



CITY OF QUESNEL ACTIVE TRANSPORTATION PLAN



FINAL REPORT | APRIL 2016



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Section 1.0
INTRODUCTION



The City of Quesnel is a vibrant community located in the North Cariboo region and is well suited for enhancing and expanding its existing active transportation network. The City has a unique picturesque geography, a well-established riverfront trail network (River Walk), and has exceptional opportunities for outdoor recreation that draws residents and visitors alike. The City has taken advantage of its natural amenities and with a beautiful setting and small town feel, there is a great opportunity to build on the established recreation lifestyle to encourage more residents to walk and bike for transportation and commuting purposes in Quesnel.

Promoting walking and cycling as attractive and convenient transportation choices can help reduce automobile dependence, increase physical activity levels, improve public health, reduce infrastructure demands, and create more livable and vibrant communities. Enhancing and improving the transportation system is a key priority in the City of Quesnel. Many of the City's planning and policy documents including the Official Community Plan (2007) outline Council's objective to encourage walking and cycling within Quesnel. This Active Transportation Plan builds off of these existing documents and the infrastructure that is on the ground today. It is a plan to enhance the active transportation network to improve comfort, connectivity and accessibility for people of all ages and abilities.

1.1 Study Purpose

The purpose of the City of Quesnel's Active Transportation Plan is to increase transportation choices within the city and provide an accessible, sustainable, and efficient transportation system in Quesnel for all modes and users. The Active Transportation Plan provides a list of infrastructure projects, actions and policies for walking and cycling over the next 20 years and beyond. The Plan also provides a detailed implementation plan with priorities for walking, cycling improvements.

1.2 The Benefits of Walking and Cycling

Quesnel recognizes that increased use of walking and cycling will result in a more balanced transportation system that is healthier, more livable, cost-effective, and more efficient in terms of the community's infrastructure investments. There are significant quality of life benefits that are associated with walking and cycling within a community, as well as the positive economic development benefits that Quesnel can enjoy through a supportive environment for walking and cycling. The benefits to supporting a walking and cycling culture in Quesnel are outlined below.

Economic Benefits

Constructing pedestrian and bicycle facilities are typically cheaper per kilometre than the cost to construct many road infrastructure projects. In turn, residents receive an easy and convenient travel option and decreased congestion. With fewer motor vehicles on the road, they experience less wear and tear, and Quesnel's budget can benefit from financially sustainable transportation solutions.

Health Benefits

Walking and cycling for transportation and recreation are effective ways to support mental and physical health and build a healthier and happier community. The World Health Organization has identified physical inactivity as one of the main risk factors for global mortality, and as an underlying factor for many chronic diseases. Both walking and cycling increase physical activity levels, which can reduce the risk of heart disease, diabetes, cancer as well as mental illness.

Environmental Benefits

Cycling and walking have many environmental benefits as these modes reduce vehicle trips, congestion, air pollution, and can help to reduce greenhouse gas (GHG) emissions. Promoting walking and cycling can also help in efforts towards climate

change mitigation while supporting the protection and improvement of Quesnel’s natural environment. Walking and cycling have a relatively low environmental impact as the act of walking and cycling generate virtually no GHG emissions or air pollution, minimal noise and light pollution, and may reduce demand for impervious surface area (pavement) through more efficient use of existing road space.

Quality of Life

A pedestrian- and bicycle-friendly community can encourage a more livable and enjoyable place to be, with a stronger sense of place and freedom of mobility. Communities that support walking and cycling can also contribute to safer streets and improved social interactions.

Safety

Walkable and bikeable environments contribute to a safer transportation system by making walking and cycling more visible and viable modes of travel, resulting in reduced risk of collisions. Streets that are designed for slower vehicle speeds feel safer for both pedestrians and cyclists. Studies have shown that slower motor vehicle speeds exponentially increase survival rates for both pedestrians and cyclists that have been involved in collisions with vehicles. When walking and cycling rates increase, rates of collisions with motor vehicles decrease. This is known as the “safety-in-numbers” principle. As a result, locations with the highest levels of pedestrians and cyclists are also the safest places to walk and cycle.

Equity

Improving active transportation conditions can improve equity by providing options to non-drivers. In many communities, a proportion of the community has restricted options to drive due to disability, income or age. Having good walking and cycling (and transit) options in place tends to increase the affordability of transportation for many people, and can benefit existing pedestrians and cyclists, as well as attracting new users.

1.3 Study Process

The City of Quesnel’s Active Transportation Plan has been developed over a four phase process, as summarized below:

Phase 1: Inventory and Assessment included a review of background information, gathering and analyzing existing conditions data, and assessing existing policies and programs as they relate to active transportation. A key component of Phase 1 was to understand what residents and stakeholders believe are the greatest issues and opportunities for walking and cycling in Quesnel.

Phase 2: Setting Future Direction. The second Phase of the planning process focused on charting the course for the future of active transportation in Quesnel by establishing future network plans and projects as well as recommending supportive actions.

Phase 3: Implementation Strategy. This Phase focused on developing a strategy for implementing the recommendations of Quesnel Active Transportation Plan, including the identification of priority projects.

Phase 4: Reporting. The final Phase of the planning process involved reporting back of all of the information heard and the work done in the previous Phases of the planning process. This Phase included the preparation of the final City of Quesnel Active Transportation Plan.

1.4 Communications and Consultation

Representative participation of community stakeholders and residents is important to the success of the Active Transportation Plan. A range of communications and consultation approaches have been used and are described below:

- ▶ **Site Visits** were conducted to observe existing walking and cycling facilities within the city.
- ▶ **Website** content was developed which included establishing a dedicated project webpage for the Active Transportation Plan with updates on materials and upcoming events.
- ▶ **A survey** was made available online and through hardcopy for all residents to complete during the month of December 2015. Just under 100 residents responded to this survey. The online survey focused on understanding travel behaviour, walking and cycling issues and challenges, and interest in active transportation. A summary of the survey result can be found in **Appendix A**.
- ▶ **A Stakeholder Committee Meetings** were held in December 2015 and January 2016. The Stakeholder Committee was made up of representatives from a variety of interest groups, committees and organizations. The first meeting focused on understanding the existing conditions for walking and cycling in Quesnel. The second meeting focused on identifying priority infrastructure projects.

1.5 Plan Framework

The City of Quesnel Active Transportation Plan includes a number of recommended strategies to improve the safety and comfort of walking and cycling within and between the city’s neighbourhoods. The improvement strategies have been grouped into five broad Action Areas: **Connections, Safety and Security, Maintenance and Accessibility, Amenities, and Education and Encouragement**. Within each Action Area, specific recommendations have been further grouped by theme.

ACTION AREA 1: CONNECTIONS	ACTION AREA 2: SAFETY AND SECURITY	ACTION AREA 3: MAINTENANCE AND ACCESSIBILITY
1.1 Walking Facilities 1.2 Bicycle Facilities	2.1 Barriers 2.2 Visibility 2.3 Personal Safety	3.1 Maintenance 3.2 Snow Removal 3.3 Accessibility

ACTION AREA 4: AMENITIES	ACTION AREA 5: EDUCATION AND AWARENESS
4.1 Bicycle Parking and End of Trip Facilities 4.2 Transit Integration 4.3 Public Amenities and Streetscapes	5.1 Walking and Cycling Education 5.2 Safe Routes to School 5.3 Wayfinding 5.4 Community Events

Section 2.0
SETTING THE STAGE



This section of the report describes the planning context for the Active Transportation Plan. This section includes a summary of the key City policies and plans that relate to active transportation, as well as a summary of the key demographic, land use, transportation, and natural characteristics of Quesnel. Together, these elements of the community context have shaped the recommended improvement strategies for the Quesnel Active Transportation Plan.

2.1 Community Context

This section outlines Quesnel's demographic and land use profile, as both demographics and land use have an important influence on transportation choice and travel patterns in a community.

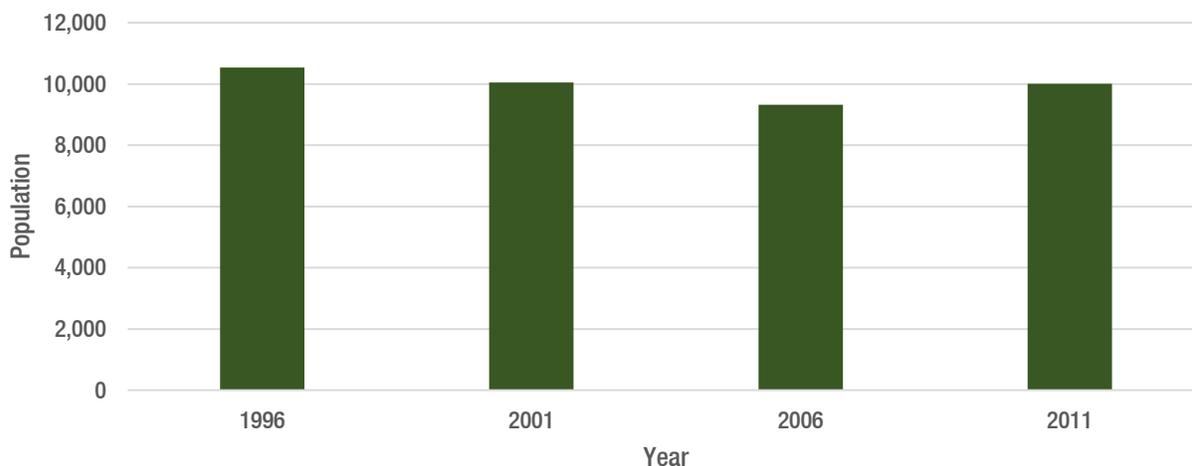
2.1.1 Demographic Profile

This section summarizes key demographic characteristics of Quesnel residents that will be used as a basis to inform the direction of the Active Transportation Plan.

- ▶ **A Relatively Stable Population.** The City of Quesnel's population has remained relatively stable over the past 20 years, currently the population of Quesnel is approximately 10,000 residents (**Figure 1**). This number is expected to remain relatively steady in coming years.

Figure 1: City of Quesnel Population (1996, 2001, 2006 and 2011)

Source: Statistics Canada (2011)

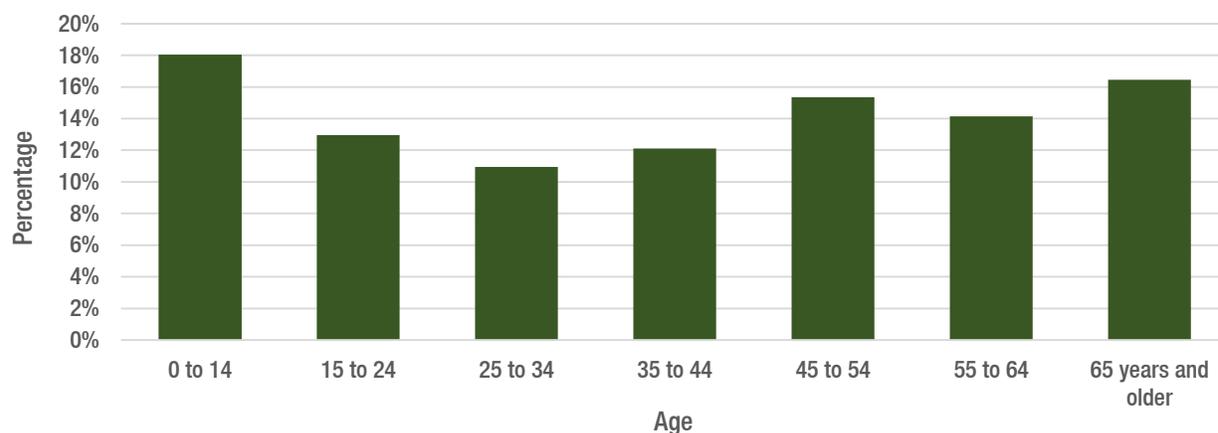


- ▶ **A Young Population.** Just under 30% of Quesnel's population is 24 years of age or younger as seen in **Figure 2**. Improving walking and cycling can significantly benefit this age group, as younger groups may not have access to automobiles and are more reliant upon transit, walking, cycling and carpooling. In addition, by attracting youth to sustainable modes of transportation early in their lives, there is a considerable opportunities to continue these trends into adulthood.
- ▶ **A Growing Senior Population.** Also shown in **Figure 2**, 16% of Quesnel residents are in the 65 years and older age category, with a further 14% that are in their pre-retirement years (aged 55 to 64). Like most communities across British Columbia and throughout North America, the number of seniors is growing. Older age groups tend to become more reliant on non-automobile transportation such as walking and transit. Safe, accessible and

well-connected walking and cycling infrastructure can make it easier for aging residents to move around freely within their community without a vehicle.

Figure 2: Age Profile of Quesnel Residents

Source: Statistics Canada (2011)



2.2.2 Land Use Profile

The city's land use and development patterns are shaped by its road and rail transportation network, which is critical in supporting the local and regional economy (**Figure 3**). The follow outlines some of the important considerations specific to existing land use and its relationship with active transportation.

