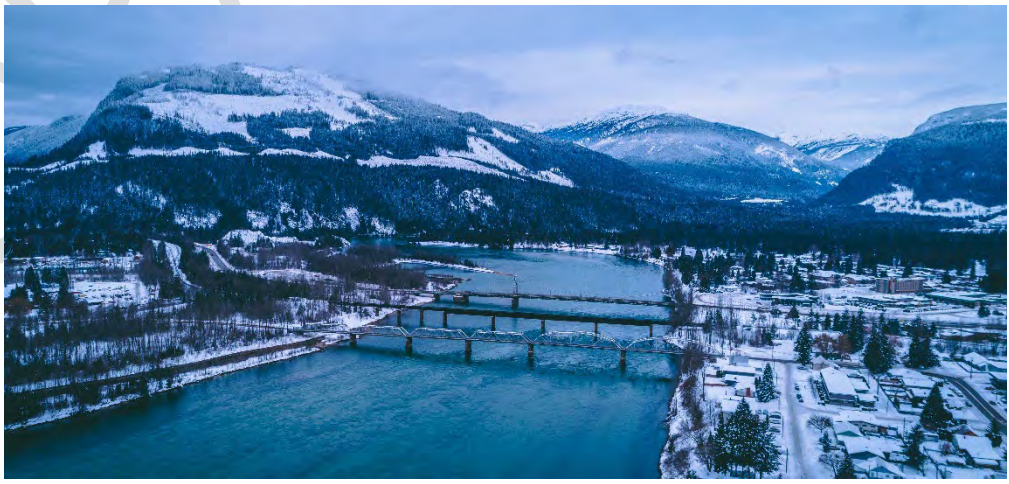
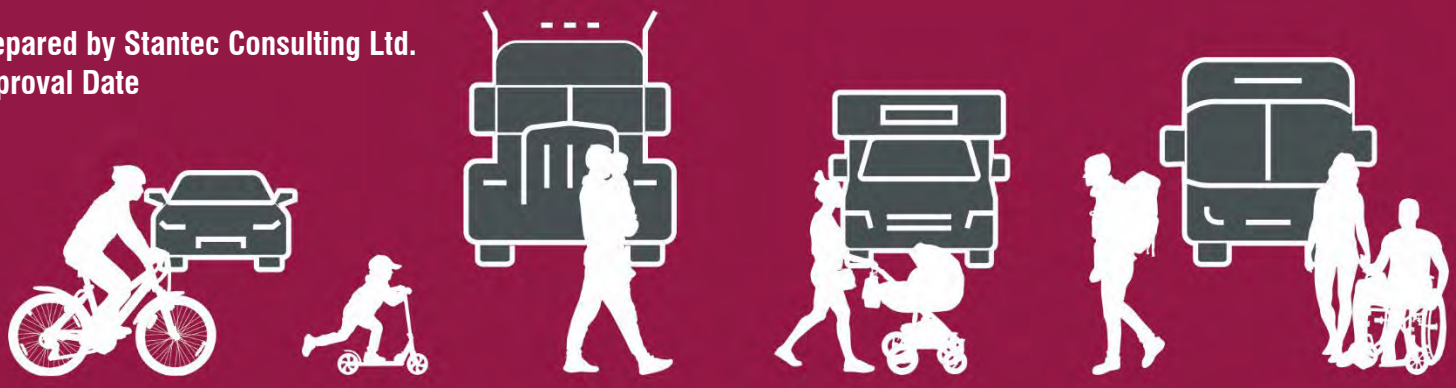
CITY OF REVELSTOKE
TRANSPORTATION MASTER PLAN



Prepared by Stantec Consulting Ltd.
Approval Date



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TERRITORIAL ACKNOWLEDGMENT

We acknowledge that Revelstoke is located in the beautiful Columbia Mountains alongside the Columbia River, which is the traditional, ancestral, unceded territory of the Sinixt, Ktunaxa, Secwepemc, and Syilx peoples.

COMMUNITY ACKNOWLEDGEMENT

We appreciate the input provided by many members of the Revelstoke community who shared their stories and wisdom with our project team.

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GLOSSARY OF TERMS

AAA	All Ages and ability - referring to infrastructure appropriate for everyone.
CPR/CP Rail	Canadian Pacific Railway
EV	Electric Vehicle
GHG	Greenhouse Gas
HandyDART	Door-to-door, shared-ride service for people who are unable to navigate conventional public transit without assistance
ICE	Internal combustion engine
ITE	Institute of Transportation Engineers
LBS	location-based services (LBS) data provided by StreetLight Data
Micromobility	Transportation using lightweight vehicles such as bicycles or scooters, especially electric ones that may be borrowed as part of a self-service rental program in which people rent vehicles for short-term use within a town or city.
MoTI	BC Ministry of Transportation and Infrastructure
Multi-use path	A path who serves all users, such as pedestrians and cyclists
OCP	Official Community Plan
OD	Origin/Destination
on Demand Service	Transit service that does not follow a standard route and schedule but instead must be requested during operating hours.
PRMP	City of Revelstoke's Parks and Recreation Master Plan
Rennie Report	Revelstoke Population & Housing Projections – Draft (2020)
RMR	Revelstoke Mountain Resort
sharrow	A road marking in the form of two inverted V-shapes above a bicycle, indicating a road should be shared between vehicles and cyclists
sq.ft.	Square Feet
TMP	Transportation Master Plan
WWHR	What We Heard Report

EXECUTIVE SUMMARY

Revelstoke is situated along the shores of the Columbia River within the Columbia Mountains. The local scenery, year-round outdoor recreational activities, and the Revelstoke Mountain Resort are a major draw for both residents and visitors alike. The topography, the Columbia and Illecillewaet Rivers, and the railway create barriers and limit connectivity within the community. Travel patterns change with the season as Revelstoke is subject to variable weather patterns, including snow, which impact the day-to-day travel. As a result, the City's transportation network is not necessarily optimally set up for the current and future needs. This Transportation Master Plan (TMP) aims to use this opportunity to develop a plan for the transportation network that will align with Revelstoke's current needs and long-term goals and objectives.

The TMP aligns with and supports the vision of the 2022 Official Community Plan. This vision is to pursue a sustainable mountain community and the transportation network plays a key role in helping to realize this vision. The previous TMP, completed in 2012, was never finalized nor adopted by council, as a result, most of the findings and recommendations were not implemented. The lack of adoption of the 2021 TMP has hurt development of funding scenarios to implement implementation of long-term plans and investment has stalled the development of a complete transportation network. This TMP identifies the gaps that need to be filled moving forward and is a tool to guide the future of Revelstoke's transportation network.

The TMP also aligns with the Council approved 2022 Parks & Recreation Master Plan (PRMP), a 10-year strategy to guide decisions related to municipal parks and recreation facilities. While this TMP focuses on trails and paths within road corridors, the PRMP focuses on off-road trails. The project teams worked together to integrate on-road and off-road trails to increase connectivity within the City.

Despite the topography, winter weather with frequent large snowfalls, and minimal supporting infrastructure, Revelstoke is a community where a large proportion of residents walk and bike to get around. This trend bodes well for Revelstoke in terms of further promoting sustainability and active transportation. As it stands, investment into bicycle infrastructure is expected to see immediate returns, particularly in the winter season, given the number of existing cyclists. This also highlights the importance of engagement with the public as they have the 'feet on the ground' knowledge to help make the most of the investment. As the active transportation network is built out, this will improve the safety and comfort for existing cyclists in all seasons and encourage new cyclists.

Through completion of this Transportation Master Plan, these key findings were made:

- Overall, the street network is adequate for the current and future traffic volumes based on the expected population growth in the 2022 Official Community Plan. Improvements and new connections will likely be required to support ongoing development in the City. Looking at the road classes and their uses, there is an opportunity to reclassify several collector roads to local roads and explore a reduction of the posted speed limit for both of these classifications to improve safety for all road users in Revelstoke. It is anticipated that local support for speed limit reductions will be high as current observations indicate that travel speeds on non-Arterial roads range between 30 km/hr and 40 km/hr and is slow enough for cyclists to be comfortable enough to share the road space (during summer months) and result in a bike-mode split that is one of the highest in North America. The proposed road classifications are provided in **Figure E.1**.
- With a comprehensive grid network of streets with 8 metre pavement widths already in place, there is an opportunity to repurpose existing pavement width to accommodate pedestrians and cyclist infrastructure.

- Some infrastructure to support cycling has been built within Revelstoke, but it largely consists of trails, with few accommodations for bicycles within the roadways. The volumes on the roadways have generally allowed for cyclists to share the roadway with vehicles during the summer months, but this is not appropriate on all roadways (e.g. Arterials), especially during the winter months, and as Revelstoke continues to grow. Developing a connected bicycle network across the City supports the cycling that is occurring today and will continue to encourage and grow cycling in the future. The key element of developing a strong north/south cycling connection is to improve the constraint of the Fourth Street (4th St) Illecillewaet Bridge. The existing connections either lack adequate bicycle facilities (Fourth Street (4th St) bridge) or reliable, direct connections (Illecillewaet River Pedestrian bridge). Additionally, lack of bicycle parking and end of trip facilities is a growing issuing in Revelstoke that needs to be addressed by providing additional supply, security, and year-round accessibility. The proposed bicycle network is provided in **Figure E.2**.

- Outside of the downtown, few sidewalks or pedestrian facilities exist, and this represents a large gap in the active transportation network. Appreciating the context of Revelstoke and the lack of curb, gutter, and stormwater infrastructure, the installation of sidewalks is costly. However, utilizing a portion of the existing asphalt on select roadways as a marked pedestrian "walkway" is a simple first step to creating a comprehensive pedestrian network across the City. The proposed pedestrian network is provided in **Figure E.3**.

- The current transit system within Revelstoke is not heavily utilized, especially since the onset of the COVID-19 pandemic. There is an opportunity to refresh the network and combine the service with the Resort Shuttle with an aim to make a transit network that connects key destinations and minimize duplication of overhead and operation and maintenance costs for the shuttle and BC Transit service. The proposed transit network is provided in **Figure E.4**.

- The transportation network is controlled by several jurisdictions (Ministry of Transportation and the Columbia-Shuswap Regional District) and used by different stakeholder groups. Success of this plan will involve working with these government and local stakeholder groups to improve the quality and efficiency of the multi-modal transportation network.

- The physical transportation network needs to be supported by new and updated policy as the context, goals, and objectives of the City continue to change. This includes items such as truck routes, traffic calming/speed management, complete streets, downtown parking, electric vehicles facilities, and other emerging trends.

- The estimated cost of the implementation of the full network improvements are an estimated $36.9 million (includes $25.4 million in bridge structures: Big Eddy Bridge upgrade ($650k), Highway 1/Columbia River bridge upgrades ($6.5M), Fourth Street/Illecillewaet River Bridge ($11.5M, new Illecillewaet River emergency/multi-use bridge($6.7M) This is broken down by infrastructure type in **Table E.1**.

Table E.1: Capital Cost for Proposed Network

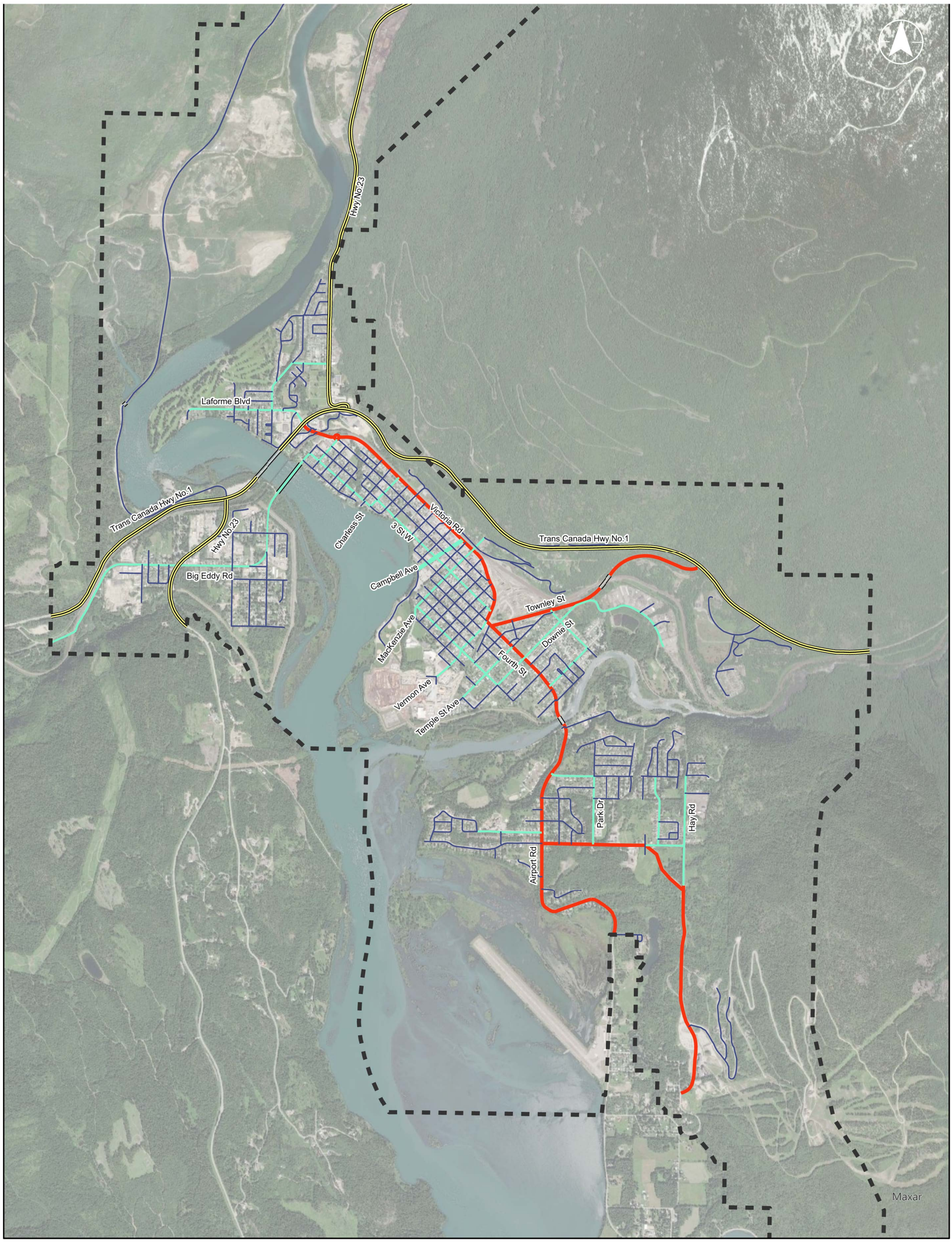
	Short Term (1 to 3 years)	Medium Term (3-6 years)	Long Term (>6 years)	Total
On-street walkways	$208,000	$332,000	$0	$541,000
On-street multi-use	$78,000	$192,000	$78,000	$348,000
On-street bikeways	$193,800	$300,800	$1,124,600	$1,619,200
Off-street MUP	$1,300,000	$4,280,000	$1,510,000	$7,090,000
Intersection Improvements	$700,000	$280,000	$950,000	$1,930,000
Bridges	$650,000 (Big Eddy upgrades)	$0	$24,770,000 (other 3 bridges)	$25,400,000
TOTAL	**$3,129,800**	**$5,384,800**	**$28,432,600**	**$36,928,200**

The anticipated additional operating and maintenance costs are expected to be $2.3 million. A breakdown is provided in **Table E.2**.

Table E.2: Anticipated Annual Operating Costs

Infrastructure	Length	Total (annually)
Pathways	15.2 km	$1.22M
Protected Bikeways	12.4 km	$1.00M
On-Street Walkways/Bikeways	55.5 km	$55,500
TOTAL		**$2.28M**

Overall, the transportation network in Revelstoke is in a good standing. Though minimal implementation of long-term plans in recent years means the transportation network is behind the current needs, the natural trends towards active transportation within the community provides a strong foundation to improve sustainable transportation. The key next step is to implement the infrastructure to support existing travel patterns and then use that as a basis to move towards future goals. This TMP lays out the beginning of the journey and points towards the long-term goal. The implementation of this plan will set Revelstoke on its way to realizing that goal.



LEGEND

- Highway
- Arterial
- Collector
- Local
- Bridges
- CityBoundary

0 250 500 750 1,000 metres

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1:35,000

LEGEND

- Existing Multi-user Pathway
- 1 Proposed Multi-user Path & Project #
- 1 Proposed On-street Multi-use & Project #
- 1 Proposed On-street Bikeway & Project #
- 1St Street / Victoria Avenue Bikeway Evaluation

0 250 500 750 1,000 metres

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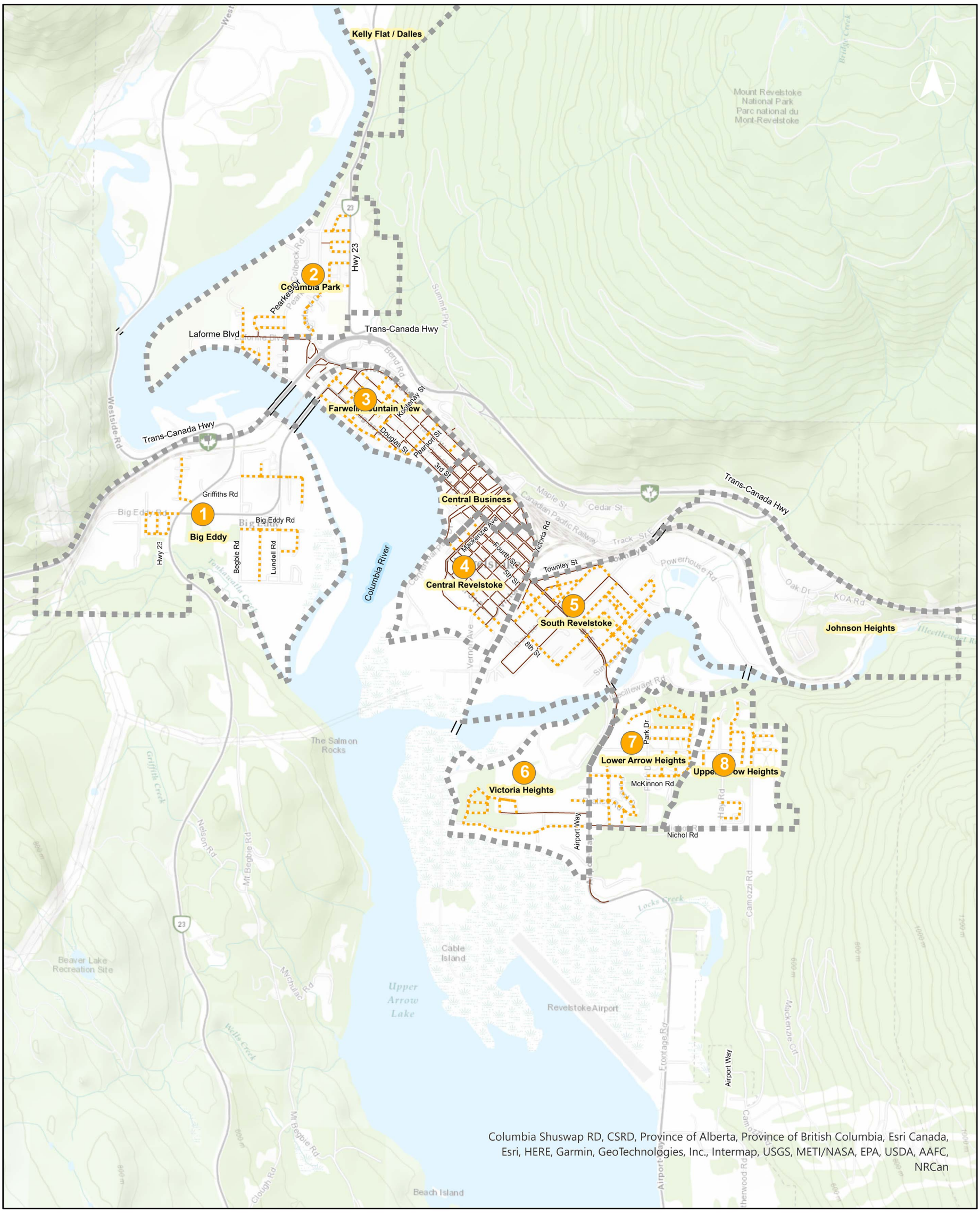

LEGEND

- Proposed Walkway (1 = Project Number)
- Existing Sidewalk
- Community Boundary

0 250 500 750 1,000 metres

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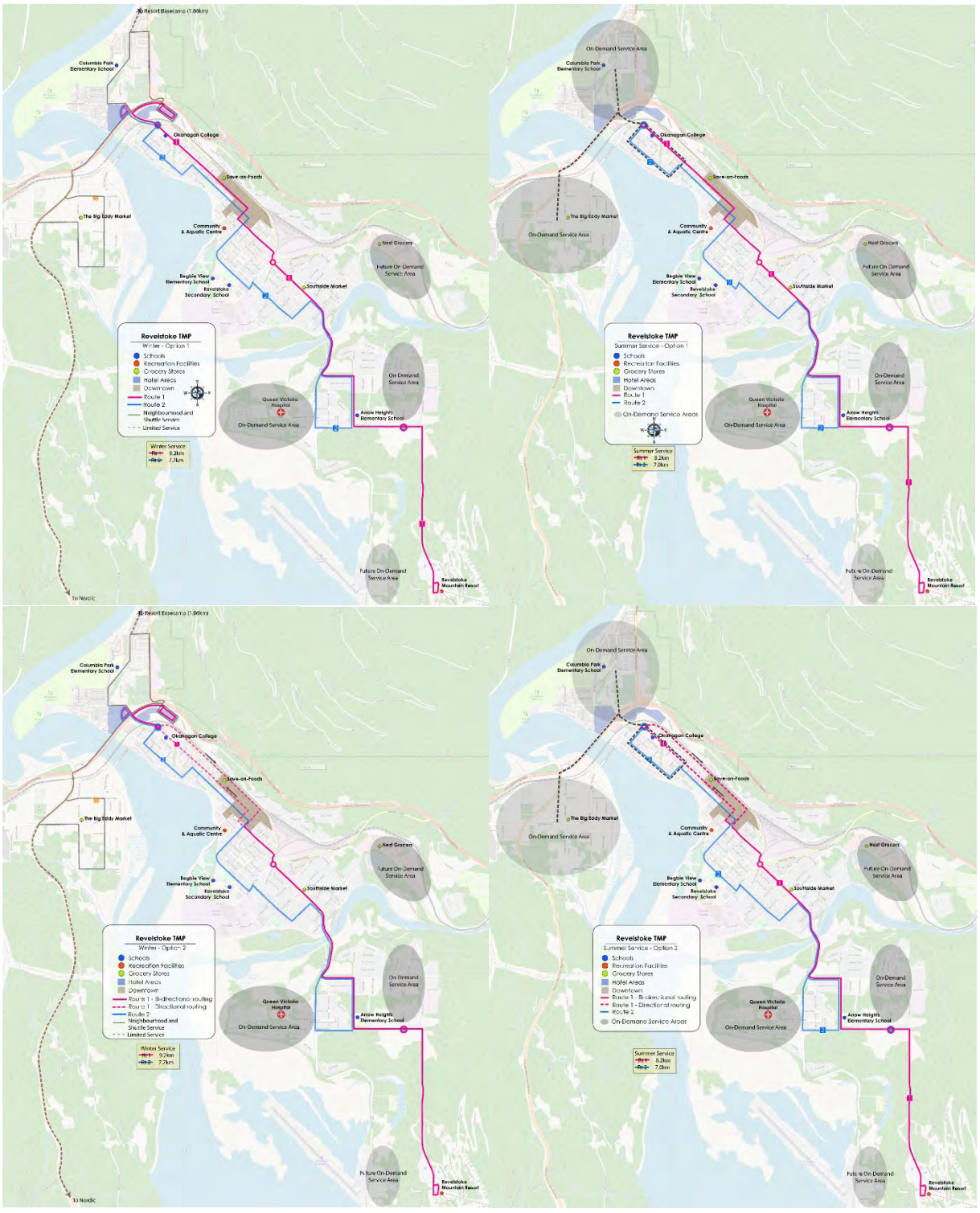


Figure E.4: Proposed Transit Network

1 INTRODUCTION

The City of Revelstoke (City) has embarked on this to their Transportation Master Plan (TMP) to re-focus the interconnectivity of the City's multi-modal transportation network and prioritize infrastructure improvements. The focus of the document is on both the long-term with the full buildout of the current City boundaries, and the short- to medium-term based on anticipated high growth (densification) areas, population, and employment changes and land use changes anticipated over the next twenty years based on the City's upcoming Official Community Plan (OCP) update.

The City's 2022 Transportation Master Plan (TMP) is a long-term vision of how the City's transportation systems will interface with one another to enhance the mobility choices of residents, visitors and workers across the City, support goods movement into and within the City, and connect land uses to one another now and in the future. It is an opportunity for the City to periodically evaluate how the City's transportation systems are functioning, incorporate new technologies and evolving best practices, and re-align the objectives of the transportation system with the new policies and practices that have been approved by City Council. Most importantly, it is an opportunity for the public to have their voices heard in shaping how the future transportation services can match their needs. As such, extensive stakeholder and public engagement has been an integral part of the TMP's development and was conducted throughout the course of this project to first establish the TMP's vision and goals, assess how the transportation system is currently functioning, identify potential gaps and opportunities, and to identify the mobility enhancements that were most important as the City's top priorities. This includes the improvements needed for the interim years leading to that long-term horizon, as the TMP outlines a series of mobility enhancements that are designed to serve as building blocks to support that journey.

The transportation industry as a whole is in significant flux. Connected and autonomous vehicle technology, mobile device integration with transportation services, micro-mobility, Mobility as a Service (MaaS), and long-term work-from-home / flexible working arrangements are expected to collectively create significant changes in how we interact with one another. While we don't have a crystal ball to show exactly how mobility will function in the future or by when, there are opportunities to shape how we manage their integration to the City as they do become introduced. As a first step, the TMP includes the future policies and practices that should be considered to support this evolutionary process and guide some of the goals and objectives of how these changes can introduced to the City. This also includes resolving potential conflicts in existing policies while laying the foundation towards the future of transportation mobility and emerging technologies.

1.1 Building an Interconnected Network

This TMP is focused on a wholistic multi-modal vision for the future of Revelstoke. Ultimately, the function of the transportation network is to connect people and places and it must serve the needs of City's residents, workers, and visitors, both current and future. The transportation system and the land use are directly connected and rely on each other for both support and success. By creating a robust transportation network with multiple mode choices and connecting it to a variety of land uses, the system as a whole has the potential to thrive. The strength, versatility, and health of the transportation network has a direct impact on the community and has a role both serving and driving existing and new development. It also serves the critical services such as emergency responders and goods movement to the City and surrounding region.

The transportation system is comprised of a multitude of networks, interwoven, and connected. Every trip taken, regardless of mode, begins and ends as a pedestrian. Building an interconnected system requires completing these connections while also building flexibility to adapt to whatever the future may bring. This includes micro-mobility such as scooters, e-bikes,

and other personal mobility devices, autonomous and connected vehicles, mobility-as-a-service (MaaS) providers, and other emerging technologies. Therefore, building an interconnected mobility network begins with ensuring strong pedestrian connections are in place. It also means providing the public with:

- the ability to both travel from their origin to their destination as directly and uninterrupted as possible,
- the flexibility to shift their travel mode along their journey, and
- the elimination of any physical or economic constraints that make have been limiting factors in the past to their mobility.

1.2 Purpose of the Plan

A TMP is designed to set a goal for the future of a transportation network and provide practical steps to build the existing network towards that goal. While the exact goal of each TMP will vary, the overarching purpose is to meet the existing and future needs of residents, visitors, and businesses within the City. This is not done in isolation, but instead must be coordinate with other policy and master plans such as the OCP and Parks and Recreation Master Plan. The TMP evaluates both the existing and future changes expected to occur, provides a long-term, ultimate vision for how the system should operate, and provides a prioritization strategy directed towards achieving that vision. This includes defining the City's next set of mobility priorities, with high level cost estimates, and incorporating this into the City's budgetary cycle. Adequate fiscal management means identifying the potential triggers for when mobility enhancements should occur that minimize throwaway costs, integrating flexibility into the design to changing conditions, and avoiding overbuilding too soon that results in unnecessary maintenance costs. The TMP should be aligned with other City policies and plans and provide guidance to how future policies can be shaped to share in this common vision.

1.3 Using the TMP

As the TMP is also a high-level plan, included are touchpoints for plan implementors to conduct more detailed analysis and review in the future to confirm assumptions and re-assess the recommended course of action. In addition, the TMP's recommendations should be formally re-assessed at an incremental time period, such as 5 to 10 years, to re-confirm the priorities of Council and project stakeholders, and incorporate new information and industry trends that may affect the plan's implementation process.

2 PLAN FOUNDATIONS

The TMP is not a stand-alone document, but instead relies upon and informs other City polices and documents. The vision for the TMP was developed to guide the direction of the TMP and provide a focus

2.1 Project Vision and Goals

As part of the City's OCP update, extensive stakeholder engagement had been undertaken that included a number of transportation-themed topics and input. As part of this TMP, this community feedback was incorporated into the overall TMP engagement plan and used to formulate a project vision and strategic goals that can support the City in achieving this vision. The project vision was defined as:

> *The City of Revelstoke's Transportation Master Plan will foster economic viability and serve the existing and future **needs of the community** and needs for **climate adaptation** by focusing on **resilient**, **multi-modal,** and **safe** transportation solutions delivered in a **fiscally responsible** and **appropriate** manner.*

Several supporting goals were defined to help achieve this vision, consisting of the following:

1. Develop a comprehensive bicycle network that connects key destinations, provides separation from traffic, and accommodates cyclists year-round.
2. More efficiently use roadways for community travel needs by designating or sharing excess space for other mobility modes, while still accommodating motor vehicles.
3. Encourage more walking, rolling, and strolling by linking preferred destinations, closing gaps in the existing sidewalk/pathway network, and maintain for year-round use.
4. Improve transit service through better location of routes, providing transit schedules, and improving stop location infrastructure.
5. Improve safety for vulnerable users through speed calming and separate/protected infrastructure for users

2.2 Integration with Other Studies

The Official Community Plan (OCP) has recently being updated by the City is a key consideration in defining how the City's future mobility network can integrate with the City's existing and future land use strategy, which includes both development of new areas, re-development of existing established areas, and densification within communities. The transportation network must be adequate to accommodate population growth and anticipated new developments and neighbourhoods. The City's OCP provides a vision for the community as well as objectives and policies regarding land use and related matters.

Additionally, the transportation system needs to integrate with the recreational multi-modal network. The City's recently completed Parks and Recreation Master Plan provides an opportunity to connect people and places to the many recreational facilities offered by the City and also identified as a high community value to residents and visitors. In addition,

the City has undertaken a number of other policy and guideline changes since the previous TMP, which provide further guidance to aligning the TMP with these strategic initiatives.

REVELSTOKE OFFICIAL COMMUNITY PLAN – (JULY 2022)

The 2022 OCP presents the following Community Vision Statement for Revelstoke:

> *Revelstoke will pursue a sustainable mountain community by balancing environmental, social economic and cultural values within a local, regional, and global context. Our rich heritage and stunning natural environment inspire us to be forward thinking, inclusive, resilient, and welcoming. We will create a supportive, vibrant community for those that live, work and visit here today and in the future.*

To realize this vision, eight community priorities are identified:

1. A range of housing options and affordability
2. Environmental protection and stewardship
3. Climate change action
4. Personal and community economic growth and stability
5. A responsive and caring social support system
6. Opportunities for lifelong learning
7. Fostering of diverse cultural and spiritual values
8. A range of recreation and activities for residents and visitors

The Community Vision and Priorities, together with the lenses of the OCP discussed in Section 1.6 shape the community goals identified in Section 1.7.

The primary information available in the Draft OCP of use in the TMP was around the growth forecasts and land use information. Key points from these documents are provided below.

Transportation Policies & Action Items

Section 3.4.2 of the 2022 OCP highlights 10 Transportation Policies and 3 Transportation Action Items to help guide this TMP:

(a) All future development shall be in alignment with the City's future Master Transportation Plan, as updated from time to time.

(b) Ensure that future comprehensive development proposals promote the use of alternative and active modes of transportation to reduce automobile dependency.

(c) Support and encourage alternative transportation modes as the predominate method of transportation.

(d) Work with BC transit to provide affordable, cost effective, and reliable transit services with frequent service in neighbourhood nodes.

(e) Support and encourage the establishment of community car share systems and similar programs.

(f) Ensure that new development is completed in a manner that promotes complete streets that provide for adequate snow storage, stormwater management, pedestrian connectivity, street furniture, and lighting that is suitable for the neighbourhood.

(g) Ensure new development is completed in a manner that reduces impacts on wildlife and promotes wildlife connectivity.

(h) Support and develop safe, accessible pedestrian and bicycle connections in all neighbourhoods with emphasis on those that will provide for access to schools and other vital community services for all users. Where feasible, key pedestrian connections will be maintained for all seasons.

(i) Integrate wayfinding features into active transportation networks to improve user safety.

(j) Work with Indigenous partners, BC Parks, Parks Canada, and the Ministry of Transportation and Infrastructure to proactively address impacts of recreational activities on the natural environment, as well as the local and regional transportation network.

(1) Consider amendments to the City's Zoning Bylaw parking regulations to explore reductions in surface parking requirements while simultaneously promoting alternative modes of transportation such as cycling.

(2) Develop a Parking Management Plan for the downtown area and explore the feasibility of closing streets to pedestrian only traffic while maintaining access to health services.

(3) Review the feasibility of additional crossings across the Illecillewaet River, including an alternative emergency access route out of the south part of the City in the event of floods, wildfires, or other natural disasters.

Growth forecasts

- Between 2010 and 2019, a period of increased growth occurred when the City grew by almost 1,100 usual residents, equating to an average annual growth rate of 1.6%. This is representative of a new period of growth for the City driven in part by a growing tourism and recreation based economy.
- To ensure that the City is well prepared for future population increases, this plan utilizes the High Growth Scenario of 1.5% growth rate to guide future planning
- By 2041, there is an expected increase of:
  - Usual residents: 2,709
  - Shadow: 201
  - Peak tourist: 1,313
  - Total pop: 21,765

To ensure the City is well prepared for future housing demand, the OCP utilizes the Centralized Growth Model with the following new development targets:

- 25% single-detached dwellings
- 50% ground-oriented units
- 25% apartment units

Rezoning for comprehensive development proposals in all areas of the City that include a variety of housing typologies should generally target a ratio of no more than 25% single-detached dwelling units with the remaining 75% of dwelling units to comprise a mixture of multi-unit ground-oriented and / or apartment style buildings

Growth areas

- In the updated OCP there is a section dedicated to “Development Permit Areas”
  - The purpose of DPAs is to specify community goals for architectural and site form and character, revitalization of commercial areas, reduction of greenhouse gas emissions, and more (see section 5 for more)
  - Downtown Revitalization DPA
    - Parking should be managed off-site through a transportation demand management system that encourages public parking.
    - On-site parking and service areas should be incorporated into underground parking or behind buildings. Parking areas at the front of buildings is discouraged.
    - Any parking areas visible from the street or public open spaces should be landscaped.
    - Shared driveways from streets or lanes are strongly encouraged. Reducing the number and width of driveways, while adhering to City standards, is a priority.

  - Scenic Corridor DPA
    - Underground parking and parking / service areas at the rear of buildings are strongly encouraged.
    - Parking and service areas should be screened and landscaped. Design consideration should be given to ease pedestrian and vehicular access
  - Multi-family residential and Mixed-Use DPA
    - Underground parking or parking / service areas located at the rear of the building are encouraged.
    - Parking and service areas should be screened and landscaped. Design consideration should be given to ease pedestrian and vehicular access.

- Land Use Designations identify future land use for all the parcels, see **Figure 2.1**, and identify areas for potential densification when compared to the existing land use map, see **Figure 2.2**.

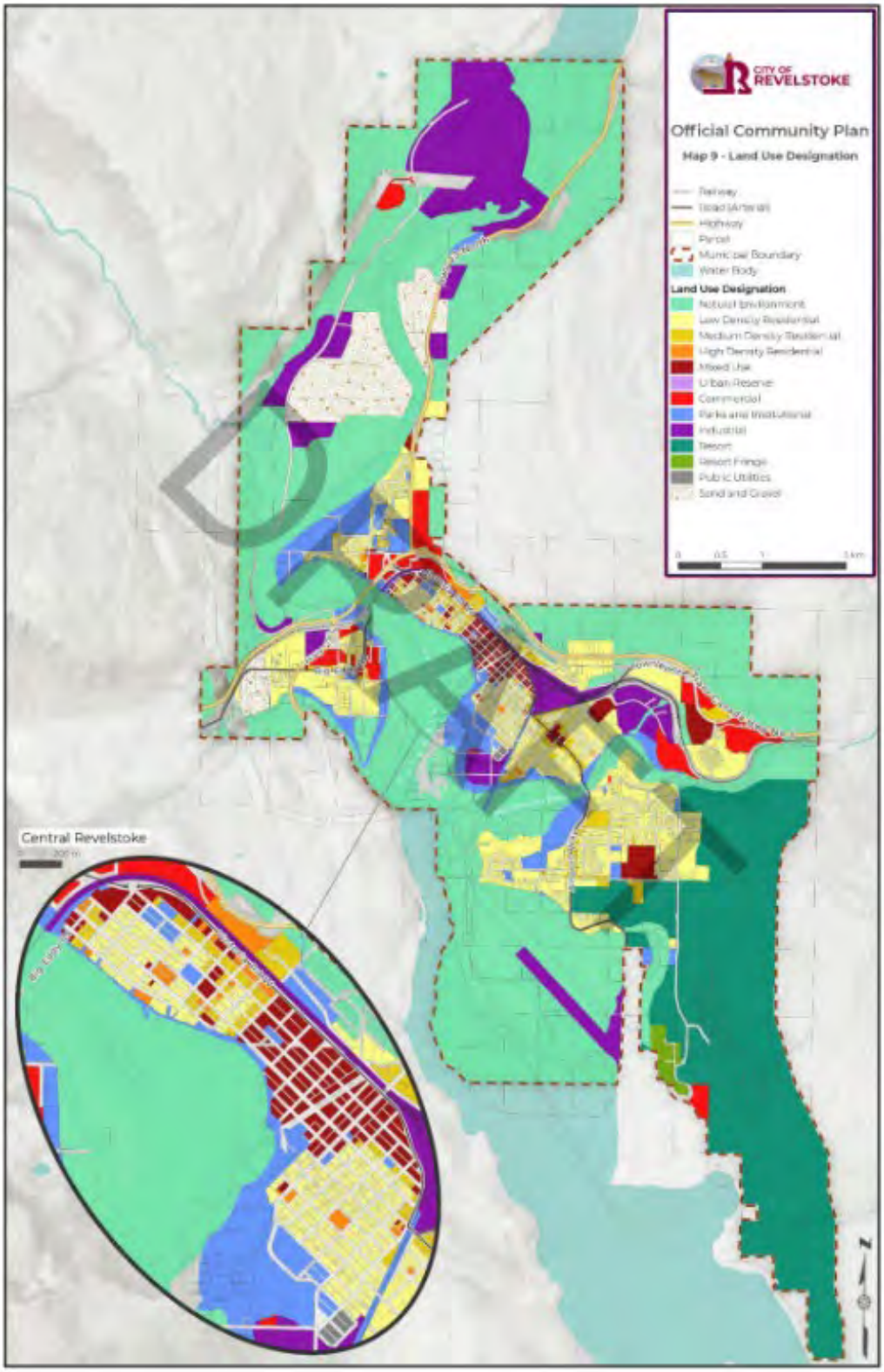


Figure 2.1: Map 9 – Land Use Designation

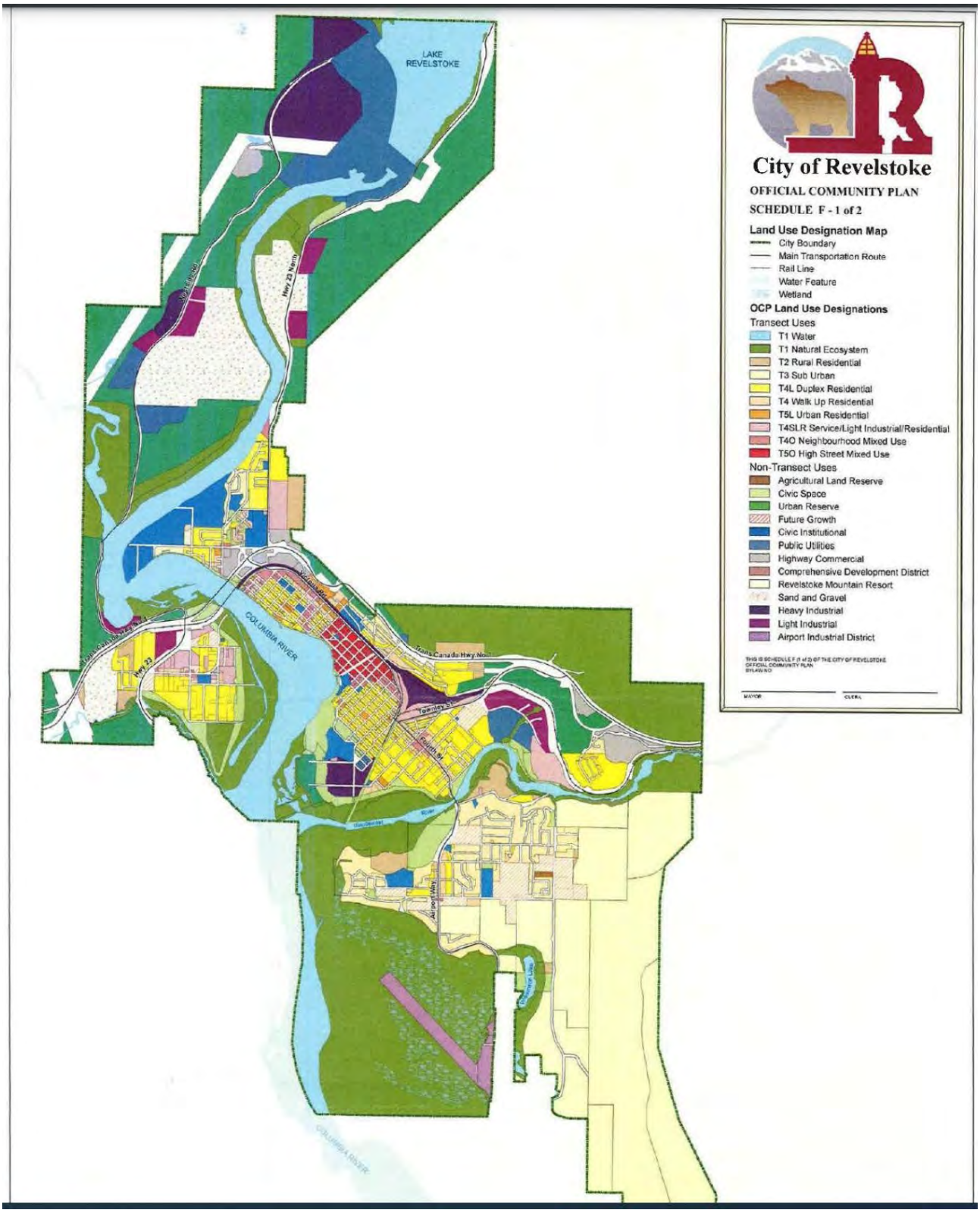


Figure 2.2: Existing Land use

2.2.2 REVELSTOKE PARKS AND RECREATION MASTER PLAN – (JUNE 2022)

The City of Revelstoke's Parks and Recreation Master Plan (PRMP) has been recently updated and approved in June 2022. The previous Master Plan was completed in 2011. The updated Master Plan is a 10-year strategy to guide decisions related to municipal parks and recreation facilities. It will provide the City direction for managing parks, trails, facility improvements, programs, and events in a cost-effective manner consistent with leading industry practices. It will also help the City achieve the vision set out in the draft Official Community Plan (OCP) of being "a supportive, vibrant community for those that live, work, and visit here today and in the future."

While this TMP focuses on trails and paths within road corridors, the PRMP focuses on off-road trails. The project teams worked together to integrate on-road and off-road trails to increase connectivity within the City. There may be some trails in this TMP that have been recommended for upgrading to paved multi-use trails that are not reflected in the PRMP.

2.2.3 BACKGROUND DOCUMENTS

Additional documents were reviewed based on their relevance to the TMP work. Some, such as the Draft 2012 TMP, aligned in many areas while others provide into insight and background information into a narrow area of the work. A brief summary of the relevant portions of these documents are provided below.

2.2.3.1 Revelstoke Comprehensive Transportation Master Plan – Draft (2012)

The City's previous TMP, dated September 2012, was never adopted by Council but serves as a guiding document in the preparation of this TMP. A particular focus in this TMP is a comparison of the future land use networks, public sentiment and priorities, and its recommendations.

Community consultation was undertaken through open houses, stakeholder meetings, steering committee meetings, and surveys during the development of this study to ensure community input on all aspects of the plan. Results of the community consultation included:

- 70 to 86% travel less than 5 kilometer for trips to work/school, shops/services and recreation and most work destinations were located within Central Revelstoke
- Active modes are used more often in the summer
- Bicycle mode share 27 to 36% in the summer
- Walking mode share 13 to 16% in the summer, 13 to 28% in the winter
- Main reason respondents didn't use alternative modes: lack of sidewalks (45%), lack of bicycle lanes, inconvenient and infrequent bus service
- When asked to prioritize spending priorities, first was expanding bicycle lanes and trails followed by expanded sidewalks. Roads and bridge improvements were ranked 3rd with transit ranked lowest.
- 60% of respondents felt that downtown parking space was appropriate. 53% would prefer decreasing parking demand through TDM or more efficient use of parking stalls.

- 50% or respondents saw a need for more bicycle parking – particularly for downtown, [Save-on Foods] parking lot, the recreation centre, parks and other businesses.

The TMP provides a breakdown of the additional land use to be added in 25 years in each of the 18 zones used in the modelling. A summary of the land use values used for future traffic volumes forecasts is shown in **Table 2.1**.

Table 2.1: Land Use Values used to Model Future Traffic Volumes

Scenario	Single Family	Multi Family	Hotel	Industrial	Commercial	Fast Food
	units	units	units	sq.ft	sq.ft	sq.ft
Existing Land Use	954	2,045	674	370,000	581,200	1,800
25 Year Land Use	2,187	5,793	3,717	1,068,000	1,156,600	28,000
50 Year Land Use	2,573	8,784	4,489	1,676,000	280,120	55,000

The recommendations and implementation plan of the 2012 Comprehensive Transportation Master Plan are extensive and outline the proposed capital improvements for the City over the next 25 years (to the year 2037). The improvements are categorized by type: road, pedestrian, bicycle, transit and TDM and by priority: low, medium, or high. Reviewing these will be essential for the development and success of the current TMP.

2.2.3.2 Revelstoke Active Transportation Plan (2010)

The Revelstoke Active Transportation Plan was developed in 2010 concurrently with the Transportation Master Plan and Parks & Recreation Master Plan. **Figure 2.3** shows the existing and proposed sidewalks and trails in the downtown area.

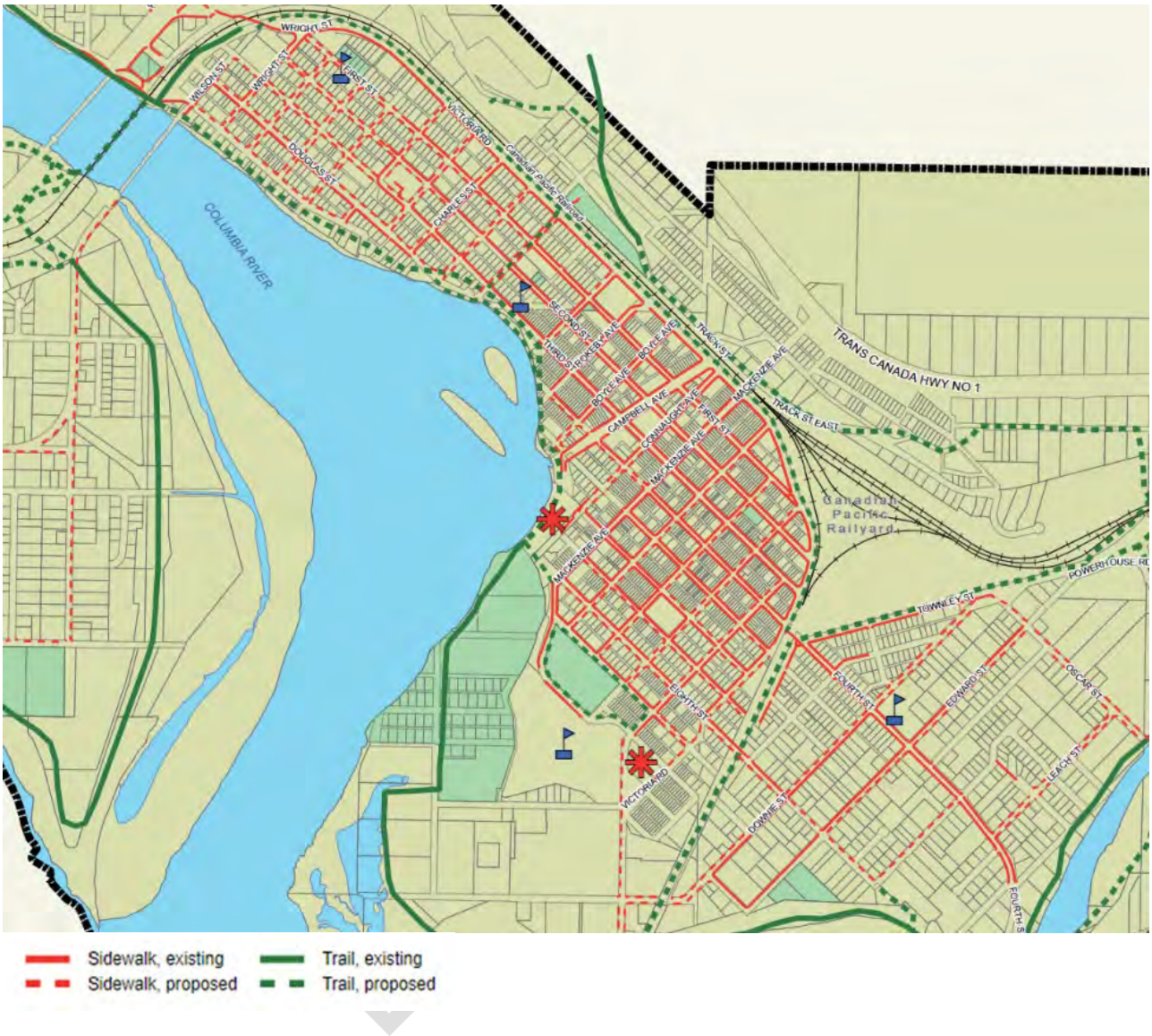


Figure 2.3: Recommended Sidewalks and Trail Routes (Downtown)

Primary cycling routes (bike lanes) are intended routes which are arterial in nature, have higher traffic volumes, and connect key community destinations. Bike lanes are marked 1.8m from face of curb. Secondary routes are suitable for shared use between motorists and cyclists which provide direction connection between proposed bike lanes and key community destinations. These routes are typically lower in volume than primary routes and do not necessitate dedicated bike lanes. The recommended cycling network is shown in **Figure 2.4.**

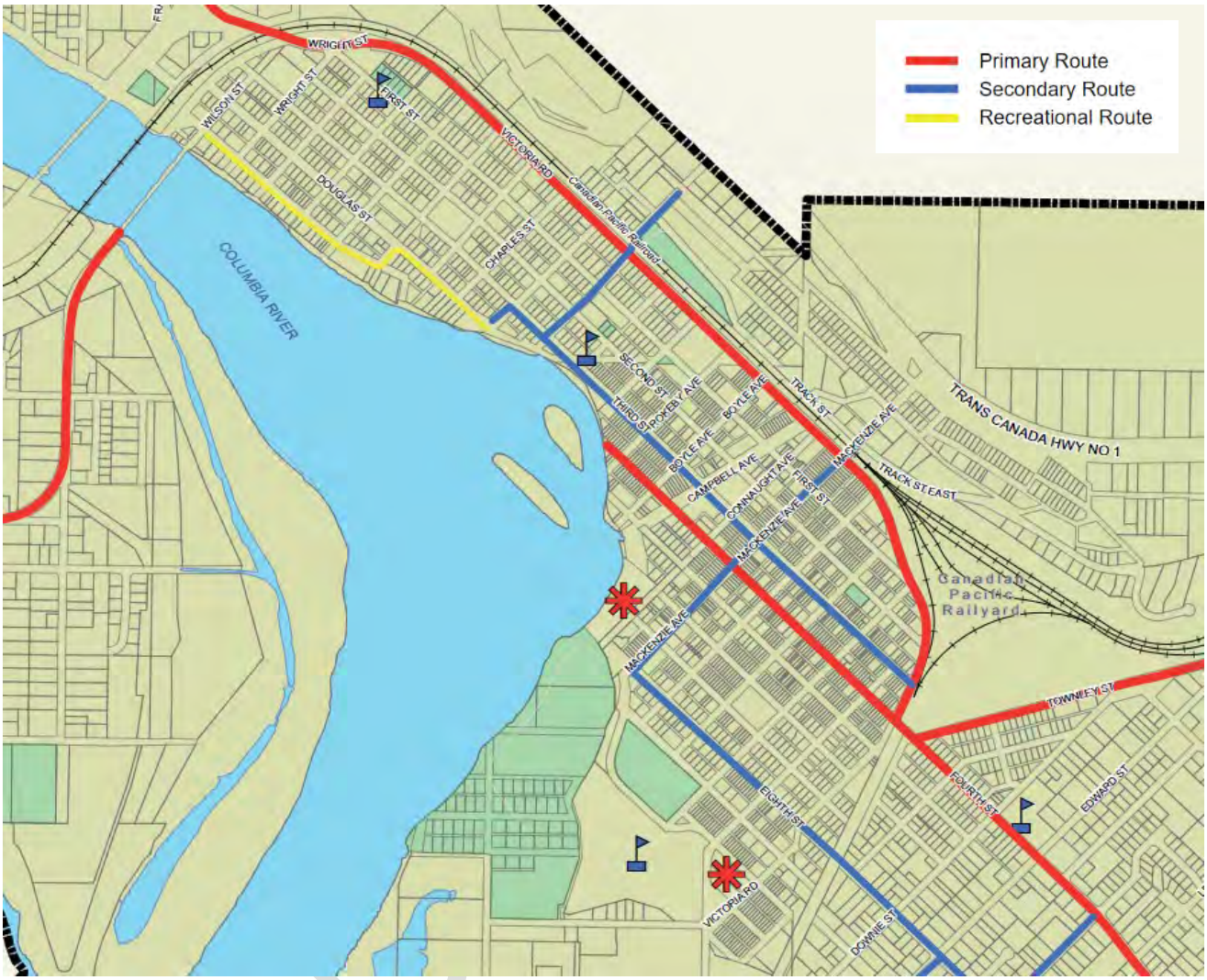


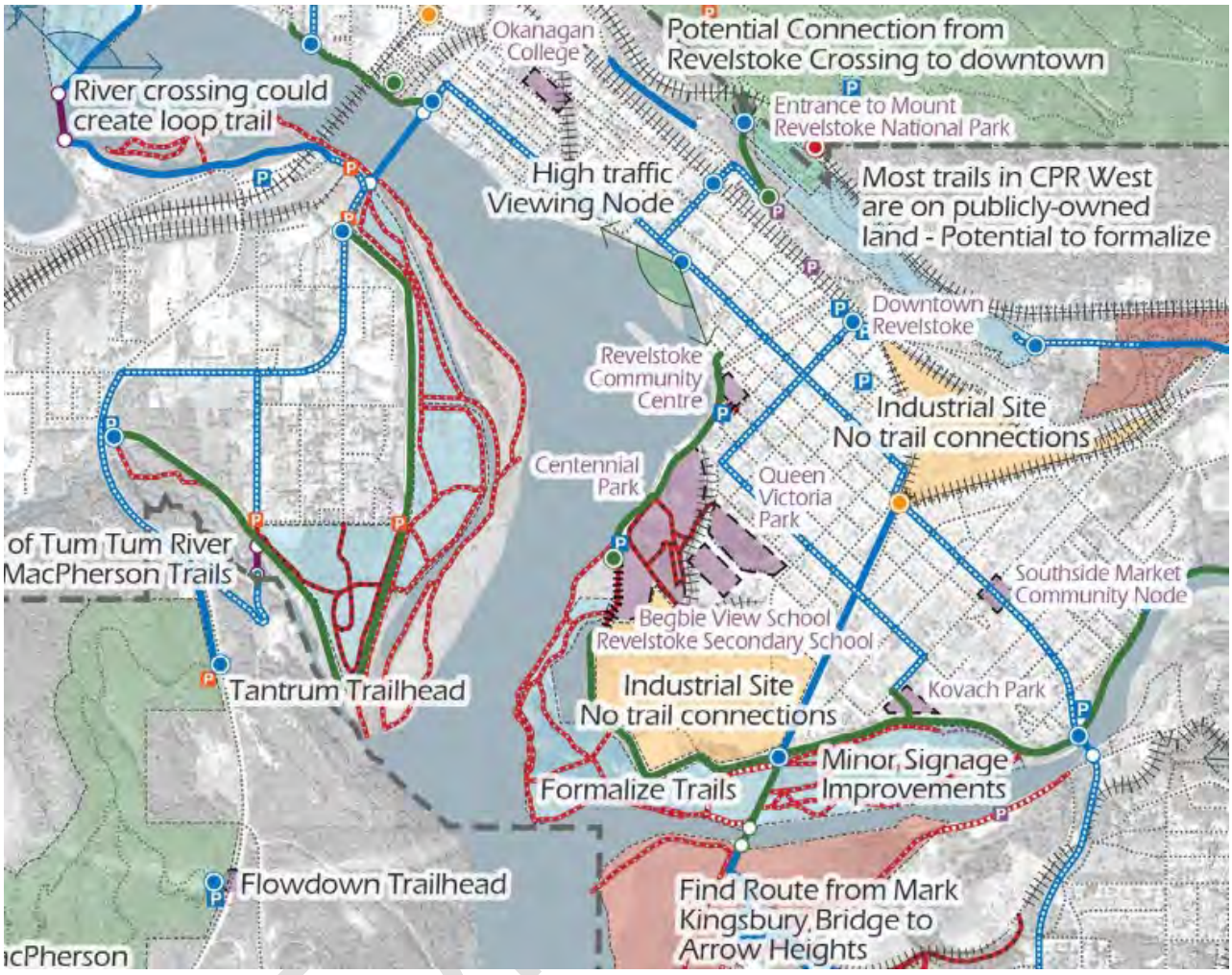
Figure 2.4: Recommended Primary, Secondary & Recreational Cycling Routes

2.2.3.3 City of Revelstoke Trails Strategy (2017)

A detailed trail inventory was undertaken to expanding the existing 150 km of trails from Strava Metro Data with an additional 423 km of trails. Trail types include multi-use, hiking mountain bike, equestrian, motorcross, and adaptive sports. Strategy includes action-oriented recommendations, development guidelines, and the prioritization of trail enhancement and development opportunities within Revelstoke's Municipal boundary through a phased approach over the next ten years and beyond.

Guiding Principles include Connectivity, All Inclusive, Signage + Wayfinding, High Quality Trail Infrastructure + Amenities, Environmental Stewardship.

Figure 2.5, Figure 2.6, **Figure 2.7** provide valuable information that will help inform the active user future transportation network.



Strength-Node
Strength-Great View
Weakness-Node - Traffic Unsuitable to Safe Trail Use
Opportunity-Node or Signage Enhancement
Opportunity-Establish Viewing Area / Node
Threat-Node-Dangerous Node
Strength-Bridge
Strength-Trail
Opportunity-Bridge Enhancement
Opportunity-New Bridge (Long Range)
Opportunity-On-Street Trail Enhancements
Opportunity-New Trail Connection
Threat-Flooding & Erosion
Threat-Trails on Private Property (Multiple Owners)
Threat-Liability Trails on City Property
Threat-Informal Trails on Provinicial or Federal Land
Threat-Significant Barrier (Traffic or Steep Slope)
Threat-CPTED-Crime/Harm Prevention

Figure 2.5: Opportunities (Downtown)

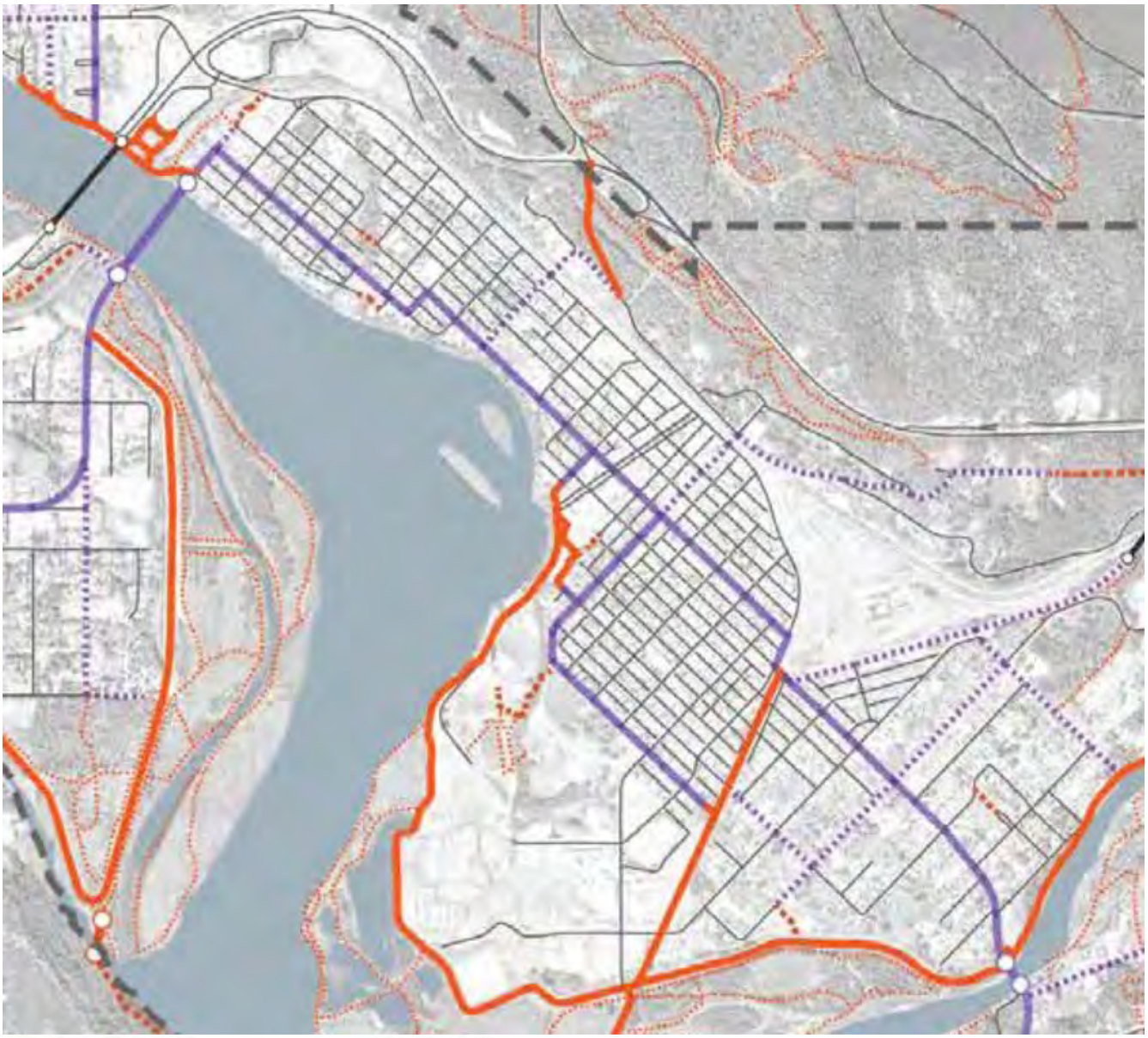


Figure 2.6: Trails Strategy Trail Hierarchy (Downtown)

Figure 2.7: Proposed Safe School Routes (Downtown)

2.2.3.4 Revelstoke Population & Housing Projections – Draft (2020)

This draft document was prepared by Rennie and is typically referred to as the "Rennie Report". This document was prepared as part of the OCP work and developed a series of long-range projections for the City's population and associated housing requirements. The population and housing information and forecasts form the background information for the OCP and the TMP work. Some of the key items are summarized below.

The report looks at past and existing population numbers and demographics and uses a variety of inputs to provide a 20-year population projection to 2041. These are summarized in **Figure 2.8** and **Figure 2.9**.

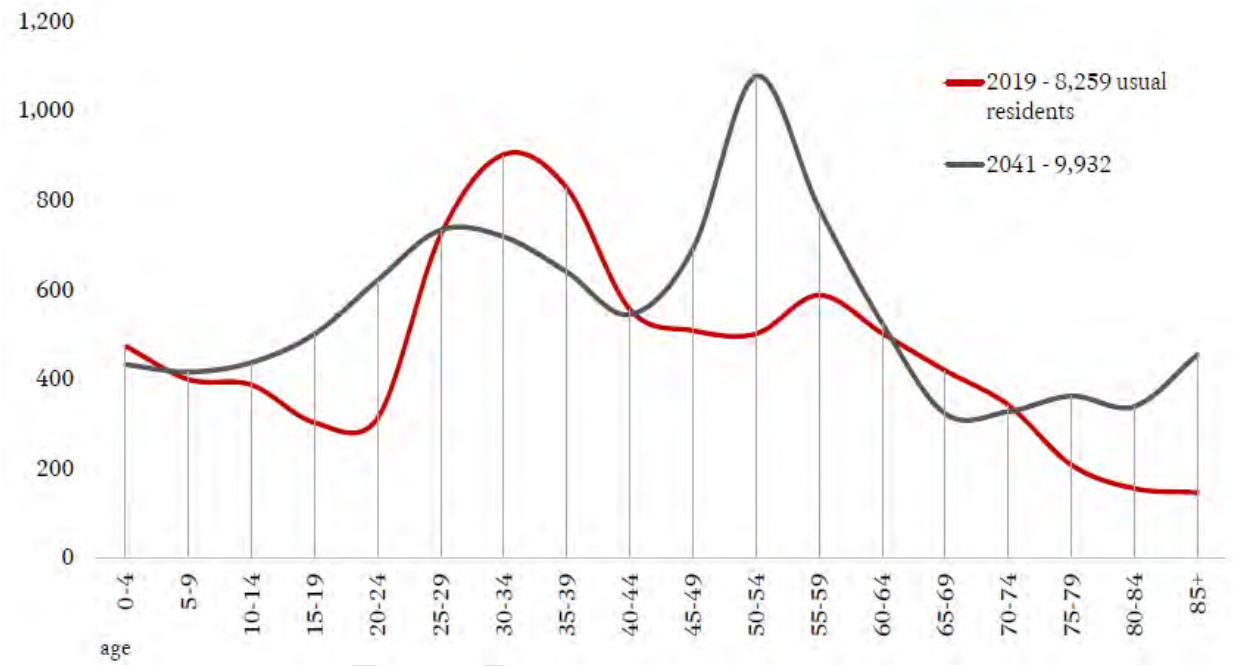


Figure 2.8: Projected Usual Residents by Age, Revelstoke

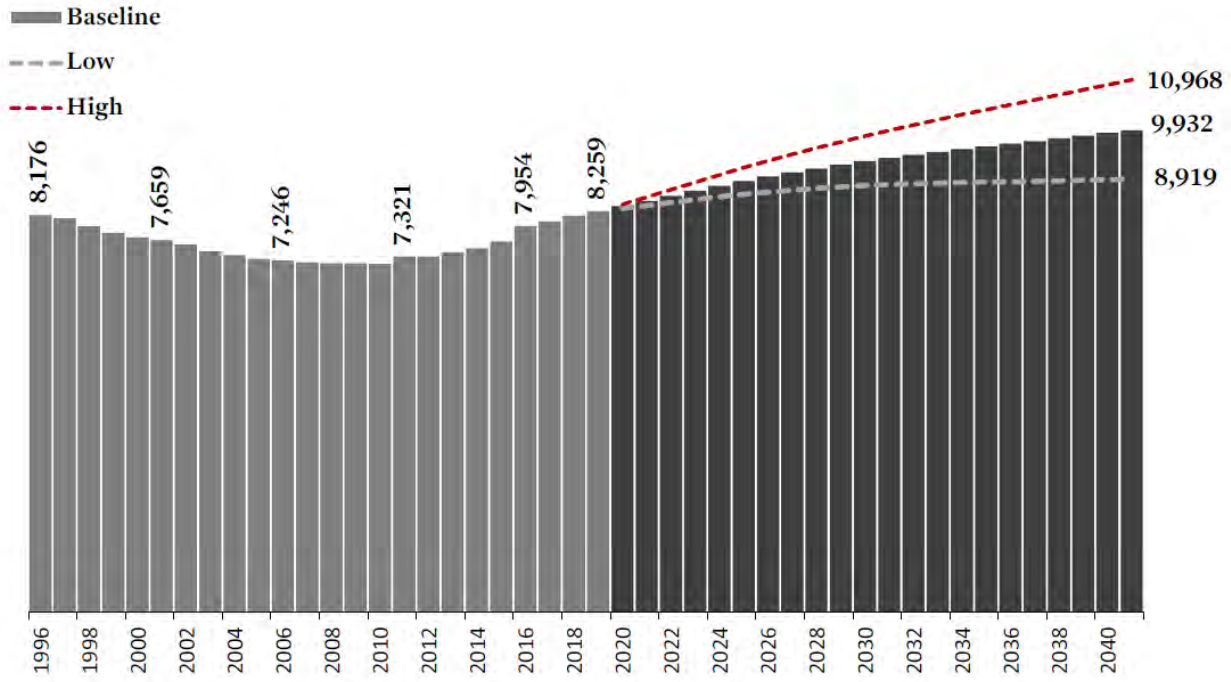


Figure 2.9: Usual Resident Population Scenarios, Revelstoke

In addition to the population forecast for three growth scenarios, a housing forecast was also provided, see **Figure 2.10**, as well has a population growth breakdown for usual resident population (captured as part of traditional data counts such as the Census), the shadow population (residents who may not captured in traditional Census counts due to seasonality but are living in the City's housing stock) and the visitor and tourist population as shown in **Figure 2.11**.

		low		baseline		high	
		pop.	housing	pop.	housing	pop.	housing
	2016	7,954	3,485	7,954	3,485	7,954	3,485
	2019	8,259	3,646	8,259	3,646	8,259	3,646
	2031	8,809	4,012	9,359	4,200	9,924	4,392
	2041	8,919	4,168	9,932	4,513	10,968	4,865
2019...2041	% chg	8.0%	14.3%	20.3%	23.8%	32.8%	33.4%
	# chg	660	522	1,673	867	2,709	1,219
	avg/yr	30	24	76	39	123	55

Figure 2.10: Population & Housing Outlook, Revelstoke

	2019	2041 low	change	2041 baseline	change	2041 high	change
usual residents	8,259	8,919	*660*	9,932	*1,673*	10,968	*2,709*
shadow population	556	651	*95*	703	*148*	757	*201*
peak tourists	8,728	10,041	*1,313*	10,041	*1,313*	10,041	*1,313*
total peak population	17,542	19,610	*2,068*	20,676	*3,134*	21,765	*4,223*

Figure 2.11: Total Peak Population

2.2.3.5 Parks, Recreation and Culture Master Plan (2011)

The purpose of this plan was to develop a network of sites, programs, and facilities for parks, recreation, and cultural activities that will encompass the character of the City of Revelstoke, providing both residents and visitors with an outstanding experience of nature, recreation, and culture. Plan provides overall direction and guidance for managing parks, recreational, and cultural facilities, resources, programs, infrastructure, and investment over a horizon of 10 years.

The Plan recognizes the benefit of parks and recreation on the community and the contributions to a wide range of community objectives, particularly helping to create healthy ecosystems and residents. A total of 54 recommendations were provided and focused on park acquisition, park facilities, trail development, facilities, recreation and culture, and implementation. The primary connection to the TMP is the trail development recommendations:

- **Recommendation 12**: The city review existing trail pans and develop a cost estimate and funding plan for the Revelstoke Waterfront Trail.
- **Recommendation 13**: Develop an on-street cycle and pedestrian connection from Revelstoke Community Centre to Williamson Lake Park and a cycling connection to Highway 23 North and South
- **Recommendation 14**: Develop and on-street cycle and pedestrian connection along Big Eddy Road to Big Eddy Bridge as described within the Revelstoke Active Transportation Plan
- **Recommendation 15**: Provide a pedestrian crossing of the Illecillewaet River to dramatically improve the extent, appeal, and safety of the trail network connections to Arrow Heights and Revelstoke Mountain Resort
- **Recommendation 16**: Develop a looped nature trail around Williamson Lake to provide an improved park experience, enhancing the park as a recreational destination for all residents.
- **Recommendation 17**: Develop a nature trail along the West bank of the Columbia River from Big Eddy Bridge to Lake Revelstoke Reservoir.

2.2.3.6 Age-Friendly Plan Update (2021)

Revelstoke received funding in 2020 to update its Age-Friendly Plan originally drafted in 2009 which highlighted many issues seniors were facing at the time. The new plan considers emerging needs of seniors and is meant to inform the Official Community Plan (OPC) update through its integration with the Housing Action Plan and the Transportation Master Plan thus ensuring that an age-friendly lens is applied to capital projects.

A survey indicated that the top five concerns were: housing, social & community support, transportation, accessibility, and communication. Some of the key transportation related concerns provided in two of the four sections mirroring the OCP were:

- **Environment:** Downtown parking availability, accommodating the visually impaired at intersections, improved sight lines at crossings, high traffic speeds, need for additional crosswalks in the downtown and Southside areas, and a need for more year round walking areas.

