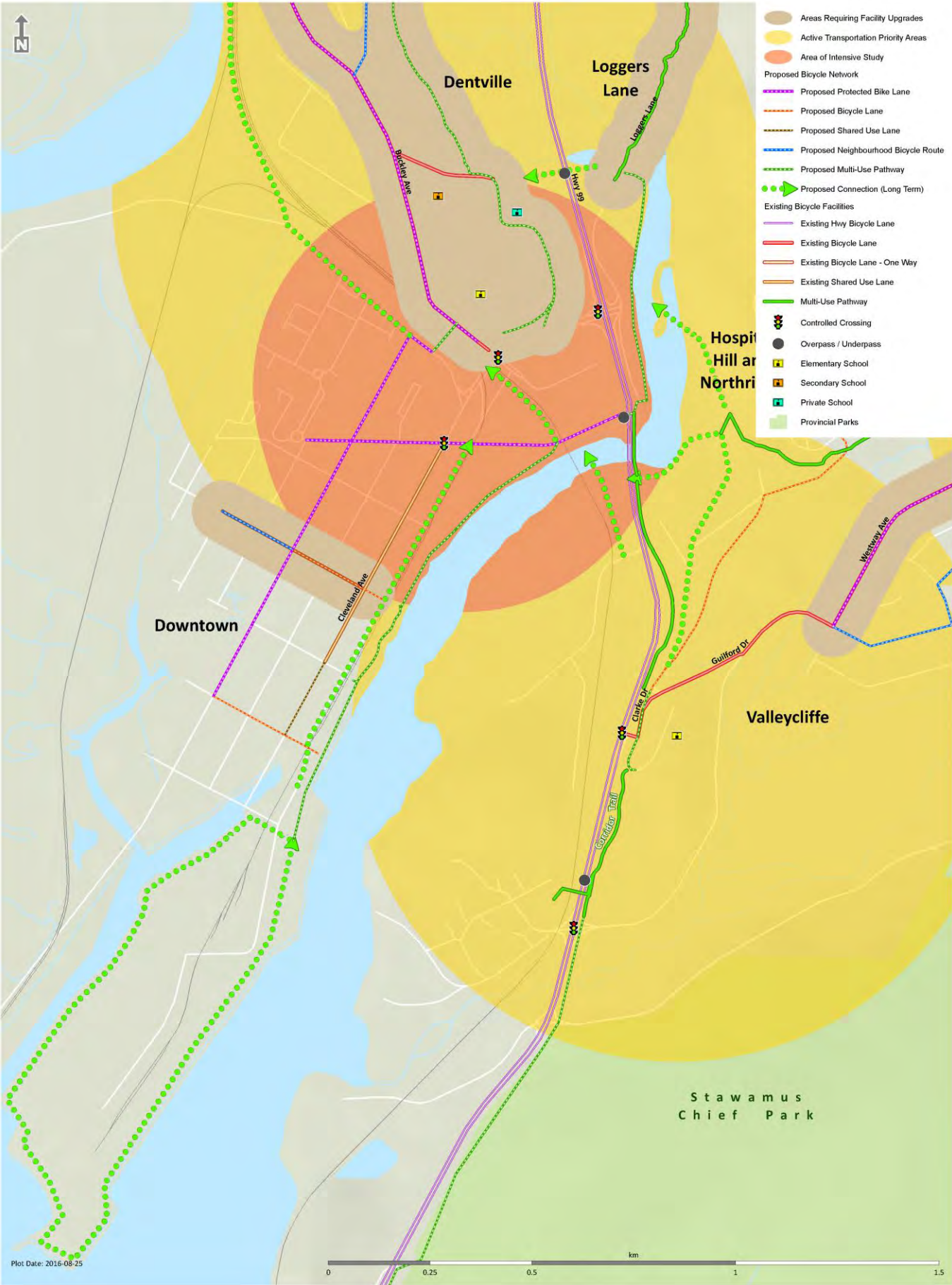
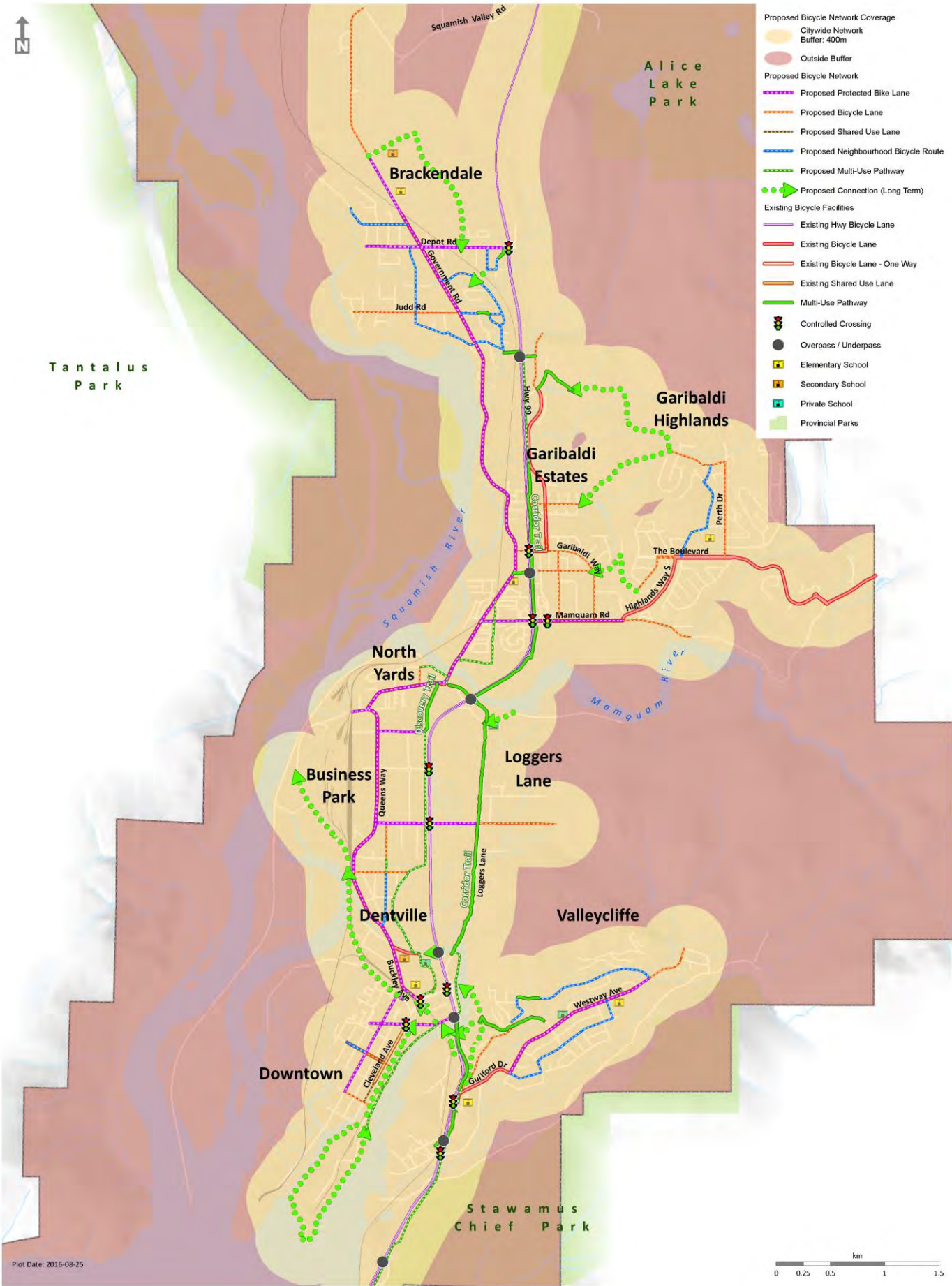




Figure 12: Proposed Bicycle Network Coverage





- **ACTION 1B.2: Aim to provide high quality, safe and comfortable bicycle infrastructure.** As shown in **Figure 10**, the proposed bicycle network includes a range of bicycle infrastructure that provides different levels of comfort and physical separation. Many cities within Canada and internationally have been moving towards providing bicycle infrastructure that is comfortable and attractive for a broad array of users, such as children and seniors and part of a complete street. An 'All Ages and Abilities' (AAA) bicycle route is intended to be suitable for persons ranging in age from children to elderly (aged 8 to 80), and is comfortable to use for most bicycle users regardless of their ability and experience.

Research conducted by the UBC Cycling in Cities Program suggests that three types of bicycle infrastructure in particular are most effective at increasing ridership: off-street pathways, protected bicycle lanes and neighbourhood routes. This type of infrastructure is the most effective because it is the most preferred type of infrastructure by users, it also tends to be the safest type of infrastructure.

While collisions involving motor vehicles and active transportation users are discussed in more detail under **Strategy 2: Safety and Security** it is important to reiterate how important considering cycling safety is when designing infrastructure for bicycle facilities. While intersections are often considered the location of greatest potential conflict between road users, it is also important to consider safety concerns at mid-block locations. Doorings for example, occur when bicycle users are struck by or strike a door of a parked motor vehicle, typically on the driver side. The City of Vancouver Cycling Safety Study found that Doorings were the most common type of reported cycling collision in the City of Vancouver, representing approximately 15.2% of all reported cycling collisions. Providing enough space and physical separation between parked vehicles and people cycling is key to providing a safe network, this can be done by designing and installing high quality bicycle facilities.

The long-term bicycle network for the District of Squamish includes a combination of different infrastructure types, including both AAA routes and non-AAA routes. Wherever feasible within Squamish, AAA routes have been recommended. A description of each of the infrastructure types proposed in the long-term network as well as the level of comfort they provide has been summarized below:

- **Multi-use pathways**, which are sometimes referred to as off street pathways, are physically separated from motor vehicles. In many cases, pedestrians, cyclists and other users may share the same travel space. Multi-use pathways can be paved or unpaved; however, paved is often preferred to ensure that the pathway is accessible to all users. In Squamish, Corridor Trail is the most well-known multi-use pathway and the best example for future pathways in Squamish. Proposed enhancements and additions to the multi-use pathway network will benefit all forms of active transportation and provide a comfortable and accessible facility for users of all ages and abilities. Multi-use pathways are an effective facility on roads where right-of-way is available either parallel to a major roadway, within a park, or along a railway corridor. Many of the proposed multi-use pathways identified in the long-term network are already unpaved existing trails. The Active Transportation Plan recommends that these trails be upgraded to paved multi-use pathways with lighting.
- **Protected bicycle lanes** are physically separated from motor vehicle travel lanes but are located on-street within the roadway surface. Protected bicycle lanes combine the benefits of increased comfort offered by off-street pathways due to their separation from motor vehicle traffic, with the benefits of route directness provided by on-street routes. There are many types of protected bicycle lanes, offering varying types of

treatments to provide protection. Types of separation include: concrete barriers, elevation, bollards, parked cars, visual surface treatments such as pavers, and painted buffers (**Figure 13**). Protected bicycle lanes are also separated from the sidewalk, facilitating separation between cyclists and pedestrians as well.

**Figure 13: Types of Protected Bicycle Lane Separation**



The increased comfort offered by protected bicycle lanes plays a significant role in increasing bicycle ridership, particularly among the interested but concerned demographic. This demographic includes individuals who are interested in cycling, but may not be comfortable riding on busy streets with high traffic volumes and speeds. They are an effective way to have people of all ages and abilities cycle on busier streets and have been proven to increase bicycle ridership in other cities. Currently, the District of Squamish does not have any protected bicycle lanes. Protected bicycle lanes have been proposed on a number of streets within Squamish including, Pemberton Avenue, Depot Road, Mamquam Road and along the Government Road Corridor, as seen in **Figure 10**. Protected bicycle lanes have also been proposed along 3<sup>rd</sup> Avenue downtown, though it is important to note that while 3<sup>rd</sup> Avenue has been identified in **Figure 10** as part of the proposed network, the results of the Downtown Truck Route study which is currently underway could see the route moved to another road downtown such as 2<sup>nd</sup> Avenue.

- **Neighbourhood routes**, also known as Bicycle Boulevards or Neighbourhood Bikeways, refer to shared bicycle routes located on streets with low traffic volumes and speeds and that have been optimized to varying degrees to prioritize bicycle traffic. In cases where the existing streets have relatively low traffic volumes and speeds, the only improvements required may be signage and pavement markings identifying the road as a bicycle route, and enhancements to crossings where the neighbourhood route intersects with major roads. However, they can and should be further enhanced with traffic calming measures such as speed humps, traffic circles and traffic diverters if volumes and speeds are higher.

Currently the District does not have any examples of neighbourhood routes. A number of corridors have been identified as potential neighbourhood routes including Dryden Road, Britannia Avenue and Eagle Run Drive.

It is important to note that as part of a complete and connected bicycle network that meets the needs of all users, there is still a place for all types of bicycle infrastructure, including non-AAA routes such as painted bicycle lanes, shoulder bikeways and shared use lanes.



- **Bicycle lanes** and **paved shoulders** help to define the road space for bicyclists and motorists. It is important to note that a conventional bicycle lane is rarely considered an all ages and abilities bicycle facility. Bicycle lanes can also have a painted buffer, which can be located between the bicycle lane and moving vehicles or between bicycle lanes and parked vehicles. Buffered bicycle lanes are believed to be more comfortable than conventional painted bicycle lanes despite not providing physical separation. Painted buffers can also provide additional space and enhanced safety for people cycling when they are located on routes that accommodate vehicles parked parallel to the bicycle lane to avoid. The buffer can provide additional space so that people cycling can avoid colliding with opening vehicles doors, either on the driver or passenger side depending on the design. Bicycle lanes and paved shoulders are currently the most common type of bicycle infrastructure in Squamish. As an example, they are currently located along the Government Road Corridor and Tantalus Road to name a few.
- **Shared Use Lanes** involve the use of sharrows as road markings to indicate a shared lane environment between bicycles and automobiles. Shared use lanes are not considered an attractive facility type for most bicycle riders, as they do not provide exclusive space for users. As such, shared use lanes are not considered an all ages and abilities facility and should be avoided except in situations where space is constrained. As an example, shared use lanes are currently located on Cleveland Avenue and Victoria Street in downtown Squamish.

- **ACTION 1B.3: Develop and adopt bicycle infrastructure design guidelines for the District.** The District of Squamish should develop design guidelines for bicycle infrastructure based on national and international best practices within District Bylaws. These guidelines should focus on designing high quality bicycle routes, both on-street and off-street, including routes for people of all ages and abilities, as well as crossing treatments. These guidelines can also include recommendations for facility type selection based on the characteristics and context of a given street.

Bicycle infrastructure design is a rapidly evolving field, and there are a number of different national and international guidelines currently available and new guidelines and updates are constantly being developed. The Transportation Association of Canada (TAC) is currently working on updating their guidelines for bicycle infrastructure. Other bicycle infrastructure design documents from North America include the NACTO Urban Bikeway Design Guide and Vélo Quebec Planning and Design for Pedestrians and Cyclists, and leading international guidelines have been developed in Denmark (Collection of Cycle Concepts) and the Netherlands (CROW Design Manual for Bike Traffic). The District should consider developing their own set of bicycle facility design guidelines to ensure all new infrastructure is designed to constant standards.

- **ACTION 1B.4: Seek opportunities to implement bicycle infrastructure in conjunction with other capital projects, plans or developments.** The District should ensure considerations for bicycle infrastructure are made through the design and implementation of all infrastructure projects within Squamish, through the land-use application process and through Development Cost Charges. This includes all new road projects, but also other infrastructure projects that may be able to provide additional pedestrian infrastructure to the active transportation network. This includes considering complete streets.

## Direction 1C: Enhance North-South Connectivity

- ▶ **ACTION 1C.1: Enhance north/south connectivity for walking and cycling.** Squamish residents, stakeholders, and Council have identified enhancing north-south active transportation routes as a priority of the Active Transportation Plan. Currently, three corridors provide north-south connections: the Government Road Corridor, Corridor Trail, and Discovery Trail. It is difficult to compare these corridors directly because they each have different existing conditions, vary in facility type, and service different neighbourhoods within Squamish. Below is a brief description of each of the corridors. More details about the proposed enhancements, cost estimates and recommendations for implementation and prioritization can be found in **Section 5.0**.

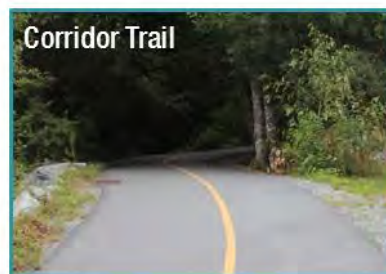
### Government Road Corridor

#### Existing Conditions

- ▶ Over 8 km in distance.
- ▶ Connects Brackendale to downtown.
- ▶ Has an existing bicycle facility (painted bicycle lanes).
- ▶ Much of the corridor does not have sidewalks.
- ▶ Provides direct access to a number of destinations including schools, businesses and downtown.

#### Proposed Enhancements

- ▶ Upgrade Government Road corridor, where possible, to an AAA route with protected bicycle lanes providing physical separation between people walking and cycling and motor vehicles. It is important to note that this may require the removal of on street parking at some locations along the corridor.
- ▶ Provide additional sidewalks on both sides of the street.
- ▶ Improve access to schools and other destinations with high pedestrian activity including economic hubs.





- ▶ Conduct a feasibility study to provide an AAA crossing over Mamquam River. Some possible options to be considered for additional study could include:

- Widening the existing deck structure;
- Add a new pathway to the side of the existing bridge structure; and/or
- Provide a new active transportation bridge adjacent to the existing structure

The feasibility of the options noted above would need to be assessed by a structural engineer in more detail. Considerations should be made to ensure that any new infrastructure is wide enough to accommodate both people walking and cycling, a minimum width of 3 metres.

- ▶ Providing ongoing public engagement with residents and stakeholders, particularly those that live adjacent to the Government Road Corridor, to discuss the impacts of implementation, including the effects on parking and driveway access.
- ▶ Consider implementing sections of the Government Road Corridor in phases focusing on prioritizing locations within close proximity to schools. Priority improvement areas include, the Government Road Corridor between Mamquam River Bridge and Garibaldi Way or along Buckley Avenue from Magee Street to the crossing at 3<sup>rd</sup> Avenue.

### Corridor Trail

#### **Existing Conditions**

- ▶ Over 7 km in distance.
- ▶ Located on the east side of Highway 99 and runs parallel to the Highway.
- ▶ Is an existing paved multi-use pathway.
- ▶ Mostly separated from vehicle traffic, except at intersection locations and at locations where there are gaps in the route, such as along Clarke Drive.
- ▶ Portions of the pathway are lit.

#### **Proposed Enhancements**

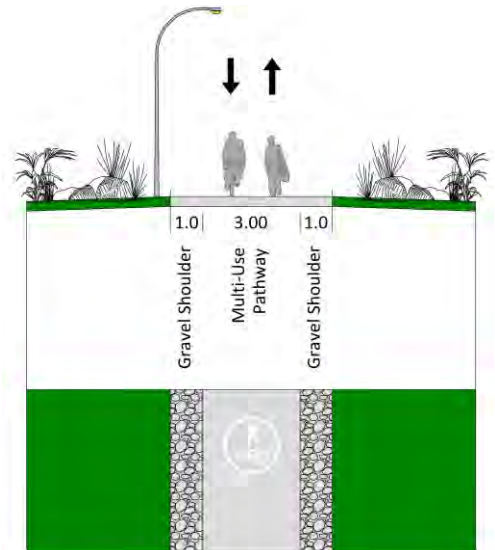
- ▶ Fill in gaps in the existing pathway corridor.
- ▶ Enhance treatments at intersection crossings to make trail users more visible to other road users and ensure that intersections are comfortable and accessible for all users.
- ▶ Provide lighting along the entire length of the corridor.
- ▶ Straighten and improve sightlines at some sections.
- ▶ Add wayfinding and signage.
- ▶ Provide better connections to the rest of the District's bicycle network (east-west connectivity).

### Discovery Trail

## Existing Conditions

- ▶ Over 3 km in distance.
- ▶ Located on the west side of Highway 99.
- ▶ Runs from just south of Mamquam River to downtown (Cleveland Avenue).
- ▶ Currently is an unpaved informal pathway.
- ▶ Mostly separated from vehicle traffic except for a few short sections in Dentville and at intersections.
- ▶ Street crossings are a challenge at several locations where it intersects with the road network (Industrial Way and Commercial Way).
- ▶ Currently Discovery Trail is used largely for recreational purposes, however there are a number of residents that use it as a key north south route. As enhancements are made to the corridor such as those proposed below, Discovery Trail will become a more appealing commuter route as it connects the business park with downtown Squamish.

Figure 14: Discovery Trail Concept



## Proposed Enhancements

- ▶ Pave and widen the pathway (as shown in **Figure 14**)
- ▶ Provide lighting.
- ▶ Address intersection conflicts at Commercial Way and Industrial Way.
- ▶ Add wayfinding and signage.

At Public Event #2 on March 12, 2016, participants were asked to identify which corridor they would prioritize for improvement, recognizing that each of these corridors would require significant capital investments to enhance. While each of the three corridors received votes, providing additional lighting to Corridor Trail was identified as the top priority. Many participants noted that this was because it is already a great facility and with some additional lighting it could be made better. Since this facility was already well used and mostly complete, enhancing it further was preferred over prioritizing enhancements to the two other options.

As noted above, additional details about the proposed enhancements, cost estimates and prioritization strategies for north-south connectivity can be found in **Section 5.0** and **Appendix B**. The Active Transportation Plan recommends prioritizing the enhancements to the Corridor Trail to enhance north-south connectivity within Squamish. Locations along Government Road have also been identified as higher priority improvements particularly at locations adjacent to schools and other high activity locations. The enhancements to Discovery Trail have been identified as a lower priority to enhance north-south connectivity though all three corridors are important components of the long-term Active Transportation Plan.