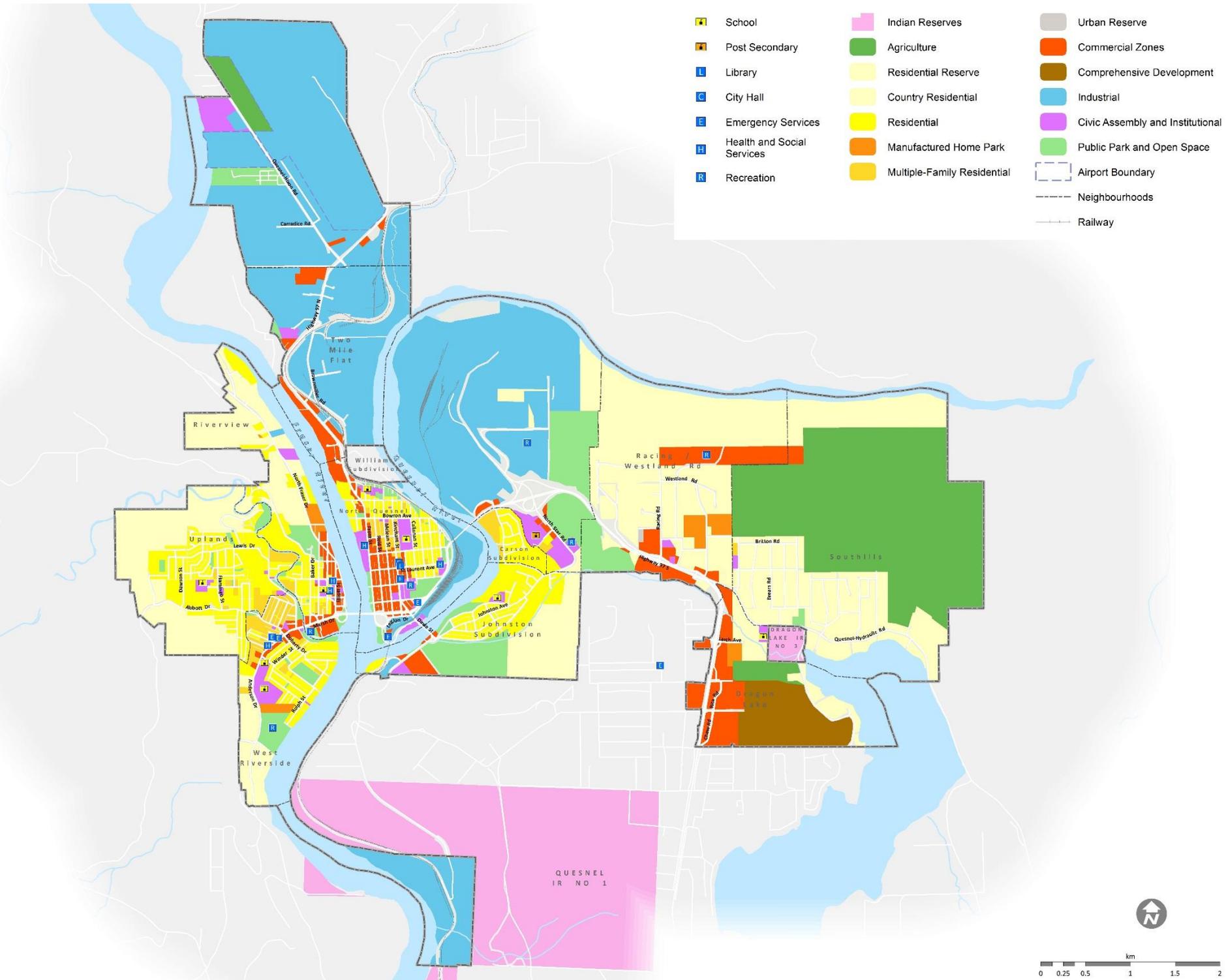
- ▶ **Downtown.** Downtown Quesnel has historically been the centre of the community, it offers a range of services and destinations. Much of the City's River Walk Trail, which will be discussed in more detail later is located within downtown Quesnel.
- ▶ **Neighbourhoods.** The City of Quesnel is made up of a number of different neighbourhoods that each have unique characteristics in terms of community destinations, geography and access to existing active transportation facilities. For example, neighbourhoods such as Southills and Dragon Lake are located in South Quesnel. They have limited active transportation infrastructure and currently do not have direct access to destinations along Highway 97. The steep topography in Uplands, as another example, presents a challenge for active transportation. Finally, active transportation access to Two Mile Flat is difficult due to high vehicle volumes and speeds on Highway 97.
- ▶ **Highway 97** is a major highway travelling in the north - south direction through much of the City of Quesnel. It is a four lanes (two lanes in each direction) south of North Star Road and north of the access road to St Ann Catholic Church and School. Within downtown Quesnel the highway travels along Legion Drive, Carson Avenue and Front Street and has three vehicle lanes. The majority of the signalized intersections within the City of Quesnel are located along Highway 97. These signalized intersections are controlled by the Ministry of Transportation and Infrastructure (MoTI).

- ▶ **Community Facilities and Parks.** One of the most important elements for supporting a vibrant city is to connect major community destinations with walking and cycling facilities. Community destinations in Quesnel include the City's Public Library, Municipal Hall, the arenas and Civic Plaza, as well as Lebourdais Park and West Fraser Timber Park, to name a few.

- ▶ **Schools.** There are currently eleven schools in Quesnel, though it is important to note that three of these schools are being considered for closure within the next year. This will have an impact on school catchment areas, resulting in longer travel distances for students. The schools currently located within the City of Quesnel are listed below:
 - Carson Elementary
 - Dragon Lake Elementary
 - École Baker Elementary
 - Kersley Elementary
 - Lakeview Elementary
 - Riverview Elementary
 - Voyageur Elementary
 - Correlieu Secondary School
 - McNaughton Centre
 - Quesnel Junior School
 - St. Ann's Catholic School

Also located in Quesnel is a campus of the College of New Caledonia.

Figure 3: Current Land Use Map



2.2 Policy and Bylaw Assessment

The Active Transportation Plan is closely linked to, and will be informed by, many of the City's key planning documents that contain pedestrian and cycling-related policies, plans, and goals. Many of these documents include broader aspirations for development and transportation and provide specific directions on how walking and cycling can become an integral part of the City's transportation system. The Active Transportation Plan can reinforce and help further the goals and policies found in other documents. This section outlines some of the key shaping influences and documents developed by Quesnel.

Official Community Plan (OCP) (2007)

The OCP outlines Quesnel's vision: *"The City of Quesnel will enhance the quality of life of the citizens of Quesnel by providing: equitable, sustainable, fiscally, responsible, physical and social infrastructure, and opportunities for diversified economic growth in a socially and environmentally responsible manner."*

Transportation has its own specific chapter within the OCP with two objectives noted below:

1. Achieve a transportation network which will provide a satisfactory level of service in terms of safety, convenience and cost; and
2. Encourage alternate forms of transportation such as public transit, walking and cycling.

These objectives identify a number of different considerations that are important for the development of the Active Transportation Plan. The OCP identifies the importance of encouraging walking and cycling, as well as the importance of providing a safe and convenient transportation network for all road users. The OCP notes the need to update the existing Bicycle Network Plan and to focus on areas with high walking and cycling demand such as areas around schools, recreation facilities, and commercial destinations. The OCP also notes the importance of providing pathway connections between different neighbourhoods within the City.

Transportation, and more specifically walking and cycling, considerations are also noted in a number of other policies included the OCP such as:

- ▶ Recognizing the importance of improving access to the downtown through various modes of transportation including walking, cycling, automobile and others.
- ▶ The underlying principle to encourage walking and cycling as major forms of transportation in Quesnel.
- ▶ Reduce automobile dependence by encouraging the use of alternative modes of transportation including bicycles and public transit, in the community.
- ▶ Encourage neighbourhood and site-specific design that will improve the "walkability" of the community.
- ▶ Ensuring sites are designed to accommodate alternative modes of transportation, with provisions made onsite for sidewalks, bicycle and walking paths or lanes, and bicycle parking racks. Onsite transportation networks should connect transportation networks off the site.
- ▶ Recognize the *Measure Up Quesnel Strategic Plan* as a tool for improving all means of transportation for people with a disability, seniors and the general public.

Bicycle Network Plan (1997)

The Bicycle Network Plan provides a list of nine priority projects. Many of the projects that are identified in the Plan are remain relevant and are important to providing a well-connected network for active transportation. Still, as recommended in the OCP, it is necessary to update this Plan with additional detail, design guidance and identified funding strategy in order to ensure the projects can be implemented successfully.

This Active Transportation Plan provides this update by building off of the projects previously identified and prioritizing the projects over the short, medium and long term. The principles used in the development of the Bicycle Network Plan were incorporated into the development of this Plan, specifically recognizing the desire to have a mix of off street and on street facilities and the importance of the River Walk Trail System.

Downtown Development Plan (2004)

The purpose of the Quesnel Downtown Development Plan is to set directions to reinforce the importance and vitality of downtown Quesnel. The results of the Plan will see the improvement of multi-modal access and more efficient and higher value use of land within the downtown core. The Downtown Development Plan provides recommendations for physical developments, design guidelines, planning and development policies, infrastructure improvements and other initiatives affecting public and private lands.

Specific to active transportation, the Downtown Development Plan notes the importance of providing access to and within downtown for all modes and specifically notes the desire for additional facilities for people walking and cycling. It also notes the importance of integrating the transportation network with the River Walk Trail. The Plan identifies a number of policies and guidelines that note the importance of providing design and infrastructure enhancements to the pedestrian environment.

Some of the key features and locations identified in the Plan are:

- ▶ **Enhancement of Reid Street**
 - Increase the sidewalk width to facilitate convenient pedestrian movement and encourage higher utilization of the right-of-way
 - Make Reid Street a better “Main Street” with emphasis on distinctive character, pedestrian quality, storefront access and amenities such as seating areas and signage
 - Enhance the streetscape along Reid Street with wider sidewalks and mid-block pedestrian crosswalks, more trees and furnishings, additional character lighting, small gathering / seating areas, and greater capacity for commercial activity.
- ▶ Development of the River Walk along Reid, Barlow and the west side of Front to provide loops and connections through the downtown with widened sidewalks, street trees, signage, directories, interpretive displays and seating areas.
- ▶ Enhancing the downtown as an appealing, compact, pedestrian-scale, retail commercial centre benefiting from proximity to the River Walk Trail and public spaces. This includes encouraging and enhancing convenient, comfortable and safe pedestrian access throughout the downtown and integrating connections with other neighbourhoods

- ▶ Recognition that the Highway dominates the character of Front Street and Carson Avenue discouraging pedestrian access and promoting auto-oriented uses and development. As well, portions of McLean Street does not have sidewalks.

Parks, Green Spaces and Outdoor Recreation Master Plan (2015)

The Parks, Green Spaces and Outdoor Recreation Master Plan provides additional guidance towards the management and protection of its parks, trails and green spaces as well as outdoor recreation amenities in order to meet the needs of the community over the next 10-year period. One of the main conclusions from the development of this Plan was that active transportation is an important issue for residents and stakeholders within Quesnel.

City of Quesnel Integrated Community Sustainability Plan (ourQuesnel) (2013)

The Integrated Community Sustainability Plan for the City of Quesnel (ourQuesnel) was developed to guide the process of moving the community toward a more desirable and sustainable future. The document identifies strategies and actions for implementation and outlines the importance of monitoring progress.

Transportation and Mobility is identified as a Strategy Area within the ourQuesnel Plan. The Transportation and Mobility strategy is concerned with ensuring that the movement of residents and goods to, from and within a community is done in a more efficient and sustainable manner. There are a number of desired outcomes for Transportation and Mobility that are specific to active transportation, they are listed below:

- ▶ Quesnel’s transportation system is accessible by all users
- ▶ The transportation system is convenient, cost effective and affordable, and allows for efficient and safe movement of people, vehicles and goods
- ▶ It is easy to get around Quesnel year-round using a variety of transportation options, including non-motorized modes

Measure Up Quesnel Strategic Plan (2008)

Measure Up Quesnel was completed to identify strategies to improve accessibility and inclusion within the community. The Plan was developed based on input received from the community and stakeholders and goals were developed for a number of considerations within the City.

The Plan’s goals regarding ‘Getting Around the Community’ refer to sidewalks and access to transit, and are particularly relevant to the Active Transportation Plan.

The goal for sidewalks is: *That all sidewalks will meet basic standards required by disabled residents.* Some of the strategies specific to this goal include:

- ▶ Review and recommend the development of City policy on meeting minimum standards for all sidewalks, including curb cut location and identification for the sight impaired.
- ▶ Explore standards on the location of audible signal button and the walk timing for pedestrians at traffic lights.
- ▶ Recommend the development of an ongoing five year City plan for sidewalk renewal and extension.

- ▶ Review City requirements for businesses to clear snow and ice from sidewalks.
- ▶ Review and recommend policies for standards for efficient and timely snow clearing of sidewalks in all areas of town, particularly around power poles, bus stops, and curb access, and allowing adequate space for wheelchairs and power chairs.