Figure 2.12: Seniors Walking Routes (Age-Friendly Plan Update)

- **Growth Management:** Consider the convenience and ease of moving about in the community through increasing wheelchair accessible taxis and buses, increased bike lanes and "scooter-safe" lanes, increased transit hours, and posted transit schedule information,

A more comprehensive list of the recommendations and an update on the status of those recommendations is provide in the implementation section. There are also suggestions for expansion of the Seniors Walking Routes map from the 2009 Plan shown in **Figure 2.12.**

2.2.3.7 Sustainability Action Plan (2013)

Revelstoke's Integrated Community Sustainability Plan is a three-part document that includes a Sustainability Framework, a State of Sustainability Report (to be updated every 3-5 years) and a Sustainability Action Plan (to be updated every 1-2 years). The eight priority Transportation Actions in this Action Plan include:

- **Improve cycling facilities and safety** throughout the community, including:
  - Provide end-point bicycle facilities, such as covered bicycle parking and shower/ locker facilities, in public facilities, and include requirements in new development
  - Improve the cycling environment, including bicycle detection at traffic signals, railway crossings, multi-use trail crossings, and short - and long-term bicycle parking at commercial, institutional, and residential locations.
  - Develop safe, convenient, and comfortable bicycle routes in accordance with the final Transportation Master Plan, which includes designated bike lanes, on-road bike routes, recreational routes, and multiuse trails.
  - Encourage biking by making it fun, with jumps etc.
  - Education and enforcement of biking road rules
- Update and present a DRAFT Master Transportation Plan to Council for adoption consideration, then implement. Plan should address:
  - **Improving community connectivity** such as a second crossing of the Illecillewaet River, left turn lanes and traffic signals along the route to all southern aspects of Revelstoke and improving access across CPR tracks
  - **Developing a truck route bylaw** to designate truck routes throughout the community
- **Support reduced vehicle use** as outlined in the final Transportation Master Plan, including:
  - Addressing safety issues including the western access
  - Expanding use of the car share co-op
  - Expanding carpooling including using the ride share (carpooling) website
  - Encourage the provision of transportation demand management programs to help reduce reliance on automobiles, such as incentives and resources to encourage transit use, walking and cycling.
  - Celebrating Bike to Work Week
  - Adopting reduced parking requirements
  - Adopting roundabout and traffic calming policies
- **Improve the street network** to support pedestrian safety, enjoyment, and convenience, including senior's walking routes as detailed in the Transportation Master Plan
- **Improve the quality and quantity of taxi service options**
- **Improve eastern highway access to the city**
- **Improve transit service delivery by:**
  - Preparing bus stop guidelines for consistency, safety, accessibility, and easy recognition of existing and new transit stops

- Improving bus stops incrementally with benches, covers, snow removal consistent with the guidelines
- Providing evening service
- Post the bus schedule at each transit stop

- **Develop guidelines for all public and private infrastructure to accommodate universal access**, recognizing the varying physical capabilities of community members.

2.2.3.8 Community Energy and Emission Plan, 2011

The Community Energy and Emission Plan encourages and facilitates energy conservation and greenhouse gas (GHG) emission reduction at the community level. CO2 emission trends by source are shown in **Figure 2.13** with transportation accounting for two thirds of total emissions.

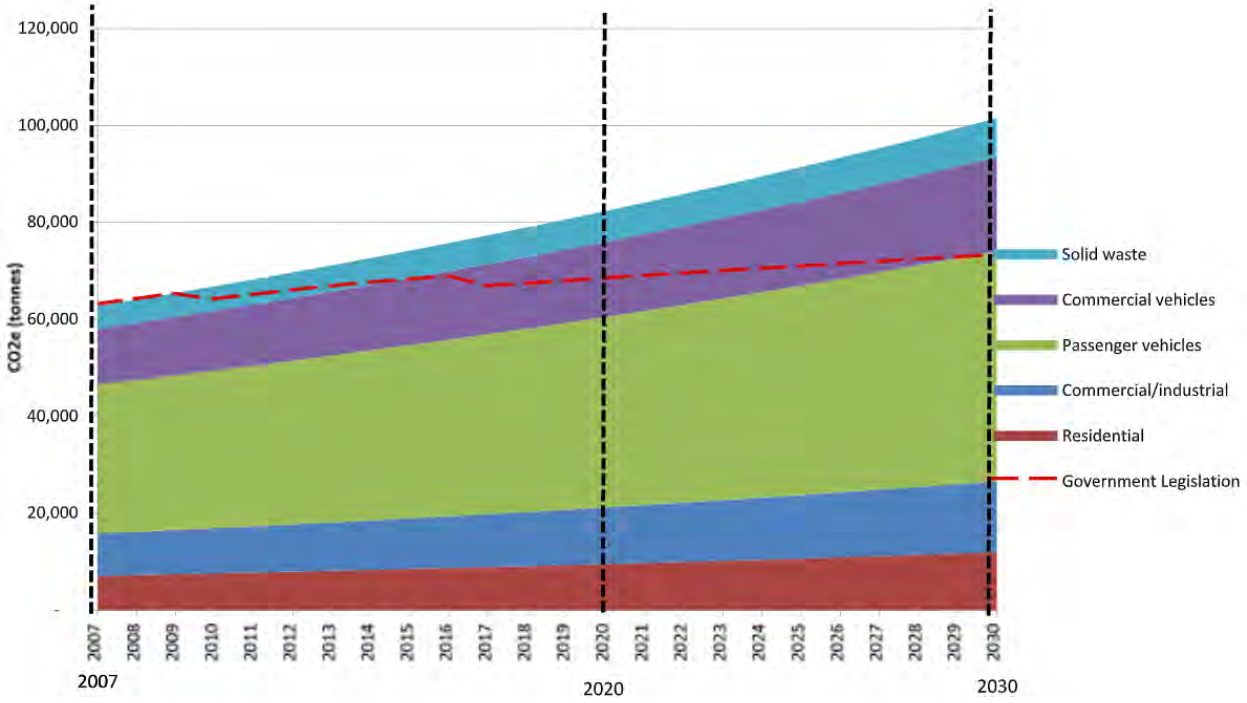


Figure 2.13: CO2 Emission Trends

Recommended Transportation Actions included:

- 2.1 Expand cycling infrastructure
- 2.2 Expand use of car share service
- 2.3 Expand the free transit service between Revelstoke Mountain Resort and downtown, as season use levels increase
- 2.4 Develop a parking strategy that encourages walking and cycling and supports small/high efficiency vehicles.

Recommended targets are an 8% reduction by 2020 and 15% by 2030 in GHG emissions compared to 2007 baseline.

2.3 Communication and Engagement Plan

At the project onset, a communication and engagement plan was developed to clearly document communication protocols and methods, communication tools, identify stakeholders, and define their spectrum of influence into the overall TMP. The engagement plan was reviewed and approved by the City prior to undertaking any engagement activities. An overview of the engagement plan has been provided in Section A.1 Engagement Plan.

2.3.1 INTEGRATION STRATEGY

Coordination with project stakeholders was undertaken at multiple phases of the TMP, beginning with the project initiation to guide the development of the project vision and goals, and identifying key constraints within the existing transportation system. Transportation-themed topics were initially discussed during the engagement phases of the OCP and were carried forward to be incorporated into TMP. This continued through the review of the existing network, assessment of the future network, and the development of preliminary and final recommendations. In the development of the TMP, input from stakeholders was coupled with technical data and used to guide the recommendations process. Stakeholders were divided into different levels using the IAP2's Levels of Engagement at the initial development of the Communications and Engagement Plan, which was then used to determine how stakeholder input would influence the overall TMP.

Throughout each phase's engagement activities, a summary What We Heard Report (WWHR) was created to outline discussion points and categorize and consolidate input received from stakeholders. Where applicable, technical results were then re-examined based on the WWHR, and carried forward to the next technical analysis stage for further incorporation. This includes integrating the results of the WWHR within the framework of the project lenses, project vision and established goals to guide the recommendations and prioritization strategy within the TMP. To achieve this, a series of routine questions were reflected upon by the team though each phase:

- What values are being reflected by project stakeholders?
- How do these values align with the project lenses, vision, and goals?
- How do these values align with other City policies and directives?
- How do we measure success in the incorporation of stakeholder input?
- How do we achieve consensus between conflicting stakeholder viewpoints and the technical analysis results, where applicable?

We recognize that the incorporation of stakeholder input into the TMP requires striking a fine balance between the technical analysis of how the transportation system is intended to function and the human experience of how mobility is actually achieved. In this TMP, **our goal is to utilize this stakeholder experience to enhance the performance of the transportation system for the decades to come**.

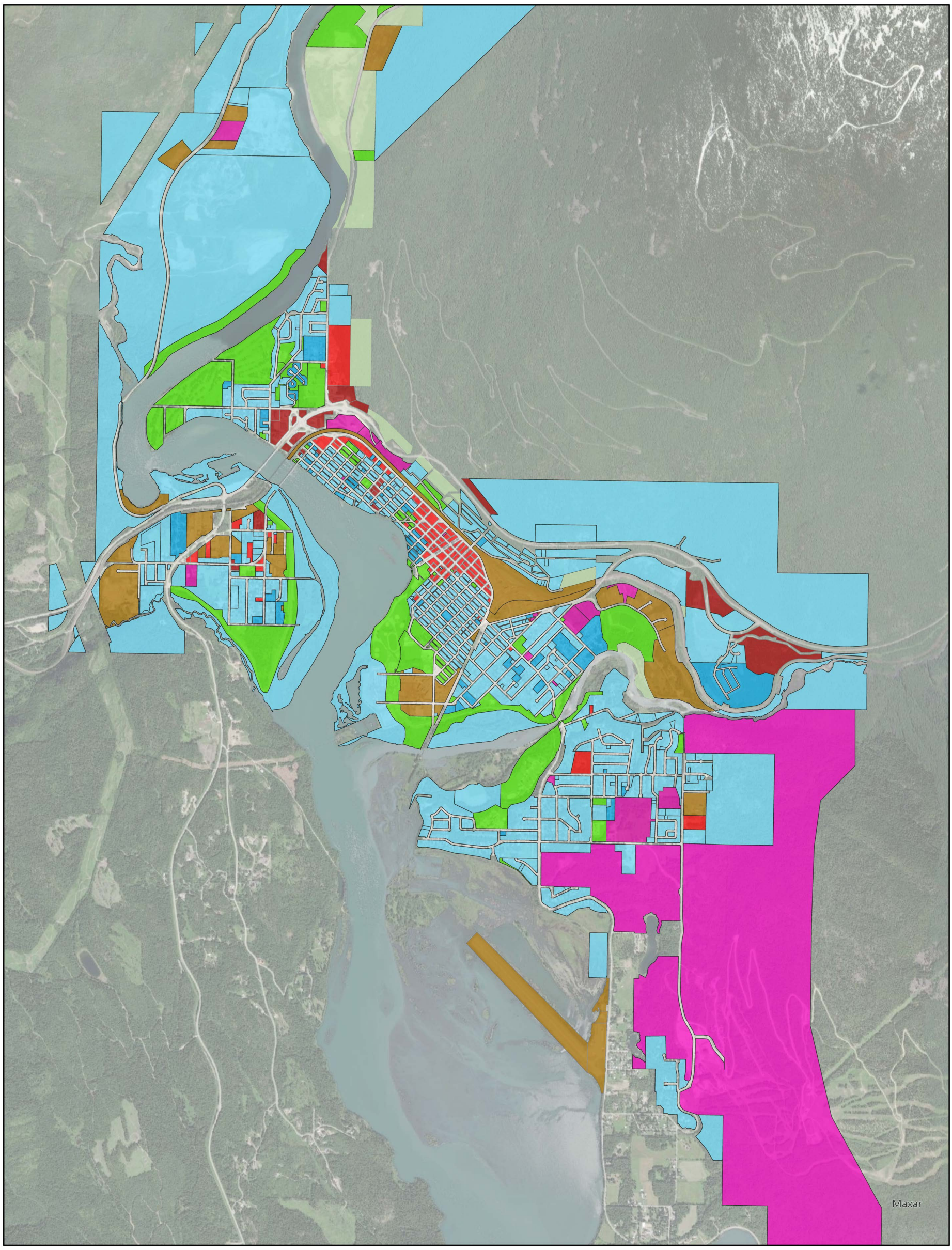
3 EXISTING TRANSPORTATION NETWORK CONDITIONS

Revelstoke, because of its geographic location in the mountains, is relatively isolated when compared to other communities in British Columbia and as a result stands alone in many respects. The Revelstoke Mountain Resort (RMR) and the natural setting makes Revelstoke draws both residents and tourists to the community. Transportation into and out of Revelstoke is primarily via Highway 1, with some connection via Highway 23. The local airport serves minimal flights and it not a primary route for tourists and visitors the Revelstoke. The city does have several natural and manmade features that either bisect the community or limit the connections available between the various neighbourhoods including, the Trans-Canada Highway, Canadian Pacific Railway (CPR) tracks, the Columbia River, the Illecillewaet River, and natural topography. Despite these challenges, the Revelstoke had developed a multi-faceted transportation network that supports the community. As an early step of the TMP, the existing transportation network was assessed to better understand it and identify gaps and areas for improvement. This analysis included engagement with the public, who understand the network the best, to further enhance our understanding.

3.1 Existing Community

Revelstoke is a well established, multi-generational and progressive community of approximately 8,300 permanent residents. The City lies within the Columbia Shuswap Regional District, which has jurisdiction over private lands outside of the City boundary. The City borders Mount Revelstoke National Park on its north and east boundaries, which is managed by Parks Canada. Revelstoke Mountain Resort is located at the southeast boundary of the City. BC Hydro owns and managed the reservoir drawdown zone that runs through the centre of the City. The Crown lands surrounding the community are managed by provincial government agencies.

The rivers and highway Revelstoke's land use map is provided in **Figure 3.1** and neighbourhood map in **Figure 3.2**. Employment is primarily located in the Central Business, Downie Mill, CP Rail, Industrial, Highway Corridor, Resort Lands, and the Big Eddy neighbourhoods. Residential land uses are spread throughout Revelstoke. The Illecillewaet River Bridge on Fourth Street (4th St) is a major connection point not only to and from the RMR, but also for the growing residential population in the Victoria Heights and Arrow Heights neighbourhoods that connect to the rest of Revelstoke.



LEGEND

A1	C2	C6	CD 01 - 20	P1	R1A	R2v	R5A	RR2v	UR
A2	C2A	C6A	RN	P2	R1v	R3	RR04	RR60	
C1	C4	C7	M1	P3	R2	R4	RR04v	RR8	
C10	C4A	C8	M2	P4	R2A	R4v	RR1	CSRD 299	
C11	C5	C9	M3	R1	R2Av	R5	RR2	CSRD 851	

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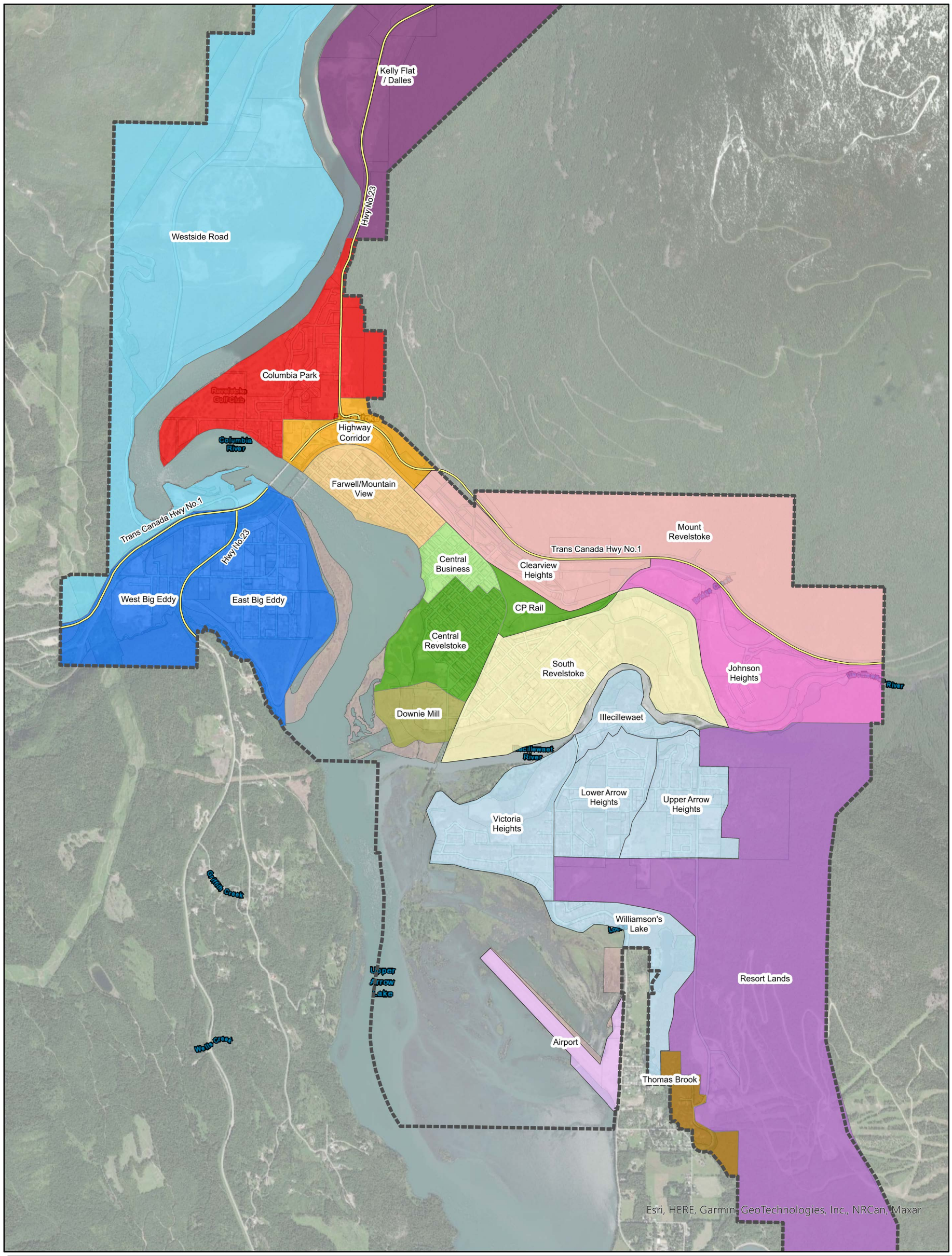

LEGEND

- CityBoundary
- Highway
- Airport
- Central Business
- Central Revelstoke
- Columbia Park
- Downie Mill
- Farwell/Mountain View
- Highway Corridor
- Johnson Heights
- Kelly Flat / Dalles
- Livestock
- Clearview Heights
- Resort Lands
- South Revelstoke
- Thomas Brook
- Arrow Heights
- Big Eddy
- Westside Road

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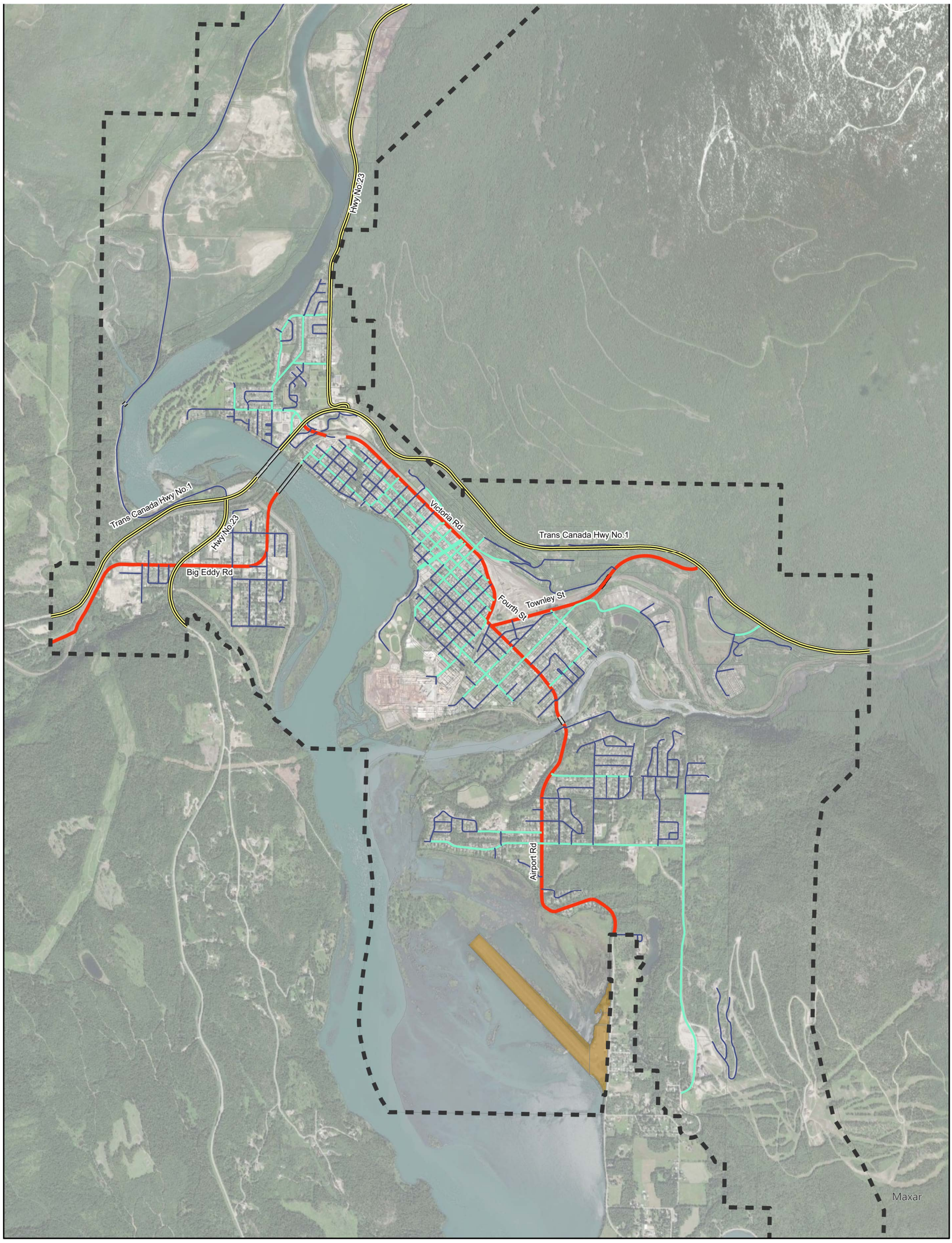
3.2 Roadway Network

The City of Revelstoke is serviced by a grid-like network through the core of the City, consisting of Collector and Local roadways and predominantly stop sign- and yield sign-controlled intersections. Regionally, the Trans-Canada Highway and the Canadian Pacific Railway act as primary east-west transportation links. Highway 23 acts as a north-south connector. The Collector and Local roadway network is maintained and controlled by the City of Revelstoke. Both the Trans-Canada Highway and Highway 23 is maintained and controlled by BC's Ministry of Transportation and Infrastructure (MOTI).

3.2.1 ROADWAY CLASSIFICATION

Revelstoke has 3 primary road classifications, Arterial, Collector, and Local. In addition to these, there are Highway 1, Highway 23, and lanes. **Figure 3.3** illustrates the existing classifications of the roadway network. Based on the City GIS data an approximate breakdown of the existing road inventory is as follows:

- Highway: 17 kilometers
- Arterial: 11 kilometres
- Collector: 26 kilometers
- Local: 61 kilometers
- Lane: 4 kilometers



LEGEND

- Highway
- Bridges
- Arterial
- Collector
- Local
- Airport
- Parcel
- CityBoundary

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A summary of the roadway classifications and their general characterizations are provided in **Table 3.1** with further discussion following the table.

Table 3.1: Existing Roadway Classifications & Characteristics

Street Classification	Number of Travel Lanes	Suggested Volume Threshold (vehicle per day)	Current Posted Speed (km/h)	On-Street Parking	Pedestrian Facilities	Bicycle Facilities
Highway	2 or 4	2 lane - <15,000 vpd) 4 lane - <30,000 vpd)	70-100	No	None	Not recommended (narrow shoulder, high posted speeds)
Arterial	2 or 4	2 lane - <10,000 4 lane - <20,000)	50-60	Yes	Sidewalks	Some 1m shoulders, otherwise no.
Collector	2	<5,000	50	Yes	Sidewalks where curb & gutter. None otherwise.	Some sharrows (e.g. 3rd Street)
Local	2	<2,000	50	Yes	Sidewalks where curb & gutter. None otherwise.	Nothing specifically designated.

The suggested volume thresholds for the various road classifications are a general guide based on typical thresholds with some adjustment for Revelstoke. Existing volumes within Revelstoke, discussed later in the document, are not expected to trigger these thresholds, but they do provide a good baseline for roadway classification as Revelstoke continues to grow. Further discussion regarding each road class is provided below.

Highway

The primary purpose of the Highways are to provide regional connection for Revelstoke. Highway 1 has four main connections to the City but mainly provides connection through Revelstoke for regional traffic. Highway 23 serves a similar purpose, but serves more like an arterial roadway, providing connection to roadways and some driveways both north and south of Highway 1. This road class is easily categorized and under the jurisdiction of MoTI.

Arterial

Arterial Roadways in Revelstoke are the spine of the road network, providing connection to key destinations and river and railway crossing locations. While this is the highest class of roadway and serves a key “cross town” function, speed is not a priority on these roadways and there are numerous driveways into the arterial roadways. Given the context of Revelstoke, this is appropriate. The arterial roadways are very much a part of the vehicle, bicycle, and pedestrian road network and do not function as a highway through town.

Collector

In a typical road network, collectors will help bridge the gap between the mobility focused arterial roadways and the access based local roads. As most of the road network facilitates access, the collector classification has been largely assigned based on either connection importance within the network or the size of the roadway. This results in nearly all roadways in the central business district being classified as collectors. Outside of the downtown, the collector road class serves as key connections within the network. However, in some locations, such as Columbia Park, the physical differences between a collector and local roadway are minimal.

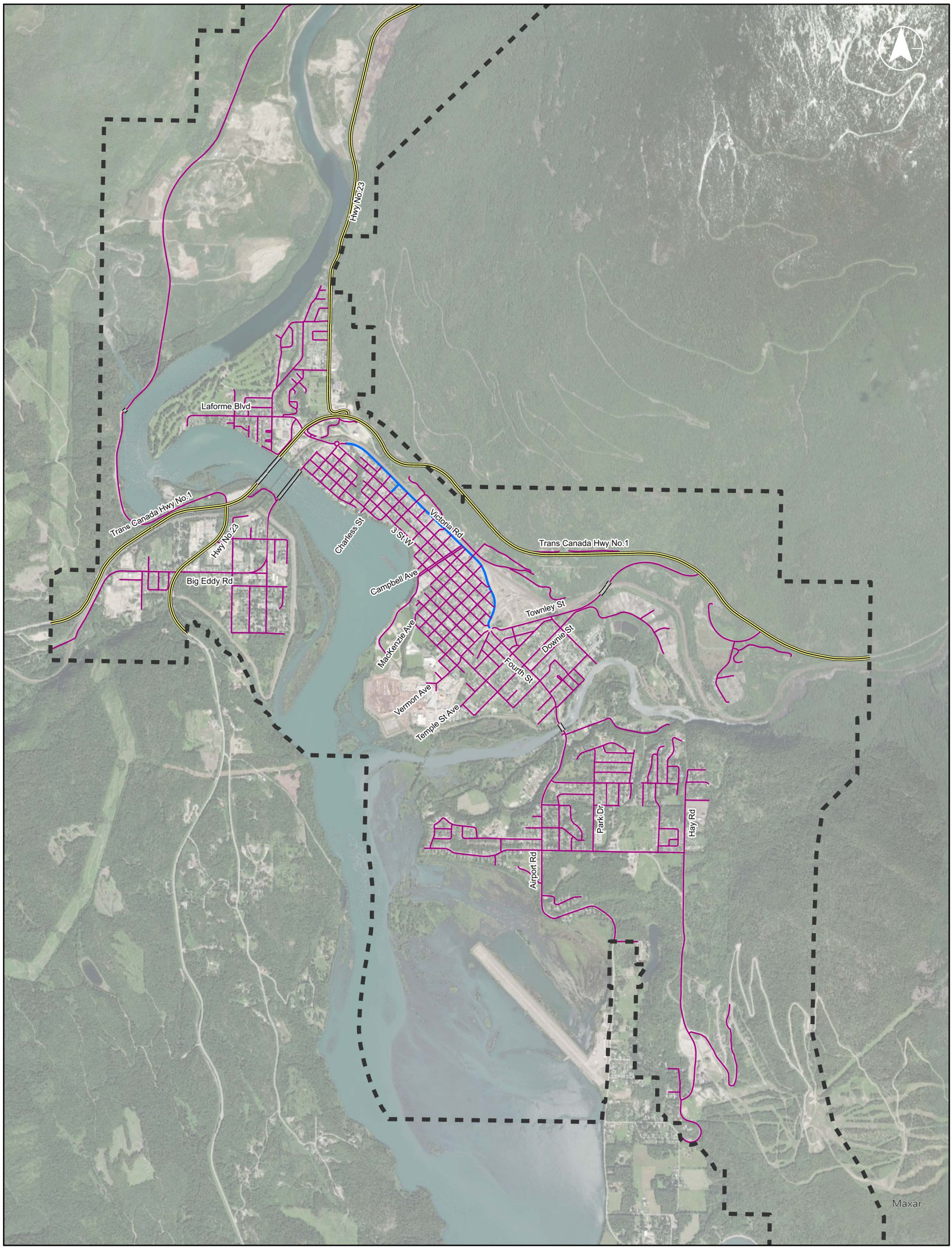
Local

As with other communities, Local roadways make up the majority of Revelstoke's transportation network. These roads provide direct residential access, are low volume and low speed. Typical pavement width is 8 to 9 metres and most of Revelstoke's local roads have no storm drainage infrastructure (ie. raised curb & gutter, and catch basins to collect water run-off). This is primarily because Revelstoke's soils have the ability to absorb a tremendous amount of water and overland run-off is rare.

Lane

Most residential areas in Revelstoke also have rear lanes to provide access to rear parking and waste & recycling services. These are typically 6 metres in width.

Figure 3.4 illustrates the number of travel lanes along each roadway within the City. Other than Victoria Avenue (4 travel lanes), all roads within Revelstoke have two travel lanes.



LEGEND

- 4
- 2
- Highway
- Bridges
- CityBoundary

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3.2.2 BRIDGES

The City of Revelstoke has five bridges in total. There are essential to Revelstoke's transportation network as they allow access across major barriers, namely the Columbia River, the Illecillewaet River, and the Canada Pacific Railway (CPR). Characteristics of these bridges are described below in **Table 3.2**.

Table 3.2: Existing Bridges

Bridge	Description	Image
Big Eddy Bridge (Connection of Big Eddy Road and Wilson Street over Columbia River)	Constructed in 1924. Ownership transferred to the City in October 1998 after the declassification of the Big Eddy Road as an arterial. Alternating one-way bridge (signal controlled). Steel grate deck surface, approximately 1m (3ft) timber walkway south side. Deficient width for multi-users Inspection report by MOTI reveals structural issues 2022 report. Load limit has been reduced. Formal maintenance agreement between MOTI and City is needed.[1]	
Revelstoke Suspension Bridge (Highway 1 crossing of Columbia River)	Suspension bridge – 2 travel lanes, 1.5m (6 ft) concrete sidewalk south side. Deficient width for multi-users.	

Illecillewaet River Bridge (Fourth Street (4th St))	2 travel lane steel truss. 1.2m (4ft) concrete sidewalk north side. Cyclists must dismount to use sidewalk (which is a deterrent to using cycling as a mode choice. Deficient width for multi-users.	
CPR Bridge (Townley Street)	2 lane overpass with 1m shoulder (south side), 0.5m shoulder and 1.5m sidewalk (north side). No bicycle facilities. Shoulder width, sidewalk width and posted speed not currently suited for cycle use.	
Illecillewaet Pedestrian Bridge	55 metre timber and steel pedestrian bridge spanning the Illecillewaet River connecting bike and walking areas on the city's treasured greenbelt. Construction was challenging as it was required to have minimal environmental impact.[2] Currently, gravel trails connect to the bridge, but the trails to the south are submerged every spring as they are in the flood plain and influenced by the Columbia River/reservoir elevation.	

[1] *Source: Revelstoke Mountaineer (Friday, July 8, 2022)*
[2] *Source: Illecillewaet Pedestrian Bridge – VVI Construction Ltd.*

3.3 Active Modes Network

Revelstoke currently has very little designated on-street bicycle infrastructure (e.g., Sharrows on 3 Street, narrow shoulders on Airport Way) and sidewalks are limited to areas with curb and gutter drainage infrastructure. This leaves numerous gaps and areas not supporting active modes throughout the City. The existing network inventory was available through the City's GIS data and this data was refined through administrative, public and stakeholder feedback. **Figure 3.5** shows existing sidewalk, multi-use pathways (paved) and trails (unpaved). **Figure 3.6** is a gap analysis map (identifying all sidewalk deficiencies (pink) and assumed only if a street has no sidewalks on either side), multi-use pathway deficiencies (light blue), and proposed trails (purple).

LEGEND

- Multi-Use_Pathway_Paved
- ExistingTrails
- Existing Sidewalk
- CityBoundary

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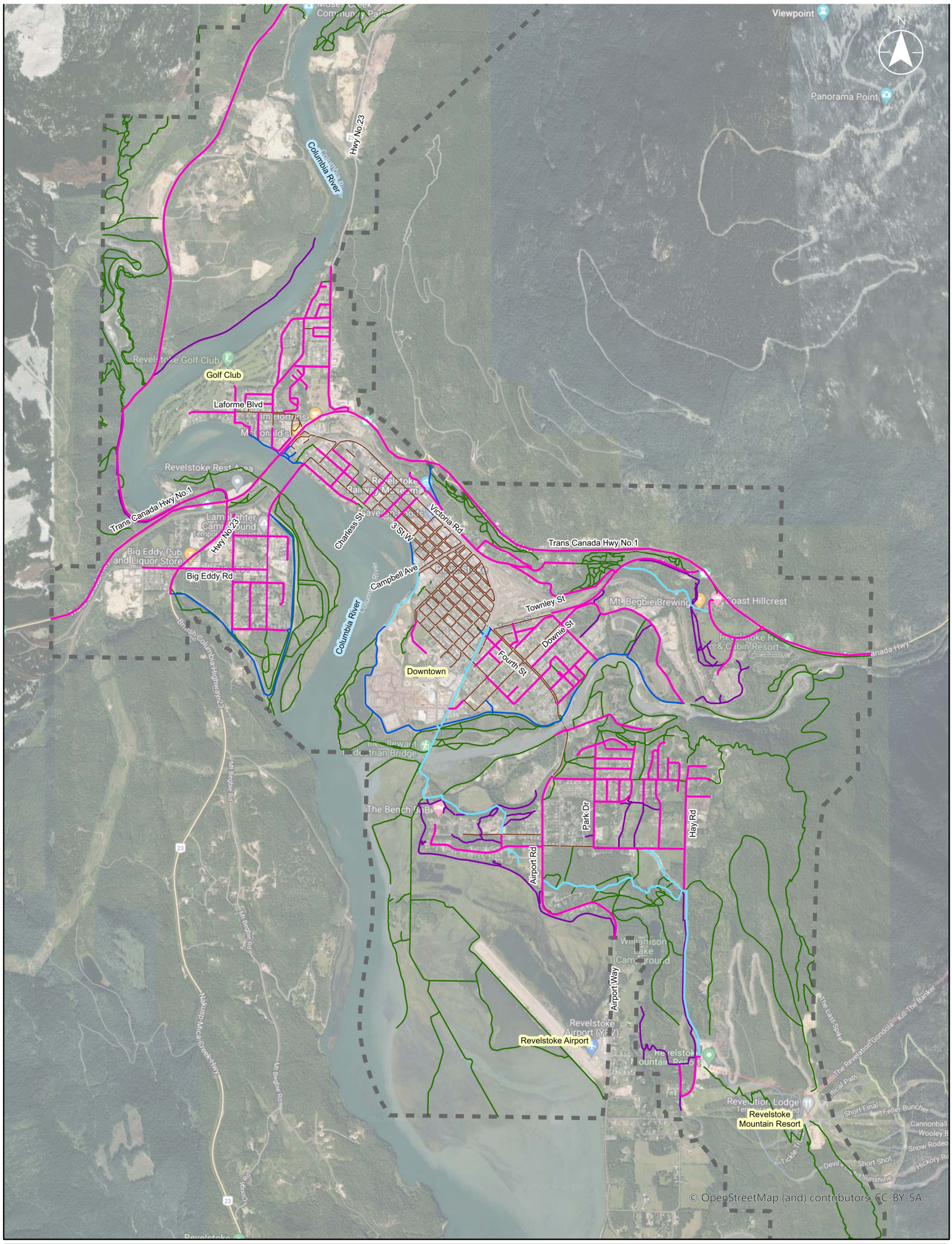

LEGEND

- Sidewalk_Deficiency
- Multi-Use_Pathway_Deficiency
- Multiuser Path (Paved)
- ProposedTrails
- ExistingTrails
- Existing Sidewalk
- CityBoundary

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The sidewalk deficient roads (pink) are those that do not have sidewalks on either side of the road as having a sidewalk on one side of the road provides a base level of pedestrian connectivity. This approach, however, does not provide the highest level of accessibility and locations near senior facilities, transit routes, etc. may require pedestrian infrastructure on both sides of the road. Central Revelstoke and the Central Business neighbourhoods have few gaps in the pedestrian network. Significant gaps, however, can be seen in all other Revelstoke communities. Proposed trails (purple) and multi-use pathway deficiencies (light blue) can be seen in the industrial and newer communities located near the Illecillewaet River. This map does not show on-street bikeway deficiencies but, as was shown in the Active Transportation Plan and Trails Master Plan, further analysis and selection of appropriate streets was required to establish the proposed active transportation network. Specific improvements identified in the 2012 Transportation Master Plan, the Age-Friendly Plan, and the 2010 Active Transportation Plan also needed consideration.

3.4 Transit Network

The existing transit network is provided through a combination of conventional fixed route fixed schedule service, accessible HandyDART services, and taxiDART. The conventional service is based on four routes (see **Figure 3.7**) that provide service throughout the town with service levels that are inconsistent through out the day. Weekday service runs from 8AM to 6PM with limited service on Saturdays between 9AM and 6PM. The #4 Commuter does a unidirectional single trip on weekdays.

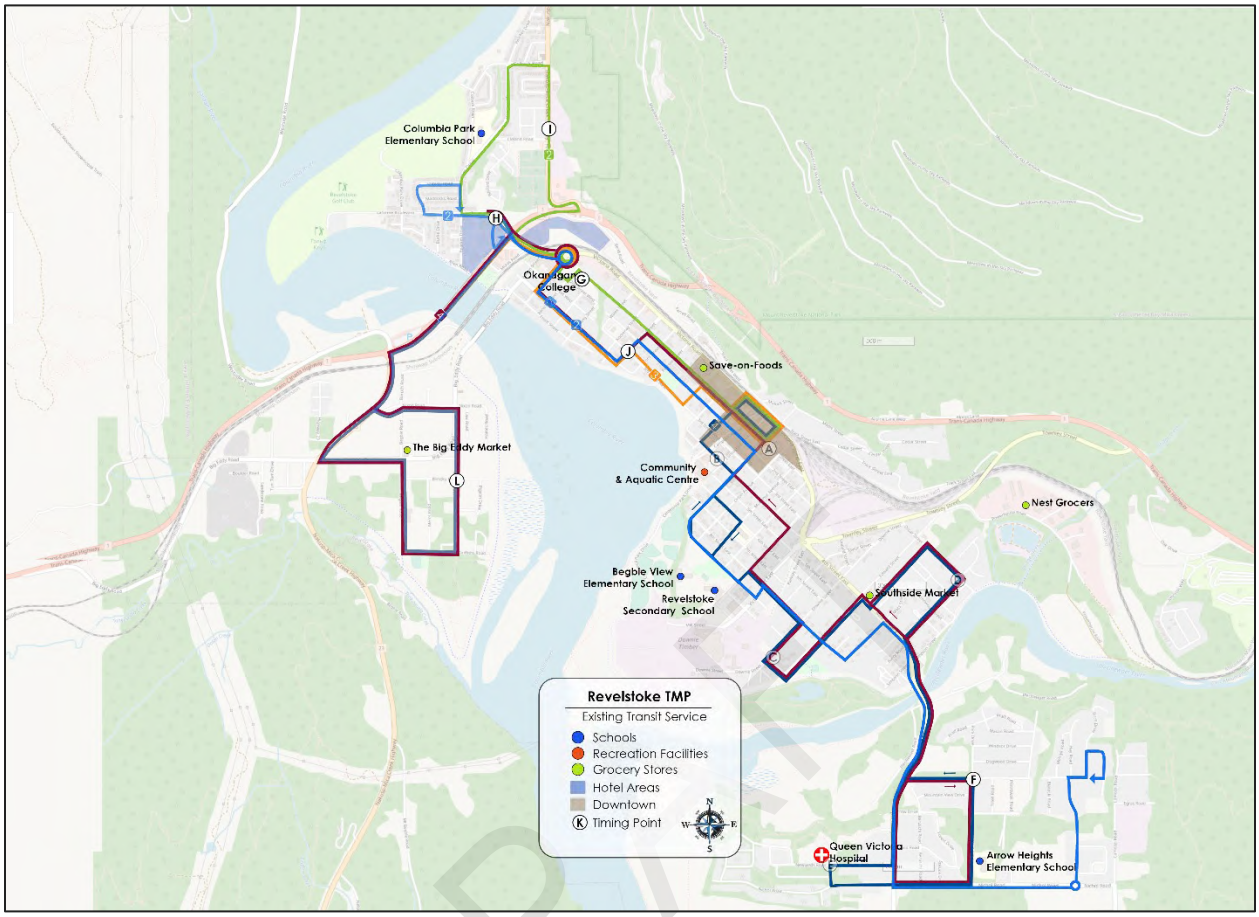


Figure 3.7: Existing Conventional Transit Routes

Route Simplicity is a notion that the more complex the route structure, the less inviting it becomes for users because they may not understand what the route actually does. We have created a simplicity calculation that examines the individual routes and categorizes them according to the three types with the methodology provided in **Table 3.3** and supplemental information in **Figure 3.8**. When we examine the simplicity of the route design based on these concepts, we can then calculation the simplicity or usability of the system Revelstoke. The results of this analysis are shown in **Figure 3.9**. When combined with the ease of understanding the public timetable, it provides a general understanding of how the average person might view the transit network. The more complex a system is, the less likely it is to attract users because the complexity becomes a barrier.

Table 3.3: Simplicity Calculation Methodology

Category	Max Score	Percent of System	Scoring
Complex	1	X%	Max Score * Percent
Compound	3	X%	Max Score * Percent
Simple	5	X%	Max Score * Percent
System Simplicity Score			Sum of Category Scores

Route Simplicity Classification

The goal of this system is to look at the routes of a transit network by how they are designed and place the routes into one of three categories. The goal of the classification is to show how simple or complex a transit network is based on how the routes are designed. The percentage of the system by classification determines how the overall network rates. The closer a system is to 5, the easier it is to use and understand.

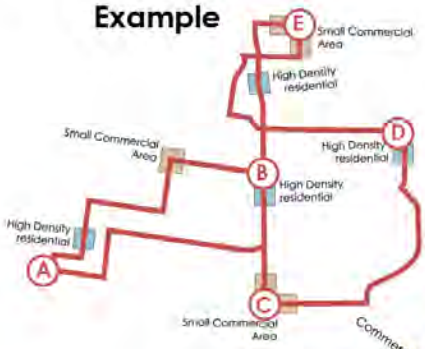
Category	Key Attributes	Example
COMPLEX	➢ Difficult to understand ➢ Too many purposes ➢ Multiple loops ➢ Crossing patterns ➢ Multiple small destinations	
COMPOUND	➢ Simple in parts & Complex in others ➢ Two or more destinations ➢ Multiple turns &changes in direction ➢ Complex loops ➢ Large one way loops at one end	
SIMPLE	➢ Simple in design ➢ A straight line or following a specific roadway ➢ Easily identifable purpose ➢ Primary Origin and primary destination Key Corridors	

Figure 3.8: Simplicity Definitions

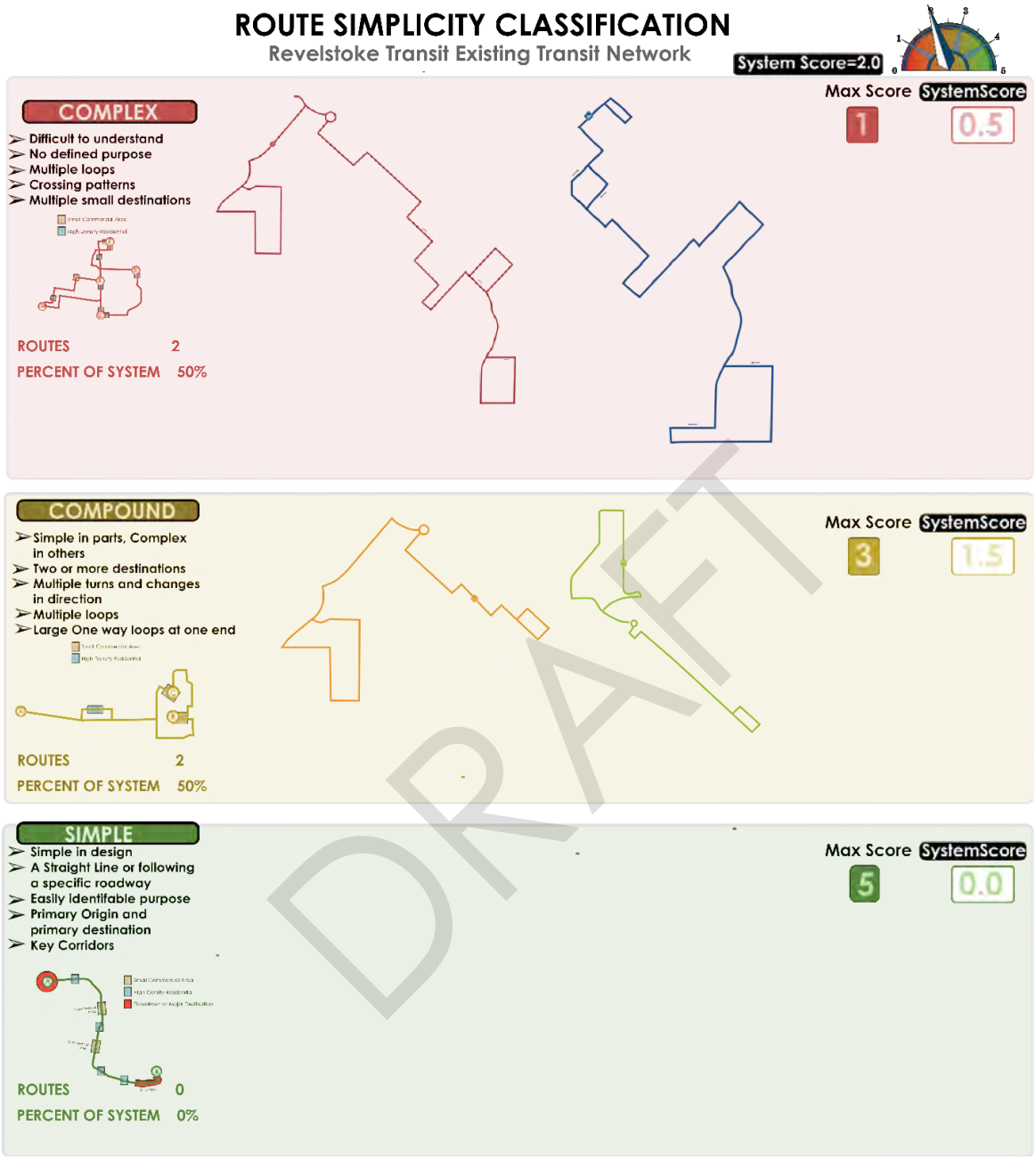


Figure 3.9: Revelstoke Simplicity Score

As can be seen in the figure above, the conventional service routes are either Complex or Compound creating a total system score of only 2 out of a possible 5.

3.4.1 PRIVATE TRANSIT SERVICES

Revelstoke Mountain Resort runs a private shuttle service, shown in **Figure 3.10**, during the winter months (December through March) to support locals and tourists gain access to the mountain without having to use a vehicle. This service effectively operates as to overlapping routes in the south end of the service, two distinct routes through downtown and overlapping again to the north end of town. The service is aimed at three key time periods – morning for the opening of the hill, lunchtime to 6PM, then evening service to 10:30PM. The private transit service will go to year around operation starting in summer 2022.

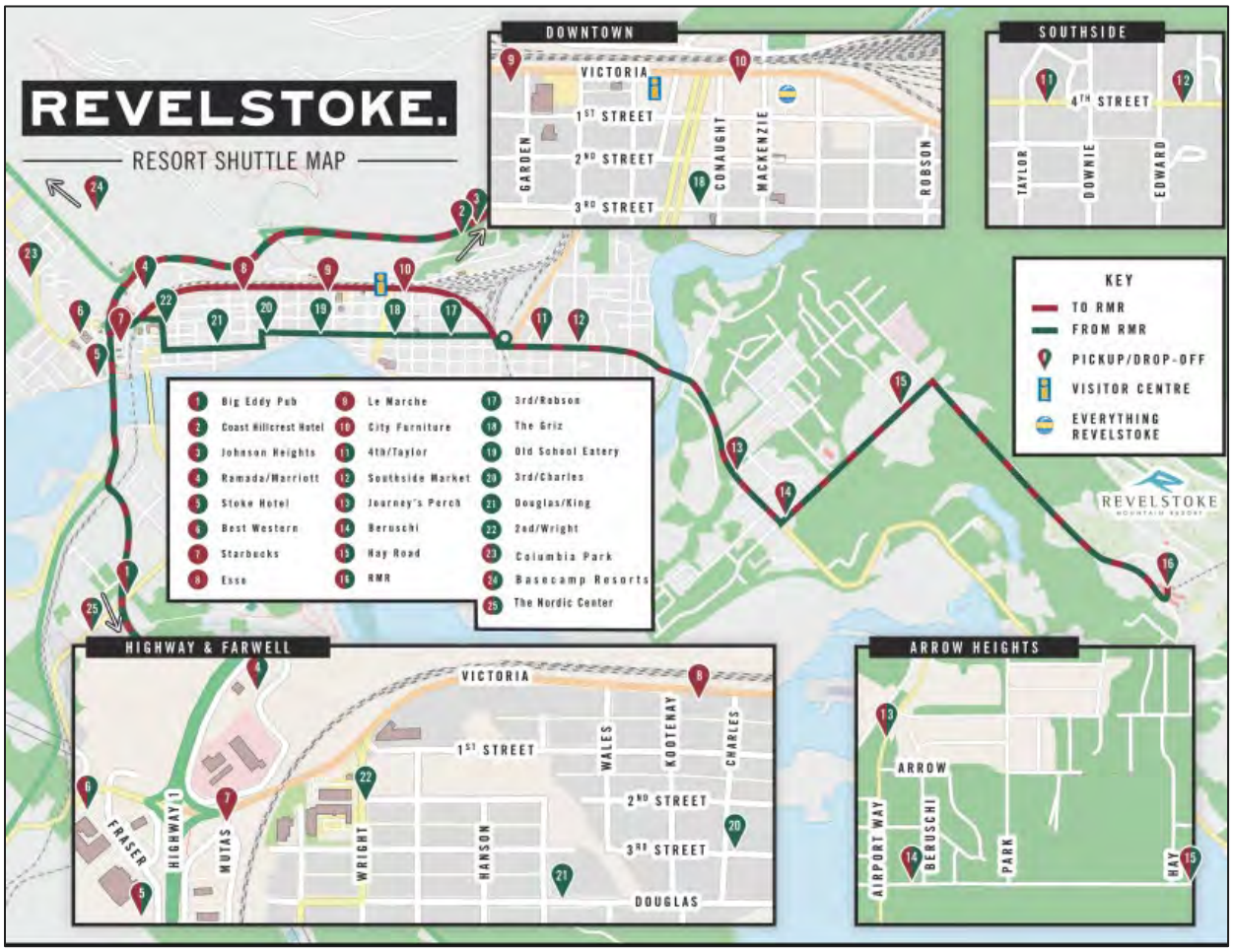


Figure 3.10: Revelstoke Mountain Resort Shuttle

3.4.2 TRANSIT PERFORMANCE

The annual system performance metrics provided by BC Transit indicate that the system is considered a Tier 3 Paratransit / Custom system despite having fixed route and fixed schedules for the major of the service hours. The cost recovery was 6% in 2019/20 and 5.5% in 2020/21. The passengers per hour sit at 2.99 in 2019/20 and 1.77 in 2020/21. The overall system ridership has plateaued for the past four years with the pandemic reducing ridership even further. These are

exceedingly low numbers for a transit service and should provide significant concern over the benefits vs cost of the existing service. As can be seen in **Figure 3.11**, the HandyDART / TaxiDART ridership numbers declined after the start of the pandemic and have flatlined since showing no recovery. The conventional ridership declined significantly after March 2019 and is currently averaging 23% fewer rides per month. September through December showed some slight improvements but has again dipped to more than 20% lower than pre-pandemic numbers.

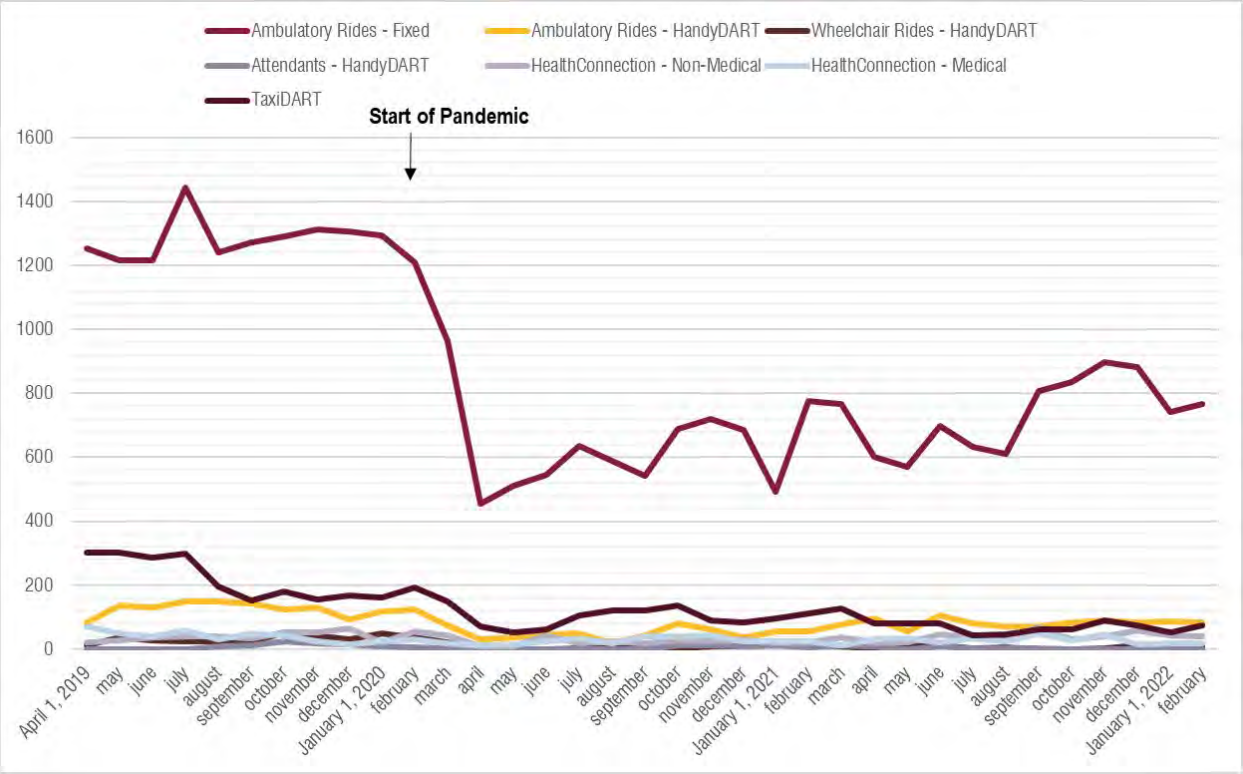


Figure 3.11: Monthly Ridership

Ridership for the Resort shuttle from winter 2021 was provided by the operator and compared against the combined ridership of the conventional Revelstoke Transit System. A comparison of these services is provided in **Figure 3.12**. November 2020 only operated for 4 days, however the shuttle carried 300-600% more riders per winter month than the public transit system.

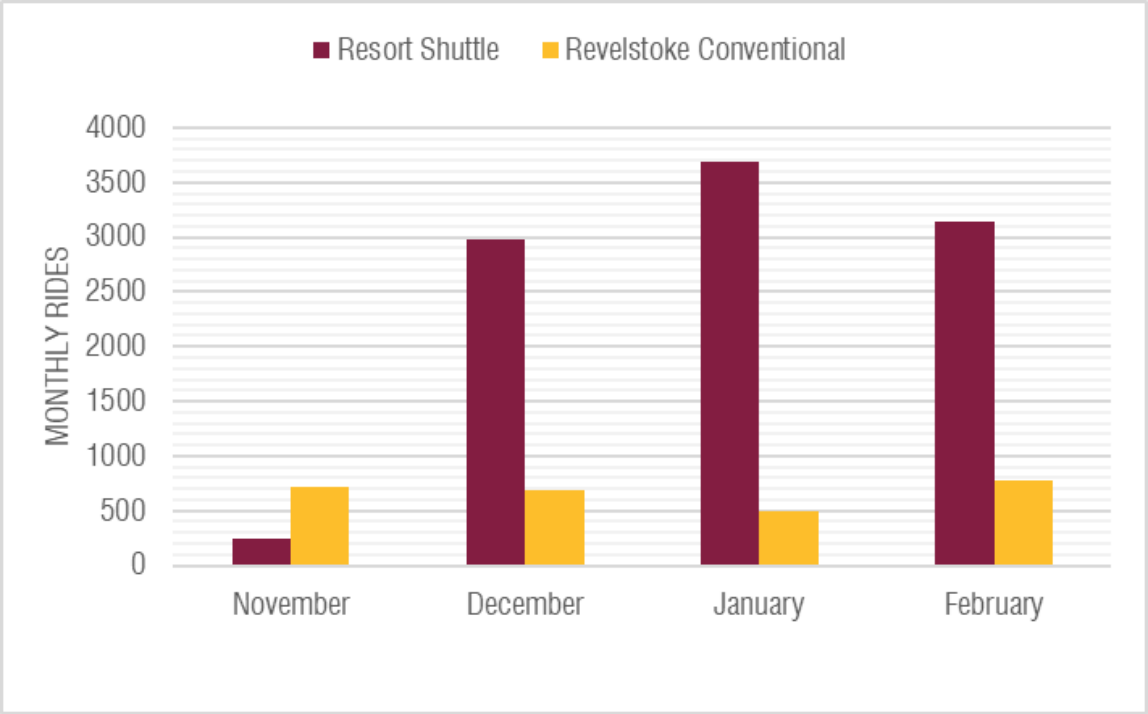


Figure 3.12: 2020-21 Winter Ridership Comparison

3.4.3 SUMMARY

The existing public transit system does not appear to be in a positive position with respect to ridership levels and overall benefit to the community. The poor performance levels over the past 5 years have been significantly impacted by the pandemic and do not appear to be on a path to recover. The performance of the resort shuttle should be an indicator that there are possibilities such as route consolidation, route simplification, and route integration that should be considered. This system does not appear to need minor tweaks to the service but rather should be examined for an overhaul of the network to reflect the mobility of residents and visitors now and in the future. Any extensions of the service day or week should not be considered until the system has been thoroughly examined for new alternatives and changes have had the opportunity to prove themselves prior to increasing the annual operating burden on the City and Province.

Accessible service hours also need to be reviewed from the perspective of matching the conventional network by day and week. This has been the direction noted in Canada based on human rights complaints and should be rectified through some plan that provides an indication of the length of time it will take to rectify the situation.

3.5 Goods Movement

The 2012 Transportation Master Plan included a section on existing truck routes, truck route improvements, avalanche closure shuttle routes, and heavy truck parking during avalanche road closures. This is summarized in **Figure 3.13** . Based on a review of bylaw and other available information from the City, it does not appear that Revelstoke has a formal truck route map.

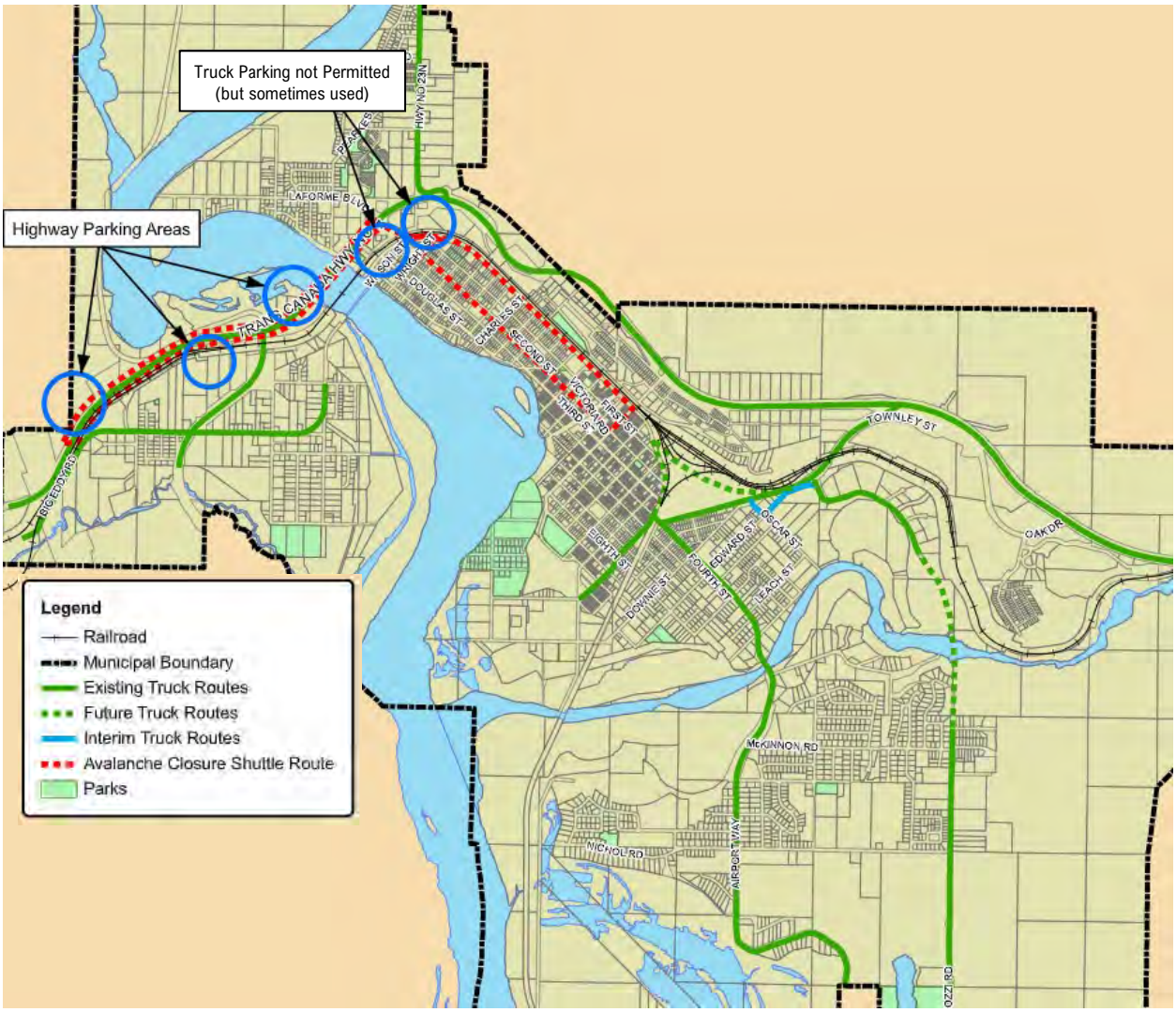
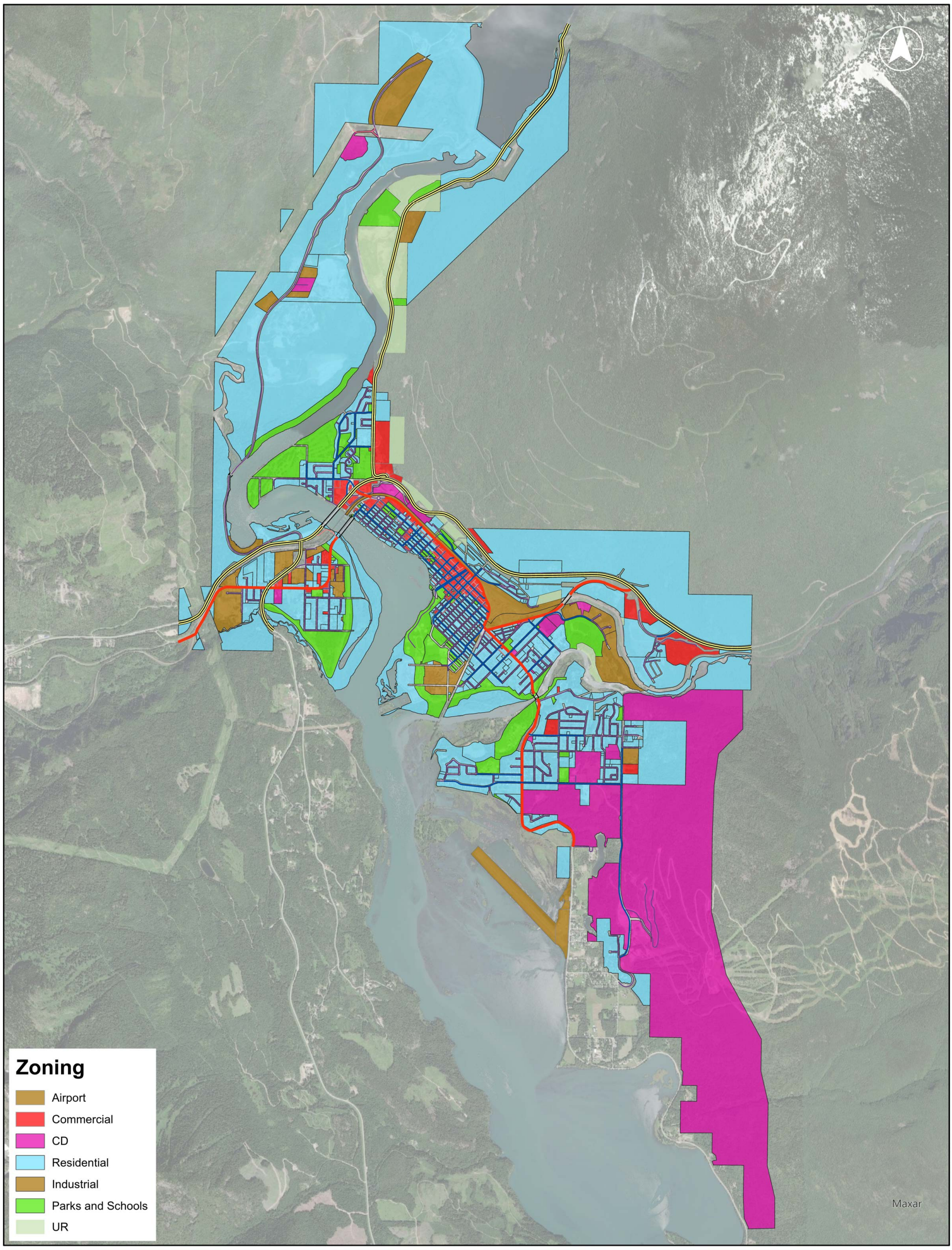


Figure 3.13: Proposed Truck Routes & Avalanche Closure Routes (2012)

Truck routes often are associated with higher class roadways such as arterials and collectors. **Figure 3.14** shows a combination of the City's land use and roadway classifications so identify areas that may be challenging for trucks to access. The City's arterial road network provides access to most neighbourhoods, particularly those with land uses associated with higher truck percentages. The high number of collector roadways may also provide options for trucks travelling throughout the City. As part of the future conditions work, formalization of the truck routes will provide more clarity and enable appropriate roadway design and maintenance.



LEGEND

Highway
Arterial
Bridges
Collector
Local
Lane

0 250 500 750 1,000
metres

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1:50,000

3.6 Travel Characteristics and Patterns

Understanding how people move around Revelstoke is a key consideration in assessing the existing and planning the future transportation network. The main challenge is accumulating the appropriate data to understand the various travel patterns of the community. This is further impacted by the ongoing COVID-19 pandemic and the change in travel behaviour it caused in 2020, 2021, and onwards. For the TMP, several data sources were utilized to better understand the local travel patterns including:

- 2016 & 2021 Canadian Census data,
- Data from background reports,
- Historic and recent traffic data counts,
- Engagement survey feedback,
- Location based services data, and
- Strava Global Heatmaps.

The following section discuss the key inputs, data, and findings of the existing traffic analysis.

3.6.1 LOCATION BASED SERVICES DATA

It is acknowledged that traffic data collected during the last two years have been impacted by the COVID-19 pandemic. As a result, underlying traffic volumes and patterns may have changed dramatically and are highly dependent on how travel and work from home restrictions were implemented by both public agencies as well as private companies. It is also unclear how long-lasting these patterns and habits may continue to hold into the future, as the long-term travel patterns of the pandemic potentially are integrated into the new norm.

To assess how mobility changed from pre-pandemic (pre-2020), during the peak of the pandemic (2020) and as people adapted to living with the pandemic (2021), location-based services (LBS) data provided by StreetLight Data was utilized from 2017 through 2021 to quantify travel vehicle patterns in hourly intervals. This allows the consideration vehicle travel patterns associated with a variety of purposes and time periods at a much more granular level than previously possible through traditional methods such as household travel surveys.

StreetLight Data uses “zones” to capture mobile device movements across user-defined boundaries. Boundaries are established by aggregating similar adjacent land uses, such as residential communities, using the surrounding roadway network or environmental barriers as the perimeter of the zone. Commercial / retail, employment, entertainment, recreational, and industrial zones can similarly be established across the City, as well as major regional routes connecting to origins and destinations outside the City. The StreetLight zones are typically established to conform with internal land use, population ad employment zones, and / or federal census tract information.

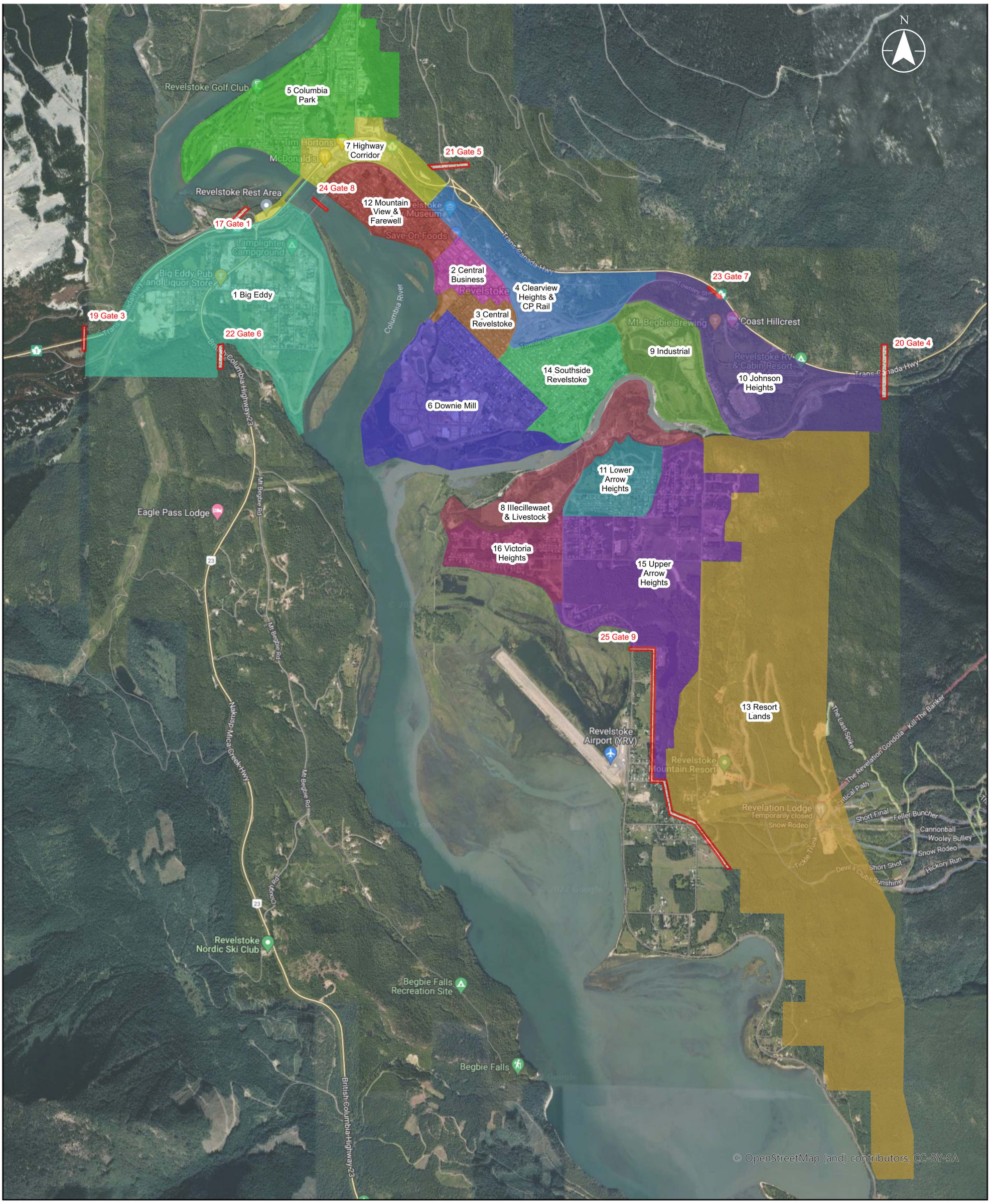
The zones used in the StreetLight analysis are shown in **Figure 3.15**. The zones used in this analysis were primarily based on the boundaries of the named Revelstoke neighbourhoods with adjustments to better capture travel patterns for the various modal analysis. Due to zone limitations with the StreetLight subscription, some neighbourhoods were combined with other adjacent neighbourhoods in the analysis. The combination of these zones took into consideration the present

land use as well as future growth plans. For example, since significant growth is expected in the Johnson Heights area, it was intentionally separated from other adjacent zones. The analysis zones also considered existing network access. For example, Upper and Lower Arrow Heights are separated along Arrow Drive and McKinnon Road which are discontinuous. Gates or "pass-through" zones were defined to identify major entrances and exits to the City boundaries, and to assist in the analysis of alternate routes. Seven gates are located at major entrances and exits to Revelstoke. For example, gates are located on either end of Highway 1 (east and west). Gates are also located on Townley Street and the Big Eddy Bridge. These gates are intended to be used as "middle filters" in the StreetLight analysis to determine routing patterns within the City.