## Direction 1D: Enhance East West Connectivity

- ▶ **ACTION 1D.1: Enhance east/west connectivity for walking and cycling.** As north-south connections were identified as a key component of the active transportation network having a network of high quality east-west running routes that connect to the north-south routes is equally important. A number of east-west running corridors have been identified as routes with proposed protected bicycle lanes, including:

- Finch Drive
- Pioneer Street
- Mamquam Road
- Garibaldi Way
- Depot Road
- Pemberton Avenue

## Connectivity: Summary of Actions

The Actions that have been developed to improve active transportation **Connectivity** are summarized below:

- ▶ 1A.1: Increase sidewalk coverage on major routes and connections to key destinations, such as schools and businesses.
- ▶ 1A.2: Upgrade or replace sidewalks that have not been maintained (downtown).
- ▶ 1A.3: Seek opportunities to implement new sidewalks in conjunction with other projects, plans or developments.
- ▶ 1B.1: Provide a complete and connected bicycle network through a phased implementation plan.
- ▶ 1B.2: Aim to provide high quality, safe and comfortable bicycle infrastructure.
- ▶ 1B.3: Develop and adopt bicycle infrastructure design guidelines for the District.
- ▶ 1B.4: Seek opportunities to implement bicycle infrastructure in conjunction with other capital projects, plans or developments.
- ▶ 1C.1: Enhance north/south connectivity for walking and cycling.
- ▶ 1D.1: Enhance east/west connectivity for walking and cycling.

## STRATEGY 2: SAFETY AND SECURITY

Safety, both real and perceived, is an important factor influencing whether people choose to walk or bike for transportation. People walking, biking and using other types of active transportation are considered to be ‘vulnerable road users’ as they are subject to a higher risk of serious injury than drivers and transit users. Safety and security is influenced by a number of different factors including the prevalence and speed of automobiles, the existing network, and the different types of barriers that make walking and cycling difficult. Safety and the perception of safety can vary user to user, and depend significantly on the level of comfort different types of infrastructure offer. As a result, the Active Transportation Plan and the District recognize the importance of providing AAA infrastructure wherever possible and implementing Complete Street Standards to enhance safety and security. Providing safe, secure and barrier-free walking and cycling environments is just as important as providing features that improve connections. Three Directions have been identified to increase the **Safety and Security** of active transportation in Squamish, they include:

- ▶ **Direction 2A: Improve Road Safety**
- ▶ **Direction 2B: Address Barriers to walking and cycling**
- ▶ **Direction 3B: Improve Personal Safety**

These Directions and the Actions associated with them have been outlined in more detail below.

### Directions and Actions

#### **Direction 2A: Improve Road Safety**

Road safety is often identified as one of the key barriers that prevents people from walking and cycling more often. People walking and cycling are often identified a ‘vulnerable road users’ as they are more likely to suffer serious injuries or fatalities when involved in a collision with a motor vehicle. As a result, it is important to evaluate the current conditions that cause road safety issues and concerns within a community. By evaluating these conditions, the District can identify clearly what measures should be undertaken to create a safer environment for vulnerable road users overall. The Actions identified below focus on how the District can improve road safety.

- ▶ **ACTION 2A.1: Provide new or enhanced pedestrian crossing locations.** Special considerations for people crossing intersections by foot should be prioritized at locations where there are currently high levels of pedestrian activity or where more walking trips are anticipated. These locations include corridors that have transit, downtown Squamish and around schools and other community destinations. Enhancements should be prioritized at these locations to make it safer and more comfortable for people walking to travel through these locations to access important destinations. The District and MoTI (where applicable) should continue to work together to provide new or enhanced pedestrian crossing locations at high activity intersections throughout Squamish. Some of these enhancements can include:
  - **Crosswalks** are marked pedestrian crossings through an intersection. They are identified through the use of pavement markings and signage at some locations.
  - **Active pedestrian corridors** are pedestrian crosswalks that combine pavement markings and signage with pedestrian activated flashing beacons.



- **Pedestrian actuated signals** are traffic signals that are activated by a pedestrian pushbutton. Pedestrian actuated signals directly control through street traffic and offer stop or yield control to create a gap in traffic that facilitates crossings.
- **Pedestrian refuge islands** are placed in the street at an intersection or mid-block to protect crossing pedestrians from motor vehicles. The refuge islands make crossing the road easier by allowing people walking to cross in two stages and to deal with one direction of traffic flow at a time.
- **Curb extensions** can be provided to reduce crossing distances. Curb extensions extend the sidewalk across the curbside parking lane. Curb extensions benefit pedestrians by improving visibility and reducing crossing distances, and can offer opportunities for pedestrian amenities, such as landscaping, benches, planters, and decorative bollards. Care should be taken to ensure any pedestrian amenities do not impede accessibility of the curb extension or sidewalk.



- **Review and adjust pedestrian clearance intervals if warranted** to ensure that the time required for a person to walk across the intersection is long enough to avoid conflicting with traffic before the signal changes. Standard walking speeds may need to be adjusted to account for areas with high levels of pedestrian activity, and a greater prevalence of seniors, people with mobility issues, or children. For example, at signalized intersections near hospitals or seniors homes, schools and parks. This will require the District to work with MoTI as highway crossings are under their jurisdiction. It is important to note that MoTI's mandate is ensuring vehicle movement along the highway.
  - **Audible pedestrian signals** communicate non-visual information about when it is time to walk or not to walk for pedestrians who are blind or visually impaired at signalized intersections.
  - **Pedestrian countdown timers** provide information to pedestrians about how much time they have to cross an intersection.
- **ACTION 2A.2: Provide enhanced bicycle intersection crossings where warranted.** The critical locations along bicycle routes are where they intersect with major streets. Crossing treatments can be used to assist people cycling to cross major roads, and to minimize potential conflicts with motor vehicles. The type of crossing treatment depends on the width of the intersecting road, the volume of motor vehicle traffic, and the number of people on bicycles that are using the crossing. The District should continue to enhance District operated intersections where warranted for bicycle users and continue to work with MoTI to ensure that Highway 99 intersections are as safe as possible for people walking and cycling to cross. The following describes the treatments that can be used to enhance bicycle crossings where bicycle routes intersect arterial streets, based on the type of bicycle facility and can be considered as the District implements the long-term network plan.
- **Multi-use pathways**
    - **Pavement markings**, such as elephant's feet, can be placed on either side of the pedestrian zebra markings permitting both cyclists and pedestrians to use the same space for crossing the intersection. Cyclists are permitted to ride across the combined crossing.

Green pavement markings can also be used at these locations to designate conflict zones and areas where cyclists are travelling can be used at locations where multi-use pathways intersect streets.

  - **Signage** at intersections to alert drivers that cyclists will be crossing at this location.
- **Protected bicycle lanes**
  - **Dedicated bicycle signals** provide cyclists with their own signal indicating when it is safe to enter an intersection without conflict from other vehicles attempting to make movements in the intersection.
  - **Bicycle detectors** at traffic signals are marked so that cyclists know where to position their bicycles to activate the detector.
  - **Protected intersections** are a combination of bicycle signal phases, design elements and space allocation that help protect cyclists from turning cars.

## ■ Neighbourhood Routes

- **Refuge islands** can be placed in the street at an intersection or mid-block to protect crossing cyclists from motor vehicles.
- **Signalized crossings, crossing corridors, or actuated signals** are used where the number of people crossing the roadway is higher, and where motor vehicle traffic volumes and speeds are higher. Signals can only be activated by cyclists and pedestrians who use the push button.
- **Bicycle detectors** to activate traffic signals for people on bicycles, either through bicycle pushbuttons, loop detectors, or other technologies.

► **ACTION 2A.3: Install bicycle activated pushbuttons or detection at traffic signals on bicycle routes where warranted.** Signalized intersections can be especially dangerous locations for cyclists as they have to navigate through several lanes of traffic. Providing bicycle detection at these locations can facilitate smoother bicycle travel throughout Squamish, and allow safer movements at intersections. As the District is installing new bicycle routes and looking at upgrading existing infrastructure, providing enhanced bicycle crossings where routes intersect arterial streets is recommended.



► **ACTION 2A.4: Explore the feasibility of reducing speed limits on streets in Squamish with added enforcement (RCMP).** Research suggests that there is a direct correlation between the speed a vehicle is travelling and the severity of a collision. Research from the UBC Cycling in Cities program also documented that there is a relationship between the impact of speed on collision frequency and fatality rates. The study found that there was half the chance of a cyclist being in a crash at intersections where the measured motor vehicle speed averaged  $\leq 30$  km/h (compared to  $> 30$  km/h). Based on these findings, the implementation of reduced speed zones on streets can be considered as a method to improve safety for people walking and cycling. Reducing the width of motor vehicle lanes can also help to reduce travel speeds along corridors.



Recent initiatives in North America and areas of the United Kingdom have seen campaigns to call for slower traffic speeds (less than 20 mph or 30 km/hr) on residential roads. For example, the Town of Rossland, BC has recently dropped the town's speed limit to 30 kilometres per hour and 20 kilometres per hour in school zones. It is believed that a slower speeds on residential roads is necessary to make the road environment more safe and comfortable for those walking and cycling in the roadway. The District should explore the feasibility of reducing speed limits on streets within Squamish. An option to test out the feasibility of this action would be to consider piloting this recommendation first by reducing speed limits on streets identified as neighbourhood bicycle routes, extending school and park zones or in downtown Squamish and assess the impact this has on reducing vehicle speeds and enhancing the perception of comfort and safety for different road users.



- **ACTION 2A.5: Reduce incidents of conflicts on multi-use pathways.** Researchers from the Cycling in Cities program at the University of British Columbia reviewed the perception of safety versus actual safety on different types of bicycle infrastructure. The results found that while multi-use pathways were perceived by users to be a safe and comfortable type of facility, the actual likelihood of an injury was quite high on this type of infrastructure. Some of the factors that contribute to higher likelihood of injuries and collisions on multi-use pathways include:

- Collisions with other users, including animals such as dogs;
- Collisions with obstructions such as bollards or poles;
- Collisions which are a result of meandering pathways and poor sightlines; and
- Collisions at intersections with motorized vehicles.

The design of a pathway has a significant impact on comfort and safety. The number of users in particular can have an impact on the potential for conflicts between road users. Below are some of the considerations to help reduce conflicts on multi-use pathways:

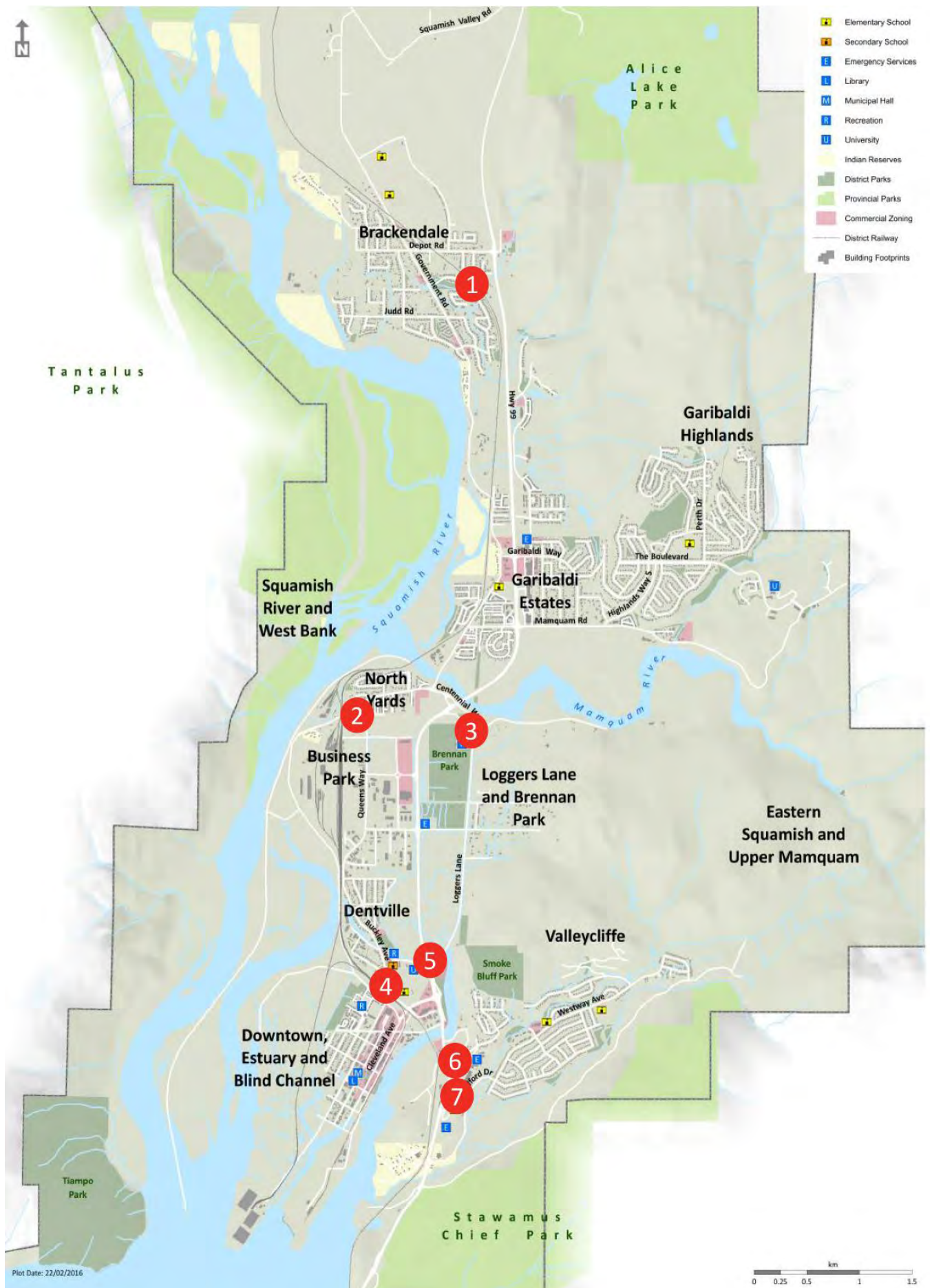
- Develop design guidance on pathway width and when is it appropriate to separate people cycling and other users to reduce potential conflict.
- There are opportunities for the District to consider installing additional signage along the multi-use pathways. Some examples of signage on other North American multi-use pathways are identified below:
  - Slow down to pass pedestrians
  - Bell or yell – warn when passing
  - Path narrows signage
  - Yield to cyclists and pedestrians at conflicts points with motorized vehicles
  - Keep right except to pass

Green conflict markings and elephants feet, can also be used at intersections and locations where multi-use pathways intersect with the road network to improve safety and awareness of potential conflicts at these locations.

## Direction 2B: Address Barriers to walking and cycling

**ACTION 2B.1: Address safety barriers to walking and cycling within Squamish.** There are a number of different types of barriers that can make walking and cycling challenging and pose a risk to an individual's safety and security. These barriers can include a lack of safe and comfortable places to cross major streets and corridors such as Highway 99. They can also include other physical barriers such as railway corridors as well as gaps in the network. There are several intersections and crossings throughout Squamish that can be improved to enhance the safety and visibility of pedestrians and cyclists. The figure below (**Figure 15**) identifies locations where crossing improvements, including highway and rail crossings as well as major intersections, are recommended to better facilitate walking and cycling. These locations have been identified through public engagement and a review of existing walking and cycling conditions while this list is not extensive, it does identify some of the key locations that have been identified as barriers to active transportation in Squamish, the following are recommended options the District can consider as the Active Transportation Plan is implemented and development opportunities occur.

Figure 15: Barrier Improvement Locations



## 1. Dryden Road to Dogwood Place – Rail Crossing

This rail crossing in Brackendale is currently a trespass crossing that is a desireline and residents are using this route as a shortcut through the neighbourhood. The crossing provides a connection between Dryden Road with Dogwood Place providing more direct access to Depot Road and Highway 99, it also provides an alternative route to Government Road.

Formalizing a new crossing at a railway requires a detailed application process through CN to address the regulatory requirements to ensure the crossing is safe for all users. While CN provides a lot of information specific to what is required to apply for a new or enhanced crossing, it will be important that the District works with CN to address the feasibility of providing a new formal crossing for people walking and cycling at this location. In addition to concerns raised by CN there are additional issues with property ownership as currently a portion of this crossing is located on private right of way. These two factors would need to be addressed before the District will be able to provide an active transportation crossing at this location. While the Plan recognizes this is an important crossing based on neighbourhood desire and network connectivity, finding a solution to address this barrier will require ongoing discussions with CN, property owners and other stakeholders that likely will require a long-term timeline.

### Recommended Improvements

- ▶ Continue to work with CN to explore the feasibility of formalizing a rail crossing at this location on an ongoing basis
- ▶ Work with property owners to address right of way and property constraints at this location to formalize crossing

## 2. Government Road and Queens Way – Intersection

The unsignalized intersection of Government Road and Queens Way is located in North Yards. Through consultation with residents, stakeholders and District staff this location was identified as a barrier and in need of safety enhancements for people walking and cycling. There are currently shoulder bicycle lanes on both Government Road and Queens Way and navigating the intersection can be challenging, particularly for people cycling southbound on government road and are required to make a left turn onto Queens Way.

In the short term, to enhance the safety of the intersection it is recommended the District realign the intersection to eliminate the southbound slip lane. This space could then be used to create a physically separated refuge area for people walking and cycling to wait to cross Government Road at a new multi-use crossing. While cyclists will still be able to make a left hand turn from the vehicle lane, for cyclists that may not feel comfortable making this movement the multi-use crossing provides an alternative option. The District can also consider making this a 3-way stop. Over the long -term and as the implementation of the proposed sidewalk and upgraded bicycle infrastructure on Government Road and Queens Way occurs the District will need to re-evaluate the intersection based on these changes.

### Recommended Improvements

- ▶ Realign intersection to eliminate southbound slip lane.
- ▶ With the additional space from the removal of the slip lane provide a refuge area with physical separation.



- ▶ Proposed multi-use crossings to indicate that both pedestrians and cyclists are permitted to travel in the crosswalk. Multi-use crossings (also sometimes referred to as elephants feet) indicate to all road users that both people walking and cycling are permitted to use the crosswalk.
- ▶ Consider controlling the intersection with a three-way stop.
- ▶ Ensure that the design considers the location of the existing bus stop and the relocation of a bus stop southbound on Government Road before the intersection.
- ▶ Install advance warning signage for crossings in all directions (WC-46R and WC-7S).

### 3. Loggers Lane and Centennial Way – Intersection

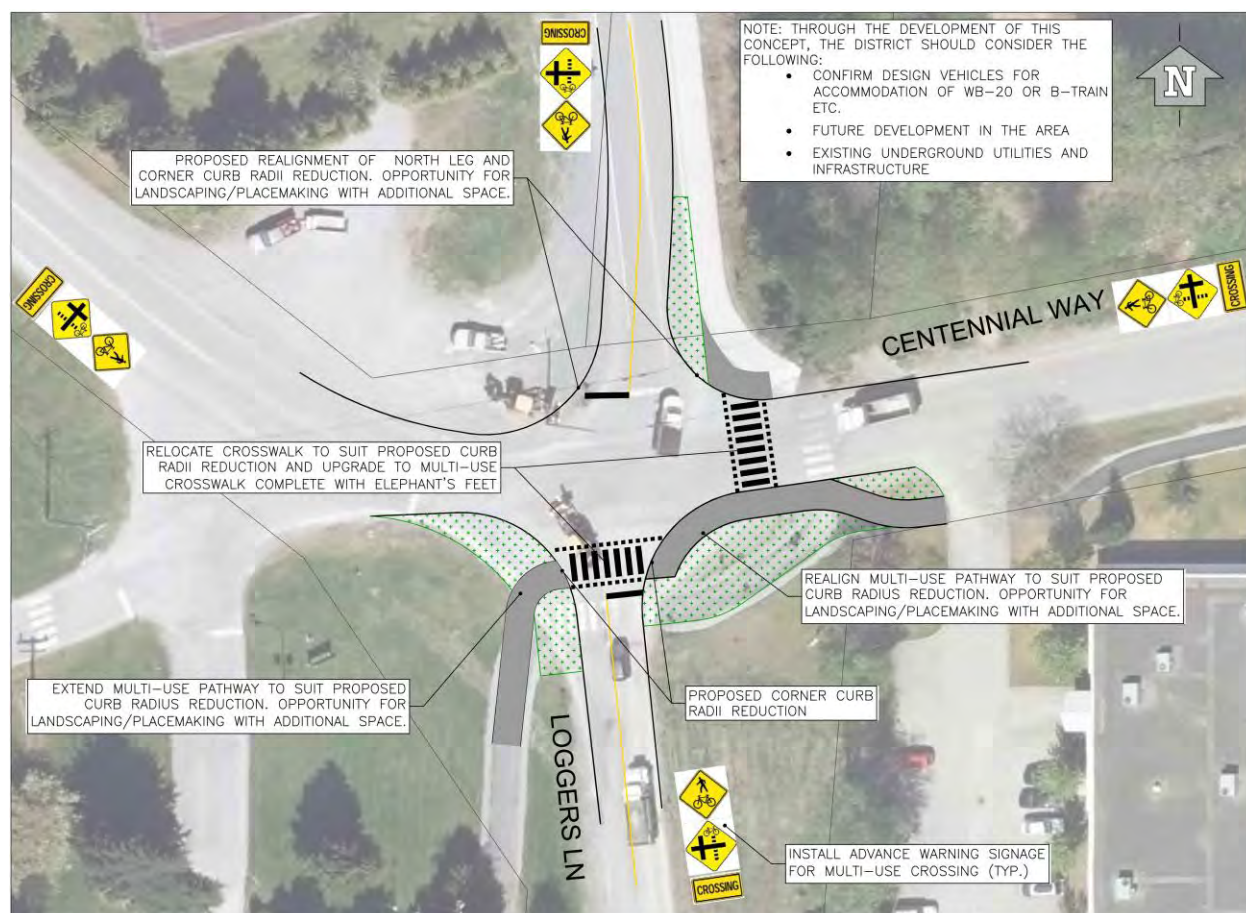
The intersection of Loggers Lane and Centennial Way is located near Brennan Park and south of the Mamquam River. The current configuration of the intersection is quite wide and can be awkward as it can be a high traffic location, especially during special events. This intersection is four way stop controlled however the width of the intersection and the location of the stop lines can make navigating the intersection challenging. This location also has a high number of active transportation users due to the proximity of Brennan Park and the fact that the Corridor Trail crosses both Loggers Lane and Centennial Way at this location.

To improve the intersection and make it less awkward to travel through the Plan recommends realigning the intersection to reduce the existing curb radii. Best practice would also recommend realigning the existing multi-use pathway and relocating the crosswalks. Upgrading the existing crosswalks to multi-use crossings and providing additional signage to inform motor vehicle drivers of the presence of people walking and cycling will also help to improve comfort and safety at this location. A conceptual plan of potential improvements at this location is provided below in **Figure 16**.