The goal specific to transit is: *To increase use of the transit system with improved service to people with a disability, seniors, and the general public.*

Some of the strategies specific to this goal that are applicable to the Active Transportation Plan include:

- ▶ Propose a standard of service which ensures that bus stops are quickly cleared of snow and ice.
- ▶ Review the location and usage of the current bus stops and shelters to ensure they meet the needs of transit users.

Bylaws and Policy Review

There are a number of City bylaws and policies that include or could include requirements and regulations related to walking and cycling. This section provides a brief introduction to these bylaws and policies.

▶ Snow Removal Practices

As Quesnel is a winter city, snow removal policies and practices are extremely important to ensure that residents are able to move around regardless of the mode throughout the year. Below is an overview of the snow removal practices in Quesnel specific to active transportation.

- The City of Quesnel maintains 146 km of roads, streets, sidewalks & trails
- A separate contractor clears the highway
- Businesses downtown remove snow and ice from the sidewalk themselves
- The City clears all residential sidewalks and pathways
- Sidewalks are prioritized for snow removal over roads

▶ Street, Traffic and Parking Bylaw

This Bylaw regulates the movement of vehicles and other traffic within municipal boundaries. The Bylaw includes restrictions on the use of sidewalks and paths, duty to clear ice and snow, and parking. Some of the document's key regulations relevant to active transportation include:

- 'No person shall ride any bicycle upon any sidewalk [...] and where it would be unsafe to operate such cycle or skateboard upon a highway, they shall dismount and walk alongside such cycle or skateboard'
- Motorized scooters shall only be operated on:
 - Sidewalks where provided for public use; or
 - The right hand portion of a highway surface as close as reasonably possible to an adjacent curb or boulevard in locations where there are no sidewalks provided for public use

▶ **Zoning Bylaw (2009)**

The Zoning Bylaw regulates the type of building and uses or activities allowed on a specific property. It also regulates building size, building siting on the property and parking. Many municipalities have requirements in their Zoning Bylaw specific to bicycle parking, both short and long term, for new and existing developments. The City of Quesnel currently does not currently provide bicycle parking requirements in their Zoning Bylaw.

▶ **Subdivision and Development Control Bylaws (1992)**

The City of Quesnel's Subdivision and Development Control Bylaw regulates the subdivision of land and sets requirements for the provision of infrastructure work when the land is subdivided or developed. This document outlines requirements for sidewalks for new developments. In general, the current Bylaw has the following requirements for sidewalks based on road classification.

- Arterials should have a sidewalk on both sides
- Collectors should have a sidewalk on at least one side
- Local roads should have a sidewalk on at least one side

Section 3.0
EXISTING CONDITIONS FOR
WALKING AND CYCLING



This section reviews existing conditions for walking and cycling in Quesnel including active transportation mode share, walking and cycling facilities and issues and opportunities.

According to the 2011 National Household Survey conducted by Statistics Canada, approximately 10% of all trips to work are made by walking and cycling in Quesnel (Figure 4). This is relatively comparable to many other peer cities in British Columbia, although Quesnel has one of the highest walking mode shares when compared to these other cities (Figure 5).

Figure 4: Existing Mode Share (2011 National Household Survey)

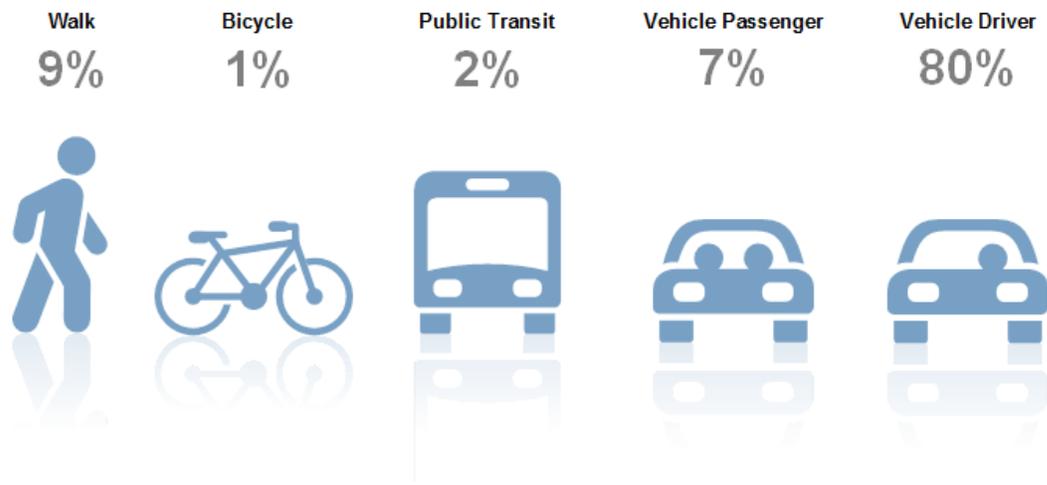
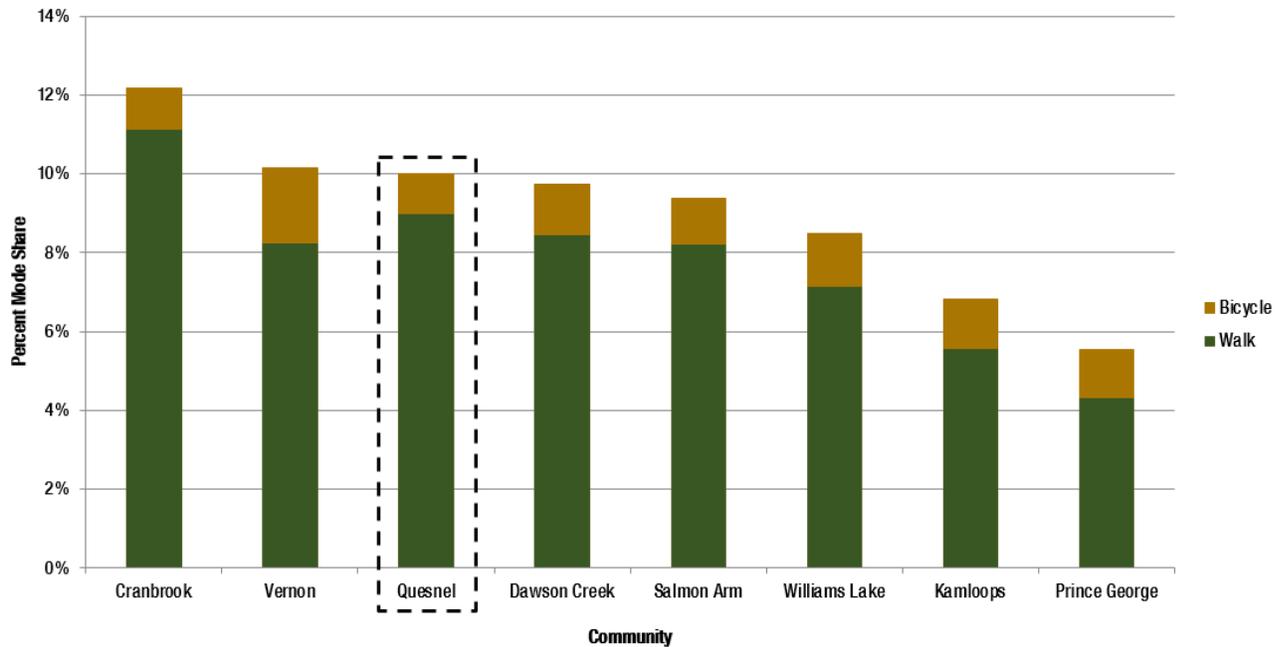
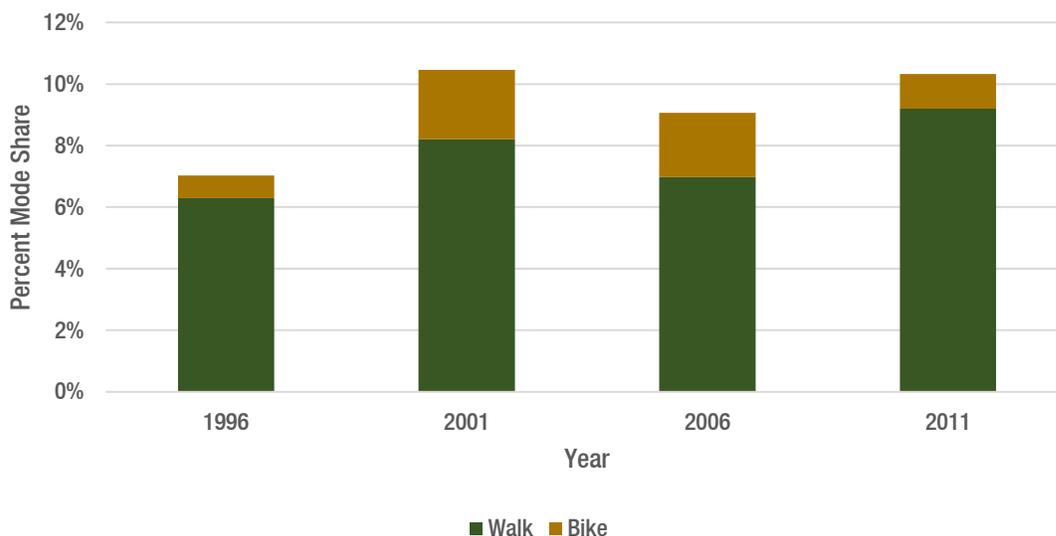


Figure 5: Peer City Comparison (2011 National Household Survey)



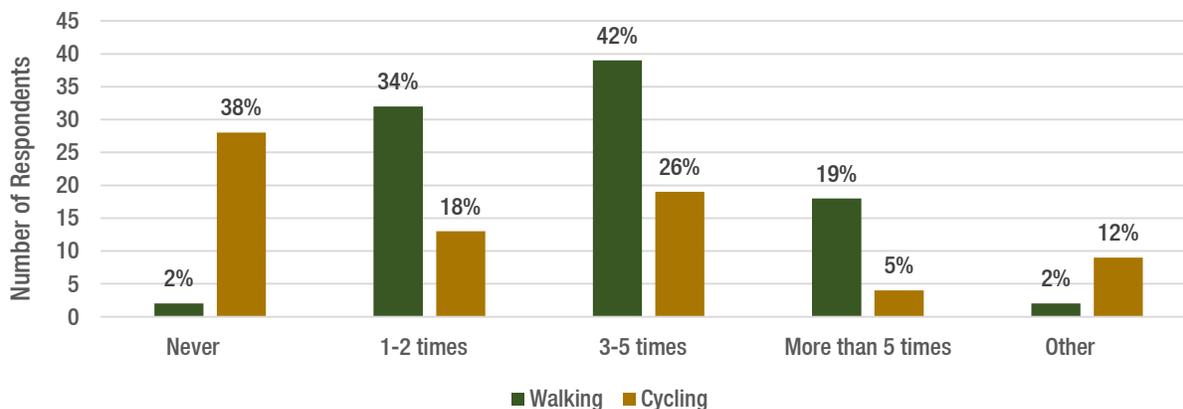
Walking trips, in particular account for over just under 10% of the daily trips to work within Quesnel, which translates to over 350 trips a day. This is the highest percentage of walking trips that has been seen in Quesnel over the last 15 years. When looking at the number of walking and cycling trips over time in the City of Quesnel, it appears that the percentage of combined walking and cycling trips has been on the rise since 1996. However, there was a drop in the percentage of mode share in 2006, as seen in **Figure 6**.

Figure 6: Walking and Bicycle Mode Share Over Time (Statistics Canada 1996, 2001, 2006, 2011)



The Active Transportation Plan survey for Quesnel was conducted in December 2015. One of the questions asked respondents to identify how often they walk and bicycle in an average week. The results are presented below in **Figure 7** and show that 61% of Quesnel residents walk more than three times a week and 31% of respondents bicycle more than three times a week. Survey respondents were also asked about their attitudes towards walking and cycling and would they like to or be willing to walk or bicycle more. The survey results showed that 61% would like to walk more and 58% of respondents would like to bicycle more.

Figure 7: Walking and Cycling Frequency



Walking and Cycling in Quesnel

This section outlines the existing conditions for walking and cycling in Quesnel today.

Existing Pedestrian Facilities

As seen in **Figure 8**, sidewalks are located along a number of streets in neighbourhoods throughout Quesnel, including major streets downtown, in the neighbourhoods of West Riverside and Uplands. There are also sidewalks on Johnston Avenue and other major streets within the city. Many of the residential streets do not have sidewalks and in South Quesnel, streets generally have no sidewalks at all. In many cases this is not a concern due to the low vehicle volumes, speeds and the residential land uses. In these cases sidewalks are unnecessary and inappropriate within the local context.

Existing sidewalks within the City of Quesnel are mainly made of concrete and are generally in good condition. It was mentioned through the survey and in discussions with stakeholders, that there are locations downtown where narrow sidewalk width is a concern. These are locations where pedestrian activity is high, parked vehicles are encroaching onto the sidewalk or where there are a number of people using scooters or mobility aids. Reid Street was identified as an example of this situation.