The LBS data does have limitations that need to be considered when assessing traffic patterns and developing recommendations from the data. The first is the built-in definition of a "trip" within the data. It is our understanding that a new trip in StreetLight is assumed to occur following an approximately 5 minutes stop. Two main affects of this definition are that a fuel or food stops may or may not be registered as a 'stop'. The direct impact of this is a possible under-representing of trips to and from the zone and difficulty discerning between these short term stops versus longer terms stays within the zone. The other main effect of the definition is that any pick up/drop off trips may not be captures within the origin/destination data. For example, a trip starting at home to drop off a person at school/work and then returning to the same zone may show up as just a trip within the single zone, and not include the trip to second zone. This limitation can be mitigated thought the use of additional zones in the analysis. The number of zones was considered to be appropriate for the level of analysis completed for the TMP.

The second main limitation is the use of adjustment to convert a limited sample of data into total numbers. The LBS data is based on only a sample of all trips and must be factored up to reflect all trips within Revelstoke. It is our understanding that Streetlight does this calibration at a large scale (provincial and national level) using available data. This means that specific areas of the model may be over or underrepresented. With enough traffic data and LBS zones, a calibration can be conducted for a given study area. For the TMP, the data was not available to conduct a full calibration. Instead, key routes with traffic data were compared to total trip numbers from the LBS data to compare their consistency and the accuracy was deemed to be acceptable.

Figure 3.15: Streetlight Data Analysis Zones



0 250 500 750 1,000 metres

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3.6.2 VEHICLE TRAVEL PATTERNS

The first task with the LBS data was to determine the monthly and annual differences in trip volumes. **Figure 3.16** shows the average daily number of trips for each month over the previous four years.

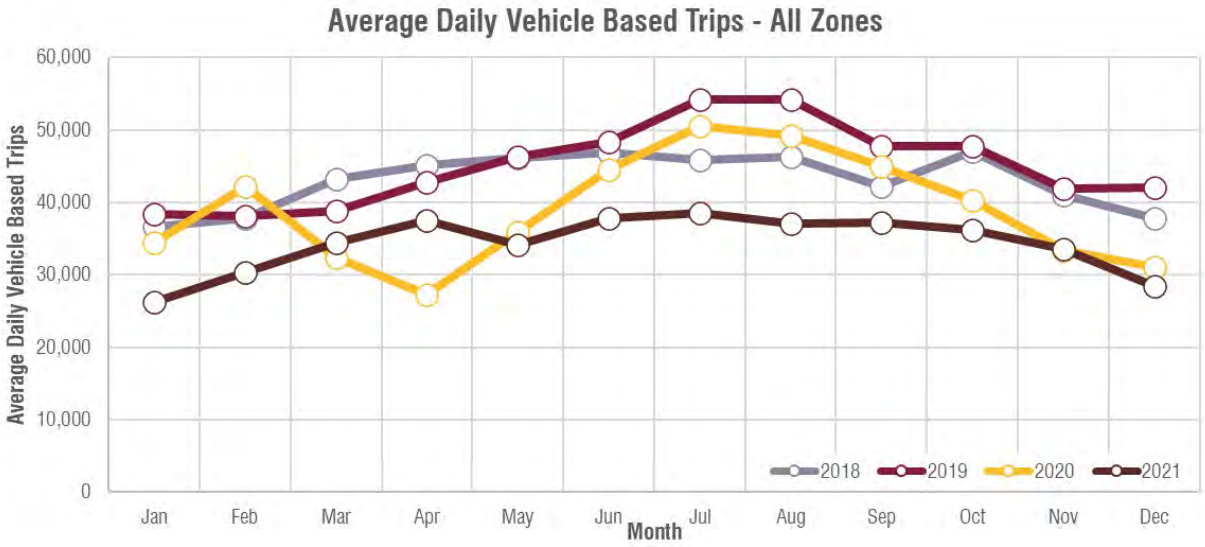


Figure 3.16: Average Daily Vehicle Trips by Month - All Gates and Zones

A sharp decline in trips was observed in March and April of 2020 (beginning of COVID-19 pandemic) as well as later in 2020 and throughout 2021. For this reason, the data utilized in the analysis is exclusively 2018 and 2019 data, unless otherwise mentioned. The summer months of July and August have historically had the highest number of daily trips with winter months representing the lowest trip months. This data includes trips within Revelstoke and trips to and from external communities. Approximately 25% of the trips in Revelstoke begin or end outside of Revelstoke via the various highways, with Highway 1 being the main external connection. **Figure 3.17** provides the average number of daily Highway 1 trips by month and direction.

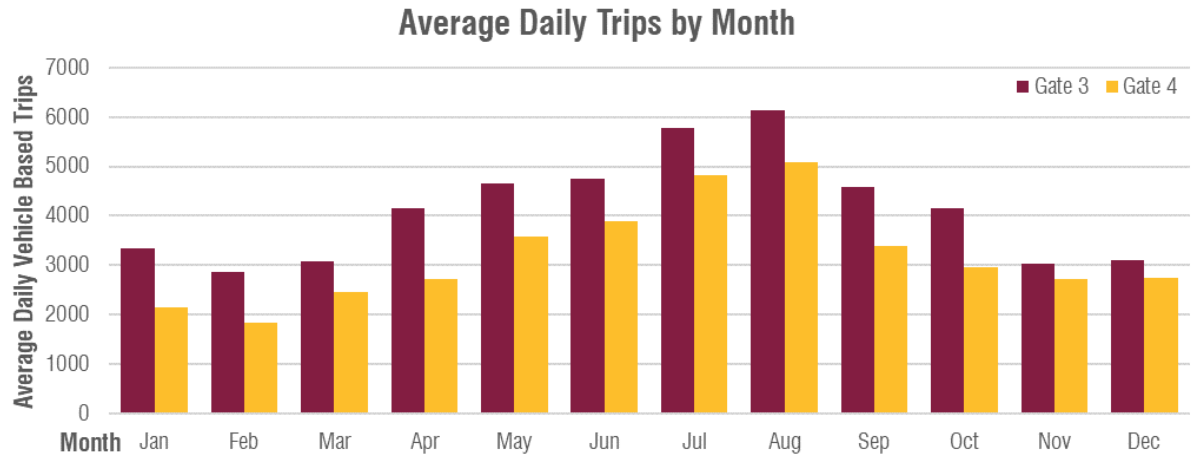


Figure 3.17: Average Daily Trips by Month - Highway 1 Gates

Evaluating the trips within or through the area via Highway 1, a similar, but more extreme, pattern is observed with trips being highest in the summer, especially July and August. Trips during the winter months are approximately half the number of trips during the summer peak.

To better understand travel patterns within Revelstoke, the average daily vehicle trips were calculated for the three types of trips:

9. Gate to Gate trips (**Figure 3.18**) – Trips that pass-through Revelstoke, but do not stop,
10. Gate to Zone trips (**Figure 3.19**) – Trips between a location within Revelstoke and one outside of Revelstoke (bi-directional), and
11. Zone to Zone trips (**Figure 3.20**) – Trips between two locations within Revelstoke.

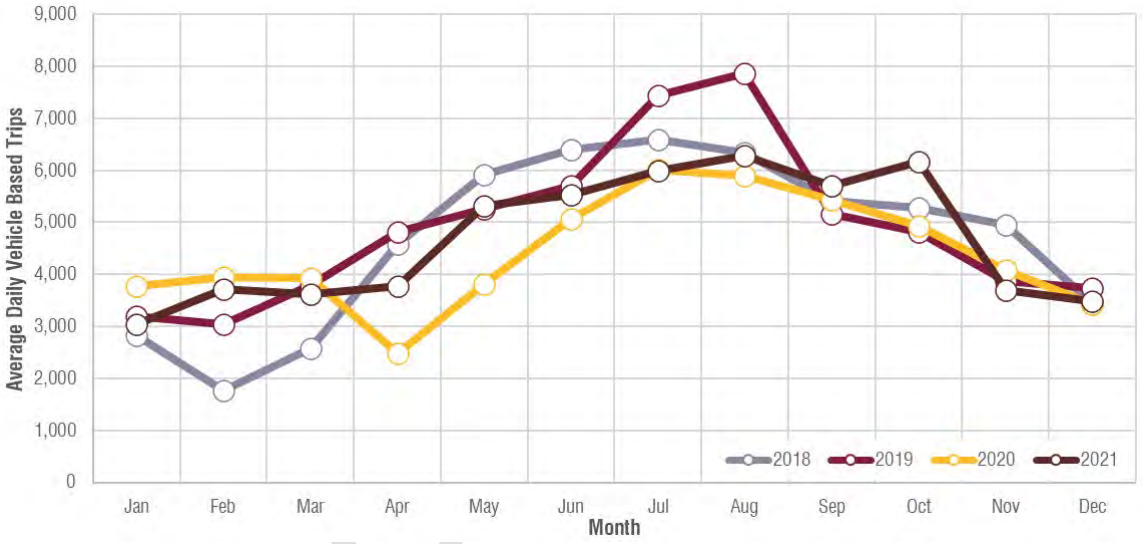


Figure 3.18: Average Daily Vehicle Trips by Month – Pass Through Trips

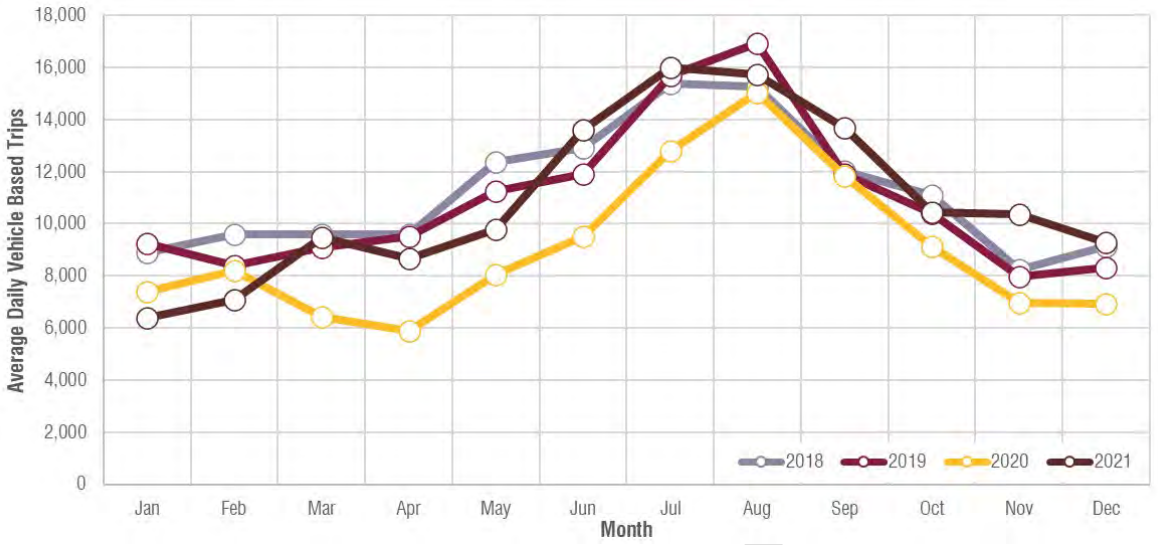


Figure 3.19: Average Daily Vehicle Trips by Month – Highway Gate to/from Revelstoke Zones

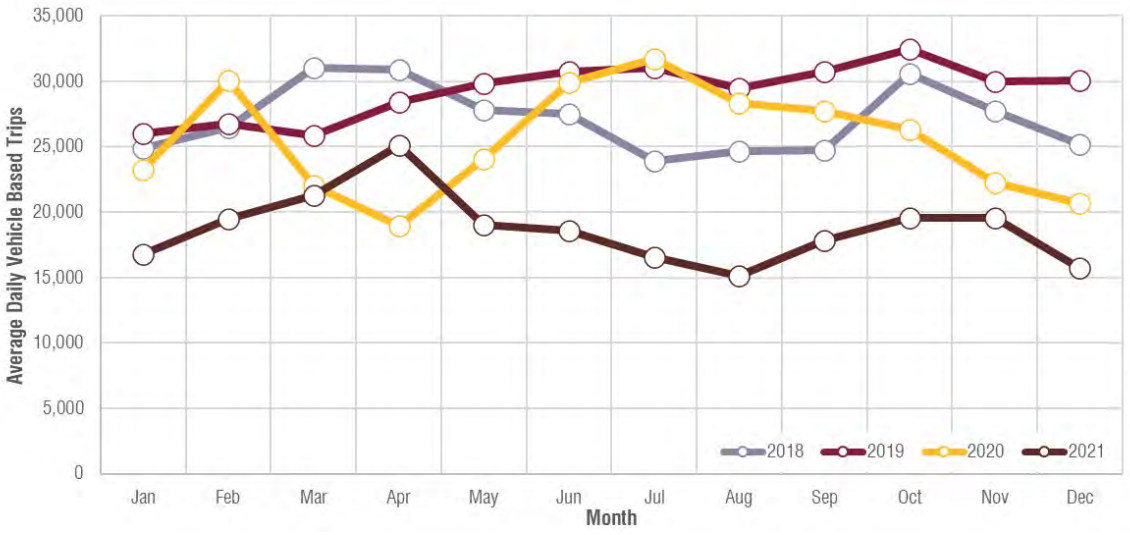


Figure 3.20: Average Daily Vehicle Trips by Month - Revelstoke Zones Only

The above figures show two that the Highway traffic is very seasonal with a significantly higher number of trips in the summer and that the trips internal to Revelstoke vary only a small amount throughout the year. The increase in trip between the Highways and Revelstoke destinations are a combination of visitors arriving in or departing from Revelstoke and those only stopping for services (gas, food, etc). As for the internal Revelstoke trips, there are some underlying travel patterns that should be considered when looking at the monthly vehicle trip data.

- An increase in visitors during the summer months, and to a less extent during ski season at the RMR, would be expected to increase the internal number of trips even if permanent resident travel remains unchanged. The number of

average daily trips for the RMR zone is provided in **Figure 3.21** and shows months of December through Mar and July and August as the busiest months.

- Previous data reviewed during this project would indicate a reduction in bicycle-based trips in the winter. If these bicycle trips are converted to vehicle trips during the winter months, this may mask an increase of person trips (trips made by any mode) during the summer months

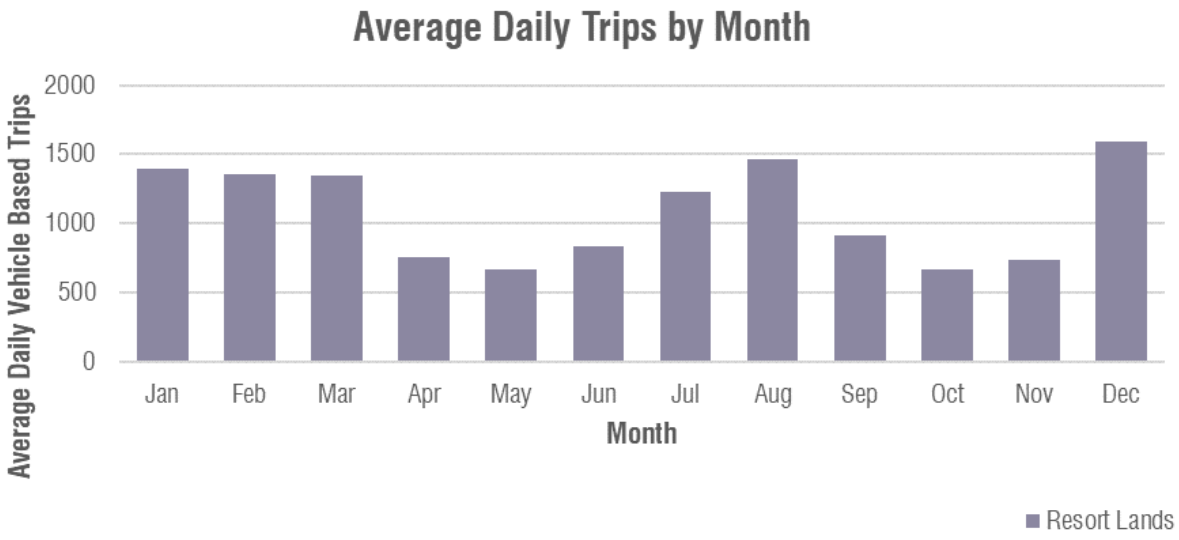


Figure 3.21: Resort Lands Average Trips by Month

StreetLight data was used to conduct origin-destination (OD) analysis and estimate the distribution of trips to / from each analysis zone. The findings were used to understand the underlying traffic patterns within the study area and inform the other analyses conducted as part of this study. A summary of the origin and destination of the trips are provided in **Table** (weekday) and **Table 3.5** (weekend) with the table for all the zones provided in **Appendix B**.

Table 3.4: Pre-COVID Weekday Origin/ Destination Percentage

Superzone\ Destination Origin	Arrow Heights	Big Eddy	Central	Eastern Highway	Northside	Southside
Arrow Heights	2%	2%	6%	0%	2%	1%
Big Eddy	1%	2%	5%	4%	4%	1%
Central	6%	6%	13%	1%	7%	4%
Eastern Highway	0%	4%	1%	0%	2%	0%
Northside	1%	4%	6%	2%	1%	1%
Southside	1%	1%	4%	0%	1%	0%

Table 3.5: Pre-COVID Weekend Origin / Destination Percentage

Superzone \ Destination Origin	Arrow Heights	Big Eddy	Central	Eastern Highway	Northside	Southside
Arrow Heights	2%	5%	1%	5%	1%	4%
Big Eddy	5%	0%	0%	1%	0%	2%
Central	2%	0%	2%	5%	1%	2%
Eastern Highway	6%	2%	5%	12%	4%	7%
Northside	1%	0%	1%	4%	0%	1%
Southside	4%	2%	2%	6%	1%	1%

The total number of trips originating from/destined to each zone was extracted for each zone and examined. The traffic profile (expressed as a percentage of the daily origin / destination traffic) for the Central Business analysis zone is shown in **Figure 3.22** with profiles for all zones provide in Appendix B. The majority of zones within Revelstoke showed a similar pattern with a peak hour near the middle of the day. The Central Business Zone does appear to have "typical" peak hours with a spike of arrivals at the start of the business day (7:00-9:00) and a spike of departures at the end (16:00 to 17:00). However, the total volume during the mid day (12:00 to 13:00) is approximately equal to or greater than the total trips of either the morning or afternoon peak. For this reason, the analysis time of the noon peak hour was used across the City.

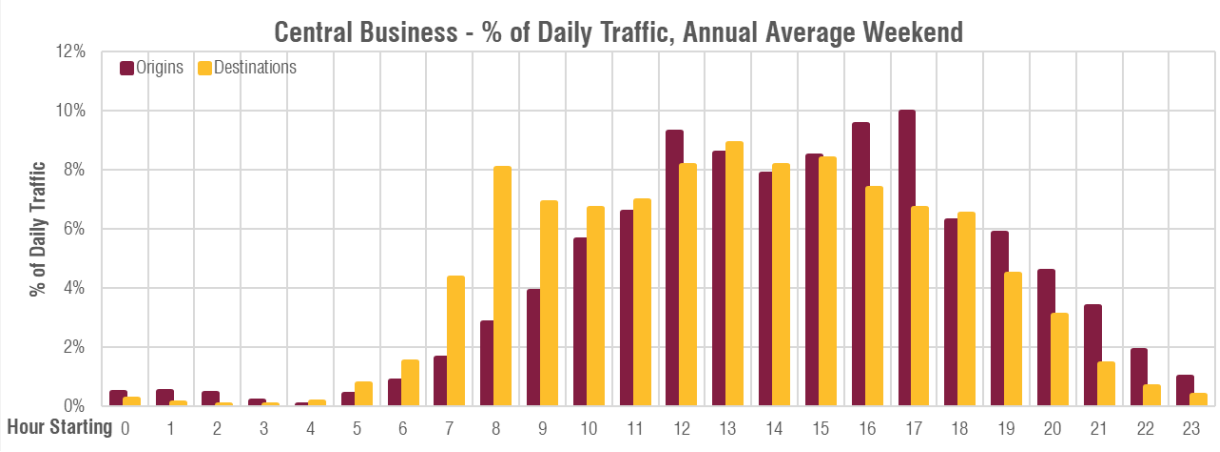


Figure 3.22: Central Business Zone Pre-COVID Weekday Daily Trips – Percentage of all trips

One zone where the noon peak was not one of the busier peak hours was the Upper Arrows zone. This primarily residential zone showed a more typical volume distribution throughout the day as shown in **Figure 3.23**. This travel pattern was noted as the distribution is expected to impact the Fourth Street (4th St) corridor. The estimated volumes and their impact are further discussed in the next section.

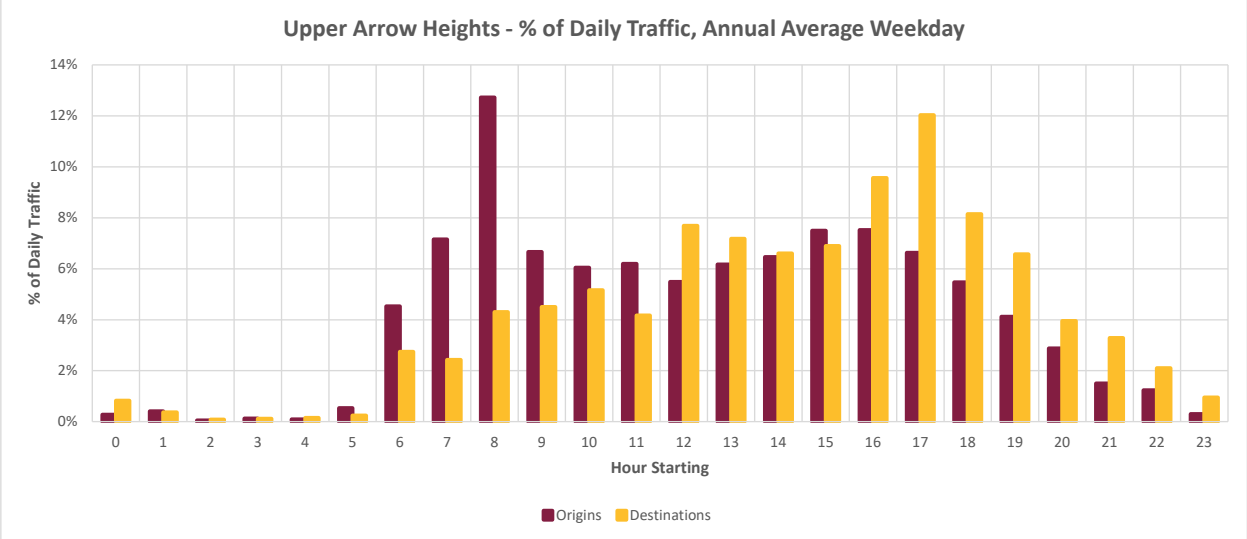


Figure 3.23: Upper Arrows Zone Weekday Daily Trips - Percentage of all trips

Based on the travel patterns observed in the LBS data, peak hours of 12:00 to 13:00 for both the weekday and weekend period were selected with morning and afternoon peak periods included for the Upper Arrows and Fourth Street (4th St) areas.

3.6.3 ROADWAY VOLUMES

The traffic volumes available for analysis were primarily recent short counts conducted at multiple intersections. These counts provide a snapshot of traffic conditions, and an estimate of the peak hours in the study area. To confirm these findings, StreetLight data was analyzed. StreetLight Data was analyzed to assess high-level traffic volume patterns prior to the COVID-19 pandemic.

It is acknowledged that the City experiences seasonal traffic flows due to the variety of recreational activities it offers. While the volumes data shows the annual peak occurring at the end of the summer, a winter peak associated with the various skiing activities is also expected to occur. The Revelstoke population numbers also fluctuate throughout the year with tourists and the shadow population. Despite this fluctuation of population between peak seasons and from year to year, travel characteristics and patterns are expected to remain relatively consistent as the origins and destinations remain the same.

While most of the network consists of a grid network with multiple or parallel routes, several locations were identified as checkpoints within the network. These are:

1. Townley Street at CPR Overpass
2. Victoria Road at CPR Underpass
3. Big Eddy Bridge
4. Fourth Street (4th St)/Illecillewaet River Bridge

The volume at these pinch points can be estimated using the LBS data. Where possible, this data was verified with the short count data to validate the LBS data numbers and the two data sources were in general agreement about the peak hour volumes. The volumes at these four pinch points are provided in **Figure 3.24** and **Table 3.6.**

Table 3.6: Network Pinch Point Traffic Volumes

Pinch Point	Direction	Weekday			Weekend
		AM Peak (8:00 - 9:00)	Midday Peak (12:00 - 13:00)	PM Peak (16:00 – 17:00)	Midday Peak (12:00 – 13:00)
River	NB	356	933	525	1,014
	SB	433	830	599	968
Victoria	NB	373	618	528	533
	SB	305	442	442	593
Townley	NB	69	161	204	265
	SB	110	165	92	179
Fourth Street (4th St)	NB	403	347	357	300
	SB	253	358	551	361

As shown, the volume at these locations is in the order of 500-600 vehicles per hour or less during the peak hour, with the exception of the Highway 1 volumes through the River chokepoint. With an ideal lane capacity of 1,800 vehicles per hour, this is well within the roadway link capacity. The adjacent intersection controls, particularly signal, roundabout, or all-way stop controls, will reduce the roadway capacity, but not enough to result in capacity issues. However, it is expected that delay will occur at these pinch points and at the adjacent intersections during some peak hours. However, the cost and scale of improvements to address these periods of delay would be significant and improvements to non-vehicle modes may be a viable alternative to facilitate increased person capacity thought these pinch points.

LEGEND

Network Pinch Points

CityBoundary

0 250 500 750 1,000 metres

(At original document size of 11x17)
1:35,000

3.6.4 ACTIVE MODES TRAVEL PATTERNS

Strava is a popular activity mobile application that is used for recording recreational activities using GPS. Recordings of the route, elevation, and other telemetry is then uploaded to the application. Since its existence, over a billion data points have been uploaded to the platform providing valuable data on the route choices that pedestrians, cyclists, paddlers and skiers are making through a tool called Global Heat Map. It is important to recognize that this data does not reflect the real activity (about 5%) and it is biased toward the more athletic individual. That said, some interesting route choices and patterns regarding more popular routes can be examined. **Figure 3.25** and **Figure 3.26** show the relative cycling activity at a City-wide scale and focused in on Downtown Revelstoke, respectively. The thick white lines represent high use routes while the smaller yellow and red lines represent lower use.

Source: Strava Global Heat Map

Figure 3.25: City-Wide Cycling Use

Source: Strava Global Heat Map

Figure 3.26: Downtown Revelstoke Cycling Use

Figure 3.27 and **Figure 3.28** show the relative pedestrian activity at a City-wide scale and focused in on Downtown Revelstoke.

Source: Strava Global Heat Map

Figure 3.27: City-Wide Pedestrian Use

Source: Strava Global Heat Map

Figure 3.28: Downtown Revelstoke Pedestrian Use

Figure 3.29 shows the relative winter sport activity at a City-wide scale and focused in on Downtown Revelstoke.

Source: Strava Global Heat Map

Figure 3.29: City-Wide Winter Activity Use

Some interesting observations for both pedestrian and cycling activity:

- Third Street (3rd St), Douglas Street, Front Street, Mackenzie St are the busiest routes in downtown
- Big Eddy Bridge sees more use than Hwy 1/Columbia River bridges
- Most popular route is the multi-use path along the Illecillewaet and Columbia rivers

For winter sport activity, Columbia Park golf course, the regional river pathway, Fourth Street (4th St) and the trail network near the rivers appear to be the most popular.

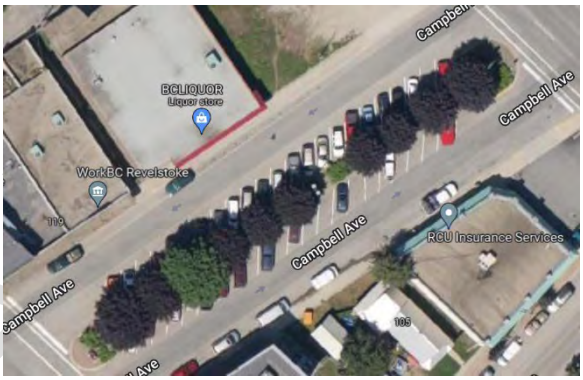
3.7 Parking Supply

3.7.1 ON-STREET PUBLIC PARKING

On-street parking is permitted throughout Revelstoke and there is more than enough parking supply to accommodate demand. Even in the busier downtown commercial areas (Campbell Ave, Mackenzie Ave, First Street (1st St), where some daytime time restrictions are in place (e.g., 1 hour), when parking utilization may be high, there is generally parking available within a block or two, even during the summer when some parking space is repurposed for patios. The highest concentration of on-street parking is along Campbell Avenue where the large right-of-way allows space for diagonal parking against the landscaped median. Mackenzie Avenue and First Street (1st St) are also highly utilized parking areas. Parking issues did not come up as a concern during TMP public engagement. Though a comprehensive parking study backed with parking supply and time of day parking utilization would provide more information to develop recommendations, a review of time restrictions, wayfinding, and visitor information could be examined in the near-term to improve public parking.

Image 3.1 shows the block of Campbell Avenue between Victoria Ave and 1st Street. Although parallel parking is permitted (1 hour time restriction), the diagonal parking along the median provides most of the parking supply and is permitted for 24 hours. This median diagonal parking configuration extends south to Fourth Street (4th St).

Image 3.2 is a street view of 1st Street showing parallel parking on both sides of the street. There are some time restrictions in place (1 & 2 hour), loading zones, and temporary patios utilizing some spaces. Parking is busiest between Boyle Street and Orton Street.



Source: Google Maps (Aerial)

Image 3.1: Campbell Avenue On-Street Parking

Source: Google Maps (Street View)

Image 3.2: 1st Street On-Street Parking

Source: Google Maps (Street View)

Image 3.3: Mackenzie Avenue On-Street Parking

Image 3.3 is a street view of Mackenzie Avenue, another popular street with well utilized parallel parking. There is no parking on the one-way block between Victoria Ave and 1st Street (Grizzly Plaza), but parking is permitted south of 1st Street The blocks between 1st Street and 3rd Street are the most utilized for parking and have a 2-hour time limit restriction.

3.7.2 OFF-STREET PUBLIC PARKING

Free off-street public parking (24 hour) is available at several locations in the downtown area and is shown as purple in the **Figure 3.33** from the 2018 Downtown Parking Strategy.

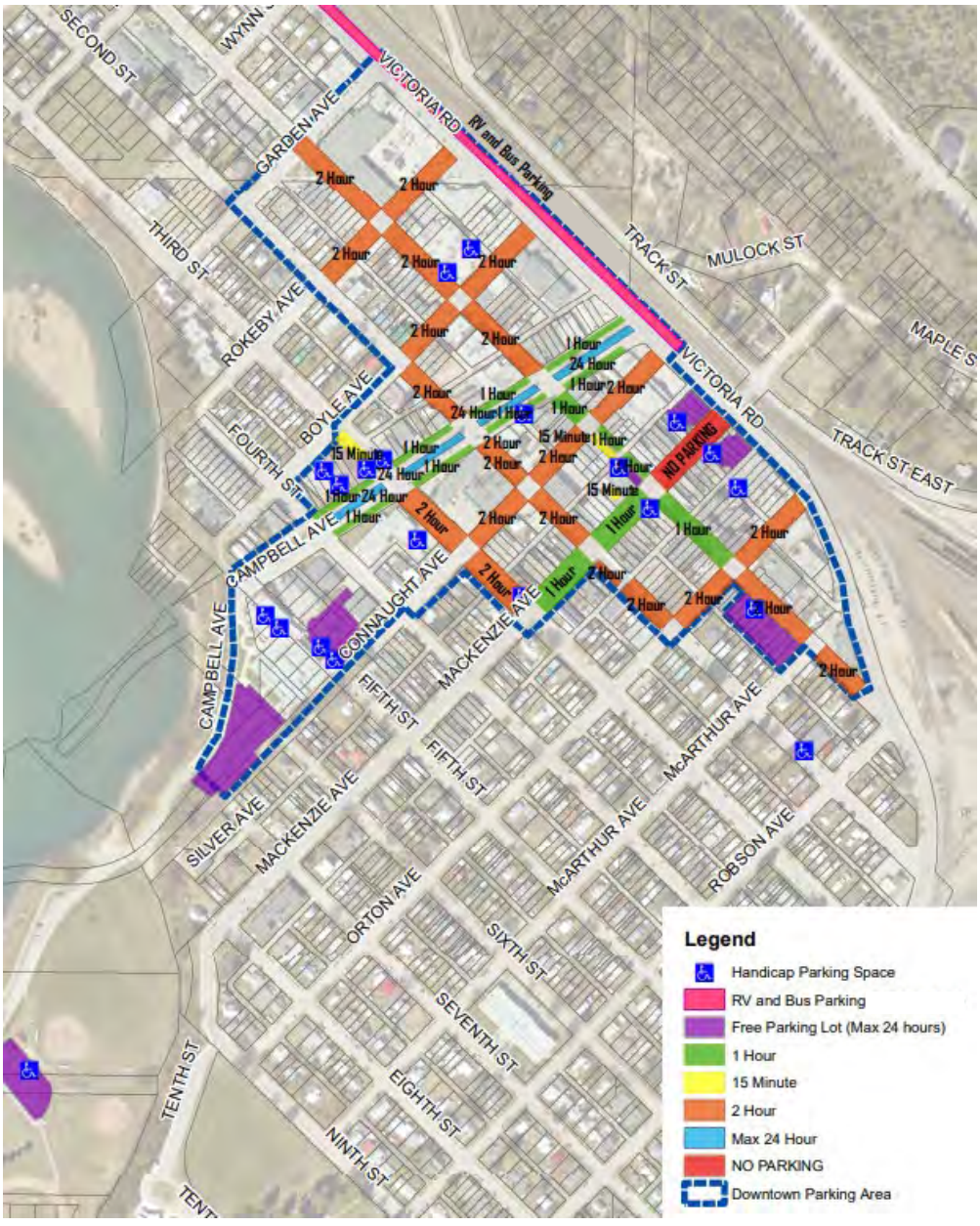


Figure 3.30: 2018 Downtown Parking Strategy

3.8 Safety Concerns

The City's existing road network can be assessed through both nominal and substantive safety approaches. Observation of existing geometry, traffic signs and signals, and other roadside features helps to identify the baseline conditions experienced by users. These road characteristics can be compared with various standards, guidelines, and design domains for suitability. Gaps between the existing road infrastructure and design standards or other issues of non-compliance enable the identification of potential road safety issues from a nominal safety approach. On the other hand, analysis of historical collision data and other surrogate safety data sources, such as near-miss data or operating speeds, enable the identification of potential road safety issues from a substantive safety approach. Both approaches may be useful in assessing the existing network and planning for improvements.

Road safety concerns for the City road network were identified using a combination of nominal and substantive safety approaches, using the following items as inputs:

- Site visits for the purpose of observing road user behaviour and identifying potential safety concerns. This exercise was performed by a core site visit team on June 13, 2022. Observations were documented with photos and videos.
- High-level review of collision data provided by the City. Collision data was analyzed for temporal, geospatial, environmental, and other trends at the network level.

The safety review did not include site-specific review of historical collision data. No data was made available for the analysis of operational speeds or near-misses.

Assessment of the City network yielded the following safety concerns:

- Many of the major arterials in the City feature winding horizontal alignments as a result of the topography and early road construction in the area. This results in skewed intersections with newer development, such as north-south grid systems or the offset southwest-northeast grid of central Revelstoke. Intersection skew presents sightline challenges particularly for turning traffic or for permissive or uncontrolled movements; these sightline challenges increase the risk of Left Turn Across Path and Right Angle collisions.
- Pedestrian exposure at intersections is high as a result of long crossing distances at multiple intersections across the network. This exposure increases the risk of vehicle-pedestrian collisions, while also impacting pedestrian comfort. There are some road safety countermeasures that target this issue, including reducing the crossing distance by use of curb bulb-outs or implementation of a Leading Pedestrian Interval (LPI) to increase pedestrian conspicuity, however these countermeasures are not commonplace across the network.
- Pedestrian risk is also high at locations where there is no crossing infrastructure. In locations where there is no crossing infrastructure, yet demand is high, pedestrian-vehicle collision risk is elevated as a result of non-compliant crossings and violation of driver expectancy. In some cases, vehicle-pedestrian collision risk may not be fully captured in collision data as a result of latent demand or selection of alternative routes.
- An incomplete bicycle facility network and a lack of protected bicycle facilities that cater to all ages and abilities translates to elevated risk of collisions involving cyclists.
- While excessive speed was not necessarily identified as a key issue, it is important to recognize that speed is a contributing factor to the severity of any collision. Misalignment between the types of road users present on a road,

the road characteristics, and the posted speed limit can result in high-speed differentials, which is correlated to collision risk, as well as elevated risk of fatality in the case that a collision occurs.

- Some instances of unprotected critical side slopes were noted on arterials within the city boundaries, including on the east side of Big Bend Highway, however these were observed on Provincially owned and maintained routes.

3.9 Accessibility Assessment & Integration

The accessibility assessment consisted of two phases, a desktop exercise, and an in-field review. The desktop review included the following:

- Determine locations where site visits should be conducted,
- Review of the City's Transit information,
- Review BC Transit's website to assess the ease of finding relevant accessible transportation information.

The in-field review included a cross-section of major land uses within the City that attract a broad range of residents and visitors, such as:

- Major Commercial Sites
- Long-Term Care Facilities
- General Medical Facilities
- Schools
- Parks
- Recreation Facilities

3.9.1 TRANSIT ACCESSIBILITY

In addition, the in-field review assessed the transit system, specifically buses, transit stops, and the connectivity of transit routes; major roadway crossings and bridges. **Image 3.4**, **Image 3.5**, and **Image 3.6** show examples of some locations with limited accessibility accommodation. Accessibility challenges can manifest in a broad range of both physical and mental barriers that are best understood from the user perspective. The assessments utilized visual inspections, walking, and using a scooter to traverse the locations. Narrower pathways were measured to verify the built width meets all standards set out by the City of Revelstoke and the province of British Columbia.

Currently, the transit system includes four routes and has decent coverage of the City – including strategically placed stops at high-use areas – and reducing the necessary distance to walk to the closest bus stop. Due to only having four routes, there is a likelihood that transfers between buses will be necessary. The transit system also offers the *handyDART*, an accessible, door-to-door transit system for people with disabilities. It is free to register to use this service. Registered users and CNIB pass holders may travel with an attendant.

The standard-route buses are low-floor models with fold-out ramps. Additionally, the seats on the front row fold up to provide additional space. Furthermore, the buses include securements for wheeled mobility devices that the drivers are trained to help properly attach.

An online review for trip planning only indicates the twelve Timing Point transit stops existing between the four routes. Once on site, a number of additional transit stops were identified but required being physically at the stop. This can present challenges to plan a trip know where to start a bus trip or where the drop-off location is in relation to one's destination.

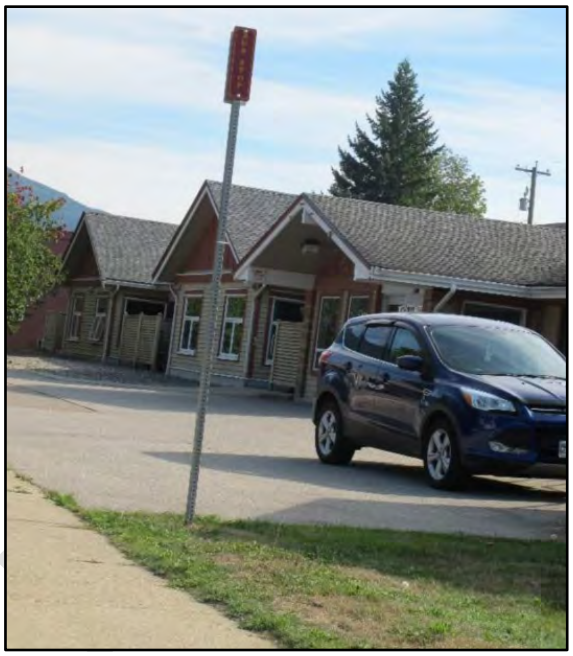


Image 3.4: Transit Stop with no Accessible Space or Amenities

Image 3.5: Transit Shelter without Space for those with Accessibility Needs

Only a limited number of observed bus stops included seating and even fewer provided covered areas to protect from the weather. Additionally, some covered stops only had space for the bench with no available space for those with wheeled mobility devices to get under the cover. The majority of observed stops consisted only of a physical sign along the road with no seating provided. Often, no sidewalks or hardscape area was present to wait on (that was not on the road). In addition, three different types of signs were noted as being used to designate transit stops, consisting of:

- Blue and white vertical signage
- Burgundy and yellow vertical signage
- Blue and white signage with bus route numbers

The inconsistency of signage design paired with the lack of stop location data publicly available can cause difficulties for finding bus stops. Additionally, the two vertical signs were not much wider than the posts they were mounted on. The narrow signage was noted as being easy to miss and would blend into the surroundings, particularly for the burgundy and yellow signs.

Image 3.6: Transit Stop with Bench and no Accessible Space

3.9.2 PEDESTRIAN ACCESSIBILITY

The existence of sidewalks varies across the City, with higher-traffic areas such as Downtown, major roadways and near significant commercial areas having sidewalks on both sides of the street, secondary roadways and some residential streets having sidewalks on one side of the street, and some roads with no sidewalks. The majority of sidewalks observed in the City included curb cuts at intersections, and had perpendicular markings in the concrete that allowed for cane-detectable notification of a road; however, the lack of sidewalks in some areas was not viewed necessarily as a negative feature. On quieter residential roads, as shown on **Image 3.7**, it creates a community benefit of equal access and right-of-use for all modes of transportation. Challenges may arise when the roads are feeder roads or are busier with vehicular traffic, making it uncomfortable for the other modes of transportation and particularly for people with mobility challenges. Many roads observed south of the Illecillewaet River experience this challenge.

Image 3.7: Local Road Without Pedestrian Infrastructure

Where sidewalks end, as shown on **Image 3.8**, it was observed that they often end approximately 1.5 – 3 m past a corner. There was rarely warning ahead of time to allow for people to take the ramp to a new sidewalk. Adding to the potential challenge is that the sidewalk is too narrow to easily turn around on a wheeled mobility device. The most problematic example of this was seen on Airport Way, south of Nelson Crescent. There is a separate pathway adjacent to the road; however, following the bend in the road, the sidewalk ends with no advance signage or markings. The pathway then directs users into the oncoming traffic lane/ shoulder, creating an unsafe condition for persons with accessibility needs.

Image 3.8: Discontinued Sidewalk at Intersection Corner

From a maintenance perspective, spot reviews of the City's pathway network indicate many are well maintained and smooth to navigate over; however, while the sidewalks are navigable, there are indications that some chipping is beginning to occur with vegetation growing in the cracks, potentially causing issues for persons with accessibility needs if not properly maintained. **Image 3.9** shows a wide sidewalk width which is well-maintained and without barriers, ideal for those with reduced mobility.

Image 3.9: Street with Good Sidewalk Width

3.9.3 ACCESS TO EXISTING FACILITIES WITHIN THE CITY

Medical facilities and newer schools have dedicated drop-off areas and access to the areas via multiple modes of transportation. The ability to always be close to the main doors for pick-up or drop-off was reported as a challenge for locations that do not have dedicated areas.

Most parks appear to have no or limited access for those with mobility needs. Parking lots are noted as rare with these amenities, and if provided were often gravel which can be difficult to navigate from an accessibility perspective. Entering these sites involved traversing grass, grave and tree roots as no dedicated paths were created apart from Kovach Park and Centennial Park.

Accessible parking stalls were identified throughout the City, including one on-street stall near City Hall and the main downtown commercial district. With the exception of this one on-street stall, accessible stalls included either a vertical sign or a painted sign on the ground, but not both. This can create challenges in identifying allocated parking spaces under poor weather conditions or if winter weather covers painted signs. It is also noted that the sign for the accessible parking at the Hospital used antiquated terminology ("Handicap").

3.9.4 SIGNAGE AND WAYFINDING

The City offers a robust street sign network, making for easier identification of where one is located in the City. The current burgundy and yellow street signs (shown below) are difficult to identify as they blend into their surroundings. Additionally,

the colours are not highly contrasted, and the use of a serif font can be challenging to read, especially for those with vision challenges. This becomes amplified on older signs that have started to fade or have not been maintained adequately. White lettering on black background as proposed in Revelstoke's Signage and Wayfinding Program shown in **Image 3.10** would provide better legibility.

Image 3.10: Example of street sign modification as proposed in Revelstoke's Signage and Wayfinding Program

Additional wayfinding signage is proposed in Program document (approved in February 2020) including the samples shown in **Figure 3.31**and **Figure 3.32** for parking wayfinding, and pedestrian or cycling wayfinding.

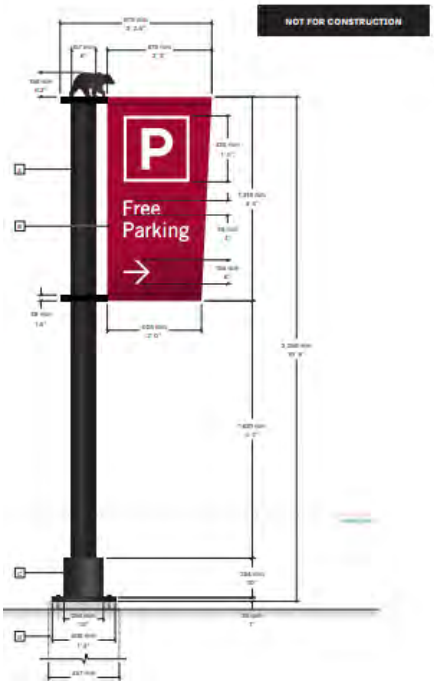


Figure 3.32: Example 1 of wayfinding sign modification as proposed in Revelstoke's Signage and Wayfinding Program

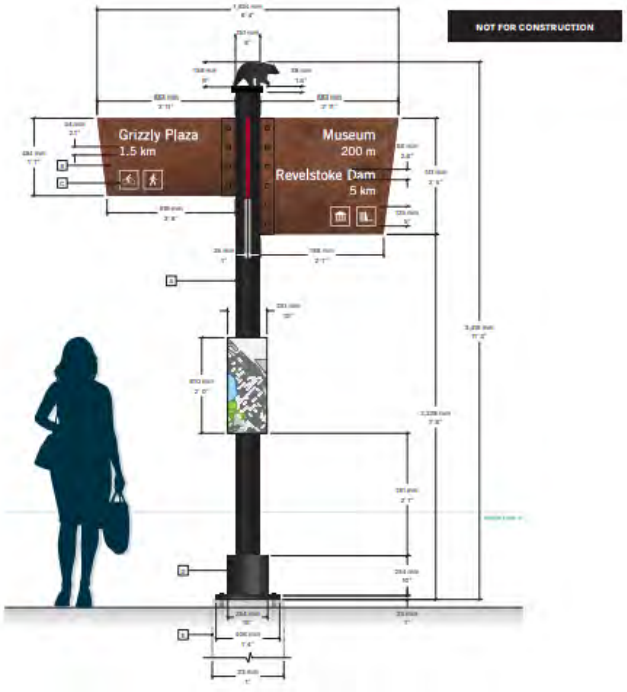


Figure 3.31: Example 2 of wayfinding sign modification as proposed in Revelstoke's Signage and Wayfinding Program

3.9.5 ACCESSIBILITY INTEGRATION

Enhancing accessibility for the City by addressing these existing gaps can become an opportunity to achieve the City's vision and goals, specifically the development of safe transportation systems and a focus on multi-modal transportation. The overall connectivity of pedestrian and walking routes should be improved to ensure consistent accessibility throughout one's journey in Revelstoke. Not knowing if a sidewalk will suddenly end or if one can safely navigate to a bus stop can create anxiety for a traveler and result in a reluctance to enjoy the amenities that the City has to offer. Building a well-integrated transportation network for the City requires addressing the gaps for all user types including those with mobility needs.

3.10 What We Heard

To gain insight into the existing conditions experienced by users of the City's transportation network, we engaged the community using the City's Talk Revelstoke online platform. Through this process, we gathered feedback about priorities overall, and those focusing on transportation modes, cycling, roadways, transit, sidewalk or roadside pathways, and specific locations. A summary of what was heard has been provided in Section A.3.1 Phase 2 Existing Conditions Assessment – Engagement Round 1.

3.10.1 KEY THEMES

Throughout all forms of engagement, two key themes were identified.

Need for traffic management along Fourth Street (4th St)–Airport Way

This area was described as high-use route to access the Revelstoke Mountain Resort; key issues were:

- Flow of movement (bottle-necking issues)
- Bridge capacity
- Pedestrian and cyclist safety
- Emergency access to/ from the hospital
- Speeding through residential areas
- Concern over the existing route's ability to accommodate traffic from new development

Desire for a more comprehensive network of safe, comfortable cycling routes on and off-roadways

Revelstoke is a very proud cycling community with cyclist of all ages and ability levels using the roadways, sidewalks, paths, and trails for both commuting and recreational biking. Enhancing the cycling network in the City was identified as a priority by respondents to increase safety, comfort, convenience, reduce traffic congestion, and curb emissions. Specific issues identified were:

- Should accommodate year-round use
- Avoid sharing lanes with traffic over the bridges
- Special attention given to routes to/ from the ski hill
- Land acquisition may be needed to preserve informal trail locations

3.10.2 PRIORITIES

The Bridge

When asked what the "most important concern that needed to be addressed in the TMP" was, the top concern identified was "the bridge". While it was not clear which specific bridge was being referred to based on the comments received, it was apparent that the concerns were related to a desire to have additional accesses over the rivers, and the capacity of the bridges, particularly the Fourth Street (4th Street) Bridge, were seen to be causing bottlenecks for traffic. Specific issues brought up regarding the bridge were access, capacity, and safety; as shown in **Figure 3.33**

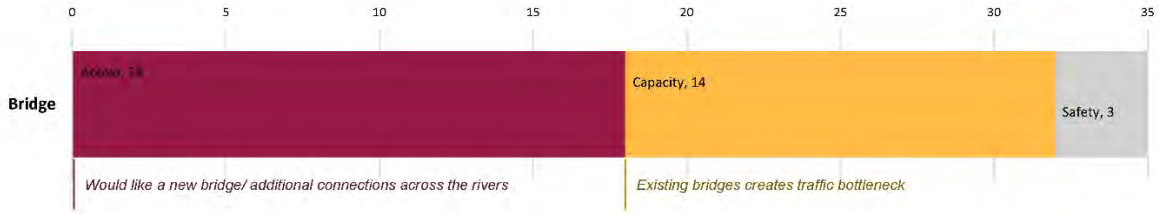


Figure 3.33: What We Heard - Bridge concerns

Priority Concerns by Mode of Transportation

When asked to consider modes of transportation, the top three priority modes were: cycling, driving, walking/ jogging/ strolling/ rolling on sidewalks or roadway pathways. Each of these modes is further detailed in the bullet points below, with more detailed information provided in Section A.3.1 Phase 2 Existing Conditions Assessment – Engagement Round 1.

- Cycling
  - Connectivity to preferred destinations,
  - Gaps in the cycling network (see **Figure 3.34**), and
  - Safety issues.
- Driving
  - Roadway maintenance,
  - Intersection issues, and
  - Traffic management.
- Specific roadways identified as problematic during the engagement were:
  - Fourth Street (4th St), Illecillewaet Bridge, Arrow Heights, Big Eddy Bridge, and the Revelstoke Mountain Resort.
- Walking/ jogging/ strolling/ rolling on sidewalks or roadside pathways
  - Connectivity to preferred destinations,

- Gaps in the sidewalk or roadside path network, and
- All-season use.

- Transit
  - While not identified as a priority area for respondents, the top transit priorities were:
    - Location of routes,
    - Transit schedules, and
    - Stop locations.

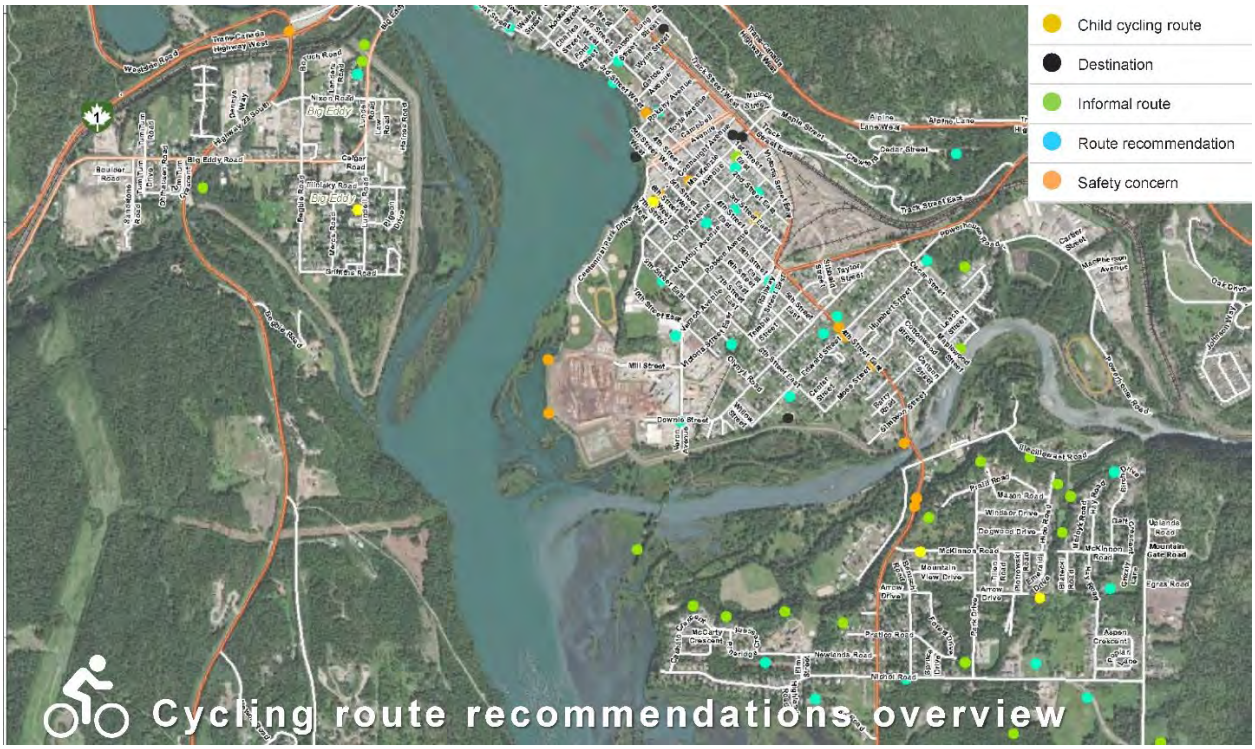


Figure 3.34: What We Heard - Cycling route recommendations overview

4 FUTURE TRANSPORTATION NETWORK CONDITIONS

The future transportation network is a reflection of matching the mobility needs of both the future land use strategy, anticipated densification and needs of the community. It is intended to achieve a balanced network that incorporates the multi-modal needs of the City, while also exercising financial stewardship for the City. In an urban environment that is also subject to seasonal flow patterns, this can also require momentary periods of congestion for the vehicular network as users adapt to the changing conditions, and potentially consider alternatives such as transit, walking, micro-mobility, and cycling.

4.1 Multimodal Integration

4.1.1 COMPLETE STREET CROSS-SECTIONS

4.1.1.1 Principles

Complete Streets is more of a concept or approach than a physical thing. It is a relatively new (15-20 years old) approach (in North America) to designing a new street or retrofitting an old street. It is a shift away from street design that focuses primarily on the movement of vehicles to the safe movement of people regardless of how they are travelling. The most comment principles of complete streets include:

- Consideration of all users (pedestrians, cyclists, transit, vehicles) even if a street cannot accommodate all of these (e.g., limited road or right-of-way width)
- Incorporating dedicated bicycle facilities on busier or higher-speed streets
- Designing for accessibility needs (e.g., wheelchair users, vision-impaired)
- Incorporating street trees (e.g., better pedestrian experience, creates a traffic calming effect, and helps combat climate change)
- Geometric design that is safe, particularly for vulnerable users (e.g., small corner radius, shorter pedestrian crossing widths, narrow vehicle travel lanes)

ACTION 4-1: Adopt these 5 complete street principles in the planning, design, construction, retrofitting, and maintenance of Revelstoke's road network.

4.1.1.2 Updating Revelstoke's Road Classification

Revelstoke's current street classifications do very little to safely accommodate cyclists and many streets are missing pedestrian facilities. Additionally, the posted speed is 50 km/hr on most roadways within the City and is a speed requiring a higher level of separation or protection from traffic lanes. From anecdotal evidence and observations, however, actual travel speeds are not very high, rarely exceeding 40 km/hr on the local roads. By adjusting the posted speed on local and collector roads, it is easier to incorporate new pedestrian and bicycle accommodation onto these streets without the need for significant separation.

Table 4.1 summarizes the current street classification parameters and the recommended posted speed, pedestrian, and bicycle facilities suitable for those street classifications.

Table 4.1: Recommended Changes to Revelstoke's Road Classification Elements

Classification	ROW Width	Pavement Width	Posted Speed		Recommended Accommodation	
			Existing	Recommended	Pedestrian	Bicycle
Highway*	60m	10-22m	60-100 km/hr	60-80 km/hr	None, except on bridge	None, except on bridge
Arterial	18-24m	11-14m	50 km/hr	50 km/hr	2.0m separate sidewalk or 3.0m MUP	2.0m Protected bike lane or 3.0m MUP
Collector	18-24m	14m	50 km/hr	40 km/hr	2.0m sidewalk	1.5-2.0m bike lane
Local	20m	8.0m	50 km/hr	30 km/hr	2.0m sidewalk or on-street walkway	shared
Lane	6.0m	6.0m	none	20 km/hr	shared	shared

**For the portions of highway withing the City of Revelstoke. Noted that these are outside of the City's jurisdiction.*

ACTION 4-2: Adopt the recommended pedestrian and bicycle accommodation design standards in Table 4.1

4.1.1.3 Example Existing & Proposed Cross-Sections

To provide guidance on how existing streets could be retrofitted to complete streets, a typical Arterial Street (Fourth Street (4th St) approaching Illecillewaet River bridge), Collector Street (3rd Street downtown), and Local Street (Ford Street) are used for the figures that follow. For each street classification, the existing cross-section and a proposed cross-section are shown for each. Note that the existing cross-sections are approximated from aerial and field investigations. They may not reflect the precise dimensions in Revelstoke's current standard detail drawings.

Arterial

For the Arterial Street (Fourth Street (4th St)) the large travel lane width and on-street parking space (which appears to be very under-utilized) in **Figure 4.1** is reclaimed for a protected bike lane with buffer space and delineator posts to protect the cyclists from the 50 km/hr traffic **Figure 4.2**.

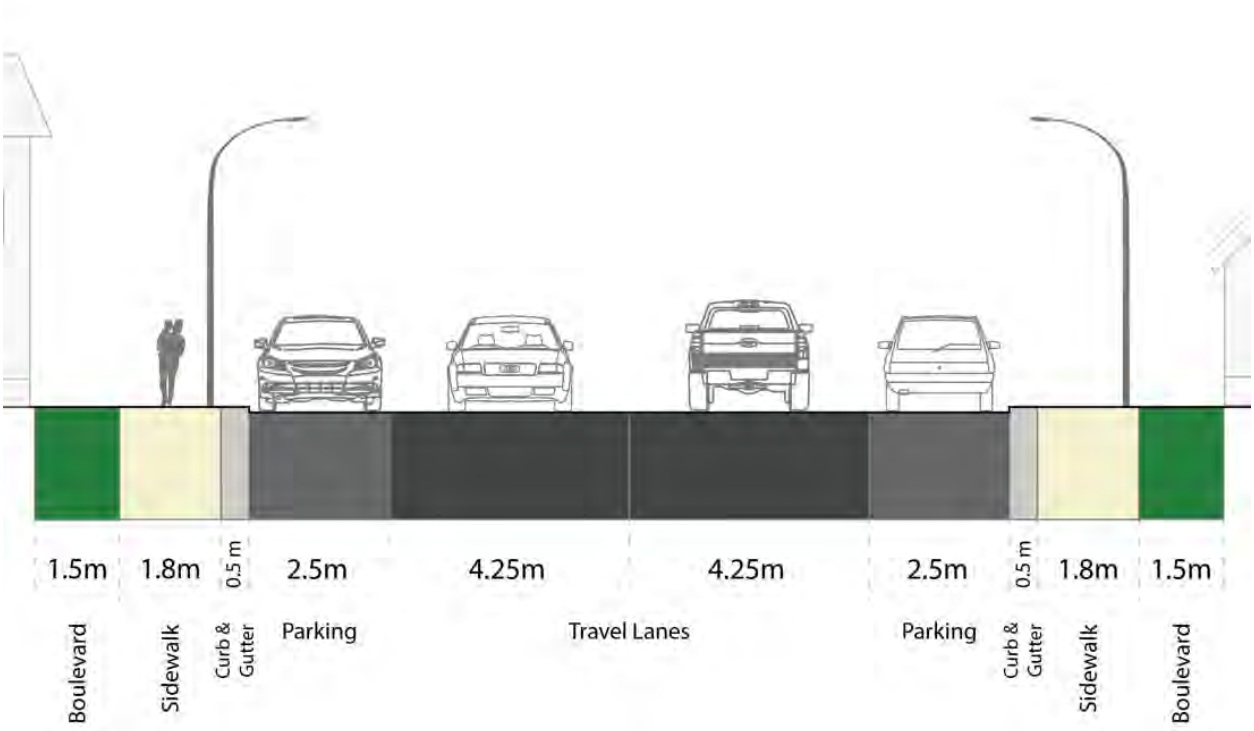


Figure 4.1: Existing Arterial Street Cross-Section

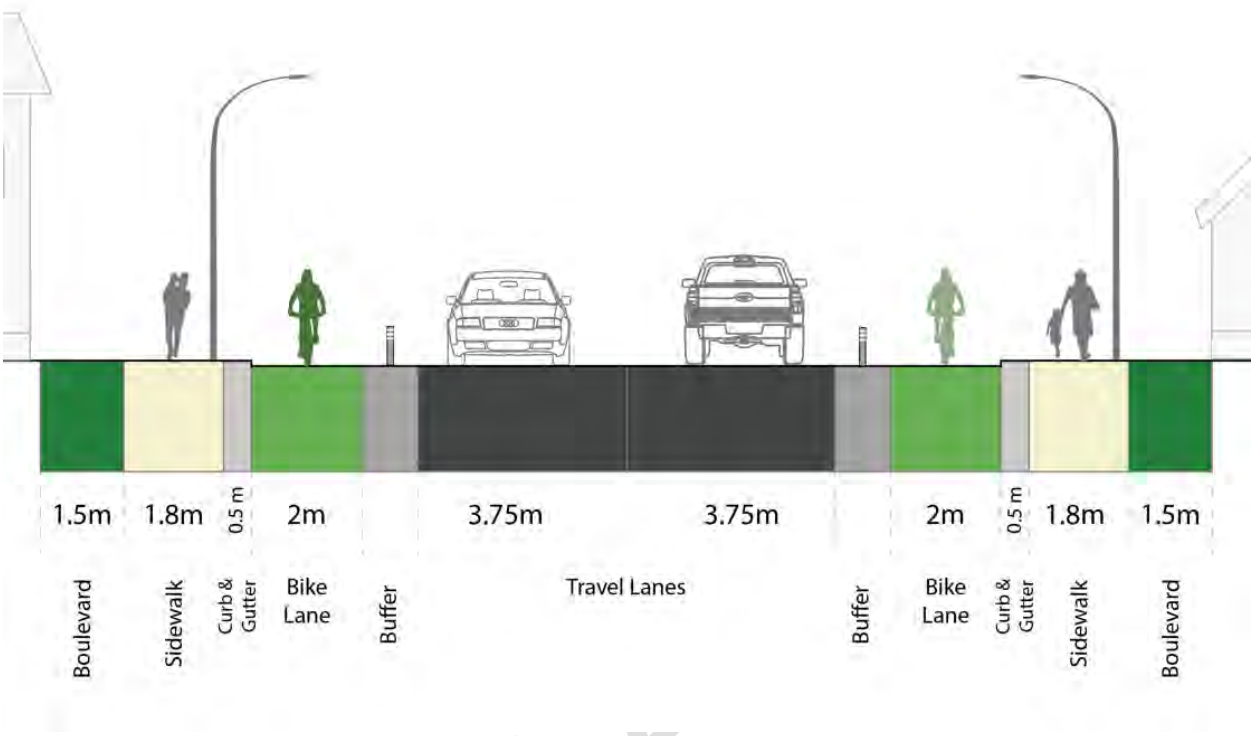


Figure 4.2: Proposed Arterial Street Cross-Section

Collector

For the Collector Street (3rd Street) the existing cross-section is similar to the Fourth Street (4th St) Arterial with the exception of the predominate residential frontage and more utilized parking as shown in **Figure 4.3**. At a 40 km/hr posted speed, the bicycle facilities do not require as much protection from traffic (bike lanes will do). Less space, therefore, needs to be repurposed. A parking lane can remain on one side of the street, but the bike lane on that side should be located between the curb and the parking lane. Otherwise, there is the issue of 'dooring' where a driver's door and a cyclist can come into contact. The proposed cross-section is shown in **Figure 4.4.**

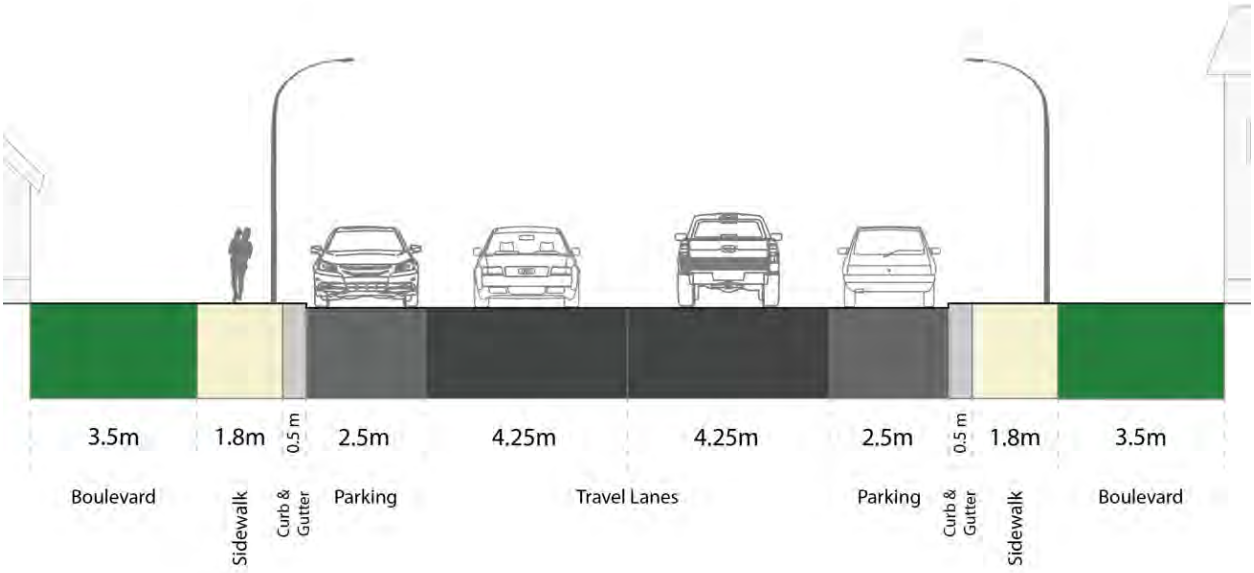


Figure 4.3: Existing Collector Street Cross-Section

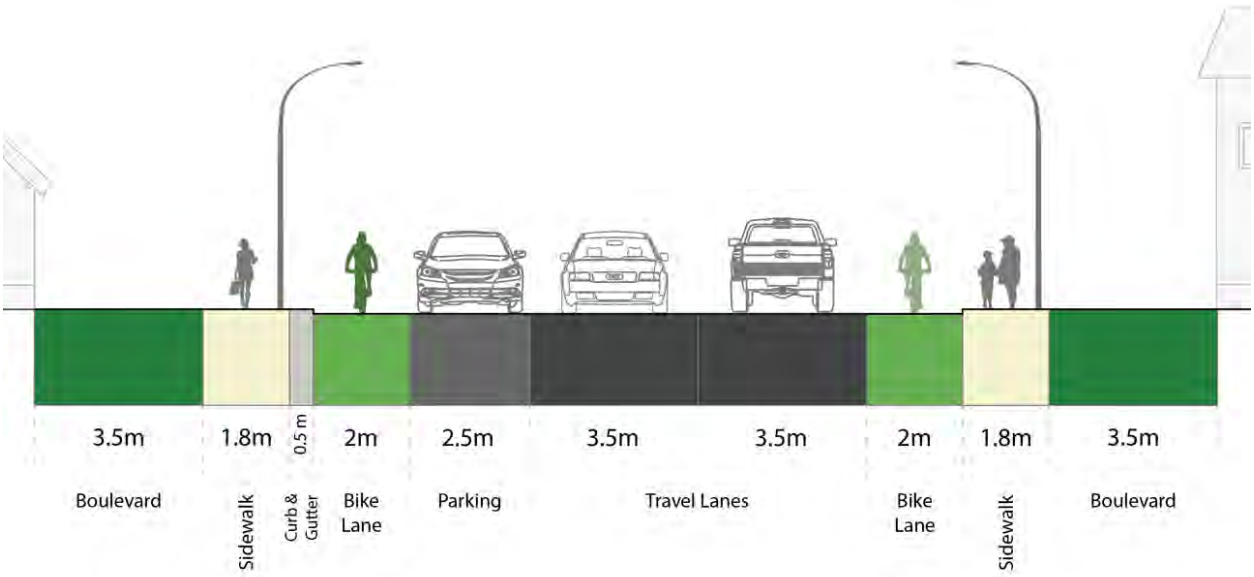


Figure 4.4: Proposed Collector Street Cross-Section

Local

Most Local Streets in Revelstoke that do not have storm drainage/sidewalks have 8 metres of pavement width as shown in **Figure 4.5**. Because posted speeds are recommended at 30 km/hr, there is not the need for separate bicycle infrastructure, but there is still a need to delineate some space specifically for pedestrians. Up to 2 metres of existing pavement space can be repurposed for this and still provide enough space for 2-way vehicle traffic. This is shown in **Figure 4.6**.

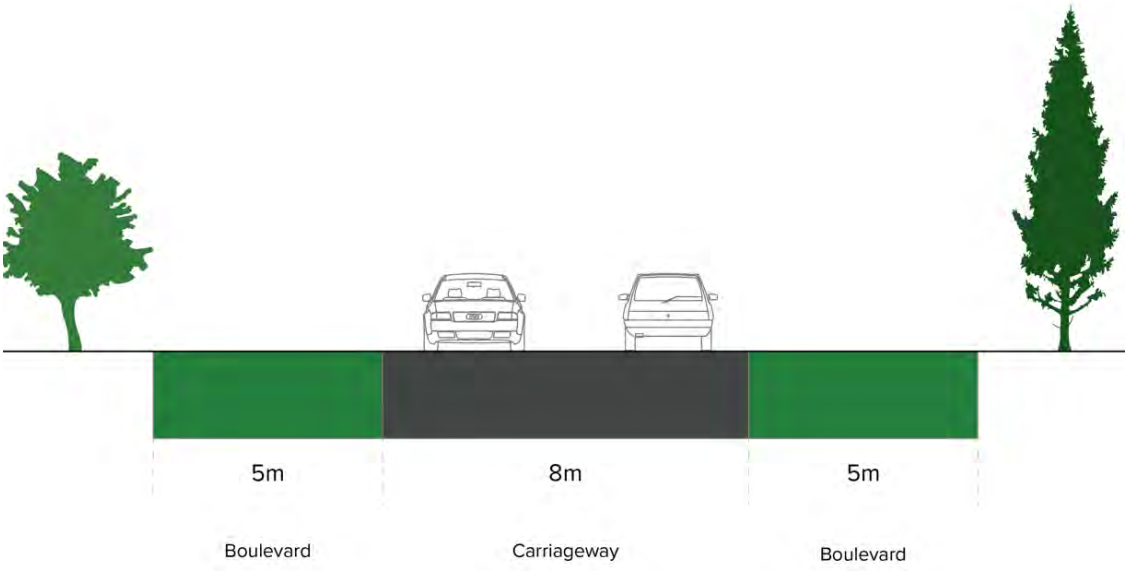


Figure 4.5: Existing Local Street Cross-Section

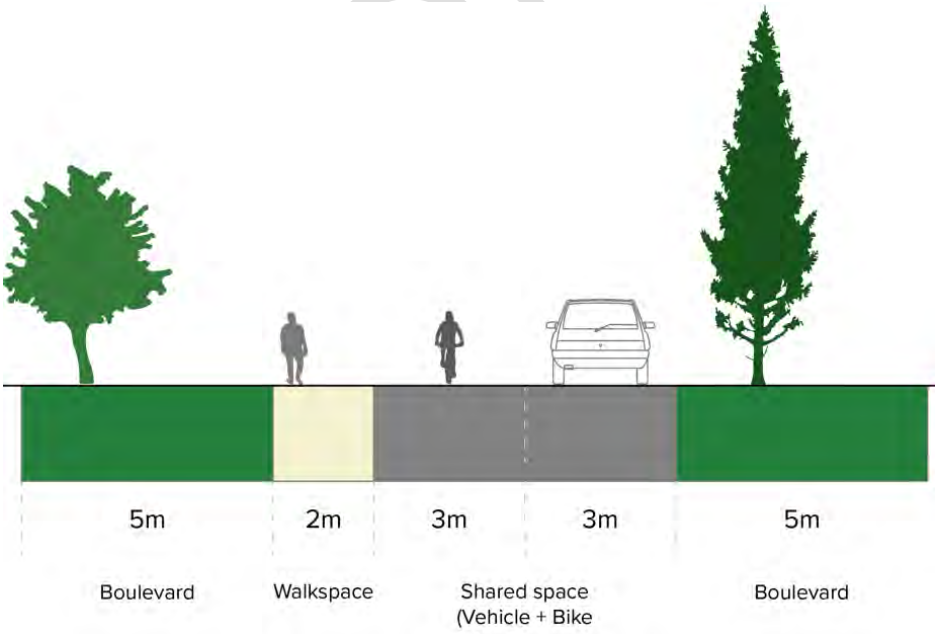


Figure 4.6: Proposed Local Street Cross-Section

4.2 Future Roadway Network

4.2.1 FUTURE COMMUNITY GROWTH

Revelstoke has set sustainability and climate change goals, visions, and targets and this is a major part of how the City will growth. As identified in the Draft OCP, a range of housing options will be provided including a shift to a higher proportion of high-density housing. The Draft OCP, past OCP, Census Canada data, and the Rennie Report were utilized to develop a population growth forecast for the purpose of vehicle trip generation.