#### Recommended Improvements

- ▶ Realign the intersection and provide a curb radii reduction, this will create an opportunity for landscaping and additional placemaking.
- ▶ Extend multi-use pathways to suite proposed curb radius reduction.
- ▶ Relocate and upgrade the existing crosswalks to a multi-use crosswalk.
- ▶ Install advance warning signage for crossings in all directions (WC-46R and WC-7S).
- ▶ Ensure that that the intersection design incorporates a WB-20 or Super B turning radius.
- ▶ Consider future development proposed in the area.
- ▶ As improvements are made to this intersection the District should also consider existing underground infrastructure.

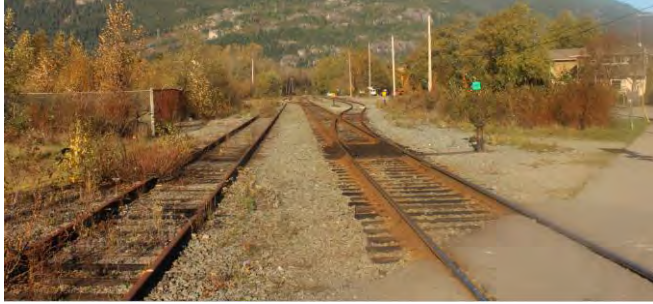
**Figure 16: Conceptual Crossing Improvements - Loggers Lane and Centennial Way**



#### 4. 3<sup>rd</sup> Avenue to Buckley Avenue – Rail Crossing

The railway runs between Buckley Avenue and 3<sup>rd</sup> Avenue separating Dentville from Downtown Squamish. This is a popular crossing location for both people walking and cycling as it provides a direct connection into Downtown and enables these users to avoid major intersections along Cleveland Avenue. Currently there is a sidewalk that provides a connection between Buckley Avenue and Bailey Street with direct access to Chieftain Plaza. As the long-term network outlined in the Strategy above (Connectivity) showed, providing an enhanced active transportation connection between 3<sup>rd</sup> Avenue and Buckley is important for improving the connectivity and providing access to Downtown. A formalized active transportation crossing at this location will tie into the proposed bicycle infrastructure on 3<sup>rd</sup> Avenue and the enhancements for both walking and cycling that are proposed on Buckley Avenue. As this is a CN rail crossing, the District will need to continue to work with CN and other partners to make enhancements to the crossing.

The property located on the north side of Bailey Avenue has the potential to change through development opportunities, which are already occurring at this time. As a result, it is a recommendation of this Plan that the District continue to work closely with CN, other partners, stakeholders and future developers to ensure that this crossing is enhanced and reconfigured to provide a direct active transportation connection between 3<sup>rd</sup> Avenue and Buckley Avenue.



### Recommended Improvements

- ▶ As ongoing development opportunities occur the District should continue to work with CN and future developers to ensure an active transportation connection is provided that connects existing and proposed bicycle infrastructure on 3<sup>rd</sup> Avenue with Buckley Avenue.

## 5. Highway 99 and Scott Crescent

Providing a direct connection for people walking and cycling to and from Valleycliffe to Downtown Squamish and the businesses on the west side of Highway 99 is challenging due to a lack of a designated crossing on the Highway north of Clarke Drive. During the Active Transportation Plan engagement process, stakeholders and residents identified this connection as a significant barrier and safety concern. Individuals that are travelling along Corridor Trail or the Valleycliffe Trail are required to stay on the east side of the highway and take the Pemberton Avenue Underpass as the most direct formal route Downtown. While this is less of a barrier for people on a bike, it is a more significant detour for people on foot. As a result, pedestrians are crossing Highway 99 at undesignated crossing locations to reduce the distance of their trip. This is creating a safety issue along the Highway and highlights a network connectivity issue.

Due to the challenges with providing additional crossings along Highway 99 the District should work closely with MoTI over the long-term to identify opportunities to provide an additional pedestrian crossing north of Clarke Drive. Scott Crescent was identified through engagement as a possible location for an additional crossing. As development opportunities occur in this area the District should also work with them, in addition to MoTI to assess the feasibility of providing an additional crossing.

As a short term solution, the District should work to enhance the comfort and design of the Pemberton Avenue Underpass to make it more inviting and provide wayfinding to ensure residents and visitors are aware of the connection



it provides. There are also opportunities for the District to work with MoTI to consider permanently providing a pedestrian access to Pemberton Avenue with the pathway on the southbound side of the Highway. While this solution will require ongoing conversations with MoTI and other partners this connection is an important consideration to address safety concerns and network connectivity.

### Recommended Improvements

- ▶ Over the long -term work with MoTI and future developers to provide an additional Highway 99 crossing for people walking and cycling to enhance connectivity between Valleycliffe and Downtown.
- ▶ Continue to work with MoTI to address the feasibility of allowing pedestrian access and a pathway connection between Pemberton Avenue and the southbound side of the Highway.
- ▶ In the short term focus on enhancing the comfort and safety of the Pemberton Avenue underpass and provide wayfinding to ensure the route is well marked and the connection to Downtown is well established. Additional recommendations for improving safety at this location are outlined in **Action 2C.1**.

## 6. Clarke Drive (Corridor Trail Connection and Intersection Enhancements)

The Corridor Trail is a paved off street multi-use pathway that provides a north south connection parallel to Highway 99. As noted in the chapter above, the trail is a popular off street route and is an important neighbourhood connection within Squamish. There are however a few locations where there are gaps in the trail and users are required to walk or bike on paved shoulders or on unpaved portions of the trail. One of these gaps is located along Clarke Drive between Guilford Drive and the entrance to Sea to Sky Learn Connections. Along this segment there are two significant intersections that users would need to cross. This results in potential for conflict with motor vehicles at these locations. The active transportation infrastructure is also important at this location due to the proximity to the elementary school, providing safe and comfortable walking and cycling connections to schools is an important area of focus within Squamish to encourage more students and families to travel to and from school by active modes. As a result, there are two important user groups travelling through this area and two options have been developed to address both of these groups. It is also important to note that this area will likely be undergoing a significant redesign as part of future developments. As a result, there will be an opportunity to ensure that considerations for active transportation infrastructure and connectivity can be addressed.

**Option 1:** To address the gap in the Corridor Trail it is recommended that the District install a multi-use pathway on the east side of Clarke Drive as a continuation of the Corridor Trail between the entrance to Sea to Sky Learning Connections and Guilford Drive. Upgrade existing, and install new multi-use crosswalks, and provide additional signage to advise other road users of the multi-use pathway crossing locations. A conceptual plan of potential improvements at this location is provided below in **Figure 17**. It is important to note that due to steep grades and space restraints, that this option will likely require significant geotechnical study and review to assess the impact on the existing parking lot making this a longer term solution.

**Option 2:** The second option focuses on providing additional enhancements for the second major user group in the area, which are the students and the families of Sea to Sky Learning Connections. By providing a formal connection between Clarke Drive and Guilford Road and improving access to and from the school. This pathway option would formalize an already well used unpaved pathway. The topography in the area, as noted with Option 1, will make

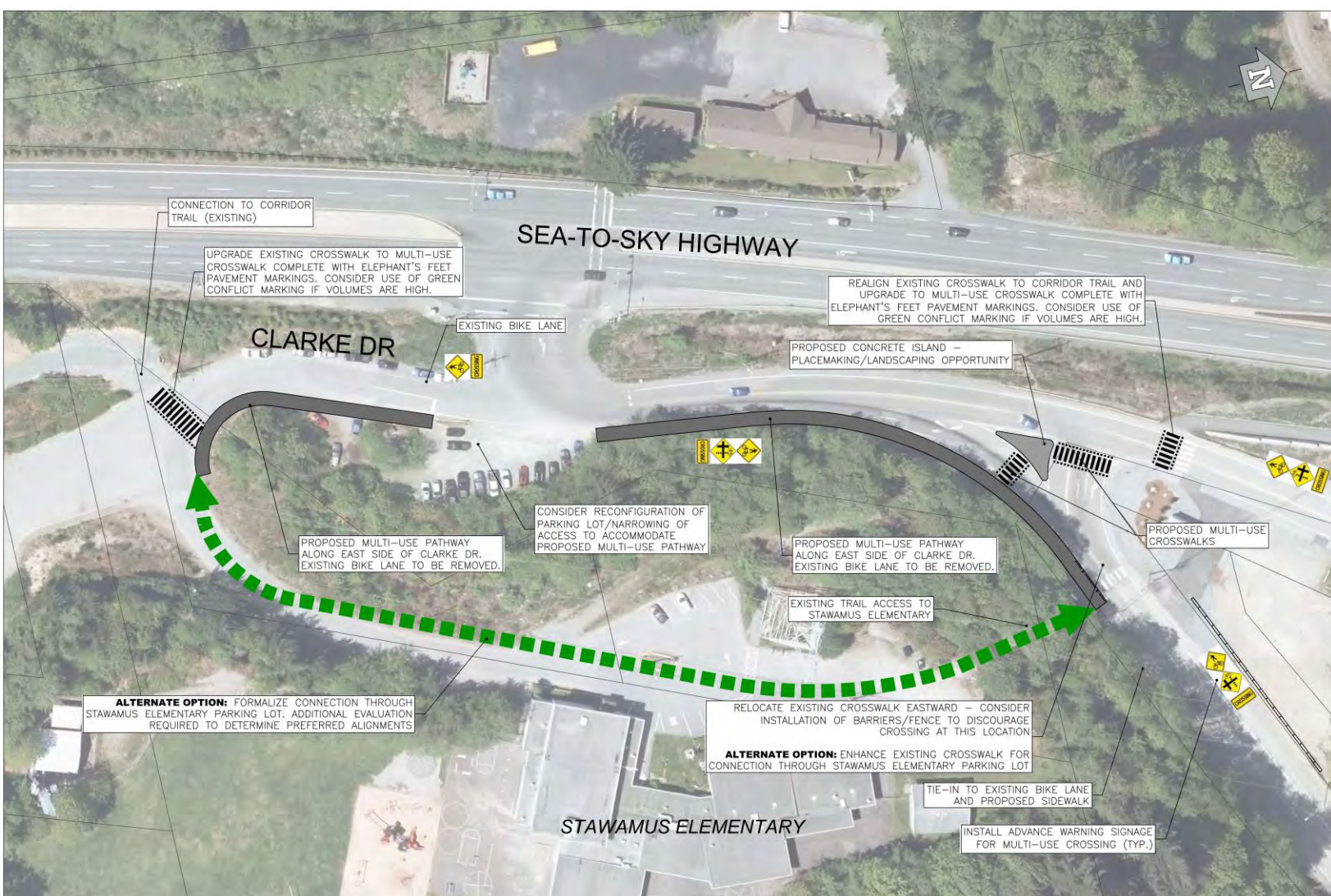
implementing this challenging and will require additional study to ensure feasibility and the most appropriate alignment.

### Recommended Improvements

#### Option 1:

- ▶ Proposed multi-use pathway along the east side of Clarke Drive (remove the existing bicycle lane on the east side)
- ▶ Upgrade existing crosswalks to multi-use pathway crossings and consider the use of green pavement markings
- ▶ Consider reconfiguring the parking lot access on the east side of Clarke Drive to narrow access
- ▶ At the intersection of Guilford Drive and Clarke Drive consider installing a concrete island to narrow the crossing distance and create an opportunity to provide placemaking and landscaping enhancements.
- ▶ Install advance warning signage for crossings in all directions (WC-46R and WC-7S).

Figure 17: Conceptual Crossing Improvements - Clarke Drive Corridor Trail Connection



## Option 2:

- Formalize a pathway between Guilford Road and Clarke Drive through further study to determine appropriate location and alignment
- Enhance existing crossing to improve visibility

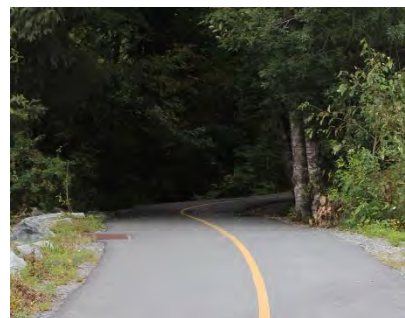
## Direction 2C: Improve Personal Safety

Personal safety and the perception of personal safety has been identified as important issue impacting walking and cycling in Squamish. It was found through stakeholder feedback, that insufficient lighting and low visibility in areas of Squamish such as the Pemberton Avenue underpass and the Corridor Trail could cause some residents to feel unsafe. The following actions focus on addressing issues of personal safety in Squamish to encourage more walking and cycling.

- **ACTION 2C.1: Improve visibility and access at underpasses.** Residents and stakeholders identified improving the comfort and perceived safety of the Pemberton Avenue underpass as something that would enhance the active transportation network. Improving the lighting, access and wayfinding at this location would help to improve individual's comfort and make the route better used. With more people using the facility there would be more 'eyes on the street' which could help to make the space feel safer. The access and usability of the underpass can also be improved by providing some additional design enhancements such as widening the radii of the corners and installing fencing. The current gates that are used at the access ramps leading to and from the underpass do a good job of slowing down cyclists as they round the corner. However, providing some additional width could help to enhance the comfort and safety and would allow the District to consider replacing these gates with features that provide a greater level of accessibility and are less of an obstruction, or consider removing the gates entirely. As pathway upgrades through Rose Park are anticipated to be completed in 2016 enhancements to this underpass location in particular will be a priority. It is also worth noting that lighting at this location is under MoTI jurisdiction.

- **ACTION 2C.2: Provide lighting along pathways, sidewalks and bicycle routes where appropriate.** The desire for additional lighting was identified by survey respondents and stakeholders as something that would help to encourage more walking and cycling within Squamish. Properly placed lighting is thought to discourage criminal activity, enhance natural surveillance opportunities, reduce fear of those walking and cycling after dark, and allow people to see any barriers, obstructions, or curves along the pathway. It is important to note however, that lighting in general, is extremely context sensitive, and it can become an obstruction if space is limited, it can also produce unnecessary ambient light and requires a high financial investment.

Some general guidance recommends that, lighting should only be provided on well used bicycle and multi-use pathways, pathways through parks, open spaces, and at locations with hazards, conflict points, and areas of safety concern. The Corridor Trail in particular was identified as needing additional lighting as well as on street routes along Depot Road, Westway Avenue, and Highlands Way. The District should review existing lighting and





consider the installation of more lighting where warranted while ensuring additional lighting is appropriate to the pedestrian scale. The District should continue to work with BC Hydro to discuss opportunities to provide additional lighting throughout Squamish.

- ▶ **ACTION 2C.3: Follow the standards of CPTED to ensure principles are followed in walking and cycling infrastructure design.** Crime Prevention Through Environmental Design (CPTED) is an approach to urban design that supports the provision of good lighting and visibility for pedestrians and cyclists as one of the most effective crime deterrents. Incorporating the principles of CPTED in facility design increases security in public areas and will in turn promote walking as a transportation mode choice. Special considerations for lighting, sightlines, fencing, and maintenance are important considerations in pedestrian facility design and should be considered as the District is designing and implementing new or enhancing existing active transportation infrastructure. However, it is also important to note that CPTED principles may discourage lighting in remote areas to discourage activity in the evening and after dark.

### Strategy Safety and Security: Summary of Actions

The Actions that have been developed to improve active transportation **Safety and Security** are summarized below:

- ▶ 2A.1: Provide new or enhanced pedestrian crossing locations.
- ▶ 2A.2: Provide enhanced bicycle intersection crossings where warranted.
- ▶ 2A.3: Install bicycle activated pushbuttons or detection at traffic signals on bicycle routes where warranted.
- ▶ 2A.4: Explore the feasibility of reducing speed limits on streets in Squamish with added enforcement (RCMP).
- ▶ 2A.5: Reduce incidents of conflicts on multi-use pathways.
- ▶ 2B.1: Address safety barriers to walking and cycling within Squamish.
- ▶ 2C.1: Improve visibility and access at underpasses.
- ▶ 2C.2: Provide lighting along pathways, sidewalks and bicycle routes where appropriate.
- ▶ 2C.3: Follow the standards of CPTED to ensure principles are followed in walking and cycling infrastructure design.

## STRATEGY 3: MAINTENANCE AND ACCESSIBILITY

Walking and cycling infrastructure should be well maintained and usable for people of all ages and abilities throughout the year. For people walking and cycling, poorly maintained infrastructure (including sidewalks, pathways, and bicycle routes), snow and ice, and inaccessible infrastructure can make it more difficult and less desirable to walk or cycle. While the implementation of infrastructure to promote walking and cycling is seen typically as a top priority, undertaking ongoing rehabilitation and maintenance and improving the accessibility of existing infrastructure needs to be an equally important focus. Two Directions have been identified to enhance and improve the **Maintenance and Accessibility** of active transportation in Squamish, they include:

- ▶ **Direction 3A: Provide Accessible Infrastructure**
- ▶ **Direction 3B: Maintain the Sidewalk and Bicycle Network**

These Directions and the Actions associated with them have been outlined in more detail below.

### Directions and Actions

#### **Direction 3A: Provide Accessible Infrastructure**

Walking to everyday destinations can be easy if streets and neighbourhoods are safe and well-designed for pedestrian accessibility. It is important that the walking and cycling environments of Squamish are accessible and usable by a large cross section of people, including people with disabilities, seniors, and parents with children. It is also important that the design of the walking environment includes accessibility features to accommodate the unique needs of these groups, and to provide better pedestrian circulation for everyone. An important location for improving accessibility is at intersections and crossings, as difficult crossings can act as significant barriers to walking, making trips much longer or creating safety issues, particularly for seniors, children, and people with physical and cognitive disabilities. The following Actions have been identified to ensure the District is providing residents with accessible infrastructure.

- ▶ **ACTION 3A.1: Consider developing Accessibility Guidelines for District streets.** These guidelines would provide recommendations for features such as accessible pedestrian signals, traffic islands, curb let downs, tactile surfaces and warning strips, and directional guiding strips that can make pedestrian crossings safer and accessible for all.
- ▶ **ACTION 3A.2: Provide accessible curb ramps at intersections.** Curb ramp features are critical to facilitate those with visual disabilities and/or using mobility aids to comfortably navigate through Squamish's street network. Curb ramps provide access between the sidewalk and the street at intersections. The District should aim to provide accessible curb ramps at all intersections, including refuge islands, as well as tactile surfaces and directional guiding strips that can make pedestrian crossings safer and accessible for all. These features should be provided at the time of new developments or during retrofits. The District should also pay special consideration to ensure that the location of curb ramps are positioned to provide direct access to the crosswalk.

The District should also work with MoTI to ensure that all refuge islands located at intersections within the District, including islands at channelized right turns have curb ramps and enough space for a bike with a carriage.

► **ACTION 3A.3: Work with BC Transit to ensure all bus stops are accessible.**

Integrating pedestrian accessibility with transit planning is critical, as nearly every transit trip starts with a walking trip. Often considered a requisite of pedestrian accessibility at bus stops is sidewalk access and accessible bus stop design. Prioritizing upgrades to improve access to all bus stops, and working with developers to identify sidewalk upgrades at the time of new development and redevelopment can continually increase the number of sidewalks with transit access, which can serve to not only improve accessibility but to enhance the appeal of both walking and transit.



Accessible bus stops facilitate people with different abilities to find, board and get off the bus. Accessible bus stop design reduces barriers for seniors, children and youth, and people with physical or cognitive disabilities using the transit system. This includes providing large platforms, appropriate bus shelter designs, and considerations regarding the placement of street furniture. Recognizing the importance of bus stop design to facilitate all types of users to access the transit system, the District of Squamish should work with BC Transit with the aim to have 100% of all bus stops accessible.

► **ACTION 3A.4: Continue to monitor crossing times at intersections to ensure adequate time is provided to cross.** The District should continue to work with the MoTI to ensure that people of all ages and abilities have enough time to cross signalized intersections to avoid conflicting with traffic before the signal changes. This is particularly important in areas of high concentration of children, senior or people with disabilities and areas with high pedestrian activity.



► **ACTION 3A.5: Continue to ensure that all multi-use pathways in the District are accessible.** In general, multi-use pathway access should be designed to restrict access from unauthorized motor vehicles (i.e. motorcycles, all-terrain vehicles). As certain gate designs can be an impediment to safe and convenient trail access for pedestrians, cyclists, cyclists towing trailers and mobility-impaired users. Bollards can be a more appropriate option however they can still create obstructions that present a potential safety concern. It is recommended that unless motor vehicle access is a serious issue, avoid placing any obstruction within the multi-use pathway. Multi-use pathways should also be paved where feasible to enhance accessibility. It is also important to ensure that pathway width is maintained and any overgrown vegetation is addressed within a timely manner to ensure that accessibility is maintained year round, this is discussed in more detail in Action 3B.1.





### Direction 3B: Maintain the Sidewalk and Bicycle Network

Maintenance is an important part of enabling more walking and cycling, as pedestrians and cyclists can be uniquely sensitive to the physical condition of infrastructure, when compared to motorists. For example, maintenance-related issues such as potholes, irregular surfaces, and debris on sidewalks, roadways, and pathway infrastructure can be unsafe and uncomfortable, affecting the overall appeal of walking or cycling. In addition, the lack of accessible and/or well-maintained infrastructure can have significant impacts on mobility and accessibility for the full range of users. The following Actions have been identified to ensure the District is providing residents with a well maintained active transportation network throughout the year.

- **ACTION 3B.1: Continue to inspect sidewalks and pathways regularly to ensure they are well maintained, including controlling vegetation.** The District of Squamish's Public Works department is responsible for the maintenance of the District's streets and sidewalks. The District has a Sidewalk Inspection and Maintenance Policy, the purpose of which is to establish an annual formal sidewalk inspection and maintenance program for District owned sidewalks. The District recognizes that it is not possible to maintain all sidewalks in perfect condition but the objective is to ensure responsible management of public safety by making sidewalks as safe as possible.

The District's policy prioritizes the repair of sidewalks in High Traffic Areas (HTA) including the downtown core, commercial areas and senior's complexes and at locations where they are deemed critical for safety. It should be noted that old sidewalks identified in Figure 8 should be replaced if the condition does not warrant maintenance investment, as identified in Direction 1A. The District's Engineering Department maintains the inventory of all sidewalks including a history of all inspections, construction and maintenance information. Public complaints of sidewalk damage are inspected within three business days. The District should continue ensure that all District sidewalks are inspected on an annual basis and repairs or upgrades are made to the existing sidewalk network. As part of this program the District should continue to regularly update their GIS inventory to provide more information about existing sidewalk width and condition.