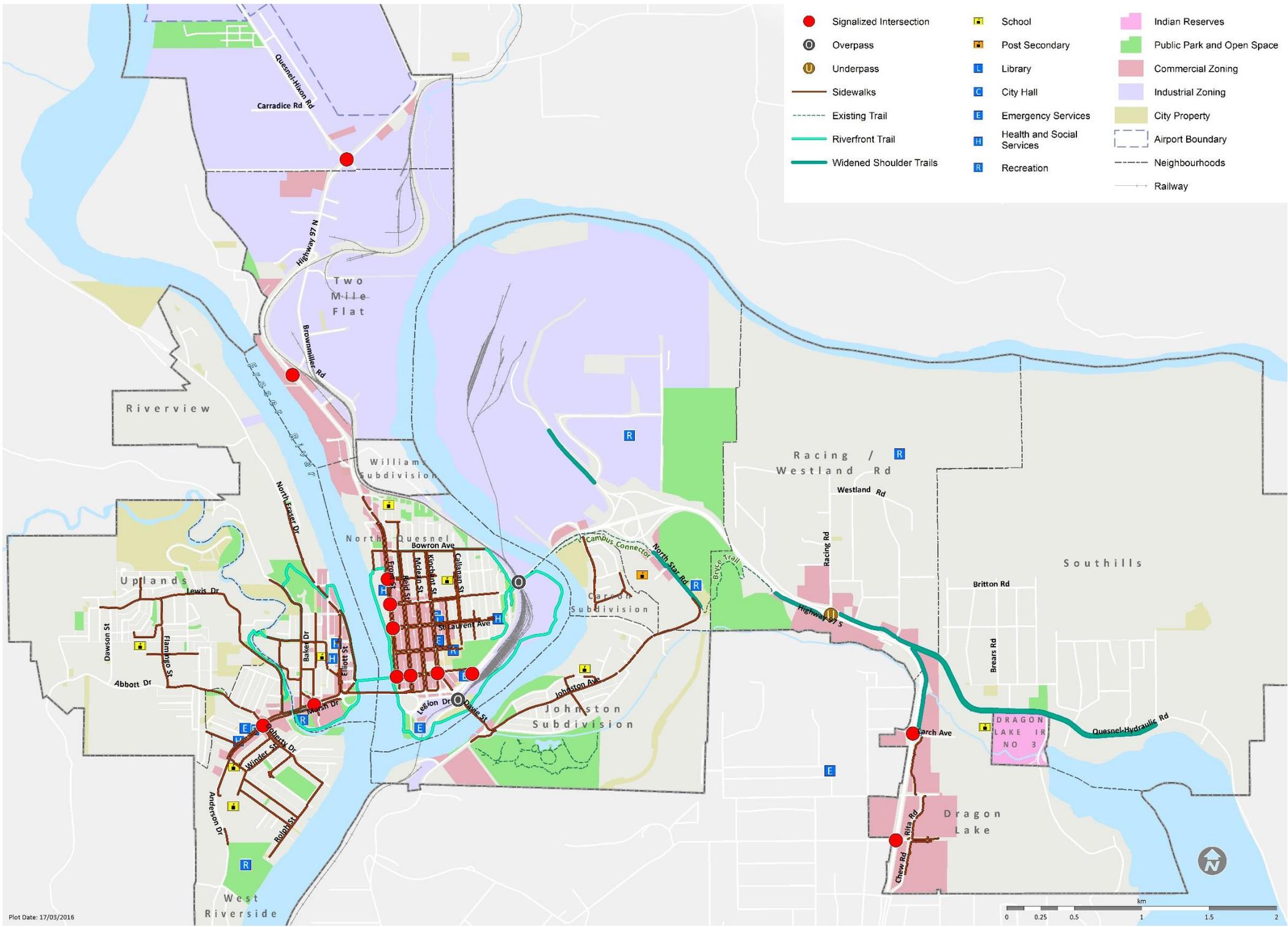
The River Walk Trail is an important facility for people walking and cycling in Quesnel. Currently the trail is 12 kilometres long and provides a circular route around downtown and extends into West Quesnel. The Campus Connector and the Bryce Road Trail extend the trail south-east to the University Campus and into South Quesnel. Most of the trail is paved as a multi-use facility for people walking and cycling. The trail is almost completely separated from motorized vehicles except in a few locations where the trail intersects with a roadway. One focus of the Active Transportation Plan is to build off of this well established, well used, and popular facility to improve connectivity and enhance existing infrastructure.

Existing Bicycle Facilities

Cycling can be an attractive transportation option, as it is convenient, low cost, and practical alternative to the motor vehicle for shorter trips. Currently, the City of Quesnel's designated bicycle network is made up of off street multi-use pathways and on-street paved shoulders.

The provision of comfortable bicycle infrastructure and end-of-trip facilities is crucial to increase the safety and connectivity of cycling. In particular, research from the Cycling in Cities Program at the University of British Columbia and other sources have found that there are two types of bicycle infrastructure that are more likely to increase bicycle ridership. Those bicycle facilities are facilities that provides a greater degree of separation between cyclists and vehicles and those that are located on quiet streets with low vehicle volumes and speeds. Currently most of the bicycle facilities located within the City of Quesnel are multi-use pathways. Key examples include the River Walk Trail and Bryce Trail. The City also has a number of locations where cyclists can ride on paved shoulders of roads such as along portions of Highway 97 and Quesnel Hydraulic Road.

Figure 8: Map of Existing Sidewalks, Pathways and Trails



Plot Date: 17/03/2016

Road Crossings

Signalized intersections in Quesnel are located primarily along the Highway and Marsh Drive / Anderson Drive at the following locations.

- ▶ Anderson Drive and Abbott Drive
- ▶ Marsh Drive and Baker Drive
- ▶ Front Street and Carson Avenue
- ▶ Front Street and St Laurent Avenue
- ▶ Front Street and Shepard Avenue
- ▶ Front Street and McNaughton Avenue
- ▶ Carson Avenue and Kinchant Street
- ▶ Carson Avenue and Moffat Bridge Approach
- ▶ Highway 97 and Cedar Avenue
- ▶ Highway 97 and Maple
- ▶ Highway 97 and Quesnel-Hixon Road

All of these signals are pedestrian activated and the ones located along Front Street downtown are audible. All intersections along Highway 97 have countdown timers.

There are four bridges within the City of Quesnel. Three bridges are motor vehicle bridges that have facilities for people walking or cycling. There is also the historic Fraser River Footbridge which is part of the Riverfront Trail system that is specifically for people walking and cycling. There are overpasses and underpasses also exclusive for pedestrians and cyclists that provide connections over major infrastructure features including Highway 97 and the railway as identified in **Figure 8**.

Traffic Calming

Traffic calming includes features such as curb extensions, raised crosswalks, speed humps, on street parking, and traffic circles. These features serve to reduce speeds, discourage high volumes of through traffic, and minimize conflicts between different road users. The City has incorporated traffic calming on a number of streets, particularly on roads such as Anderson Drive and Callanan Street in front of schools. In addition, 30 km zones are in place on roads adjacent to schools and parks to slow down traffic at these locations which are associated with high pedestrian demand and have vulnerable road users nearby.

Transit Accessibility and Integration

Most transit trips begin or end with a walking or biking trip. Hence, it is important to consider how well the active transportation network is integrated with transit services and facilities. Ensuring that bus stops are accessible throughout the year and are within walking distance of residences is an important consideration of the Active Transportation Plan. In addition, pedestrian amenities at bus stops, such as shelters and benches, can help enhance the pedestrian environment

and encourage trips on transit. **Figure 9** identifies bus stop locations and bus route coverage, demonstrating that much of the residential areas of the City of Quesnel is within 400 metres of a bus stop. There are approximately 119 bus stops in the City, eight of those stops have bus shelters. A number of bus stops are on the side of the road with no sidewalks. In Quesnel, bicycle racks are available on all full-sized buses all year.

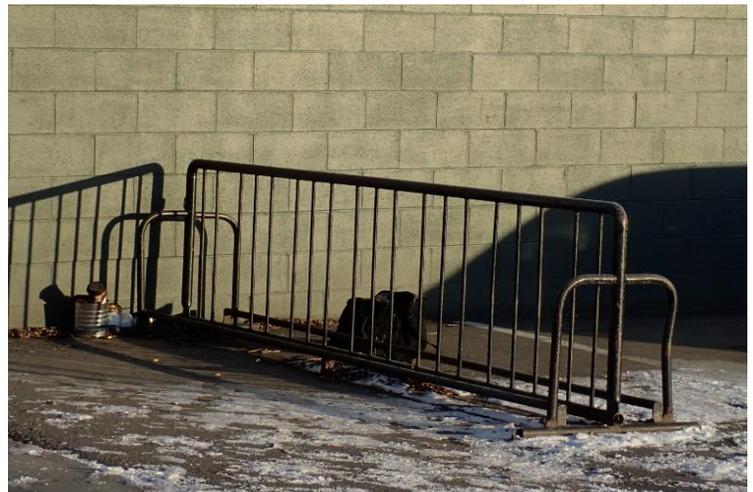


Safety

People walking and cycling of all ages and abilities are disproportionately impacted by traffic collisions. ICBC collects collision data for reported incidents involving a motor vehicle and a person walking and cycling. Between the years 2009 and 2013 in Quesnel there were a total of six collisions involving a person cycling and a motor vehicle. Over the same time period there were 20 collisions involving a motor vehicle and a person walking (**Figure 10**). Only two locations in the City had more than one collision over the time period in question. The intersection of Carson Avenue and Front Street had three collisions involving people walking and a motor vehicle and the mid-block location on St Laurent Avenue between Reid and Mclean Street had two reported collisions. It is important to note that this data does not provide any information about near misses or collisions that were a result of infrastructure.

Bicycle Parking and End of Trip Facilities

The City of Quesnel has some short term bicycle parking at various locations throughout the city. Most of the parking facilities are bicycle racks located in the downtown on sidewalks and in front of City buildings such as Municipal Hall and the Public Library. There is also some longer term bicycle parking available at different businesses and developments within the City. As noted, the City does not currently have any requirements for short or long term bicycle parking within its Zoning Bylaw. The OCP notes that bicycle parking should be considered during site design.



Active Transportation Key Issues and Opportunities

Key issues and opportunities related to walking in Quesnel were identified through input received from the survey and meetings with the Stakeholder Committee. Many residents of Quesnel have stated how much they enjoy and cycling within the City, highlighting that the scenery and being outside, the trail network, the access to different services and the act of being social are some of the key features that make Quesnel an enjoyable place to walk.

Respondents and stakeholders also identified active transportation issues. The key themes are summarized below (more detailed results can be found in the Survey Summary in **Appendix A**):

- ▶ **Lack of sidewalks** and rural shoulders make for a fragmented walking network and an unpleasant walking experience. Key locations identified where walking infrastructure was lacking or unsafe included South Hills and other areas, and shoulders along highways that were either missing in many areas or too cluttered with debris to be useable.
- ▶ **Insufficient lighting** along pathways, such as the Riverfront Trail, was a concern for some survey respondents. Poor lighting left respondents feeling concerned for their personal safety and unsafe due to limited visibility and not being able to follow the trail.
- ▶ **Unsafe crossings or lack of crossings** throughout the city were cited as a concern for many respondents. Unsafe crossings and connections around bridges was a common concern.

Based on feedback from the survey and public consultation, residents indicate that active transportation in Quesnel could be improved by providing the following:

- ▶ **More sidewalks**, or shoulder facilities in rural areas, to allow for safer separation between cars and pedestrians;
- ▶ **More off-street pathways and shortcuts** that address the missing pathway links;
- ▶ **Improved lighting on pathways**, as well as landscaping treatments, to improve visibility and safety after dark; and
- ▶ **Accessibility considerations**, such as curb let-downs and gentler grades on hills.

Section 4.0
STRATEGIES AND ACTIONS



This section outlines a number of recommendations to improve the safety and comfort of walking and cycling within and between Quesnel’s neighbourhoods. The recommendations in this section have been organized into four key action areas as shown below. Within each Action Area, specific recommendations have been further grouped by theme as described in detail throughout this section.

Action Area 1:	Connections
Action Area 2:	Safety and Security
Action Area 3:	Maintenance and Accessibility
Action Area 4:	Amenities
Action Area 5:	Education and Awareness

ACTION AREA 1: CONNECTIONS

Expanding and enhancing walking and cycling connections is a fundamental part of making active transportation a convenient and attractive travel option in Quesnel. The heart of the active transportation network in Quesnel is the River Walk Trail and the multi-use pathways that connect to it. Despite the extensive off street trail network there are notable gaps in both the walking and cycling networks including challenges travelling between neighbourhoods and to important city destinations. A more integrated and connected network of on and off-street pedestrian and cycling facilities can significantly improve the ease of moving around the community, and can thus make travel on foot and by bicycle a more attractive alternative to driving. Further, providing a more comprehensive network will also uphold the commitments in the OCP to enhanced pedestrian and cycling circulation. Two actions have been identified to increase the **Connections** for active transportation in Quesnel. Each is outlined in more detail below.