4.2.1.1 Future Growth Areas

Information provided by the City of Revelstoke Planning Department provided a summary of planned developments in various stages of planning, ranging from under construction to very long term. This data was used to identify the growth areas within Revelstoke shown in **Figure 4.7**. The locations marked in blue represent development with residential or hotel land uses.

Figure 4.7: Future Growth Areas

The full build out of all identified growth areas would result in population numbers much greater than the forecasts provided in the Rennie Report. For this reason, the population growth areas were combined with the population forecasts to generate a reasonable scenario of development to inform the traffic analysis.

4.2.1.2 Future Population Forecast

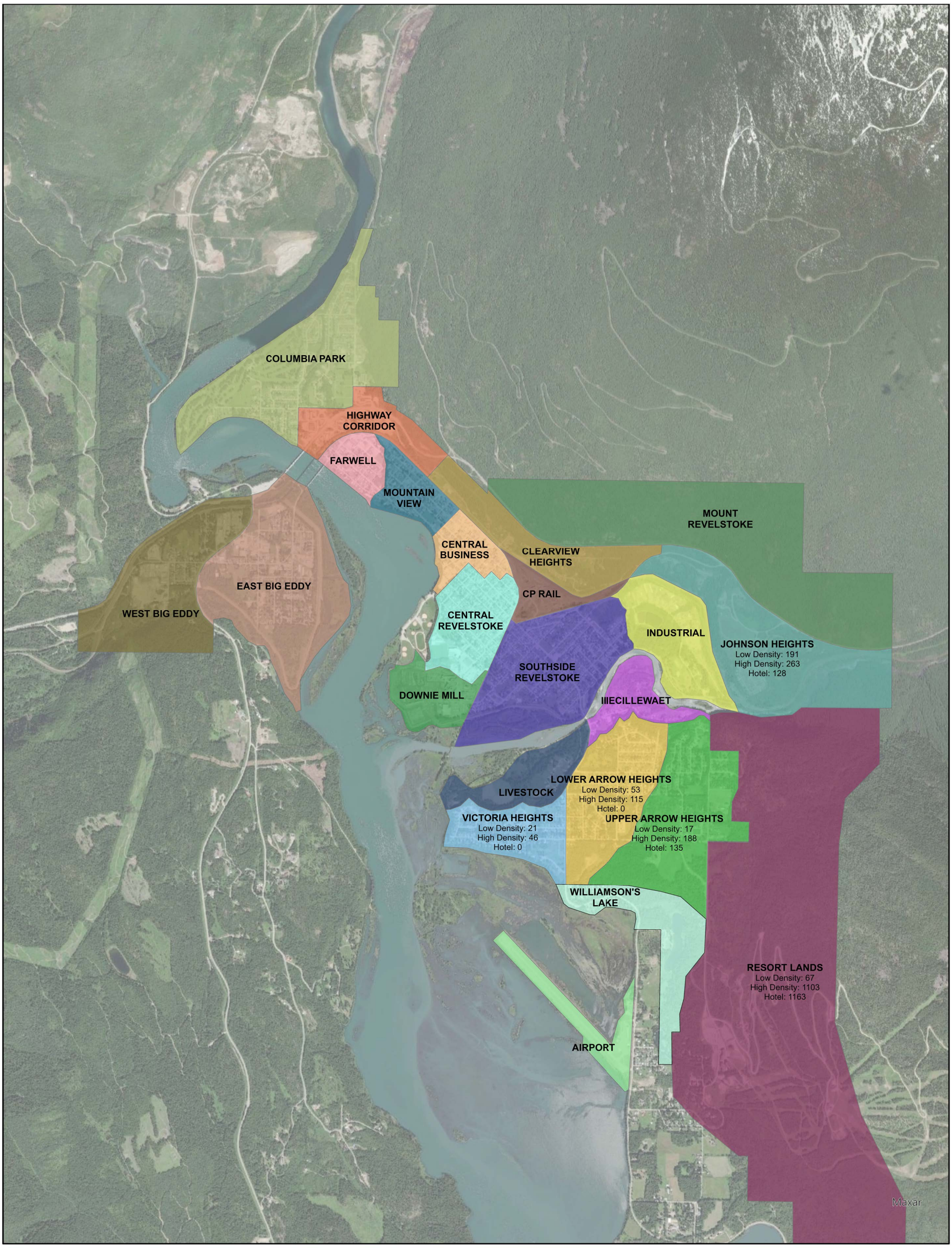
The growth areas, along with unit mix and number estimates, were combined with the Rennie Report population forecasts to develop the population forecast scenario. Because 100% of the developments could not be supported by the 20-year population forecasts, assumptions on the locations and unit mix of the future developments were made. It is almost certain that the actual future build out will differ from the assumptions made, but this assumed growth scenario allows us to better understand the impact of the additional development on the existing roadway.

Information available in the previous OCP, the draft OCP, the Rennie Report, and from the development information provided by the Planning department was utilized to generate population numbers for the population growth scenario. The assumptions included unit mix, unit size, hotel occupancy, household occupancy, and other assumptions. A full summary of these assumptions and their origin is provided in **Appendix C**.

Population growth was assumed in four primary areas:

- RMR
- Victoria/Arrow Heights
- Johnson Heights
- Highway Corridor

Additional non-residential and minor infill developments were not included in the analysis. A summary of the new population growth is provided in **Figure 4.8**. For the purpose of this analysis, usual residents and shadow population were grouped together.



Note: Figure shows projected population (persons) growth by land use type

0 250 500 750 1,000 metres

(At original document size of 11x17)
1:35,000

4.2.2 FUTURE VEHICLE VOLUMES

The future growth in Revelstoke is expected to have the largest impact on traffic volumes for the future horizon. An analysis for the future growth areas identified in the above section was completed to estimate the additional vehicles that could be expected on Revelstoke roadways. Similar to the existing traffic analysis, the future analysis was limited to the four pinch points identified in Section 3.6 where limited routing options limit vehicle routing. Future volumes were forecast using the community growth forecast, Trip Generation rates and daily profiles from the ITE Trip Generation Manual (10th Edition), and origin/destination information from LBS data. A summary of the resulting volumes is provided in **Table 4.2**.

Table 4.2: Long Term Forecast Traffic Growth

Superzone	Weekday – Daily Two-way Volume			Weekend – Daily Two-way Volume		
	Single Family	Multi Family	Hotel	Single Family	Multi Family	Hotel
Big Eddy	-	-	-	-	-	-
Northside	-	390	-	-	417	-
Central	-	-	-	-	-	-
Southside	-	-	-	-	-	-
Arrow Heights	524	3,928	5,761	490	4,489	5,818
Eastern Highway	608	645	569	569	778	575

This was a high-level analysis, and some key items need to be understood when evaluating these numbers:

- Residential growth was utilized because it was the most complete information and includes tourist-based trips. From a vehicle trip perspective, it is assumed that most new trips will start or end at a residential land use, especially for trips passing through one of the four pinch points.
- Assumptions on location and unit mix of future developments are likely to not match the actual buildout in the next 20 years.
- Persons per unit and hotel bed rates were estimated based on Canada census data and information in the Draft OCP and may differ from actual future rates.
- ITE trip rates were used without adjustment and likely overestimate the future vehicle volumes. The two main reasons are:
  - lack of adjustment for Revelstoke's existing and future high non-vehicle mode split and
  - An expected higher than typical number of walking trips from hotels at the RMR due to proximity to the resort.

Keeping all these items in mind, it is important to understand what these numbers are saying and how they can be used. These growth values have been added to the existing chokepoint volumes developed from the LBS data to determine the future volumes. The future volumes are provided in **Table 4.3** with graphical representations provided in **Figure 4.9**, **Figure 4.10**, **Figure 4.11**, and **Figure 4.12.**

Table 4.3: Existing and Future Pinch Point Two-way Volumes

Pinch Point	Direction	Weekday – AM Peak		Weekday – Midday Peak		Weekday – PM Peak		Weekend – Midday Peak	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future
River	NB	356	378	933	1,022	525	582	1,014	1,128
	SB	433	486	830	873	599	673	968	1,052
Victoria	NB	373	507	618	678	528	613	533	563
	SB	305	339	442	491	442	538	593	716
Townley	NB	69	83	161	197	204	235	265	311
	SB	110	155	165	193	92	115	179	204
Fourth Street (4th St)	NB	403	765	347	581	357	621	300	686
	SB	253	390	358	685	551	905	361	672

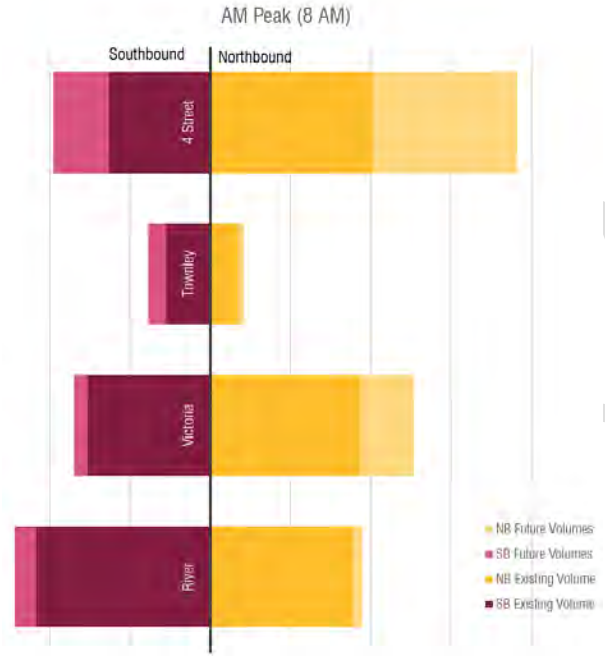


Figure 4.9: Weekday Chokepoint Projected Future Hourly Volumes - AM Peak

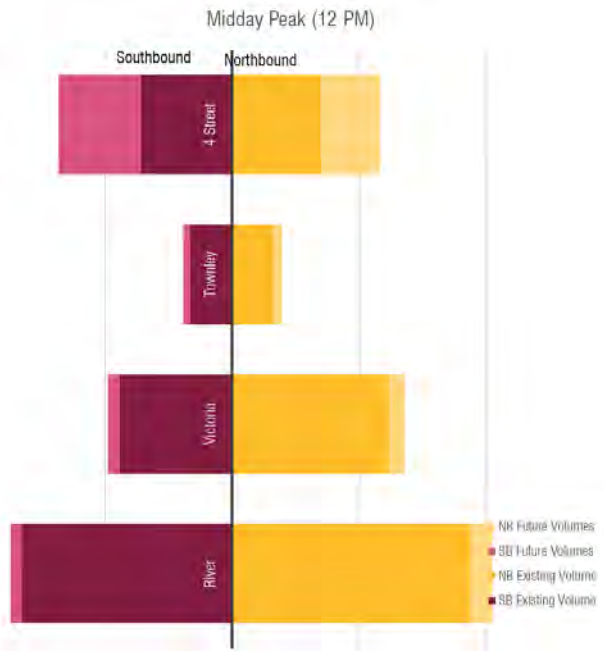


Figure 4.10: Weekday Chokepoint Projected Future Hourly Volumes - Midday Peak

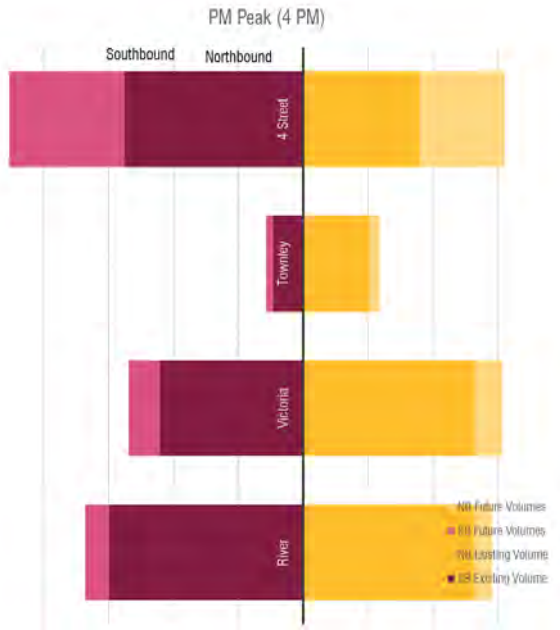


Figure 4.11: Weekday Chokepoint Projected Future Hourly Volumes - PM Peak

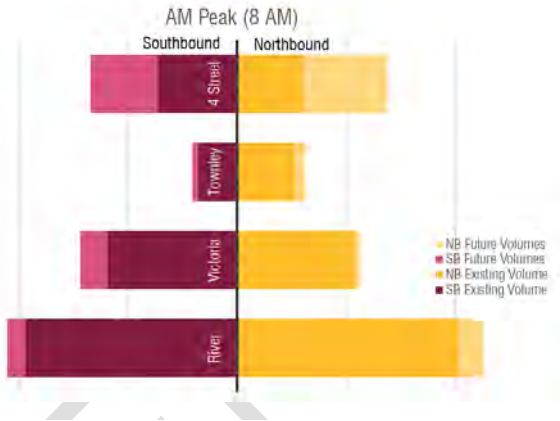


Figure 4.12: Weekend Chokepoint Projected Future Hourly Volumes - Midday Peak

The above data highlights that the Arrow Heights super zone is expected to be most impacted by future growth. For some directions and time frames, the existing volume along Fourth Street (4th St) is expected to nearly double. It is noted that, as previously discussed, this is likely a high growth estimate and does not fully account for existing and future mode splits. The Fourth Street (4th St) Bridge river crossing was one location where feedback was received that existing delay and volume was an issue. The anticipated growth in Upper Arrows and RMR are likely to further increase this, however this volume can still continue to be serviced with a two-lane bridge (or pair of bridges). The volume in the peak direction is approximately 900 vehicle per hour, within the lane capacity of the bridge. A four-lane bridge provided at this location would require substantial roadway improvements along Fourth Street (4th St) and Airport Way to fully support the potential throughput of the bridge lanes. This would result in a high-volume roadway with limited access and promote use of vehicles along this corridor and throughout Revelstoke. Keeping the roadway with the existing cross section will result in increased delay and capacity concerns along Fourth Street (4th St) and Airport Way. Intersection improvement at some or all adjacent intersection may need to be explored as growth occurs. However, this potential level of vehicle volume growth can be mitigated by supporting active transportation and transit along this corridor. Additionally, changes to the travel patterns of drivers may also occur as delay increases for the peak periods, resulting in some spreading of the peak hour volumes into more than one hour.

A profile of the hourly volumes throughout a typical weekday for the Fourth Street (4th St) Chokepoint showing the existing and future projected directional volumes is provided in **Figure 4.13**. This plot shows the anticipated spikes in volume during the AM and PM peak hours with steady two-way volume throughout the day. It is noted that, while this is precise set of data points, the accuracy is consistent with a high-level analysis and future volumes will likely be different for a number of reasons.

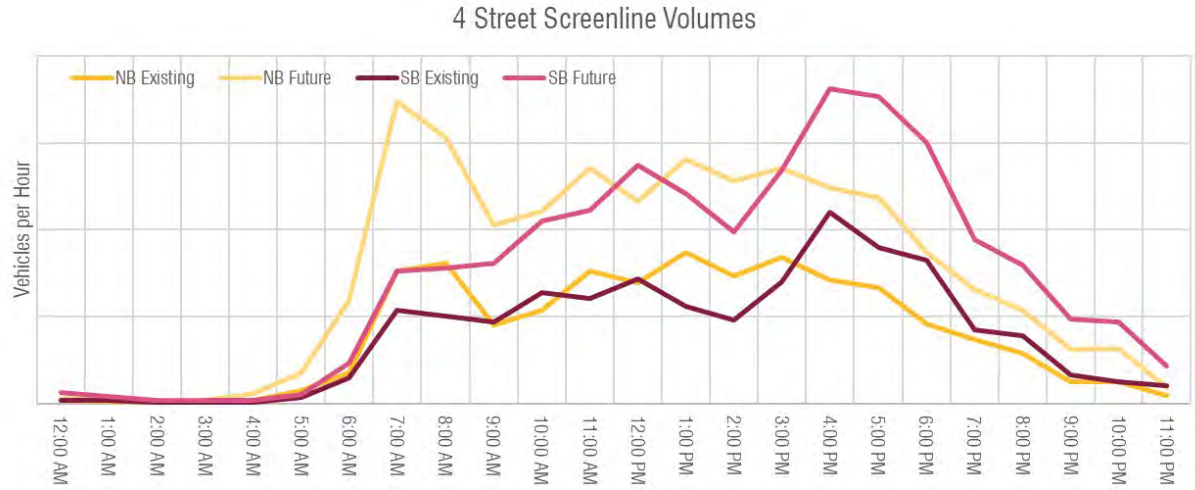


Figure 4.13: Fourth Street (4th St) Chokepoint Existing and Projected Future Hourly Weekday Volumes

Another key part of the future road network is the proposed development in Johnson's Heights. This development is expected to heavily utilize Townley Road to access Revelstoke and the anticipated growth can be observed in the above figures. The existing volumes and relatively small amount growth are not expected to result in significant capacity concerns along this corridor. However, it is understood that MOTI has determined that any significant development in the Johnson's Heights area will require another access into Revelstoke that is not via Highway 1. The current potential alignment of such a collector road is shown in **Figure 4.14**. This connection from Oak Drive to Townley Street would be the preferred connection so that city traffic does not compete with access to the highway - and the cost to construct protected intersections is significantly more than the cost of the connection. Traffic safety is critical for the Highway intersections and reducing the number for turning vehicles would provide safety benefits.

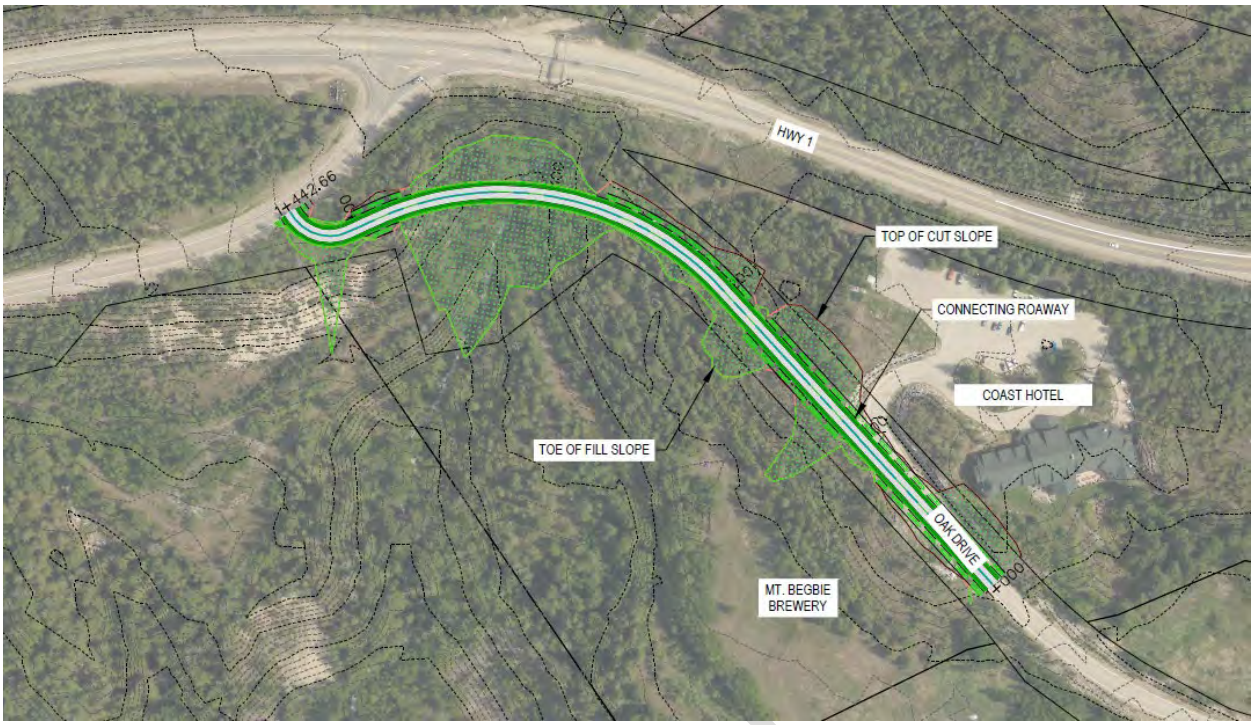


Figure 4.14: Potential Alignment of Johnson's Heights and Townley Road Connector

Overall, the road network is expected to continue to serve the needs of the community into the future. The Fourth Street (4th St) and Airport Way corridor is expected to experience the most stress of additional volumes from growth in the community. Intersection level improvements may be required as development progresses, but the timing and need of this will be largely influenced by the quality, connectivity, and use of the active transportation network.

ACTION 4-3: Advance the design and cost estimating for the Townley Road/Oak Drive Connector and secure funding partners (eg. Province, developers) to cover the capital needs to implement.

4.2.3 STREET CLASSIFICATIONS & POSTED SPEEDS

Too Many Collector Streets

Downtown Revelstoke in particular, has a several East-West and North-South collector streets that are currently functioning as local street which are generally defined by residential frontage, narrow pavement width, and lower traffic volumes. With such a resilient existing grid roadway network, there is not a requirement for higher traffic carrying collector streets. Some existing collectors, however, should remain as collectors. 3rd Street and Mackenzie Avenue, for example, with their wider carriageway, carry more through traffic than other corridors.

Big Eddy Road

Big Eddy Road connects to Highway 1 west of Revelstoke, through the communities of Big Eddy East and Big Eddy West, and to the 1-lane Big Eddy Bridge. The existing traffic volume, posted speed, and connection within the network do not warrant keeping this road classified as an Arterial. It is recommended that it be reclassified as a Collector Street.

Lower Posted Speeds for Collectors and Locals

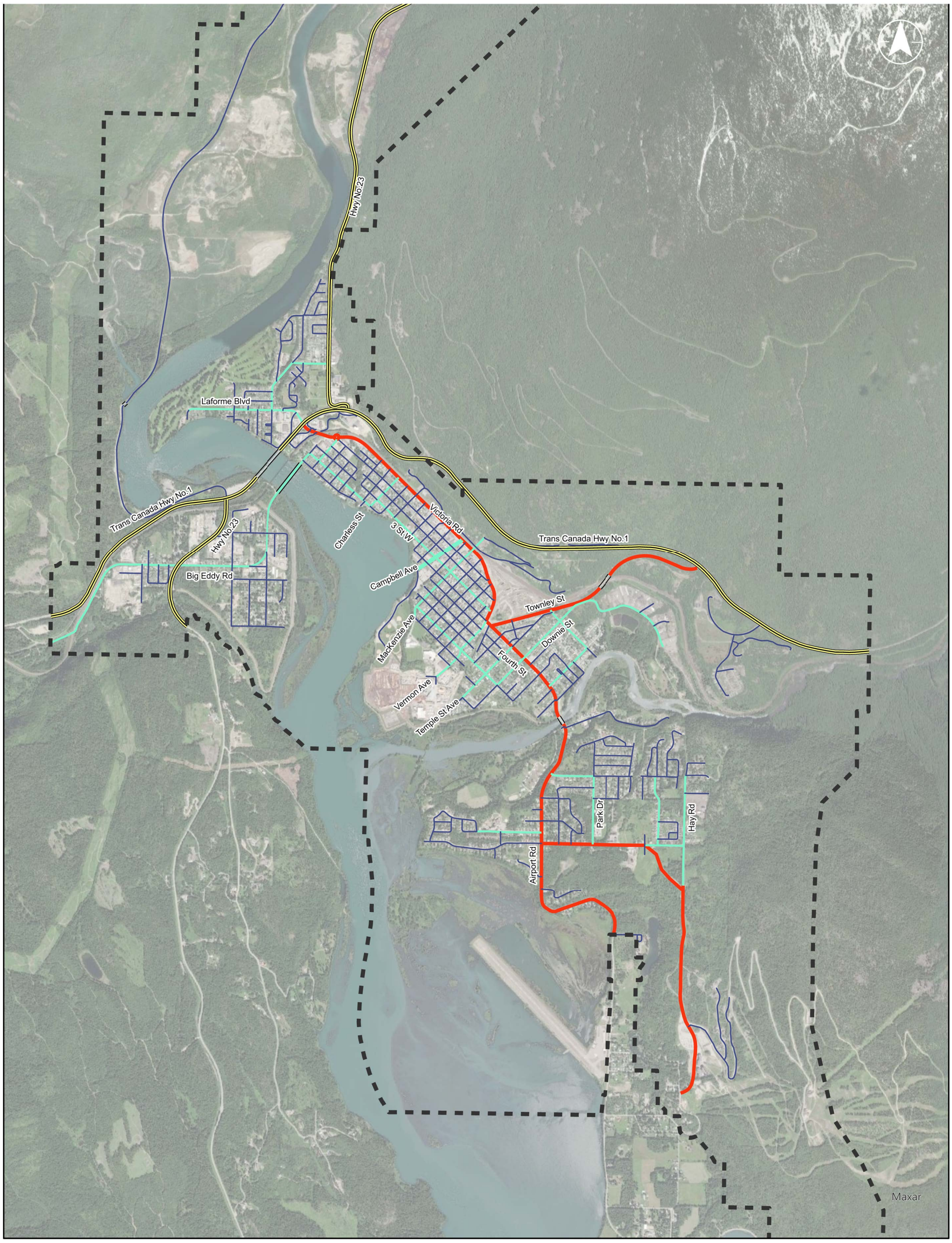
As discussed in Section 4.1, 30 km/hr posted speeds for Local Streets and 40 km/hr posted speeds for Collector Streets are appropriate for the context of these streets. Error! Not a valid bookmark self-reference. Is a summary of all street segments that will be impacted by the recommended changes in street classification, and by default, posted speeds. An updated map is also provided in Error! Reference source not found..

Table 4.4: Proposed Street Re-Classifications and Posted Speeds

Roadway	Road Classification		# Travel Lanes	On street parking	Posted Speed (km/hr)	
	Existing	Proposed			Existing	Proposed
1 St	Collector	Local	2	Yes	50	30
2 St	Collector	Local	2	Yes	50	30
3 St	Collector	Collector	2	Yes	50	40
4 St (north of Victoria)	Collector	Local	2	Yes	50	30
8 St	Collector	Collector	2	Yes	50	40
Airport Way	Arterial	Arterial	2	Yes	50	50
All other locals	Locals	Locals	2	Yes	50	30
Big Eddy Road	Arterial	Collector	2	Yes	50	40
Boyle Ave	Collector	Local	2	Yes	50	30
Camozzie Rd (north of Nichol Rd)	Collector	Collector	2	Yes	50	40
Campbell Ave	Collector	Collector	2	Yes	50	40
Cleland Rd	Collector	Collector	2	Yes	50	40
Colbeck Rd	Collector	Local	2	Yes	50	30
Columbia Park Dr	Collector	Local	2	Yes	50	30
Connaught Ave	Collector	Local	2	Yes	50	30
Carnozzie Road (south of Nichol Rd)	Collector	Arterial	2	Yes	50	50-60
Douglas St	Collector	Collector	2	Yes	50	40
Downie St (west of Fourth St)	Collector	Collector	2	Yes	50	40
Downie St (east of Fourth St)	Collector	Local	2	Yes	50	30
Edward St	Collector	Collector	2	Yes	50	40
Ford St	Collector	Collector	2	Yes	50	40
Fraser Dr	Collector	Local	2	Yes	50	30
Highway 1	Highway	Highway	4+	Varies	70-100	60-70
Highway 23	Highway	Highway	2	Yes	60	60
Laforne Blvd	Collector	Collector	2	Yes	50	40

Roadway	Road Classification		# Travel Lanes	On street parking	Posted Speed (km/hr)	
	Existing	Proposed			Existing	Proposed
Leach St	Collector	Collector	2	Yes	50	40
MacKenzie Ave	Collector	Collector	2	Yes	50	40
Nicol Rd	Collector	Arterial	2	Yes	50	50
Oak Dr	Collector	Collector	2	Yes	50	40
Oscar St	Collector	Collector	2	Yes	50	40
Park Dr	Local	Collector	2	Yes	50	40
Pearkes Dr (From Cleland Rd to Laforne Blvd)	Collector	Collector	2	Yes	50	40
Pearkes Dr (north of Cleland Rd, south of Laforne Blvd)	Collector	Local	2	Yes	50	30
Powerhouse Rd	Collector	Collector	2	Yes	50	40
Rokeby Ave	Collector	Local	2	Yes	50	30
Townley St	Arterial	Arterial	2	Yes	50	50
Track St	Collector	Local	2	Yes	50	30
Victoria Rd (north of Townley Rd)	Arterial	Arterial	4	Yes	50	50
Victoria Rd (West of Fourth St)	Collector	Collector	2	Yes	50	40
Wilson St	Collector	Collector	2	Yes	50	40
Wright Street	Collector	Collector	2	Yes	50	40

ACTION 4-4: Revise Revelstoke's Road Classifications as summarized in Table 4.4 and Figure 4.15.



LEGEND

- Highway
- Arterial
- Collector
- Local
- Bridges
- CityBoundary

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4.3 Future Active Modes Demand

High demand routes for pedestrians will continue to be in the downtown, along regional multi-use pathways adjacent to the Columbia and Illecillewaet River, connection to the trail network in the river flood plain, near major parks and across the Columbia River.

These same routes will continue be in high demand for cyclists, but because cyclists can travel further, the Revelstoke Ski Resort, and Columbia Park, and the mountain bike park to the north are key destinations that could see an increase in cycling demand with the introduction of new infrastructure (e.g. separate multi-use pathway to the resort).

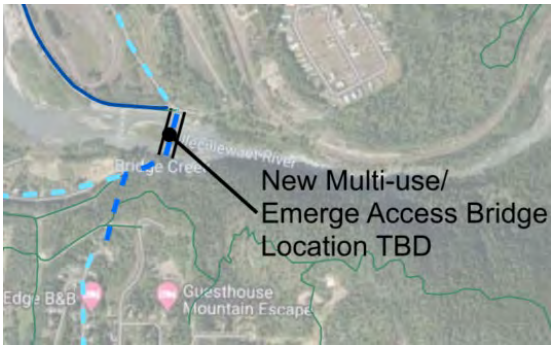
4.3.1 BRIDGE CONNECTION IMPROVEMENTS

Bridge connections are critical to the transportation network for all modes. Currently, all four multi-modal bridges and the one pedestrian bridge are either substandard in facility width, protection from traffic, or accessibility needs. Specific requirements to bring these up to standard are summarized in **Table 4.5**.

Table 4.5: Summary of Bridge Current and Required Active Modes Facilities

Bridge	Image	Existing Facilities	Required Facilities
Highway 1/Columbia River		Approx. 1.5m (6ft) concrete sidewalk (no clearances)	Widen (cantilever) existing sidewalk to achieve a minimum 3.0m MUP or widen (cantilever) north side of bridge to accommodate a new 3.0m MUP.
Big Eddy Bridge		Approx. 1-1.2m (4ft) timber sidewalk (no clearances).	Widen (cantilever) existing sidewalk to achieve a minimum 3.0m MUP.

Bridge	Image	Existing Facilities	Required Facilities
Fourth Street (4th St) / Illecillewaet Bridge		Approx. 1-1.2m (4ft) concrete sidewalk (no clearances). Cyclists must dismount.	Widen (cantilever) existing sidewalk to achieve a minimum 3.0m MUP.
Townley St/CPR Bridge		Approx. 1.5m concrete sidewalk. 0.5m shoulder on sidewalk side. 1.0m shoulder on other side. No dedicated bicycle infrastructure.	Shift curb 1.0-1.5m to upgrade sidewalk to 2.5-3.0m MUP.
Illecillewaet Pedestrian Bridge		Approx. 3.5m (12ft) timber multi-use connected to gravel trails at either end.	Upgrade trail approaches to paved multi-use paths.

Bridge	Image	Existing Facilities	Required Facilities
2nd Illecillewaet Bridge		None	New bridge for multi-users and emergency vehicle access.

4.3.2 PEDESTRIAN NETWORK

The core of any City is the people, often the tone of City is set by the observance of people moving through that City. Often the most vibrant and exciting Cities are best defined by the street level activity. The City of Revelstoke's transportation network, while being car oriented, has areas of activity that support a human scale demonstrated by pedestrian experience. The aim of the pedestrian realm in the City is to create an experience within which visitors are motivated to park and walk from destination to destination, and residents are motivated the experience the City on foot.

While the pedestrian experience is most commonly considered one of people walking, other users include those rolling, in wheelchairs or strollers. It is important to consider in the pedestrian improvements a consistent level of universal accessibility that supports comfort and mobility options. This universally accessible approach both invites other users to the City, but also establishes a comfortable and safe pedestrian experience for everyone.

4.3.2.1 Pedestrian Facility Improvements

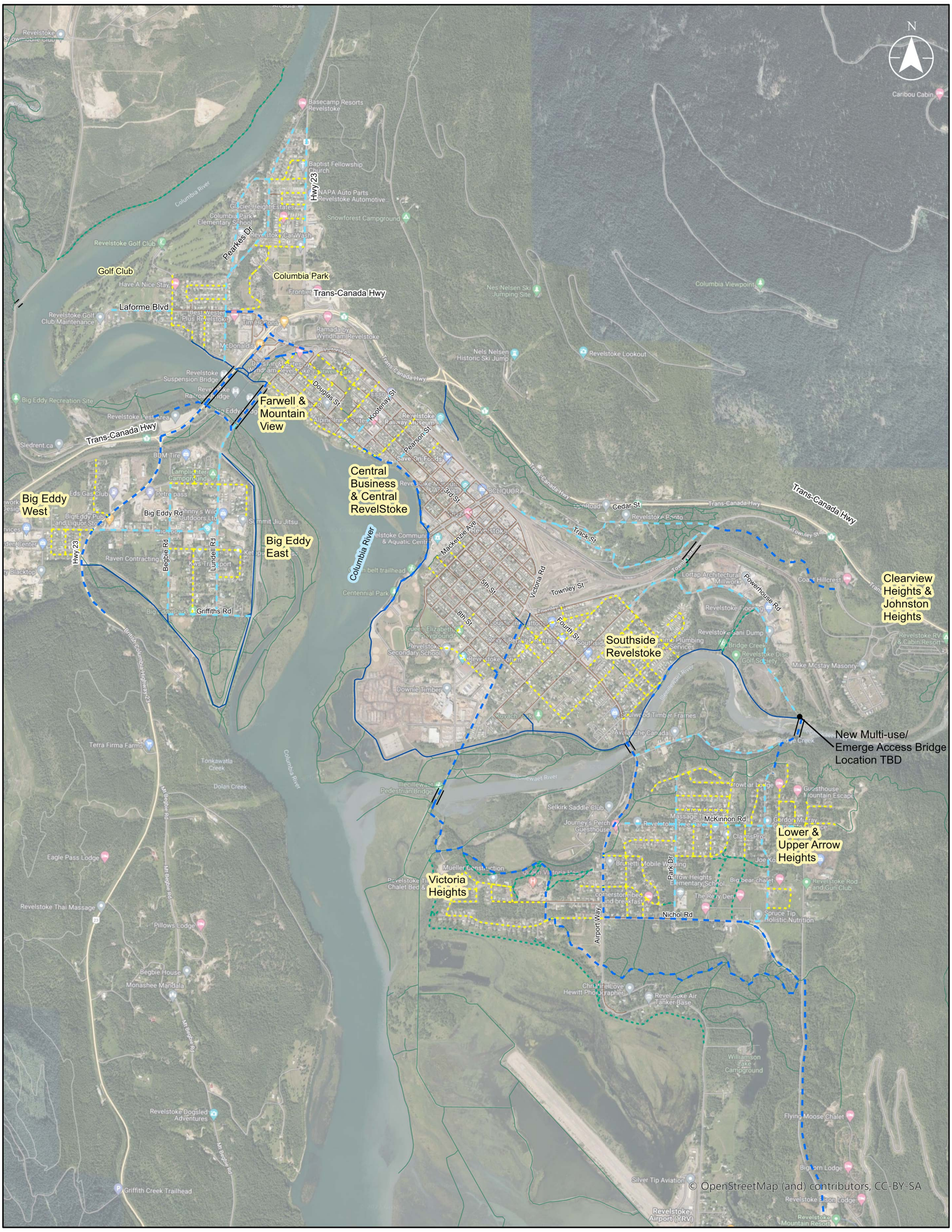
The pedestrian network is the connective tissue of the human experience in the City. Revelstoke is defined by:

- a tight street network in neighbourhoods many of which are lacking pedestrian amenities such as sidewalks,
- considerable barriers between neighbourhood (e.g., Highway 1 and the River), and
- A core pathway network that supports both rapid travel and recreational users.

The recommended improvement presented aim to work within the Revelstoke experience and improve where possible. The plan recommends a network of walkways within the communities that aim to address the missing pedestrian infrastructure. In most conditions this would be accommodated through sidewalks, however; there is an opportunity in Revelstoke to redefine excess pavement using barriers and paint to create pedestrian facilities without the additional capital costs (see concept illustration **Figure 4.16**). This will provide the base mobility needed for the pedestrian network. In several cases these facilities are recommended to include cycling accommodation through an on-street multiuser facility. These would include some design accommodation to minimize the conflict between user types. Multi-user pathways are also part of the pedestrian network. The pathways system provides both a high-quality recreational function and the equivalent of an active transportation highway that provides safe movement through the City with minimal conflicts. The riverside and bridge pathways in particular, are key network components to serve residents and visitors alike. New sidewalk construction

should still be a funding priority in locations where there is a critical need, particularly those with mobility challenges. These locations include: assisted living, hospitals, doctors offices, bus stop location, and grocery stores. The proposed pedestrian network is provided in **Figure 4.17**.

Figure 4.16: Example Implementation of Walkway



LEGEND

- Proposed Walkway
- Proposed Multiuser Path
- Proposed Multiuser Facility (On Street)
- Proposed Trails
- Multiuser Path (Paved)
- Existing Trails
- Existing Sidewalk
- Bridges

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4.3.2.2 Pedestrian Crossings

The road network in the City provides a core function for the mobility of all users, especially as the recommended walkways are implemented. The City however has a significant range in intersection treatments which can create an unsafe or uncomfortable pedestrian environment. The feeling of 'risk' in crossing the road is one that is addressed through consistent, high-quality design. The outcomes must inform drivers that they need to be cautious and move slowly, while concurrently informing pedestrians that they have a responsibility to be aware and equally cautious.

In conditions, such as Victoria Avenue, we note that the crosswalk is located to access the commercial areas from the north-side parking, such as the one shown in **Image 4.1**. This crosswalk is located to provide a safe centralized crossing point, avoiding pedestrian conflicts, and likely minimize jaywalking. A central median with a pedestrian refuge as sketched in Image 4.1 demonstrates that there are opportunities to increase the quality of the pedestrian crossing while creating a traffic calming effect by narrowing the travel lane widths slightly. This will increase the value of the crosswalk for pedestrians increasing the pedestrian preference to use it and have a meaningful effect on driver awareness and compliance.

Image 4.1: Existing Pedestrian Crossings at Victoria Avenue & Campbell Street

A second example is the crossing of the intersection at Campbell and 1st Street, see **Image 4.2**. This crossing is particularly important as it connects downtown commercial with parking and residents. The intersection itself has intersection treatments with zebra stripes in one direction and not in the other, where the zebra is not used in conjunction with a stop line. The intersection includes a boulevard area, contributing to a very large pedestrian crossing, and does not provide a refuge to those crossing. When considered in combination the treatment of large intersections like this can create a complex environment for all users navigating. This can be addressed through creating significant curb extensions as

shown to tighten up the intersection space. This not only limits pedestrian's exposure to traffic, but it will also calm traffic as they have less room to navigate the intersection.

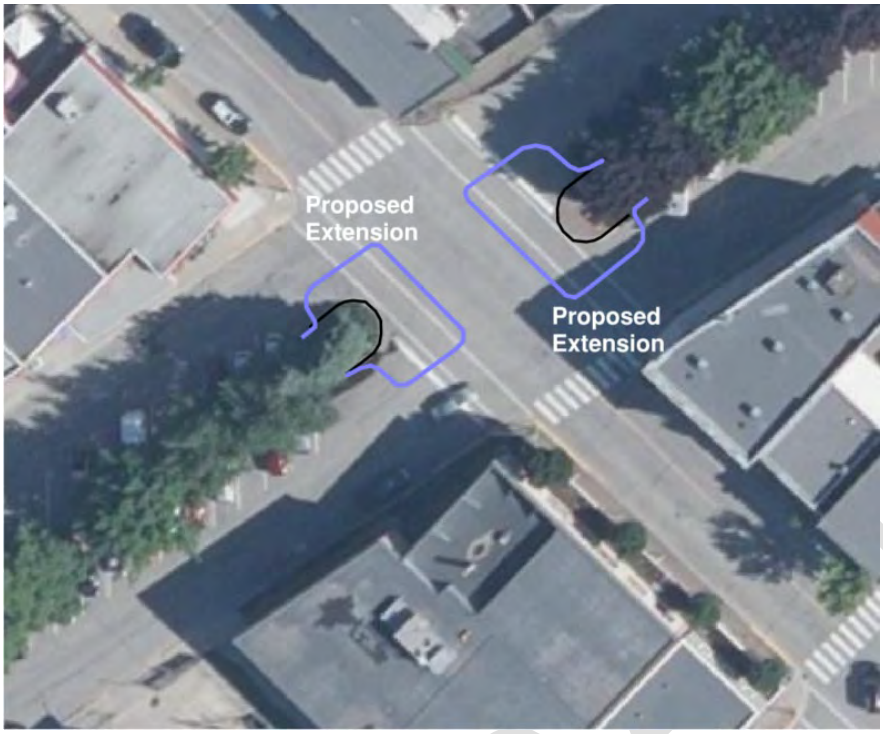


Image 4.2: Existing Pedestrian Crossings at Campbell Street & 1st Street

Guidelines for pedestrian crossing improvement measures include:

- Shorten crossing distances through narrow roads and curb extensions.
- Provide visibility between drivers and pedestrians through curb extensions and pedestrian scale lighting.
- Increase driver awareness through pedestrian activated lights or paint markings
- Manage conflicting movements (such as left turns) through traffic controls
- Include curb-cuts and urban braille for universal accessibility

4.3.2.3 Other Pedestrian Opportunities

Grizzly Plaza

Grizzly Plaza is a uniquely designed one block segment of Mackenzie Avenue between Victoria Avenue and First (1st) Street, see **Image 4.7**. It is a popular destination for residents and visitors to the downtown. The street trees, park benches, brick surface treatment, one-way only (northbound) traffic operation and restaurants create a perfect pedestrian environment. The opportunity exists for temporary closures to use the street space for a market, festival, or other event without impacting

the traffic circulation in the downtown. The grid network of two-way streets provides excess capacity for vehicular traffic to move around.

Image 4.3: Mackenzie Plaza

Reclaiming Street Corners and Parking Space

Considerable investment has already been made in downtown Revelstoke to make street corners and building faces more attractive to pedestrians. In this example (**Image 4.8**) at Mackenzie Ave & 2nd Street, landscaping, street trees, and park benches have made these locations attractive for pedestrians. With so much unused parking space, Revelstoke is in the unique position to reclaim more of this space for pedestrians.

Image 4.4: Attractive Street Corner Example

4.3.3 BICYCLE NETWORK

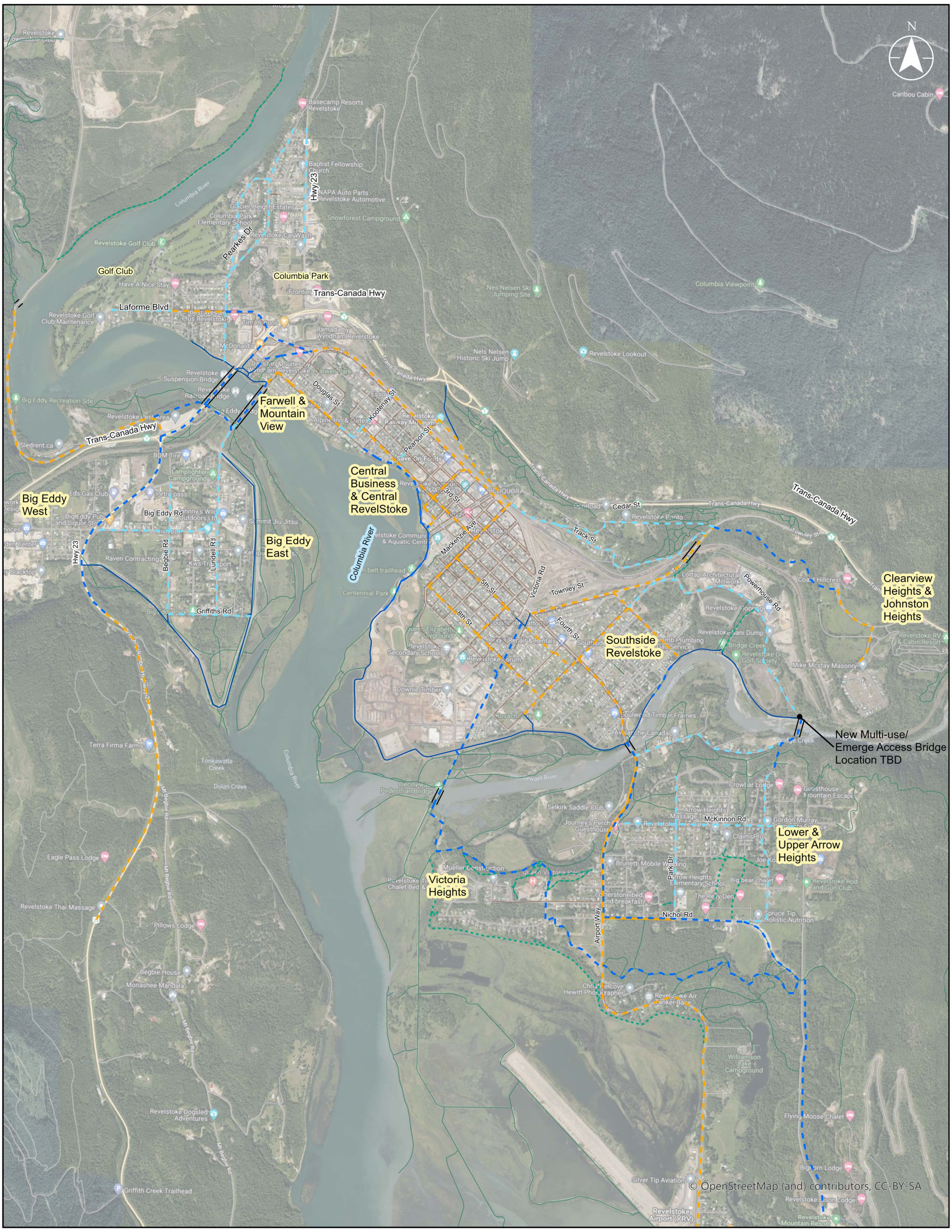
A robust cycling network provides a core mobility service for Residents and visitors alike. A cycling facility should be designed to meet the needs of All Ages and Abilities (AAA) when considering user groups. AAA is a transportation industry term that guides the level of protection (both perceived and actual) for users to create a cycling network that supports a range of user groups, generally facilities that do not meet the AAA guidelines have high speed traffic intermixed or low levels of protection.

The network identified provides for urban permeability within the City based on core transportation corridors. The use of multiuser facilities, designed to support both cycling and pedestrians, creates a core mobility network. This is supplemented with specific cycling infrastructure to connect key destinations. The cycling network, because the range and speed of cycling does not have to be accommodated on every street, instead provides core connections that gets users to low volume low speed roads that can help connect them to their final destination is optimal.

Proposed Bicycle & Multi-User Network Map

Building on the existing network presented in Section 3 of the TMP, and through stakeholder engagement, street-view analysis of routes, and refinement of these routes, **Figure 4.18** was developed. For simplicity, the facilities on this map have been separated into existing facilities (sidewalks, trails, and multi-use paths) and proposed facilities (multi-user facility, bikeway, trails, and multi-use paths). A separate map appearing later in the TMP proposing on-street walkway facilities.

The proposed trails and some of the proposed multi-use pathways come from the Parks Master Plan. The rest were developed as part of this TMP. The facility type for the bikeways, or on-street multi-use facilities are not specified as this can range from shared space (vehicles and bicycles on a local street) to a protected/buffered space which depends on the specific context (including street classification) of the segment being examined.



LEGEND

- Proposed Multiuser Path
- Proposed Multiuser Facility (On Street)
- Proposed Bikeway
- Proposed Trails
- Multiuser Path (Paved)
- Existing Bikeway (Narrow Shoulder)
- Existing Trails
- Existing Sidewalk
- Bridges

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Special Study Area: Victoria Avenue & 1st Street

A specific discussion identified through development of this TMP is recommending cycling infrastructure on Victoria Road or 1st Street. A short evaluation was undertaken which to compare the opportunities and challenges each corridor presented. These opportunities and challenges are summarized in **Table 4.6**.

Table 4.6: Victoria Avenue & 1 Street Bicycle Route: Opportunities & Challenges

Route	Design	Opportunity	Considerations / Challenges
Victoria Road	a protected two-way facility on the south side on the road.	Direct connections to the front of several key destinations on an intuitive cross City route. Sufficient space available for the design if travel lanes are reduced. Cycling facility will improve the quality of the pedestrian environment through here.	A significant number of intersections that need to be considered / addressed in the design. It is anticipated that this option would be more costly than the option on 1rst Street. Cyclists accessing destinations would need to navigate significant on-site parking. Potentially unsafe 2-way bicycle traffic at multiple commercial driveways and side-street crossings.
1st Street	A protected cycling facility traveling in each direction.	Secondary access to several destinations, including back of the destinations on Victoria. Lower traffic volumes and large vehicle types to be considered in the design. Intersections and property accesses are simple. Likely considerably less expensive to implement.	This will require the loss of parking or a travel lane in a commercial area. On the Northwest of the corridor there are few destinations to connect to. The intersections connecting to Victoria Road on each end will require special consideration in implementation.

Based on this summary and a discussion with stakeholders, 1st Street is the preferred route however the impacts to commercial parking and traffic cannot be ignored. An alternative approach could be to examine one-way traffic operations along 1st Street. This could preserve parking and allow space for bicycle lanes. A recommendation from this TMP is that this be examined further.

Victoria Avenue still presents and a unique opportunity for improvement, however. Daily traffic is not currently (nor will ever be) at the volumes levels to warrant four travel lanes. This is evident when driving or walking on the corridor. Two travel lanes (one each direction) and left turn lanes at key intersections are sufficient. This, coupled with the large crossing distances for pedestrians across Victoria, the uninviting pedestrian experience along the south sidewalk, and speeding along Victoria Avenue presents an opportunity to "right-size" Victoria Avenue to something narrower. Another recommendation from this TMP is to examine how the eastbound curb lane could be repurposed for an improved (wider) pedestrian infrastructure, landscaping, or other attractive uses of that space.

ACTION 4-5: Undertake a comprehensive evaluation to determine the preferred corridor (First (1st) Street or Victoria Avenue) for an east-west bicycle connection on the north side of downtown.

ACTION 4-6: Consider repurposing the eastbound curb lane of Victoria Avenue for a safer, more attractive pedestrian environment on the south side of Victoria Avenue.

4.3.3.2 Bicycle Parking

Bicycle parking is in short supply in the City of Revelstoke, particularly considering the high bicycle ridership statistics in the summer months. Key locations that have been identified for additional bicycle parking:

- The Recreation Centre
- Schools, Parks, Sports Fields
- Downtown, particularly where restaurants, shops, hotels and other key destinations

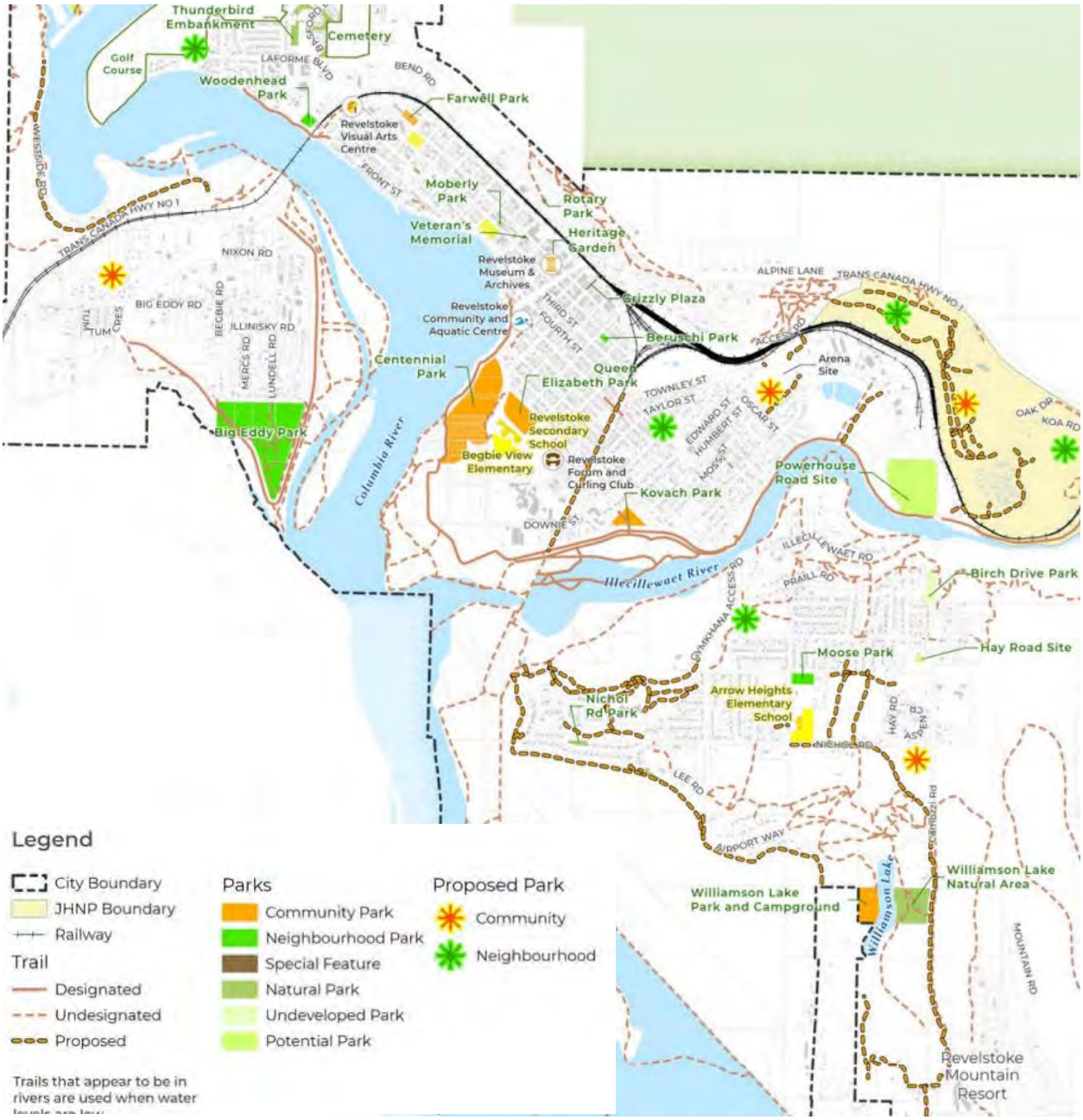
Some considerations for bicycle parking:

- Locate bicycle parking near street corners if space is available
- Utilize underutilized parking space for bike corrals where 10 or more bikes can park
- Given the wet and snowy climate that Revelstoke has, consider sheltered public bike parking

ACTION 4-7: Develop a program to identify locations and dedicate funding towards increasing secure and sheltered public bicycle parking.

4.3.3.3 Parks and Recreation Connectivity

The 2022 Parks and Recreation Master Plan was reviewed for key considerations and policy alignment. Section 4.2 of that plan highlights the role of the City Trails in providing recreational opportunities. The key findings included that the trail system, while well used, lacks connectivity. Specifically, the opportunity to connect trails to and through on-street cycling and commuting routes and use available land / land acquisition to provide the key connections that are otherwise missing. This TMP proposed bikeway and multi-use network provides that on-street connectivity and provides direct access to the current and proposed parks shown in the Parks and Recreation Master Plan Proposed Parks and Trails in Figure 4.19.



Source: 2022 Parks & Trails Master Plan Figure 4

Figure 4.19: Proposed Parks & Trails

4.4 Future Transit Servicing

4.4.1 TRANSIT ROUTES AND SERVICE

Service proposals are based on the evaluation of travel characteristics by season obtained from LBS data to identify the major origins and destinations of vehicle trips. The proposals incorporate the well-used Revi Resort Shuttle winter service that is currently provided by Everything Revelstoke together with an understanding of the utilization of the existing BC Transit funded services.

Network

The network consists of two main north-south corridors that extend from the hotel strip in the north adjacent to Highway 1 in the north, through the downtown core, towards the Revelstoke Mountain resort in the south. In terms of the alignment of Route 2, two options have been proposed. Option 1, **Figure 4.20** and **Figure 4.21**, features a 2-way routing arrangement through the Downtown along 1st Street and Option 2, **Figure 4.22** and **Figure 4.23**, proposes a one-way loop routing along 1st Street in the northbound direction and Victoria Street in the southbound direction to better integrate service with sidewalk provision and accommodate bus stops.

These two spine routes are supplemented by feeder services serving the Big Eddy and Columbia Park neighbourhoods in the north as well as the Queen Victoria Hospital and Arrow Heights neighbourhood in the south. When development occurs, feeder services are also proposed to the Johnson Heights neighbourhood and Airport lands in the south. Feeder services that connect to the two spine routes can range from fixed-route, scheduled services to on-demand services in new developments or areas with low demand.

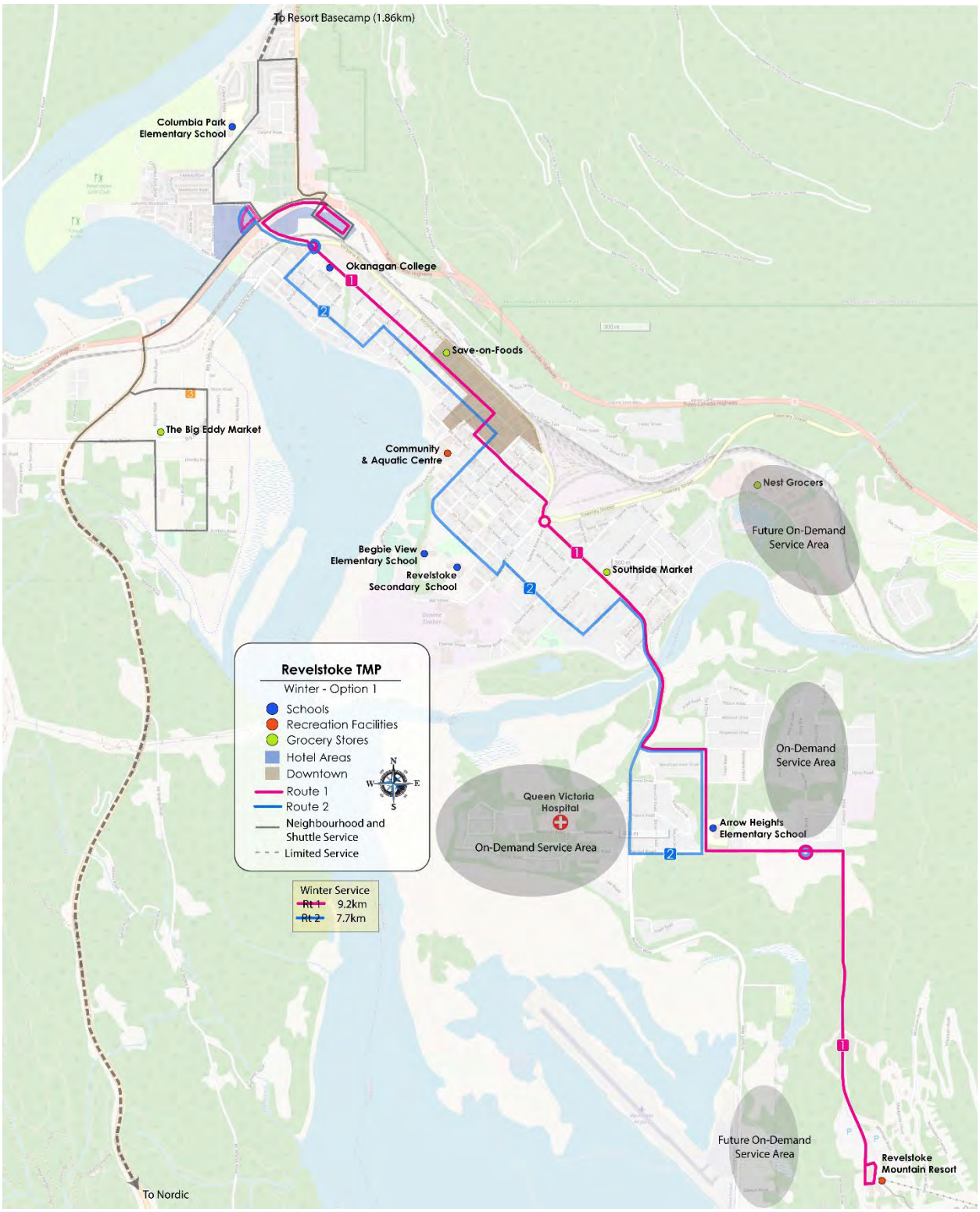


Figure 4.20: Winter Transit Service Routes – Option 1

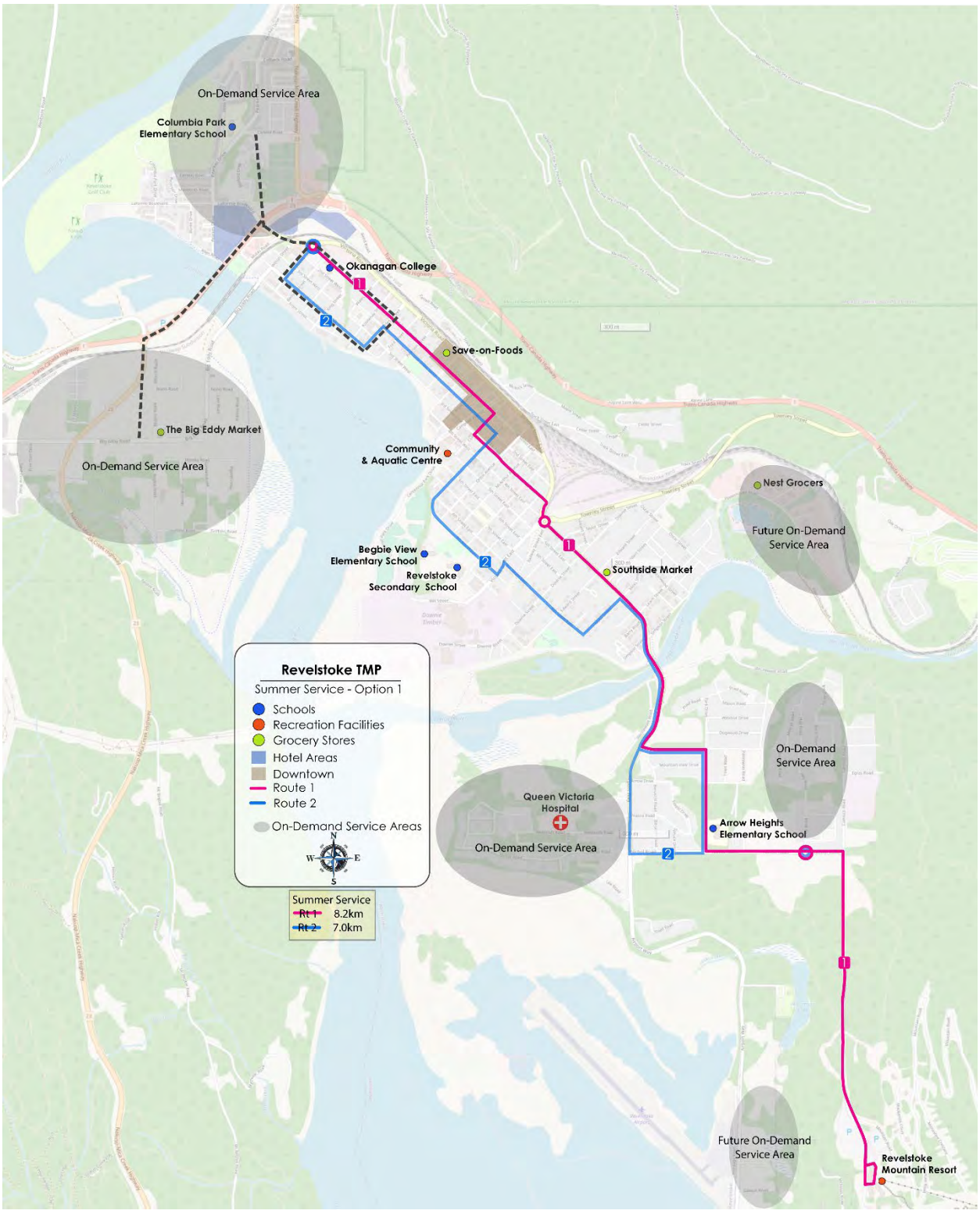


Figure 4.21: Summer Transit Service Routes – Option 1

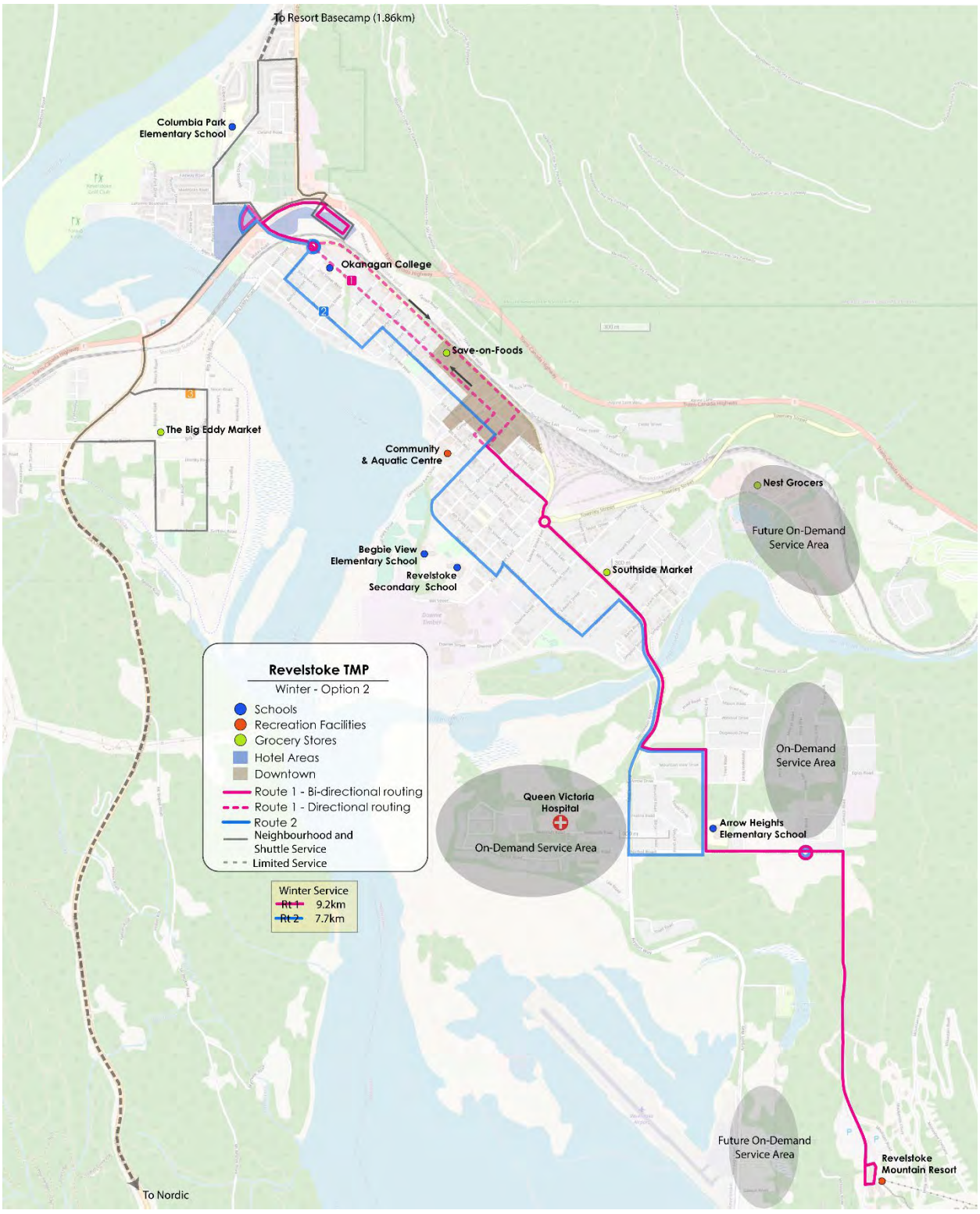


Figure 4.22: Winter Transit Service Routes – Option 2

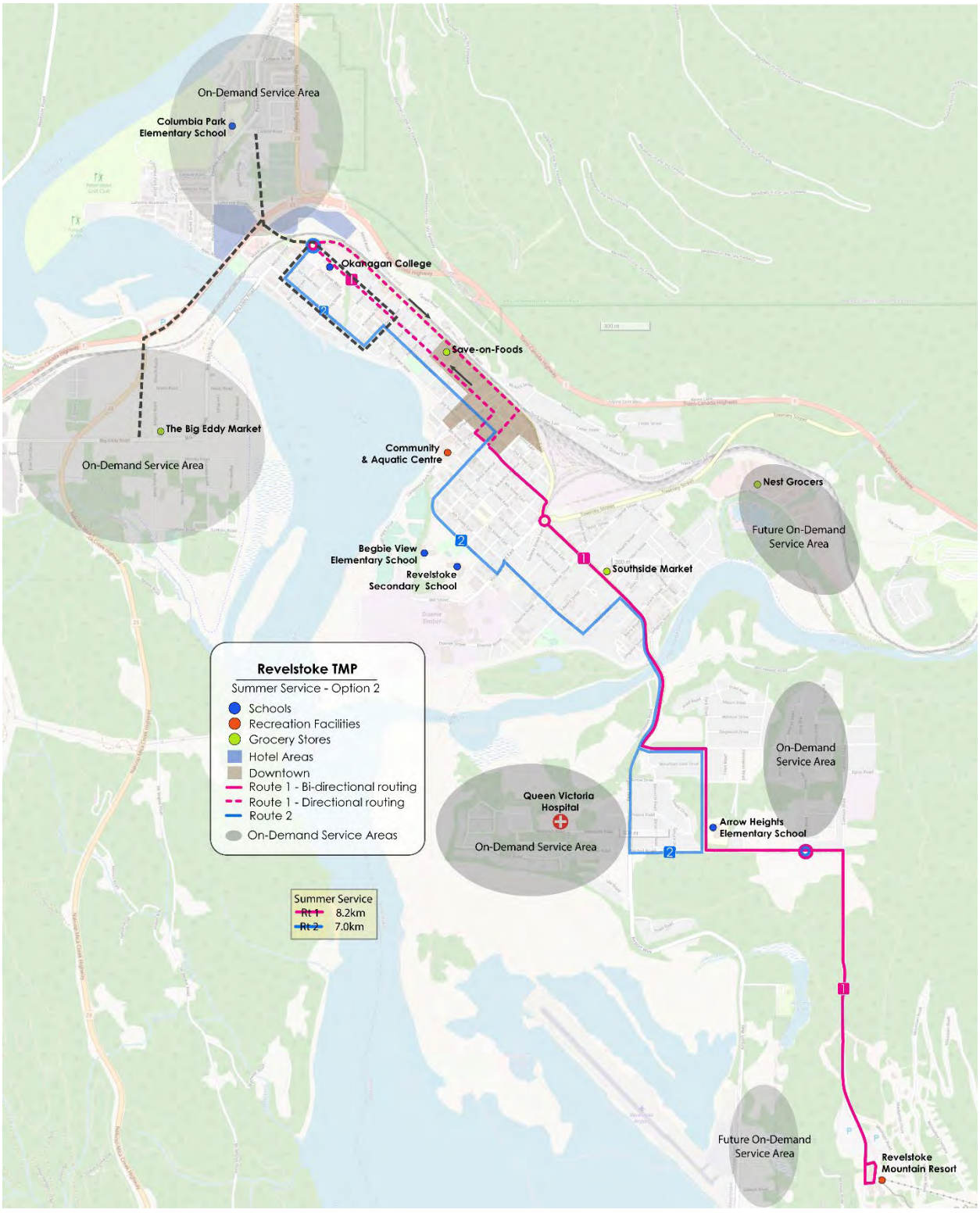


Figure 4.23: Summer Transit Service Routes – Option 2

Seasons

Due to the seasonal variation in travel demand travel, a base summer schedule with lower frequencies is proposed. This is supplemented with higher frequencies in the peak winter season. Two shoulder seasons (Early Winter and Late Winter) have also been identified to accommodate the ramping up and ramping down of service between the two main seasons.