In addition, the District should continue to guarantee that the vegetation adjacent to pathways is well maintained, ensuring that plants are not overgrown, that sightlines are not obstructed and that the width and accessibility of pathways is not compromised by vegetation. Concerns regarding evasive plant species will also be addressed by District staff during time of pathway construction and maintenance.

- **ACTION 3B.2: Review and update current sidewalk snow removal requirements**

The District's Traffic Regulation Bylaw and Snow Removal Policy sets requirements for sidewalk snow removal. The Traffic Regulation Bylaw requires that snow and ice removal on sidewalks or foot paths adjacent to any residential or business property is the responsibility of the property owner. The Bylaw states that any snow or ice must be removed promptly to allow for the safe and convenient use of the sidewalk or footpath by pedestrians.

The complementary Snow Removal Policy outlines that the District of Squamish clears sidewalks of snow and ice in the following areas: Police Station, Valleycliffe Fire Hall, Municipal Hall, Public Library, Sidewalk Overpasses, sidewalks on hills, sidewalk letdowns for accessibility, in front of schools, downtown business section, in front of senior citizen complexes, and Community Policing Station. The District in the future may want to further review this policy and consider shifting responsibility of sidewalk snow clearing from all property owners to the District. In the meantime it is recommended that the Traffic Regulation Bylaw be updated to refer to the Snow Removal

Policy and exceptions to the property owner's responsibility to remove snow and ice. It is also recommended that the references to 'promptly' be clarified to provide clear timeline requirements. In addition, it is recommended that the Snow Removal Policy be enhanced to identify priority areas for snow removal within the current list of locations that are the responsibility of the District of Squamish. This priority list could also include timelines for the District to achieve. The following priority list should be considered:

- **Priority 1 Sidewalks:** In front of community institutions related to public safety (Municipal Hall, Police Station, Valleycliffe Fire Hall and Community Policing Station)
- **Priority 2 Sidewalks:** In front of municipal institutions and other community destinations (Public Library, schools, senior citizen complexes)
- **Priority 3 Sidewalks:** Downtown (Downtown business section)
- **Priority 4 Sidewalks:** Other areas (sidewalk Overpasses, sidewalks on hills, sidewalk letdowns for accessibility)

An important component of snow removal requirements is compliance and Bylaw enforcement. Established penalties for infractions and the steps the District will take to ensure sidewalks throughout Squamish are kept clear, need to be outlined and made transparent to all parties. A more detailed discussion on general Bylaw enforcement within the District is also discussed in Action 5B.5.

► **ACTION 3B.3: Review and update bicycle facility and multi-use pathway snow removal requirements**

Currently the District of Squamish has limited requirements for snow removal on bicycle routes. Current snow removal practices for on-street routes are based on existing roadway snow removal requirements. The snow clearing operations are based on the following:

- **Primary Routes:**
  - Arterial roads, major collector roads, bus routes, police station, fire stations, ambulance stations, hilly areas and school zones
  - Sanding and plowing are carried out on a 24-hour basis during poor conditions
  - Once the storm ceases or crews have successfully plowed and sanded/salted first priority routes, second and third priorities will then be addressed.
- **Secondary Routes:**
  - Through-roads between the arterial or major collector road grids.
  - Secondary work is performed during scheduled eight-hour shifts
- **Remaining Residential Roads:**
  - Dealt with in a systematic manner starting with the more significant roads, and specific problem locations.
  - Third priority work is performed during scheduled eight-hour shifts.

The District should review existing requirements and provide additional guidance for snow removal requirements specific to on-street bicycle routes and identifying them as priority routes. Routes with bicycle infrastructure should be plowed to bare pavement to the edge of the curb.

► **ACTION 3B.4: Design bicycle routes to facilitate drainage, snow removal and snow storage.** One of the best ways to avoid drainage issues and flooding of bicycle infrastructure is through thoughtful roadway design. The design of infrastructure can also facilitate the removal of snow from bicycle routes. Unfortunately, with roadways that include typical, unprotected bicycle lanes at the edge of the roadway, the bicycle lane often becomes the area for snow storage and can also result in accumulation of debris and gravel. This leaves cyclists either trying to share the car lanes or riding on the edge of the road while trying to avoid piled-up snow, debris or pools of water. There are several roadway planning and design considerations that can be taken to avoid this situation, including:

- Ensure drainage issues are addressed at time of construction
- Plan new or renewed roadways with sufficient right-of-way to provide enough space for a bicycle lane and an adequately sized storage space on the side of the road. This would allow a typical truck-mounted snowplow to plow snow into the storage space rather than the bicycle lane. A 1.8 m bicycle lane would also allow for some narrowing of the bicycle lane due to adjacent snow storage, while still maintaining functionality.
- Provide a wide bicycle lane buffer. Where feasible, a wide protected or unprotected bicycle lane buffer can provide ample storage space for snow, while providing cyclists protection from vehicles. A minimum 1.5 metre buffer is preferable to accommodate moderate snowfall with minimum encroachment upon the bicycle lane. This design would require the use of a smaller bicycle lane snow plow to clear this portion of the roadway.
- Restrict on-street parking during snow events. Where a bicycle lane is located between on-street parking and the vehicular lane, parking along the roadway can be restricted during snow events to allow this space to become snow storage space. While this isn't an option for all roadways, it could be utilized along priority bicycle routes in the winter.
- Provide enough width for small truck snowplows and invest in acquiring a fleet to maintain existing and future protected bicycle lanes and infrastructure in house.
- Recessed Thermoplastic Pavement Markings. The use of 'green paint' at conflict zones and at intersections can play an important role in making cyclists more visible at high conflict locations. However, ensuring that the application of paint is well maintained and worth the level of investment there are some strategies to enhance the lifespan of the paint through winter months. For example, milling the area of pavement 3mm in depth where thermoplastic pavement markings are applied has shown to be effective in reducing damage as a result of snowplows in a 2010 study. Minneapolis, MN mills the area of pavement where thermoplastic bicycle lane indicators are placed to help reduce damage as a result of snowplows. While this method results in more expensive installation costs, if the bicycle lane is located on a street that receives heavy plowing, it may save in long-term maintenance costs (and help preserve safety conditions along the roadway). Milling may also be applied to off-road trails that receive heavy plowing.



► **ACTION 3B.5: Ensure the District has the equipment to maintain all types of proposed bicycle infrastructure.**

Protected bicycle lanes along existing roadways have been found to increase cyclist safety which can result in an increase in ridership. It does however, present challenges related to maintenance, especially if appropriate equipment to sufficiently maintain the protected network isn't available. Without this equipment, depending on the separation used, it is likely that posts or other delineation will need to be removed and replaced for ditch maintenance, catch basin cleaning, etc. and that snow cannot be cleared according to the current snow removal policy.

Keeping bicycle lanes in all forms clear of debris is critical to ensuring the safety of those travelling along separated corridors. Considerations for sweeping, snow removal, vegetation maintenance, drainage, catch basin cleaning and servicing and other necessary maintenance should be made when designing bicycle facilities, as identified in **Action 3B.4**. In addition to designing facilities to accommodate these maintenance requirements, ensuring necessary equipment is available to work within a confined area is also essential.

At this time, the District of Squamish does not have the narrow equipment required to keep separated bicycle lanes clear of debris and snow or to maintain vegetation, etc. without needing to remove the physical separation to complete the work in most instances. It is recommended that prior to providing separation along extended portions of roadways that the District of Squamish procure the equipment necessary to ensure routes can be adequately maintained and that maintenance expectations are well defined and attainable.

It is also recommended that when considering potential capital projects maintenance costs be factored into the approval process. Maintenance costs will be more reliable when a specific design is proposed as sections will present different maintenance demands such as mowing and ditching versus sections that front strata owned properties or private lots. Maintenance will also depend on the space available within the separated lane and the type of physical separation used. It is recommended that these factors be included when proposing new capital projects.

The Operations team at the District of Squamish has estimated that maintenance costs will vary significantly based on the design of infrastructure. The following costs have been provided which help to highlight the additional maintenance expenditures that should be considered when planning and designing future bicycle infrastructure in the District. The costs provided are rough costs as design and scale has not been applied. These costs are meant to represent possible considerations for increased maintenance demands and are not prescriptive. Below are the estimated maintenance costs based on the type of separation used:

- \$270 per kilometre annually for painted bicycle lanes.
- \$630 per kilometre annually for concrete no post separation
- \$840 per kilometre annually for plastic delineation

This demonstrates a considerable increase in maintenance costs for separation compared to painted lanes. The District has estimated that the maintenance costs for pathways such as the Corridor Trail is roughly an \$1800 per kilometer annually but will vary depending on design and maintenance expectations. -The Operations team made it clear that maintenance costs could be significantly higher depending on expectations around clearing snow and debris, the design and materials used, and the selected routes as each roadway presents unique challenges for maintenance.

As a result, some of the maintenance items to be considered when incorporating protected bicycle lanes into Squamish's bicycle network include:

- Snow removal requirements and expectations and snow storage
- No post (or other delineation) removal and reinstallation for shoulder maintenance, catch basin cleaning, ditching, etc., and replacement for less substantial plastic separation
- Increased opportunity for graffiti and vandalism
- Salting and sanding slippery and hazardous sections in winter conditions

It is important to note that, plastic delineation is not recommended for long stretches of busy road ways due to high replacement costs. Over the last twelve months the District has piloted delineation in a short, high pedestrian conflict area on a residential street in Brackendale. It has proven to be burdensome to maintain the delineators which, in general require replacement every three weeks. Although a lower cost initially, this design has proven to be costly to maintain.

### Maintenance and Accessibility: Summary of Actions

The Actions that have been developed to provide more **Maintenance and Accessibility** are summarized below:

- ▶ 3A.1: Consider developing Accessibility Guidelines for District streets.
- ▶ 3A.2: Provide accessible curb ramps at intersections.
- ▶ 3A.3: Work with BC Transit to ensure all bus stops are accessible.
- ▶ 3A.4: Continue to monitor crossing times at intersections to ensure adequate time is provided to cross.
- ▶ 3A.5: Continue to ensure that all multi-use pathways in the District are accessible.
- ▶ 3B.1: Continue to inspect sidewalks and pathways regularly to ensure they are well maintained, including controlling vegetation.
- ▶ 3B.2: Review and update current sidewalk snow removal requirements.
- ▶ 3B.3: Review and update bicycle facility and multi-use pathway snow removal requirements.
- ▶ 3B.4: Design bicycle routes to facilitate drainage, snow removal and snow storage.
- ▶ 3B.5: Ensure the District has the equipment to maintain all types of proposed bicycle infrastructure.

## STRATEGY 4: GROWTH AND AMENITIES

Networks and infrastructure can go a long way in ensuring that walking, cycling and other forms of active transportation are convenient options. In addition to building infrastructure, it is also important to provide supportive infrastructure that make walking, cycling and other forms of active transportation more viable transportation options.

This strategy, Growth and Amenities, focuses on ensuring that active transportation infrastructure and amenities are considered as Squamish grows with new developments. This strategy also focuses on ensuring that existing neighbourhoods incorporate amenities that make walking and cycling as convenient and comfortable as possible. Squamish is growing quickly and is expected to continue to grow rapidly over the next 15 years. This growth makes promoting active transportation important to alleviate pressures on the transportation network, but it also allows for great opportunities to take advantage of development opportunities and ensuring that active transportation infrastructure is incorporated into all new developments

Features that can increase the ease and appeal of active transportation include secure and convenient bicycle parking, end-of-trip facilities, pedestrian amenities at bus stops and streetscape enhancements. In addition, ensuring seamless connections between public transit and pedestrian and cycling networks can extend the reach of transit trips and increase the ease and appeal of walking and cycling to get around Squamish. Two Directions have been identified to ensure active transportation is considered when discussing growth and amenities in Squamish, they include:

- ▶ **Direction 4A: Ensure Active Transportation is Considered and Mandated in All New Developments and mandated in Bylaws**
- ▶ **Direction 4B: Provide Amenities to Make Walking and Cycling Convenient**

These Directions and the Actions associated with them have been outlined in more detail below.

### Directions and Actions

#### **Direction 4A: Ensure Active Transportation is Considered and Mandated in All New Developments and mandated in Bylaws**

As development occurs within Squamish in the coming years it will be important that the District work with developers and other stakeholder to ensure that new developments consider different components of active transportation. This includes ensuring that they consider Complete Street designs and providing cut throughs to shorten trip distance on streets with cul-de-sacs. When considering the Active Transportation Plan within the context of new developments there are opportunities for the District to take advantage of Development Cost Charges to incorporate active transportation projects that benefit new growth in the community.

- ▶ **ACTION 4A.1: Consider Complete Streets designs in all new development and road projects.** In many cities in North America roadways have, and continue to be, designed for cars and trucks, and designed to accommodate high speeds and volumes. Complete Streets Policies aim to provide a range of transportation options, including transit, biking, walking and driving an automobile, along a street that is safe and comfortable for all road users. The focus is on enabling safe access for all road users. Complete streets are often context sensitive and generally incorporate road treatments that address the unique issues of each corridor and community, such as reducing the width of travel lanes which can provide additional space for people walking and cycling and help to reduce



travel speeds. The District's Subdivision and Development Control Bylaw provides standard drawings for typical roadworks based on road classification. For specific roadways, the District and developers can provide enhanced walking and cycling infrastructure, for example separated bicycle lanes or buffered bicycle lanes. The District should build off of the Subdivision and Development Control Bylaw standards to develop a Complete Streets Toolkit of treatments and ensure that they are being incorporated into new and existing roads where appropriate.

**ACTION 4A.2: Ensure site design supports active transportation.** The District's current Official Community Plan (OCP) outlines a number of different considerations regarding site design and land use planning that focus on supporting active transportation. For example, the OCP notes that each major neighbourhood should have a centre containing a mix of uses, including commercial, parks, and cultural or institutional amenities to service the daily needs of neighbourhood residents. This can reduce trip distance and promote the use of more active forms of transportation. It also notes, that growth should be predominately accommodated through infill downtown and within existing residential neighbourhoods or redevelopment of the Waterfront Landing and Oceanfront Land. It will be important that the District continues to provide guidance regarding site design that supports active transportation as part of the Development Permit Areas. This includes ensuring infrastructure considerations for walking and cycling are made within strata-owned developments which can also be addressed through the OCP and as part of Development Permit Areas. The District should continue to work with developers and other stakeholder and examine existing policies and standards to ensure new developments are permeable for people walking and biking and ensuring sidewalks are provided within all new subdivisions.



- ▶ **ACTION 4A.3: Develop a program to address gaps in the sidewalk network when new developments occur.** It should be clearly stated that developers are required to construct and install (or provide appropriate monetary compensation for) sidewalks along street rights of way as specified by the District as per the sidewalk requirements outlined in the Subdivision and Development Bylaw.
- ▶ **ACTION 4A.4: Renew the downtown streetscape designs.** As part of ensuring that new developments within downtown Squamish are designed to promote and encourage active transportation and support the Active Transportation Plan, it is recommended that the District review and update existing downtown streetscape designs. New streetscapes in downtown Squamish are to include bicycle lanes or separated bicycle lanes that can be integrated into the Subdivision and Development Control Bylaw and potentially the Zoning Bylaw to ensure that appropriate building setbacks are also provided.
- ▶ **ACTION 4A.5: Develop an Internal Active Transportation Working Group.** This working group would be made up of District of Squamish staff and will focus on ensuring that components of the Active Transportation Plan and other considerations specific to active modes and accessibility are addressed in all new development and infrastructure projects in the District. Members of this group will also work with the Bicycle and Pedestrian Advisory Committee outlined below in **Action 5B.4**.
- ▶ **ACTION 4A.6. Consider Developing a Future Alternative Transportation Infrastructure Reserve Fund.** Local governments are now enabled to create unique reserve funds by bylaw for 'transportation infrastructure that supports walking, bicycling, public transit or other alternative forms of transportation' (LGA 906 (7)). The District may wish to consider this option to allocate a portion of payment in-lieu of parking to fund alternative transportation improvements. This would create an additional revenue stream to standard levies such as Development Cost Charges that fund capital works for roads, parks, water, storm, and sewer infrastructure.

## Direction 4B: Provide Amenities to Make Walking and Cycling Convenient

Making walking and cycling convenient focuses on integrating various modes of transportation, such as transit, walking and cycling, as well as providing amenities such as bicycle parking and end-of-trip facilities. Investing in these areas will help to make walking, cycling and other forms of active transportation a more practical option for day-to-day travel. Other active transportation amenities can be used to enhance the public realm and streetscapes. With these amenities there is the ability to create more welcoming and vibrant everyday spaces to travel and move around, linger within, and socialize. It is also inherent that by creating a more inviting and safe public realm, more people may be encouraged to walk or cycle to and from certain destinations.

- ▶ **ACTION 4B.1: Support the installation of public amenities such as planters, benches and public art.** The District should continue to support incorporating streetscape amenities within the public realm that enable comfort, convenience and enjoyment of public spaces where appropriate space is available. This includes recommendations that build off of directions outlined in some of the District's other plans and policies including the District's Downtown Neighbourhood Plan and the Downtown Streetscape Standards outlined in the Subdivision and Development Control Bylaw. Some of the ways in which the District can encourage walking and cycling through design include:

- Enhanced sidewalk width on commercial streets such as Cleveland Avenue and 2<sup>nd</sup> Avenue to improve pedestrian comfort;
  - Landscaping, including a boulevard between the curb and the pathway;
  - Café Seating in the Parking Zone;
  - Pedestrian amenities, such as benches and water fountains, and garbage cans;
  - Street trees and planting beds;
  - Banners and hanging baskets;
  - Street level lighting;
  - Public art; and
  - Alternative stormwater management techniques, such as rain gardens.
- **ACTION 4B.2: Review requirements for short and long term bicycle parking and end of trip facilities.** Having safe and secure bicycle parking is critical, as most trips by bicycle require a place to park when the rider reaches their destination. At its most basic, this means locking a bike to something within the street right of way. The fear of theft or vandalism is a significant barrier to biking regardless of the cost of an individual's bicycle. There are many different types of bicycle parking, which can be suitable in different situations depending on the duration of the stay. As a result, providing safe and secure bicycle parking at key locations in Squamish is important for facilitating cycling.
- **Short Term Bicycle Parking** typically consists of bicycle racks distributed in the public right-of-way in commercial areas and at key destinations throughout Squamish. Short-term bicycle parking can take a variety of forms, such as a Post-and-Ring Rack or Inverted 'U' Rack. Bicycle racks are generally oriented to residents and visitors, who may stop in the area for shopping or other personal business, and should be located as close to destinations as possible in convenient locations and highly visible for users. It is desirable to provide a limited number of covered bicycle racks to provide protection from the elements.
  - **Long-term bicycle parking** is more secure than typical bicycle racks. It may include bicycle lockers or larger secure facilities, such as bicycle rooms, bicycle cages, secure bicycle parking areas or full service bicycle stations. Long-term parking is generally oriented toward cyclists needing to park a bicycle for an entire day or longer. Major employment areas and multifamily are ideally suited to long-term parking facilities.



### *Examples of different types of bicycle parking*



The District's Zoning Bylaw currently requires short and long-term bicycle parking for new developments, however the District should review these requirements and ensure that adequate parking is being provided based on best practices in other similar communities and a review of existing utilization. Based on these findings the District may consider amending existing regulations accordingly.

There are currently no requirements in place for providing bicycle parking at established businesses. The District should work with businesses to create an incentive program for short term bicycle parking. Partnerships can play a critical role in helping to make cycling more convenient. It is important that incentives be put in place to encourage existing businesses to provide bicycle parking within public spaces in front of their businesses. It is important to ensure however, that these bicycle facilities are not obstructing the movement of people walking or using mobility aids. Additional and/or improved bicycle parking is recommended in key areas of Squamish including:

- **Key commercial areas** including downtown Squamish, businesses that are located parallel to Highway 99, and other commercial destinations within the District.
- **Schools** including all elementary and secondary schools
- **Squamish General Hospital**
- **Parks**
- **High activity bus stops**
- **Recreation Centers and community facilities** including Brennan Park Recreation Centre and the Library.

The District may also want to consider a Bike Rack Sponsorship Program, similar programs have been implemented in other British Columbian cities. This program invites individuals, businesses, service clubs and other organizations to sponsor a bike rack in Squamish. The District can then work with sponsors to determine the best placement and location of the parking facility within Squamish.

Other end-of-trip facilities, such as changing rooms, showers and storage space for equipment can also make cycling more convenient as well as to help build a culture for active transportation within a specific development or place of employment. This is particularly important in cities that experience variable weather conditions

including rain and snow, as more gear is required at certain times of year and having a place to store it has a significant impact on convenience. The District should review existing requirements and ensure appropriate amounts of short-term and long-term bicycle parking and end-of-trip facility are required for new and existing developments. The District can also change and shower facilities requirements in relation to Class A bicycle parking requirements in non-residential buildings.

- ▶ **ACTION 4B.3: Ensure adequate bicycle parking is provided at all District of Squamish owned and operated facilities.** Installing and improving existing bicycle parking and end-of-trip facilities at District owned and operated buildings can help send a message to residents and businesses that the District supports cycling as a means of transportation. Continuing these investments can benefit employees, residents and visitors by providing better access to facilities within the District. This can include the provision of short-term facilities at locations and buildings that see a lot of visitor activity and longer-term bicycle parking and other end of trip facilities should be considered at locations where there are high concentrations of employees.
- ▶ **ACTION 4B.4: Work with partners to consider the feasibility of developing an on-street bicycle corral program on commercial streets within the existing right of way.** Bicycle corrals are a grouping of bicycle racks located on-street. They are typically located in a parking space that may normally be allocated to motor vehicles or in unutilized space within the road right of way. Because they are often located within the road right of way, bicycle corrals minimize sidewalk clutter, free up space for people walking and other uses and increase bicycle parking at locations with high demand. The District of Squamish should work with the Downtown Squamish Business Improvement Association and local business to consider the feasibility of developing an on-street bicycle corral program to look for opportunities to replace on-street parking in strategic locations or utilize unused space within the right of way for bicycle corrals.
- ▶ **ACTION 4B.5: Work with event coordinators and partners to provide temporary bicycle parking at large community events.** Large community events can create traffic congestion and overwhelm motor vehicle parking capacity. One way to mitigate such challenges is to work with event organizers to provide and promote the use of temporary secure bicycle parking and/or bicycle valet programs. The District of Squamish should continue to work with event and bike valet coordinators to ensure that temporary bicycle parking is provided at all corporate-sponsored and large community events.
- ▶ **ACTION 4B.6: Improve the transit customer experience with bus stop improvements and increase bike carrying capacity on buses.** All transit trips begin or end with a trip by some form of active transportation. Therefore, improving access and connections to transit for people walking and cycling increases multi-modal transportation choices and helps to extend the reach of public transit. Integrating transit with active transportation can encompass a variety of infrastructure treatments and amenities, such as providing accessible bus stops, the provision of shelters, benches, lighting, and transit schedule information. Ensuring that snow is cleared quickly along sidewalks and streets with bus routes is also important in winter months.