Action Area 1.1: Walking Facilities

In general, there are a number of different types of sidewalks and pedestrian facilities that offer a range of comfort. As seen below in **Figure 11**, these can range from pedestrian only off street trails and pathways and multi-use pathways which provide people walking with physical separation from moving vehicles. Sidewalks can range in width, and are often wider in locations where pedestrian demand is high, such as downtown and commercial areas. Standard sidewalks in most municipalities are concrete with a curb and range in width between 1.5 to 1.8 metres, within the downtown core and on major commercial streets they are often wider (minimum 3.0 metres). Other types of pedestrian infrastructure include, unpaved sidewalks or pathways located at the side of the street, these can be problematic for people with mobility issues. Paved shoulders are also a common type of pedestrian facility in Quesnel, in many cases if vehicle volumes and speeds are comfortable wide paved shoulders are a suitable facility for pedestrians to use.

Figure 11: Pedestrian Facility Examples



The map below (**Figure 12**) outlines locations within the City of Quesnel where pedestrian facility improvements are recommended if they are tied into other road and infrastructure projects, demand requires and as other active transportation projects and policies are implemented. These improvements can take a number of different forms depending on appropriate local context. It is also important to note that many of the projects identified on the map below will also help to enhance the bicycle network which is discussed in more detail below.



Recommended pedestrian facility improvements and example locations include:

- ▶ **Additional sidewalks or pedestrian facilities** have been recommended on streets within downtown Quesnel and adjacent to schools within the City. These are locations where there are a high number people walking and vulnerable road users. As identified in the Figure above, recommended locations for additional sidewalks include:
 - A portion of McLean Street (Bowron to Shepherd Avenue)
 - Shepherd Avenue (Reid Street and Kinchant Street)
 - Callanan Street (Quesnel Junior High School)
 - St Laurent Avenue (Jones Street and Wilson Street)
 - Graham Avenue (Carson Elementary School)
- ▶ **Existing sidewalk and pedestrian environment enhancements** have been recommended at locations within the downtown core that currently have high levels of pedestrian activity. It is also likely that current levels of pedestrian activity will increase along these corridors as the implementation of the Active Transportation Plan occurs. Recommended enhancements are mainly focused on providing wider sidewalks and a more comfortable walking environment. Building off of the recommendations of the Downtown Development Plan the follow locations have been identified for enhancements:
 - Reid Street – Shepherd Avenue and Carson Avenue
 - Barlow Avenue – Reid Street to Vaughan Street
- ▶ **Multi-Use Pathway Projects** – Multi-use pathways, sometimes referred to as off street pathways, are physically separated from motor vehicles. In many cases, pedestrians, cyclists and other users may share the same travel space. Multi-use pathways can be both paved and unpaved, paved is often preferred to ensure that the path is accessible to all users. In Quesnel, the River Walk is the most well-known multi-use pathway. Proposed enhancements and additions to the multi-use pathway network will benefit all forms of active transportation. More detailed information about some of the locations for multi-use pathways identified in **Figure 12** will be discussed in the following sections of this Plan but below is a list of some of the locations identified:
 - Pave the portion of the pathway that travels along Sugarloaf Park
 - Enhance the pathway that connects Anderson Drive and Doherty Drive
 - Provide a pathway to enhance the connection between Anderson Drive and Rolph Street and provide access to the indoor soccer fields
 - Connect the existing multi-use pathway with Barlow Avenue parallel to Gary Avenue

Additional information regarding design guidelines for multi-use pathways and other active transportation facilities can be found in **Appendix B** of this report.

- ▶ **Wide Paved Shoulders** - Wide shoulders can provide additional space for people walking and biking on streets where sidewalks may not be necessary. Like multi-use pathways these facilities can benefit both

people walking and cycling. It is recommended that the City should incorporate shoulder widening projects on the identified streets with other capital works projects. The locations identified are located in South Quesnel and include portions of:

- Westland Road
- Coach Road
- Galvin Road
- Phillips Road
- Neighbour Road
- Thompson Road
- Sanderson Road



In locations where additional separation may be required, a low-cost option is to install a curb barriers between the shoulder and roadway, these are used in some municipalities in BC as seen in the photo above.

► **Quiet Streets** – Many of the streets within Quesnel have relatively low traffic volumes and speeds, as a result there are significant opportunities to better accommodate people walking and biking along these routes. Like the two other facility types presented above, quiet streets are appropriate for both walking and cycling. In particular, less infrastructure-intensive treatments such as signage and pavement markings can be used to identify corridors as walking and cycling routes, and to make motorists aware that other users may be on the roadway. Recommended treatments include:

- **Signage.** On roads with no paved shoulder, it is recommended that “share-the-road” signage should be provided to indicate to motorists that cyclists and pedestrians may be present on the roadway and that vehicles must yield. Also, providing “yield to cyclists” and/or “yield to pedestrians” signage at key crossings is recommended. Generally, the assumption of 2 signs every 150m (one facing either direction) would be sufficient.
- **Pavement markings.** Provide Shared Use Lane Symbols ‘sharrows’ (double chevron with a stencil of a cyclist to indicate a shared roadway) or stencils of cyclists and pedestrians on the roadway surface to indicate that these are walking and cycling routes. Roadway stencils can also include the shapes of pedestrians and cyclists, or text such as “Slow Down” or the speed limit. Design guidance suggests that low volume routes should have a shared lane pavement markings spaced approximately every 80m.



Some of the streets within Quesnel that have been identified as quiet streets include:

- Moffat Avenue
- Rolph Street

- Allard Street
- Nadeau Street

Action Area 1.2: Bicycle Facilities

It is important that bicycle facilities are direct and provide adequate connections to key destinations within the community. Providing direct routes that connect to key destinations will ensure that cyclists have travel times that are competitive with automobiles. The City of Quesnel should plan the bicycle network and target infrastructure improvements where there is the greatest opportunity to increase the number of cycling trips while developing context specific solutions that recognize geographical, physical and financial constraints. **Figure 13** outlines the proposed long term bicycle network for the City of Quesnel.

The guiding principles in the development of the proposed long term bicycle network were to:

- ▶ Provide additional multi-use pathways to build on and connect the network of existing facilities
- ▶ Enhance and pave existing off-street pathways where required
- ▶ Utilize streets with lower vehicle volumes and speeds to create a network of Quiet Street Bikeways within neighbourhoods
- ▶ Provide signage and pavement markings major streets within the downtown and on Johnston Avenue to advise motorists to share the road with people cycling
- ▶ Provide bicycle lanes and wider paved shoulders where appropriate as a designated space for people cycling

There are a range of different types of bicycle facilities that can be applied in various contexts. Five types of on-street and off-street bicycle facilities can be considered throughout the City. Three of which, multi-use pathways, quiet streets, and paved shoulders were discussed above as they can serve as both bicycle and pedestrian facilities. The other options for bicycle facilities are bicycle lanes and shared use lanes which are described in more detail below.

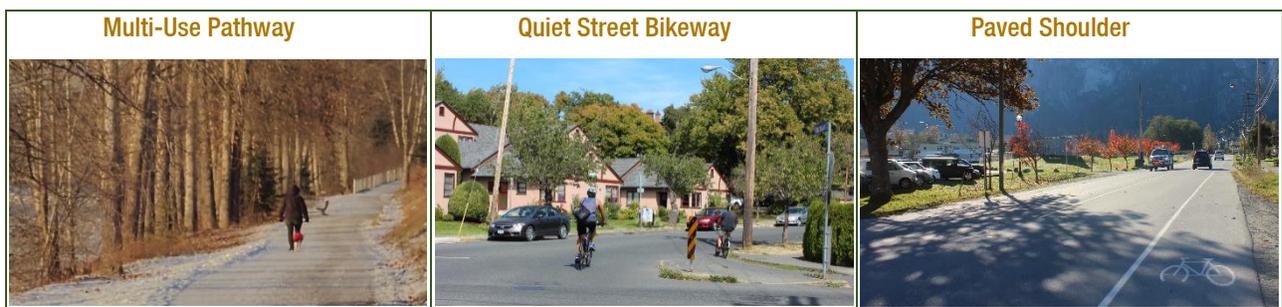
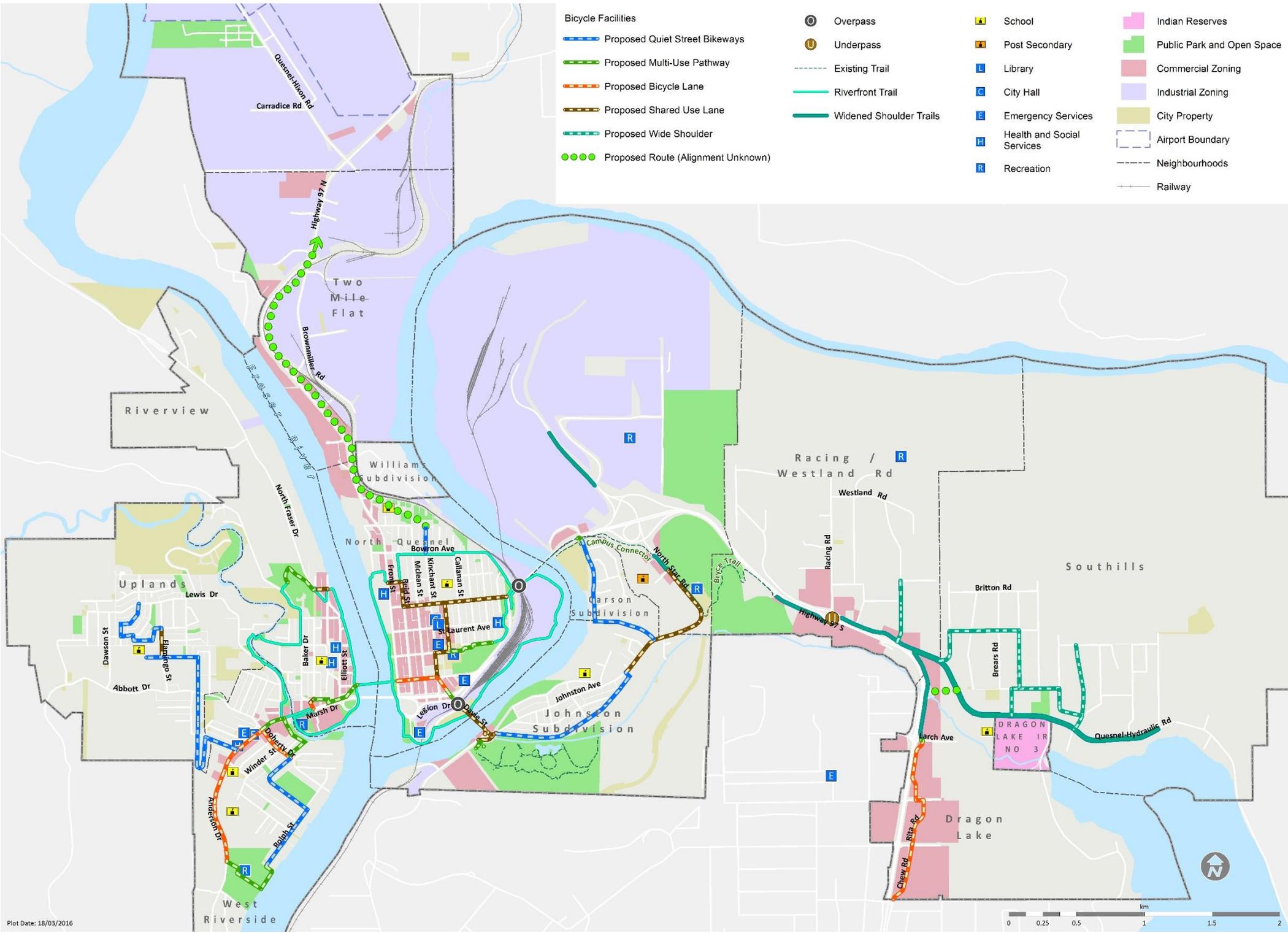


Figure 13: Proposed Long Term Bicycle Network



▶ **Shared Use Lanes** are often denoted by the use of a sharrow pavement marking to indicate that this is a shared space. Bicycles and motorists have to share the lane, either side-by-side, or in single file. Shared use lanes can be considered on streets with travel lanes that are wide enough for side-by-side bicycle and vehicle operation, but that are not wide enough to provide a standard bicycle lane. While shared use lanes are often designed for side-by-side operation to allow sufficient width for an automobile to safely overtake a bicycle without crossing over into the adjacent or oncoming motor vehicle traffic lane, this is not always the case. Additional information regarding design guidelines for shared use lanes and other active transportation facilities can be found in **Appendix B** of this report. Some of the corridors within Quesnel that been identified as proposed shared use lanes include:



- Johnston Street
- Portions of Shepard Avenue, Kinchant Street, Vaughan Street and Reid Street Downtown

▶ **Bicycle Lanes** are separate travel lanes designated for the exclusive use of bicycles. In most cases, they are located on the right-hand side of the road adjacent to the curb, and are identified with a solid white line and by signage and pavement markings placed at regular intervals. Bicycle lanes help to define the road space for bicyclists and motorists, reduce the chance that motorists will stray into the cyclists' path, discourage people cycling from riding on the sidewalk, and remind motorists that cyclists have a right to the road. Over the long-term bicycle lanes are proposed on the follow streets in Quesnel:



- Anderson Drive
- Doherty Drive
- Chew Road (parallel to Highway 97)

Connections: Summary of Actions

The Actions that have been developed to enhance **Connections** for active transportation in Quesnel are summarized below:

- ▶ Expand and enhance the pedestrian network
- ▶ Expand and enhance the bicycle network

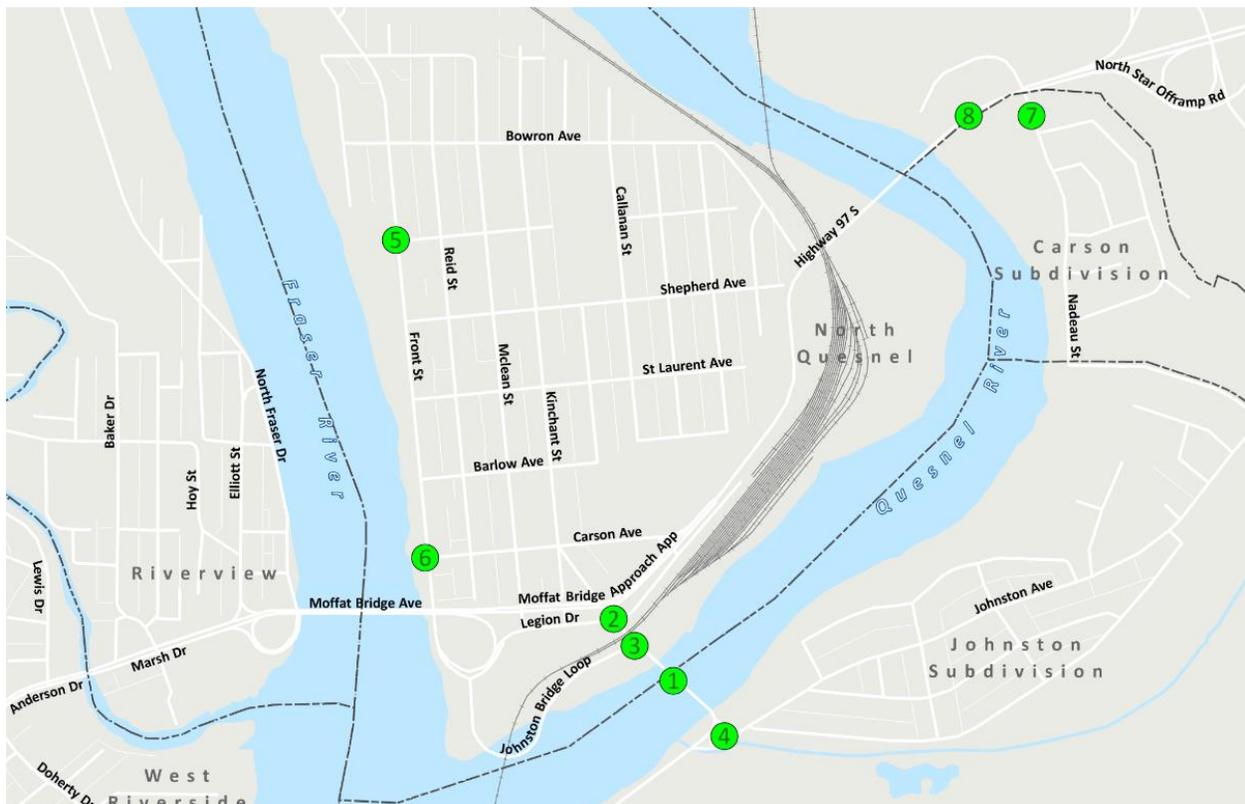
ACTION AREA 2: SAFETY AND SECURITY

Safety, both real and perceived, is an important factor influencing whether people choose to walk or bike for transportation. People walking and biking are considered to be ‘vulnerable road users’ as they are subject to a higher risk of serious injury than drivers and transit users. Safety and security is influenced by a number of different factors including the prevalence and speed of automobiles, the existing network, and different types of barriers that make walking and cycling difficult. Providing safe, secure and barrier-free walking and cycling environments is just as important as providing features that improve connections. Three actions have been identified to increase the **Safety and Security** of active transportation in Quesnel, each is outlined in more detail below.

Action Area 2.1: Address Barriers

There are a number of different types of barriers that can make walking and cycling challenging and pose a risk to an individual’s safety and security. These barriers can include a lack of safe and comfortable places to cross major streets and corridors such as Highway 97. They can also include other physical and geographical barriers such as the Fraser River, Quesnel River, and railway corridors. There are several intersections and crossings throughout Quesnel that can be improved to enhance the safety and visibility of pedestrians and cyclists. The figure below (**Figure 14**) identifies locations where crossing improvements, including bridge and rail crossings and major intersections, are recommended to better facilitate walking and cycling. These locations have been identified through public engagement and a review of existing walking and cycling conditions.

Figure 14: Barrier Improvement Locations



1. Johnston Street Bridge Deck

The Johnston Street Bridge is a steel grate bridge deck that crosses over the Quesnel River. It provides an important connection to downtown Quesnel for residents living in Johnston Subdivision as well as access to West Fraser Timber Park. It is the fastest and most convenient route for people living in this neighbourhood to access downtown. Currently, people walking and cycling share a pathway on the north side of the bridge. This pathway is narrow, making it challenging to pass other users. The railings along the side of the pathway also pose a serious safety concern as bicycle handlebars could potential get caught.

The posted speed limit on the bridge is 30 kilometres per hour, it has one lane of traffic in each direction, and an approximate roadway width of 7 metres (3.5 metre travel lanes). Stakeholders and residents noted that they would prefer to travel on the bridge deck and share the lane with vehicles, however the steel plate bridge deck makes this uncomfortable and feel unsafe. As this bridge is an important connection, making the bridge deck more comfortable for both pedestrians and cyclists was identified as a high priority project. Pedestrians will also feel more comfortable if they do not have to share the narrow pathway with cyclists.

Recommended Improvements:

- ▶ Apply slip resistant, perforated metal panels in the centre of the vehicle lane in each direction on the bridge deck so that a more comfortable riding surface can be provided for cyclists
- ▶ Apply Shared Use Plan Pavement Markings along the centre of each lane
- ▶ Install Shared Use Lane Single File Sign (WC-20) with the single file supplementary tab sign (WC-20S) to inform motor vehicle drivers of the presence of cyclists.

2. Davie Street Railway Overpass (North Side)

The Johnston Street Bridge was identified as an important active transportation connection through the resident survey and discussions with stakeholders. As a result, the crossing enhancements 1 through 4 as identified in **Figure 14** all focus on addressing barriers identified along this corridor.

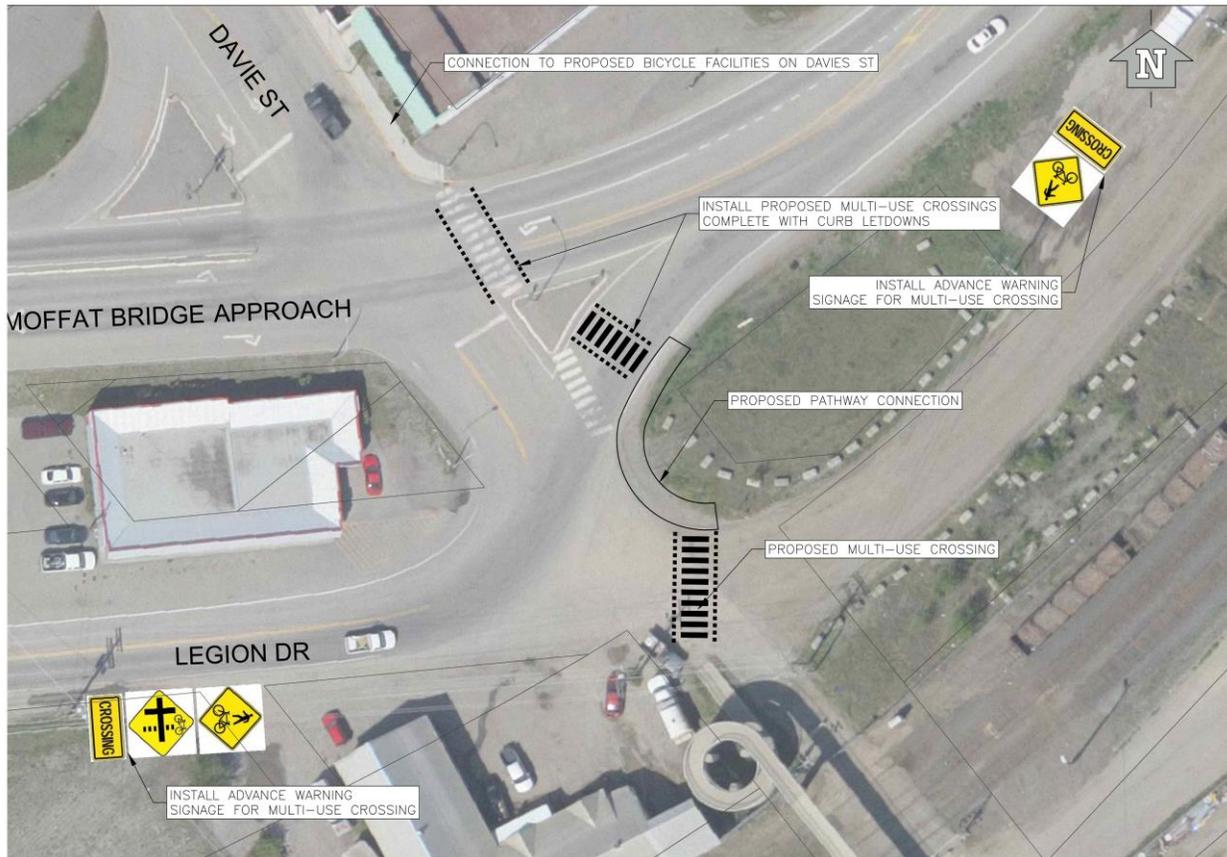
The Davie Street Overpass provides an active transportation crossing over the railway and a direct connection between downtown Quesnel and the Johnston Street Bridge. Getting to and from the overpass can be challenging for people walking and cycling as there is no clear route. As well, there is currently little warning for motor vehicles that cyclists may be entering the lane and pedestrians may be crossing at this location. Through the installation of additional signs, a proposed pathway on the east side of Legion Drive and additional painted crosswalk locations, better access will be provided for people walking and cycling to and from the overpass. A conceptual plan of potential improvements at this location is provided below in **Figure 15**.

Recommended Improvements:

- ▶ Install multi-use crossings to indicate that both pedestrians and cyclists are permitted to travel in the crosswalk. Multi-use crossings (also sometimes referred to as elephants feet) indicate to all road users that both people walking and cycling are permitted to use the crosswalk. More details about this type of treatment can be found in **Appendix B**.

- ▶ Install advance warning signage for crossing on Legion Drive in both directions (WC-46R and WC-7S)
- ▶ Provide a shared pathway on the east side of Davie Street as an off-street connection to the intersection crossing
- ▶ Provide curb letdowns at the refuge island

Figure 15: Conceptual Crossing Improvements – Davie Street Railway Crossing (North Side)



3. Davie Street Railway Overpass (South Side)

On the south side of the overpass, similar to the north, there is little guidance for individuals walking or cycling on how they can best use the overpass. Cyclists that are travelling down the overpass ramp, at potentially high speeds, find themselves entering the intersection in potential conflict with motor vehicle users that may not be anticipating them. After the implementation of the recommendations noted above for Location 1 (Johnston Street Bridge Deck), cyclists will need to be able to safely enter the southbound lane and share the lane with motor vehicles. To help facilitate this movement and provide more space for pedestrians at this location it is recommended that a refuge area is provided for pedestrians and cyclists as they exit the overpass. It is also recommended that a stop sign is installed for cyclists requiring them to stop before entering southbound lane. A conceptual plan of potential improvements at this location are provided below in **Figure 16**.

Recommended Improvements:

- ▶ Provide an enhance refuge area for pedestrians and cyclists with the use of concrete roadside barriers
- ▶ Install stop controls for southbound cyclists
- ▶ Add Shared Use Lane Symbol with arrows to direct cyclists through the intersection



Figure 16: Conceptual Crossing Improvements – Davie Street Railway Crossing (South Side)



4. Johnston Street Access (South Side)

On the south side of Johnston Bridge there is a roundabout that may present a challenge for cyclists to navigate. There are also potential challenges for cyclists accessing West Fraser Timber Park along Johnston Avenue. The following recommendations have been made to improve connectivity and address barriers at this location. A conceptual plan of potential improvements at this location are provided below in **Figure 17**.