Service types

The service comprises the following service types:

Scheduled service consisting of the two main routes that operate year-round with varying frequencies. In the Winter service periods, scheduled feeder service is provided between the Big Eddy and Columbia Heights neighbourhoods to connect to the major routes.

Limited, **on-Demand** service is proposed in a number of other neighbourhoods and areas of future development where travel demand is lower. The intent is to provide an introductory level of service to connect to the major routes and it is recommended that the utilisation of these services are monitored to assess whether these should be transformed into scheduled services to accommodate demand, or conversely discontinued if demand is lacking.

Service Specification and Operating Costs

Table 4.7 below provides a summary of estimated service hours and operating costs based an average cost per hour of $130. This reflects an expansion of approximately 3,000 hours in comparison to the current combined service hours of BC Transit (5,160) and the Rev Shuttle (2,560). A detailed summary of this data is provided in Appendix D.

Table 4.7: Estimated Seasonal Transit Service Hours and Operating Costs

Service Period	Conventional	Shuttle	On Demand	Annual Service Hours	Annual Operating Cost
Summer	2,825	0	1464	4,289	$367,250
Early Winter	463	110	88	661	$85,930
Peak Winter	3,453	920	368	4,741	616,330
Late Winter	631	120	120	871	$113,230
Total	**7,372**	**1,150**	**2,040**	**10,562**	**$1,373,060**

4.4.1.2 Infrastructure Upgrades and Changes

Based on the review and analysis of accessibility by Level Playing Field, the following recommendations have been made:

- Accessible bus shelters (enough cover to provide space for wheelchairs, for example)
- Bus stop amenities – sufficient bus pad space
- Sidewalk connections and ramps to bus stops.
- It is recommended that transit stops should include a hardscaped space for pedestrians to wait for the bus and load / unload wheeled mobility devices without encroaching into the road right-of-way.

- Consideration should also be given for stops to include seating to allow people to rest while waiting for transit.
- Bus stop signs could also be updated to match the same blue and white wider sign style that includes the bus route numbers.
- The BC Transit website offers limited information for people with accessibility challenges to adequately plan their trip on public transit. The only information available is the timed-stops and the path travelled for each of the four routes. An accessible resource could be made available that shows all the transit stop locations and the corresponding transit routes.

ACTION 4-8: Develop/update transit shelter design standards to ensure they are accessible for those with mobility impairments.

ACTION 4-9: Develop a Transit Strategy that establishes a clear vision, combines local and resort transit services, and ensures consistent transit signage/branding.

4.5 Future Goods Movement Servicing

Goods movement is generally restricted to the Highways and Arterials in Revelstoke and there is an adequate network to accommodate those needs. However, formalizing the truck routes on a map that also includes truck parking and fueling locations is recommended.

ACTION 4-10: Develop a formal truck route map that includes truck parking and fueling locations.

4.6 Wayfinding and Parking Accessibility

As identified in the existing conditions, the colouring and font of some street signs within Revelstoke may be challenging to read for the visually impaired. Street signage could be improved by using higher contrast colours and more easily legible fonts.

In terms of public and private parking stalls, It is recommended that accessible parking stalls should include both vertical signage and the painted symbol of accessibility on the ground. The vertical signage increases visibility, especially during the winter when snow clearing may obstruct the pavement markings. References to “handicap” should also be replaced with new signs that use the term “accessible”. Accessible parking area should have the boundary areas clearly marked. The boundary is important for accessible users as many accessible stalls are curbside and do not have the usual definition that stalls in regular parking lots entail. In the absence of the boundary, the designated area could be encroached upon, making it no longer accessible.

ACTION 4-11: Revise accessible parking stall standards to include: vertical signage, “accessible” (not handicap) language, and clearly marked stall boundaries.

4.7 Summary / Project List

4.7.1 CURRENT PROJECTS

The City of Revelstoke, as with any municipality, continuously has capital projects either in the planning, design or construction phase. So that this TMP doesn't recommend projects that have already been committed to and to identify current project opportunities at the planning or early design phase that can be leveraged for advance easier to implement (e.g. pavement markings and signage) bicycle and pedestrian improvements. A list of current projects underway is provided below:

- School Improvement Plan (Arrow Heights School and Columbia Park School) – Sidewalks, bus pull outs, crosswalks, and curb and gutter installation.
- Airport Way multi-use pathway from McKinnon Road to Nichol Road (east side)
- Nichol Road multi-use pathway from Park Avenue Way to Hay Road (south side)
- Nichol Road –sidewalk Park Street to Hay Road (north side)
- Hay Road – sidewalk Hay Road to 350 m north
- Camozzi Road multi-use pathway Hay Road/Nichol Road to Revelstoke Mountain Resort

4.7.2 RECOMMENDED MAJOR INFRASTRUCTURE PROJECTS

Major recommended projects to complete the multi-modal transportation network that require high capital costs to complete and may require either Federal, Provincial or other stakeholders (e.g. CPR) to undertake either because of jurisdiction and/or funding needs are listed in Table

Table 4.8: Major Infrastructure Costs (Bridge Connections)

Improvement	Assumptions	Cost Estimate
Highway 1 / Columbia River Bridge	Cantilever 3m Additional for MUP expansion. 290m length.	$6.5 million
Big Eddy Bridge (multi-use and emergency only)	New timber decking. 4m width. 330m length	$650,000
Fourth Street (4th St) / Illecillewaet River Bridge	Replacement. 12m width. 80m length.	$11.5 million
New Illecillewaet River Bridge (multi-use and emergency only)	New Bridge. Location TBD. 8m width, 70m length.	$6.7 million
TOTAL (BRIDGES)		**$25.4 million**

4.7.3 COST ESTIMATING ASSUMPTIONS

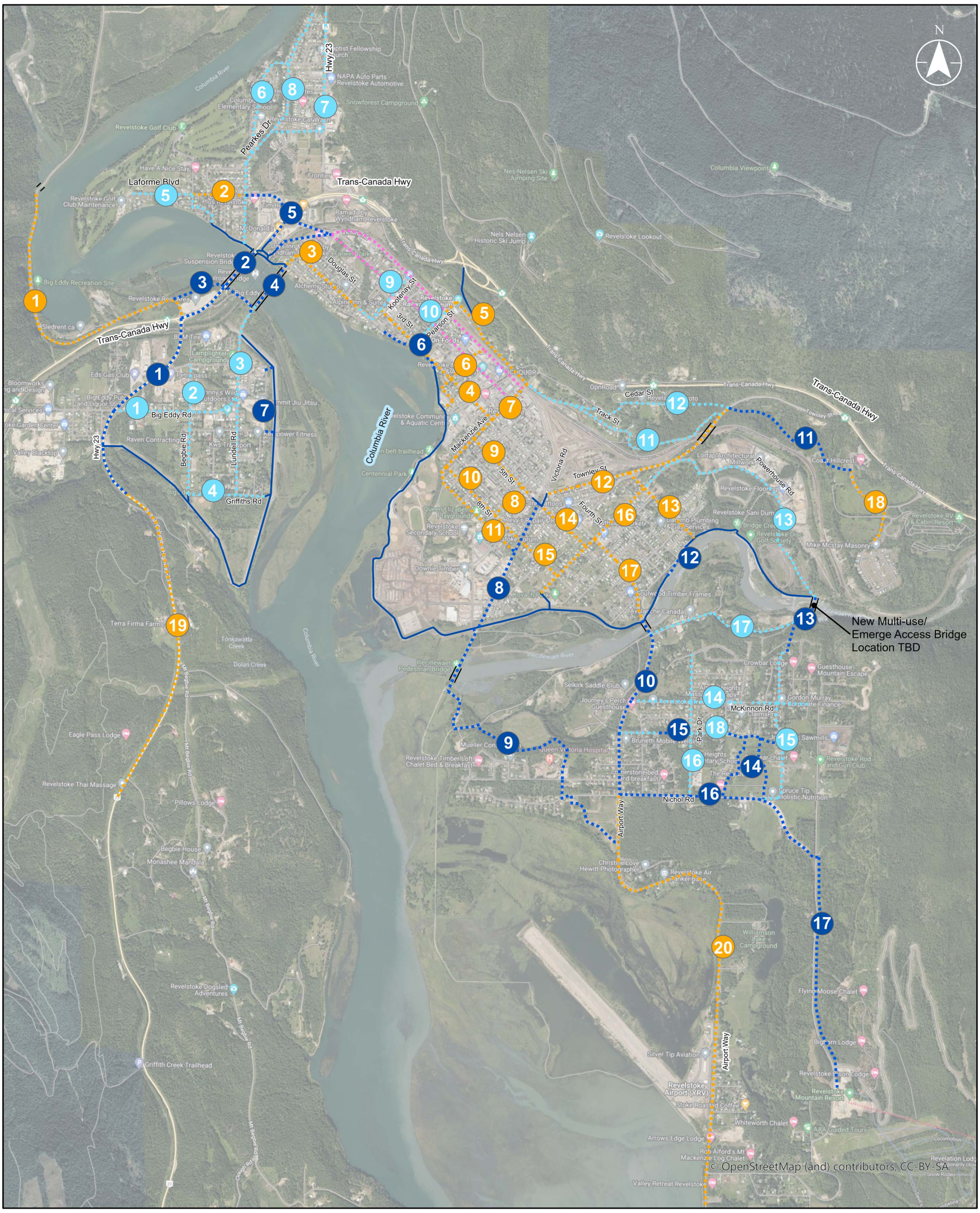
At the Transportation Master Planning stage, cost estimation is not very precise, but provides a good starting point from which to refine capital costs through concept or functional design. Accounting for base and paving materials, signage, and pavement markings, the unit costs used for estimating TMP project costs are shown in **Table 4.9**.

Table 4.9: Facility Unit Costs

Facility/Improvement	Assumptions	Unit Cost
On-Street Walkway Space	Pavement markings, signs.	$20 / l.m.
On-Street Multi-Use Space	Pavement markings, signs.	$20 / l.m.
On-Street Shared Bike Lane (Local Street)	Sharrow symbols, signs.	$20 / l.m.
On-Street Bike Lane (Collector Street)	Signs, bike symbols, lane line, buffer space.	$40 / l.m.
On-Street Protected Bike Lane (Arterial Street)	Signs, conflict markings, delineator posts, buffer space, line painting.	$100 / l.m.
Off-Street Multi-Use Pathway	Grading, gravel, pavement, signage, paint.	$230 / m^2 (3m width)
Intersection Improvements	See Table 4.14	$20k to $300k per intersection (~$60k/each)
MUP Bridge Improvements	3m structural cantilever for 4m clear asphalt path (assumes no structural or geotechnical improvements to the existing bridge. This will need to be confirmed prior to implementation)	$5k / m^2
MUP Bridge Improvements – Timber	Adding 4m timber deck to existing steel grate deck.	$320/ m^2
New Bridge	Bridge costs vary widely, but general cost is between $6k and $10k / sq metre.	8k / m^2 (+50% contingency)

4.7.4 RECOMMENDED BIKEWAYS & MULTI-USE PROJECTS

Bikeways and multi-use projects have been grouped into three types as shown in **Figure 4.24**: multi-use pathways (dark blue), on-street multi-use space (light blue) and on-street bikeways (orange).



LEGEND

- Existing Multi-user Pathway
- 1 Proposed Multi-user Path & Project #
- 1 Proposed On-street Multi-use & Project #
- 1 Proposed On-street Bikeway & Project #
- 1St Street / Victoria Avenue Bikeway Evaluation

0 250 500 750 1,000 metres

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4.7.4.1 Bikeway Projects

The bikeway projects in **Figure 4.24** are summarized by location, street classification, length and cost in **Table 4.10.** The project numbers can be cross referenced between the Figure and Table.

Table 4.10: Recommended Bikeway Projects

Project No.	Street	From	To	Facility Type	Length	Cost Est.
1	Westside Road	Highway 1	Jordan River Bridge	Bike Lane/Shoulder	1.98 km	$79,400
2	Laforme Blvd	Pearks Drive	Columbia Dr	Bike Lane	0.34 km	$4,500
3	Douglas Street	Wilson St	Kootenay St	Bike Lane	0.63 km	$25,300
4	3rd Street	Kootenay St	Mackenzie Av	Bike Lane	1.01 km	$39,100
5	Track Street	Long Av	Mackenzie Av	Bike Lane	0.80km	$30,400
6	Boyle Ave & Fourth Street (4th St)	Fourth St	Victoria Av	Shared Lane & Bike Lane	0.54 km	$17,100
7	Mackenzie Blvd	Track St	8th St	Bike Lane	0.75 km	$30,200
8	Vernon Avenue	5th St	8th St	Shared Lane	0.23 km	$5,200
9	5th Street	Mackenzie Ave	Victoria Rd	Shared Lane	0.50 km	$10,300
10	8th Street	Orton Ave	Victoria Rd	Bike Lane	0.72 km	$29,100
11	9th Street	Mackenzie Ave	Rail Trail	Shared Lane	0.74 km	$14,700
12	Townley Street	Cedar St	Victoria Rd	Protected Bike Lane	1.34km	$133,700
13	Oscar Street	Townley St	Maplewood St	Bike Lane	0.60 km	$24,000
14	5th Street	Victoria Rd	Edward St	Shared Lane	0.37 km	$7,500
15	8th Street	Victoria Rd	Edward St	Bike Lane	0.29 km	$11,600
16	Edward Street	Oscar St	Willow St	Bike Lane	0.96 km	$35,300
17	Fourth Street (4th St)	Victoria Rd	Illicillewaet River	Protected Bike Lane	0.64 km	$64,300
18	Johnson Way	Oak Dr	Johnson Ave	Shared Lane	0.61 km	$12,300
19	Highway 23	Big Eddy Greenway	Mt. Begbie Rd	Protected Bike Lane/Shoulder	2.15 km	$214,700
20	Airport Way	Nichol Rd	Airport	Protected Bike Lane/Shoulder	8.31 km	$830,500
TOTAL					**23.5 km**	**$1.62M**

4.7.4.2 On-Street Multi-Use Projects

The on-street multi-use projects in **Figure 4.24** are summarized by location, facility type, length, and cost in **Table 4.11.** The project numbers can be cross referenced between the Figure and Table.

Table 4.11: Recommended On-Street Multi-Use Projects

Project No.	Street	From	To	Facility Type	Length	Cost Est.
1	Big Eddy Road	Lundell Rd	Highway 23	Designated space	0.85 km	$17,000
2	Lundell Rd	Big Eddy Bridge	Griffiths Rd	Designated space	0.84 km	$17,000
3	Begbie Rd	Nixon Rd	Griffiths Rd	Designated space	1.25 km	$25,000
4	Griffiths Rd	Begbie Rd	Big Eddy Greenway	Designated space	0.49 km	$10,000
5	Laforme Blvd	Columbia Park Dr	Hamilton Dr	Designated space	0.68 km	$14,000
6	Colbeck Rd	Pearkes Dr S	Pearkes Dr N	Designated space	0.73 km	$15,000
7	Highway 23	Cleland Rd	Pearkes Dr	Designated space	1.11 km	$22,000
8	Pearkes Dr	Allen Rd	Highway 23	Designated space	1.63 km	$33,000
9	Kootenay St	Douglas St	Victoria Rd	Designated space	0.48 km	$10,000
10	Pearson St	3rd St	Victoria Rd	Designated space	0.26 km	$6,000
11	Track St	Mackenzie Av	Townley St	Designated space	1.17 km	$23,000
12	Cedar St	Track St	Townley St	Designated space	1.39 km	$28,000
13	Powerhouse Rd	Oscar St	New Bridge	Designated space	1.79 km	$36,000
14	McKinnon Rd	Airport Way	Galt Cr.	Designated space	1.05 km	$21,000
15	Hay Rd	Nichol Rd	Melnyk Rd	Designated space	1.12 km	$22,000
16	Park Drive	Prail Rd	Nichol Rd	Designated space	0.92 km	$18,000
17	Illecillewaet Rd	Airport Way	New Bridge	Designated space	1.01 km	$20,000
18	Arrow Road	Park Drive	Forest Drive	Designated space	0.53 km	$11,000
TOTAL					**17.33 km**	**$348,000**

4.7.4.3 Multi-Use Pathway Projects

The multi-use pathway projects in **Figure 4.23** are summarized by location, facility type, length and cost in **Table 4.12.** The project numbers can be cross referenced between the Figure and Table.

Table 4.12: Recommended Off-Street Multi-Use Pathway Projects

Project No.	Location	From	To	Facility Type	Length	Cost Est.
1	Highway 23	Highway 1	Big Eddy Greenway Trail	MUP (adjacent)	1.34 km	$960,000
2	Highway 1	Highway 23	East side of Bridge	MUP (adjacent)	0.37 km	$260,000
3	Big Eddy Greenway	Big Eddy Rd	West Side Rd	MUP (new alignment)	0.62 km	$430,000
4	Big Eddy Bridge	Wilson St	Big Eddy Rd	MUP (new timber on existing bridge)	0.33 km	Included in Bridge Costs
5	Laforme Bv/Victoria Rd	Multiple connections to Hwy 1/Victoria Rd Intersection		MUPs (adjacent)	1.24 km	$860,000
6	Riverfront Path	Charles St	Garden Ave	MUP (new alignment)	0.44 km	$300,000
7	Greenway Connections	At Nixon Rd & Illinisky Rd		MUP (new alignments)	0.20 km	$140,000
8	Mill Spur Rail Trail	5th Street	Victoria Heights	MUP (new surface, exist ROW)	1.37 km	$940,000
9	New Greenway	Illecillewaet Pedestrian Bridge	Airport Way	MUP (new surface)	2.01 km	$1,380,000
10	Airport Way	Illecillewaet Bridge	Nichol Rd	MUP (adjacent)	1.09 km	$750,000*
11	New Connector	Townley St	Oak Drive	MUP (new)	0.97 km	$670,000
12	Riverfront Missing Connection	Oscar St	Carlson St	MUP (new)	0.24 km	$160,000
14	New Illecillewaet Bridge Connector	New Bridge	Birch Drive	MUP (new alignment)	0.43 km	$290,000
15	Nichol Rd	Airport Way	Camozzi Rd	MUP (adjacent)	1.47 km	$1,020,000*
16	Mckenzie Village Connectors	Arrow Drive	Nichol Rd	MUP (new alignments)	1.24 km	$860,000
17	Camozzi Rd	S of Nichol Rd	Resort	MUP (adjacent)	1.52 km	$1,050,000*
TOTAL					**15.14 km**	**$7.25 million**

**Already Funded Projects.*

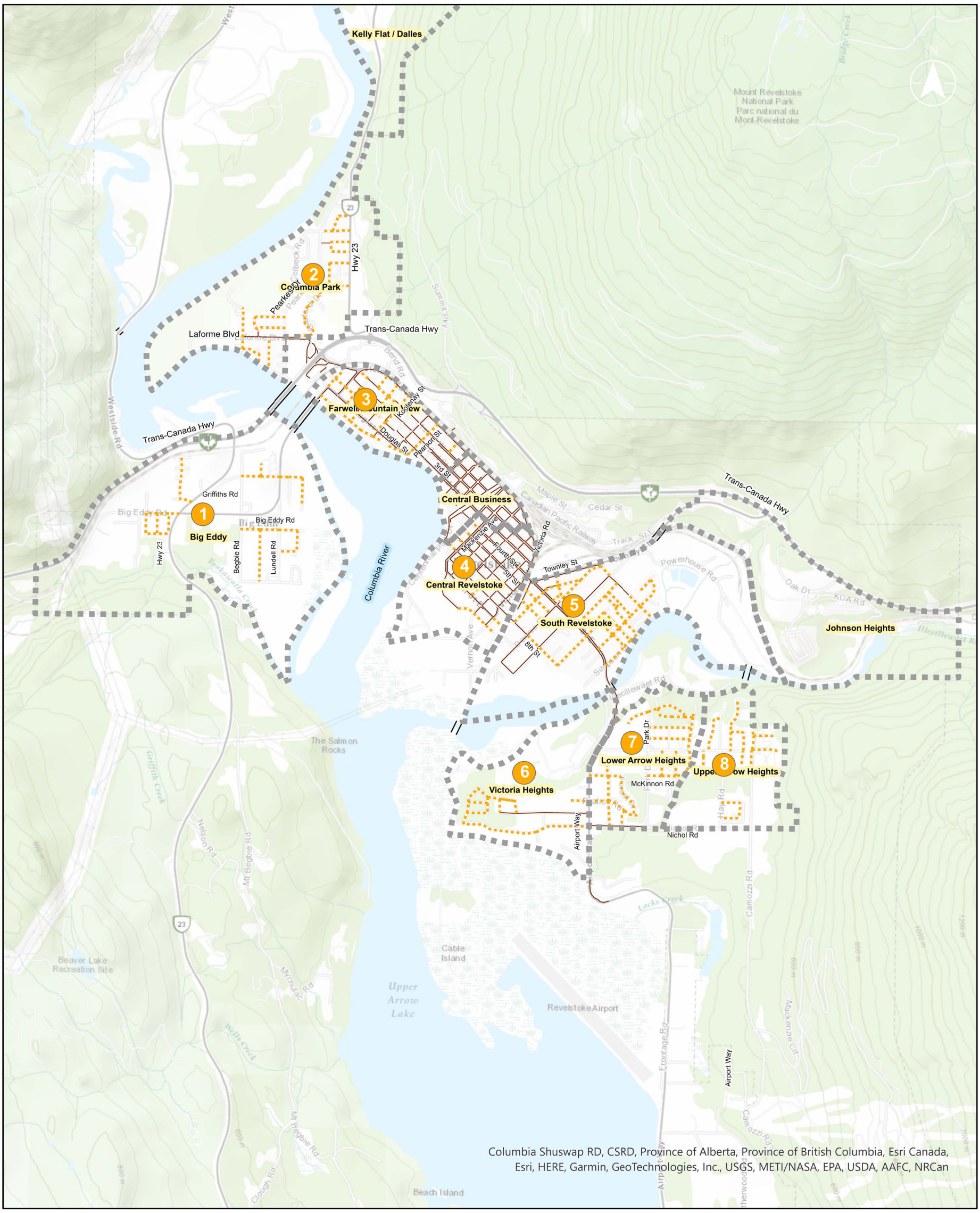
4.7.5 WALKWAY SPACE (ON-STREET)

On-street walkway space is similar in design to on-street multi-user space except it is only required to accommodate pedestrians (typically because these are local roads and bicycles can share the driving lanes). Because there are so many of these recommended segments and it makes sense to deploy these at a community scale, they have been grouped by community into a single project. These community projects are shown in **Figure 4.25**.

The multi-use pathway projects in **Figure 4.25** are summarized by location, facility type, length and cost in **Table 4.13.** The project numbers can be cross referenced between the Figure and Table.

Table 4.13: Recommended On-Street Walkway Projects

Project No.	Community	Facility	Length	Cost Est.
1	Big Eddy	On-street walkways	3.36 km	$67,000
2	Columbia Park	On-street walkways	3.41 km	$68,000
3	Farewell/Mountain View	On-street walkways	3.40 km	$68,000
4	Central Revelstoke	On-street walkways	1.07 km	$21,000
5	South Revelstoke	On-street walkways	5.99 km	$120,000
6	Victoria Heights	On-street walkways	2.61 km	$52,000
7	Lower Arrow Heights	On-street walkways	4.68 km	$94,000
8	Upper Arrow Heights	On-street walkways	2.56 km	$51,000
TOTAL			**27.1 km**	**$541,000**



LEGEND

- Proposed Walkway (1 = Project Number)
- Existing Sidewalk
- Community Boundary

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4.7.6 INTERSECTION IMPROVEMENTS

4.7.6.1 Active Modes/Accessibility Improvements

Pedestrian Crossings & Accessibility

Several intersections in Revelstoke have pedestrian crosswalks where traffic volumes are high, but they either have poor pavement marking visibility (e.g. worn parallel lines), are very long (e.g. up to 4 travel lanes in width with no refuge), have poor night-time lighting, or do not have pedestrian crossing controls. In an effort to give pedestrians a higher priority in Revelstoke, crossings need to be engineered to look and feel safe.

Bicycle/Multi-Use Crossings

The proposed bicycle network needs to cross major roads at intersections. To do this safely, signage, pavement markings and cross-bikes (similar to crosswalks) need to be implemented. Where bicycle/vehicle conflicts are a concern (e.g. intersections, commercial driveway crossings), green conflict road markings are a recommended application for protected and unprotected bike lanes. Where pedestrians and cyclists are using the same crossing (e.g. a multi-use pathway is crossing an intersection), a multi-use crossing treatment (combination of crosswalk and crossbike pavement markings) should be used.

4.7.6.2 Operational Improvements

There are several intersections in Revelstoke that have atypical or oversized designs that may have adverse impacts on their operation, particularly for pedestrians. Two such intersections recommended for improvement:

- Highway 23 @ Big Eddy Road (skewed intersection with existing south crosswalk)
- Victoria Road/Laforme Boulevard @ Fraser Drive (skewed intersection on a curve with west crosswalk)

The recommendation for both intersections is to modify the geometry without major civil works. This can be accomplished by narrowing corner radii and street width and redefining the boundaries of the intersections with measures such as delineator posts and paint lines. This helps to slow turning speeds and reduce pedestrian crossing distances.

Improvements at other intersections to provide safe connections for users of the proposed active transportation network are also recommended in **Table 4.14**.

Table 4.14: Recommended Intersection Improvements

Intersection	Existing Image	Recommended Improvements	Cost Est.*
TCH / Hwy 23-Westside Rd		Geometric changes to right lane ramps. Pedestrian and multi-use crossing treatments at approach legs and right lane ramps. Ped/bike push button to get across Hwy 1.	$450k

Intersection	Existing Image	Recommended Improvements	Cost Est.*
Hwy 23 / Big Eddy Road		Geometric improvements to narrow or tighten intersection and shorten pedestrian crossing. This could be in the form of delineator posts and paint lines.	$100k
Victoria Rd/Laforme Blvd@ Fraser Dr		Geometric improvements to narrow or tighten intersection and shorten pedestrian crossing. This could be in the form of delineator posts and paint lines.	$100k
TCH @ Victoria Rd		Pedestrian and/or multi-use crossings at all 4 intersection legs and right turn ramps. Consider RRFB installation at right turn ramps. Tactile surface treatment at all ramps. Ped/Bike push buttons. Check lighting levels over crosswalks.	$500k
Victoria Rd @ Pearson St/Long Av		Reduced crossing width of Victoria Avenue (curb extension or medium refuge). Convert pedestrian crossing to multi-use crossing.	$100k
Victoria Rd @ Rokeby Av		Geometric changes or introduction of a pedestrian refuge (median). Enhanced (ladder style) pedestrian crossing markings.	$100k

Intersection	Existing Image	Recommended Improvements	Cost Est.*
Campbell Av @ Victoria Av		Introduction of a pedestrian refuge. Enhanced (ladder style) pedestrian crossing markings.	$50k
Campbell Av @ 1St St		Enhanced (ladder style) crosswalks all legs. Introduce pedestrian refuges for crossing Campbell. Consider skip lines for left turning vehicles.	$100k
Campbell Av @ 2nd St		Enhanced (ladder style) crosswalks all legs. Introduce pedestrian refuges for crossing Campbell. Consider skip lines for left turning vehicles.	$100k
Campbell Av @ 3rd St		Enhanced (ladder style) crosswalks all legs. Introduce pedestrian refuges for crossing Campbell. Consider skip lines for left turning vehicles.	$100k
Campbell Av @ Fourth St		Enhanced (ladder style) crosswalks all legs. Introduce pedestrian refuges for crossing Campbell. Consider skip lines for left turning vehicles.	$100k
Victoria Rd @ Mackenzie Av		Reduced crossing width of Victoria Avenue (curb extension or medium refuge). Convert pedestrian crossing to multi-use crossing.	$100k

Intersection	Existing Image	Recommended Improvements	Cost Est.*
Mackenzie @ 8th Street		Bike lane signage/pavement markings. Multi-use crossing treatment across Campbell.	$40k
Victoria Rd @ 8th Street		E-W multi-use crossing pavement markings. Consider flipping 2-way stop to N-S (to give E-W priority)	$40k
TOTAL (INTERSECTION IMPROVEMENTS)			**$1.98 million**

**These high-level conceptual construction cost estimations have been provided based on historical cost averages up to 2021. At the time this document was prepared the industry was experiences major infrastructure price increases in the order of 30%+ with impacts from inflation, international conflict, labour shortages and other impacts. It is unknown if these recent price increases are temporary or may be sustained long term, with some expectation that pricing may normalize in the coming years. Considering this TMP is for long term planning, the conceptual estimates provided would be considered averages based on 2021 pricing and do not account for recent price spikes which may be temporary in nature. However, the City may want to add 30% to the values shown if conservative estimations are desired to account for recent market price spikes.*

These high-level conceptual construction cost estimates include construction cost values only, when budgeting the City should also include non-construction related costs to be added in addition to what is shown including design, administration, potential land acquisition, stakeholder engagement, environmental mitigation, etc. To develop accurate budgeting for each of the items in the Table below a feasibility study or preliminary design efforts would be required.

5 PREPARING FOR THE FUTURE

The previous sections have dealt with the infrastructure improvements to improve and expand Revelstoke's transportation network. In support of these physical improvements are also policy changes and future transportation trends. This section aims to both prepare Revelstoke for upcoming changes and services as well as highlight areas where new policies or additional studies would be appropriate to add value to the TMP.

5.1 Emerging Tech

The transportation industry is continually innovating and changing. Recent trends in smart mobility and electric vehicles may represent an opportunity for Revelstoke to further enhance their network. The discussions below aim to inform the City and help them be prepared for upcoming changes and trends. This will provide the residents and visitors with new opportunities as well as attempt to "future-proof" the TMP.

5.1.1 SMART MOBILITY

The emergence of new technologies and new approaches to transportation is broadly categorized as Smart Mobility. More broadly, we recognize that Smart Mobility as a practice is one that builds more resilience and equitable communities through less dependence on one mode of transportation, and effective information use in planning and delivery.

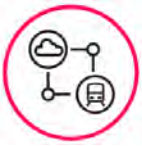
To evaluate the readiness for Smart Mobility and direct investment, the framework uses six domains which interrelate and overlap. Within each domain, there are several metrics to get a 'full picture'. The domains used to evaluate the readiness are:

Diversity, Equity, Safety, and the Environment – evaluates physical infrastructure

Roadway System Efficiencies – evaluates the operations of transportation infrastructure

Travel Demand Management and Access to Travel Information – evaluates the availability and accessibility of information

Data Sharing and Privacy – evaluates the infrastructure necessary for the operation of a digital transportation framework



Interoperability / Communications Across and Between Modal Networks and Communities – evaluates the flexibility of the digital domain across transportation networks.

Planning and Governance – evaluates the people and funding frameworks in place to support Smart Mobility.

The Readiness Assessment Tool establishes a set scale of 1-5, where each number aligns with the sate of readiness as shown in **Figure 5.1**. Through an understanding of policy direction, and meetings with key people who are working in this area, targets are established. The targets are meant to identify where the system believes it is going or is. Where a gap is greatest between the targets and the actual score there are opportunities for meaningful investment to meet the policy or political aims.

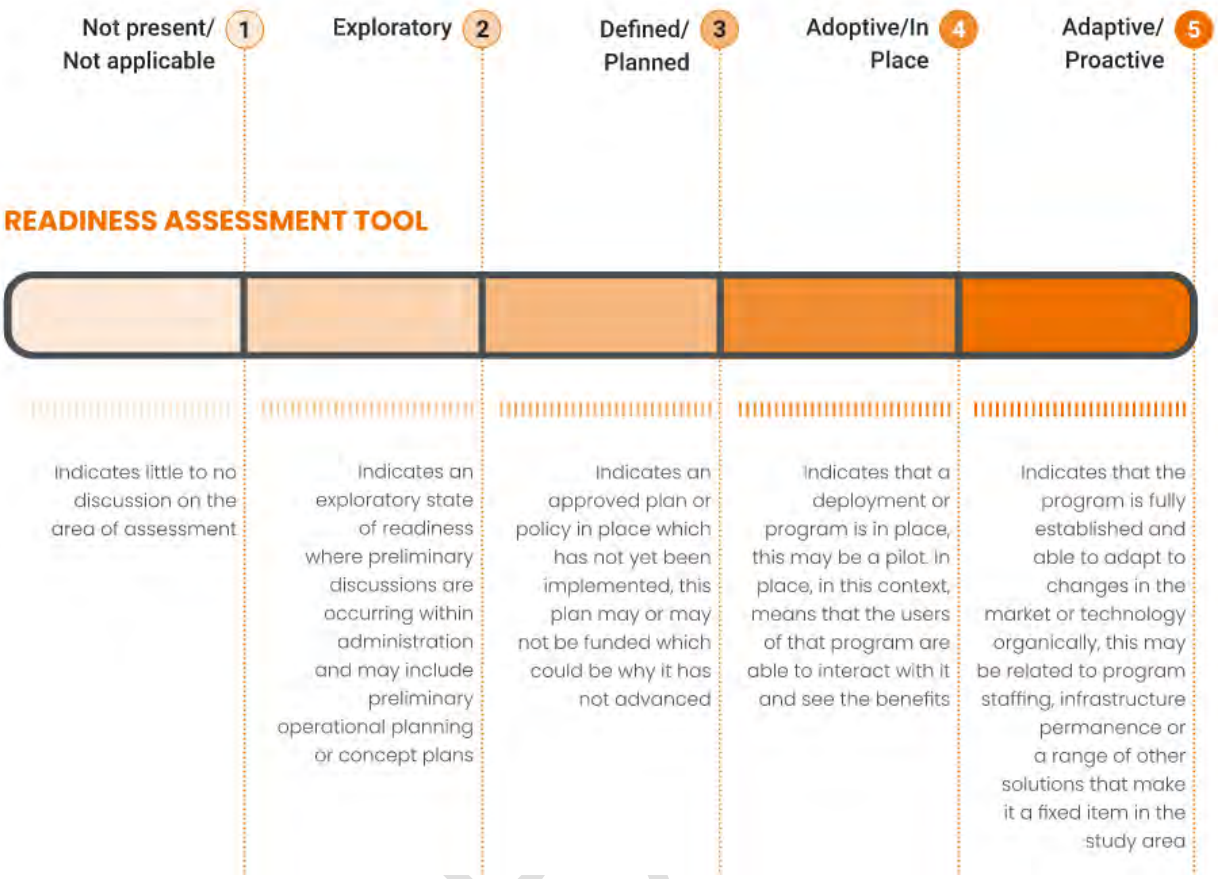


Figure 5.1: Smart Mobility Readiness Assessment Tool Scoring

Table 5.1 provides a summary of the comparison between the Target Level and the Assessed Maturity Level. While the green shading indicates close alignment between target levels and assessed maturity levels, yellow indicates some areas for improvement to achieve target levels.

Table 5.1: Community Smart Mobility Readiness Summary

CATEGORY	METRIC	TARGET LEVEL	ASSESSED MATURITY LEVEL
Diversity, Equity, Safety and the Environment	1 - Not present/Not Applicable 2 - Exploratory 3 - Defined/Planned 4 - Adoptive/In Place 5 - Adaptive/Proactive	4	2.44
Roadway System Efficiencies	1 - Not present/Not Applicable 2 - Exploratory 3 - Defined/Planned 4 - Adoptive/In Place 5 - Adaptive/Proactive	2	1.38
Travel Demand Management and Access to Travel Information	1 - Not present/Not Applicable 2 - Exploratory 3 - Defined/Planned 4 - Adoptive/In Place 5 - Adaptive/Proactive	2	1.83
Data Sharing and Privacy	1 - Not present/Not Applicable 2 - Exploratory 3 - Defined/Planned 4 - Adoptive/In Place 5 - Adaptive/Proactive	1	1.33
Interoperability/Communications Across and Between Modal Networks and Communities	1 - Not present/Not Applicable 2 - Exploratory 3 - Defined/Planned 4 - Adoptive/In Place 5 - Adaptive/Proactive	1	1.4
Planning and Governance	1 - Not present/Not Applicable 2 - Exploratory 3 - Defined/Planned 4 - Adoptive/In Place 5 - Adaptive/Proactive	5	3.25

A full Smart(er) Mobility Readiness Assessment report is provided in **Appendix E**.

5.1.2 MICROMOBILITY INTEGRATION

The City has identified potential opportunities to providing micromobility services to residents and visitors. Micromobility is most often understood to include bike share (both e-bike and conventional) and e-scooters. The services and designs have expanded internationally to include a range of other technologies, including sit down scooters, cargo bikes, and small golf cart similar vehicles. These are provided in a shared format for a fee to access, generally $/min unlocked. The audience for Micromobility targets those users that take short trips with varying requirements, which often results in a car trip or no trip at all. These trips may range in purposes from trips to work or schools, first-last mile trips that enable users to leave their car in one spot and travel, or recreational trips which enable greater enjoyment of the City pathway system. At their core

the service offered is eco-friendly, which a lower carbon and space requirements, equitable through universal comparatively inexpensive costs and flexible. Micromobility serves a growing market demand, fed by the decreasing cost of the hardware and programs. The North American Bikeshare & Scooter Association identifies that trips made by e-bike increased from 7 million in 2019 to almost 10 million in 2020.

The City has an opportunity for Micromobility create additional transportation options which reduces reliance on the Car, acknowledging that the market is small and low density so any system would need to serve both residents and visitors. The system would likely be to small to operate without private and public subsidy however the opportunity to provide a strong community link serving businesses, the resort and the pathway network would be a strong value proposition. Initial evaluation suggests that a system would likely benefit from being primarily electric assist (bikes, cargo bikes and scooters), using a hub or docking station at key locations in the community which serve residents (eg. Victoria Rd. and Campbell Ave) key pathway access/car parking locations and the resort. This service would be provided by a private company through a public tender for service.

5.1.3 ELECTRIC VEHICLE CHARGING STATION STRATEGY

The global pressures to reduce dependence on fossil fuels, combined with the costs of operating Internal Combustion Engine (ICE) vehicles has increased the market presence of Electric Vehicles (EV's). Currently the market is comparatively small of light duty vehicles, the Government Canada has a targeted 10% of new vehicle sales as electric by 2025. To make the transition viable the supporting charging network is already being deployed and the City is well positioned to capitalize on this transition. In August of 2022, there are nine existing or planned chargers serving the range of vehicle types. This demonstrates that the core of the service is organically responding to the market requirement, however; by leaving this deployment to market demand is underserves the residential or local business demands.

The opportunity created here is to support the change of behaviour that is possible through EV charging. Since charging takes longer than the filling of fuel for an ICE it provides an opportunity to generate short activity in public spaces, for example supporting activities like and coffee shops in the City. Where possible the EV chargers should be provided in public parking, including on street, so generate this opportunity. This is importantly tied to the availability and capacity of electrical utilities, which are necessary for implementation. To this end there is an opportunity to identify quick deployment areas which serve companies installation of EV parking.

Recommendations to support EV charging:

- Provide global utility mapping identifying 'quick win' locations of installation based on infrastructure
- Invest in public EV charging at key business and community locations which will support the 20minute charging and associated public activity.
- Define a process, and costing for, private company EV charging
- Update parking requirements to mandate EV parking installed in public parking locations and preserved for new private development.

ACTION 5-1: Develop a program to support EV charging including mapping locations, investing in public EV charging at key locations, defining a process/costing for private company EV charging, and updating parking requirements to require EV designated locations.

5.2 Policy/Future Study Recommendations

There are several areas that cannot be assessed in the required detail within this high-level TMP. Adoption of or revisions to existing polies will provide guidance and consistency for various areas of transportation. Additionally, there are several topics that would benefit from additional investigation and planning that builds off the TMP.

5.2.1 TRAFFIC CALMING AND SPEED MANAGEMENT

5.2.1.1 Traffic Calming

The Canadian Guide to Traffic Calming (ITE & TAC 2018) defines Traffic Calming as the broad term used to describe the process and measures applied by road authorities to address concerns about the behaviour of motor vehicle drivers travelling on streets within their jurisdiction. The concerns are typically about either speeding and/or shortcutting traffic and the associated perceived and real safety concerns posed by this behaviour. The intent of traffic calming is to achieve driver behaviours that are appropriate within the context of a road's intended use or environmental conditions.[1]

A simpler definition from the Institute of Transportation Engineers (ITE) defines Traffic Calming as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users".[1]

Traffic calming measures come in three main forms – vertical deflection measures, horizontal deflection measures, and signage (e.g., permanent posted speeds, special zones, or automated speed displays). Vertical deflection measures are typically more effective as they require vehicles to slow down to traverse the measure while horizontal deflection measures are slightly less effective. An example of each is shown in **Image 5.1** and **Image 5.2.**

[1] Source: Canadian Guide to Traffic Calming, 2018 (ITE, TAC)

Image 5.1: Traffic Button

Image 5.2: Speed Hump

Speeding in Revelstoke is observed generally on its Arterial Roads (e.g., Fourth Street (4th Street), Airport Way). Traffic calming measures should be focused on this road classification and any collector roads that are experiencing speeding. Additionally, driver education and targeted enforcement are recommended short-term strategies until traffic calming measures can be implemented.

Generally developed for larger municipalities, a traffic calming policy allows a City to determine what areas of the community need traffic calming, how to prioritize the needs and have a formal procedure that is able to be applied consistently. In the absence of a policy, the following provides some general guidance when implementing traffic calming measures.

General Implementation Guidelines

There is no single "best" solution when implementing traffic calming and can be applied based solely on objective criteria. A combination of local knowledge, technical expertise, and experience must be applied to determine the best measure or combination of measures. There are five principles that will help create an effective plan and build community acceptance. They are:

1. **Identify and Quantify the Real Problem** – collect data to determine the type and extend of the traffic problems
2. **Consider Area Wide Solutions** – solving a traffic problem on one street may move the problem to a neighbouring street. Look at the context of the area.
3. **Avoid Restricting Access** – closures, diverters and other barriers may create access issues for residents, emergency service providers, and large city service vehicles
4. **Consider All Potential Impacts** – consider the needs of emergency vehicles, transit, bicycles, visually impaired, maintenance, local access, parking, street sweeping/snow removal, and police enforcement.
5. **Monitor and Follow-Up**- perform follow-up evaluations to determine effectiveness of traffic calming measures and public acceptance after implementation

When traffic calming is requested by a complaint, the following steps should be taken. A Traffic Calming Policy will expand on these steps and identify the Traffic Calming Criteria and appropriate traffic calming measures to implement in Revelstoke.

Step 1 – Is the Road an Appropriate Candidate for Traffic Calming Based on Traffic Calming Criteria?

Step 2 – Request a Petition from the Neighbourhood

Step 3 – Consider the Road in Context

Step 4 – Develop Two Concept Plans

Step 5 – Present the Options to Stakeholders (including a Pilot program)

Step 6 – Integrate Feedback, Evaluate Options

Step 7 – Council Approval

ACTION 5-2: Adopt these Traffic Calming Guidelines as an interim measure until community growth and traffic complaints warrant the development of a more comprehensive Traffic Calming Policy.

5.2.1.2 Speed Management

Traffic calming is closely linked to speed management, which is typically addressed at the policy level from agency to agency. Speed management practice is evolving in Canada and globally to better reflect the Vision Zero approach and fatality risk by road type. Many agencies are currently implementing lower posted speed limits, including modifying the default posted speed limit, than those recommended by traditional practice. Traditional speed management practice relies on the relationship between design speed, posted speed, and operating speed, with a particular focus on percentile speeds observed in operational data. For example, an existing posted speed limit can be reviewed for suitability if it is within 10 km/h of the 85th percentile of operational speeds. This presents a feedback loop that can result in undue increases to the posted speed limit. As a different approach, Safe System Speeds represents an emerging approach to speed management and establishing posted speed limits, while also fitting in the Safe Systems approach. The Safe Speeds approach was developed to minimum the risk of fatal and injury collisions though analysis of the potential for specific collision configurations to occur based on the road characteristics, as well as consideration of biomechanical injury thresholds and other collision dynamics. Application of Safe Systems Speeds in the Canadian context results in the following recommended posted speed limits shown in Error! Reference source not found..

Table 5.2: Safe Systems Speeds (2016)

Road type	Posted Speed Limit [km/h]
Roads with a mix of motorized and unprotected road users (i.e., pedestrians and cyclists)	30
Roads with uncontrolled access where Right Angle collision can result	50
Undivided roads where Head On collision can result	70
Controlled access facilities with a physical median separation, where at-grade access and non-motorized road users are prohibited	100+

Source: Extracted from Table 9 of the Transportation Association of Canada Speed Management Guide (2016)

It is worthwhile to recognize the importance of roads with 'self-explaining' or 'self-enforcing' when considering policy-level implementation of Safe Speeds or considering traffic calming measures at the site-level. The City may need to evaluate other solutions along with traffic calming and posted speed limit reductions, including roadside changes, driver education, and targeted enforcement.

In the interest of safe system speeds, allowing the shared use of users on local streets, and aligning with a Vision Zero approach, it is recommended that the City of Revelstoke revised its posted speed limits as follows:

- Arterials: 50 km/hr
- Collectors: 40 km/hr
- Locals: 30 km/hr

ACTION 5-3: Initiate a program to revise the posted speed limits on Collector Roads to 40 km/hr and Local Roads to 30 km/hr. This will require review of the latest BC Motor Vehicle Act, City of Revelstoke Bylaws 1846 and 1400 and the most economical implementation approach to signing.

5.2.2 ROUNDABOUT IMPLEMENTATION

The City of Revelstoke currently has 3 roundabouts within city limits:

- Nichol Road & The McKenzie Village Access
- Victoria Road & Townley Street
- Victoria Road & Wright Street

Properly designed and implemented, roundabouts operate safer than convention intersections (signals, two and four way stops) due to reduced speeds and significantly less conflict points. A convention intersection has 32 conflict points compared to 8 for a roundabout. Collisions in roundabouts are typically side swipes or right turn collisions which are typically less severe than other types (head on, left turn, etc). The lower speeds on the approach and through a roundabout also reduce the severity of collisions and allow for cyclists to safely integrate with vehicles.

Roundabouts are better able to adapt to time of day traffic compared to a traffic signal. Less stop and go traffic (more free-flow) means less CO2 emissions compared to vehicles idling at intersections. Roundabouts do not function well within a signalized corridor where the roundabout is between signalized intersections within 200 m spacing.

Roundabouts allow for crosswalk on all legs of the intersection and allow pedestrians to cross one lane of traffic at a time with a splitter island refuge to stop and observe the next lane of traffic; as shown on **Image 5.3**. Cyclists are accommodated by integrating with the vehicle traffic, which is travelling at speeds similar to the cyclists while travelling through the roundabout.

Roundabouts are typically more expensive to implement than traffic signals during construction; however, typically long term maintenance costs are lower (no need for power and signal maintenance costs). Roundabouts are appropriate in areas where snow I prevalent in the winter months and provide an opportunity for turning snow plows. Snow storage requirements need to be a consideration during design.

Image 5.3: Recently Implemented One-Lane Roundabout on Nichol Road

Roundabouts require more right-of-way at the intersection of two roads compared to traffic signals, but typically require less on the approaches as there are no turn lanes. Typical inscribed diameters for single lane roundabouts are between 35m and 46m. For two lane roundabouts, the inscribed diameter ranges from 45m to 60m.

The City of Revelstoke's Subdivision, Development & Servicing Bylaw No. 1846 governs the municipality's current standards around street design.

ACTION 5-4: Amend Schedule 4 (Design Standards) of Revelstoke's Subdivision, Development & Servicing Bylaw No. 1846 and its associated standards to reflect the geometric standards required for the recommended posted speeds, cross-section layout, and minimum user widths as reflected in this Transportation Master Plan.

5.2.3 TRAVEL DEMAND MANAGEMENT

A particularly effective travel demand management strategy is the use of car share or similar programs. As already stated in the OCP, the following action should be undertaken:

ACTION 5-5: Support and encourage the establishment of community car share systems and similar programs.

5.2.4 PARKING MANAGEMENT STRATEGY

A Downtown Parking Strategy was completed in 2018 (see **Figure 3.30**) but with the changing dynamic of parking demand, a review/update of this Strategy should be undertaken to determine if the current time restrictions are appropriate for the current (2022) parking demands. In addition, reductions in the surface parking requirements in the City's Zoning bylaw should be considered to reduce land requirements for parking, promote the use of alternative modes of travel, and repurpose on-street parking space for uses such as bicycle parking, patios, parklets.

ACTION 5-6: Review/update the 2018 Downtown Parking Strategy to determine if the current time restrictions are appropriate for current parking demands.

ACTION 5-7: Consider reductions in the surface parking requirements in the City's Zoning bylaw should be considered to reduce land requirements for parking, promote the use of alternative modes of travel, and repurpose on-street parking space for uses such as bicycle parking, patios, parklets.

5.2.5 ACCESSIBILITY NEEDS INTEGRATION

Universal access allows for freedom of mobility for all residents and visitors to Revelstoke. An accessible transit network provides all users with the opportunity to freely navigate their environment and participate fully in the community. Additionally, universal design meets the needs of more than just persons with disabilities but also seniors, persons with limited mobility, persons with vision loss, parents with strollers, and people using wheeled grocery carts/luggage/etc.

Revelstoke's transportation network incorporates multi-modal systems of access, whether that includes walking, cycling, wheeling, transit, and/or private vehicle use. Removing barriers to transit enables a larger number of people within the population to freely access areas of Revelstoke that may not currently be accessible.

Furthermore, reducing barriers to transit access has the potential to lessen, if not eliminate, the exclusion of individuals lacking economic, culture and entertainment, educational and medical service participation.

Accessible Needs Integration Objectives

- Increase accessibility throughout Revelstoke by integrating accessible features and elements to the city's transit network through the application of Universal Design standards.
- Create accessible bus stops (sheltered, level with bus entrance, etc.) at key sites throughout Revelstoke and area.
- Ensure transit routes provide access to most, if not all, key locations.
- Improving transit wayfinding by providing consistent and high-contrast signage.

Bus Stop Accessibility

- Accessible bus stops will be located at key sites, such as medical services, grocers, educational institutions, assisted living and long-term care residences, support services, arts and entertainment and parks.
- Bus routes will aim to accommodate as many key sites as allowable across the City of Revelstoke.

Aging Population

Statistics Canada data was used to create a visualization of the city's current population (%) as of 2021. As seen in Graph 1, the current population of Revelstoke residents over the working age of 65 years is significant at 13.7% 0r 1,130 people. What's more is the current population from ages 45 to 64 years (outlined in Graph 1) that will be over 65 years of age over the next 20+ years increases dramatically.

This is only one variable that shows the express need for Revelstoke to integrate accessibility into it's Transit Master Plan.

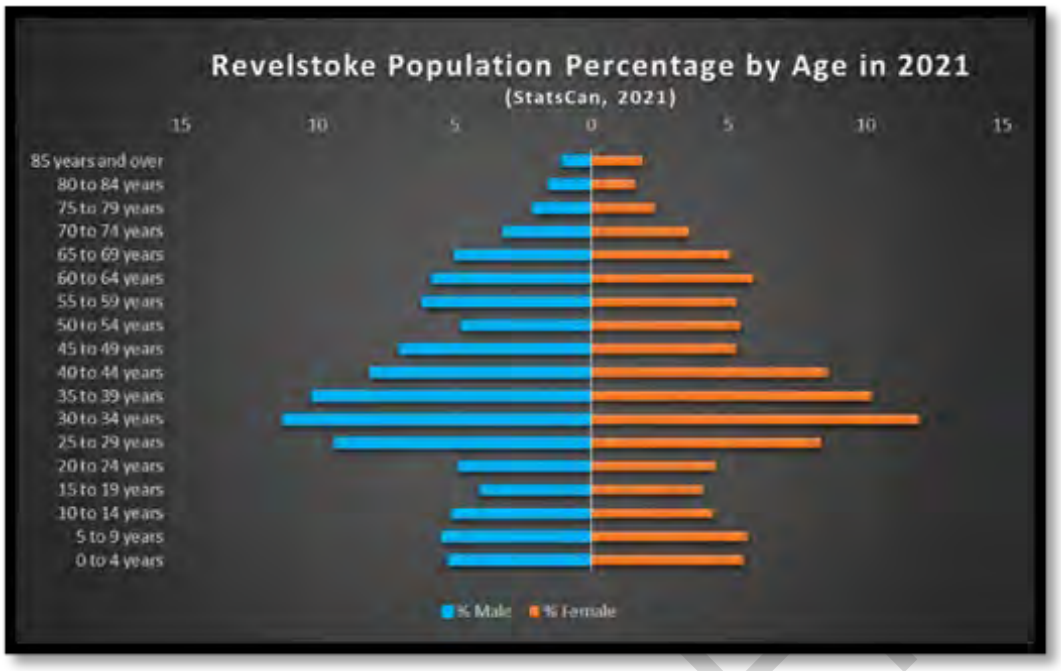


Figure 5.2: Revelstoke Population Pyramid (%)[2]

Persons with Disabilities

Statistics Canada completed the Canadian Survey on Disability in 2017. Author Rebecca Choi (2021) found that many Canadians with a disability find themselves housebound due to the lack of accessible transportation. 44.9% of respondents with a physical disability reported that they needed to travel with at least one type of mobility aid or assistive device. 20.6% of respondents aged 15 to 64 years indicated an interest in job-related training courses. Of the 20.6%, 14.1% reported that inaccessible transportation prevented them from pursing job-related training of the 14.1% interested in job-related training, 2.0% did not purse a job-related training course due to a transportation barrier.

[2] Author: Jesika Lindley of Level Playing Field.

Data collected from: Statistics Canada. 2022. (table). Census Profile. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released July 13, 2022.
https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E (accessed August 5, 2022).

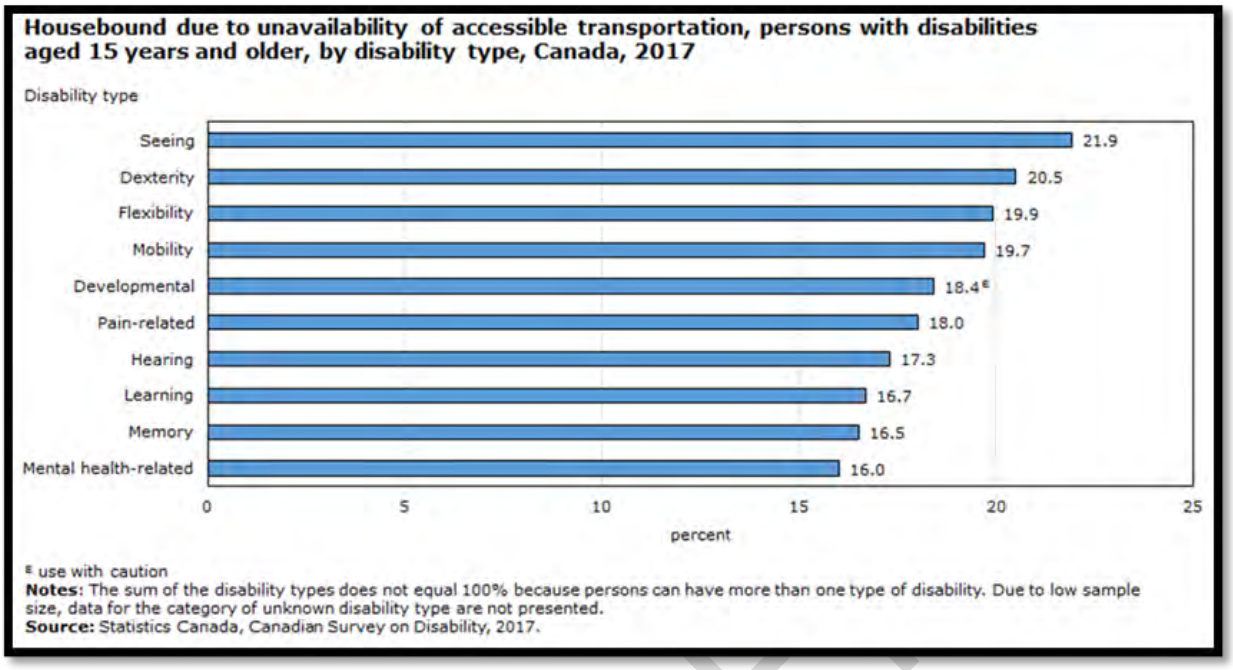


Figure 5.3: Canadians that are housebound due to unavailability of accessible transportation[3]

The Need for Complete Streets

The inclusion of a Complete Streets strategy, as mentioned in Section 4.1, would be ideal to accompany the integration of accessibility into Revelstoke's Transit Master Plan. While providing accessible bus stops an accessible bus fleet, the interconnectedness of each street can further be a barrier to accessing services within Revelstoke if not planned for in tandem.

[3] Source: https://www150.statcan.gc.ca/n1/pub/89-654-x/89-654-x2021002-eng.htm

Current Transit Model for Persons Requiring Accessible Public Transportation

Revelstoke provides people with permanent and temporary disabilities with a door-to-door handyDART services and a taxiDART service for those who do not use a mobility aid or device. According to BC Transit the availability of said services is limited to:

- handyDART Service Hours
- Monday, Thursday and Friday: 8:30 a.m. – 4:30 p.m.
- Sunday and holidays: No Service
- taxiDART Service Hours
- Tuesday, Wednesday and Saturday: 7:30 a.m. – 6:00 p.m.
- Sunday and holidays: No Service

The addition of an accessible transit network that reaches key sites in Revelstoke will allow residents to access services on their own schedule, without having to book ahead, and during times when handyDART and taxiDART are not in service.

6 PLAN IMPLEMENTATION

The true strength of the TMP is not the planning, but the implementation. The following section outlines the recommendations and action items provided earlier in the document along and provides timeline and cost estimates. The implementation of this plan will involve ongoing action from Revelstoke Administration and financial support from grants and budget.

6.1 Additional Supporting Actions

Implementation of the TMP will require investment both in terms of capital and operating expenses as well as staff hours. Recognizing these challenges and planning to overcome them will improve the likelihood of successful implementation of the plan. These supporting actions are recommended for the successfully implementation of this Transportation Master Plan and future updates to it. In no specific order, these include:

ACTION 6-1: Develop a data collection strategy for all modes of travel.

ACTION 6-2: Continue to coordinate with Parks department for the implementation of recommended MUP projects.

ACTION 6-3: Continue applying for Active Transportation funding grants from the BC Province for the recommended short-term projects.

ACTION 6-4: Work with the Province to determine the maintenance requirements to maintain the Big Eddy Bridge as a pedestrian/bicycle only bridge.

ACTION 6-5: Establish dedicated staff resources to the implementation of this TMP and annual reporting back to City Council.

ACTION 6-6: Work with local groups/volunteers supporting the winter maintenance of ski, snowshoe, and winter-bike trails.

6.2 Project Costs & Prioritization

6.2.1 COST ESTIMATE

As presented in Section 4, projects have been grouped into six categories: on-street walkway, on-street multi-use, off-street multi-use pathway, on-street bicycle facilities (three types), intersection improvements, and bridge improvements. These categories and their associated high-level estimated costs to complete all transportation network improvements are summarized in **Table 6.1**.

Table 6.1: Transportation Network Improvement Costs

Project Category	Length	Assumptions	Total
On-Street Walkway	27.1 km	27.8 km total. $20/linear metre for painted symbols, lines, signs	$541,000
On-Street Multi-Use	17.3 km	17.2 km total. $20/linear metre for painted symbols, lines, signs	$348,000
On-Street Bicycle	23.5 km	22.6 km total. Varies: $20/l.m. (local). $40/l.m. (collectors). $100/l.m. (arterials)	$1,619,000
Off-Street Multi-Use Path	15.1 km	15.7 km. $230/sq m x 3m width	$7,390,000
Intersection Improvements	14 locations	See Table 4.12	$1,980,000
Bridge Improvements	4 locations	See Table 4.8	$25,400,000
TOTAL			**$37.3 Million**

There are additional maintenance costs associated with the recommended transportation network improvements. These include: snow and ice clearing of additional pathway, snow and ice clearing of bike lanes if protected from traffic and inaccessible by standard snow clearing equipment, additional line annual line painting for on-street walkways and bikeways. **Table 6.2** provides an estimate of those additional annual operating costs to the City.

Table 6.2: Additional Annual Operating Costs

Infrastructure	Length	Assumptions	Total
Pathways	15.2 km	$80/m for annual snow/ice clearing	$1.22M
Protected Bikeways	12.4 km	$80/m for annual snow/ice clearing	$1.00M
On-Street Walkways/Bikeways	55.5 km	$1.00/l.m. for annual repainting (includes white paint lines, symbols, crossing markings	$55,500
TOTAL			**$2.28M**

6.2.2 PRIORITIZATION

In order to prioritize the proposed capital projects so that they can be implemented in a logical order as budget becomes available, the following evaluation factors were considered:

- Number of residents/visitors served by the project,
- Network gaps across: major barriers (e.g. rail, rivers), complete connectivity gaps within the City,
- Addresses senior or accessible needs,
- Access significant destinations,
- Ease of implementation (constructability, conflicts, cost, collaboration potential),
- Available / applicability from other government support,
- Lower cost solutions,
- Speed of implementation (how quickly can it be achieved),
- Support for local businesses (customer access or goods movement),
- Alignment with City Plan and objectives,
- Alignment with TMP objectives, and
- Is adjacent to a committed corridor project which can be leveraged.

From this evaluation, projects were identified as a potential short, medium, or long-term project and is summarized in Section 6.2.3.

6.2.3 SUMMARY

Table 6.3 is a summary of all the **recommended short-term projects using the criteria above. Generally, these projects are easier to implement, lower cost, and in centralized or high use areas. Total cost for the short-term projects is an estimated $3.13 million.**

Table 6.3: Short-Term Projects

Project No. & Location	Description	Length	Cost Est.
(3) Farewell/Mountain View	On-street walkways	3.40 km	$67,000
(4) Central Revelstoke	On-street walkways	1.07 km	$21,000
(5) South Revelstoke	On-street walkways	5.99 km	$120,000
(8) Pearkes Drive	On-street multi-use (Allen Rd to Highway 23)	1.63 km	$33,000
(9) Kootenay Street	On-street multi-use (Douglas St to Victoria Rd)	0.48 km	$10,000
(10) Pearson Street	On-street multi-use (3rd Street to Victoria Rd)	0.26 km	$6,000
(16) Park Drive	On-street multi-use (Prail Rd to Nichol Rd)	0.92 km	$18,000
(18) Arrow Road	On-street multi-use (Park Drive to Forest Drive)	0.53 km	$11,000
(3) Douglas Street	Bike Lane (Wison St to Kootenay St)	0.63 km	$25,300
(4) 3rd Street	Bike Lane (Kootnay St to Mackenzie Ave)	1.01 km	$39,100
(6) Boyle Ave & Fourth Street (4th St)	Bike Lane (Fourth Street (4th St) to Victoria Ave)	0.54 km	$17,100
(7) Mackenzie Blvd	Bike Lane (Track St to 8th St)	0.75 km	$30,200
(9) 8th Street	Shared Lane (Mackenzie Ave to Victoria Rd)	0.50 km	$10,300
(14) 8th Street	Shared Lane (Victoria Rd to Edward St)	0.37 km	$7,500
(17) Fourth Street (4th St)	Protected Bike Lane (Victoria Rd to Illecilleweat)	0.64 km	$64,300
(6) Riverfront Pathway	Off-street MUP (Charles St to Garden Ave)	0.44 km	$300,000
(7) Greenway connections	Off-Street MUP (Nixon Rd & Illinisky Rd)	0.20 km	$140,000
(16) Mackenzie Village	Off-Street MUPs (Arrow Drive to Nichol Rd)	1.24 km	$860,000
Victoria Road	Intersection Improvements @ Pearson & Rokeby		$200,000
Campbell Avenue	Intersection Improvements @ 1 St, 2 St, 3 St, 4 St		$400,000
Victoria Road	Intersection Improvements @ Mackenzie Ave		$100,000
Big Eddy Bridge	New Timber Decking for Multi-use & Emergency		$650,000
Total Cost Short-Term Projects			**$3.13 million**

Table 6.4 is a summary of all the recommended medium-term projects using the criteria above. Generally, these projects are not as centralized as the short-term projects, are less critical to the network and a bit more challenging to implement. Total cost for the medium-term projects is an estimated $1.71 million.

Table 6.4: Medium-Term Projects

Project No. & Location	Description	Length	Cost Est.
(1) Big Eddy	On-street walkways	3.36 km	$67,000
(2) Columbia Park	On-street walkways	3.41 km	$68,000
(6) Victoria Heights	On-street walkways	2.61 km	$52,000
(7) Lower Arrow Heights	On-street walkways	4.68 km	$94,000
(8) Upper Arrow Heights	On-street walkways	2.56 km	$51,000
(1) Big Eddy Road	On-street multi-use (Lundell Rd to Hwy 23)	0.85 km	$17,000
(2) Lundell Road	On-street multi-use (Big Eddy Bridge to Griffiths Rd)	0.84 km	$17,000
(3) Begbie Road	On-street multi-use (Nixon Road to Griffiths Rd)	1.25 km	$25,000
(4) Griffiths Road	On-street multi-use (Begbie Rd to Big Eddy Greenway)	0.49 km	$10,000
(5) Laforme Blvd	On-street multi-use (Columbia Park Dr to Hamilton Dr)	0.68 km	$14,000
(6) Colbeck Road	On-street multi-use (Pearkes Dr S to Pearks Dr N)	0.73 km	$15,000
(7) Highway 23	On-street multi-use (Cleland Rd to Pearks Dr)	1.11 km	$22,000
(11) Track Street	On-street multi-use (Mackenzie Ave to Townley St)	1.17 km	$23,000
(12) Cedar Street	On-street multi-use (Track S to Townley St)	1.39 km	$28,000
(14) McKinnon Road	On-street multi-use (Airport Way to Galt Cr.)	1.05 km	$21,000
(2) Laforme Blvd	Bike Lane (Pearks Drive to Columbia Drive)	0.34 km	$4,500
(5) Track Street	Bike Lane (Long Ave to Mackenzie Ave)	0.80 km	$30,400
(8) Vernon Avenue	Shared Lane (5th Street to 8th Street)	0.23 km	$5,200
(10) 8th Street	Bike Lane (Orton Ave to Victoria Rd)	0.72 km	$29,100
(11) 9th Street	Shared Lane (Mackenzie Ave to Rail Trail)	0.74 km	$14,700
(12) Townley Street	Protected Bike Lane (Cedar St to Victoria Rd)	1.34 km	$133,700
(13) Oscar Street	Bike Lane (Townley St to Maplewood St)	0.60 km	$24,000
(15) 8th Street	Bike Lane (Victoria Rd to Edward St)	0.29 km	$11,600
(16) Edward Street	Bike Lane (Oscar St to Willow St)	0.96 km	$35,300
(18) Johnson Way	Shared Lane (Oak Dr to Johnson Ave)	0.61 km	$12,300
(3) Big Eddy Greenway	Off-street MUP (Big Eddy Rd to West Side Rd)	0.62 km	$430,000
(5) Laforme Bv/Victoria Rd	Off-street MUP (Multiple connects to Hwy 1/Victoria)	1.24 km	$860,000
(8) Mill Spur Rail Trail	Off-street MUP (5th Street to Victoria Heights)	1.37 km	$940,000
(9) New Greenway	Off-street MUP (Illecillewaet Ped Bridge to Airport Way)	2.01 km	$1,380,000
(11) New Connector	Off-street MUP (Tonwley St to Oak Drive)	0.97 km	$670,000
(2) Highway 23	Intersection Improvements at Big Eddy Road		$100,000
(3) Victoria Ave/Laforme Bv	Intersection Improvements at Fraser Drive		$100,000
(13) Mackenize Ave	Intersection Improvements at 8th Street		$40,000
(14) Victoria Road	Intersection Improvements at 8th Street		$40,000
Total Cost Medium-Term Projects			**$5.38**

Table 6.5 is a summary of all the recommended long-term projects using the criteria above. Generally, these projects are complex, high cost, generally relay on the timing of other critical network connections and may require funding partners to implement (particularly the bridge structures). Total cost for the long-term projects is an estimated $18.63 million. Without the bridge improvements included, the total cost is an estimated $2.10 million.

Table 6.5: Long-Term Projects

Project No. & Location	Description	Length	Cost Est.
(13) Powerhouse Road	On-street multi-use (Oscar St to New Bridge)	1.79 km	$36,000
(15) Hay Road	On-street multi-use (Nichol Rd to Melnyk Rd)	1.12 km	$22,000
(17) Illecillewaet Road	On-street multi-use (Airport Way to New Bridge)	1.01 km	$20,000
(1) Westside Road	Bike Lane/Shoulder (Hwy 1 to Jordan River Bridge)	1.98 km	$79,400
(19) Highway 23	Protected Bike Lane/Shoulder (Big Eddy Greenway to Mt. Begbie Road	2.15 km	$214,700
(20) Airport Way	Protected Bike Lane/Shoulder (Nichol Rd to Airport)	8.31 km	$830,500
(1) Highway 23	Off-street MUP (Hwy 1 to Big Eddy Greenway Trail)	1.34 km	$960,000
(2) Highway 1	Off-street MUP (Hwy 23 to East side of Hwy 1 Bridge)	0.37 km	$260,000
(14) New Illecillewaet Bridge Connector	Off-street MUP (new bridge to Birch Drive)	0.43 km	$290,000
(1) TransCanada Hwy	Intersection improvements @ Hwy 23/Westside Rd		$450,000
(4) TransCanada Hwy	Intersection improvements @ Victoria Road		$500,000
Highway 1 Bridge	Cantilever 3m additional MUP.	0.29 km	$6.53 million
Fourth Street (4th St) Bridge	Bridge Replacement (12m width)	0.08 km	$11.52 million
New Illecilleweat River Bridge	New multi-use/emergency only bridge for an eastern connection across the Illecillewaet River. (8m width)	0.07 km	$6.72 million
Total Cost Long-Term Projects			**$28.4 million**

6.2.4 SUPPORTING ACTION LIST

For a TMP to be successful, its Implementation Plan requires 3 key components: projects, costing, and actions. Actions are the short (1-3 year), medium (3-6 year), and long-term (>6 year) recommended tasks that support the deployment of the TMP. These actions, some of which have already been identified through this document, are summarized in **Table 6.6** with action numbers relating to the original section in the report.

Table 6.6: Revelstoke TMP Supporting Action List

Action #	Theme	Description	Cost Estimate
4-1	Design Guidelines	Adopt the 5 complete street principles (Section 4.1.1.1) in the planning, design, construction, retrofitting, and maintenance of Revelstoke's road network	Short-term
4-2	Design Guidelines	Adopt the recommended pedestrian and bicycle accommodation design guidelines in Table 4.1	Short-term
4-3	Design	Advance the design and cost estimating for the Townley Road / Oak Drive Connector and secure funding partners (eg. Province, developers) to cover the capital needs to implement.	Short-term
4-4	Design Guidelines	Revise Revelstoke's Road Classification Map as shown in Figure 4.7 (and detailed in Table 4.2	Short-term
4-5	Study/Evaluation	Undertake a comprehensive evaluation to determine the preferred corridor (First Street or Victoria Avenue) for an east-west bicycle connection on the north side of downtown.	Short-term
4-6	Design	Consider repurposing the eastbound curb lane of Victoria Avenue for a safer, more attractive pedestrian environment on the south side of Victoria Avenue.	Medium-term
4-7	Amenities	Develop a program to identify locations and dedicate funding towards increasing secure and sheltered public bicycle parking.	Short-term
4-8	Design Guidelines	Develop/update transit shelter design guidelines to ensure they are accessible for those with mobility impairments.	Short-term
4-9	Strategy	Develop a Transit Strategy that establishes a clear vision, combines local and resort transit services, and ensures consistent transit signage/branding.	Short-term
4-10	Mapping	Develop a formal truck route map that includes truck parking and fueling locations.	Medium-term
4-11	Design Guidelines	Revise accessible parking stall guidelines to include: vertical signage, "accessible" (not handicap) language, and clearly marked stall boundaries.	Short-term
5-1	Emerging Technology	Develop a program to support EV charging including mapping locations, investing in public EV charging at key locations, defining a process/costing for private company EV charging, and updating parking requirements to require EV designated locations.	Medium-term
5-2	Guidelines	Adopt the Traffic Calming Guidelines (Section 5.2) as an interim measure until community growth and traffic complaints warrant the development of a more comprehensive Traffic Calming Policy.	Short-term
5-3	Speed Changes	Initiate a program to revise the posted speed limits on Collector Roads to 40 km/hr and Local Roads to 30 km/hr. This will require	Short-term

Action #	Theme	Description	Cost Estimate
		review of the latest BC Motor Vehicle Act, City of Revelstoke Bylaws 1846 and 1400 and the most economical implementation approach to signing.	
5-4	*Design Standards*	*Amend Schedule 4 (Design Standards) of Revelstoke's Subdivision, Development & Servicing Bylaw No. 1846 and its associated standards to reflect the geometric standards required for the recommended posted speeds, cross-section layout, and minimum user widths as reflected in this Transportation Master Plan.*	*Short-term*
5-5	*Strategy*	*Support and encourage the establishment of community car share systems and similar programs.*	*Medium-term*
5-6	*Strategy*	*Review/update the 2018 Downtown Parking Strategy to determine if the current time restrictions are appropriate for current parking demands.*	*Short-term*
5-7	*Bylaw Change*	*Consider reductions in the surface parking requirements in the City's Zoning bylaw should be considered to reduce land requirements for parking, promote the use of alternative modes of travel, and repurpose on-street parking space for uses such as bicycle parking, patios, parklets.*	*Medium-term*
6-1	*Data Collection*	*Develop a data collection strategy for all modes of travel.*	*Medium-term*
6-2	*Collaboration*	*Continue to coordinate with Parks department for the implementation of recommended MUP projects.*	*Ongoing*
6-3	*Funding*	*Continue applying for Active Transportation funding grants from the BC Province for the recommended short-term projects.*	*Short-term*
6-4	*Maintenance*	*Work with the Province to determine the maintenance requirements to maintain the Big Eddy Bridge as a pedestrian/bicycle only bridge.*	*Short-term*
6-5	*Staffing*	*Establish dedicated staff resources to the implementation of this TMP and annual reporting back to City Council.*	*Short-term*
6-6	*Collaboration*	*Work with local groups/volunteers supporting winter maintenance of ski, snowshoe, and winter-bike trails.*	*Short-term*

6.3 Budget Needs

The short-term project budget needs based on the prioritized recommended projects (see Table 6-3) is $3.13 million. This estimate, however, may be high due to currently funded project commitments, and/or other department budget sources. The currently funded project commitments are understood to be the following are not included in the short-term project estimate.