The District of Squamish should continue to work with BC Transit to inventory existing bus stops and identify priorities for shelters, amenities and accessibility upgrades. The District will strive for 100% of bus stops in Squamish to be made accessible and will work to provide shelters and amenities at stops with a high rate of

boarding. The District should also continue to work with BC Transit to look for opportunities to increase bike carrying capacity on buses.

## Growth and Amenities: Summary of Actions

The Actions that have been developed to address and support active transportation through **Growth and Amenities**:

- ▶ 4A.1: Consider Complete Streets designs in all new development and road projects.
- ▶ 4A.2: Ensure site design supports active transportation.
- ▶ 4A.3: Develop a program to address gaps in the sidewalk network when new developments occur.
- ▶ 4A.4: Renew the downtown streetscape designs.
- ▶ 4A.5: Develop an Internal Active Transportation Working Group.
- ▶ 4A.6: Consider Developing a Future Alternative Transportation Infrastructure Reserve Fund.
- ▶ 4B.1: Support the installation of public amenities such as planters, benches and public art.
- ▶ 4B.2: Review requirements for short and long term bicycle parking and end of trip facilities.
- ▶ 4B.3: Ensure adequate bicycle parking is provided at all District of Squamish owned and operated facilities.
- ▶ 4B.4: Work with partners to consider the feasibility of developing an on-street bicycle corral program on commercial streets within the existing right of way.
- ▶ 4B.5: Work with event coordinators and partners to provide temporary bicycle parking at large community events.
- ▶ 4B.6: Improve the transit customer experience with bus stop improvements and increase bike carrying capacity on buses.





## STRATEGY 5: EDUCATION AND AWARENESS

Although “hard” measures such as walking and cycling infrastructure is critical to encouraging active transportation, a range of “soft” support measures are also recommended to encourage people to walk and cycle in Squamish. These “soft” measures provide awareness and information about active transportation. Education and encouragement initiatives can include providing information to the public on the benefits of active transportation, information on local walking and cycling routes (such as trail maps), and programs that teach skills and awareness around road safety, walking, and cycling. Education and encouragement initiatives are important and cost-effective measures to enable residents to feel more safe and comfortable walking and cycling throughout Squamish. Two Directions have been identified to help improve education and awareness of Active Transportation in the District of Squamish, they include:

- ▶ **Direction 5A: Enhance Wayfinding, Signage and Trip Planning**
- ▶ **Direction 5B: Improve Education and Awareness**

These Directions and the Actions associated with them have been outlined in more detail below.

### Directions and Actions

#### Direction 5A: Enhance Wayfinding, Signage and Trip Planning

A seamless, consistent and easy-to-understand District-wide system of wayfinding, signage and trip planning tools for both walking and cycling is important to make the network easier to navigate, identify the location of important destinations and provide information about route type. Most importantly wayfinding provides information that helps people make decisions on how they navigate a neighbourhood or municipality for people walking and cycling. Based on feedback received from residents and stakeholders, wayfinding on pathways and off street trails and signage that provides directions to lesser known routes and shortcuts would be beneficial in Squamish.



- ▶ **ACTION 5A.1: Develop and implement Pedestrian and Cycling Wayfinding Guidelines.** A seamless, consistent and easy-to-understand District-wide system of wayfinding, signage and trip planning tools for both walking and cycling is important to make the local network easier to navigate. Wayfinding should be simple, easy to read, intuitive, and provide pedestrians and cyclists with a level of confidence that they are travelling the most efficient and accessible route. The District is already working on developing more general wayfinding standards, though these are not being specifically designed for active transportation routes and users.

As the District works to provide more walking and cycling infrastructure throughout Squamish it should consider developing and implementing a wayfinding program and guidelines specifically for people walking and cycling. This can include a plan for the installation of wayfinding throughout the



Squamish as well as agreed-upon protocols for route naming and identification of destinations, consistent design and application of route markings and cycling signage. The guidelines should provide information on all wayfinding signs available, including decision, confirmation, and turn signs. In addition, the guidelines can provide information specific to prioritizing locations for wayfinding signage.

- ▶ **ACTION 5A.2: Continue to update the District's online cycling network map.** The District of Squamish provides information about the location of bicycle routes and sidewalks on the Squamish GIS Web Map and the location of parks and trails on the District website. Ensuring this information is easily accessible, printable and in an easy to read format will be important to ensure that cyclists have access to the most accurate network information. The map should be regularly updated, and provided in both print and interactive on-line formats. The map should also display other information including key destinations, transit routes, locations for bicycle parking and bicycle retailers, as an example. The District could consider working in partnership with other organizations or groups to develop and update the map.
- ▶ **ACTION 5A.3: Work with interested community groups to develop neighbourhood based walking and cycling maps.** In addition to the District-wide wayfinding information and maps, the District should continue to work with partner agencies and organizations to develop more detailed neighbourhood-based maps showing walking and cycling routes. This can provide people with more finite detail on where to travel within their own neighbourhood to access local destinations, while complimenting the District-wide information. This can include representatives from HASTe, the Squamish Trails Society, the Advisory Design Committee and Squamish First Nation, to name a few.



## Direction 5B: Improve Education and Awareness

As the District seeks to support walking and cycling as convenient and attractive forms of transportation, education and awareness for pedestrians, bicycle users and other active transportation users as well as motorists will become increasingly important. Education and awareness is part of a well-rounded approach to creating safe and varied transportation options. While infrastructure is not built overnight, education and awareness can help to increase confidence and knowledge of how to travel through Squamish and share the road. In addition, education and awareness campaigns can actively build community interest for District investments in walking and cycling.

- ▶ **ACTION 5B.1: Continue to support and develop walking and cycling education programs.** While improving infrastructure can make cycling and walking safer and more attractive, it is also important to ensure that residents have the skills, information, confidence and support they need to walk and cycle more in Squamish. There are a number of education and awareness programs and initiatives that the District can develop and support with its partners. This can include partnerships with agencies and organizations such as ICBC (i.e. road safety campaigns), RCMP, School District #48, Vancouver Coastal Health, and local groups and businesses to deliver 'share the road' and road safety campaigns, promote bike/walk to work week, road cycling skills workshops, and walking safety seminars. Educational information around walking and cycling can be delivered through a variety of formats, including an online walking and cycling webpage on the District of Squamish website, promotional safety brochures, radio/television commercials, skills training sessions / workshops, and in-school classes.
  
- ▶ **ACTION 5B.2: Support events and festivals that encourage walking and cycling.** The District of Squamish can host or support events that bring awareness to walking and cycling. This can include working with partners to organize a winter cycling event, street closures for special events or markets, Bike to Work Day/Week, Walk to Work Day/Week, International Walk to School Day, and other events that encourage walking and cycling and increase momentum for active transportation.
  
- ▶ **ACTION 5B.3: Maintain support for Safe Routes to School programming.** Safe Routes to School is a term used to describe an international movement to improve children's safety as they walk and bicycle to school. The initiative is built on five program elements, called the "5 E's" of safe routes to school: engineering, education, encouragement, enforcement, and evaluation. The District of Squamish's Safe Routes to School program is currently underway at the schools throughout the District. The District should continue to support this program and work towards implementing the actions identified at each of the schools through this process. Ensuring that the recommendations are implemented as well as monitoring and reporting back progress and success. Safe routes to school programming can also include incorporating walking and safety as part of the school curriculum, in-school bicycle skills training, promotion / competitions for Walk / Bike to School week, and participation in International Walking Day (iWalk).
  
- ▶ **ACTION 5B.4: Consider the development of a Bicycle and Pedestrian Advisory Committee.** Building off of the success of the Active Transportation Plan Stakeholder Committee, the District should consider developing a volunteer Active Transportation and Cycling Advisory Committee to continue to provide input as the Active Transportation Plan is implemented. This committee would include representatives from a variety of groups and users including people that identify as pedestrians, cyclists, trail users, seniors, and people with mobility challenges. The group will provide input on the implementation and monitoring of the actions identified in the Active Transportation Plan.
  
- ▶ **ACTION 5B.5: Ensure District Bylaws are enforced.** A review of District Bylaws demonstrates that there are already significant regulations that support walking and cycling in the district. This includes snow removal and prohibiting the obstruction of sidewalks and bicycle lanes. It is important that these Bylaws are enforced by the District. This includes responding to public complaints and prioritizing the enforcement of the Bylaws through regular patrols. To ensure that Bylaws are enforced the District should consider allocating additional resources to Bylaw enforcement including hiring additional staff and ensuring that there is someone available on weekends.



- ▶ **ACTION 5B.6: Continue to actively market and promote active transportation through various forms of media.** Campaigns and District-wide communications through various forums such as radio advertisements, bus shelter advertisements, online/website content and others can be effective tools for reaching out to Squamish residents, increasing awareness and interest in active transportation. The District already has a website dedicated to active transportation, and should ensure that the content on this website is regularly updated with news updates, project information and other materials and resources.

- ▶ **ACTION 5B.7: Develop a bicycle and pedestrian count and monitoring program**

The District of Squamish should develop a District-wide bicycle and pedestrian monitoring program that identifies locations for the installation of permanent counters to monitor the number of people walking and cycling along routes within Squamish. This will be an excellent way for the District to monitor how well they are achieving the goal of encouraging more walking and cycling trips and will be able to determine which routes are the most popular. This information can be shared to residents regularly. The District can also consider investing in a counter that provides real time updates on popular routes, such as the Corridor Trail, to help raise awareness of active transportation and current levels of usership.



- ▶ **ACTION 5B.8: Ensure the District Considers the Impact of Changing Technologies and Different Users on the Active Transportation Network.** The District will want to consider the impact of new technologies and the influence they may have on active transportation infrastructure. For example, the placement of electric vehicle charging stations and how they interact with both walking and cycling infrastructure should be considered in future designs and may need to be regulated through District-wide policies or Bylaws. Additionally, the District may want to provide more regulation for people skateboarding or using mobility scooters on bicycle lanes and multi-use pathways. For example, in 2016 Vancouver City Council approved a pilot Bylaw that allows people on skates, skateboards and push scooters to use protected bicycle lanes. The District should consider updating policies and Bylaws to regulate how new technologies, other types of active transportation and people of all ages and abilities are integrated into the existing and future active transportation network.

## Education and Awareness: Summary of Actions

The Actions that have been developed to support **Education and Awareness** are summarized below:

- ▶ 5A.1: Develop and implement Pedestrian and Cycling Wayfinding Guidelines.
- ▶ 5A.2: Continue to update the District's online cycling network map.
- ▶ 5A.3: Work with interested community groups to develop neighbourhood based walking and cycling maps.
- ▶ 5B.1: Continue to support and develop walking and cycling education programs.
- ▶ 5B.2: Support events and festivals that encourage walking and cycling.
- ▶ 5B.3: Maintain support for Safe Routes to School programming.
- ▶ 5B.4: Consider the development of a Bicycle and Pedestrian Advisory Committee.
- ▶ 5B.5: Ensure District Bylaws are enforced.
- ▶ 5B.6: Continue to actively market and promote active transportation through various forms of media.
- ▶ 5B.7: Develop a bicycle and pedestrian count and monitoring program.
- ▶ 5B.8: Ensure the District Considers the Impact of Changing Technologies and Different Users on the Active Transportation Network





## 5.0 IMPLEMENTATION



The District of Squamish Active Transportation Plan provides long-term actions which include a variety of projects and policy directions to enhance and encourage walking and cycling within the District. Recognizing that the long-term vision will require significant investment, an Implementation Strategy is required to prioritize improvements and identify priority projects.

The District of Squamish Active Transportation Plan groups pedestrian and cycling improvements into the five key action areas of Connectivity, Safety and Security, Maintenance and Accessibility, Growth and Amenities and Education and Awareness. This Implementation Strategy details the priorities and costs for capital improvements within the District's jurisdiction that are required for implementation of the Active Transportation Plan. The Implementation Strategy identifies walking and cycling capital project priorities over the short-term (0 to 5 years), medium term (5 to 10 years), and long-term (10 years and beyond).

## 5.1 Implementation Strategy



The following sections summarize the priorities and costs for the capital improvements that are within the District's jurisdiction that are required for implementation of the Active Transportation Plan. The recommended capital improvements are grouped into three categories: pedestrian network improvements, on-street bicycle network improvements, and multi-use pathway improvements. The implementation strategy includes order-of-magnitude cost estimates for each capital project based on typical unit costs and recent construction pricing in Squamish and throughout Metro Vancouver. Cost estimates have been provided to identify the relative cost between projects for planning purposes, but should not be used for budgeting purposes. Wherever possible, the District should work with other agencies and levels of governments to establish cost sharing agreements or to seek grant opportunities in order to off-set total project costs.

It is important to note, the Active Transportation Plan is intended to be a flexible, working, document. For the proposed networks and infrastructure projects there has been a level of flexibility assigned regarding the specific corridors, facility types and level of priority that are recommended. It should also be noted that these priorities may change over time. The District will need to review the feasibility and desirability of each infrastructure project in regards to changes to the overall transportation network and as the District grows and develops. If an opportunity arises to implement an action or infrastructure project identified as a medium or long-term priority, such as through a redevelopment opportunity or other capital project, the District should seek to maximize the opportunity. Additionally, the list of projects provided in the Plan is not exhaustive and the District recognizes the need to be flexible and adapt to change as Squamish continues to grow and new development occurs.

### 5.1.1 Responsibility and Methods of Implementation


The Active Transportation Plan categorizes improvements for active transportation into the five strategies of Connectivity, Safety and Security, Maintenance and Accessibility, Growth and Amenities, and Education and Awareness. This section outlines the primary responsibility of each of the key strategies in the Active Transportation Plan. Many of the features of the Plan are the primary responsibility of the District, while others are the primary responsibility of other agencies or organizations, such as the Ministry of Transportation and Infrastructure, BC Transit, School District #48, or the private sector. For those strategies identified as the primary responsibility of the District, this section also outlines whether they will be implemented through capital planning, operations and maintenance, or policy development and programming such as, updating existing Bylaws, developing guidelines or developing a bicycle and pedestrian monitoring program. **Table 3** summarizes the primary responsibility and method of implementation for each of the actions identified in the Active Transportation Plan.

Table 3: Responsibility and Project Type for the Active Transportation Plan

	TIMEFRAME			METHOD OF IMPLEMENTATION			LEADERSHIP	GOALS <sup>1</sup>
	Short 5 yr	Medium 5 -10 yr	Long-Term 10+ yr	Capital	Operations and Maintenance	Policy and Programming		
1. Connectivity 								
Direction 1A: Expand and Enhance the Sidewalk Network								
1A.1 Increase sidewalk coverage on major routes and connections to key destinations, such as schools and businesses	Ongoing			✓			District	1/2/3/4
1A.2 Upgrade or replace sidewalks that have not been maintained (downtown)		✓		✓			District	4
1A.3 Seek opportunities to implement new sidewalks in conjunction with other projects, plans or developments	Ongoing			✓		✓	District with support from partners and stakeholders	1/2/3/4
Direction 1B: Expand and Enhance the Bicycle Network								
1B.1 Provide a complete and connected bicycle network though a phased implementation plan	Ongoing			✓			District	1/2/3/4
1B.2 Aim to provide high quality, safe and comfortable bicycle infrastructure	Ongoing			✓			District	1/3/4
1B.3 Develop and adopt bicycle infrastructure design guidelines for the District	✓					✓	District	2/3/4
1B.4 Seek opportunities to implement bicycle infrastructure in conjunction with other capital projects, plans or developments	Ongoing			✓		✓	District with support from partners and stakeholders	1/2/3/4
Direction 1C: Enhance North/South Connectivity for Walking and Cycling								
1C.1 Enhance north/south connectivity for walking and cycling	Ongoing			✓			District	1/3/4
Direction 1D: Enhance East/West Connectivity for Walking and Cycling								
1D.1: Enhance east/west connectivity for walking and cycling	Ongoing			✓			District	1/3/4
2. Safety & Security 								
Direction 2A: Improve Road Safety								
2A.1 Provide new or enhanced pedestrian crossing locations	Ongoing			✓			District	1/3/4
2A.2 Provide enhanced bicycle intersection crossings where warranted	Ongoing			✓			District	1/3/4
2A.3 Install bicycle activated pushbuttons or detection at traffic signals on bicycle routes where warranted	Ongoing			✓			District & MoTI	1/3/4

<sup>1</sup> Goal #1: Build a Culture for Active Transportation  
Goal #2: Make Considerations for Active Transportation through all Infrastructure Projects

Goal #3: More Walking and Cycling Trips  
Goal #4: Safe and Accessible Walking and Cycling

	TIMEFRAME			METHOD OF IMPLEMENTATION			LEADERSHIP	GOALS <sup>2</sup>
	Short 5 yr	Medium 5 -10 yr	Long-Term 10+ yr	Capital	Operations and Maintenance	Policy and Programming		
2A.4 Explore the feasibility of reducing speed limits on streets in Squamish with added enforcement (RCMP)	✓					✓	District	1/4
2A.5: Reduce incidents of conflicts on multi-use pathways	Ongoing			✓	✓	✓	District	1/3/4
Direction 2B: Address Barriers to Walking and Cycling								
2B.1 Address safety barriers to walking and cycling within Squamish	✓			✓	✓		District, MoTI & CN	1/3
Direction 2C: Improve Personal Safety								
2C.1 Improve visibility and access at underpasses	✓			✓			District	1/3/4
2C.2 Provide lighting along pathways, sidewalks and bicycle routes where appropriate	✓			✓	✓		District	1/3/4
2C.3 Follow the standards of CPTED to ensure principles are followed in walking and cycling infrastructure design	Ongoing			✓	✓		District	1/2/3/4
3. Maintenance & Accessibility 								
Direction 3A: Provide Accessible Infrastructure								
3A.1 Consider developing Accessibility Guidelines for District streets	✓					✓	District	1/2/3/4
3A.2 Provide accessible curb ramps at intersections	Ongoing			✓	✓		District & MoTI	1/2/3/4
3A.3 Work with BC Transit to ensure all bus stops are accessible	Ongoing			✓	✓		District & BC Transit	1/2/3/4
3A.4 Continue to monitor crossing times at intersections to ensure adequate time to cross	Ongoing				✓		District & MoTI	1/3/4
3A.5 Continue to ensure that all multi-use pathways in the District are accessible	Ongoing			✓	✓		District	1/3/4
Direction 3B: Maintain the Sidewalk and Bicycle Network								
3B.1 Continue to inspect sidewalks and pathways regularly to ensure they are well maintained, including controlling vegetation	Ongoing			✓	✓		District	1/3/4
3B.2 Review and update current snow removal requirements	✓					✓	District	1/3/4
3B.3 Review and update current bicycle facility and multi-use pathway snow removal requirements	✓					✓	District	1/3/4
3B.4 Design bicycle routes to facilitate drainage, snow removal and snow storage	Ongoing			✓	✓		District	1/2/3/4
3B.5: Ensure the District has the equipment to maintain all types of proposed bicycle infrastructure.	✓			✓	✓		District	1/3/4



<sup>2</sup> Goal #1: Build a Culture for Active Transportation

Goal #2: Make Considerations for Active Transportation through all Infrastructure Projects

Goal #3: More Walking and Cycling Trips

Goal #4: Safe and Accessible Walking and Cycling



	TIMEFRAME			METHOD OF IMPLEMENTATION			LEADERSHIP	GOALS <sup>3</sup>
	Short 5 yr	Medium 5 -10 yr	Long-Term 10+ yr	Capital	Operations and Maintenance	Policy and Programming		
4. Growth & Amenities 								
Direction 4A: Ensure Active Transportation is Considered and Mandated in All New Development Projects and mandated in Bylaws								
4A.1 Consider Complete Street designs in all new development and road projects	✓				✓	✓	District	1/2/3/4
4A.2 Ensure site design supports active transportation	✓					✓	District	1/2/3/4
4A.3 Develop a program to address gaps in the sidewalk network when new developments occur		✓				✓	District	1/2/3/4
4A.4 Renew the downtown streetscape designs	✓					✓	District	1/2/3/4
4A.5 Develop an Internal Active Transportation Working Group	✓					✓	District	1/2/3/4
4A.6. Consider Developing a Future Alternative Transportation Infrastructure Reserve Fund	✓					✓	District	1/2/3/4
Direction 4B: Provide Amenities to Make Walking and Cycling Convenient								
4B.1 Support the installation of public amenities such as planters, benches and public art	✓			✓		✓	District	1 / 3
4B.2 Review requirements for short-term and long-term bicycle parking and end of trip facilities	✓					✓	District & Local Businesses	1 / 3
4B.3 Ensure adequate bicycle parking is provided at all District of Squamish owned and operated facilities	✓			✓	✓		District	1 / 3
4B.4 Work with partners to consider the feasibility of developing an on-street bicycle corral program on commercial streets within the existing right of way	✓					✓	District & Local Businesses	1/2/3
4B.5 Work with event coordinators and partners to provide temporary bicycle parking at large community events	✓					✓	District	1 / 3
4B.6 Improve the transit customer experience with bus stop improvements and increase bicycle carrying capacity on buses	✓					✓	District & BC Transit	1 / 3
5. Education & Awareness 								
Direction 5A: Enhance Wayfinding, Signage and Trip Planning								
5A.1 Develop and implement pedestrian and cycling wayfinding guidelines		✓		✓		✓	District	1 / 2/ 3
5A.2 Continue to update the District’s online cycling network map	Ongoing					✓	District	1 / 2/ 3
5A.3 Work with interested community groups to develop neighbourhood based walking and cycling maps		✓		✓			District	1/2/3/4

<sup>3</sup> Goal #1: Build a Culture for Active Transportation  
Goal #2: Make Considerations for Active Transportation through all Infrastructure Projects

Goal #3: More Walking and Cycling Trips  
Goal #4: Safe and Accessible Walking and Cycling

	TIMEFRAME			METHOD OF IMPLEMENTATION			LEADERSHIP	GOALS <sup>5</sup>
	Short 5 yr	Medium 5 -10 yr	Long-Term 10+ yr	Capital	Operations and Maintenance	Policy and Programming		
Direction 5B: Improve Education and Awareness								
5B.1 Continue to support and develop walking and cycling education programs	✓					✓	District & Other	1/3/4
5B.2 Support events and festivals that encourage walking and cycling	✓					✓	District	1/2/3
5B.3 Maintain support for Safe Routes to School programming	Ongoing					✓	District with support from partners and stakeholders	1/2/3/4
5B.4 Consider the development of a Bicycle and Pedestrian Advisory Committee	✓					✓	District	1/2/3
5B.5 Ensure District Bylaws are enforced	Ongoing					✓	District	1/2/3
5B.6 Continue to actively market and promote active transportation through various forms of media	Ongoing					✓	District	1/2/3
5B.7 Develop a bicycle and pedestrian count and monitoring program	✓				✓	✓	District	1/2/3
5B.8: Ensure the District Considers the Impact of Changing Technologies and Different Users on the Active Transportation Network	Ongoing					✓	District	1/2/3/4

<sup>5</sup> Goal #1: Build a Culture for Active Transportation  
Goal #2: Make Considerations for Active Transportation through all Infrastructure Projects

Goal #3: More Walking and Cycling Trips  
Goal #4: Safe and Accessible Walking and Cycling

The following sections provide a summary of the costs and priorities for the features of the Active Transportation Plan that have been identified as being the primary responsibility of the District and involve resources for capital infrastructure. As noted, the capital improvements have been broken down into three categories pedestrian network improvements, bicycle network improvements, and north south connection improvements. Projects identified in each of the three categories will help to address multiple strategies, directions and actions.