Recommended Improvements:

- ▶ Install Shared Use Lane pavement markings within circulatory roadway of the roundabout
- ▶ Upgrade the existing crosswalk to a multi-use crosswalk
- ▶ Install proposed pathway through field of West Fraser Timber Park to connect with existing pathway
- ▶ Upgrade existing pathway by paving it
- ▶ Provide curb letdowns for both pedestrians and cyclists to access pathway on south side of roundabout

Figure 17: Conceptual Crossing Improvements – Johnston Street Access (South Side)



5. Highway 97 (Front Street) and McNaughton Avenue

The intersection of Front Street (Highway 97) and McNaughton Avenue has been identified as a potential crossing improvement location due to popular use and safety concerns. This signalized intersection provides access to G.R. Baker Memorial Hospital and the River Walk Trail. The long term bicycle network plan identifies McNaughton Avenue as a proposed bicycle route. There is currently a pedestrian crossing located on the north side of the intersection (crossing Front Street). This intersection the site of a reported collision between a motor vehicle and a cyclist. As Highway 97 is under MoTI's jurisdiction, the City should work with MoTI to enhance the crossing for people walking and cycling.

Recommended Improvements:

- ▶ On Front Street, in both directions, install a pedestrian and bicycle crossing ahead sign (WC-46R with WC-7S tab).
- ▶ Review pedestrian crossing times with MoTI at this intersection. Due to the proximity to the hospital it is appropriate to consider providing extra crossing time for seniors and individuals that may require more time to cross.

6. Highway 97 (Front Street) and Carson Avenue

The intersection of Front Street and Carson Avenue provides direct access to the Footbridge which plays an important role in the active transportation network. It was also identified as the top collision location for pedestrians in the city. The City should work with MoTI to enhance the crossing for people walking and cycling at this location.

Recommended Improvements:

- ▶ On Front Street install pedestrian and bicycle crossing ahead signs (WC-46R with WC-7S tab) in both directions.
- ▶ Review pedestrian crossing times at this intersection with MoTI Due to the Footbridge and the higher rates of pedestrian traffic anticipated, it is appropriate to consider providing extra crossing time for seniors and individuals that may require more time to cross.

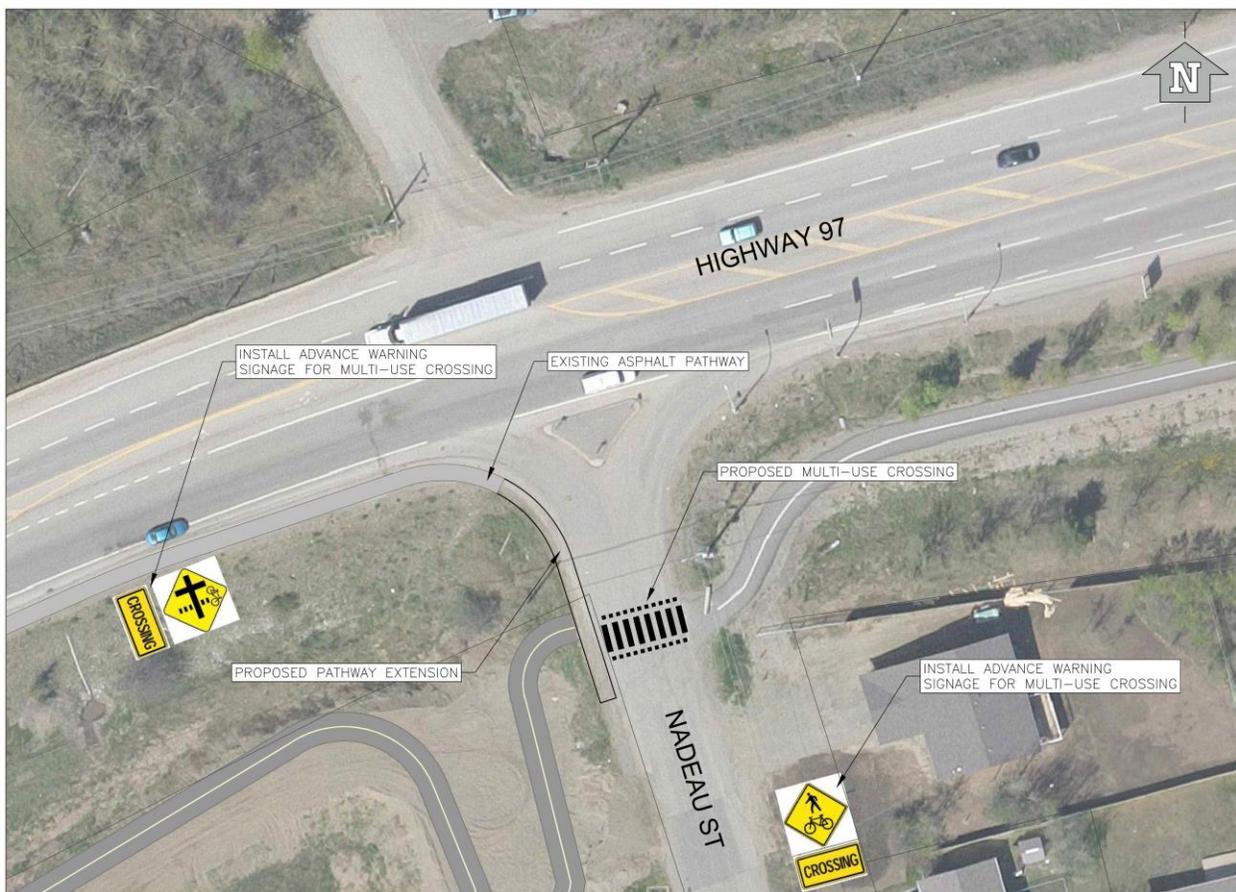
7. Multi-Use Pathway Crossing at Nadeau Street

The Campus Connector Pathway that runs parallel to Highway 97 provides access to the College Campus and South Quesnel. West of Nadeau Street the pathway continues parallel to the Highway in a field, but does not provide a connection to the Quesnel River Bridge. While enhancing access to the Quesnel River Bridge along Highway 97 is discussed in more detail below, there are opportunities to address the multi-use pathway crossing at Nadeau Street and provide access to Highway 97. The City should work with MoTI to enhance the crossing for people walking and cycling at this location. A conceptual plan of potential improvements at this location are provided below in **Figure 18**.

Recommended Improvements:

- ▶ Install advance warning signage for the multi-use crossing on Highway 97 for vehicles travelling eastbound and on Nadeau Street for vehicles travelling north.
- ▶ Consider installing multi-use crossing pavement markings across Nadeau Street where the multi-use pathway intersects the street.
- ▶ Extend the existing pathway onto the west side of Nadeau Street to provide a connection from the pathway to the Quesnel River Bridge.

Figure 18: Conceptual Crossing Improvements – Multi-Use Pathway Crossing at Nadeau Street



8. Quesnel River Bridge Access (East Side)

Residents and stakeholders noted that improving access to the Quesnel River Bridge could enhance network connectivity for walking and cycling. The location of the gas line that runs between Highway 97 and the multi-use pathway in the field makes linking the existing pathway with the bridge challenging. Building off of the

recommendations noted above (Location 7) it is recommended the City work with MoTI to consider the following recommendation:

Recommended Improvements:

- ▶ Consider installing concrete roadside barriers on the low side of the asphalt curb west of Nadeau Street to the narrowing of the fog line to provide physical separation of pedestrians and cyclists and motorized vehicles travelling along Highway 97.

Action Area 2.2: Improve Visibility

The desire for additional lighting was identified by survey respondents and stakeholders as something that would help to encourage more walking and cycling within Quesnel. Properly placed lighting is thought to discourage criminal activity, enhance natural surveillance opportunities, reduce fear of those walking and cycling after dark, and allow people to see any barriers, obstructions, or curves along the pathway. It is important to note however, that lighting is extremely context sensitive, it can become an obstruction, produce unnecessary ambient light and requires a high financial investment.

Some general guidance recommends that, lighting should be only be provided on well used bicycle and multi-use pathways, pathways through parks, open spaces, and at locations with hazards, conflict points, and areas of safety concern. One location in particular that was identified as needing additional lighting was the Footbridge. The City should review existing lighting and consider the installation of more lighting where warranted.

Action Area 2.3: Enhance Personal Safety

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

Safety and Security Facilities Summary of Actions

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

- ▶ Improve walking and cycling access to existing bridges and overpasses.
- ▶ Provide improvements to existing pedestrian and bicycle crossings at intersection locations.
- ▶ Provide lighting along pathways, walking and bicycle routes where appropriate.
- ▶ The City should consider CPTED design principles when designing and implementing new or enhancing existing active transportation facilities.

ACTION AREA 3: MAINTENANCE AND ACCESSIBILITY

Walking and cycling facilities should be well maintained and usable for people of all ages and abilities throughout the year. For people walking and cycling, poorly maintained infrastructure (including sidewalks, pathways, and bicycle routes), snow and ice, and inaccessible infrastructure can make it more difficult and less desirable to walk or cycle. While the implementation of infrastructure to promote walking and cycling is seen typically as a top priority, undertaking ongoing rehabilitation and maintenance and improving the accessibility of existing infrastructure needs to be an equally important focus. Three sub-actions have been developed to address **Maintenance and Accessibility** specific to active transportation, each of which is detailed below.

Action Area 3.1: Maintain the Network

The City of Quesnel Public Works department is responsible for the maintenance of the City's streets and sidewalks. Maintenance efforts are important to keep facilities as near as possible to their original condition, so that infrastructure remains functional and usable over time. To ensure that the pedestrian and bicycle network is well maintained the following recommendations have been identified:

- ▶ Continue to inspect sidewalks and pathways regularly to ensure they are well maintained. The City should continually create and update an inventory of sidewalks including condition, width, adjacent road classification, and land use and integrate this information into Geographical Information Systems.
- ▶ The City could adopt a Sidewalk Maintenance Policy. This policy would include standards for inspection, identifying defects and obstacles, and prioritizing repairs.
- ▶ Develop guidelines for the more timely removal of debris such as gravel and sand on paved shoulders and future designated bicycle routes. Clearing debris along major roads had been identified by survey respondents and the Stakeholder Committee as something that could be done to make cycling more comfortable. Ensuring that roads are cleared of excess gravel in the spring at the end of winter and as weather starts to get better will help to encourage more people to bicycle. The City can work with MoTI to ensure that streets within Quesnel are swept and cleared of debris in a timely manner and on a regular basis.

Action Area 3.2: Address Snow Removal

The City of Quesnel clears snow from residential sidewalks and multi-use pathways within the city after a snow event. Sidewalk snow plowing begins in the outskirts of the downtown core and North Quesnel, then proceeds to the West side of the city. All sidewalks can be cleared within a 12 hour shift. The multi-use pathway network is then cleared the following day provided no additional snow has fallen. As the City currently has limited designated on street bicycle facilities there is currently no guidelines in place to prioritize the clearing of bicycle routes, however as implementation of the Active Transportation Plan occurs this will become a more significant consideration.

Within the downtown core businesses are responsible for snow removal from the sidewalk abutting their property prior to 10:00 am on each business day regardless of their operating hours. The Measure Up Quesnel Strategic Plan provides a number of recommendations for improving all means of transportation for people with a disability, seniors and the general public. Building off of the recommendations for the Measure Up Strategic Plan the following actions are recommended to address active transportation snow removal.

- ▶ Review the City’s existing standards for efficient and timely snow clearing of sidewalks in all areas of town, particularly around power poles, bus stops, and curb access, and allowing adequate space for wheelchairs and power chairs.
- ▶ Consider updating snow clearing guidelines to prioritize routes with designated bicycle facilities as they are installed.
- ▶ Ensure new bicycle routes are designed to facilitate snow removal, snow storage and drainage. One of the best ways to facilitate the removal of snow from bicycle routes is thoughtful roadway and bicycle facility design. Unfortunately, on roadways that include bicycle lanes or shoulder bicycle lanes, they often become the area for snow storage on the roadway. There are several roadway planning and design considerations that can be taken to avoid this situation which are outlined in the Design Guidelines in **Appendix B**.

Action Area 3.3: Provide Accessible Infrastructure

It is important that the walking and cycling environments of Quesnel are accessible and usable by a large cross section of people, including people with disabilities, seniors, and parents with children. It is important that the design of the walking environment includes accessibility features to accommodate the unique needs of these groups, and to provide better pedestrian circulation for everyone. It is a recommendation of the Active Transportation Plan that the City continue to recognize and work towards the accessibility goals outlined in the Measure Up Quesnel Strategic Plan. The following actions are specific to enhancing network accessibility for all road users.

- ▶ **Work towards providing accessible curb ramps** at all intersections, with special considerations to ensure that curb letdowns are located to provide direct access to the crosswalk.
- ▶ **Consider developing Accessibility Guidelines for walking and cycling facilities.** The guidelines would provide recommendations for features such as accessible pedestrian signals, traffic islands, curb let downs, tactile surfaces and warning strips, and directional guiding strips that can make pedestrian crossings safer and accessible for all.
- ▶ **Continue to ensure that multi-use pathways within Quesnel are accessible.** In general, multi-use pathway access should be designed to restrict access from unauthorized motor vehicles (i.e. motorcycles, all-terrain vehicles). As certain gate designs can be an impediment to safe and convenient trail access for pedestrians, cyclists and mobility-impaired users. Bollards can be a more appropriate option however they can still create obstructions that present a potential safety concern. It is recommended that unless motor vehicle access is a serious issue, avoid placing any obstruction within the multi-use pathway. Multi-use pathways should also be paved where feasible to enhance accessibility.
- ▶ **Work with the Ministry of Transportation and Infrastructure to upgrade all traffic signals in Quesnel to Accessible Pedestrian Signals.** Accessible Pedestrian Signals communicate non-visual information about when it is time to walk or not to walk for visually impaired pedestrians at signalized intersections. There are a number of signalized intersections within Quesnel that have Accessible Pedestrian Signals including the intersections along Front Street at Carson Avenue, St Laurent Avenue, Shepard Avenue and McNaughton Avenue. An inventory of the signalized intersections and recommendations for accessible upgrades can be found in **Table 1**.