Table 6.7: Currently Funded Projects

Project No. & Location	Description	Length	Cost Est.
(10) Airport Way	Off-Street MUP (Illecillewaet Bridge to Nichol Rd)	1.09 km	$750,000
(15) Nichol Road	Off-Street MUP (Airport Way to Comossiz Rd)	1.47 km	$1,020,000
(17) Camozzi Rd	Off-Street MUP (S of Nichol Rd to Resort)	1.52 km	$1,050,000
TOTAL			**$2.82 million**

There is an estimated $340,000 in other off-street multi-use pathway projects that might fall under the budget needs of the Parks Department. This would reduce the short-term project budget needs to $2.48 million.

6.3.1 GRANTS AND OTHER FUNDING SOURCES

6.3.1.1 B.C Active Transportation Infrastructure Grants Program

The B.C. Active Transportation Infrastructure Grants Program offers two grant options for Indigenous governments and local governments, including municipalities, regional districts, Islands Trust, and Indigenous Economic Development corporation where the Nation is the shareholder.

Active Transportation Infrastructure Grant

Eligible governments may apply for a maximum of **two** active transportation infrastructure grants for different projects or different phases of the same project if they satisfy the following criteria:

- Projects funded **prior to** 2021/22 by BC Active Transportation Grants must be completed by application submission date.
- Project is part of an active transportation network plan or equivalent
- Project can begin construction once provincial funding has been announced
- Projects will be completed by March 2024 (projects under $1 million) or by March 2025 (projects over $1 million)
- Projects are open to the public

The province cost-shares to a maximum of $500,000 per project. For Revelstoke (population <15,000), percent of eligible funding is 70%.

Active Transportation Network Planning Grant

Network planning grants help smaller communities develop active transportation network plans to encourage active transportation for all ages and abilities. Eligible governments may apply if:

- Their community has a population under 25,000
- Their community Active Transportation Network Plan is over 5 years old or non-existent

The province cost-shares to a maximum of 50%, or $50,000 whichever is less.

6.3.1.2 Government of Canada Active Transportation Fund

There are two streams of projects eligible for funding: capital projects and planning projects.

The maximum amount payable for a planning project will not exceed $50,000.

Planning and Design Projects (Grant Program)

Planning and design projects refer to the development or enhancement of formal active transportation strategic planning documents or stakeholder engagement. This could entail the development of an Active Transportation Strategy, that could support the National Active Transportation Strategy, or the development of an active transportation component which can be added to other planning documents, such as Official Community Plans, Sustainability Plans, and Transportation Plans.

Capital Projects (Contribution Program)

Capital projects refer to new infrastructure construction, enhancement of existing infrastructure, and fixed design and safety features that encourage increased active transportation. Eligible capital projects include:

- Building or enhancing infrastructure for active transportation, such as multi-use paths, sidewalks, footbridges, separated bicycle lanes, and connections to other roadways (this could include nature trails and other infrastructure which could support recreation, so long as this infrastructure can be demonstrated to reflect evaluation criteria);
- Enhancing active transportation infrastructure, including design considerations in which there may be no net gain in kilometers of infrastructure, but quality improvements that support greater usage;
- Building or enhancing design features and facilities which promote active transportation, such as storage facilities, lighting, greenery, shade, and benches;
- Building or enhancing safety features which promote active transportation, such as crosswalks, medians, speed bumps, and wayfinding signage.

6.4 Pilot Project Opportunities

6.4.1 EXPANDED GRIZZLY PLAZA STREET TREATMENT

As shown in **Image 6.1**, Mackenzie Avenue between Victoria Road and First Street (1st St) E has an attractive public realm – street trees, street furniture, brick colored paver surface across the right of way. Expand this treatment using temporary installations (potted trees or plants, moveable tables and chairs, moveable public art) further south along Mackenzie Avenue, east and west along 1st Street, and Campbell Avenue. Consider temporarily reclaiming parking space with pedestrian space and seating using paint and planters.

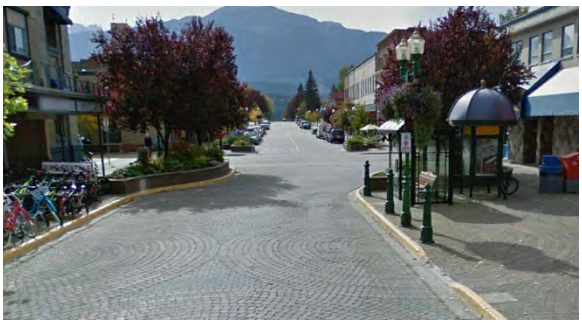


Image 6.1: Mackenize Avenue (Grizzly Plaza) Looking North

6.4.2 VICTORIA ROAD RESIZING

A review of daily traffic along Victoria Avenue indicates that the road has excessive capacity as a 4-lane arterial. As shown in **Image 6.2**, the large width coupled with a narrow monolithic sidewalk along its south side makes the pedestrian experience along Victoria Road an unpleasant one. This could be greatly improved by reclaiming the southern most eastbound lane.

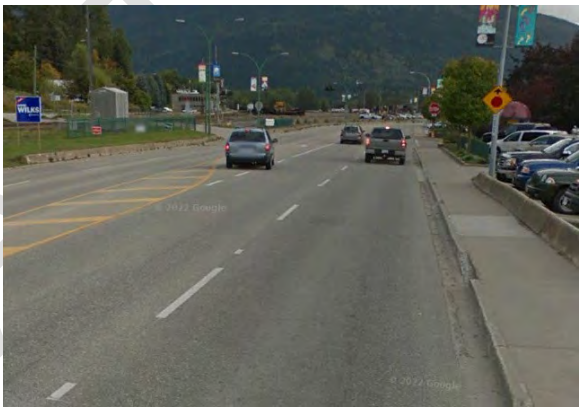


Image 6.2: Hostile Pedestrian Environment on Victoria Road (Looking East)

Before significant investment was committed for shifting the curb and creating a space similar to Rokeby Avenue (as shown in **Image 6.3**), use rubber curbing, delineator posts and/or planters to temporarily reclaim the space. Monitor traffic and pedestrian activity for a period of time to see if a permanent change would be beneficial.

6.4.3 ONE-WAY OPERATION ON 1ST STREET

Experiment with traffic operation along First Street (1st Street) between Orton Avenue and Pearson Street. Propose the westbound direction as this appear to be the predominate direction of travel for visitors passing through. The traffic signals at Pearson Street and Victoria Avenue provide an opportunity to easily circulate. The temporary change in operation should be accompanied with street narrowing (e.g., 1 travel lane, 1 bike lane, 1 or 2 parking lanes) as two-lane one-way streets present their own safety challenges (e.g., poor sightlines for pedestrians in crosswalks). This is precisely the recommended street configuration if the Victoria Avenue/1 Street bicycle route review recommends First Street (1st Street).

Image 6.4: First Street (1st St)

6.4.4 TRAFFIC CALMING

As an Arterial Street with adjacent residential homes and a critical link for the bike network, traffic calming along Fourth Street (4th St) between the Victoria Avenue roundabout and the Illecillewaet Bridge should remain a high priority. Formalization of the existing temporary treatments and identification of other locations for measures should be a short-term priority.

As a primary east-west bicycle corridor, Third Street (3rd St) should also be examined for potential traffic calming measures, in conjunction with the proposed 40 km/hr posted speed limit for collectors.

6.4.5 E-BIKE/ E-SCOOTER PILOT

Consider partnering with a vendor of e-bikes/e-scooters for a 1-year pilot of a limited fleet of devices. Grizzly Plaza would be an excellent centralized location for parking most of the devices with some others located at key destinations (e.g., Recreation Centre, Railway Museum). If usership uptake is good and profits are being made by the vendor, it may be time to make the service permanent and expanding it across the City. It is recommended that this pilot be done in conjunction (or after) development of the on-street multi-use and bicycle network so that a more protected network is in place for these new users.

7 SUMMARY

7.1 Conclusions

Revelstoke's transportation network is falling behind in providing an efficient, safe, and multimodal network for its residents and visitors. The roadway capacity for vehicles is adequate for the anticipated future growth with the main gaps relating to pedestrian and bicycle infrastructure. The aim of this TMP is to get the network back on track and start shaping the ongoing transportation changes in the City. The key actions to achieve this are:

5. Transportation Network Improvements:
    a. Implement the proposed Active Transportation Network including a new or improved active transportation crossing of the Illecillewaet River.
    b. Complete identified studies and evaluations to finalize active transportation network
    c. Advance the design and cost estimating for the Townley Road Connector and secure funding partners
    d. Develop a Transit Strategy that establishes a clear vision, combines local and resort transit services, and ensures consistent transit signage/branding
6. Supporting Policy:
    a. Revise the road classifications and initiate the process to revise the posted speed limits on Collector and Local Roads.
    b. Adopt the 5 complete street principles in the planning, design, construction, retrofitting, and maintenance of Revelstoke's road network
    c. Adopt the Traffic Calming / Speed Management Guidelines
    d. Develop a formal truck route map
7. Supporting Infrastructure:
    a. Identify locations and dedicate funding towards increasing secure and sheltered end-of-trip public bicycle parking.
    b. Develop a program to support EV charging
    c. Review/update the 2018 Downtown Parking Strategy
    d. Examine and revise current signage, parking stall, and transit shelter design guidelines to improve accessibility.

7.2 Next Steps

Once this Transportation Master Plan has been adopted by City Council and finalized, the next recommended steps are for the City to:

- Secure funding for select short term improvements
- Establish dedicated staff resources to the implementation of this TMP and annual reporting back to City Council.
- Begin the application process for Active Transportation funding grants from the Province for the recommended short-term projects.
- Ongoing coordination with stakeholders to achieve TMP goals and objectives
  - Parks Department regarding implementation of MUP projects,
  - MoTI regarding bridge maintenance and use,
  - BC Transit regarding affordable, cost effective, and reliable transit service, and
  - Local groups and volunteers regarding winter maintenance of ski, snowshoe, and winter-bike trials.
- Develop an ongoing data collection strategy for all modes of travel.
- Develop concept designs and cost estimates for the short-term improvements
- Engage affected stakeholders and public on these designs

APPENDIX A

APPENDIX A ENGAGEMENT SUMMARY

A.1 Engagement Plan

The City of Revelstoke hired Stantec to complete an updated transportation master plan for their community that showcases best practices, provides clear guidance for future development, and incorporates the need for creativity in the realms of sustainability and climate change.

This engagement plan will:

- describe in detail the purpose of engagement to be undertaken for the project,
- outline the desired outcomes of engagement,
- identify engagement levels by stakeholder category, and
- describe tools to be used for public and stakeholder engagement.

The Engagement Plan will be submitted to the City of Revelstoke for their review and approval prior to any engagement being completed.

A.1.1 PURPOSE

The purpose of this engagement is to provide stakeholders and residents with information about the TMP and the future of the City's multi-modal network.

During the engagement process, our **engagement goal** will be to:

- share information as clearly as possible,
- build on and take advantage of engagement synergies with the ongoing OCP and Parks Master Plan processes,
- gather feedback from a cross-section of the community.

A.1.2 KEY MESSAGES

The following key messages will be used to shape engagement materials:

- The TMP is being completed alongside the new Official Community Plan to guide the future of our community.
- Long-term community transportation goals:
  - Shift the multi-modal breakdown towards more shared and active transportation methods
    - Strengthen active transportation in the historic core of the community
    - Increase transit ridership
  - Improve safety
    - Calm traffic
  - Increase accessibility for all users
  - Increase efficiency and safety of goods movement
  - Manage parking
  - Consider sustainability and climate change initiatives

A.1.3 GUIDING PRINCIPLES

Engagement undertaken for this project was guided by the following principles:

Inclusivity	We will encourage participation by those who will be affected by the outcome of the project and those who are interested in the outcomes. We will engage varied audiences using appropriate tools. To further accessibility to engagement, the following will be used: • Closed captioning during online meetings • Talk Revelstoke page content will be prepared with consideration for Web Content Accessibility Guidelines • Notification posters and engagement materials will be prepared in large print and may be available in alternative formats
Trust and respect	We will strive to engage stakeholders in an open and respectful way that fosters understanding between diverse views, values, and interests.
Transparency and accountability	We will design engagement activities that are open and clear. Those participating will understand their role, the level of engagement, how their input will be used, and how it fits into the entire process.
Open and timely communication	We will strive to provide information that is timely, accurate, objective, easily understood, accessible, and balanced.
Equity	The processes will include a range of events and tools to allow stakeholders a reasonable opportunity to contribute, as well as hear and understand other views.

A.1.4 DESIRED OUTCOMES

The engagement process will aim to accomplish the following desired outcomes.

1. Build awareness

- Increase stakeholders' and the public's understanding about the TMP's scope, goal, objectives, motivations, and timeline.

Strategies to achieve this outcome:

- Post background information to the Talk Revelstoke project website.
- Include a preamble to the online survey questions to let them know baseline information prior to asking for their feedback.

2. Gather information to inform the plan

- Gather stakeholder and public input to help identify opportunities and challenges (e.g. traffic and parking trouble areas, accessibility gaps, priority active transportation routes).

Strategies to achieve this outcome:

- Gather map-based information to identify information spatially.

3. Build and strengthen relationships

- Build and strengthen relationships with Collaborative Partners, Stakeholders, and the public to foster a shared sense of ownership in the community and support future stewardship or partnership opportunities.

Strategies to achieve this outcome:

- Use multiple methods of engagement to allow multiple opportunities for providing feedback.
- Complete a "What We Heard" report to showcase how input has been used.

A.1.5 DETERMINING LEVELS OF ENGAGEMENT

The engagement undertaken for this project strives to engage those who may be impacted by the outcome of the plan—which includes all City of Revelstoke residents. To increase effectiveness in engagement planning, different engagement levels have been determined as set below. All known stakeholders have been reviewed by the project team, considered based on their connection with the Study Area's floodplain, and placed into one of the following groups.

Table A-7.1: Engagement level descriptions

Engagement Level		Description
PROJECT TEAM		The Project Team is comprised of the City of Revelstoke's administrative departments and Stantec.
OCP FOCUS GROUP		The OCP Focus Group will act as a sounding board for connectivity between the TMP and OCP.
COLLABORATIVE PARTNER		Collaborative Partners are part of the overall approval and regulatory process for Revelstoke; as such, they are generally considered 'internal' stakeholders.
FIRST NATION GOVERNMENTS		First Nation governments are important partners for all future planning of the City of Revelstoke. These groups require private, one-on-one engagement.
STAKEHOLDERS	*Primary Stakeholder*	Primary Stakeholders are major users of the City's transportation network. These stakeholders hold in-depth knowledge regarding the operation, function, and maintenance of the City's transportation network.
	Secondary Stakeholder	Secondary Stakeholders have a direct connection to the City's transportation network; however, they do not meet the criteria of Primary Stakeholders.
PUBLIC		This group includes all residents, business owners and operators, visitors, and tourists.

Additions and modifications

It was understood that throughout the life of this project, it would become apparent that specific stakeholders had been missed during the initial planning process. In the event that a stakeholder contacted Stantec, the City, or Level Playing Field

to self-identify and request inclusion in the formal stakeholder engagement process; they were analyzed based on their relationship to the transportation network, as shown in Table A-7.1: Engagement level descriptions, assigned to a stakeholder category, and engaged in alignment to their corresponding Engagement Level.

A.2 Engagement Overview

Engagement for this project was used on a per-phase basis to share information and gather feedback, a general overview has been provided below.

- Phase 1 Project Kick-Off and Visioning
  - Project kick-off with the OCP Focus Group and Collaborative Partners
- Phase 2 Existing Conditions Assessment
  - Engagement round 1
- Phase 3 Existing Conditions Summary
  - Reporting back on what was heard in Phase 2
- Phase 4 Future Needs Assessment
  - Engagement round 2
- Phase 5 Road and Corridor Design Principles
  - Reporting back on what was heard in Phase 4
- Phase 6 Implementation Plan
- Phase 7 Reporting Back
  - Engagement round 3

A.2.1 PHASE 2 EXISTING CONDITIONS ASSESSMENT - ENGAGEMENT ROUND 1 (OCTOBER 4-NOVEMBER 19)

During this round of engagement, all identified partners and stakeholders were sent notifications of the project and informed of the launch of TalkRevelstoke engagement website. This engagement platform focusing on the Transportation Master Plan and included:

- Background information about the project,
- Links to existing reports and the OCP,
- An interactive map identifying opportunities and constraints,
- An online survey, and
- An area for visitors to submitting questions.

In addition to notifying respondents of the project, it also encouraged recipients to participate in the upcoming engagement activities, primarily held through the TalkRevelstoke website, and also included an online public information session held using Microsoft Teams, on Tuesday November 2 from 6-7pm. Engagement during this phase was focused on sharing what was heard during the OCP engagement process that would be used to inform the TMP, gather feedback on priority settings, and identify existing opportunities and constraints.

During the Phase 2 engagement period, a total of 435 persons participated providing insight through answering a poll prioritizing existing issues (158 responses), completing our comprehensive survey (88 submissions), submitting comments on an online map (190 markers), attending the public information sessions (19 attendees), and emailing the project team (10 submissions).

A.2.2 PHASE 4 FUTURE NEEDS ASSESSMENT - ENGAGEMENT ROUND 2 (MAY 19 - JUNE 30)

During this round of engagement, all identified partners, stakeholders, and previously engaged persons were sent notifications of the upcoming engagement opportunities which were hosted on the TalkRevelstoke website and in-person. Engagement during this phase was focused on sharing proposed pedestrian network, bicycling network, and transit network maps; and gathering feedback. Opportunities for provide feedback during this phase included:

- An online public information session on Tuesday June 7 from 6-7pm,
- Two in-person public open houses on Tuesday June 14 from 11am-1pm and 6-8pm,
- Open invitations to stakeholders for online or in-person meetings, only one of which was requested and held,
- An online survey, and
- An area for visitors to submitting questions.

During the Phase 4 engagement period, a total of 41 persons completing our comprehensive survey, 7 persons attended the online public information session, and 24 persons attended one of the in-person open houses.

A.2.3 PHASE 8 REPORTING BACK - ENGAGEMENT ROUND 3 (DATE - DATE)

During this round of engagement, all identified partners, stakeholders, and previously engaged persons were sent notifications of the upcoming engagement opportunities. Engagement during this phase was focused on sharing the complete Transportation Master Plan and gathering feedback. Opportunities for provide feedback during this phase included:

- An online public information session on Tuesday June 7 from 6-7pm,
- Two in-person public open houses on Tuesday June 14 from 11am-1pm and 6-8pm,
- Open invitations to stakeholders for online or in-person meetings, only one of which was requested and held,
- An online survey, and
- An area for visitors to submitting questions.

A.3 What We Heard

A.3.1 PHASE 2 EXISTING CONDITIONS ASSESSMENT – ENGAGEMENT ROUND 1

A visual summary of what was heard during Engagement Round 1 has been included in the following pages. This information was posted to the TalkRevelstoke website to report back to the community following the engagement process.

CITY OF REVELSTOKE TRANSPORTATION MASTER PLAN

What we heard

October 4 – November 19, 2021

435	228	158	88	19	10
TalkRevelstoke participants	Online contributions	Quick poll responses	Survey responses	Attendees at the public information session	E-mail submissions

1

CITY OF REVELSTOKE TRANSPORTATION MASTER PLAN

OCP Feedback

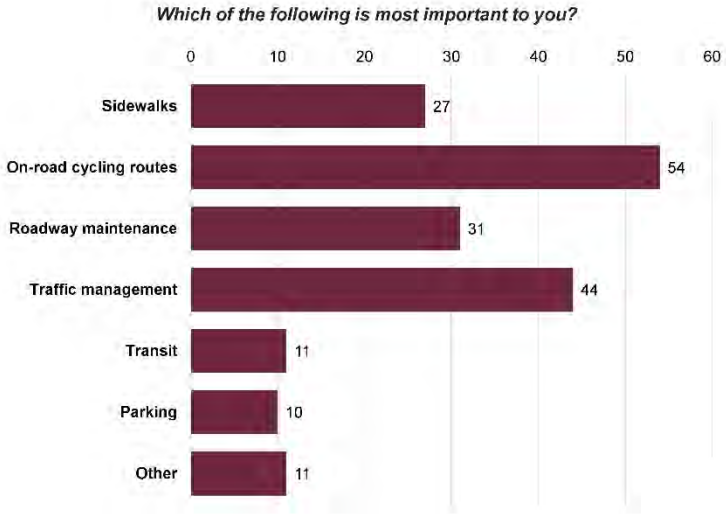
During the OCP engagement process, we heard the following were key transportation concerns.

- **Cycling:** desire for new routes, better connectivity, enhanced safety, and year-round use
- **Maintenance:** desire for fixed roadway potholes and sidewalk failures
- **Transit:** desire for new routes and scheduling changes
- **Pedestrian connectivity:** desire for new and enhanced sidewalks and trails, more accessible design, and enhanced maintenance
- **Parking and traffic:** desire for more parking and better traffic management

2

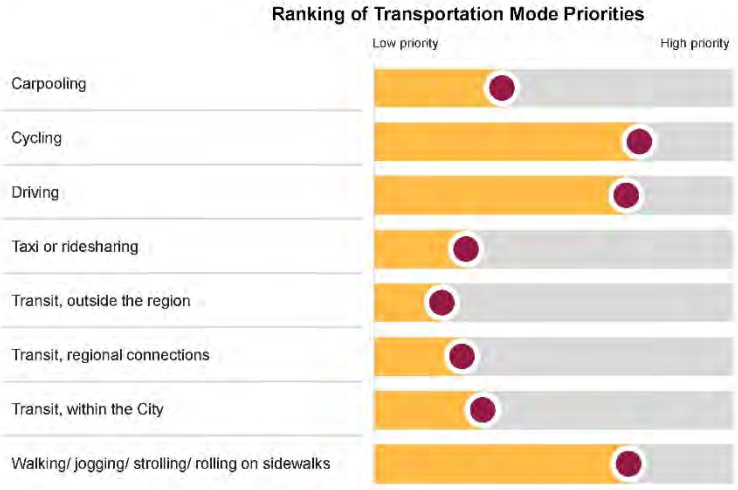
Priorities

To determine which of the topics heard during the OCP visioning was the most important, we asked respondents to prioritize them.



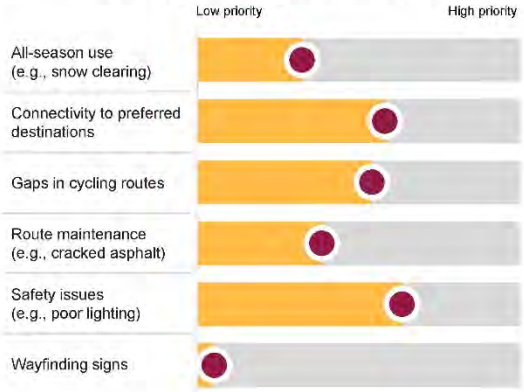
Survey feedback

To further understand what the community's concerns were, we then asked more specific questions about each element of the transportation network.

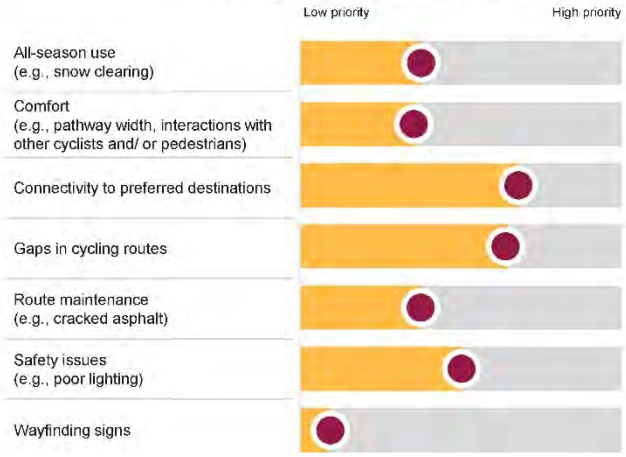


Cycling priorities

Ranking of In-Road Cycling Priorities

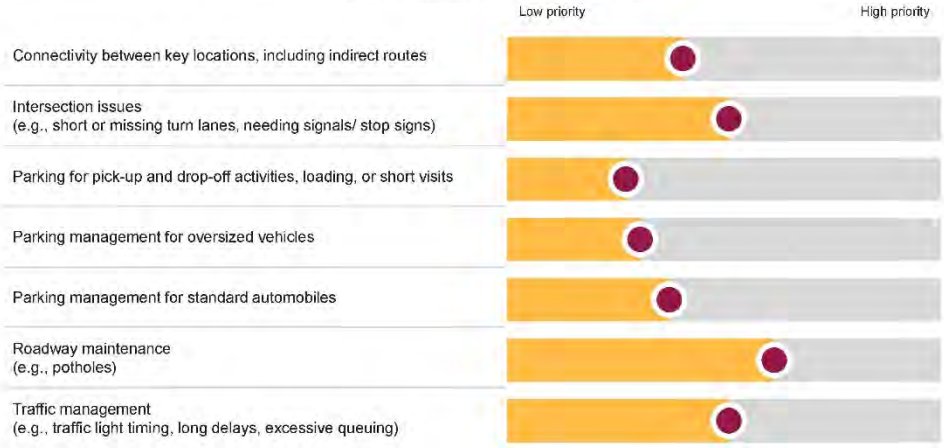


Ranking of Off-Road Cycling Priorities



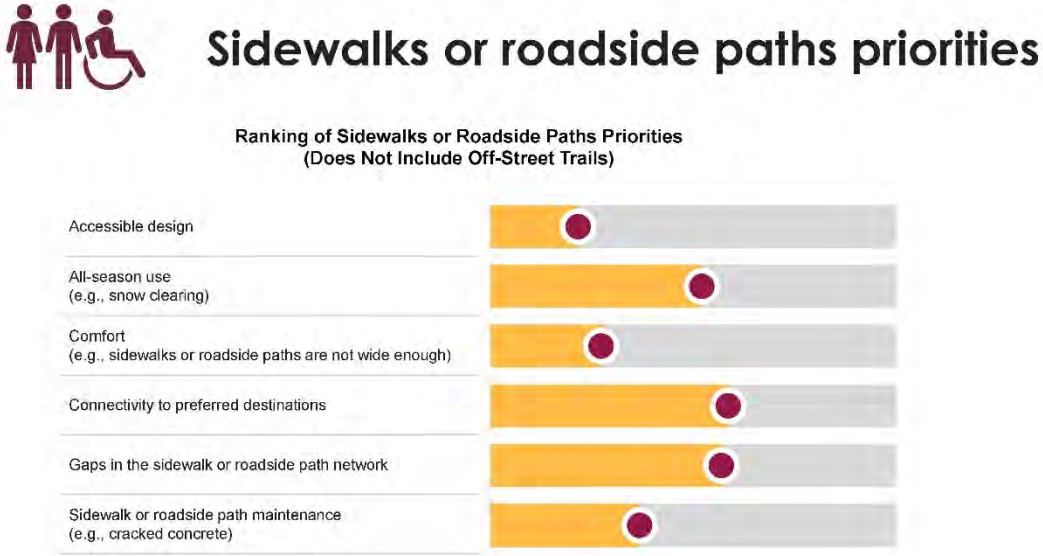
Roadway priorities

Ranking of Roadway Priorities



Transit priorities

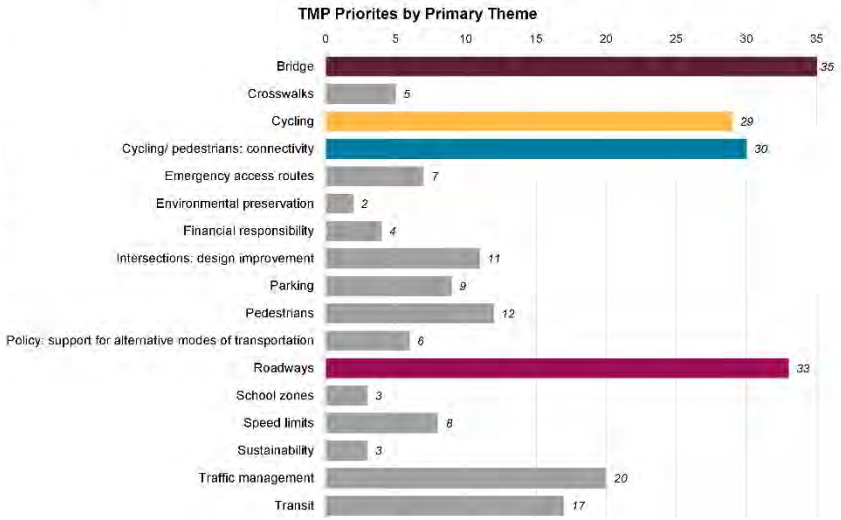
Sidewalks or roadside paths priorities



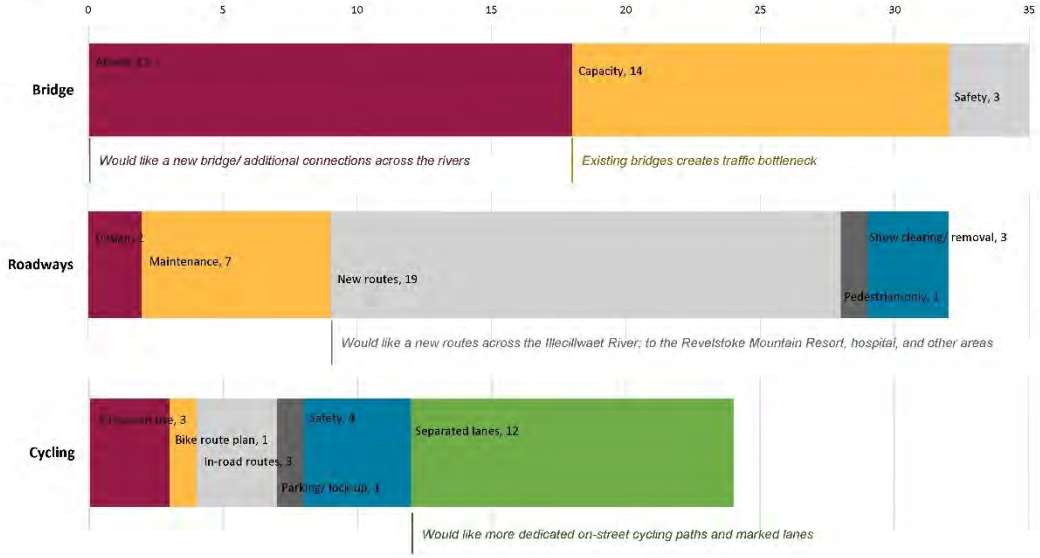
Primary concern priorities

As a final question, we asked:

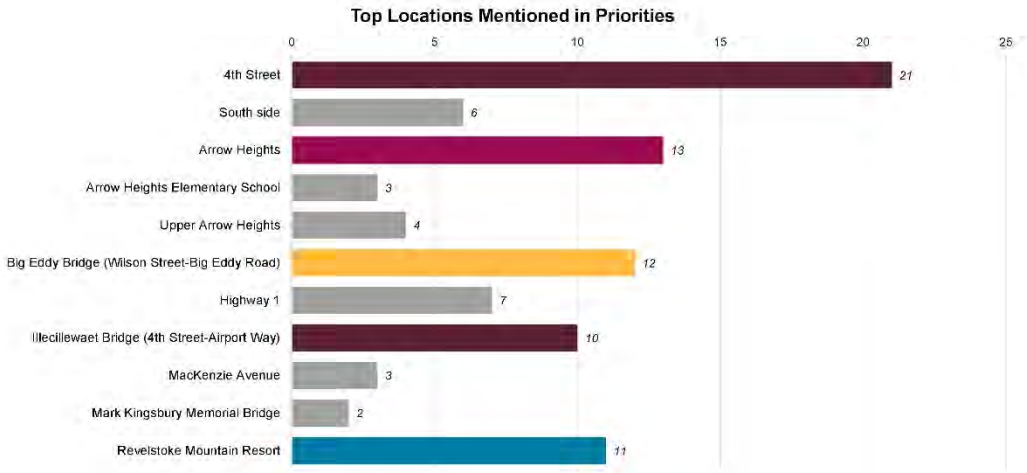
What do you think is the most important concern that needs to be addressed in the TMP?



Top 3 concerns by comment sub-theme

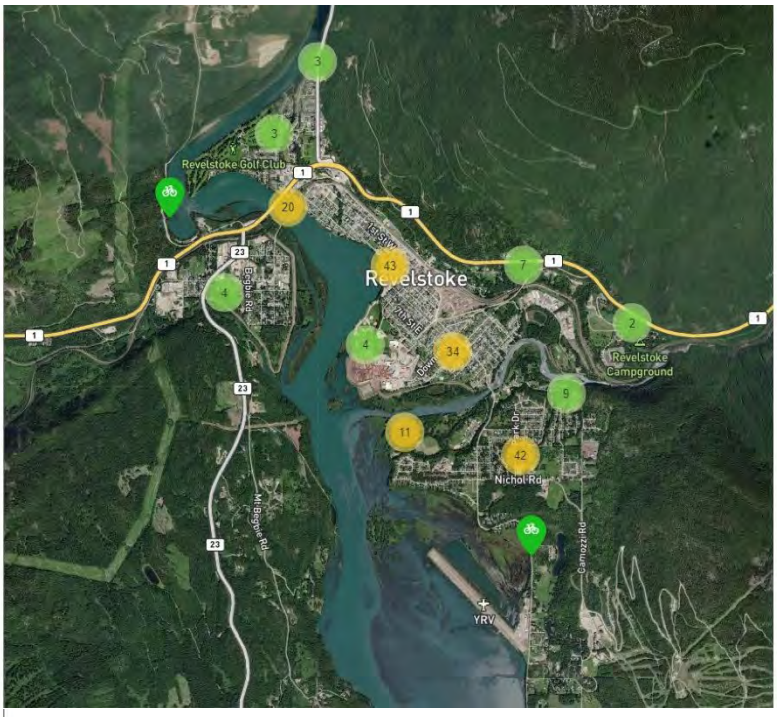


Locations mentioned in priority concerns



Overview of the top themes we heard

- In need of traffic management along 4th St–Airport Way
  - Flow of movement (bottle-necking issues)
  - Bridge capacity
  - Pedestrian and cyclist safety
  - Emergency access to/ from the hospital
  - Speeding through residential areas
  - Concern over the existing route's ability to accommodate traffic from new development
- Desire for a more comprehensive network of safe, comfortable cycling routes on and off roadways
  - Should accommodate year-round use
  - Avoid sharing lanes with traffic over the bridges
  - Special attention given to routes to/ from the ski hill
  - Land acquisition may be needed to preserve informal trail locations



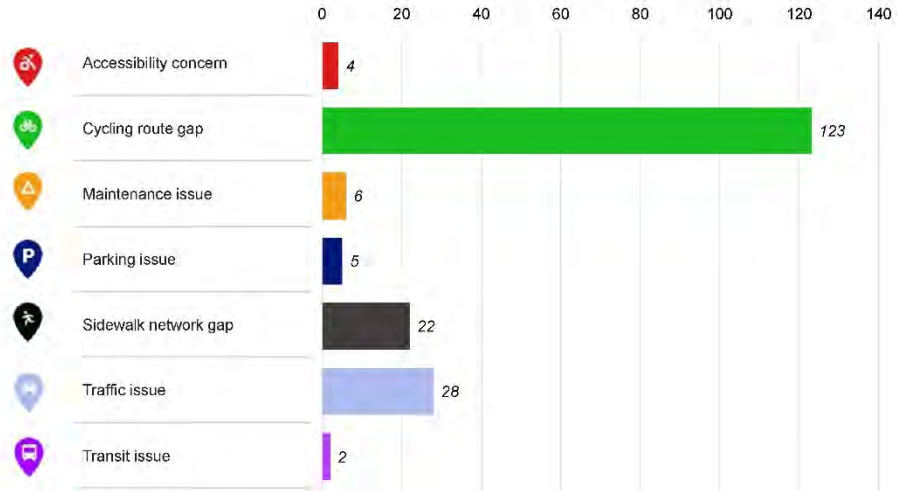
Mapping of opportunities and constraints

Used to identify areas where respondents had concerns or recommendations for the City's existing transportation network

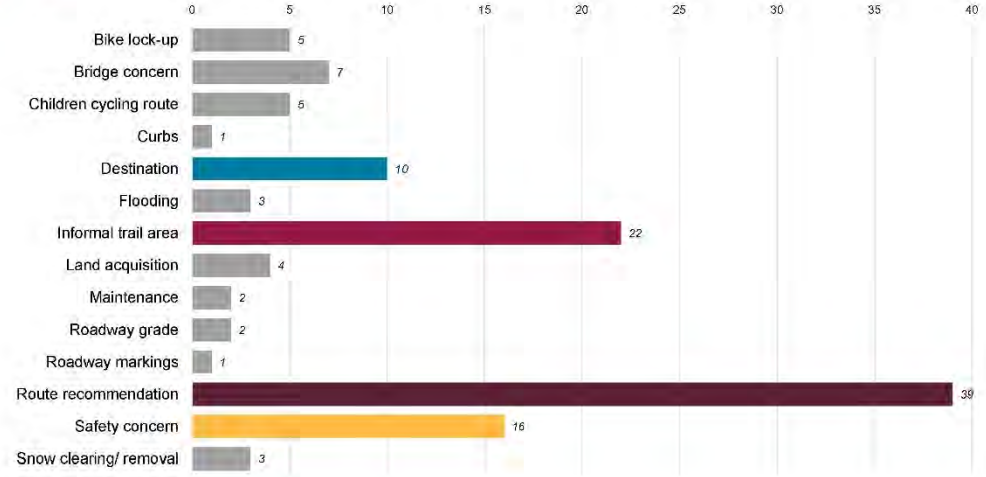
190

Total markers added

Map markers by category



Cycling map markers by theme



Cycling route recommendations overview

A.3.2 PHASE 4 FUTURE NEEDS ASSESSMENT - ENGAGEMENT ROUND 2

A visual summary of what was heard during Engagement Round 2 has been included in the following pages. This information was posted to the TalkRevelstoke website to report back to the community following the engagement process.

CITY OF REVELSTOKE TRANSPORTATION MASTER PLAN 1

What we heard

May 19 – June 30, 2021

245
TalkRevelstoke visitors

41
Survey responses

7
Attendees of the online information session

X
Attendees at the public open houses

CITY OF REVELSTOKE TRANSPORTATION MASTER PLAN 2

Vision and Goals

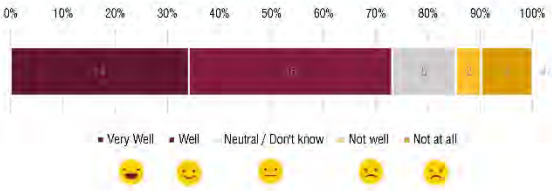
DRAFT Vision

The City of Revelstoke's Transportation Master Plan will foster economic viability, serve the existing and future needs of the community, and address the need for climate adaptation by focusing on resilient, multi-modal, and safe transportation solutions delivered in a fiscally responsible, innovative, and appropriate manner.

DRAFT Goals

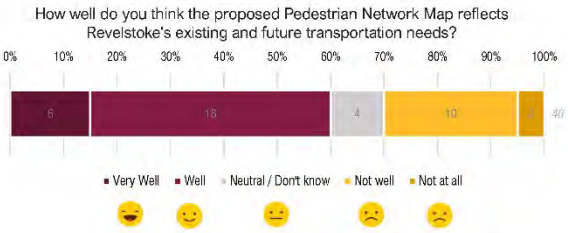
- *Develop a comprehensive bicycle network that connects key destinations, provides separation from traffic and accommodates cyclists year-round.*
- *More efficiently use roadways for community travel needs by designating or sharing excess space for other mobility modes, while still accommodating motor vehicles.*
- *Encourage more walking, rolling, and strolling by linking preferred destinations, closing gaps in the existing sidewalk/pathway network, and maintaining routes for year-round use.*
- *Improve transit service through better location of routes, updated transit schedules, and improving bus stop infrastructure.*
- *Improve safety for all users of the transportation network, with specific attention to vulnerable users through traffic calming and separated or protected infrastructure.*

How well do you think the proposed draft vision and goals for the TMP reflect your vision of Revelstoke's future transportation network?



Proposed Pedestrian Network

Proposed Pedestrian Network Map



Key Areas of Strength

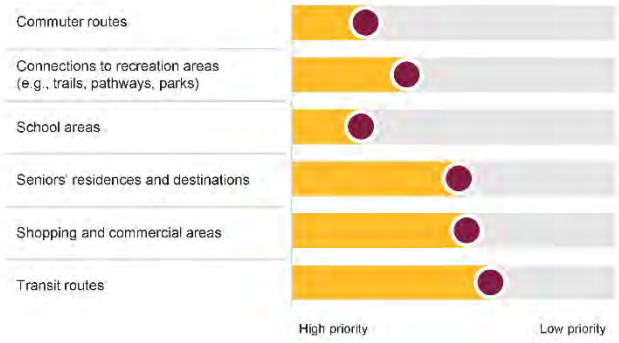
- *Connections between the Downtown and RMR*
- *Upper Arrow Heights*
- *Old rail line trail*

Key Areas of Improvement

- *Sidewalks surrounding schools*
- *Johnson Heights*
- *Columbia Park*
- *Airport Way*

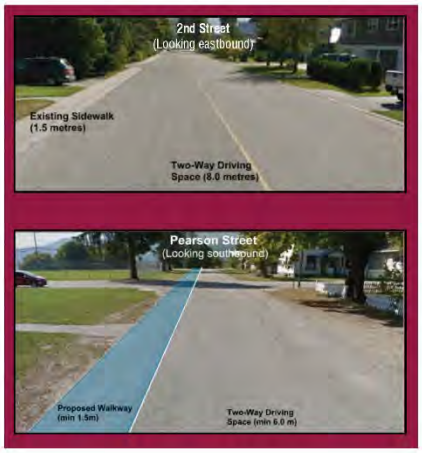
Proposed Pedestrian Network

Ranking of Pedestrian Network Priorities

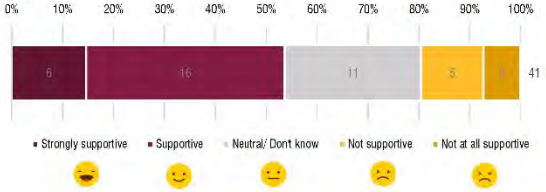


Proposed Pedestrian Network

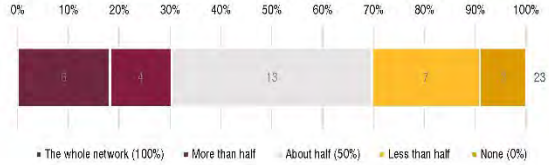
Focus On: Walkways



How supportive are you of using WALKWAYS to help fill in gaps in the City's pedestrian network where SIDEWALKS cannot be constructed for costs or feasibility reasons?



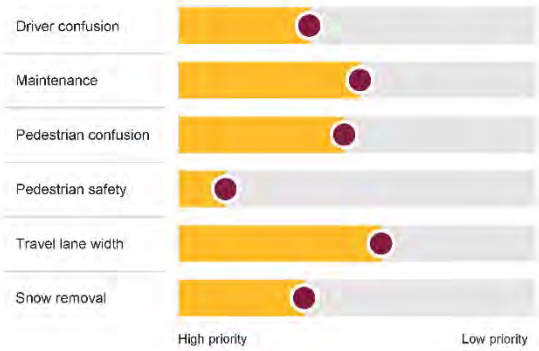
Approximately how much of the City's pedestrian network would you be comfortable having WALKWAYS used to enhance connectivity?



Proposed Bicycle Network

Focus On: Walkways

Ranking of Potential Walkway Concerns



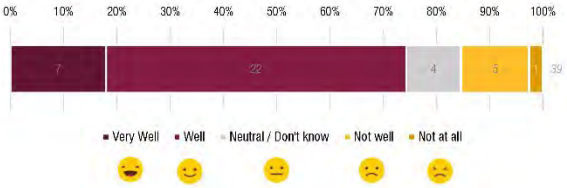
Other Concerns

- *Sidewalks surrounding schools*
- *Connections to other connections (e.g., sidewalks, off-street trails, on-street bicycling routes)*
- *Loss of parking*
- *Clear identification/ delineation markings fading each spring*
- *Users' visibility at night*
- *Vehicle speeds on these roadways*

Proposed Bicycle Network

Proposed Bicycle Network Map

How well do you think the proposed Bicycle Network Map reflects Revelstoke's existing and future transportation needs?



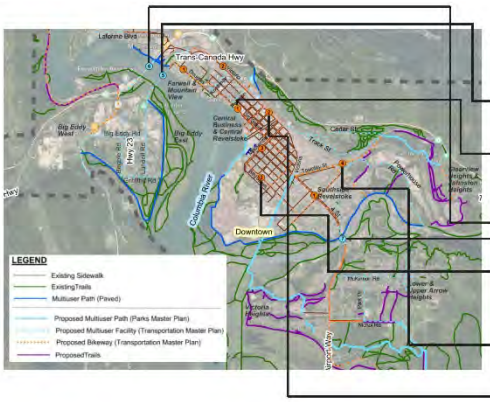
Key Areas of Strength

- *Connections between the Downtown and RMR*
- *Old rail track trail*
- *Multi-user facility along Townley Rd to Arrow Heights*

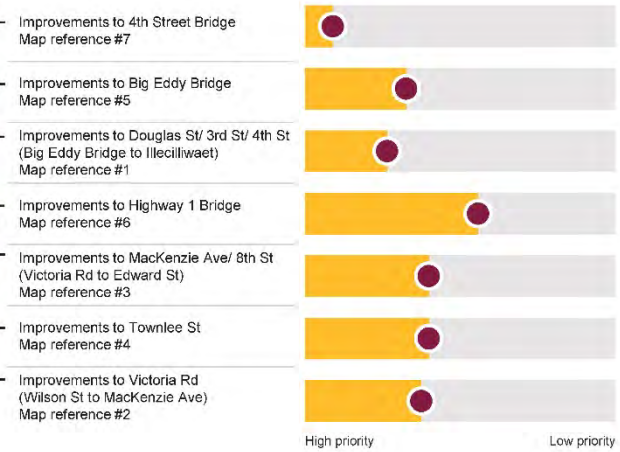
Key Areas of Improvement

- *4th Street –would prefer 5th Street*
- *Consideration for topographic grades*
- *Consideration for interruptions in trail network due to land ownership issues or seasonal flooding*
- *Cycling education for residents and visitors*

Proposed Bicycle Network



Ranking of Bicycle Network Priorities

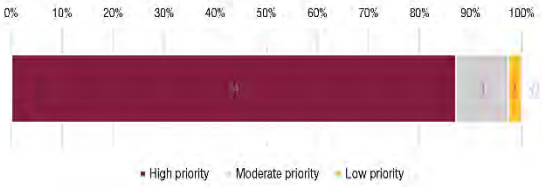


Proposed Bicycle Network

Focus On: Big Eddy Bridge

When the Big Eddy Bridge is no longer able to accommodate vehicles in the future, either due to age, condition, or other circumstances; it may be possible to maintain its alignment as a pedestrian/ bicycling connection.

What level of priority do you feel it would be to maintain the Big Eddy Bridge alignment for non-motorists, rather than along the TransCanada Highway Bridge alignment?



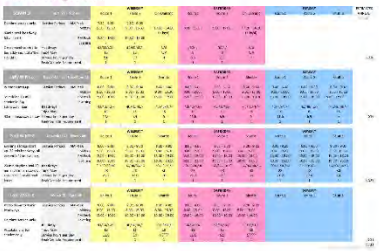
Transit priorities

Proposed Transit Network

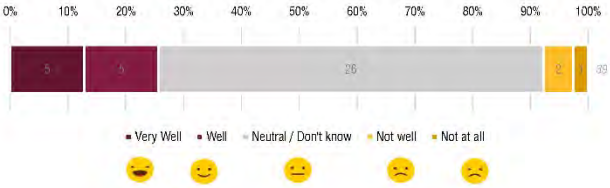
Summer Service

Winter Service

Tentative Routing Schedule



How well do you think the proposed Transit Network Map reflects Revelstoke's existing and future transportation needs?



Key Areas of Strength

- *Arrow Heights*
- *Connections between the Downtown and RMR*

Key Areas of Improvement

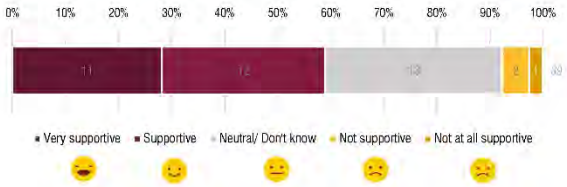
- *Johnson Heights*
- *Stops at the hospital, Kovack Park, Centennial Park*
- *Ensure timelines support RMR use*
  - *Early morning for employees*
  - *Lunch time for half-day skiiers*

Transit priorities

Focus On: Combining Transit Providers

Combining the local transit service (BC Transit) and shuttle provider (Revelstoke Mountain Resort) will help establish a cohesive and efficient transit service for Revelstoke by removing overlapping routes, providing efficiencies for service, offering more connectivity between the City and the RMR, and increasing ridership thereby improving transit performance.

How supportive are you of combining the local transit service (BC Transit) with the Revelstoke Mountain Resort shuttle service?



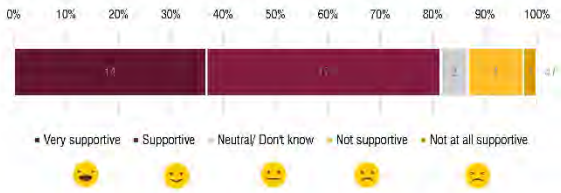
Proposed Roadway Network

Focus On: Intersections

Roundabouts

The existing and planned roundabouts in Revelstoke create intersections and routes that are essentially free-flow for drivers. While this is generally considered a good thing, traffic signals can often create breaks in the vehicular traffic that better allow vehicles to turn onto the main routes from the side streets.

How supportive are you of the City constructing roundabouts at intersections rather than other measures of traffic control (e.g., traffic lights, 4-way stop signs)?



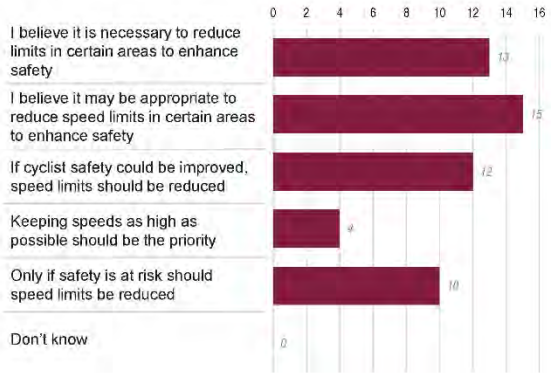
Key Intersections of Issue

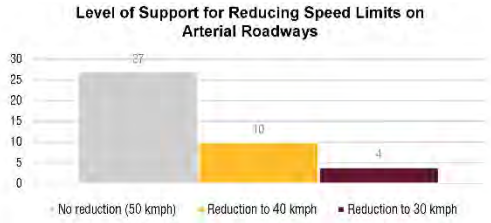
- *4th St/ Edwards St*
- *4th St/ Mackenzie Ave*
- *4th St/ Airport Way*
- *4th St/ Townley Rd*
- *Airport Way/ Nichol Rd*
- *Charles St/ Victoria Rd*
- *Victoria Rd/ Mackenzie Ave*

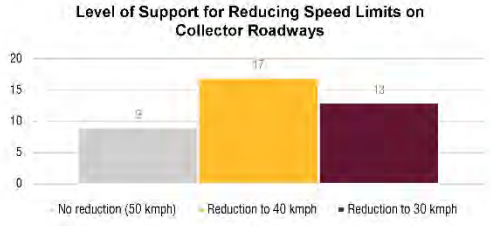
Proposed Roadway Network

Focus On: Speed limits

To help inform decisions on potential speed reductions, please select the statement(s) that best reflect your opinion of speed limits.







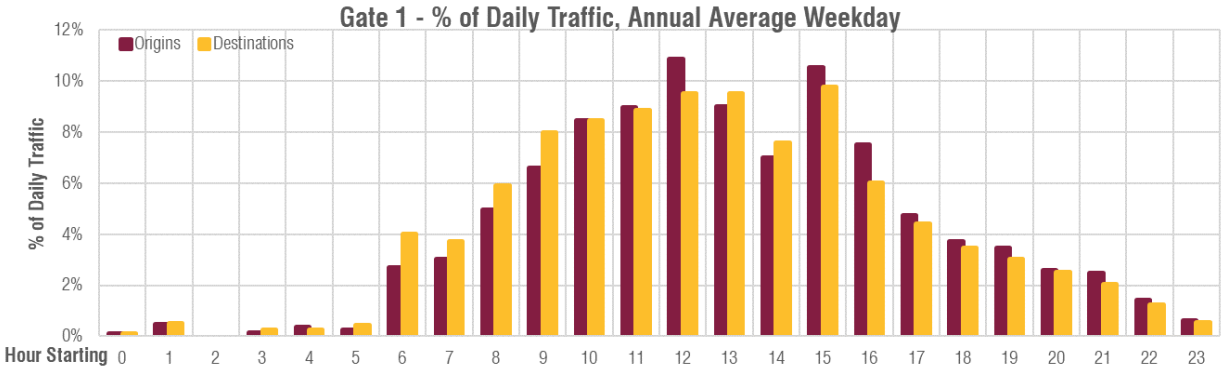
A.3.3 PHASE 8 REPORTING BACK - ENGAGEMENT ROUND 3

APPENDIX B

LBS Data Summary

Percentage of Annual Total inter-zone Weekday Trips - 2018 & 2019

Origin Zone Name	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5	Gate 6	Gate 9	Big Eddy	Central Business	Central Revelstoke	Clearview Heights & CP Rail	Columbia Park	Downie Mill	Highway Corridor	Illecillewaet & Livestock	Industrial	Johnson Heights	Lower Arrow Heights	Resort Lands	Southside Revelstoke	Upper Arrow Heights	Victoria Heights	Mountain View & Farwell
Gate 1		0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Gate 2	0.0%		0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Gate 3	0.2%	0.1%		3.9%	0.0%	0.2%	0.1%	0.4%	0.6%	0.1%	0.1%	0.1%	0.2%	1.5%	0.0%	0.0%	0.1%	0.0%	0.1%	0.2%	0.1%	0.0%	0.5%
Gate 4	0.1%	0.1%	3.9%		0.1%	0.1%	0.0%	0.1%	0.4%	0.0%	0.1%	0.0%	0.0%	1.3%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.2%
Gate 5	0.0%	0.0%	0.1%	0.1%		0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gate 6	0.0%	0.1%	0.1%	0.1%	0.0%		0.0%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Gate 9	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%		0.1%	0.3%	0.1%	0.0%	0.1%	0.1%	0.2%	0.0%	0.1%	0.0%	0.0%	0.2%	0.2%	0.2%	0.1%	0.2%
Big Eddy	0.2%	0.1%	0.3%	0.1%	0.0%	0.1%	0.1%		1.6%	0.2%	0.1%	0.6%	0.2%	0.6%	0.1%	0.1%	0.1%	0.1%	0.1%	0.4%	0.2%	0.3%	0.8%
Central Business	0.2%	0.1%	0.8%	0.3%	0.1%	0.3%	0.5%	1.6%		0.7%	0.2%	1.9%	1.3%	1.8%	0.1%	0.2%	0.4%	0.4%	0.4%	2.2%	1.2%	0.7%	2.6%
Central Revelstoke	0.1%	0.0%	0.2%	0.0%	0.0%	0.1%	0.1%	0.3%	0.7%		0.0%	0.3%	0.3%	0.3%	0.0%	0.0%	0.1%	0.0%	0.1%	0.3%	0.2%	0.2%	0.5%
Clearview Heights & CP Rail	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%		0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.2%	0.0%	0.1%
Columbia Park	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.5%	1.7%	0.2%	0.1%		0.4%	0.4%	0.0%	0.1%	0.1%	0.1%	0.1%	0.3%	0.2%	0.1%	0.9%
Downie Mill	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.3%	1.2%	0.3%	0.1%	0.4%		0.3%	0.0%	0.1%	0.1%	0.1%	0.0%	0.4%	0.2%	0.1%	0.5%
Highway Corridor	0.3%	0.1%	1.8%	1.3%	0.1%	0.2%	0.2%	0.6%	1.6%	0.2%	0.2%	0.4%	0.2%		0.0%	0.1%	0.2%	0.1%	0.2%	0.5%	0.2%	0.1%	0.6%
Illecillewaet & Livestock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Industrial	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%		0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%
Johnson Heights	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%		0.0%	0.1%	0.1%	0.1%	0.0%	0.1%
Lower Arrow Heights	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%		0.0%	0.1%	0.1%	0.0%	0.1%
Resort Lands	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.2%	0.1%	0.4%	0.1%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%		0.2%	0.2%	0.0%	0.3%
Southside Revelstoke	0.1%	0.0%	0.2%	0.0%	0.0%	0.1%	0.2%	0.4%	2.2%	0.3%	0.1%	0.4%	0.4%	0.6%	0.0%	0.2%	0.1%	0.1%	0.2%		0.3%	0.2%	0.8%
Upper Arrow Heights	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.2%	1.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.0%	0.1%	0.1%	0.1%	0.3%	0.3%		0.1%	0.3%
Victoria Heights	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.7%	0.2%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%		0.2%
Mountain View & Farwell	0.2%	0.1%	0.6%	0.2%	0.1%	0.1%	0.2%	1.0%	2.9%	0.4%	0.2%	1.0%	0.6%	0.6%	0.0%	0.1%	0.1%	0.1%	0.3%	0.7%	0.3%	0.2%	


Gate 1 - % of Daily Traffic, Annual Average Weekday
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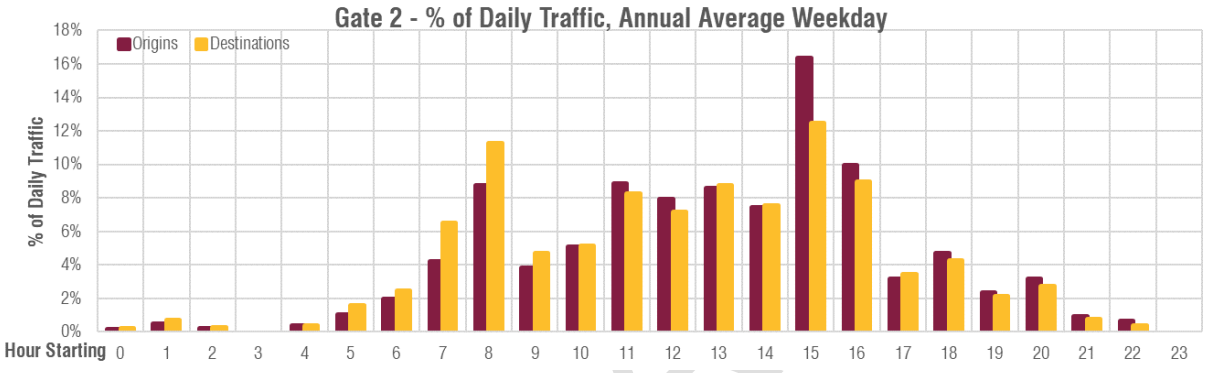
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Gate 2 - % of Daily Traffic, Annual Average Weekday
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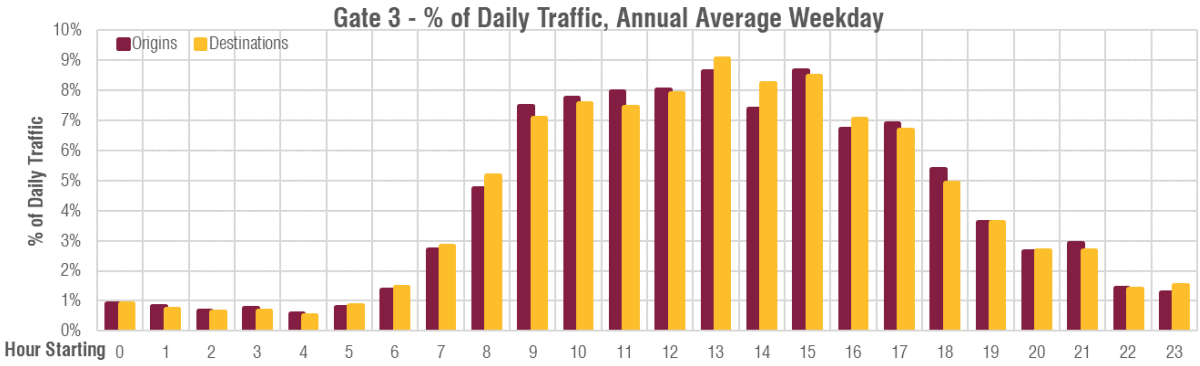
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Gate 3 - % of Daily Traffic, Annual Average Weekday
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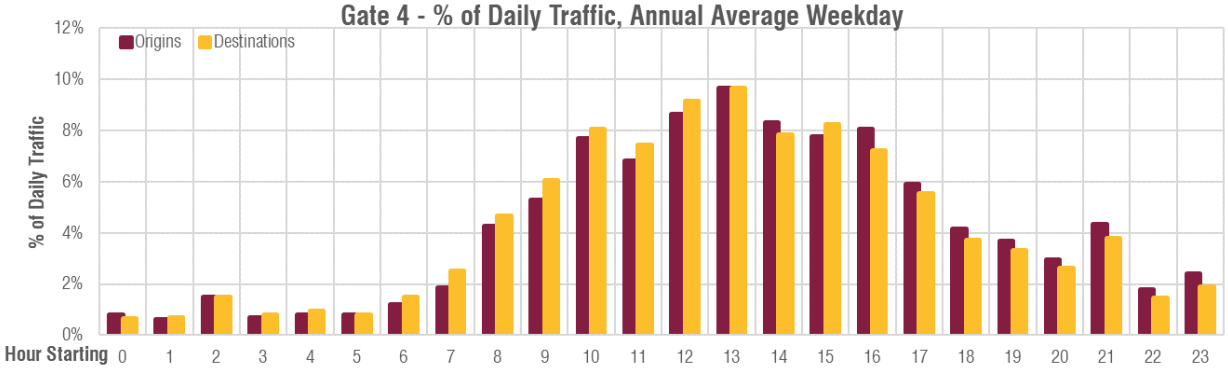
Gate 4 - % of Daily Traffic, Annual Average Weekday
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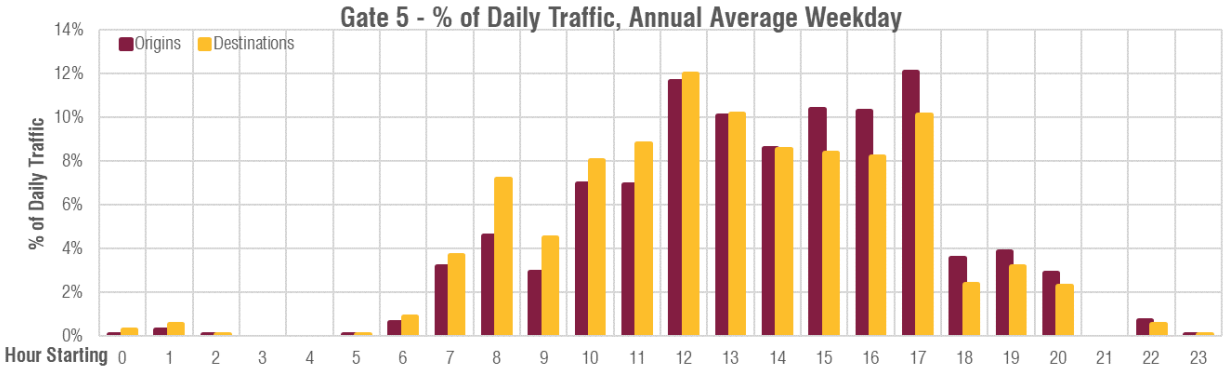
Gate 5 - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
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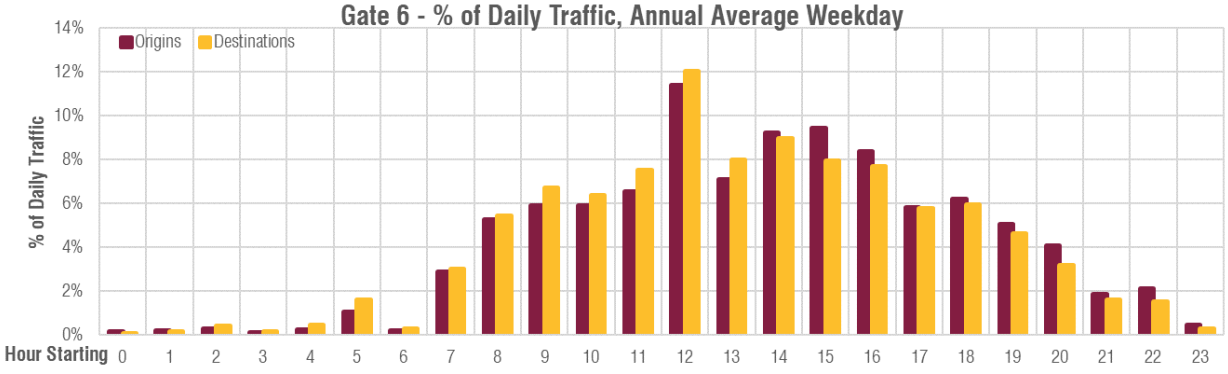
Gate 6 - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
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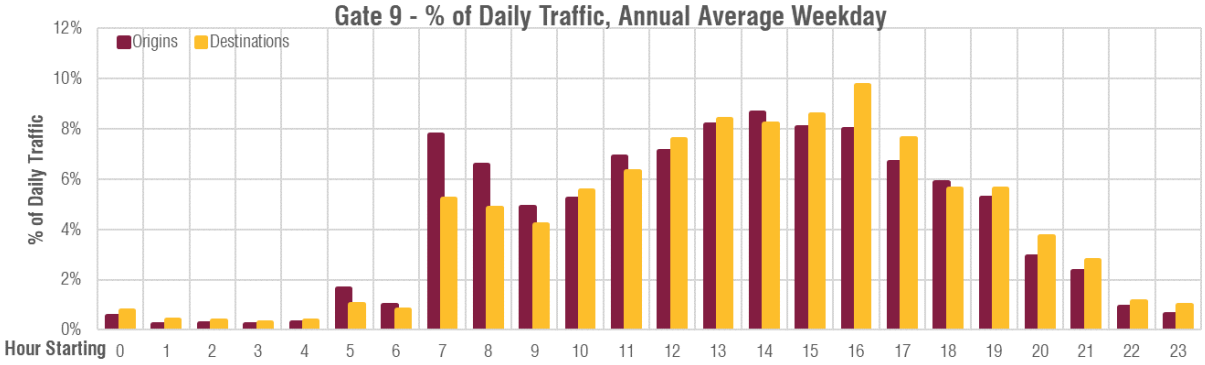
Gate 9 - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
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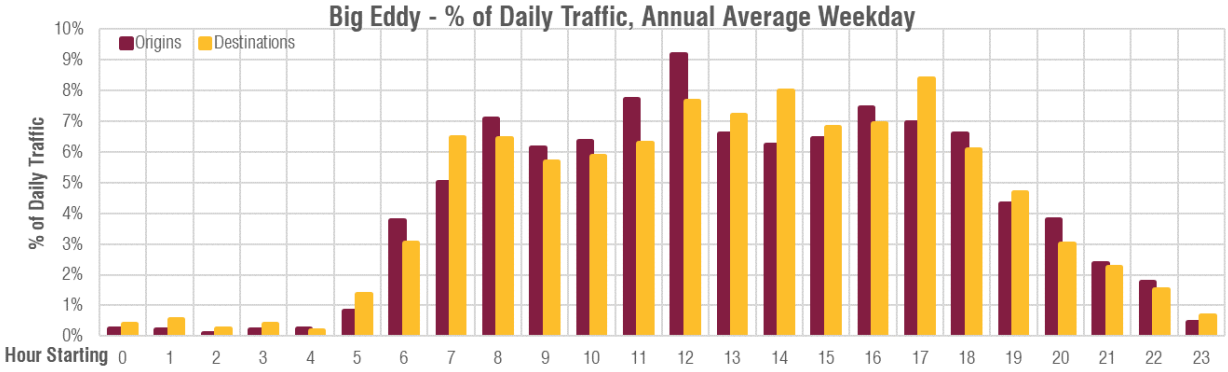
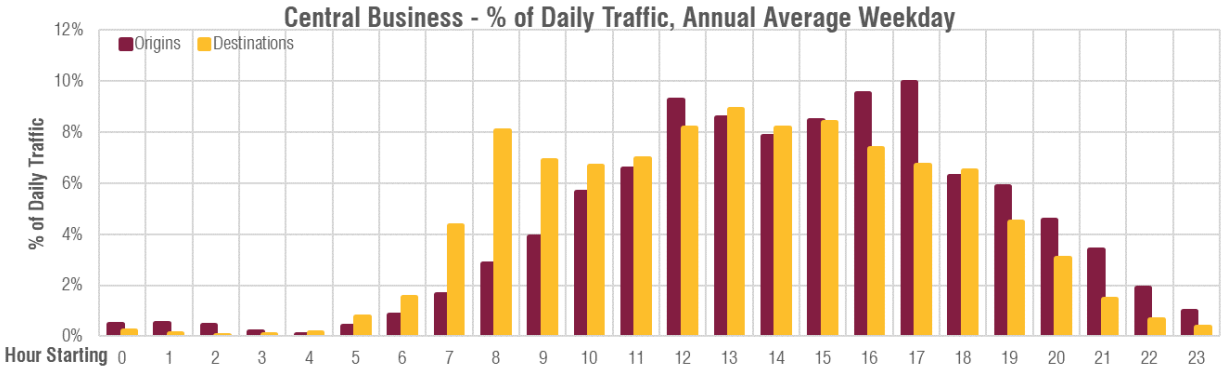