### 5.1.2 Pedestrian Network Improvements

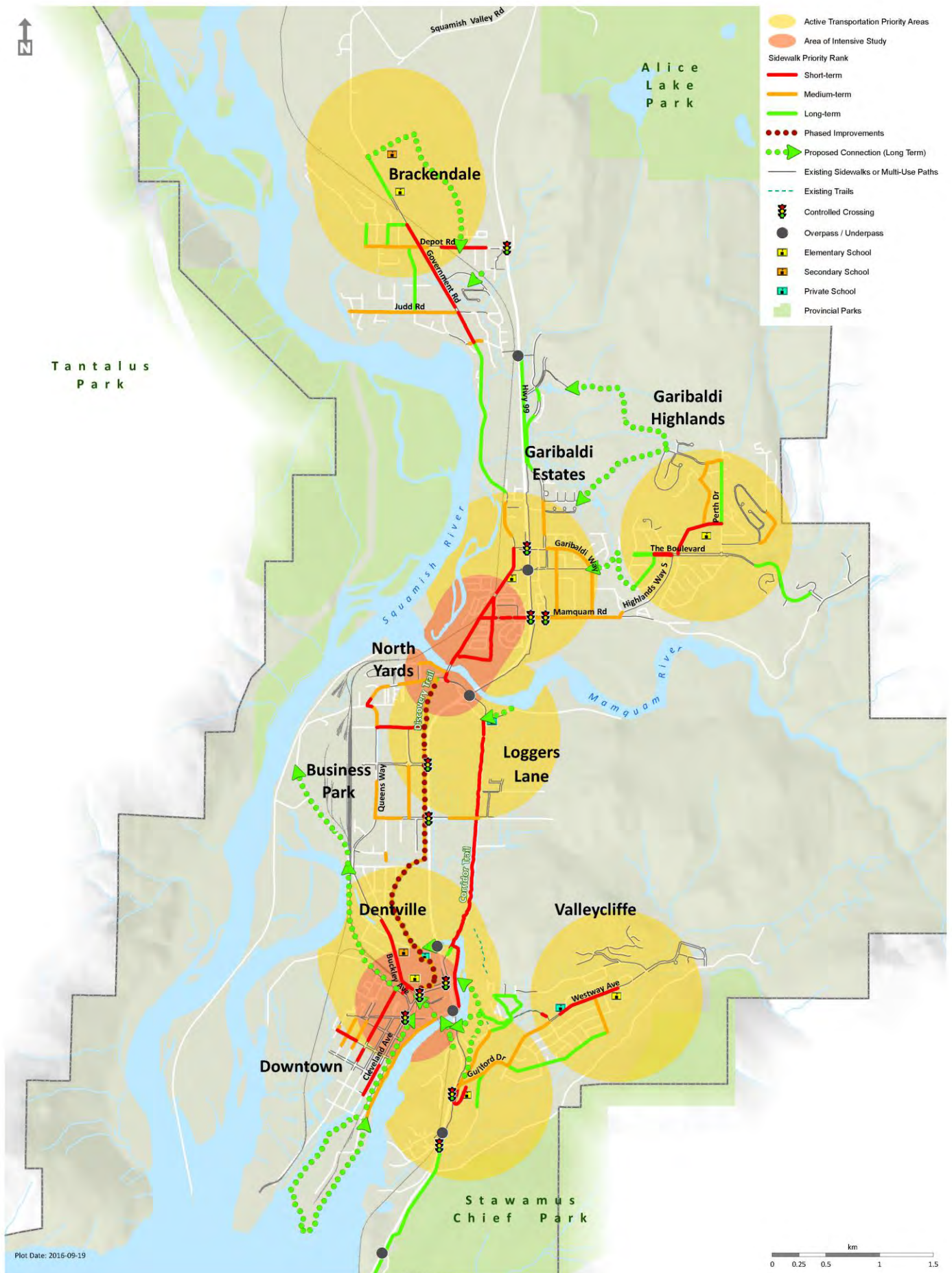
Pedestrian network improvements focus on increasing sidewalk (or other types of pedestrian facility) coverage on major roads, upgrades to sidewalks that have not been maintained and accessibility enhancements throughout the District. The following cost estimates have been based on a sidewalk unit cost of \$300 per metre. **Figure 18** identifies all the locations of proposed new pedestrian facilities and the level of priority based on short, medium and long term timelines. **Table A-1** in **Appendix B** also identifies each new pedestrian facility recommendation and outlines the preliminary capital costs and priorities for implementation of this network in more detail. The total estimated cost to implement all of the sidewalk facilities is approximately **\$8,016,000**. It is important to note that this number does not include sidewalk recommendations along the Government Road Corridor as this corridor is discussed specifically in **Section 5.1.4**.

This magnitude of improvement will require significant investment, and it will take well several years for the District to complete the implementation of all recommended sidewalk facilities identified in the Plan, based on current and historic funding levels for sidewalk construction. It is for this reason that implementation priorities are used to help identify those improvements that should be completed in the short term, medium term and long term horizons. Priorities have been established based primarily upon providing new facilities to demand areas that either experience or have the potential for generating the highest pedestrian demands, filling in network gaps, and enhancing the safety and comfort of pedestrians throughout the District. This included reviewing existing population density in Squamish, as presented in **Figure 2**, and recognizing that connecting neighbourhoods with the highest population density with each other and with commercial and employment areas was an important priority. In general, the highest priorities for short-term implementation were identified in areas with a high presence of pedestrian activity and vulnerable road users. Moderate priority sidewalks for medium-term implementation were identified at locations where there are network gaps. Longer-term priority sidewalks were identified on streets that would be improved through redevelopment or on streets with lower anticipated demand.

It is important to note that there will likely be opportunities for financial contribution from development activities as a result the Active Transportation Plan focused on identifying locations where the installation of sidewalks is a priority if development opportunities occur. In addition, the District will want to explore the possibility of incorporating some of these improvements with already scheduled maintenance or rehabilitation of the District's network. To that end, it is expected that priorities may shift over time to coordinate with other activities.



Figure 18: Proposed Pedestrian Network Priorities



As mentioned above, the anticipated cost to implement the recommended pedestrian network improvements is approximately **\$8 million**, as summarized in **Table 4** and detailed in **Table A-1**. However, the short-term priorities are estimated to cost approximately **\$2.5 million**, which represents an annual investment of just over **\$500,000** per year in new sidewalks over the next five years.

**Table 4: Summary of Cost and Priorities of Pedestrian Improvements (Excluding Government Road, Corridor Trail and Discovery Trail)**

Priority	Distance (m)	Cost Estimate
Short Term	5,500	\$ 2,500,000
Medium Term	12,896	\$ 4,000,000
Long Term	8,000	\$ 1,500,000
<b>Total</b>	<b>26,000</b>	<b>\$ 8,000,000</b>

### 5.1.3 Bicycle Network and Multi-Use Pathway Improvements

Cost estimates and implementation priorities for the proposed bicycle network included in the Active Transportation have been prepared and are presented in this section. **Figure 19** identifies all the new bicycle and multi-use pathway facilities that are recommended in the Active Transportation Plan and identifies the level of priority based on short, medium and long term timelines. **Table A-2** in **Appendix B** also identifies each new on-street facility recommendation and outlines the preliminary capital costs and priorities for implementation of this network in more detail. **Table 5** outlines the unit cost applied to the bicycle network and multi-use pathway projects. It is important to note that these unit costs are typical costs however, they do not include factors such as burying hydro lines, property acquisition or the cost of replacing existing infrastructure. As a result, at locations where these types of treatments are required the cost per kilometre will be significantly higher.

**Table 5: Bicycle Facility Unit Cost**

Facility Type	Unit Rate
Proposed Protected Bicycle Lane	\$ 875,000 per/km
Proposed Neighbourhood Route	\$ 25,000 per/km
Proposed Bicycle Lane	\$ 65,000 per/km
Proposed Shared Use Lane	\$ 20,000 per/km

By comparing the number of kilometres of proposed bicycle infrastructure in Squamish with other similar communities as presented in **Table 6**, the results show that Squamish's proposed bicycle network is generally comparable to other communities with a similar number of residents. The geographic size and shape of the community is also something that can be considered, as are potential development opportunities. Squamish is a growing community and having a

comprehensive Active Transportation Plan in place ensures the District is able to be well positioned for projects such as, new bicycle infrastructure, to be implemented through development.

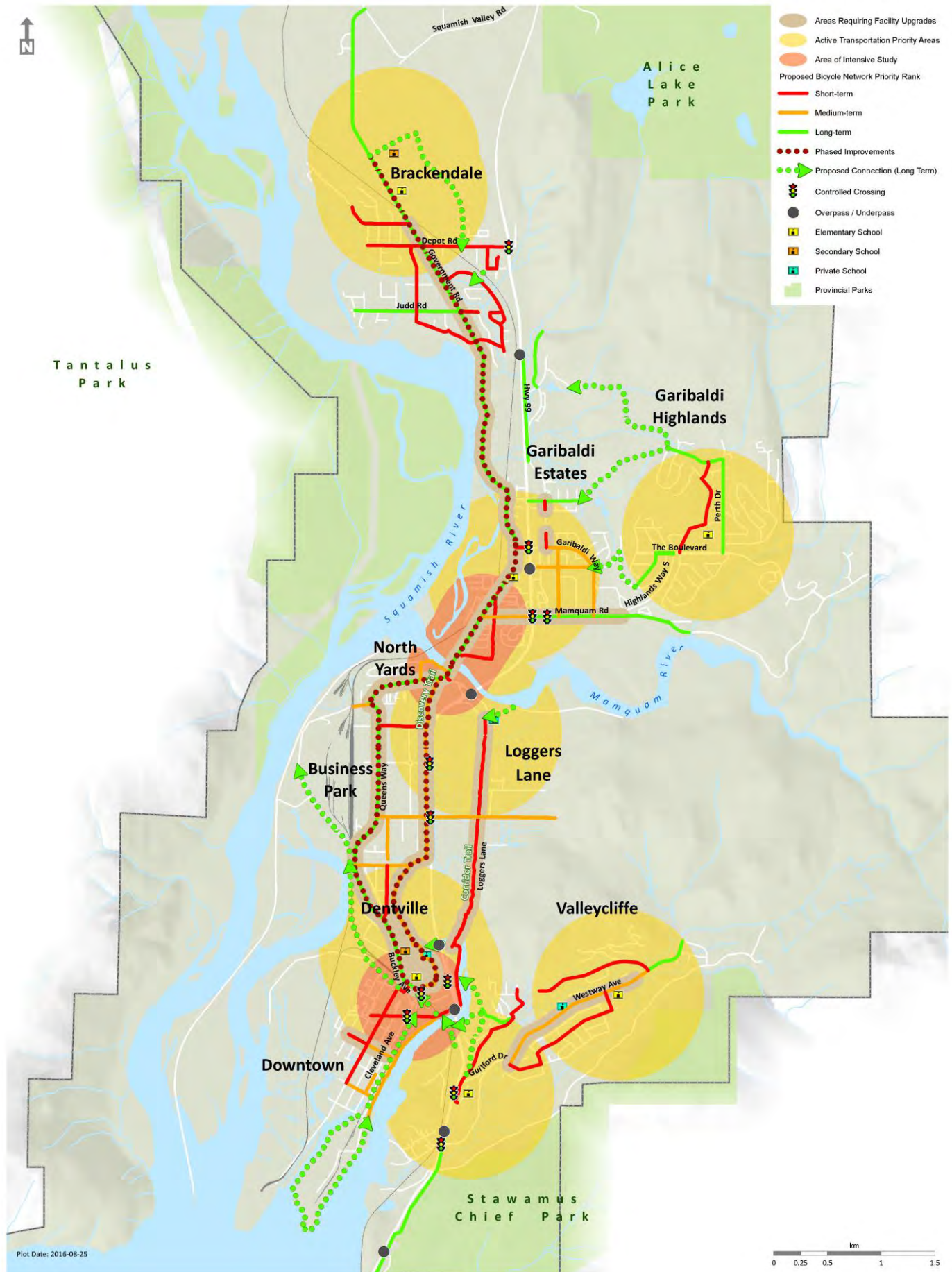
**Table 6: Proposed Bicycle Network Comparison**

Municipality	Existing (km)	Proposed New (km)	Total New + Existing	Population	Proposed Km per 10,000 residents	Total per 10,000 residents
City of White Rock	12	16.67	28.67	18,535	9	15
City of Quesnel	16	13.5	29.5	9,830	14	30
City of Colwood	17.1	66.5	83.6	16,000	42	52
<b>District of Squamish</b>	<b>55</b>	<b>60</b>	<b>115</b>	<b>19,000</b>	<b>32</b>	<b>61</b>
City of Pitt Meadows	100	40.1	140.1	17,710	23	79

Priorities were established based on proximity to downtown, and other commercial and community destinations. Short-term priorities are assigned to proposed bicycle facilities that will provide direct access and connectivity to important destinations within the District and improve the cycling environment within neighbourhoods. Medium-term priorities are assigned to proposed bicycle facilities that will provide connections between destinations. Finally, longer-term priorities are assigned to bicycle routes that link residential areas of Squamish.



Figure 19: Proposed Bicycle Network and Multi-Use Pathway Priorities



As summarized in **Table 7** the total cost to implement all recommend bicycle network and off street pathway improvements are approximately **\$13.2 million**. It is important to note that this total does not include improvements to corridors identified as north south connections. The highest priority on-street bicycle infrastructure to be implemented over the short-term are estimated to cost approximately **\$4.3 million** representing an annual investment in bicycle and multi-use pathway infrastructure of **\$900,000** per year, excluding other funding opportunities.

**Table 7: Summary of Cost and Priorities for the Bicycle and Multi-Use Pathway Network** (Excluding Government Road, Discovery Trail and Corridor Trail (Lighting Upgrades) it does include Corridor Trail north and south extensions)

Priority	Protected Bicycle Lane	Neighbourhood Route	Multi-Use Pathways	Bicycle Lane	Shared Use Lane	Total
Short Term	\$2,710,000	\$340,000	\$1,180,000	\$100,000	-	\$ 4,330,000
Medium Term	\$3,410,000	-	\$970,000	\$390,000	\$10,000	\$ 4,780,000
Long Term	\$450,000	-	\$3,300,000	\$370,000	-	\$ 4,120,000
<b>Total</b>	<b>\$6,570,000</b>	<b>\$340,000</b>	<b>\$5,450,000</b>	<b>\$860,000</b>	<b>\$10,000</b>	<b>\$ 13,230,000</b>

#### 5.1.4 North South Connection Improvements

Three corridors were identified as important north south connections within the District, Government Road Corridor, Corridor Trail and Discovery Trail. As part of the development of the Active Transportation Plan these three corridors were reviewed in more detail to identify the type of enhancements and prioritize implementation. The table below outlines the cost of improvements as presented under **Strategy 1 Direction 1C**.

Based on feedback received from Squamish residents and stakeholders lighting of Corridor Trail was identified as one of the top priorities. Formalizing Discovery Trail was identified as a longer term project but there was a clear desire to improve intersection crossings over the short term. Finally, providing walking and cycling enhancements along Government Road was identified as an ongoing process that would begin with some short term spot improvements at intersection and begin providing additional separation where feasible, as described in more detail below. Cost estimates for the long-term proposed enhancements can be found in **Table 8**.

Due to the length of the Government Road Corridor and the complexity of the right of way and the different land use patterns, it is likely that the upgrades to the existing facilities along Government Road will require phased implementation. To ensure that the District is continually working to increase safety and improve overall conditions the following phased improvements have been proposed along the corridor:

- Provide intersection enhancements (short and medium term, including pedestrian facility improvements at intersections). Cost estimates for intersection improvements have not been provided as they require a more detailed review of options.
- Where feasible install physical separation at conflict areas such as corners along the route (short to medium term)
- Where space is available provide painted buffers (short to medium Term)

- Where space is available, and maintenance possible, provide a separated bicycle lane (short to long term)

A more detailed review of the long-term cost estimates for enhancing bicycle facilities along the different sections of the Government Road Corridor can also be found in **Appendix B**.

It is important to note that all three north south connections have been identified as key components of the active transportation network in Squamish. Each corridor has segments that would be considered a higher priority if investment opportunities present themselves through additional funding sources or opportunities through development. Short and medium term intersection improvements have been identified in **Figure 20**.

**Table 8: Summary of Cost and Priorities for North South Connection Improvements (Government Road, Corridor Trail and Discovery Trail)**

Priority	Government Road Corridor (includes sidewalks)	Corridor Trail (Lighting Only)	Discovery Trail	Total
Short Term	\$2,421,000	\$900,000	-	\$3,321,000
Medium Term	\$3,702,000	-	-	\$3,702,000
Long Term	\$4,412,000	-	\$3,600,000	\$8,012,000
<b>Total</b>	<b>\$10,535,000</b>	<b>\$900,000</b>	<b>\$3,600,000</b>	<b>\$15,035,000</b>

### 5.1.5 Summary

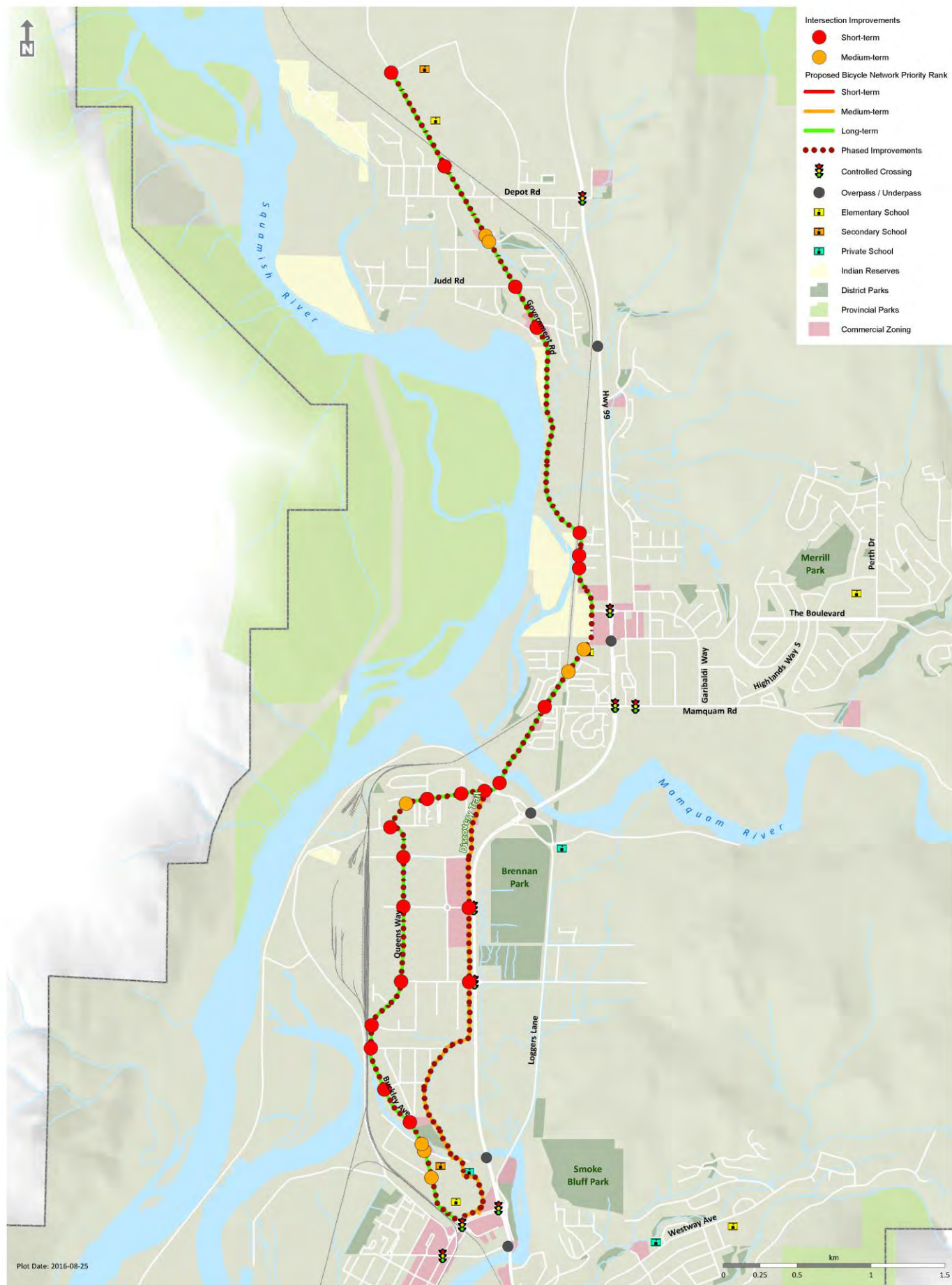
The overall capital costs for the Active Transportation Plan are summarized in **Table 9** below. The complete implementation of all capital projects in the plan is estimated to cost **\$36.3 million**. However, by prioritizing projects into short-term, medium-term, and long-term horizons, it is estimated that the highest priority projects for implementation over the short-term would cost approximately **\$10 million**. This is equivalent to an annual investment of approximately **\$2 million** over the next five years.