Big Eddy - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Central Business - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
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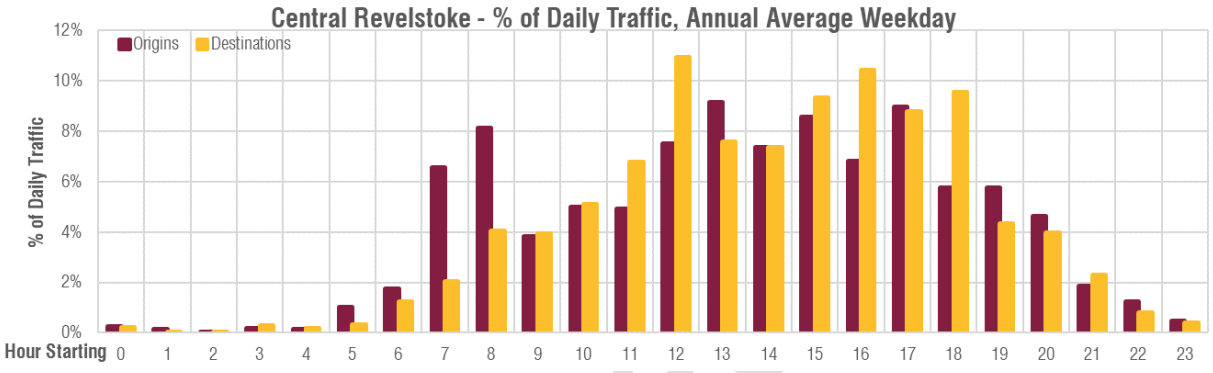
Central Revelstoke - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
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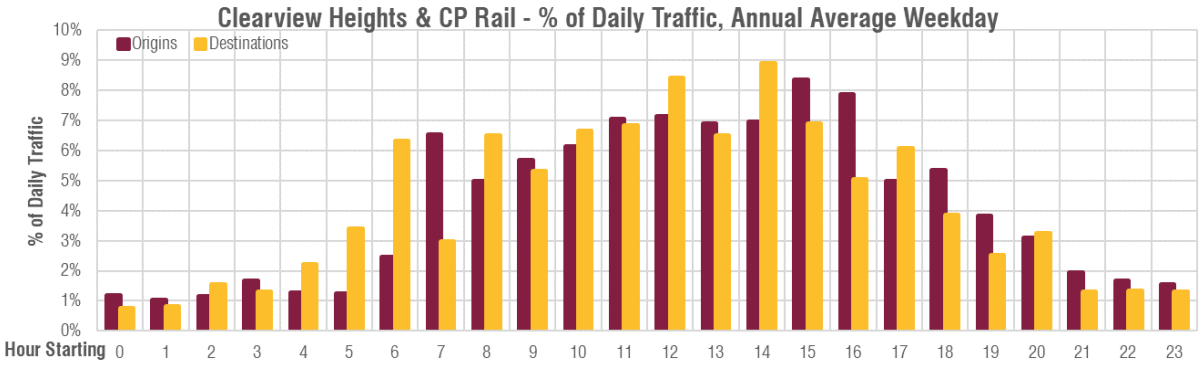
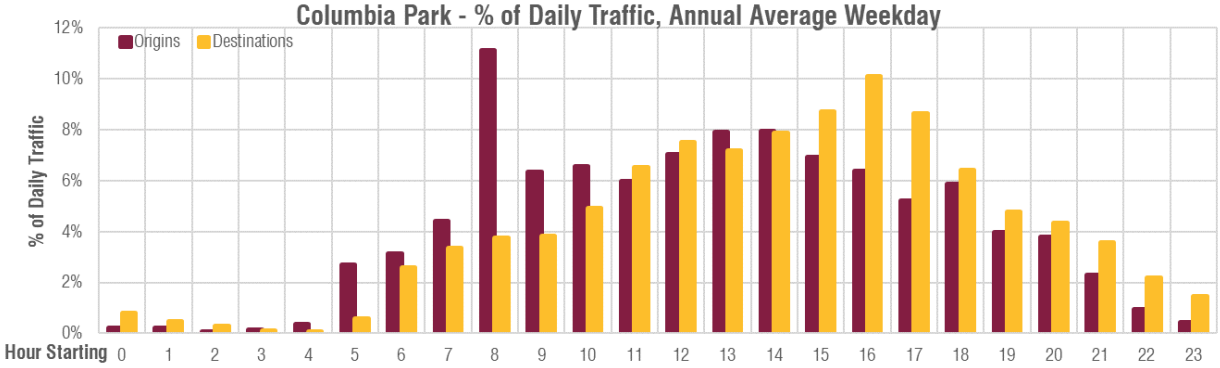
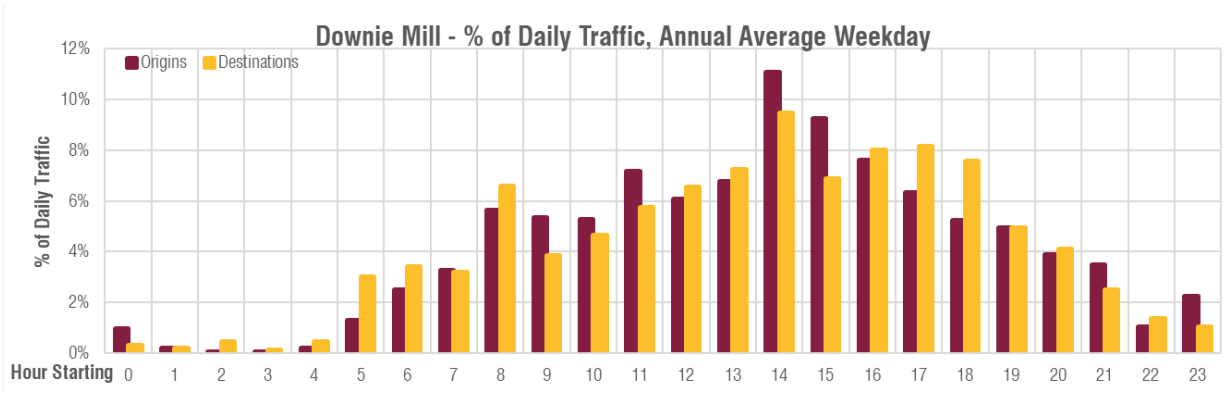

Clearview Heights & CP Rail - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Columbia Park - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Downie Mill - % of Daily Traffic, Annual Average Weekday
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Hour Starting
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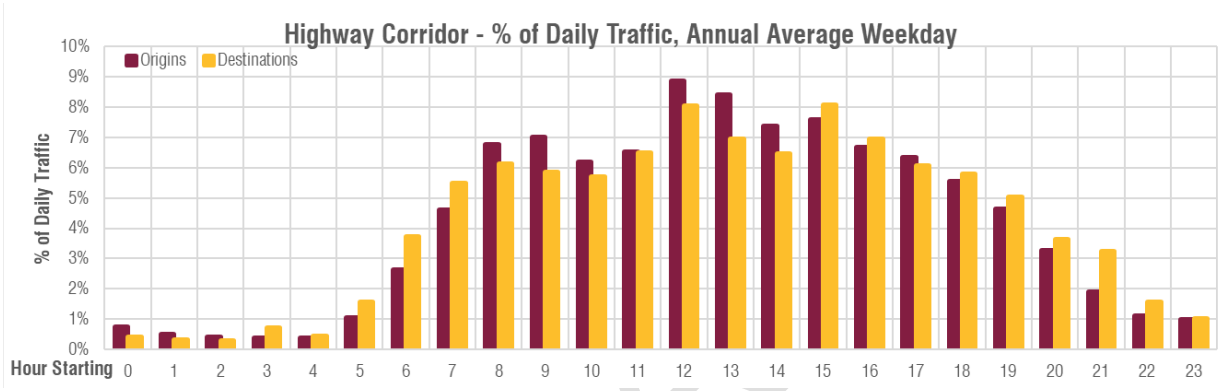
Highway Corridor - % of Daily Traffic, Annual Average Weekday
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Hour Starting
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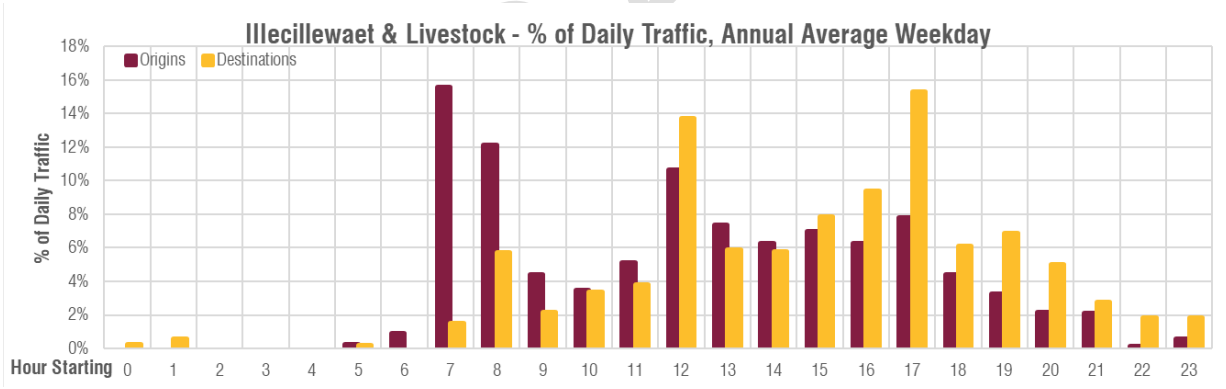
Illecillewaet & Livestock - % of Daily Traffic, Annual Average Weekday
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Destinations
% of Daily Traffic
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Hour Starting
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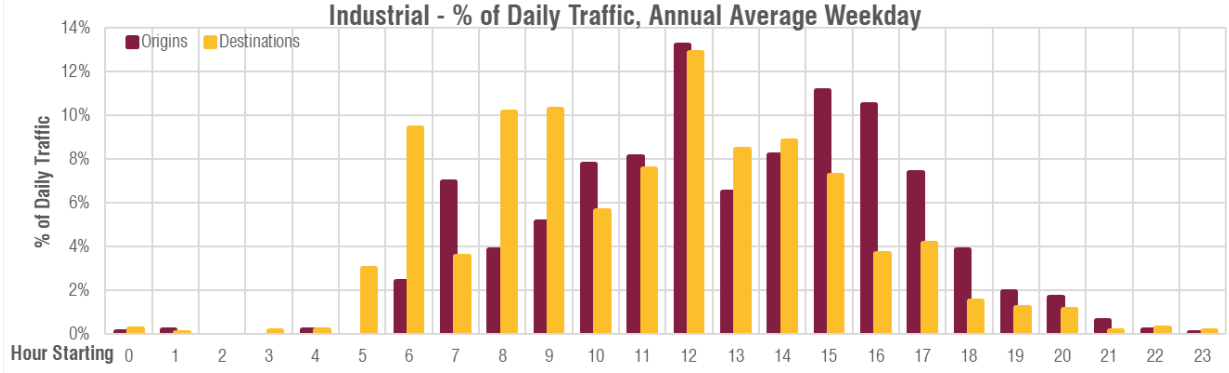
Industrial - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
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Hour Starting
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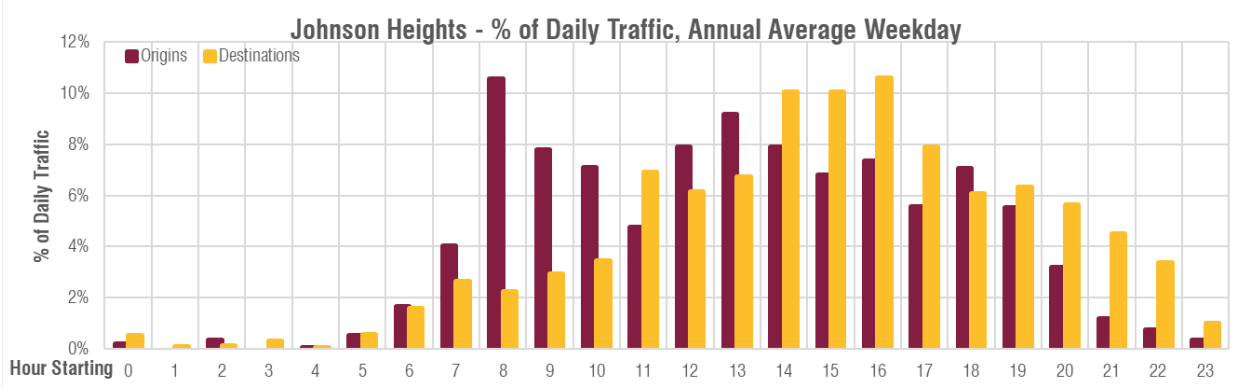
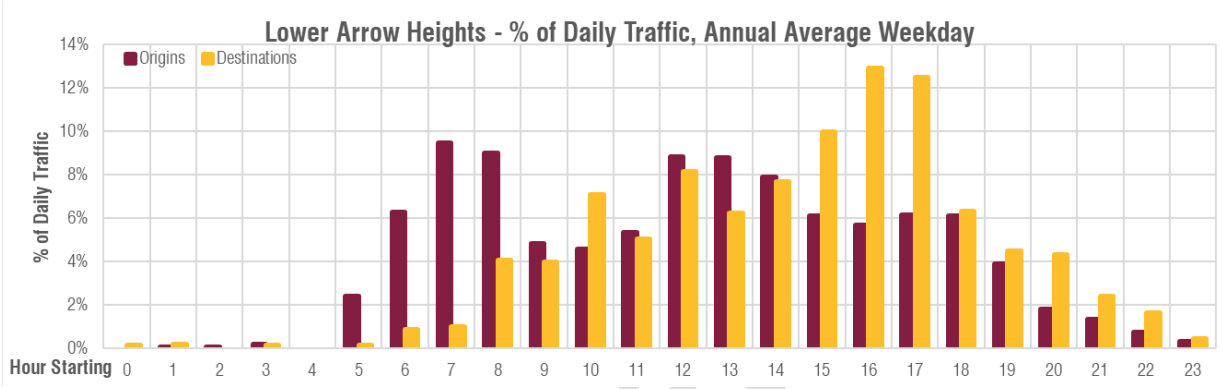
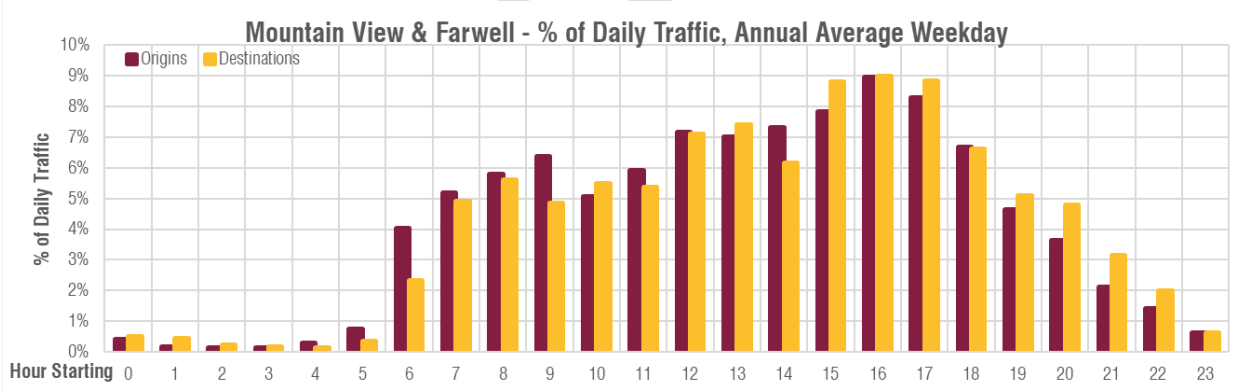
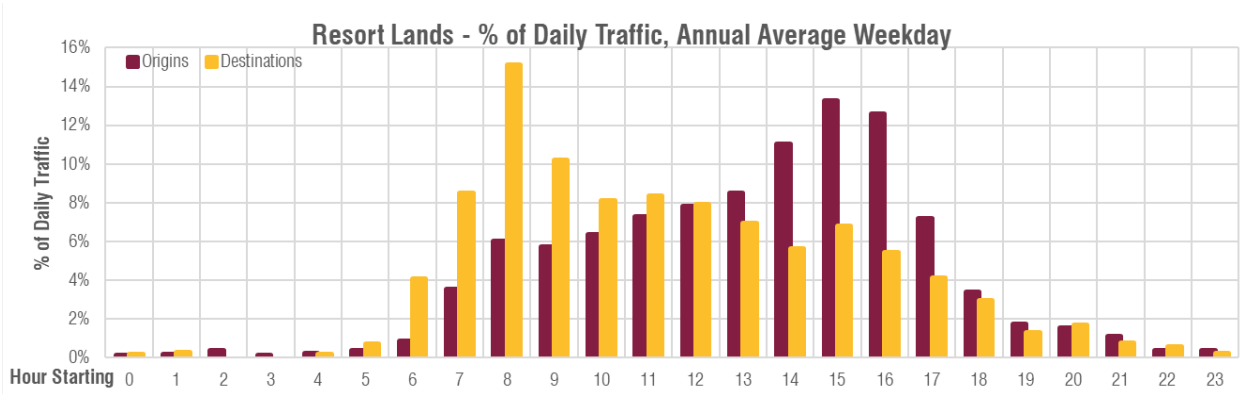
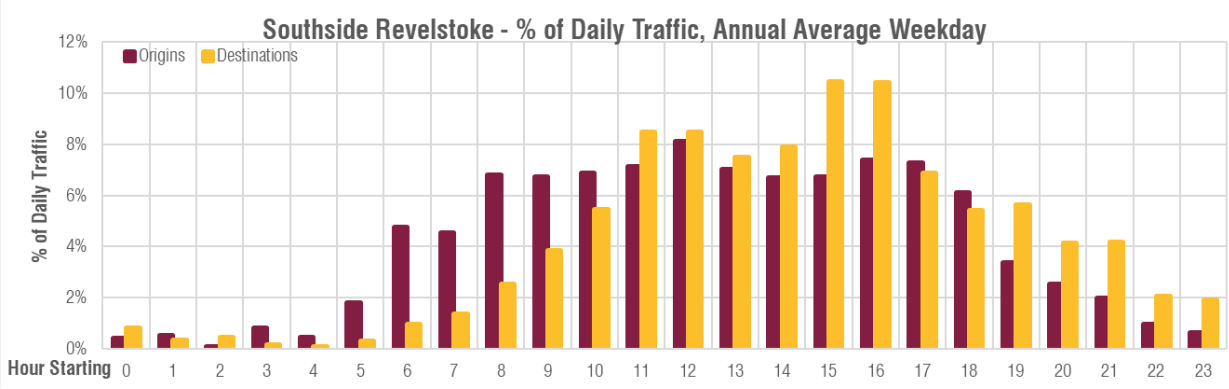

Johnson Heights - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting


Lower Arrow Heights - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting


Mountain View & Farwell - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting


Resort Lands - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
Hour Starting


Southside Revelstoke - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
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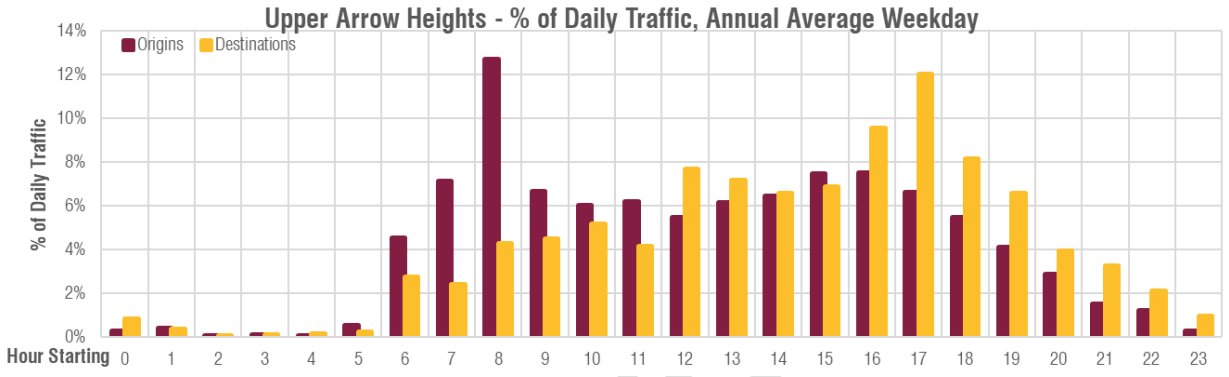
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Upper Arrow Heights - % of Daily Traffic, Annual Average Weekday
Origins
Destinations
% of Daily Traffic
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Hour Starting
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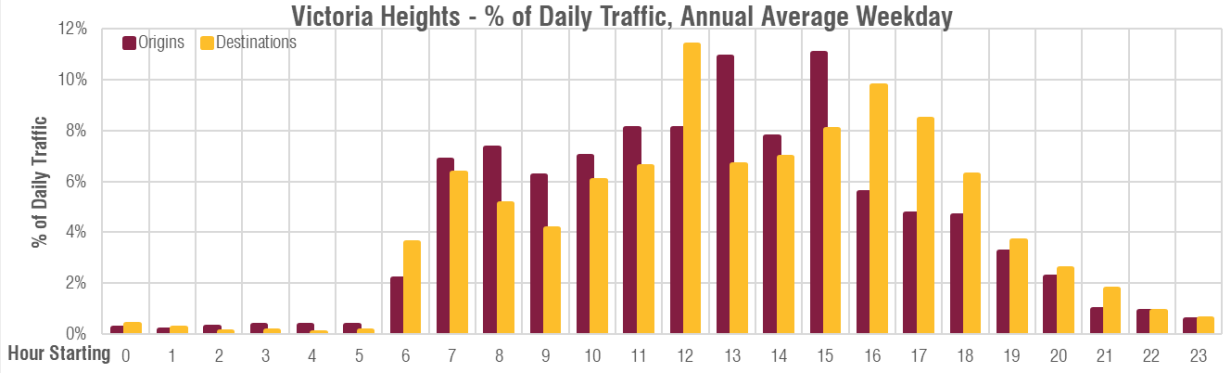
Victoria Heights - % of Daily Traffic, Annual Average Weekday
Origins
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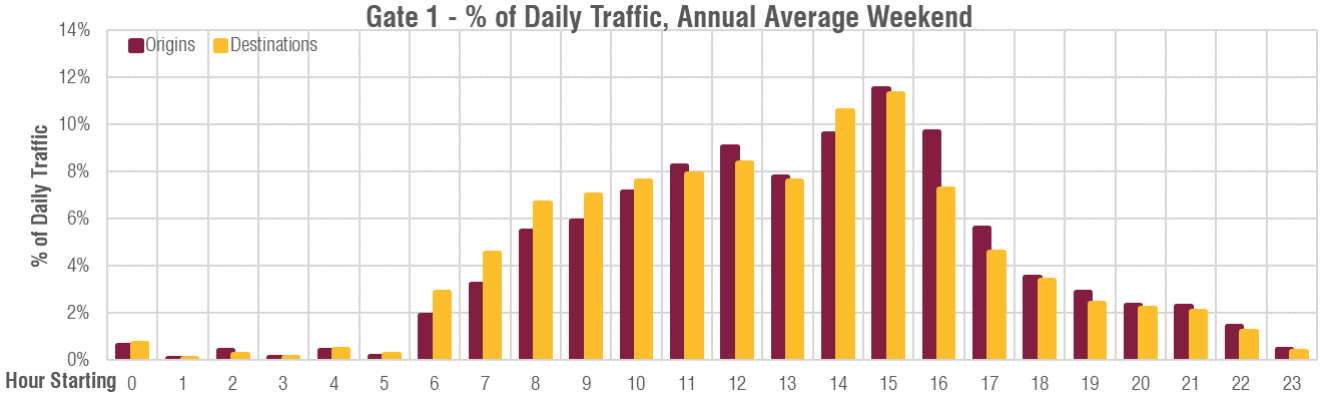
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Gate 1 - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
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Hour Starting
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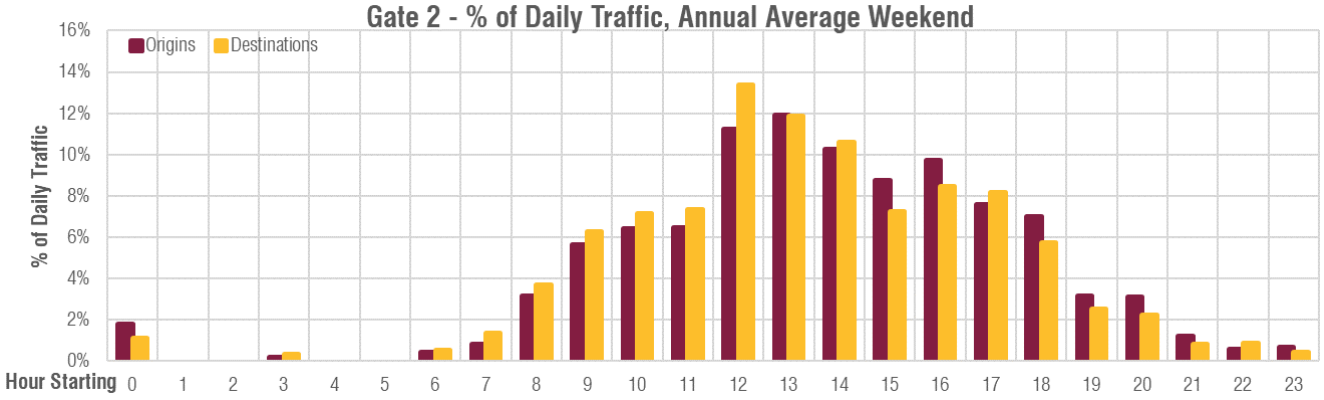
Gate 2 - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
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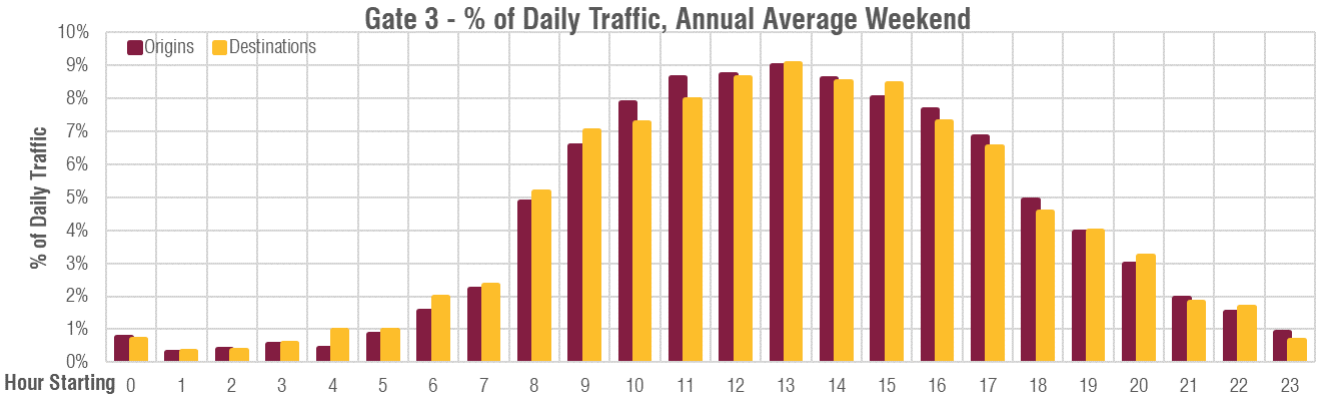
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Gate 3 - % of Daily Traffic, Annual Average Weekend
Origins
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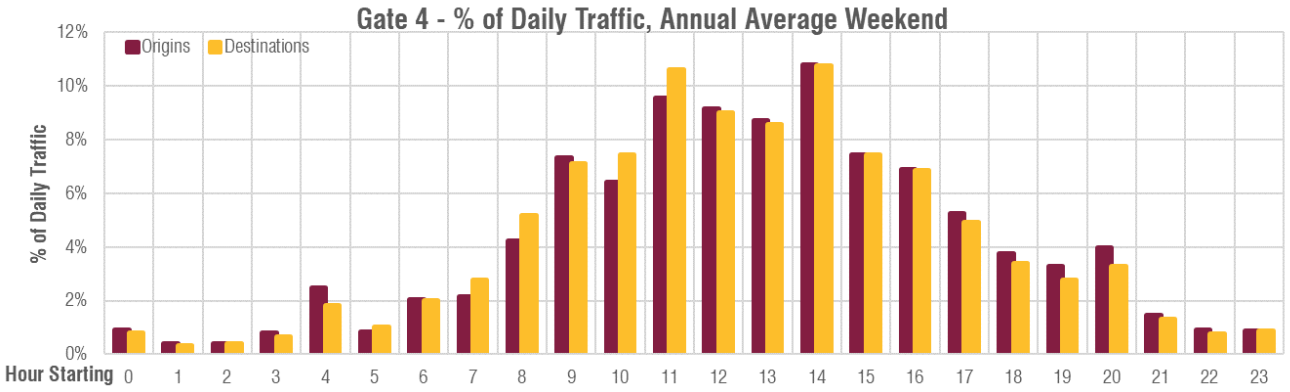
Gate 4 - % of Daily Traffic, Annual Average Weekend
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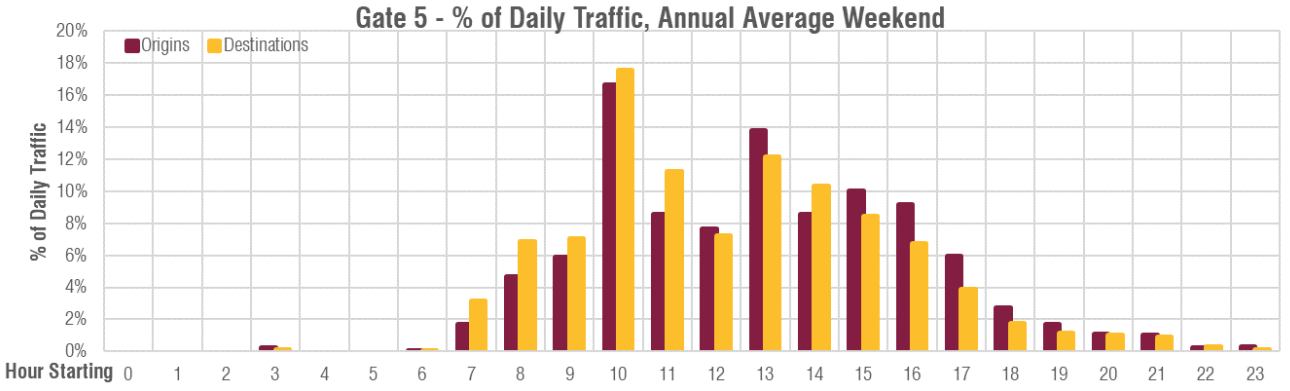
Gate 5 - % of Daily Traffic, Annual Average Weekend
Origins
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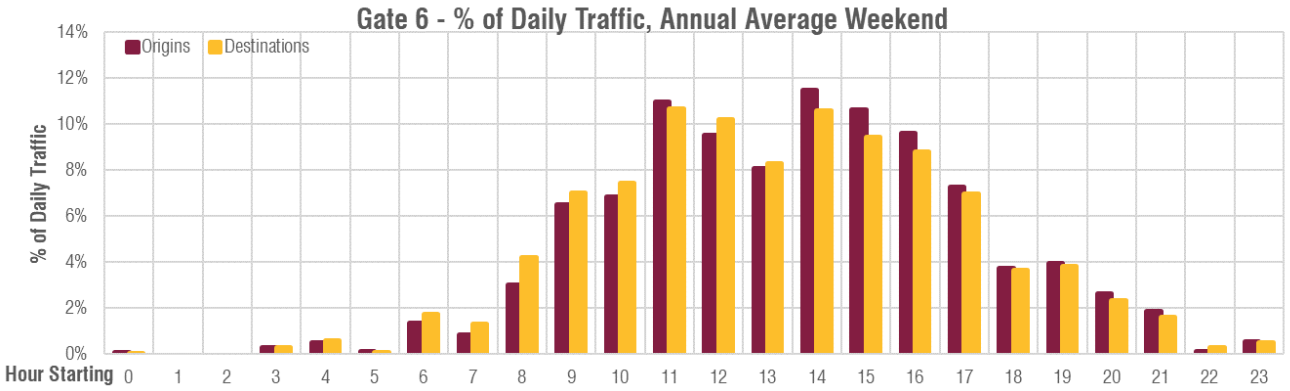
Gate 6 - % of Daily Traffic, Annual Average Weekend
Origins
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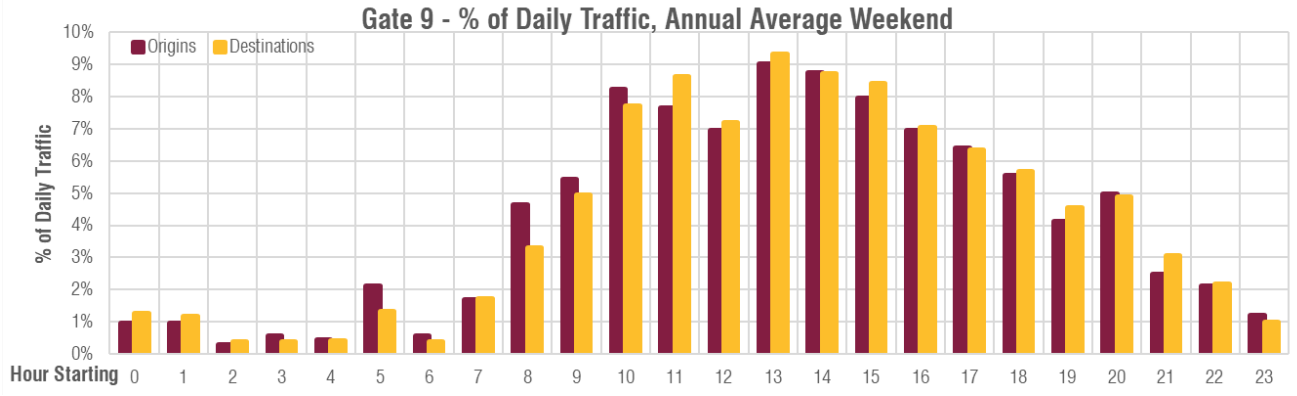
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Gate 9 - % of Daily Traffic, Annual Average Weekend
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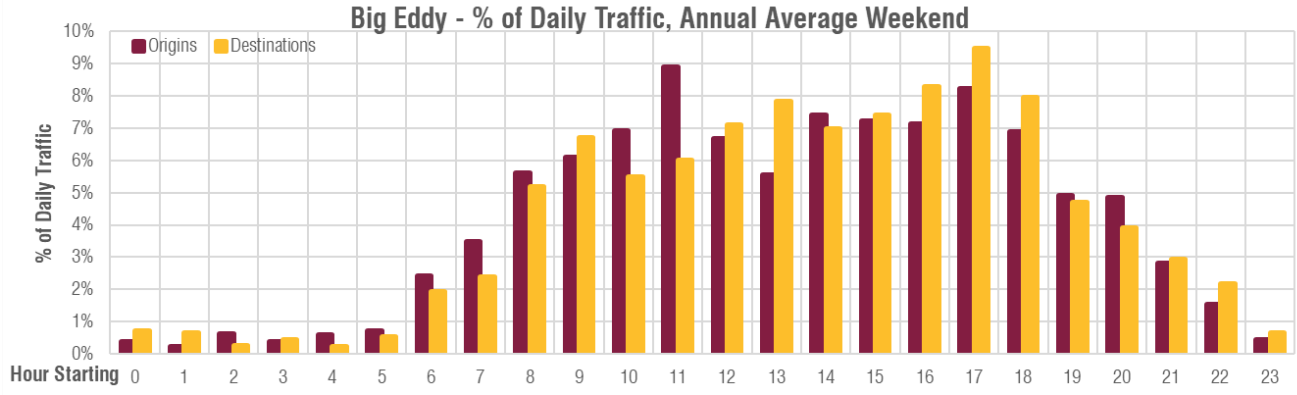
Big Eddy - % of Daily Traffic, Annual Average Weekend
Origins
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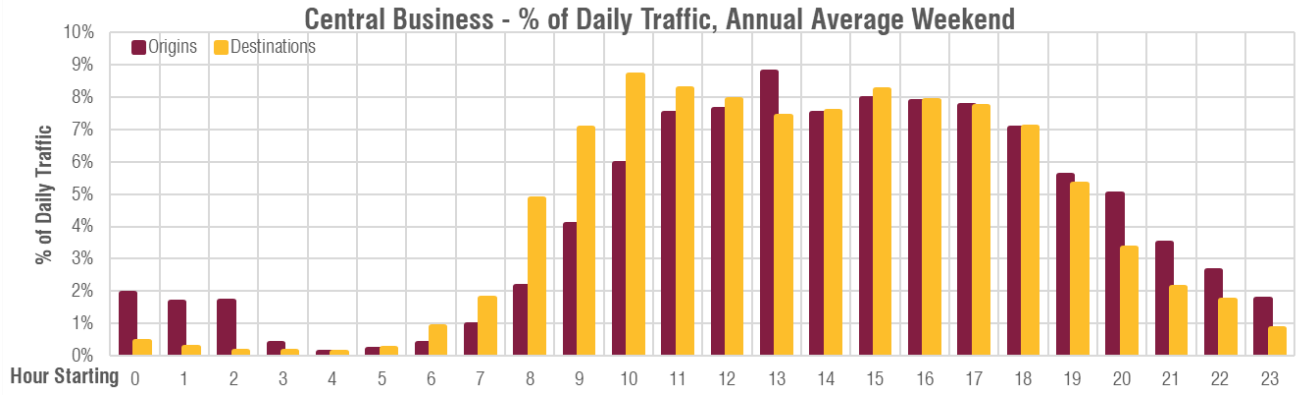
Central Business - % of Daily Traffic, Annual Average Weekend
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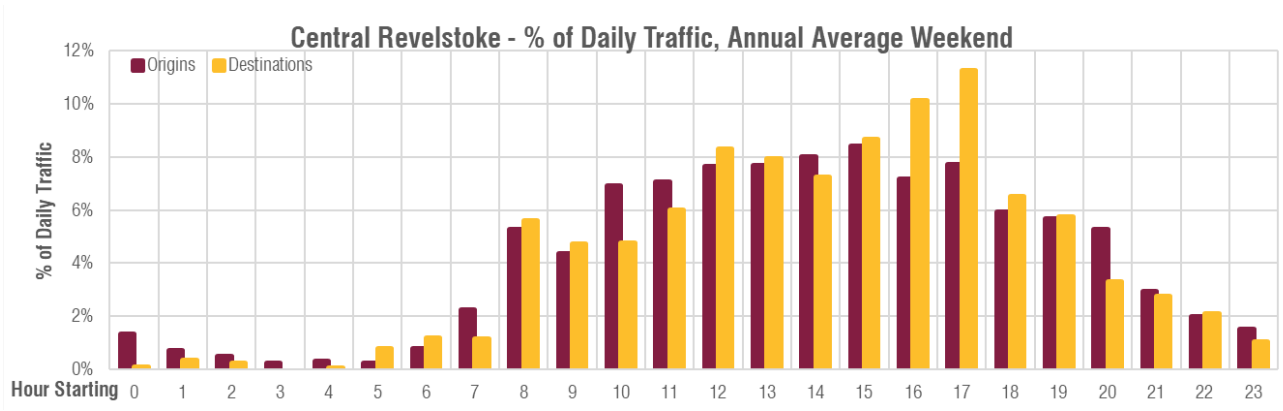
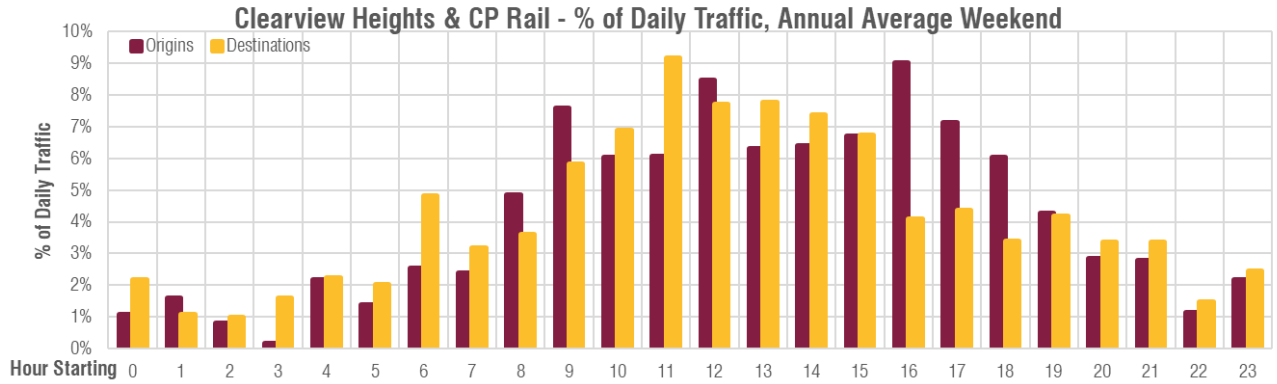
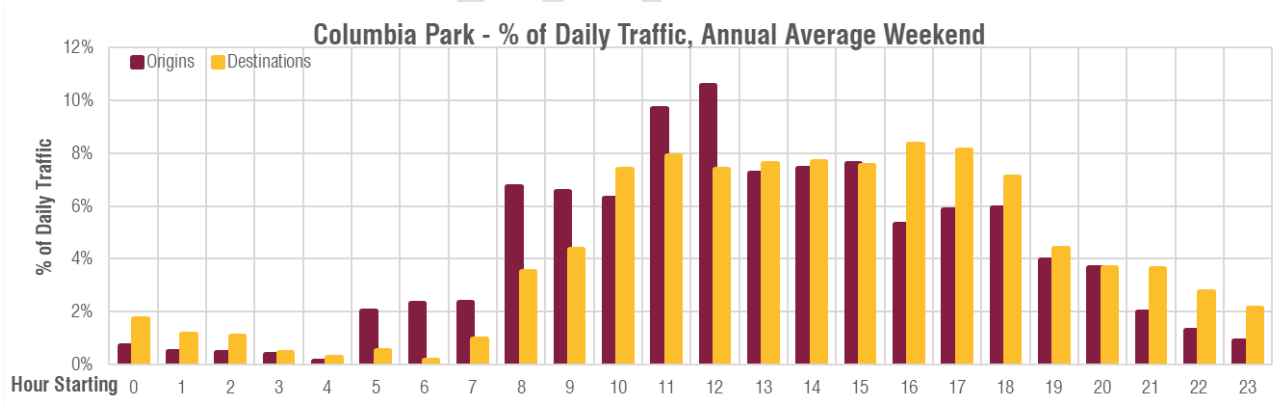
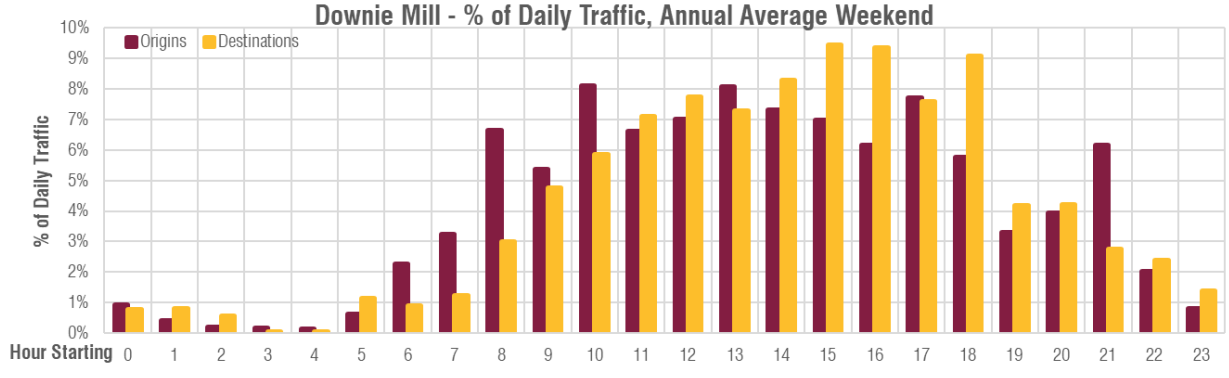
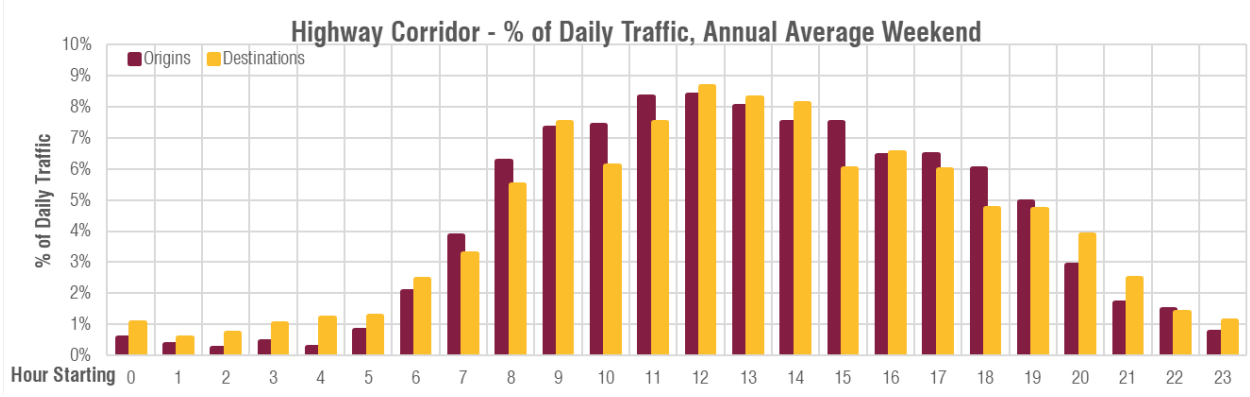
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Central Revelstoke - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
Hour Starting


Clearview Heights & CP Rail - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
Hour Starting


Columbia Park - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
Hour Starting


Downie Mill - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
Hour Starting


Highway Corridor - % of Daily Traffic, Annual Average Weekend
Origins
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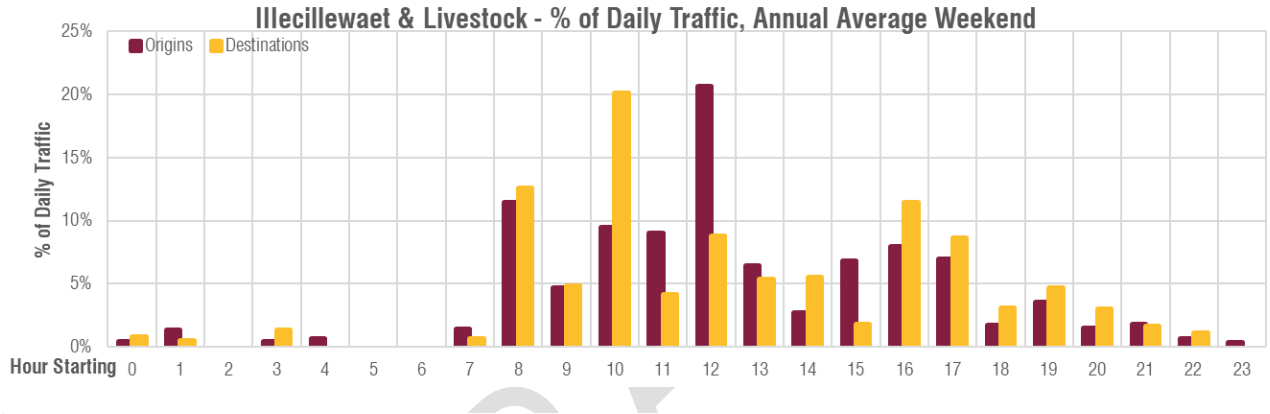
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Illecillewaet & Livestock - % of Daily Traffic, Annual Average Weekend
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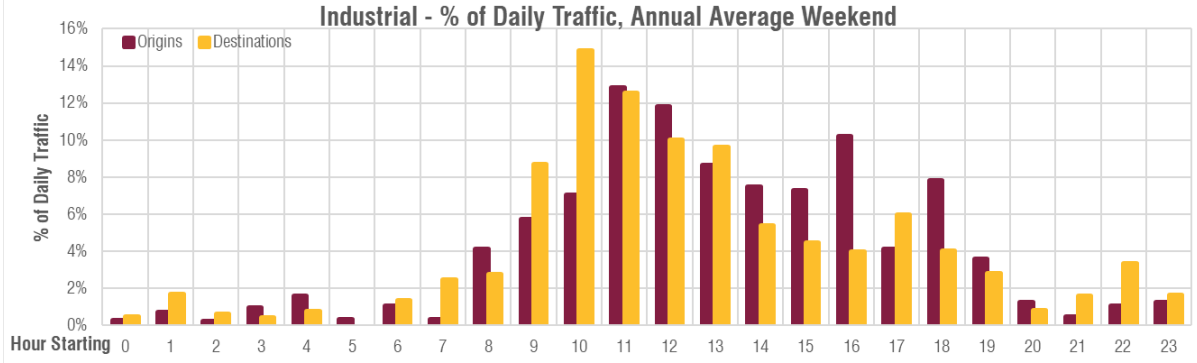
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Industrial - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
16%
14%
12%
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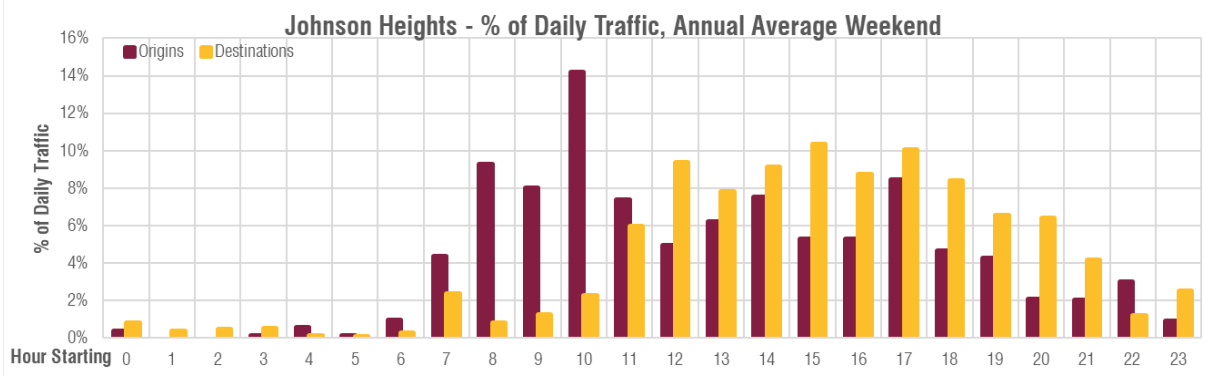
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Johnson Heights - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
16%
14%
12%
10%
8%
6%
4%
2%
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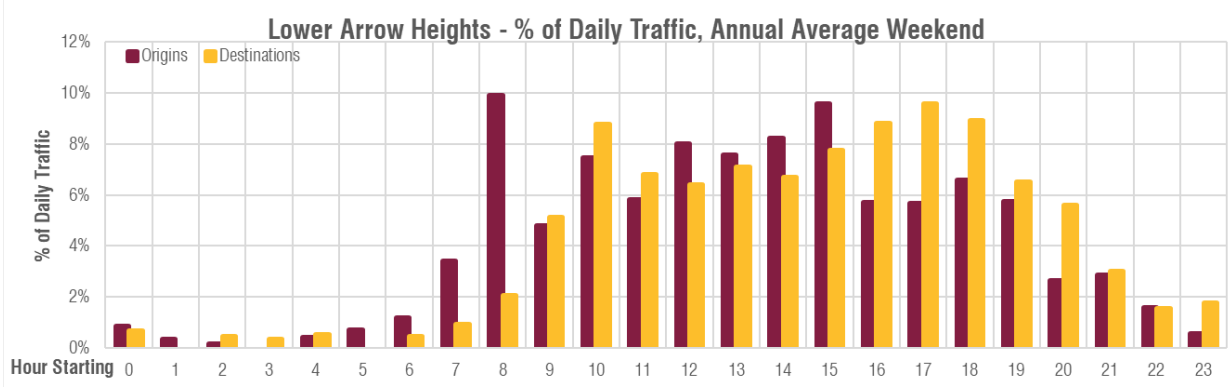
Hour Starting 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Lower Arrow Heights - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
12%
10%
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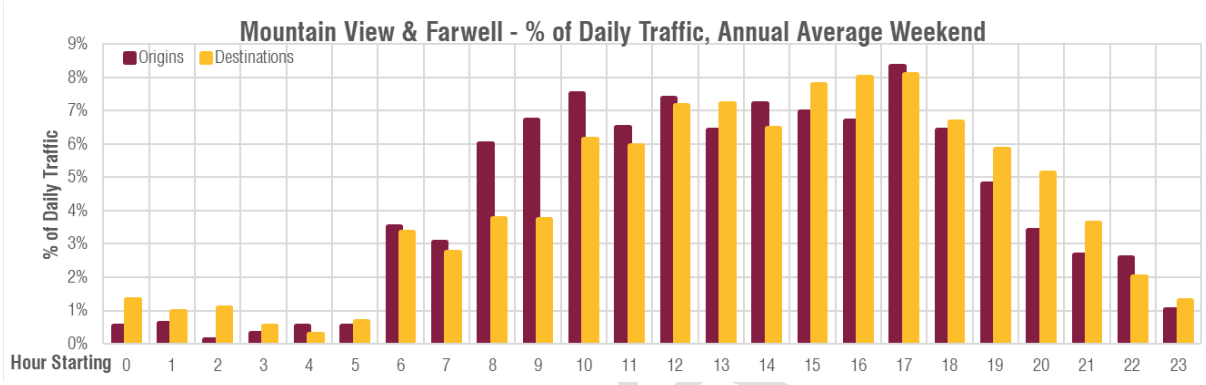
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Mountain View & Farwell - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
9%
8%
7%
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Hour Starting
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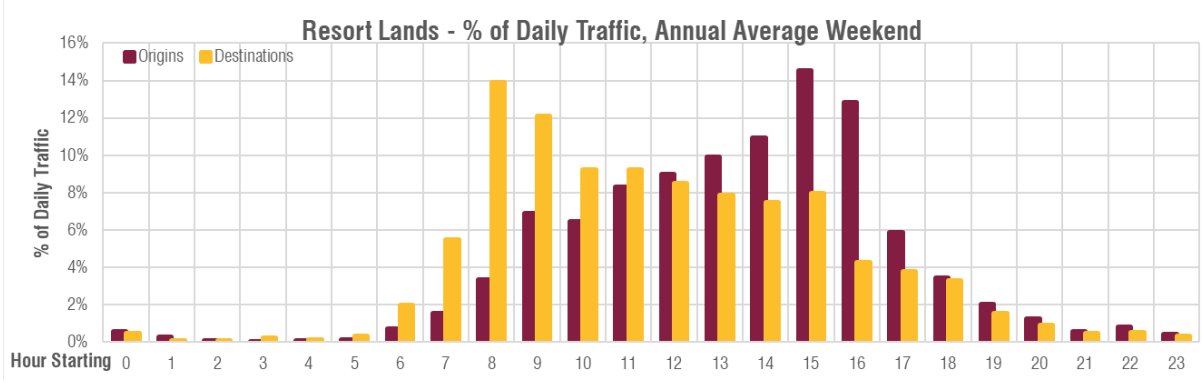
Resort Lands - % of Daily Traffic, Annual Average Weekend
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Destinations
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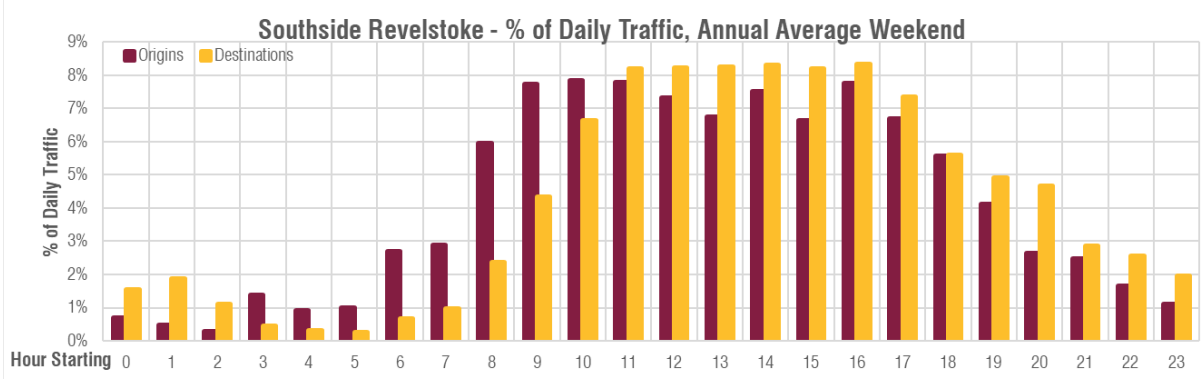
Southside Revelstoke - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
9%
8%
7%
6%
5%
4%
3%
2%
1%
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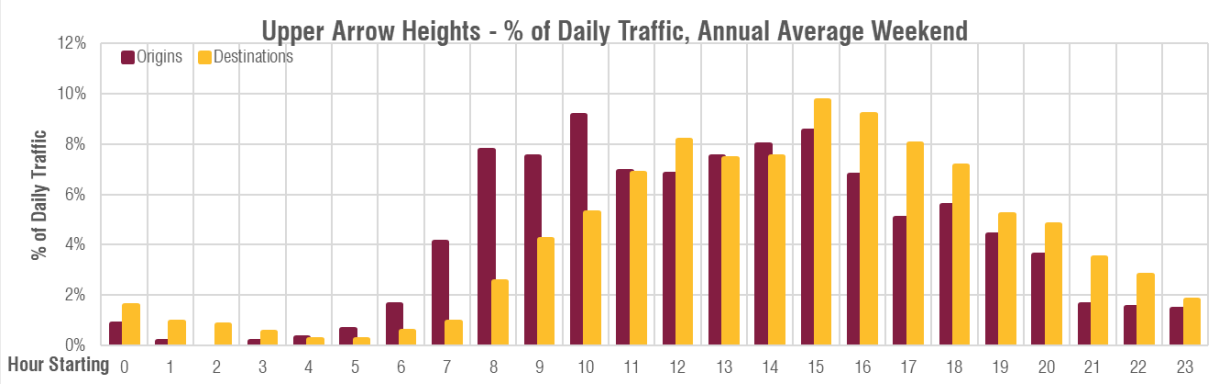
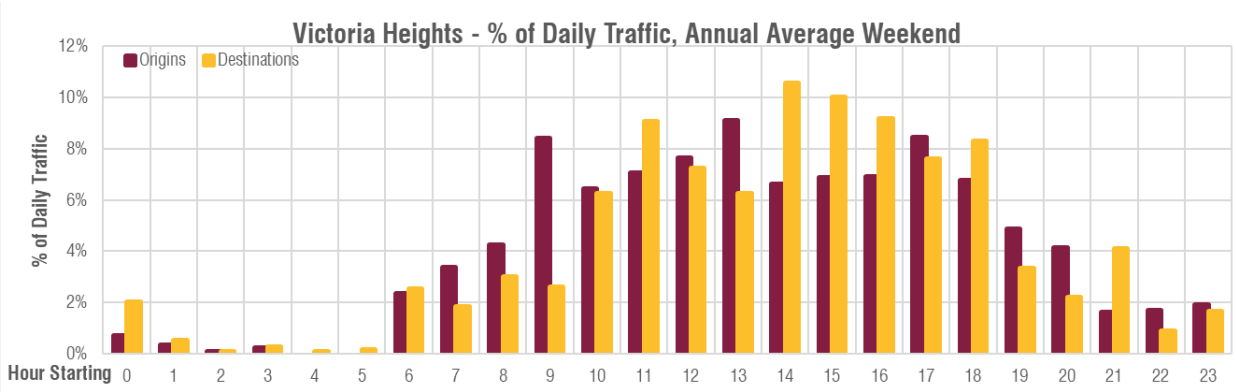
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Upper Arrow Heights - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
12%
10%
8%
6%
4%
2%
0%
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


Victoria Heights - % of Daily Traffic, Annual Average Weekend
Origins
Destinations
% of Daily Traffic
12%
10%
8%
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4%
2%
0%
Hour Starting
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

APPENDIX C

Future Population Growth Assumptions

Assumptions & Methodology for Revelstoke Population and Trip Generation Projections

Revelstoke Transportation Master Plan

<table>
<tr><th></th><th>Item</th><th>Description</th></tr>
<tr><td>1</td><td>2041 Population Estimate</td><td>

Used Rennie Report volume scenarios:

TABLE 9: TOTAL PEAK POPULATION
<table>
<tr><th></th><th></th><th colspan="6">2041</th></tr>
<tr><th></th><th>2019</th><th>low</th><th>change</th><th>baseline</th><th>change</th><th>high</th><th>change</th></tr>
<tr><td>usual residents</td><td>8,259</td><td>8,919</td><td>660</td><td>9,932</td><td>1,673</td><td>10,968</td><td>2,709</td></tr>
<tr><td>shadow population</td><td>556</td><td>651</td><td>95</td><td>703</td><td>148</td><td>757</td><td>201</td></tr>
<tr><td>peak tourists</td><td>8,728</td><td>10,041</td><td>1,313</td><td>10,041</td><td>1,313</td><td>10,041</td><td>1,313</td></tr>
<tr><td>total peak population</td><td>17,542</td><td>19,610</td><td>2,068</td><td>20,676</td><td>3,134</td><td>21,765</td><td>4,223</td></tr>
</table>

Used High Growth Scenario per the latest OCP draft

“To ensure that the City is well prepared for future population increases, this plan utilizes the High Growth Scenario of 1.5% growth rate to guide future planning. By 2041, the high growth scenario envisions an increase in usual residents by 2,709, the shadow population by 201, and the peak tourist population by 1,313. This would equate to a total peak population of 21,765 by 2041” (Click here for OCP draft)

</td></tr>
<tr><td>2</td><td>Areas of Development in Revelstoke</td><td>

See map of growth area provided in report.

</td></tr>
<tr><td>3</td><td>Overview of Methodology for forecasting Development Trips</td><td>

Calculate total number of hotel units per development
Calculate number of residents per residential development
Scale down the total number of residents and units to fall in a closer range with the predicted 2041 population estimate
Applied the 11th ed ITE trip gen rates to the units per development and calculated trips exiting and entering each superzone accordingly
<ol type="a">
For some land uses, ITE did not provide sufficient information to calculate trips, so similar land uses were used (I.e. for Multi-family low rise, in some cases it used Single-Family rates).

Use the ITE daily trip distributions to have daily hour volumes available

</td></tr>
<tr><td>4</td><td>Hotel Development Trip Calculations</td><td>

Calculating hotel units:

Square ft of entire hotel floor area per room = 200 sq.ft
Hotel Capacity = 100%
% of proposed hotel developments built = 100%

Calculating hotel visitors:

1.8 persons/hotel unit (Based on Rennie report)

Applying Trip Gen Rates:

ITE Land Use: 310 Hotel

</td></tr>
<tr><td>5</td><td>Future Residents Calculations</td><td>

Calculating Residents:

People per residence = 2.25 (based on latest OCP draft detailing housing demand)

</td></tr>
</table>

Assumptions & Methodology for Revelstoke Population and Trip Generation Projections

Revelstoke Transportation Master Plan

<table>
<tr>
<td>6</td>
<td>Scaling of Residential Developments to match projected growth</td>
<td>Residential development forecasting were scaled down based on their superzone. (Note: This does not apply to hotels)

<table>
<tr><th>Development Areas</th><th>% of Proposed Development</th></tr>
<tr><td>All Hotels</td><td>100%</td></tr>
<tr><td>Highway Corridor (SF&MF)</td><td>100%</td></tr>
<tr><td>JH (SF&MF)</td><td>40%</td></tr>
<tr><td>LAH (SF&MF)</td><td>35%</td></tr>
<tr><td>UAH (SF&MF)</td><td>35%</td></tr>
<tr><td>VH(SF&MF)</td><td>35%</td></tr>
<tr><td>RMR(SF&MF)</td><td>35%</td></tr>
</table>
</td>
</tr>
<tr>
<td>7</td>
<td>Residential Trip Calculations</td>
<td>

ITE Land Use Trip generations:

210: Single Family Detached Housing

ITE daily distribution applied

220: Multi family low rise
221: Multi family mid rise
Combination of 220 & 221 based on available ITE data and relevancy

</td>
</tr>
<tr>
<td>8</td>
<td>Peak Hours</td>
<td>

AM Peak: 8 AM
Midday Peak: 12 PM
PM Peak: 4 PM

</td>
</tr>
</table>

APPENDIX D

Transit Service Data

APPENDIX D TRANSIT SERVICE DATA

Table D-1 – Table Title

Service Period	Service Type	Service Days and Levels of Service			Annual Service Hours	Annual Operating Cost
		Weekdays	Saturday	Sunday/Holiday		
Summer	Conventional	f: 40/60/40/-	f: -/60/-/-	-	2,825	$ 367,250
	Shuttle Service (Big Eddy/Columbia)	-	-	-		$ -
	On Demand (Big Eddy/Columbia)	4h	4h	-	732	$ 95,160
	On Demand (South)	4h	4h	-	732	$ 95,160
	Total				**4,289**	**$ 557,570**
Early Winter	Conventional	40/40/40/-	40/40/40/-	40/40/40/-	463	$ 60,190
	Shuttle Service (Big Eddy/Columbia)	40/40/40/-	40/40/40/-	40/40/40/-	110	$ 14,300
	On Demand (Big Eddy/Columbia)	-	-	-		$ -
	On Demand (South)	4h	4h	4h	88	$ 11,440
	Total				**661**	**$ 85,930**
Peak Winter	Conventional	30/30/30/40	30/30/30/40	30/30/30/40	3453	$ 448,890
	Shuttle Service (Big Eddy/Columbia)	40/40/40/-	40/40/40/-	40/40/40/-	920	$ 119,600
	On Demand (Big Eddy/Columbia)	-	-	-		$ -
	On Demand (South)	4h	4h	4h	368	$ 47,840
	Total				**4,741**	**$ 616,330**
Late Winter	Conventional	40/40/40/-	40/40/40/-	40/40/40/-	631	$ 82,030
	Shuttle Service (Big Eddy/Columbia)	40/40/40/-	40/40/40/-	40/40/40/-	120	$ 15,600
	On Demand (Big Eddy/Columbia)	-	-	-		$ -
	On Demand (South)	4h	4h	4h	120	$ 15,600
	Total				**871**	**$ 113,230**
ANNUAL TOTAL					**10,562**	**$ 1,373,060**
	Frequency of Service:	am/middy/pm/evening				
	Service hours per day:	4h				

Source:

APPENDIX E

Smart Mobility Readiness Report

Stantec

STN Sm Smart + STN E Equity + STN R Resilience

SMART(ER) MOBILITY

READINESS ASSESSMENT

PREPARED FOR: **THE CITY OF REVELSTOKE**

AS PART OF THE TRANSPORTATION MASTER PLAN

AUGUST 2022

REPORT ACKNOWLEDGMENTS

The Smart(ER) Mobility Readiness report report was prepared by Stantec, for the City of Revelstoke as part of the Transportation Master Plan in 2022.

TERRITORIAL ACKNOWLEDGEMENT

We acknowledge the City of Revelstoke, and the mountain lands surrouding it are located on the traditional lands of four nations: the Sinixt, the Secwepemc, and the Syilx. In creating plans for the future we hope to learn from and honour our inidgenous partners, the beautiful natural landscapes and the history through which we work.

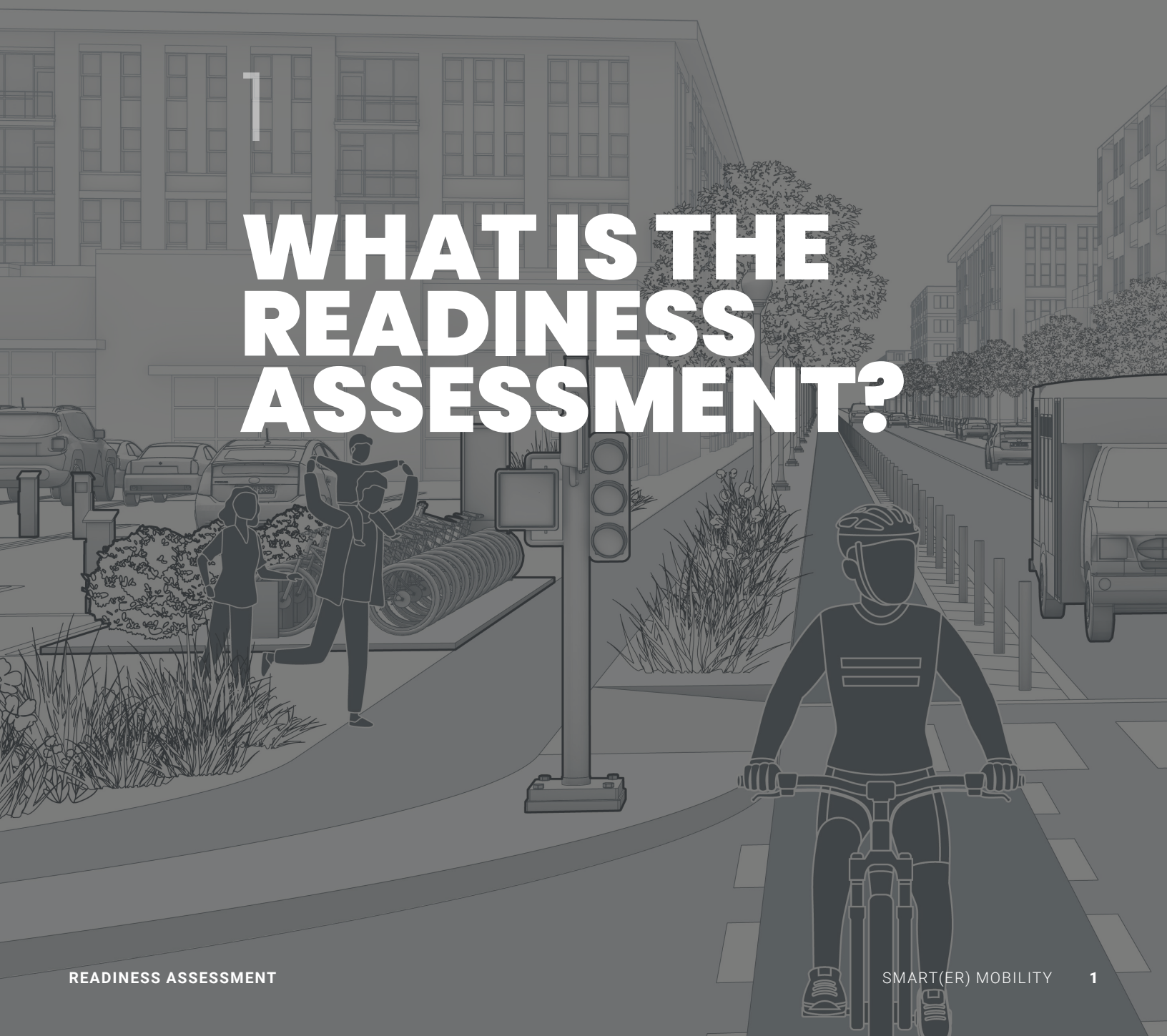
COMMUNITY ACKNOWLEDGEMENT

We appreciate the input provided by the members of the Revelstoke community who participated in the development of the Transportation Master Plan and are invested in the future of the City.

TABLE OF CONTENTS

1

WHAT IS THE READINESS ASSESSMENT?



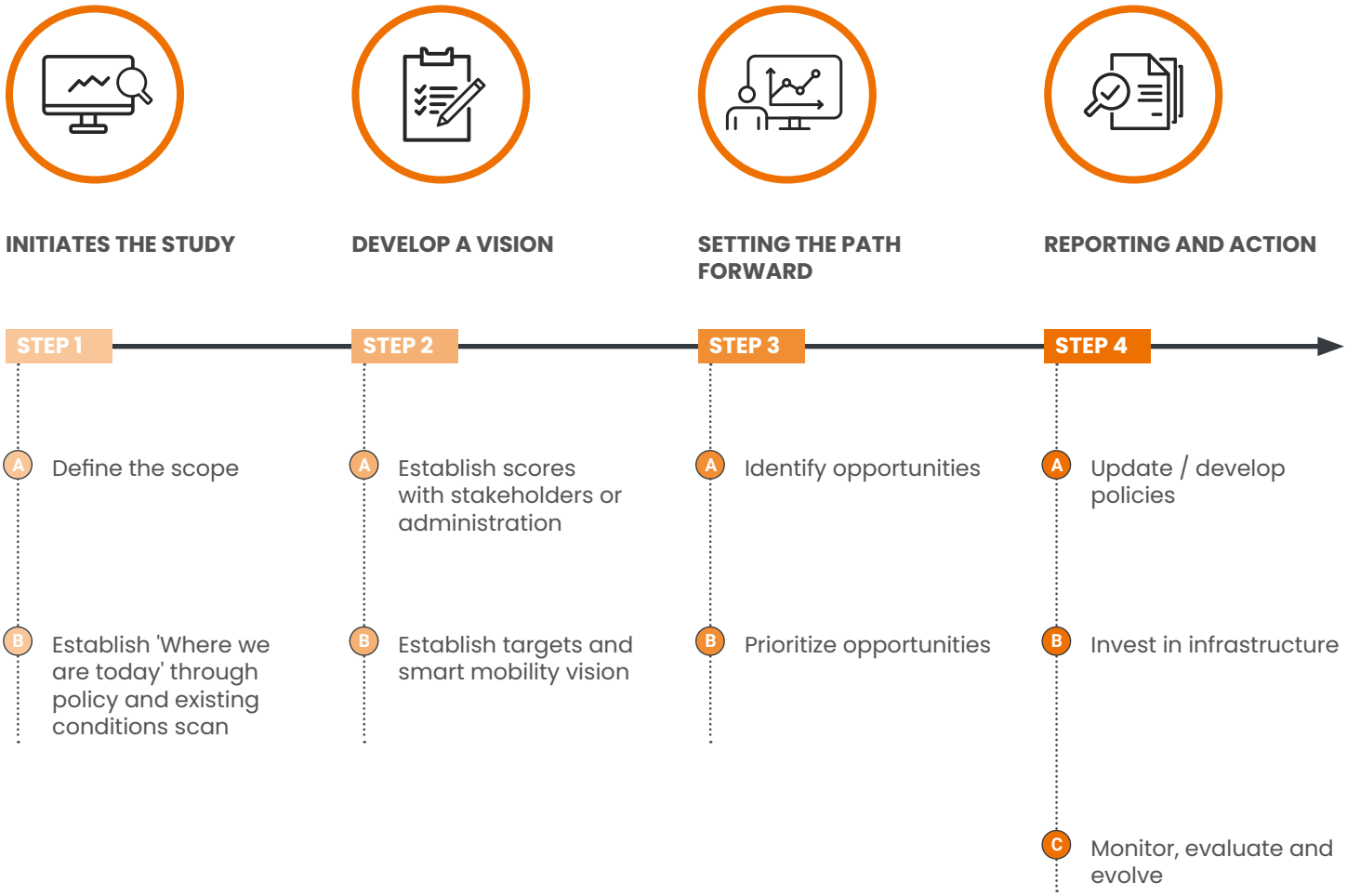
1 WHAT IS THE READINESS ASSESSMENT?

1.1 SMART MOBILITY READINESS ASSESSMENT TOOL

1.1.1 SMART MOBILITY APPROACH AND PROCESS

The emergence of new technologies and new approaches to transportation is broadly categorized as Smart Mobility. More broadly, we recognize that Smart Mobility as a practice is one that builds more resilient and equitable communities through less dependence on one mode of transportation, and effective information use in planning and delivery.

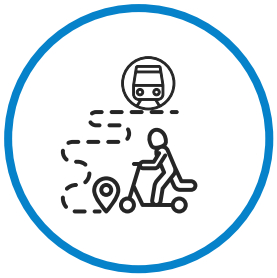
We identify that this occurs over a few key domains simultaneously, and the readiness of an agency, company or government to advance Smart Mobility initiatives will not be equal among these. The Smart Mobility Readiness Assessment Tool provides an approach to evaluating and quantifying these domains and identifying an action plan.