**Table 9: Summary of Costs and Priorities for the Active Transportation Plan**

	Short-Term	Medium-Term	Long-Term	Total
Pedestrian Network	\$2,500,000	\$4,000,000	\$1,500,000	\$8,000,000
Bicycle and Multi-Use Pathway	\$4,330,000	\$4,780,000	\$4,120,000	\$13,230,000
North South Connections	\$3,321,000	\$3,702,000	\$8,012,000	\$15,035,000
<b>Total</b>	<b>\$10,151,000</b>	<b>\$12,482,000</b>	<b>\$13,632,000</b>	<b>\$36,265,000</b>



Figure 20: Government Road and Discovery Trail Intersection Improvements



## 5.2 Maintenance Costs

As outlined through **Direction 3B: Maintain the Sidewalk and Bicycle Network**, there are additional maintenance costs associated with different types of bicycle infrastructure. The Operations team at the District of Squamish has estimated that maintenance costs will vary significantly based on the design of infrastructure. The following costs have been provided which help to highlight the additional maintenance expenditures that should be considered when planning and designing future bicycle infrastructure in the District. Below are the estimated maintenance costs based on the type of separation used:

- \$270 per kilometre annually for painted bicycle lanes.
- \$630 per kilometre annually for concrete no post separation
- \$840 per kilometre annually for plastic delineation

This demonstrates a considerable increase in maintenance costs for separation compared to painted lanes. The District has estimated that the maintenance costs for pathways such as the Corridor Trail is roughly an \$1800 per kilometer annually but will vary depending on design and maintenance expectations. The Operations team made it clear that maintenance costs could be significantly higher depending on expectations around clearing snow and debris, the design and materials used, and the selected routes as each roadway presents unique challenges for maintenance.

It is important to keep in mind that Constructing and maintaining walking and cycling facilities is typically cheaper per kilometre than the cost to construct many road infrastructure projects. Residents receive an easy and convenient travel option and decreased congestion, roads experience less wear and tear, and capital budgets can benefit from a financially sustainable transportation solution.

## 5.3 Interim Design Strategies (Pilot Projects)

As communities throughout North America and internationally implement their Active Transportation Plans, and in particular their bicycle networks, they often face significant challenges technically, politically and financially. Some of the issues and questions that arise when implementing bicycle networks include:

- ▶ Skeptical residents and stakeholders that may not believe in the potential to increase the number of bicycle trips by installing new routes and are concerned about the impact new bicycle infrastructure will have on traffic congestion, safety, or parking spaces.
- ▶ Ensuring routes are connected to a larger network and destinations, this can be a struggle when communities are in the early stages of implementing their bicycle network plans. Communities may not have the resources to build more than a few corridors at a time and research suggests that significant increases in ridership do not tend to occur until a connected network of routes is established.
- ▶ Funding limitations and capital resources can make implementing new infrastructure a challenge.

These common issues have resulted in communities looking for ways to implement bicycle routes, particularly All Ages and Abilities routes, in a timely and cost effective manner through interim design strategies. Interim design strategies offer ways to make significant strides in network implementation while respecting the concerns of residents and stakeholders. These interim designs include the use of low-cost materials, ongoing monitoring of project success and the understanding

that the project can be changed or relocated if it is felt that it is failing to meet intended needs. Examples of interim designs of AAA networks can be found throughout North America including the protected bicycle lanes on the Burrard Street Bridge in Vancouver and the City of Calgary's Centre City Cycle Track Network. Some of the benefits of interim design options include:

- ▶ Faster implementation and more flexible design
- ▶ Ability to make design changes based on feedback received from users and other stakeholders
- ▶ As the project is introduced as a trail or pilot project it can ease tensions of those opposed to the project as they know the project is not being forced upon them
- ▶ Relatively low risk if the facility does not perform well or is not well received.

A key component of an interim design strategy is ongoing monitoring of performance based on a number of variables including:

- ▶ Levels of Satisfaction
- ▶ Safety for all road users including the number of collisions and perceived safety concerns
- ▶ Economic impact on nearby businesses
- ▶ Demographics of who is using the facility

## 5.4 Funding Strategies

The costs of implementing the improvements identified in the District of Squamish Active Transportation Plan can be significantly reduced by pursuing external funding sources and partnership opportunities for many of the identified projects. This section describes some funding strategies and potential funding sources that the District may consider to help leverage its investments and to maximize its ability to implement transportation improvements. The District should regularly check with all levels of government to keep up to date on current funding opportunities. The District of Squamish should pursue all available sources of funding for transportation infrastructure and programs, including the programs identified below (Note: as funding opportunities change regularly, the information in this section is subject to change):

- ▶ **Provincial Programs and Initiatives.** The Provincial Government administers the **BikeBC** program, which promotes new, safe and high quality cycling infrastructure through cost-sharing with local governments. Some possible projects include new bicycle trails and bicycle lanes, improvements to existing cycling infrastructure, and providing for bicycle lockers and other equipment that makes cycling a safer and more convenient option for travellers. The BikeBC program provides funding for infrastructure which forms part of a bicycle network plan adopted by a BC local government.

Funding for cycling infrastructure projects may also be available through the **New Building Canada Fund — Small Communities Fund**. The provincial and the federal governments will each allocate funding to support infrastructure projects in communities with a population of less than 100,000 people. This 10-year funding program runs from 2014 to 2024.



- ▶ **Federal Funding.** There are several programs that provide funding for environmental and local transportation infrastructure projects in municipalities across Canada. Typically, the federal government contributes one-third of the cost of municipal infrastructure projects. Provincial and municipal governments contribute the remaining funds, and in some instances, there may be private sector investment as well.
- ▶ **Green Municipal Funds.** The Federation of Canadian Municipalities manages the Green Municipal Fund, with a total allocation of \$550 million. This fund is intended to support municipal government efforts to reduce pollution, reduce greenhouse gas emissions and improve quality of life. The expectation is that knowledge and experience gained in best practices and innovative environmental projects will be applied to national infrastructure projects.
- ▶ **Carbon Tax Rebate.** Each municipality that has signed the Climate Action Charter received an annual rebased based on completion of the CARIP form. The District of Squamish could choose to direct this funding towards sustainable transportation projects, such as funding bicycle and pedestrian infrastructure.
- ▶ **ICBC** provides funding for road improvements, including pedestrian and bicycle infrastructure, particularly where these have the potential to reduce crashes, improve safety, and reduce claims costs to ICBC. Funding is available through ICBC's Road Improvement Program, and other ICBC programs include the Speed Watch Program (through the Community Policing Centres), Speed and Intersection Safety Program, Counter Attack, Operation Red Nose, and Road Sense Speaker Program for Schools.
- ▶ **Developers.** Squamish should explore opportunities for road improvements to be constructed as development occurs within the District. This process could be formalized through an update to the *Subdivision Development Servicing Bylaw* or through individual negotiations.
- ▶ **Private sector.** Many corporations wish to be good corporate neighbours — to be active in the community and to promote environmentally-beneficial causes. Bicycle and pedestrian routes and facilities are well-suited to corporate sponsorship, and have attracted significant sponsorship both at the local level and throughout North America. Examples in B.C. include Construction Aggregates in Sechelt, which constructed an overpass over a gravel conveyor to provide a link for pedestrians and cyclists, and 7-Eleven and Molson Breweries, which have sponsored multi-use pathways in Metro Vancouver.
- ▶ **Development Cost Charges.** Opportunity to update the DCC bylaw to incorporate active transportation projects that benefit new growth in the community.
- ▶ **Service Clubs.** In many communities, service clubs have been involved in funding and building bicycle infrastructure and facilities including rails with trails and bicycle parking.
- ▶ **Advertising.** If the District is creating a bicycle route map it may want to work with local business who would be interested in providing advertising and therefore revenue to cover some or all of the cost of advertising.

## 5.5 Monitoring

A monitoring strategy is important to ensure that the Active Transportation Plan is implemented as intended, and to determine whether the Plan is achieving its goals. A monitoring program will also enable District staff to justify continued expenditures and allocation of resources to implement prioritized initiatives of the Active Transportation Plan. Monitoring also provides a means of identifying changing conditions which would require changes to the Active Transportation Plan. The monitoring program needs to be:

- ▶ **Meaningful.** The monitoring strategy should yield meaningful results and point to the success in achieving the vision and goals of the Active Transportation Plan.
- ▶ **Measurable.** The monitoring program needs to establish criteria that are readily measurable and for which data or information can be readily obtained.
- ▶ **Manageable.** The monitoring program needs to take into account the resource limitations of the District and will identify measures where information is accessible or data is simple to collect.

Monitoring of the Active Transportation Plan focuses on two main components, the first is the degree of progress in implementing the Plan and the second is monitoring outcomes, in particular how much progress is being made to meet the goals of the Plan as outlined in **Section 3.0**.

**Table 10: Active Transportation Plan General Measures of Success**

Measure of Success	Indicator
Walking and cycling mode share (work)	%
Walking and cycling mode share (all trips)	%
Walking and cycling volumes on key corridors	#
Walking and cycling funding levels	\$
District staff resources	# FTE

In addition, different monitoring strategies have been identified below based on the goals as well as the projects and strategies that have been identified as part of the Active Transportation Plan.

**Goal #1: Building a Culture for Active Transportation** is a less quantitative than the other goals. Monitoring of this goal could include a variety of strategies including:

- ▶ Tracking the number of Bylaw infractions and public complaints of different road users.

- ▶ The number of campaigns and programs such as, share the road campaigns, road safety initiatives and education programs the District is promoting.
- ▶ Has bicycle parking and / bike valet service been made available at large events, festivals and celebrations throughout the District.
- ▶ The number of events or festivals the District promotes and sponsors that occur throughout the year that encourage and promote walking and cycling.
- ▶ The number of active transportation wayfinding displays.
- ▶ The number of neighbourhood-based walking and cycling maps.

## Goal #2: Make Considerations for Active Transportation through all Infrastructure Projects

**Implementation.** Number of completed projects identified in the Active Transportation Plan.

- ▶ Sidewalks (# projects)
- ▶ Bicycle Route (# projects)

**Level of Investment.** The amount of capital investment the District is putting towards active transportation.

- ▶ Walking (\$ and % of City's total transportation capital investments)
- ▶ Cycling (\$ and % of City's total transportation capital investments)

## Goal #3: More Walking and Cycling Trips

Can be measured by reviewing Canada Census Data and reviewing the mode share of trips to work.

- ▶ Walking Trips (%)
- ▶ Cycling Trips (%)
- ▶ The District will monitor the number of people walking and cycling. This will be undertaken prior to and following infrastructure upgrades by conducting manual counts or installing automated counters along pathways or on-street routes.

## Goal #4: Safe and Accessible Walking and Cycling

- ▶ Safe Walking and Cycling. Safety, accessibility and comfort can be monitored by reviewing the number and severity of collisions (vehicle and infrastructure related) based on ICBC data and injury data if available.
  - Collision between a person walking and a motor vehicle (# collisions, location)
  - Collision between a person cycling and a motor vehicle (#collisions, location)



- ▶ **Accessible Walking and Cycling.** Accessibility improvements can be monitored through the implementation of projects.
- ▶ The total number of complaints received by the District regarding icy sidewalks or sidewalks where snow has not been removed.

## Appendix A: Bylaw and Policy Recommendations

Title	Description of Bylaw/Policy	Relationship to walking and cycling	Best Practices	Current Squamish Bylaw/Policy	Assessment of Squamish Bylaw/Policy	Recommendations
<b>Subdivision and Servicing Bylaw</b>	Regulates the subdivision of land and sets requirements for the provision of infrastructure works when the land is subdivided or developed	Requirements for new developments to provide sidewalks and bike infrastructure	<ul style="list-style-type: none"> <li>• Sidewalk width (1.8m clear of obstructions) both side of street</li> <li>• Bike lanes (1.5. unless positioned adjacent to parked car- 1.8m)</li> <li>• Cul de sac connections</li> </ul>	<p>Current bylaw includes:</p> <ul style="list-style-type: none"> <li>• Required provision of sidewalks and traffic calming adjacent to subdivisions,</li> <li>• Collector and neighbourhood trail standards,</li> <li>• Required road cross sections, some of which include bicycle facilities,</li> <li>• Minimum width of 1.5m for bicycle lanes, and,</li> <li>• Standards for cul-de-sacs that identify an optional walkway if a trail exists.</li> </ul>	An initial assessment reveals that the District has a thorough Subdivision and Development Control Bylaw that includes significant active transportation infrastructure requirements. There are opportunities to provide enhancements to the walking and cycling facility widths. More cul-de-sac connections are an important component of making neighbourhoods with cul-de-sacs more walkable.	<p>The Subdivision and Servicing Bylaw provides typical road cross sections. If there is interest from the municipality or developer on particular streets for additional enhancements, these corridors should be identified.</p> <p>Recommendations for enhancements on the typical road cross-sections include the introduction of buffered bike lanes on major roads; 1.5m bike lanes; 1.8m beside parked cars; and 1.8m sidewalks.</p>
<b>Zoning Bylaw</b>	Regulates the type of building and uses or activities allowed on a specific property. It also regulates building size, building siting on the property and parking.	Bike parking required with development of buildings	<ul style="list-style-type: none"> <li>• Provides bicycle parking requirements for institutional; multi-family residential; commercial; and, schools zones</li> <li>• Includes requirements for Class A (long-term) and B (short term)</li> <li>• Includes performance criteria for bike parking racks. Source: APBP <a href="http://c.ymcdn.com/sites/www.apbp.org/resource/resmgr/Bicycle_Parking/EssentialsofBikeParking_FINA.pdf">http://c.ymcdn.com/sites/www.apbp.org/resource/resmgr/Bicycle_Parking/EssentialsofBikeParking_FINA.pdf</a></li> <li>• Include rack placement, including clearance for maximum convenience and use</li> <li>• Recommends weather protection, where possible</li> <li>• End of trip facilities: Change and shower facilities requirements in relation to Class A bicycle parking requirements in non-residential buildings (1 facility for 30 Class A bicycle parking spaces)</li> </ul>	<p>Current bylaw includes Class A and B bicycle parking requirements including thorough description of minimum requirements (convenient, well-lit, visual surveillance by occupants, enable locking bicycle frame and front wheel).</p> <p>Minimum bicycle parking requirements are provided for apartment, townhouse and non-residential uses.</p>	<p>It is important to monitor how the current bylaw is being interpreted and applied to ensure easy and accessible bicycle parking is bring provided in new developments.</p> <p>Page 249 of Zoning Bylaw- no indication of parking requirements being Class A or B</p> <p>Use of cash-in-lieu when Class B bicycle spaces are not provided (page 347)</p>	<p>Monitor the application of the Zoning Bylaw to evaluate the success and challenges in its application. Include placement dimensions for Class A bicycle parking and increase Class B bicycle parking dimensions to 0.6m per bicycle. Consider specific bicycle parking requirements for schools as there may be additional demands for the facilities.</p>



Title	Description of Bylaw/Policy	Relationship to walking and cycling	Best Practices	Current Squamish Bylaw/Policy	Assessment of Squamish Bylaw/Policy	Recommendations
<b>Development Cost Charges Bylaw</b>	Developer's financial contribution towards infrastructure related to growth	Ability to fund walking/cycling infrastructure that is required to support growth	Include walking and cycling projects in the transportation and parks (trails) programs	Includes road projects that involve sidewalks and bicycle lanes and trail improvements and expansions	Appropriate based on the master plans that have been completed to date	<p>Updated in 2015</p> <p>Add priority projects related to growth/capacity from the Active Transportation Plan</p> <p>OCP policy notes the District should review the Transportation Network Plan in the DCC Bylaw at least once every two years.</p>
<b>Traffic Bylaw</b>	Regulates use and behavior on roadways, sidewalks and paths	Regulations on where you can walk and cycle, and snow removal requirements	<ul style="list-style-type: none"> <li>Allow children under a certain age to cycle on the sidewalk</li> <li>Allow bikes to use sidewalks and crosswalks in specific circumstances (i.e. when multi-use path crosses road)</li> </ul>	<p>Requires property to remove snow and ice promptly</p> <p>"A person must not drive or operate a vehicle, cycle or other conveyance on a highway at a rate of speed in excess of 20km per hour on a lane that is narrower than 8m in width"</p> <p>"A person must not ride a cycle on the sidewalk or on any pedestrian path in a park, except as permitted under this Bylaw or as directed by a police officer, firefighter or a traffic control device."</p>	The reference to 'promptly' when referring to snow removal is vague	<p>Approved in 2012</p> <p>Update to:</p> <ul style="list-style-type: none"> <li>Define 'promptly' when updating the Snow Removal Policy</li> <li>Consider allowing children under a certain age to cycle on the sidewalk legally</li> <li>Allow people to ride a bicycle in any crosswalk which forms a direct and immediate link between adjacent portions of a multi-use trail</li> </ul> <p>Enforcement of bylaw - Ensure sidewalks have sufficient clearance from plants/hedges/trees encroaching on sidewalk to allow clear sightlines and safe and accessible use of the facility</p>
<b>Municipal Ticket Information Bylaw</b>	Identifies fines for infractions against municipal bylaws	Fines for walking, cycling and driving violations	Setting traffic fines based on risk and potential harm if violated; clear and consistent enforcement procedures	<p>Includes fines for:</p> <ul style="list-style-type: none"> <li>Cycle on sidewalk or pedestrian only path,</li> <li>Cycle, ride or skate on a commercial area sidewalk, at excessive speed, failure to yield or dismount, without due care for others, or failure of care to avoid collision</li> <li>Failure to clear snow</li> <li>Stop, stand or park vehicle where restricted, including crosswalk, cycle lanes</li> </ul>	Current level of fines do not reflect the level of risk or potential harm if violated.	Ensure education and enforcement of all traffic violations, in particular obstruction of bicycle lanes and sidewalk due to parking, garbage cans or other objects.

Title	Description of Bylaw/Policy	Relationship to walking and cycling	Best Practices	Current Squamish Bylaw/Policy	Assessment of Squamish Bylaw/Policy	Recommendations
Official Community Plan	Guides decision making on land use planning	Provides cycling/pedestrian network; goals, objectives and policies related to transportation; transportation hierarchy	Official Community Plans may include: <ul style="list-style-type: none"><li>Goals, objectives and policies to support cycling and walking,</li><li>Transportation mode share goals,</li><li>Transportation mode prioritization, and</li><li>Requirements or direction for walking and cycling components within Development Permit Areas (for example, bicycle parking).</li></ul>	<p>The current OCP identifies a guiding principle related to transportation:</p> <ul style="list-style-type: none"><li>Transportation Choices: The District will work towards providing a balanced transportation systems that encourages transit, cycling, pedestrian and other modes of travel throughout the municipality that minimize greenhouse gas emissions. The District will work with Provincial and Regional authorities to ensure a safe and efficient transportation and transit system between the communities in the Sea to Sky corridor.</li></ul> <p>Objectives includes “To develop a connected and integrated network of bikeways &amp; commuter trails connecting major activity areas.</p> <p>Policies includes those related to pedestrian-friendly design, trail network and transportation options.</p> <p>Development Permit Areas refer to site design that facilities pedestrian access and safe storage of bicycles.</p>	Significant number of principles, objectives and policies related to walking and cycling. Development Permit Area direction is important to ensure walking and cycling is considered throughout the planning process.	<p>Incorporate goals and objectives from the Active Transportation Plan in the OCP Update</p> <p>Consider stronger language to support walking and cycling, including a hierarchy of travel modes that prioritizes walking and cycling.</p>

Title	Description of Bylaw/Policy	Relationship to walking and cycling	Best Practices	Current Squamish Bylaw/Policy	Assessment of Squamish Bylaw/Policy	Recommendations
<b>Snow Removal Policy</b>	Regulate snow removal on roads, sidewalks and pathways	Removing snow and ice helps make walking and cycling safer and more accessible during the winter. This is particularly important for seniors and people with disabilities.	<ul style="list-style-type: none"><li>• Sidewalks snow clearing is the responsibility of City or property owner, with a trend towards municipality clearing the arterial or high pedestrian routes</li><li>• Timeframe: Clear within 24 hours or (preferred) accumulation limit of 2.5cm (1")</li><li>• Condition: Clear all ice and snow</li><li>• Bike lanes should be prioritized for snow clearance and should not be used to store snow; clear snow from off-street bike lanes</li><li>• Identify a priority network of sidewalks and bikeways for clearing</li><li>• Ice removal is important (salt or alternative)</li></ul>	<p>Policy regarding salting and sanding</p> <p>Responsibility of private property (residential and commercial) to remove snow and ice as per Traffic Regulation Bylaw (Remove ice and snow promptly)</p> <p>District is responsible for municipal locations, overpasses, sidewalks on hills, sidewalk let downs, schools, downtown business section, senior citizen complexes</p> <p>Snow is bermed on the right side of the road</p>	<p>There is a need to clarify the District's current responsibilities and prioritization of sidewalk snow clearing. The policy should not recommend storing snow in the bike lanes.</p> <p>The District should prioritize off- street paths for snow removal.</p>	<p>This policy should be updated along with the Traffic Regulation Bylaw because both include direction on snow removal.</p> <p>Snow removal by the District</p> <p>Prioritize list of areas responsible for (based on land use and population)</p> <p>Identify time for removal:</p> <p>Priority 1 – 12 hours</p> <p>Priority 2 – 24 hours</p> <p>Priority 3 – 36 hours</p>
<b>Sidewalk Inspection and Maintenance Policy</b>	Procedure to inspect and maintain sidewalks	Ensures the accessibility of walking facilities and reduces risk due to uneven sidewalks.	Inspection/complaints; specific repair criteria; Municipal Insurance Association provides templates.	Identifies annual inspection, response time for public complaints, and defines specific repair criteria.	Current policy is comprehensive.	No recommendations



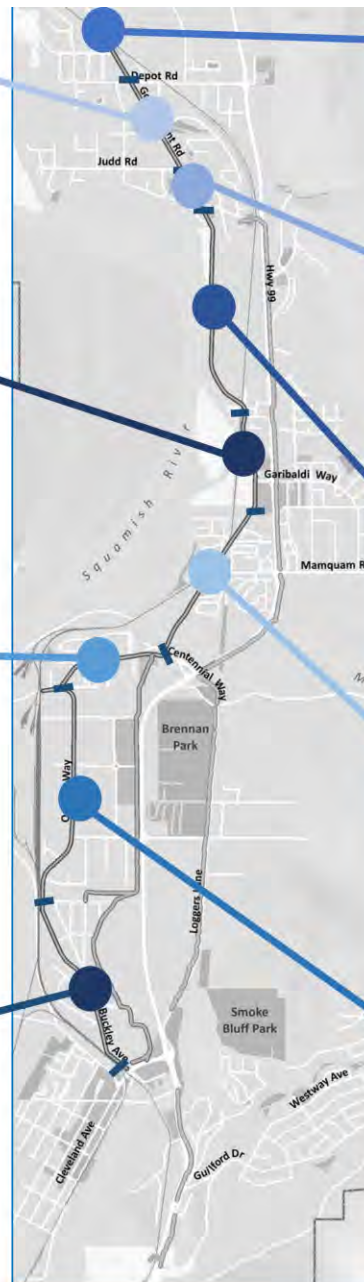
## Appendix B: Detailed Cost Estimates

8 – Judd Road to Axen Road	Total
Length of Segment (metres)	944
Proposed Sidewalk (approx. cost)	\$266,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$720,000

5 – Mamquam Elementary to Olson Road	Total
Length of Segment (metres)	824
Proposed Sidewalk (approx. cost)	\$259,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$640,000

3 - Government/Queens to Mamquam Bridge	Total
Length of Segment (metres)	902
Proposed Sidewalk (approx. cost)	\$207,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$720,000

1 - 3 <sup>rd</sup> Avenue to Magee Street	Total
Length of Segment (metres)	1362
Proposed Sidewalk (approx. cost)	\$216,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$1,040,000



9 – Axen Road to Ross Road	Total
Length of Segment (metres)	730
Proposed Sidewalk (approx. cost)	\$130,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$560,000

7 –Eagle Run Drive to Judd Road	Total
Length of Segment (metres)	313
Proposed Sidewalk (approx. cost)	\$94,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$240,000

6 – Olson Road to Eagle Run Drive	Total
Length of Segment (metres)	1509
Proposed Sidewalk (approx. cost)	\$453,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$1,200,000

4 - Mamquam Bridge to Mamquam Elementary* Does not Include Mamquam Bridge	Total
Length of Segment (metres)	1052
Proposed Sidewalk (approx. cost)	\$459,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$800,000

2 - Magee Street to Government/Queens	Total
Length of Segment (metres)	1579
Proposed Sidewalk (approx. cost)	\$166,000
Proposed Bicycle Facility Upgrade (approx. cost)	\$1,280,000

Bicycle Facility Upgrade = Protected Bicycle Lane

**Table A-1: Detailed Sidewalk Cost Estimates**

Street	To	From	Sidewalks Required	Priority	Metres (m)	Rounded Cost
Axen Rd	Hope Road	Government Road	1	Long	175	\$ 52,000
Behrner Dr	North of Clarke Drive	Guilford Drive	2	Medium	484	\$ 291,000
Braemar Dr	Clarke Drive S	Clarke Drive N	1	Long	376	\$ 113,000
Clarke Dr	Guilford Drive	Behrner Drive	2	Medium	76	\$ 46,000
Clarke Dr	Hwy 99	Stawamus Elementary	1	Short	189	\$ 57,000
Clarke Dr	Behrner Drive	Northridge Drive	2	Long	284	\$ 171,000
Cleveland Ave	Vancouver Street	South of Victoria Street	1	Short	309	\$ 93,000
Cottonwood Rd	Judd Road	Depot Road	1	Long	618	\$ 186,000
Depot Rd	Government Road	E of Government Road	1	Medium	70	\$ 21,000
Depot Rd	Peterson Road	Reid Road	1	Short	415	\$ 125,000
Depot Rd	Rayburn Road	Government Road	1	Short	506	\$ 152,000
Diamond Head Rd	Garibaldi Way	Mamquam Road	2	Medium	640	\$ 385,000
Discovery Way	Commercial Way	Industrial Way	1	Medium	481	\$ 145,000
Eagle Run Dr	West of Government Road	East of Government Road	1	Medium	124	\$ 38,000
Fifth Ave	Winnipeg Street	South of Victoria Street	2	Medium	276	\$ 166,000
Finch Dr	East of Hwy 99	Loggers Lane	1	Medium	271	\$ 82,000
Fourth Ave	Winnipeg Street	South of Victoria Street	2	Medium	281	\$ 169,000
Garibaldi Way	Tantalus Road	Mamquam Road	2	Medium	940	\$ 565,000
Guilford Dr	Behrner Drive	Valley Drive	2	Medium	112	\$ 68,000
Guilford Dr	Valley Drive	Westway Avenue	1	Medium	407	\$ 123,000
Guilford Dr	Westway Avenue	Spruce Drive	2	Long	1027	\$ 617,000
Highlands Way N	at school	Portree Way	1	Short	39	\$ 12,000
Highlands Way N	The Boulevard	Portree Way	2	Short	358	\$ 215,000



Street	To	From	Sidewalks Required	Priority	Metres (m)	Rounded Cost
Highlands Way N	Portree Way	Pitlochry Way	1	Medium	461	\$ 139,000
Highlands Way S	Mamquam Road	Read Crescent	2	Medium	51	\$ 31,000
Hope Rd	Depot Rd	Axen Rd	1	Long	202	\$ 61,000
Industrial Way	Queens Way	West of Discovery Way	2	Medium	241	\$ 145,000
Judd Rd	End	Government Road	1	Medium	1012	\$ 304,000
Mamquam Rd	Willow Cres W	Willow Cres E	1	Short	90	\$ 28,000
Mamquam Rd	Willow Cres E	Hwy 99	1	Short	102	\$ 31,000
Mamquam Rd	Government Road	Willow Cres W	1	Short	150	\$ 46,000
Mamquam Rd	Hwy 99	Diamond Head Road	1	Medium	192	\$ 58,000
Mamquam Rd	Diamond Head Road	Highland Way	2	Medium	589	\$ 354,000
Maple Dr	Westway Avenue	School	1	Short	44	\$ 14,000
Northridge Dr	Vista Crescent	Clarke Drive	2	Long	254	\$ 153,000
Perth Dr	Pia Rd	Portree Way	1	Long	591	\$ 178,000
Pia Rd	Pitlochry Way	Perth Drive	1	Medium	144	\$ 44,000
Pitlochry Way	Pia Rd	Highlands Way N	1	Medium	171	\$ 52,000
Portree Way	Highlands Way N	East of Highlands Way N	1	Short	48	\$ 15,000
Portree Way	Perth Drive	East of Highlands Way N	2	Short	117	\$ 71,000
Rayburn Rd	Axen Road	Depot Road	1	Long	202	\$ 61,000
Sixth Ave	Victoria Street	North of Victoria Street	2	Medium	41	\$ 25,000
Spruce Dr	Westway Avenue	Guilford Drive	2	Medium	349	\$ 210,000
Tantalus Rd	South of Dowad Drive	North of Newport Ridge Drive	1	Long	105	\$ 32,000
Tantalus Rd	Newport Ridge Drive	South of Starview Place	1	Medium	141	\$ 43,000
Tantalus Rd	South of Starview Place	Cheakamus Way	2	Medium	159	\$ 96,000
Tantalus Rd	Dowad Drive	South of Dowad Drive	1	Long	524	\$ 158,000
The Boulevard	Braemar Drive	Highlands Way	1	Short	149	\$ 45,000

Street	To	From	Sidewalks Required	Priority	Metres (m)	Rounded Cost
The Boulevard	Braemar Drive	Highlands Way	1	Short	163	\$ 49,000
The Boulevard	Ayr Drive	Braemar Drive	1	Long	181	\$ 55,000
The Boulevard	Ayr Drive	Braemar Drive	1	Long	186	\$ 56,000
Third Ave	Victoria Street	Main Street	2	Short	113	\$ 69,000
Third Ave	Victoria Street	Bailey Street	1	Short	543	\$ 164,000
Thunderbird Ridge	Glacier View Drive N	Glacier View Drive S	1	Medium	365	\$ 110,000
University Blvd	East of Kintyre Drive	Mamquam Road	1	Long	761	\$ 229,000
Valley Dr	North of Hwy 99	Guilford Drive	1	Long	328	\$ 99,000
Victoria St	6 Avenue	4 Avenue	2	Short	199	\$ 120,000
Vista Cres	Northridge Drive	Vista Crescent	2	Long	437	\$ 263,000
Westway Ave	Birch Drive	Myrtlewood Crescent	2	Short	98	\$ 59,000
Westway Ave	South of Juniper Crescent	Birch Drive	1	Short	494	\$ 149,000
Westway Ave	Guilford Drive	Maple Drive	1	Medium	579	\$ 174,000
Buckley Ave	Cleveland Avenue	Britannia Avenue	1	Short	717.44	\$ 216,000.00
Government Rd	Turning Lane	Mamquam River Crossing	1	Long	14.61	\$ 5,000.00
Government Rd	Strata Road	Strata Road	1	Short	70.53	\$ 22,000.00
Government Rd	Strata Road	South of Mamquam Elementary	1	Short	102.89	\$ 31,000.00
Government Rd	Mamquam River Crossing	Squamish Public Works Yard	2	Short	122.21	\$ 74,000.00
Government Rd	Squamish Public Works Yard	Strata Road	1	Medium	175.76	\$ 53,000.00
Government Rd	Strata Road	Mamquam Road	2	Medium	194.14	\$ 117,000.00
Government Rd	North of Government Road	Edgewater Drive	1	Medium	217.26	\$ 66,000.00
Government Rd	Mamquam Road	Strata Road	2	Short	227.06	\$ 137,000.00
Government Rd	North of Garibaldi Way	North of Harris Road	1	Medium	320.37	\$ 97,000.00
Government Rd	Edgewater Drive	Turning Lane	1	Medium	344.19	\$ 104,000.00
Government Rd	South of Mamquam Elementary	Garibaldi Way	2	Short	352.41	\$ 212,000.00

Street	To	From	Sidewalks Required	Priority	Metres (m)	Rounded Cost
Government Rd	Brackendale Elementary School	Ross Road	1	Long	431.69	\$ 130,000.00
Government Rd	Judd Road	Axen Road	1	Short	884.91	\$ 266,000.00
Government Rd	Olson Road	Judd Road	1	Long	1822.57	\$ 547,000.00
Queens Way	South of Government Road	Government Road	1	Short	42.33	\$ 13,000.00
Queens Way	Pioneer Way	South of Government Road	1	Medium	213.12	\$ 64,000.00
Queens Way	Industrial Way	South of Commercial Way	1	Medium	339.55	\$ 102,000.00
Turning lane	Mamquam River Crossing	Government Road	2	Medium	64.70	\$ 39,000.00
Pioneer Street	Queens Way	Discovery Trail	1	Short	425.18	\$ 128,000.00



**Table A-2: Detailed Bicycle Network Cost Estimates**

Street	To	From	Infrastructure Type	Priority	Length (km)	Cost
Axen Rd	Axen Road	Government Road	Neighbourhood Route	Short	0.61	\$ 20,000
Bailey St	Third Street	West of Cleveland Avenue	Protected Bicycle Lane	Short	0.07	\$ 70,000
Behrner Dr	Clarke Drive	Clarke Drive	Bicycle Lane	Short	0.49	\$ 40,000
Birch Dr	Westway Avenue	Hemlock Avenue	Neighbourhood Route	Short	0.18	\$ 10,000
Braemar Dr	Skyline Drive	The Boulevard	Bicycle Lane	Long	0.38	\$ 30,000
Britannia Ave	Magee Street	Buckley Avenue	Neighbourhood Route	Short	0.51	\$ 20,000
Cedar Dr	Hemlock Avenue	Guilford Drive	Neighbourhood Route	Short	0.11	\$ 10,000
Centennial Way	Corridor Trail	Mamquam River Crossing	Multi-Use Pathway	Long	0.27	\$ 170,000
Clarke Dr	Behrner Drive	Guilford Drive	Bicycle Lane	Short	0.08	\$ 10,000
Clarke Dr	Behrner Drive	Northridge Drive	Bicycle Lane	Short	0.29	\$ 20,000
Clarke Dr	Corridor Trail	Corridor Trail	Multi-Use Pathway	Short	0.22	\$ 140,000
Cleveland Ave	Main Street	Vancouver Street	Shared Use Lane	Medium	0.21	\$ 10,000
Cottonwood Rd	Depot Road	Maple Crescent	Neighbourhood Route	Short	0.72	\$ 20,000
Depot Rd	Rayburn Road	Highway 99	Protected Bicycle Lane	Short	1.27	\$ 1,120,000
Diamond Head Rd	Garibaldi Way	Mamquam Road	Bicycle Lane	Medium	0.65	\$ 50,000
Diamond Rd	West of Glenalder Place	Garibaldi Way	Bicycle Lane	Medium	0.51	\$ 40,000
Dryden Rd	Government Road	Kingswood Road	Neighbourhood Route	Short	0.91	\$ 30,000
Eagle Run Dr	Maple Crescent	Kingswood Road	Neighbourhood Route	Short	0.57	\$ 20,000
Edwards Rd	Reid Road	Honey Lane	Neighbourhood Route	Short	0.09	\$ 10,000
Finch Dr	Loggers Lane	End	Bicycle Lane	Medium	0.71	\$ 50,000
Finch Dr	Highway 99	Loggers Lane	Protected Bicycle Lane	Medium	0.46	\$ 410,000
Garibaldi Way	Tantalus Road	Mamquam Road	Bicycle Lane	Medium	0.95	\$ 70,000
Garibaldi Way	Government Road	Hwy 99	Bicycle Lane	Short	0.08	\$ 10,000
Guilford Dr	Westway Avenue	Cedar Drive	Neighbourhood Route	Short	0.32	\$ 10,000
Hemlock Ave	Cedar Drive	Birch Drive	Neighbourhood Route	Short	0.82	\$ 30,000
Highlands Way N	Pitlochry Way	The Boulevard	Neighbourhood Route	Short	0.86	\$ 30,000
Honey Lane	Edwards Road	Multi-Use Pathway	Neighbourhood Route	Short	0.11	\$ 10,000

Street	To	From	Infrastructure Type	Priority	Length (km)	Cost
Industrial Way	Queens Way	Hwy 99	Protected Bicycle Lane	Medium	0.50	\$ 440,000
Judd Rd	Rae Road	Government Road	Bicycle Lane	Long	0.98	\$ 70,000
Judd Rd	Government Road	Meadow Ave	Neighbourhood Route	Short	0.18	\$ 10,000
Kingswood Rd	Kingswood Road	Dryden Road	Neighbourhood Route	Short	0.12	\$ 10,000
Kingswood Rd	Kingswood Road	South of Eagle Run Drive	Neighbourhood Route	Short	0.41	\$ 20,000
Railway ROW adjacent to Loggers Lane	Pemberton Avenue	Westminster Street	Multi-Use Pathway	Long	0.95	\$ 570,000
Magee St	Queens Way	River Drive	Bicycle Lane	Medium	0.50	\$ 40,000
Mamquam Rd	Read Crescent	End of paved road	Bicycle Lane	Medium	0.67	\$ 50,000
Mamquam Rd	Government Road	Read Crescent	Protected Bicycle Lane	Medium	1.31	\$ 1,150,000
Mamquam River Bridge	turning lane	Government Road	Protected Bicycle Lane	Short	0.11	
Maple Cres	Cottonwood Road	Eagle Run Drive	Neighbourhood Route	Short	0.32	\$ 10,000
Newport Ridge Dr	Tantalus Road	East of Regency Place	Bicycle Lane	Long	0.34	\$ 30,000
No Name Rd	Proposed Multi-Use Pathway	Government Road	Bicycle Lane	Medium	0.17	\$ 20,000
Northridge Dr	Clarke Drive	North of Vista Crescent	Neighbourhood Route	Medium	0.31	\$ 10,000
Pemberton Ave	Eaglewind Blvd	Overpass	Protected Bicycle Lane	Short	0.79	\$ 700,000
Perth Dr	Pia Road	The Boulevard	Bicycle Lane	Long	0.88	\$ 60,000
Pia Rd	Jay Crescent	Perth Drive	Bicycle Lane	Long	0.55	\$ 40,000
Pioneer Way	Queens Way	East of Discovery Way	Protected Bicycle Lane	Short	0.43	\$ 380,000
Pitlochry Way	Pia Road	Highlands Way N	Neighbourhood Route	Short	0.18	\$ 10,000
Plateau Dr	West end	Westway Avenue	Neighbourhood Route	Short	1.11	\$ 30,000
Production Way	Enterprise Way	Industrial Way	Bicycle Lane	Medium	0.34	\$ 30,000
Queens Way	Industrial Way	Commercial Way	Protected Bicycle Lane	Long	0.51	\$ 450,000
Queens Way	Enterprise Way	Industrial Way	Protected Bicycle Lane	Medium	0.37	\$ 330,000
Queens Way	Commercial Way	Aspen Road	Protected Bicycle Lane	Medium	0.55	\$ 490,000

Street	To	From	Infrastructure Type	Priority	Length (km)	Cost
Queens Way	Aspen Road	Government Road	Protected Bicycle Lane	Short	0.05	\$ 50,000
Reid Rd	Depot Road	Edwards Road	Neighbourhood Route	Short	0.21	\$ 10,000
Scott Cres	Highway 99	Behrner Drive	Multi-Use Pathway	Long	0.87	\$ 530,000
Skyline Dr	Garibaldi Way	Braemar Drive	Multi-Use Pathway	Long	0.72	\$ 440,000
Tantalus Rd	Segments between Dowad Drive	End	Bicycle Lane	Long	0.56	\$ 40,000
Tantalus Rd	Segments between Dowad Drive	End	Bicycle Lane	Short	0.09	\$ 10,000
Tantalus Rd	Segments between Dowad Drive	End	Bicycle Lane	Short	0.14	\$ 10,000
The Boulevard	Braemar Drive	Highlands Way S	Bicycle Lane	Long	0.17	\$ 20,000
The Boulevard	Braemar Drive	Highlands Way S	Bicycle Lane	Long	0.17	\$ 20,000
Third Ave	Bailey Street	Vancouver Street	Protected Bicycle Lane	Short	1.01	\$ 890,000
turning lane	Corridor Trail	Mamquam River Crossing	Multi-Use Pathway	Short	0.09	\$ 60,000
Vancouver St	Third Avenue	Loggers Lane	Bicycle Lane	Medium	0.30	\$ 20,000
Victoria St	Fifth Avenue	Third Avenue	Neighbourhood Route	Short	0.20	\$ 10,000
Victoria St	Third Avenue	Loggers Lane	Bicycle Lane	Medium	0.26	\$ 20,000
Westway Ave	Ash Place	Cherry Drive	Bicycle Lane	Long	0.18	\$ 20,000
Westway Ave	Plateau Drive	Ash Place	Bicycle Lane	Long	0.29	\$ 20,000
Westway Ave	Guilford Drive	Plateau Drive	Protected Bicycle Lane	Medium	1.61	\$ 1,410,000
Unnamed Road	Newport Rdige Drive	Highway 99	Bicycle Lane	Long	0.16	\$ 20,000
Dyke Pathway	Government Road	No Name Road	Multi-Use Pathway	Medium	0.29	\$ 180,000
Corridor Trail - Southern Extension	Valley Drive	Stawamus Chief	Multi-Use Pathway	Long	1.65	\$ 990,000
Oceanfront Pathway	Pemberton Avenue	Oceanfront Development	Multi-Use Pathway	Medium	1.00	\$ 600,000
Pathway Connection	Enterprise Way	Magee Street	Multi-Use Pathway	Medium	0.07	\$ 50,000
Rose Park	Pemberton Avenue	Loggers Lane	Multi-Use Pathway	Short	0.60	\$ 360,000
Pathway - North of Mamquam River	Government Road	Railwoods Trail	Multi-Use Pathway	Short	0.32	\$ 200,000



Street	To	From	Infrastructure Type	Priority	Length (km)	Cost
3rd Avenue Crossing	Buckley Avenue	Bailey Street	Multi-Use Pathway	Short	0.09	\$ 60,000
Blind Channel Trail	Oceanfront Pathway	Oceanfront Pathway	Multi-Use Pathway	Medium	0.23	\$ 140,000
Corridor Trail - Northern Extension	Tantalus Road	Overpass	Multi-Use Pathway	Long	1.00	\$ 600,000
Railwoods Trail	Government Road	Pathway - North of Mamquam River	Multi-Use Pathway	Short	0.59	\$ 360,000
Bowen Ave	Enterprise Way	South of Magee Street	Protected Bicycle Lane	Medium	0.22	\$ 200,000
Buckley Ave	Britannia Avenue	Bowen Ave	Protected Bicycle Lane	Medium	0.53	\$ 470,000
Buckley Ave	Cleveland Avenue	Britannia Avenue	Protected Bicycle Lane	Short	0.75	\$ 660,000
Government Rd	Ross Road	Squamish Valley Road	Protected Bicycle Lane	Long	1.46	\$ 100,000
Government Rd	Olsen Road	Ross Road	Protected Bicycle Lane	Long	3.50	\$ 3,070,000
Government Rd	Brothers Place	Edgewater Drive	Protected Bicycle Lane	Medium	0.15	\$ 140,000
Government Rd	Queens Way	Rail	Protected Bicycle Lane	Medium	0.15	\$ 140,000
Government Rd	Edgewater Drive	Turing Lane	Protected Bicycle Lane	Medium	0.41	\$ 360,000
Government Rd	Mamquam River Bridge	Mamquam Road	Protected Bicycle Lane	Medium	0.50	\$ 440,000
Government Rd	Garibaldi Way	Harris Road	Protected Bicycle Lane	Medium	0.56	\$ 490,000
Government Rd	Queens Way	North of Queens Way	Protected Bicycle Lane	Short	0.09	\$ 80,000
Government Rd	Mamquam Road	Garibaldi Way	Protected Bicycle Lane	Short	0.75	\$ 660,000
Turning lane	Government Road	Mamquam River Crossing	Protected Bicycle Lane	Long	0.12	\$ 110,000