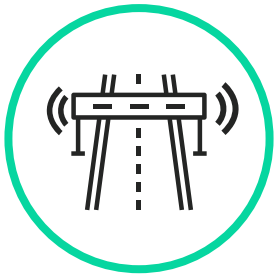
1.1.2 THE READINESS ASSESSMENT TOOL

To evaluate the readiness for Smart Mobility and direct invtestment the framework uses six domains which interelate and overlap. Within each domain there are several metrics to get a 'full picture'. The domains used to evaluate the readiness are:

- **Diversity, Equity, Safety and the Environment**, - evaluates physcial infrastructure
- **System Efficiencies**, - evaluates the operations of transportation infrastructure
- **Travel Demand Management and Access to Travel Information**, - evaluates the availability and accessibility of informaiton
- **Data Sharing and Privacy**, - evaluates the infrastructure necessary for the operation of a digital transportation framework
- **Interoperability / Communications Across and Between Modal Networks and Communities**; - evaluates the flexibility of the digitital domain accross transportation networks
- **Planning and Governance** - evaluates the people and funding frameworks in place to support Smart Mobility



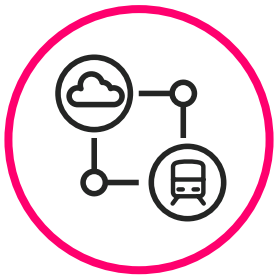
DIVERSITY, EQUITY, SAFETY AND THE ENVIRONMENT



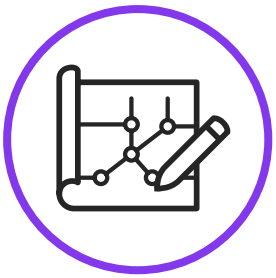
ROADWAY SYSTEM EFFICIENCIES

TRAVEL DEMAND MANAGEMENT AND ACCESS TO TRAVEL INFORMATION

DATA SHARING AND PRIVACY



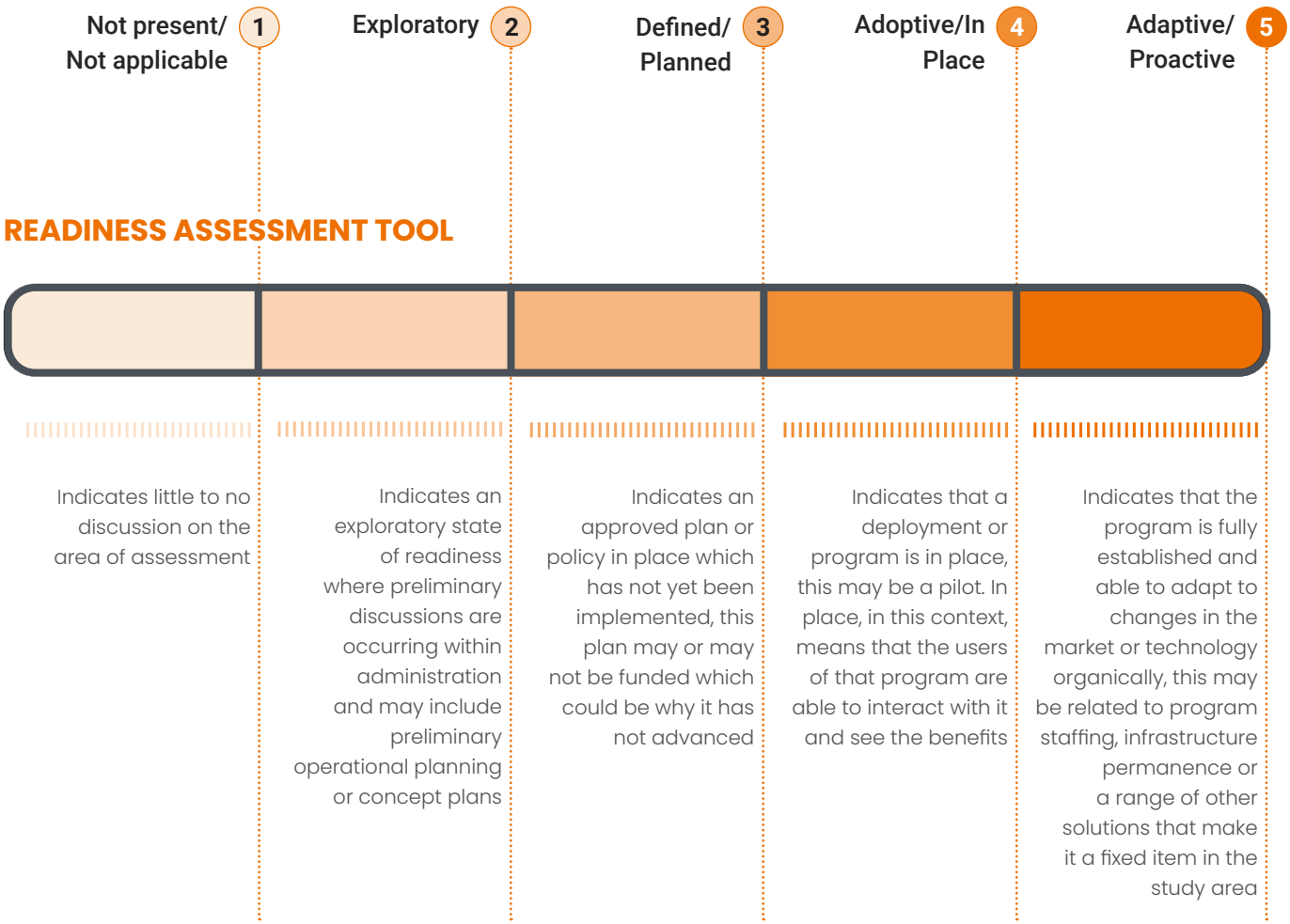
COMMUNICATIONS ACROSS AND BETWEEN MODAL NETWORKS AND COMMUNITIES

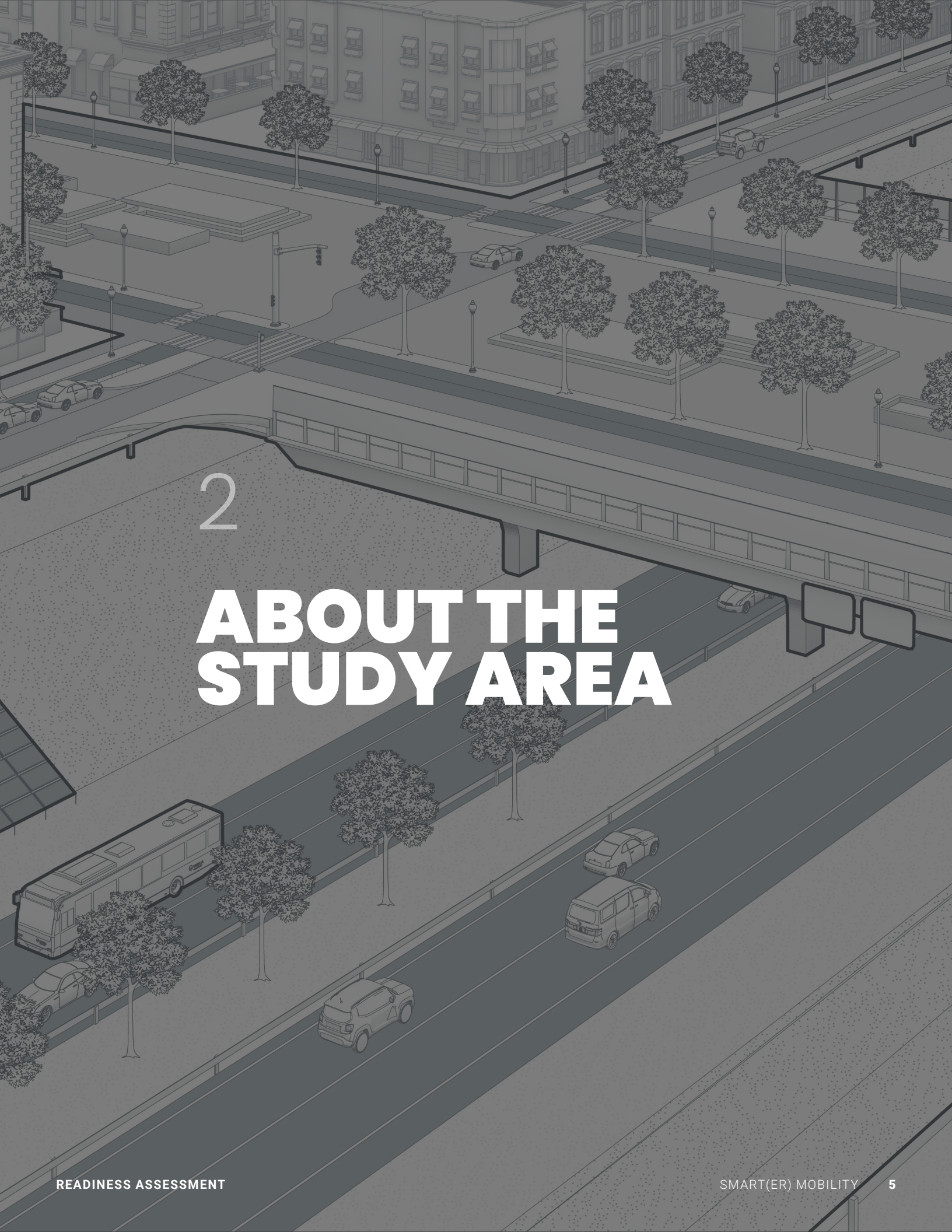


PLANNING AND GOVERNANCE

1.1.3 EVALUATION CRITERIA

The Readiness Assessment Tool establishes a set scale of 1-5, where each number aligns with the state of readiness. Through an understanding of policy direction, and meetings with key people who are working in this area, targets are established. The targets are meant to identify where the system believes it is going or is. Where a gap the gap is greatest between the targets and actual score there are opportunities for meaningful investment to meet the policy or political aims.





2

ABOUT THE STUDY AREA

2 ABOUT THE STUDY AREA

2.1 CITY OF REVELSTOKE

2.1.1 CONTEXT OVERVIEW

At the core of the City of Revelstoke has an inherent relationship with the natural setting in which it is set. Foundational to the policy direction, across the range of plans including the updated Transportation Master Plan and Official Community Plan, is the importance of sustainability. The areas heritage, natural environment and development of the local mountain resort provide keystones in how the City is experienced and long term development.

2.1.2 DEMOGRAPHICS

The City of Revelstoke has a population of less than 10,000 including the hundreds of people who live in the surrounding Columbia Shuswap Regional District and rely on the services from the City. The population has continuously grown at an annual rate of around 1.6% between 2010 and 2019, which has been largely fueled by the growing recreation and tourism elements in the economy. The City is anticipating an increase of residents and tourists towards a population around 20,000.

FIGURE 2.1.A
EXISTING ROADWAY INFRASTRUCTURE IN CITY OF REVELSTOKE SHOWING CONTRAST WITH NATURAL ENVIRONMENT

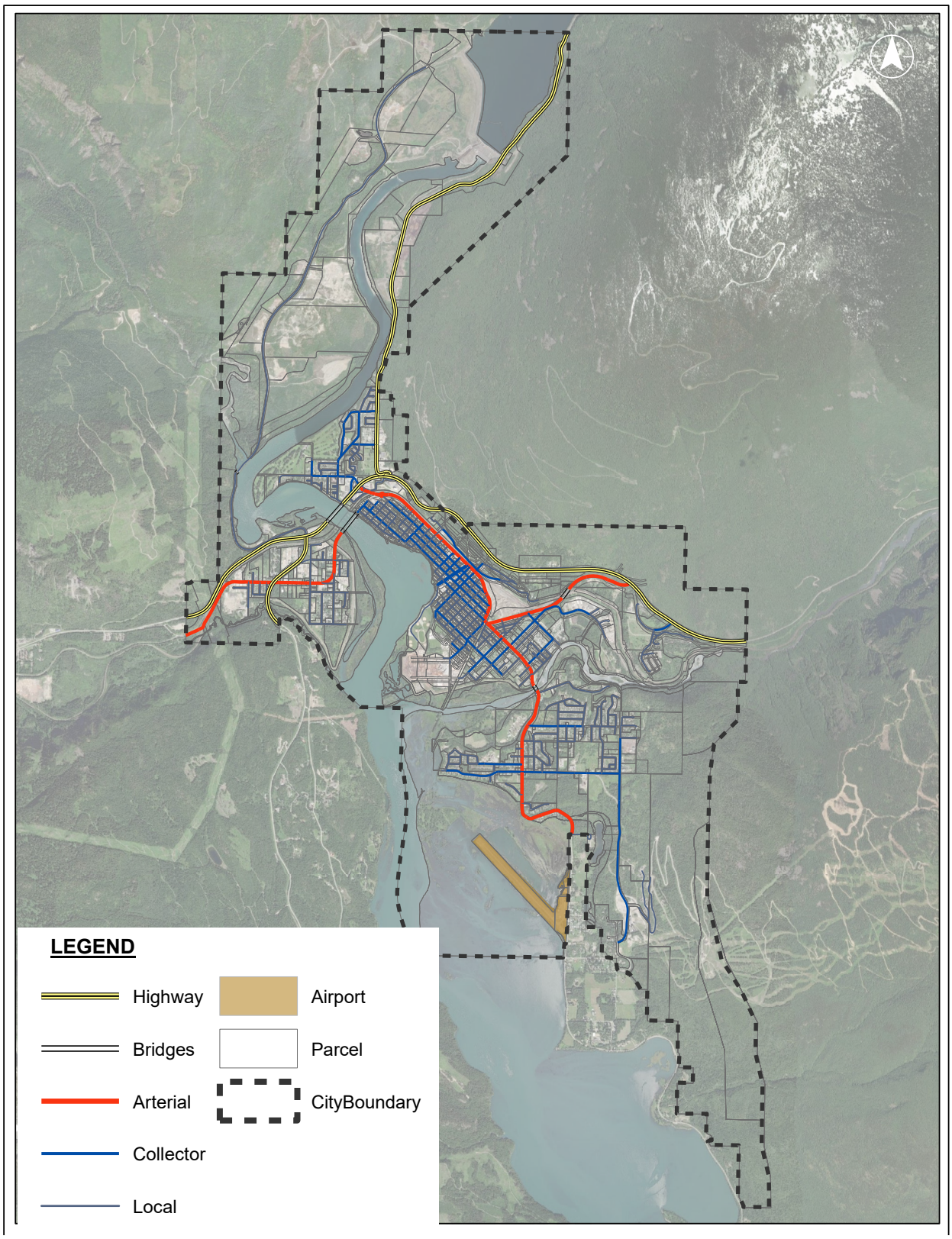
2.1.3 TRANSPORTATION

The City of Revelstoke is located at a key transportation connection, 400km west of Calgary, 200km East of Kelowna, with the Trans-Canada Highway and Canadian Pacific Railway providing high-capacity transportation access east west through it. The City roadways include 17km of highway, 11km of arterial, and 91km of lower classification roadways.

The City provides a destination for visitors, staying in the area and those where the City provides a place for fuel, food or a natural break from on their journey. This is balanced with the residents and employment in the City. All these factors highlight the requirement for a transportation system that provides efficient, accessibility and multi-modal choice.

FIGURE 2.1.B
REVELSTOKE STREETS: BICYCLE PARKING ALONG SIDEWALK

FIGURE 2.1.C
MULTI-USE PATHWAY IN THE CITY OF REVELSTOKE


LEGEND
Highway
Bridges
Arterial
Collector
Local
Airport
Parcel
CityBoundary

3

COMMUNITY SMART MOBILITY READINESS PROFILE

3 READINESS ASSESSMENT

3.1 SMART MOBILITY READINESS TOOL

The City of Revelstoke, while a small City in population, serves a range of transportation users coming from abroad. As a result the City has opportunities to develop a framework of policies and programs that will support Smart Mobility and immediately impact residents, businesses and visitors. The City relies heavily on the personal car as key transportation mode, providing access for both visitiors and residents. The transportation systems operates to support the movement of those vehicles in key places in a design familiar in the North Americian experience. A cornerstone of Smart Mobility is creating a transportation system that can serve the needs of all users, and developing that into the transportation network is important.

While the targets are low on the scale they reflect the scale and size of the City in its context. A lot of the emerging approaches are tied to existing congestion, existing signal operations or existing multimodal demand. The City currently has very few signals, as they are not warranted, which indicates both the infrastructure needed and the general level of traffic.

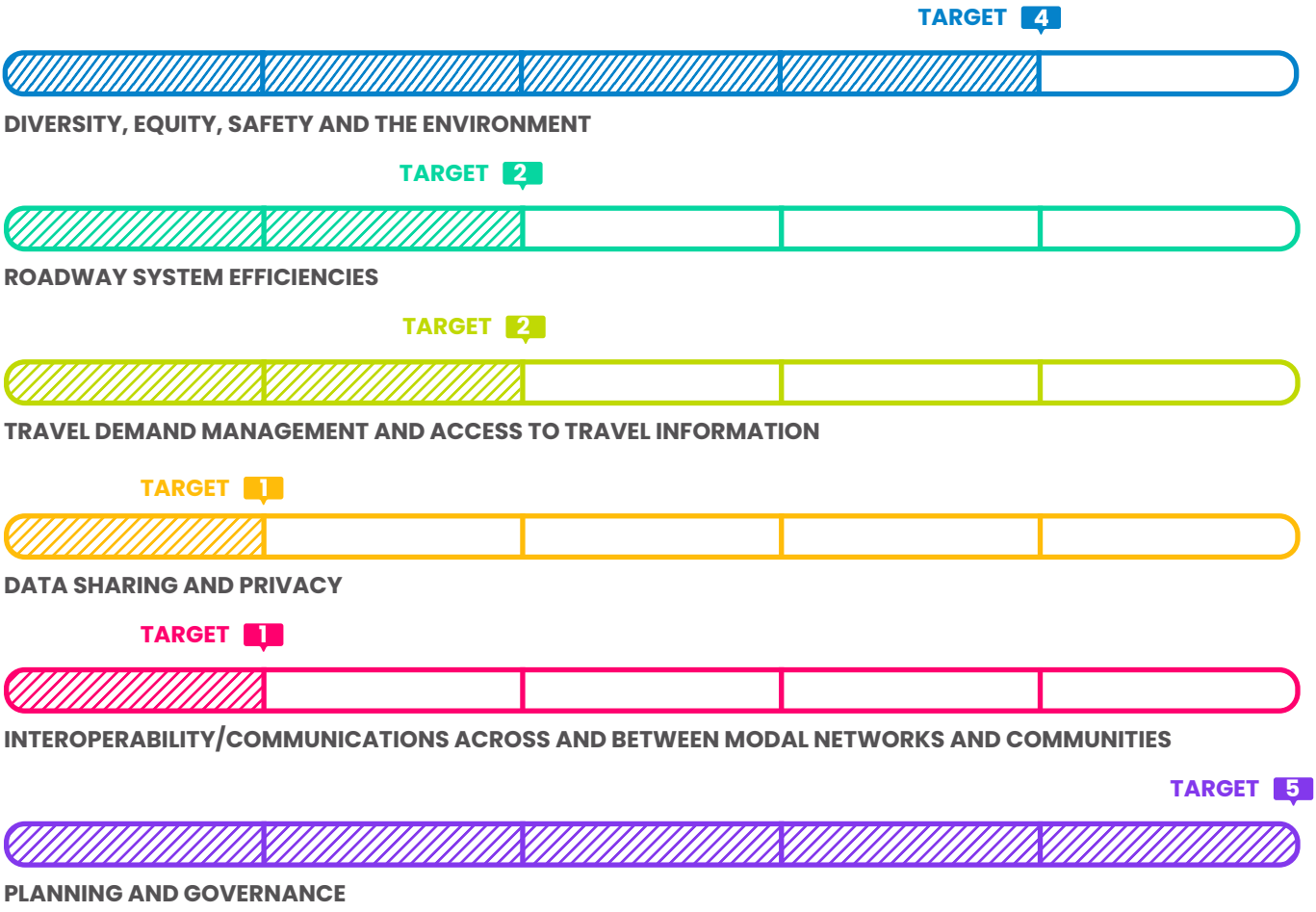


TABLE 3.1 COMMUNITY SMART MOBILITY READINESS PROFILE - SUMMARY

CATEGORY	METRIC	TARGET LEVEL	ASSESSED MATURITY LEVEL
Diversity, Equity, Safety, and the Environment	**1** - Not present/Not Applicable **2** - Exploratory **3** - Defined/Planned **4** - Adoptive/In Place **5** - Adaptive/Proactive	**4**	**2.44**
Roadway System Efficiencies	**1** - Not present/Not Applicable **2** - Exploratory **3** - Defined/Planned **4** - Adoptive/In Place **5** - Adaptive/Proactive	**2**	**1.38**
Travel Demand Management and Access to Travel Information	**1** - Not present/Not Applicable **2** - Exploratory **3** - Defined/Planned **4** - Adoptive/In Place **5** - Adaptive/Proactive	**2**	**1.83**
Data Sharing and Privacy	**1** - Not present/Not Applicable **2** - Exploratory **3** - Defined/Planned **4** - Adoptive/In Place **5** - Adaptive/Proactive	**1**	**1.33**
Interoperability/Communications Across and Between Modal Networks and Communities	**1** - Not present/Not Applicable **2** - Exploratory **3** - Defined/Planned **4** - Adoptive/In Place **5** - Adaptive/Proactive	**1**	**1.4**
Planning and Governance	**1** - Not present/Not Applicable **2** - Exploratory **3** - Defined/Planned **4** - Adoptive/In Place **5** - Adaptive/Proactive	**5**	**3.25**

3.2 DIVERSITY, EQUITY, SAFETY, AND THE ENVIRONMENT

EVALUATED MATURITY BETWEEN **2 (EXPLORATORY)** - **3 (PLANNING)**

This Smart Mobility domain accounts for much of the physical infrastructure users experience in the transportation system. When a user experiences a Smart Mobility trip they are often unaware of the role Smart Mobility played in it, the trip is available comfortable and safe throughout the community.

Where some technologies, such as Micromobility (scooters and bike share) are directly associated the availability of transit, car share and rideshare all contribute to providing flexible transportation options. The availability of these modal options are critical is creating a transportation system less dependent on a single mode of transportation, notably the personally owned car.

In the City of Revelstoke there are several barriers to the implementation of many of the mobility options, the low resident population and lower pattern of development density both contribute to the challenges in deploying several of these measures. This being the case there are still opportunities to explore and plan across the network with a view towards deployment in select areas.

The transportation services that are operating the City are tied generally to the resort services and oriented to visitors, there are opportunities to modify the service towards residents and businesses.

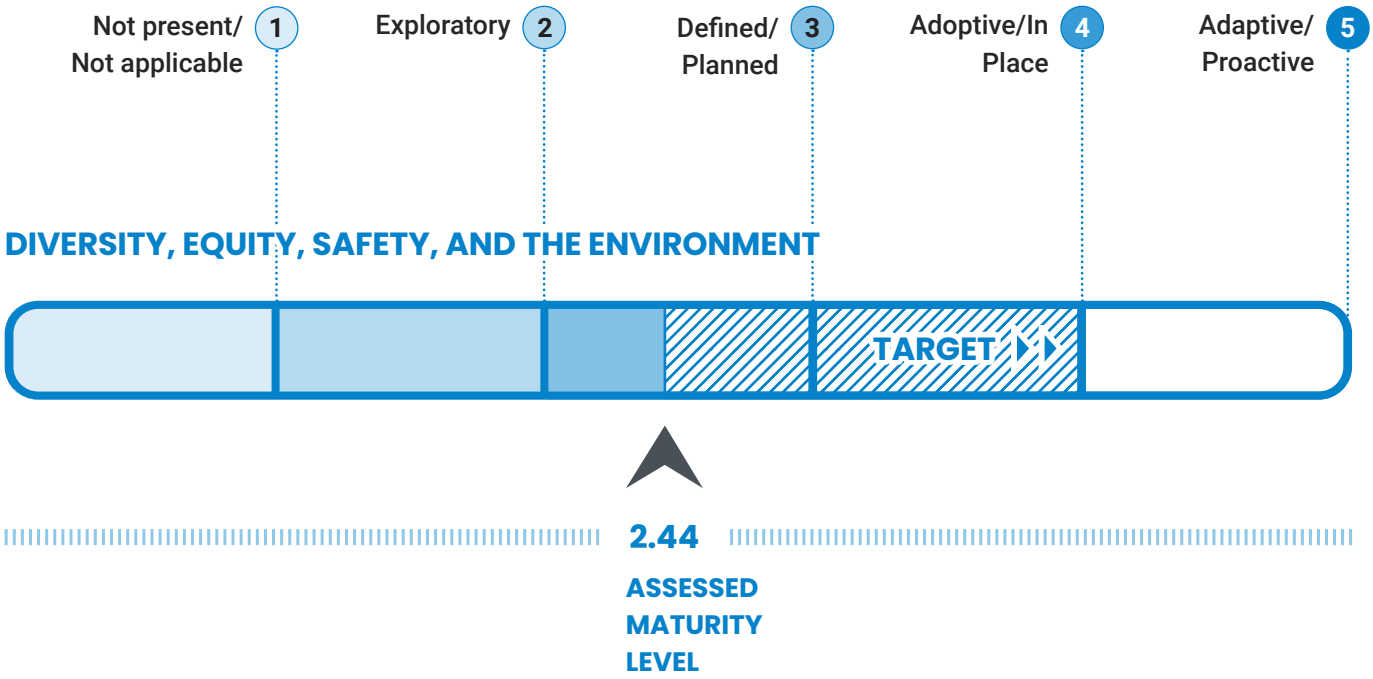


TABLE 3.2 DIVERSITY, EQUITY, SAFETY, AND THE ENVIRONMENT		
SMART MOBILITY FACTORS	**METRIC**	**POINTS AWARDED**
1. MULTI-MODAL PROGRAMS Offers access to shared multi-modal mobility programs	**1.1** Transit Services Provided	4
	1.2 Bike Share	1
	1.3 Scooter Share	1
	1.4 Car Share	4
	1.5 Autonomous Vehicles	1
	1.6 Connected Vehicles	1
	1.7 Electric Vehicle Charging Infrastructure	5
	1.8 TNC/Rideshare services	5
2. TECH-ENHANCED TRANSIT AMENITIES Transit facilities (passenger waiting shelters, transfer hubs, etc.) and buses/rail offer Wi-Fi capabilities to access real-time arrival information	**2.1** Wi-Fi enabled bus/train shelters	1
	2.2 Wi-Fi enabled buses/trains	1
3. ACCOMMODATIONS FOR ALTERNATIVE FUELS AND ASSOCIATED INFRASTRUCTURE Facilitating and achieving the conversion to both battery and hydrogen powered electric-drive vehicles for improved energy efficiencies and reduced GHG emissions	**3.1** Infrastructure to accommodate electric vehicle charging, biodiesel, and or other alternative fuel for private passenger vehicles	5
	3.2 Infrastructure to accommodate electric vehicle charging, biodiesel, and or other alternative fuel for transit and/or other large, non-personal vehicle fleets	2
4. RELIABLE, EFFICIENT SERVICE Accessibility for individuals with disabilities and access limitations	**4.1** Paratransit and/or flexible vehicles	3
	4.2 Audible and accessible pedestrian push buttons, or advanced pedestrian detection systems	4
	4.3 Single pay fares (e.g. app or tap card)	1
	4.4 Multiple payment forms accepted	1
5. PEDESTRIAN SAFETY IMPROVEMENTS Synchronization and updated signals to improve safety of pedestrians	**5.1** Signals that are synchronized to improve traffic flow and pedestrian crossing safety	3
	5.2 Pedestrian crossing safety technology, such as activated crosswalk lighting, ped detection, and other technology	1
	ASSESSED MATURITY LEVEL	2.44

3.3 ROADWAY SYSTEM EFFICIENCIES

EVALUATED MATURITY **1 (NOT-PRESENT)**

This domain speaks the potential of Smart Mobility interventions to increase the efficiency of the transportation to all modes. Particularly this can be addressed through targeting lane interventions, such as HOV or BRT lanes, dynamic lane signage or other lane management systems or coordinated signal management.

In the case of the City of Revelstoke the areas for which these interventions are most applicable are managed by the Province, or in some cases National Railroads. While there are few opportunities to manage the traffic efficiencies it is notable that the City has a role in engaging the province in these discsussion.

Other opportunities exist such as the development of a cohesive Curbside Management strategy for both those streets with high frequencies of visitors to support the businesses.

This strategy could more efficiently use the curb space available to manage recreational vehicles, general traffic in an efficient and mixed manner. In this case the Curbside management will create a more efficient system as vehicles will not be circling the community to find appropriate parking and the most appropriate uses / locations will be available for the users.

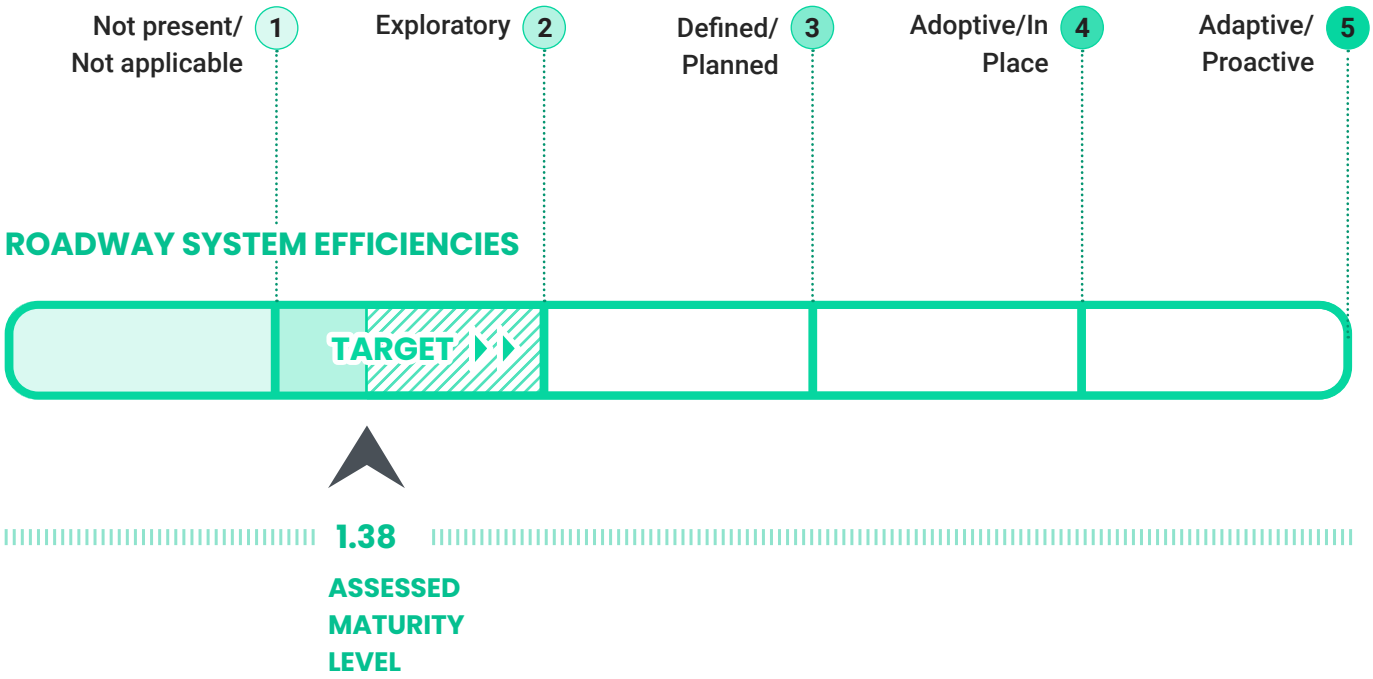


TABLE 3.3 ROADWAY SYSTEM EFFICIENCIES (EFFICIENCY OF ROADWAY INFRASTRUCTURE TO MOVE PEOPLE)		
SMART MOBILITY FACTORS	**METRIC**	**POINTS AWARDED**
1. MORE EFFICIENT TRAVEL LANES Availability or potential for bus rapid transit and/or express buses	**1.1** Existing BRT or express lanes	**1**
	1.2 Curbside Management	**1**
2. REAL-TIME INFORMATION AVAILABILITY OR POTENTIAL FOR BUSES OR OTHER TRANSIT TO TRANSMIT LOCATION AND SCHEDULES IN REAL TIME	**2.1** Buses have automated vehicle location (AVL) technologies onboard units or other similar devices	**1**
3. LANE MANAGEMENT SYSTEMS Real-time traffic systems that can manage lanes and optimize efficiency of road lane infrastructure	**3.1** Active Lane Management, Ramp Metering, or Lane Reversal systems, to optimize the efficiency of existing infrastructure	**1**
4. COORDINATED SIGNAL MANAGEMENT Provide traffic signal timing and management systems to move traffic more efficiently	**4.1** Actuated traffic signals	**4**
	4.2 Regional or local Traffic Management Center with advanced traffic management system	**1**
	4.3 Traffic Adaptive or Traffic Responsive Systems	**1**
	4.4 Preemptive or prioritized signalization for transit and/or rail	**1**
	ASSESSED MATURITY LEVEL	**1.38**

3.4 TRAVEL DEMAND MANAGEMENT AND ACCESS TO TRAVEL INFORMATION

EVALUATED MATURITY BETWEEN **1 (NOT-PRESENT)** - **2 (EXPLORATORY)**

To meet a municipality's transportation demand, providing critical information to users facilitates a diverse menu of transport options. This can be achieved through the concepts of Mobility As A Service (MaaS), where data is readily available for users. Or addressed through a combination of infrastructure approaches that reduce user barriers for transportation access, such as the implementation of Mobility Hubs. The combination of approaches reduces the barriers for users in selecting other modes, supporting the presence and availability of them. Digitally this is provided through accurate travel information (vehicle availability and trip time), and optionality through a digital platform (single fare payment or vehicle reservation).

Transportation Demand Management (TDM) as a practice provides behaviour change solutions and information to drivers which supports awareness of other options, combined with the incentives and infrastructure to make them viable. In practice the City of Revelstoke has little digital presence and what it does have is not centralized. The services of a mobility hub are provided at Victoria and Mackenzie without supporting infrastructure which would create a better experience for everyone.

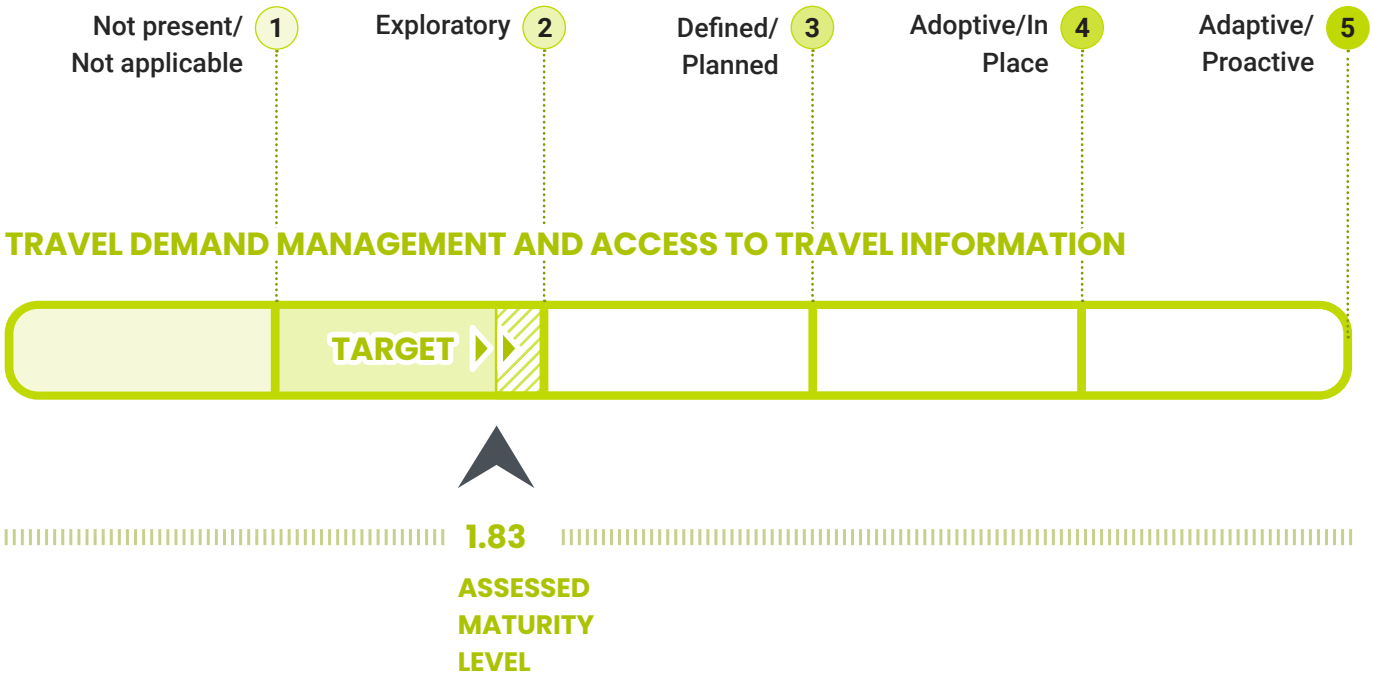


TABLE 3.4 TRAVEL DEMAND MANAGEMENT AND ACCESS TO TRAVEL INFORMATION		
SMART MOBILITY FACTORS	**METRIC**	**POINTS AWARDED**
1. TRAVEL INFORMATION Improved travel information and software platforms to help users in planning trips, etc.	**1.1** Real-time travel information detection hardware, travel time display dynamic signs, traffic advisory radio or other advanced travel information systems	**3**
	1.2 Smart parking options, public parking guidance systems, digital options for pay-by-sky and pay-by-plate	**1**
	1.3 Real-time bus/train/transit information, via digital signage and/or apps	**1**
	1.4 Parking to include reservable parking from digital platforms	**1**
	1.5 Roadway condition reports (e.g. snow removal)	**5**
2. MULTI-MODAL TRANSPORTATION HUBS Accommodations for different travel modes (rideshare loading/unloading, bike/scooter stations, transit hubs)	**2.1** Transit hubs/stations	**3**
	2.2 Dedicated rideshare loading/unloading locations	**1**
	2.3 Bike/scooter stations or docking locations	**1**
	2.4 Pedestrian corridors with surge/capacity for alighting passengers	**1**
	2.5 Transit Transfer designed to functionally enable transfers between services (e.g. increased dwell time between bus and train for late arrivals)	**1**
	2.6 'Park and Ride' Parking includes EV parking	**1**
3. MOBILE DATA TERMINALS Provide real-time information for increased user convenience and informed trip planning	**3.1** Real-time trip planning related to paratransit and other options	**3**
	ASSESSED MATURITY LEVEL	**1.83**

3.5 DATA SHARING AND PRIVACY

EVALUATED MATURITY **1 (NOT-PRESENT)**

The application of Data is a major trend in all forms of management and analysis. Smart Cities describes the leveraging of Big Data by municipalities across Canada and the world to enhance urban and regional planning. Foundationally Smart Mobility provides opportunities for the employment of that data to create better decisions in the planning framework. The Objectives of the Data framework assume that those parties that are able to benefit from the data need access to it to inform their work.

These other parties may be external agencies, companies or private individuals interested in tends. Smart City is an urban area that uses different types of electronic data collection sensors to supply information to manage assets and resources efficiently. The expansion of open data, combined with advances in big data analytics, is freeing information that was once trapped inside the dusty pages of overlooked reports, enabling improved decision making, new product and service offerings, and greater accountability.

To be successful this data needs to be captured and maintained in a useable manner. Generally, this is achieved through creating an overarching Data Sharing Policy, that outlines the technical details of how the data is captured where it is stored and how privacy is addressed.

The City of Revelstoke has little digital integration for data sharing, while some work is being done to collect data this is currently exploratory and should be positioning to make that information readily available to interested parties who may be able to leverage it.

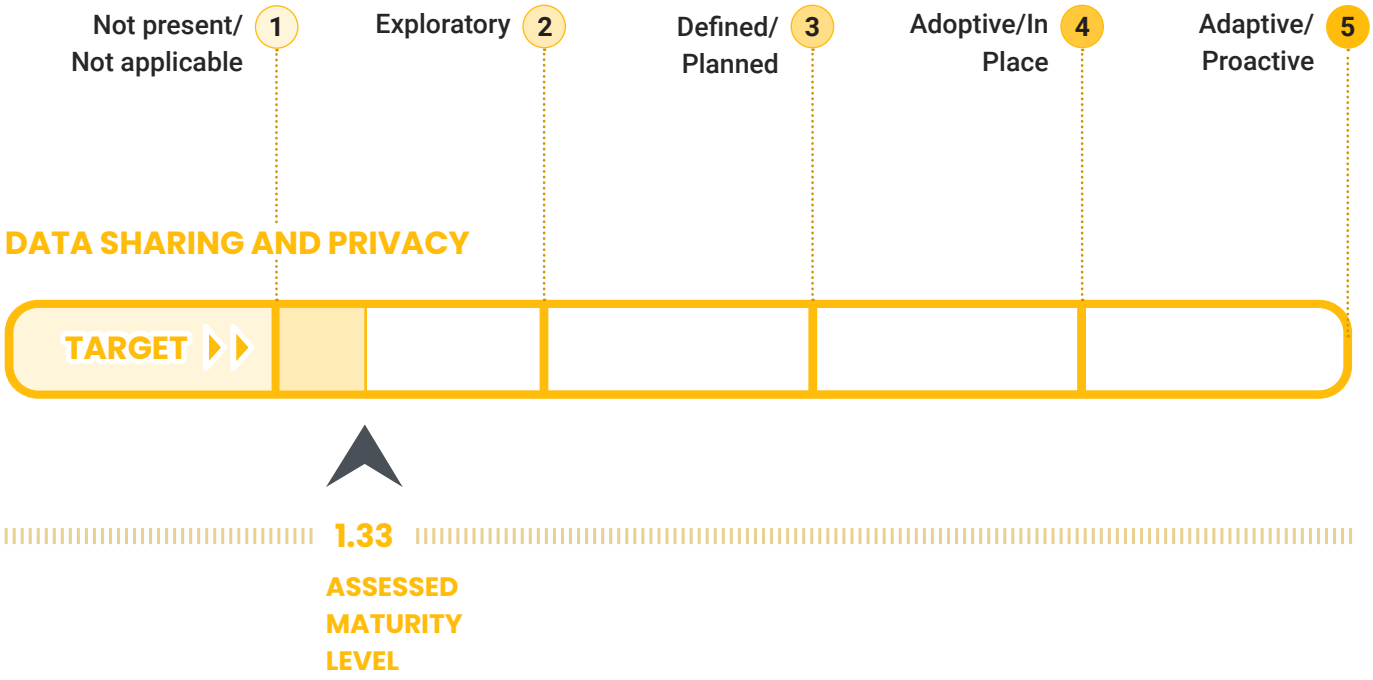
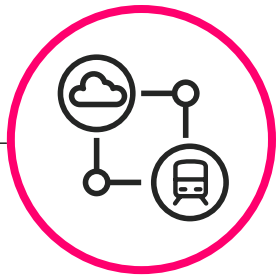


TABLE 3.5 DATA SHARING AND PRIVACY		
SMART MOBILITY FACTORS	**METRIC**	**POINTS AWARDED**
1. DATA SHARING Transparency and coordination with planning organizations, other communities, and prioritization of real-time data	**1.1** Data sharing policies in place	**2**
	1.2 Data sharing infrastructure in place to accommodate sharing of historical/archived data	**1**
	1.3 Advanced data sharing that allows for electronic and/or automated data sharing through a digital interface such as a RSS feed, KML, or API with some time delay	**3**
	1.4 Low latency real-time data sharing in place, such as connected vehicle infrastructure, DSRC Road Side Units, etc.	**1**
2. SENSORS AND CONTROL Use of technology for traffic monitoring and traffic control through sensors and other devices	**2.1** Advanced sensors and measurement capabilities (Includes Origin-destination and travel time detection systems, mid-block detectors, bluetooth/Wifi detectors, etc.)	**1**
	2.2 Actuation/Control (Includes actuated traffic signals)	**1**
	2.3 User counts collected by mode of travel	**2**
3. REAL-TIME INFORMATION Policies, infrastructure, and/or technologies are utilized for sharing real-time information across jurisdictions and available to private industry (transit arrival times, parking availability, locations of shared mobility vehicles, etc.)	**3.1** Sharing of real-time road closure and travel information from government systems to external systems	**1**
	3.2 Sharing of real-time parking guidance and parking availability information from government systems to external systems	**1**
	3.3 Sharing of real-time transit information from government systems to external systems	**1**
	3.4 Real-time availability of third party ride-share services	**1**
4. CYBERSECURITY Efforts are made to identify and prevent software and network vulnerabilities	**4.1** Risk-informed policies and/or procedures to anticipate and/or prevent software/system vulnerabilities	**1**
	ASSESSED MATURITY LEVEL	**1.33**

3.6 INTEROPERABILITY/COMMUNICATION ACROSS AND BETWEEN MODAL NETWORKS AND COMMUNITIES



EVALUATED MATURITY **1 (NOT-PRESENT)**

Suitability of technology should be practical and applicable, but notably investments in Smart Mobility should be viewed through the additional lenses of interoperability. The potential of cost-effective demands of creating shared data services for the goods movement through the City provide the highest potential use cases.

However, it is notable that without the open data or mode share options in place the interoperability retains current value.

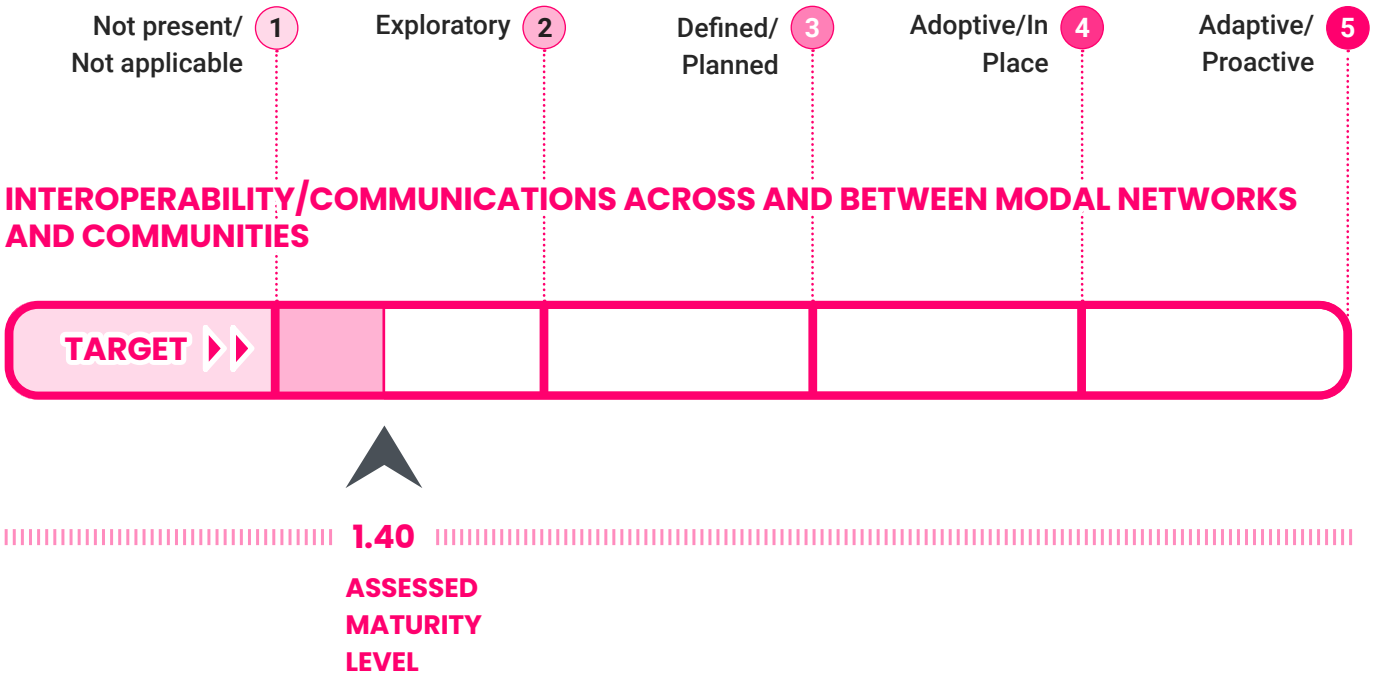


TABLE 1.1 INTEROPERABILITY AND COMMUNICATIONS ACROSS AND BETWEEN MODAL NETWORKS AND COMMUNITIES		
SMART MOBILITY FACTORS	**METRIC**	**POINTS AWARDED**
1. SMART TRANSPORTATION SOLUTIONS Partnerships and coordination between local and regional transit organizations and TNCs	**1.1** Partnership(s) with one or more goods delivery services for data sharing	**2**
	1.2 Deployment of goods delivery by CAV/ Autonomous hauling robot by third party	**1**
	1.3 Deployment of delivery by arial drones by third party	**2**
	1.4 Connected Infrastructure	**1**
2. STANDARDIZED SYSTEMS Coordination across transportation agencies for technology use, data formats and software integration, etc.	**2.1** Coordination of standardized technologies and/or data formats, etc. with other jurisdiction or agency. Follows ITS Architecture	**1**
	ASSESSED MATURITY LEVEL	**1.4**

3.7 GOVERNANCE, PLANNING, AND FINANCING

EVALUATED MATURITY **3 (PLANNED)**

When considering investments into emerging technology approaches need to consider the potential value to the transportation network. The delivery of those plans requires a coordinated approach, generally tied to a policy framework and the staff to deliver it.

The City of Revelstoke currently is well positioned in the staffing of transportation planning, relative to their size, and is the recipient of federal / provincial funding opportunities. They however can expand their policy framework through several of the strategies to create a more robust Smart Mobility environment that serves all transportation system users.

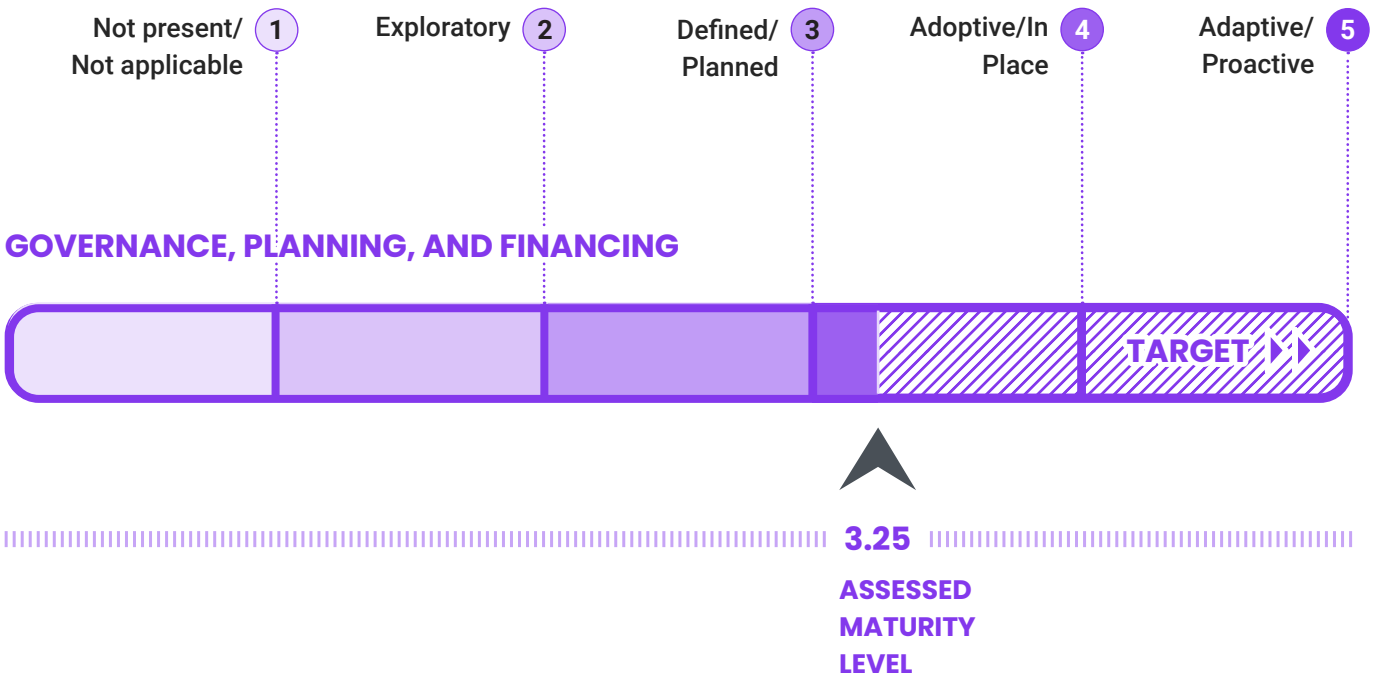


TABLE 1.1 GOVERNANCE, PLANNING, AND FINANCING		
SMART MOBILITY FACTORS	**METRIC**	**POINTS AWARDED**
1. TRANSPORTATION DEMAND MANAGEMENT (TDM) Regional planning for progressive TDM through smart technology utilization and multi-modal transportation options	**1.1** Plans and/or policies that promote smart technology for improved TDM and utilization of multi-modal transportation options	**1**
2. TRANSPORTATION PLANNING Synthesis and coordination of planning efforts across communities including open data agreements, appropriate staffing, etc.	**2.1** Dedicated transportation planning staff	**4**
	2.2 Actively evaluating and assessing current "system" status and opportunities for improvements	**4**
	2.3 Planning efforts to accommodate emerging transportation technologies such as electric vehicle charging infrastructure, connected and autonomous vehicle infrastructure, etc.	**4**
	2.4 Participates in regional transportation planning activities or in partnership with other nearby communities	**5**
3. LEGISLATION AND POLICIES Policies, regulations, or legislations to enable or anticipate Smart Mobility trends	**3.1** Policies or legislation to enable testing, pilots, and deployments of automated and connected vehicle technology	**1**
	3.2 Policies or legislation to enable data sharing, public data portals, etc.	**2**
4. FUNDING Utilization of allocated and available funding to support transportation initiatives	**4.1** Recipient of federal infrastructure improvement funds	**5**
	4.2 Recipient of state/provincial infrastructure funds	**5**
	4.3 Recipient of Congestion Mitigation and Air Quality Improvement Program (CMAQ) Funds or other funding focused on congestion/traffic management (not built highway infrastructure-specific funding)	**5**
	4.4 Local funding in place (i.e. user-pay models, internal funding)	**1**
	4.5 Research partnerships with Universities or similar	**2**
	ASSESSED MATURITY LEVEL	**3.25**

4

OPPORTUNITIES AND BARRIERS

4 OPPORTUNITIES AND BARRIERS

4.1 IDENTIFIED STRATEGIES FOR REVELSTOKE

4.1.1 PROVIDE OPPORTUNITY FOR MORE MOBILITY OPTIONS

Undertake a market feasibility study for expanding or providing mobility options in the City. This can be achieved through partnerships with the resorts or businesses, participation in provincially / federally funded pilots or direct engagement with the market.

The first step would be to undertake a market feasibility for other modes of transportation, including an expanded view towards partnerships.

4.1.2 SMART CONNECTED SIGNALS

Smart signals through coordinated signal management and counters, could alleviate some of the transportation pressures at key intersections. This could adapt to presented travel patterns in real time, including coordinated signals with nearby crossing locations. This is most valuable for the City in adapting to both weather and traffic conditions, where the travel behavior of users are heavily influence by closures or delays on highway 1.

Connected/coordinated signals can be adapted to ensure that the City is able to move residents and visitors through congestion points, while providing safe crossing during times of unexpected delays.

FIGURE 4.1.A
EXAMPLE OF ADDITIONAL MOBILITY OPTIONS

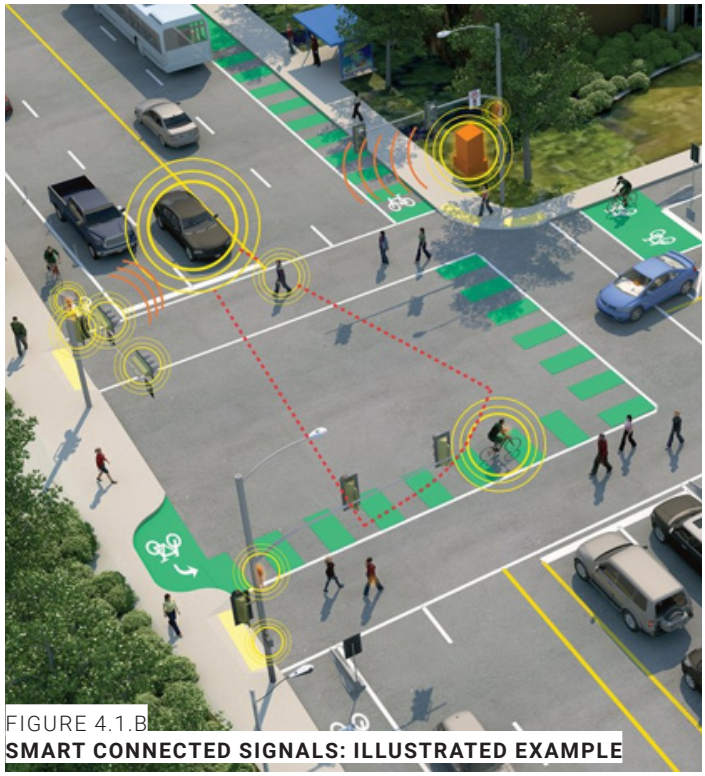


FIGURE 4.1.B
SMART CONNECTED SIGNALS: ILLUSTRATED EXAMPLE

4.1.3 PERMANENT COUNTERS/VOLUME AND TRIP COUNTERS

Revelstoke has several key transportation corridors, which indicate overall transportation volumes across modes. The introduction of permanent counters combined with a coordinated counter approach would support long- and short-term transportation planning, both for the investments in Active Transportation, Recreational Networks and vehicles infrastructure.

The counter technology may be manual/pneumatic or based on sensors or video depending on use case and applicability. This can be provided through a strategic approach to counters (for example some permanent and some temporary based on seasonality). Permanent counters could be coordinated with ITS solutions to manage signal timing a key congestion points based on seasonality or congestion.

4.1.4 OPEN DATA / DATA SHARING POLICIES

Currently the City has limited the data sharing to GIS/Online mapping. Open access to data available for responds to market needs can be implemented to serve the needs of a range of users be they recreational, industrial or commercial. The process of capturing historical data, converting them to a consistent format, and uploading them to a database provides an additional layer of effort, which must be examined when scoping, to ensure relevant timelines should be included in this policy.

With this comes concerns for data privacy and technology standards. An open data / data sharing policy would provide a framework for users of the City which provides trust in data security, reliability and accuracy.

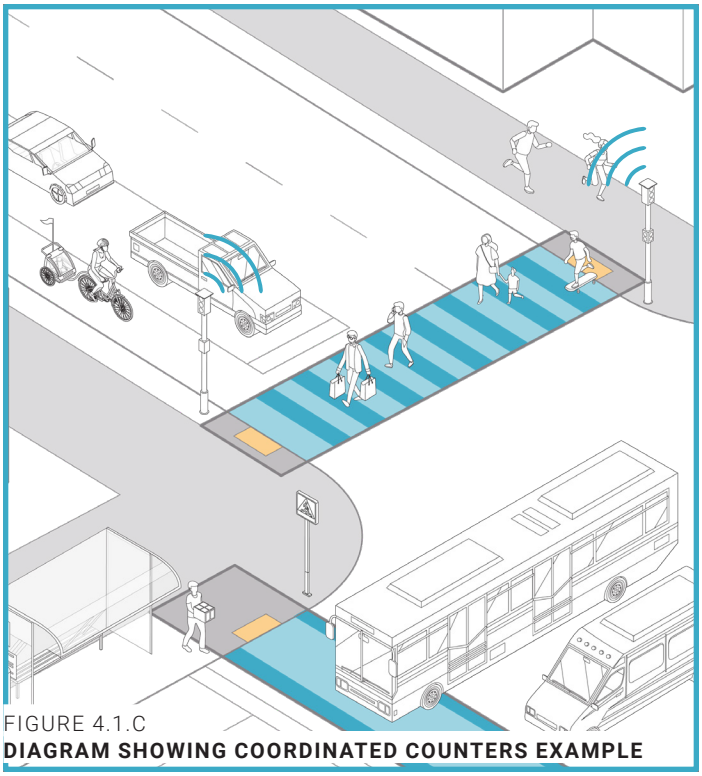


FIGURE 4.1.C
DIAGRAM SHOWING COORDINATED COUNTERS EXAMPLE

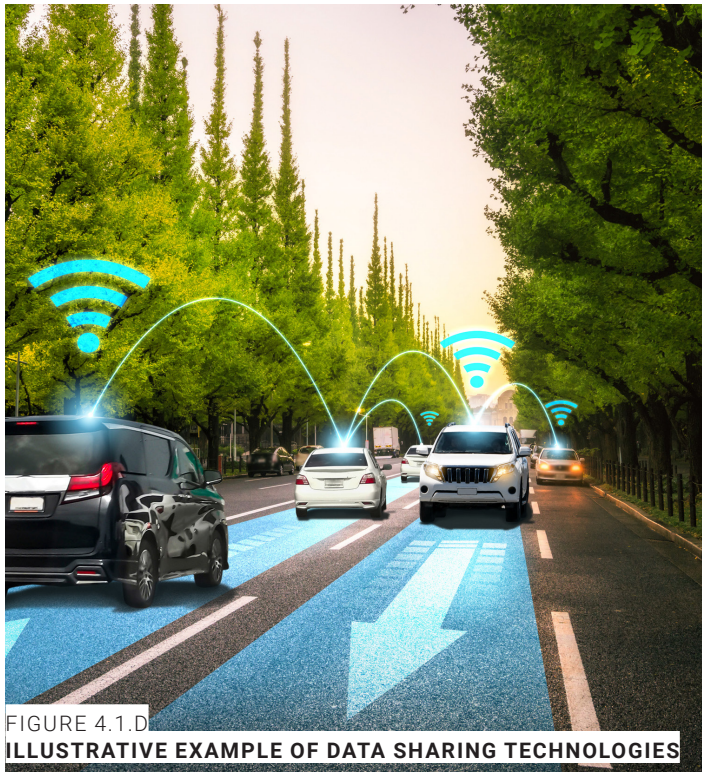


FIGURE 4.1.D
ILLUSTRATIVE EXAMPLE OF DATA SHARING TECHNOLOGIES

4.1.5 EXPLORE PARTNERSHIPS WITH LOCAL INDUSTRIES FOR DEVELOPMENT OF A TRANSPORTATION DEMAND MANAGEMENT PROGRAM AND/OR MAAS PLATFORM

At a municipal level the transportation system is planned to respond to the needs of users, through a coordinated approach to travel planning, fare payment and mode option key investments can be put before users that may reduce the requirement for visitors to use a SOV for their trip to the City. For this to be effective the point of contact must also see value to their customers, which can use an app to create a more global user experience.

It is important to acknowledge investment in Smart Mobility is starting at the ground level, and key industry partners, including the resorts, will be driving this investment locally.

4.1.6 DEVELOP A CURBSIDE MANAGEMENT STRATEGY

The City has the opportunity to create a cohesive approach to curbside management in those areas that have high demand for short and long term visitors, pick up / drop off or parking for recreational vehicles. This would leverage the existing approach to patios for private businesses and recognize that many vehicles visiting the City are a balance between 'stop as they pass through' and 'stay for vacation'.

A strategy would target those areas where those destinations create delay through better information for visitors, coordinated parking and access and dynamic uses depending on demand.

FIGURE 4.1.E
EXAMPLE OF COORDINATED APPROACH TO PUBLIC TRANSIT SYSTEMS USING APP TECHNOLOGY

FIGURE 4.1.F
EXAMPLE OF CURBSIDE MANAGEMENT STRATEGIES IN A MAIN STREET CONTEXT

4.1.7 DEPLOY A MOBILITY HUB AT VICTORIA & MACKENZIE

This intersection already functions with some key functions for a mobility hub, providing a bus pick up drop off, and creating a key origin for trips. By investing in other alternatives at this location, both public realm and mobility, users have a location where they are able to access shared mobility resources, travel information and increase the transportation options.

Partnerships with other services would be drawn to make that the point of origin for a visit which could create market opportunities for bike share, and even package delivery at a single recognizable point of reference serving both visitors and residents.

FIGURE 4.1.G
EXISTING TRANSPORTATION FACILITIES: BUS SHELTER IN CITY OF REVELSTOKE

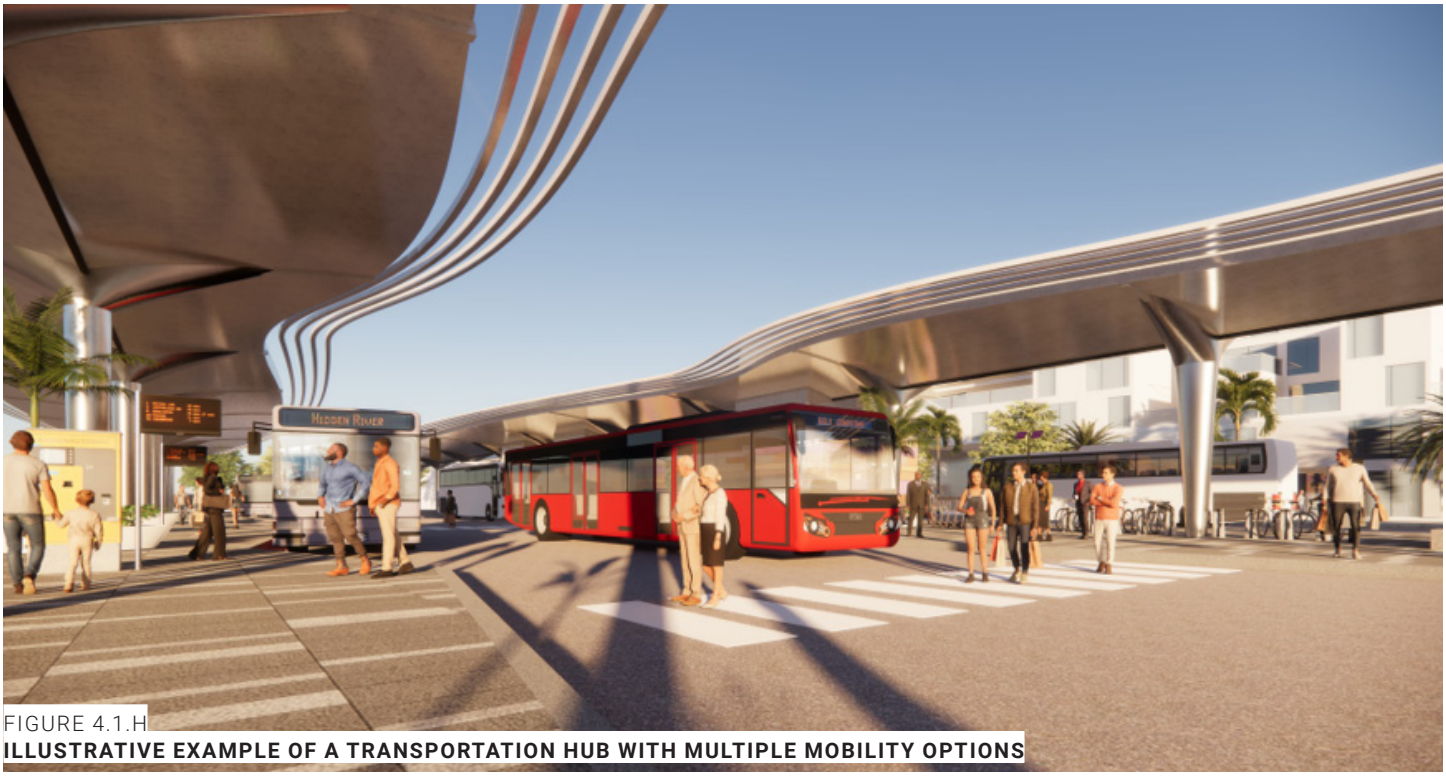


FIGURE 4.1.H
ILLUSTRATIVE EXAMPLE OF A TRANSPORTATION HUB WITH MULTIPLE MOBILITY OPTIONS

4.2 APPLYING THE EQUITY AND RESILIENCE LENS

4.2.1 GENERAL CONSIDERATIONS

The core of mobility planning is the opportunity of people to move through a City. To create this opportunity the transportation system must be accessible through a range of transportation options that serve people at different life stages, economic opportunities, and accessibility barriers. When the transportation system is equitable the opportunity for participation is available to all, and in some cases additional transportation options have been provided to those communities / areas with additional barriers to participation.

When the transportation system is resilient the options for transportation enable access through a range of services that will minimize the exposure to risk. The risk considered may be created through localized weather patterns, in the case of the City this accounts for both extreme winter conditions and the risk of forest fires, or the risks of market vulnerability when the impacts of Climate change impact international markets. When examining the City of Revelstoke the area of greatest consideration is the dependence on the Car for mobility.

FIGURE 4.2.A
EXISTING CONDITION ON ROADWAY INFRASTRUCTURE IN CITY OF REVELSTOKE

4.2.2 TRANSPORTATION EQUITY

The operations and maintenance of a transportation network that is dependent on cars for mobility is costly for both the individual and the municipality. The Transportation Master Plan identifies opportunities to expand the opportunities within the transportation network responding to the needs of people and increasing their accessibility. To be successful these opportunities to create a multimodal network that serves all users through an 8 to 80 / All Ages and Abilities approach is the cornerstone of Smart(ER) Mobility planning. This can be supported and achieved through high quality data collection and monitoring, which will direct capital and operational investment into those areas where users are present.

4.2.3 SYSTEM RESILIENCE

When considering the response to resilience actioning a MaaS platform, especially in partnership with local businesses, enables people to access timely transportation information and adapt their trip as necessary to a range of conditions. When fully implemented a MaaS platform would be able to provide updated notifications for transportation disruptions and provide both service operators and customers with a platform to adapt services to meet their needs. The needs to create a transportation system that adapts to the potential extreme weather events should be considered when examining the areas of snow clearance and network redundancy through additional transportation options, where snow clearance on pathways and sidewalks may be critical for mobility.

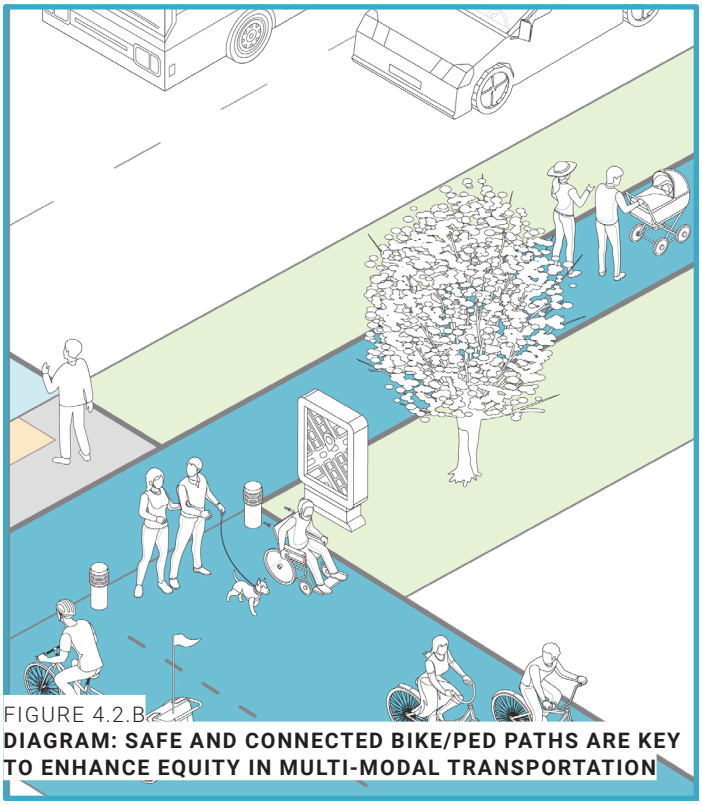


FIGURE 4.2.B
DIAGRAM: SAFE AND CONNECTED BIKE/PED PATHS ARE KEY TO ENHANCE EQUITY IN MULTI-MODAL TRANSPORTATION

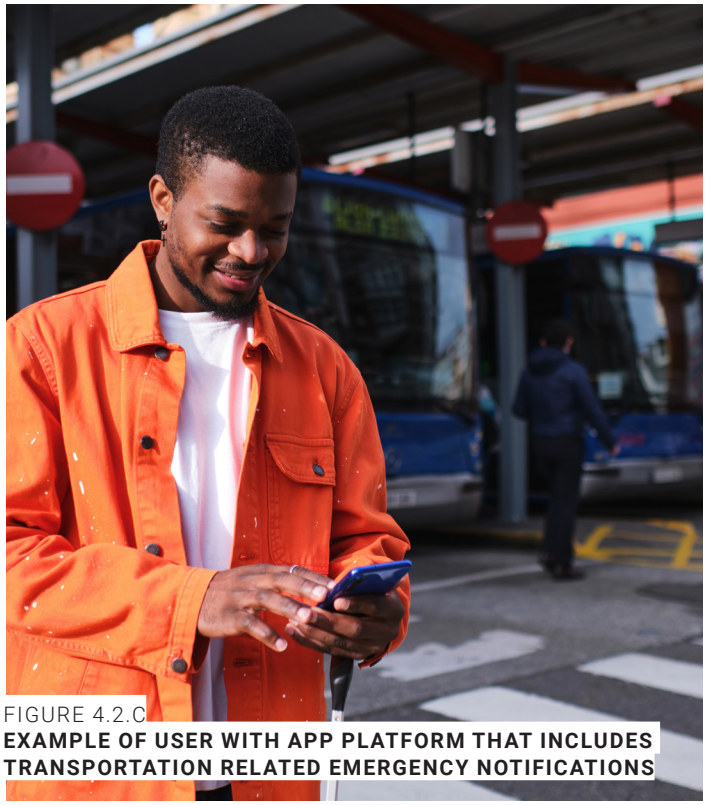


FIGURE 4.2.C
EXAMPLE OF USER WITH APP PLATFORM THAT INCLUDES TRANSPORTATION RELATED EMERGENCY NOTIFICATIONS

FIGURE 4.2.D
EXISTING ROADWAYS IN CITY OF REVELSTOKE ARE MAINLY CAR-ORIENTED WITH LACK OF CONNECTED SIDEWALKS

FIGURE 4.2.E
EXISTING PEDESTRIAN INFRASTRUCTURE: CROSSINGS IN ROUNDABOUT IN REVELSTOKE


Stantec