- ▶ **Work to install pedestrian countdown timers at warranted locations within the city.** Pedestrian Countdown Timers provide information to pedestrians about how much time they have to cross an intersection. As seen in **Table 1**, there are two signalized intersection in Quesnel that do not have countdown timers.
- ▶ **Review pedestrian clearance intervals** with MoTI to ensure that the time required for a person to walk across the intersection is long enough to avoid conflicting with traffic before the signal changes. Special considerations should be made at intersections located along routes to schools, medical centres, senior housing and other important community destinations (**Table 1**).

Table 1: Existing Signalized Intersection Recommended Upgrades

Intersection	Pedestrian Activated	Install Countdown Timers	Install Accessible Signal (Audible)	Review Signal Timing - Pedestrian Clearance Interval
Anderson Drive and Abbott Drive	Existing	Recommended	Recommended	NA
Marsh Drive and Baker Drive	Existing	Recommended	Recommended	NA
Reid Street and Carson Avenue	Existing	Existing	Recommended	NS Direction
Front Street and Carson Avenue	Existing	Existing	Existing	WB Direction
Front Street and St Laurent Avenue	Existing	Existing	Existing	-
Front Street and Shepard Avenue	Existing	Existing	Existing	NS Direction
Front Street and McNaughton Avenue	Existing	Existing	Existing	NS Direction
Carson Avenue and Kinchant Street	Existing	Existing	Recommended	-
Carson Avenue and Moffat Bridge Approach	Existing	Existing	Recommended	-
Highway 97 and Cedar Avenue	Existing	Existing	Recommended	NB & EB Direction
Highway 97 and Maple	Existing	Existing	Recommended	-
Highway 97 and Quesnel-Hixon Road	Existing	Existing	Recommended	-
Highway 97 and Rome Avenue	Existing	Existing	Recommended	-

Maintenance and Accessibility: Summary of Actions

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

- ▶ Continue to inspect sidewalks and pathways regularly to ensure they are well maintained.
- ▶ Consider the adoption of a Sidewalk Maintenance Policy.
- ▶ Review the City’s standards for the timely removal of debris such as gravel and sand on paved shoulders and future designated bicycle routes.
- ▶ Review existing standards for efficient and timely snow clearing of sidewalks, multi-use pathways and bicycle routes.
- ▶ Ensure new bicycle routes are designed to facilitate snow removal, snow storage and drainage.

- ▶ Provide accessible curb ramps at all intersections.
- ▶ Consider developing Accessibility Guidelines for walking and cycling facilities.
- ▶ Continue to ensure that multi-use pathways within Quesnel are accessible.
- ▶ Work with the Ministry of Transportation and Infrastructure to upgrade all traffic signals in Quesnel to Accessible Pedestrian Signals.
- ▶ Work towards installing pedestrian countdown timers at warranted locations within the city.
- ▶ Review pedestrian clearance intervals to ensure that the time required for a person to walk across the intersection is long enough to avoid conflicting with traffic before the signal changes.



ACTION AREA 4: AMENITIES

For walking and cycling to become attractive and competitive transportation choices, they first need to be as convenient and comfortable as possible. Networks and infrastructure can go a long way in ensuring that walking, cycling and other forms of active transportation are convenient options. In addition to building infrastructure, it is also important to provide supportive facilities that make walking, cycling and other forms of active transportation more viable transportation options.

Features that can increase the ease and appeal of active transportation include secure and convenient bicycle parking, end-of-trip facilities, pedestrian amenities at bus stops and streetscape enhancements. In addition, ensuring seamless connections between public transit and pedestrian and cycling networks can extend the reach of transit trips and increase the ease and appeal of walking and cycling to get around Quesnel. Three sub-actions have been developed to enhance and provide active transportation **Amenities** to make walking and cycling more convenient and comfortable ways to travel, each of which is detailed below.

Action Area 4.1: Provide Bicycle Parking and Other End of Trip Facilities

Having safe and secure bicycle parking is critical, as most trips by bicycle require a place to park when the rider reaches their destination. At its most basic, this means locking a bike to something within the street right of way. The fear of theft or vandalism is a significant barrier to biking regardless of the cost of an individual's bicycle. There are many different types of bicycle parking, which can be suitable in different situations depending on the duration of the stay. As a result, providing safe and secure bicycle parking at key locations in Quesnel is important for facilitating cycling.

- ▶ **Short Term Bicycle Parking** typically consists of bicycle racks distributed in the public right-of-way in commercial areas and at key destinations throughout the city. Short-term bicycle parking can take a variety of forms, such as a Post-and-Ring Rack or Inverted 'U' Rack. Bicycle racks are generally oriented to residents and visitors, who may stop in the area for shopping or other personal business, and should be located as close to destinations as possible in convenient locations and highly visible for users. It is desirable to provide a limited number of covered bicycle racks to provide protection from the elements.
- ▶ **Long Term Bicycle Parking** is more secure than typical bicycle racks. It may include bicycle lockers, which can be rented by individuals, or larger secure facilities, such as bicycle rooms, bicycle cages, secure bicycle parking areas, or full service bicycle stations. While their main feature is indoor bicycle parking, bicycle stations integrate multiple services within their structure and are typically not exposed to the weather. Long-term parking is generally oriented to cyclists needing to park a bicycle for an entire day or longer. Major employment areas, transit stations and areas with high cycling activity are ideally suited to long-term parking facilities, and they can also be required in private developments.
- ▶ **Other end-of-trip facilities** such as changing rooms, showers and storage space for equipment can also help to make cycling more convenient. This is particularly important in winter cities as more gear may be required at certain times of year and having a place to store it has a significant impact on convenience.

Examples of different types of bicycle parking



The City can consider developing requirements for short-term and long-term bicycle parking and other end-of-trip facilities for new developments. The City of Quesnel notes the importance of providing bicycle parking facilities in its OCP but does not provide specific requirements for developments. The City's Downtown Development Permit Guidelines require considerations for bicycle parking. As seen in other municipalities, requirements for bicycle parking can be based on a number of different considerations including, the number of square metres of gross floor area devoted to commercial use or residential use, the number of employees, or the number of building units. It is a recommendation of the Active Transportation Plan that the City should consider updating their Zoning Bylaw to provide bicycle parking requirements for new developments in Quesnel. **Appendix C** of this documents provides a snapshot of Bylaws within North America that require bicycle parking through the development process.

The City can work with the Quesnel Downtown Association, business, the School District to implement short-term bicycle parking and other end-of-trip facilities at various locations within the City and within public space, where appropriate. Partnerships can play a critical role in helping to make cycling more convenient. It is important that incentives be put in place to encourage existing businesses to provide bicycle parking and end-of-trip facilities within public spaces in front of their businesses. It is important to ensure however, that these bicycle facilities are not obstructing the movement of people walking or using mobility aids. Additional and/or improved bicycle parking is recommended in key areas of Quesnel including:

- ▶ **Key commercial areas** including downtown Quesnel, businesses along Highway 97 and the various malls throughout the City. The City currently has Development Permit Guidelines for downtown that requires the consideration of bicycle parking.
- ▶ **Schools** including elementary and secondary schools
- ▶ **G.R. Baker Memorial Hospital**
- ▶ **Parks**, including City, Community and neighbourhood parks within Quesnel. In particular priority should be placed on parks that are located on planned and future bicycle routes such as, Lebourdais Park, West Fraser Timber Park and Sugar Loaf Park to name a few.
- ▶ **Recreation Centers** including the current arenas, the new Multi-Centre as well the Indoor Sports Centre

The City may also want to consider a Bike Rack Sponsorship Program similar to one that has been established in Williams Lake, BC. This program invites individuals, businesses, service clubs and other organizations to sponsor a bike rack in the City. The City can then work with sponsors to determine the best placement and location of the parking facility within the City.

The City of Quesnel should demonstrate leadership and ensure adequate bicycle parking is provided at all City of Quesnel owned and operated facilities. Installing and improving existing bicycle parking and end-of-trip facilities at City owned and operated buildings can help send a message to residents and businesses that the City supports cycling as a means of transportation. Continuing these investments can benefit employees, residents and visitors by providing better access to facilities within the city. This can include the provision of short-term facilities at locations and buildings that see a lot of visitor activity and longer-term bicycle parking and other end of trip facilities should be considered at locations where there are high concentrations of employees.

Action Area 4.2: Integrate with Transit

Improving access and connections to transit for people walking and cycling increases multi-modal transportation choices and helps to extend the reach of public transit. Integrating transit with active transportation can encompass a variety of infrastructure treatments and amenities, such as providing accessible bus stops, the provision of shelters, benches, lighting, and transit schedule information. Ensuring that snow is cleared quickly along sidewalks and streets with bus routes is also important in winter months.

It is recommended that the City of Quesnel work with BC Transit to inventory existing bus stops and identify priorities for shelters, amenities and accessibility upgrades, striving for 100% bus stops to be accessible and shelters and amenities are provided at stops with high rates of boarding.

Action Area 4.3: Public Amenities and Streetscapes

The City should continue to support incorporating streetscape amenities within the public realm that enable comfort, convenience and enjoyment of public spaces where appropriate space is available. This recommendation builds off of directions outlined in some of the City's other plans and policies including the City's Downtown Development Plan. Some of the ways in which the City can encourage walking and cycling through design include:

- ▶ Mixed used developments with street-oriented retail uses;
- ▶ Street-oriented developments with minimal building setbacks and parking lots located at the rear of buildings to create a more interesting streetscape;
- ▶ Enhanced sidewalk width on commercial streets such as Reid Street to improve pedestrian comfort;
- ▶ Landscaping, including a boulevard between the curb and the pathway;
- ▶ Pedestrian amenities, such as benches and water fountains, and garbage cans;
- ▶ Street trees;
- ▶ Street level lighting;

- ▶ Public art and interpretive signage; and
- ▶ Alternative stormwater management techniques, such as rain gardens.

Amenities: Summary of Actions

The Actions that have been developed to provide more active transportation **Amenities** are summarized below:

- ▶ Develop requirements for short-term and long-term bicycle parking and other end-of-trip facilities for new developments.
- ▶ The City can work with the Quesnel Downtown Association, business, the School District to implement short-term bicycle parking and other end-of-trip facilities at various locations within the City and within public space, where appropriate.
- ▶ The City of Quesnel should demonstrate leadership and ensure adequate bicycle parking is provided at all City of Quesnel owned and operated facilities
- ▶ Work with BC Transit to inventory the existing bus stops and identify priorities for shelters and accessibility upgrades
- ▶ Continue to support the installation of public amenities such as planters, patios, benches, and public art where appropriate, particularly in the city's downtown along commercial streets



ACTION AREA 5: EDUCATION AND AWARENESS

Although “hard” measures such as walking and cycling facilities are critical to encouraging walking and cycling, a range of “soft” support measures are also recommended to encourage people to walk and cycle in Quesnel. These “soft” measures provide awareness and information about active transportation. Education and encouragement initiatives can include providing information to the public on the benefits of active transportation, information on local walking and cycling routes (such as trail maps), and programs that teach skills and awareness around road safety, walking, and cycling. Education and encouragement initiatives are important and cost-effective measures to enable residents to feel more safe and comfortable walking and cycling throughout Quesnel. Four sub-actions have been developed to support **Education and Awareness** of active transportation, each of which is summarized below.

Action Area 5.1: Walking and Cycling Education

While improving infrastructure can make cycling and walking safer and more attractive, it is also important to ensure that residents have the skills, information, confidence and support they need to walk and cycle more in Quesnel. There are a number of education and awareness programs and initiatives that the City can develop and support with its partners. This can include partnerships with agencies and organizations such as ICBC (i.e. road safety campaigns), RCMP, School District #28, Northern Health, and local groups and businesses to deliver ‘share the road’ and road safety campaigns, promote bike/walk to work week, road cycling skills workshops, and walking safety seminars. Educational information around walking and cycling can be delivered through a variety of formats, including an online walking and cycling webpage on the City of Quesnel website, promotional safety brochures, radio/television commercials, skills training sessions / workshops, and in-school classes.



Action Area 5.2: Safe Routes to School

Safe Routes to School is a term used to describe an international movement to improve children’s safety as they walk and bicycle to school. The initiative is built on five program elements, called the “5 E’s” of safe routes to school: engineering, education, encouragement, enforcement, and evaluation. Promotion of the Safe Routes to School program is an important initiative to support pedestrian and cyclist safety in Quesnel and it is recommended that this initiative be led by the schools in Quesnel and the School District #28, with support from the City. Safe routes to school programming can include incorporating walking and safety as part of the school curriculum, in-school bicycle skills training, promotion/competitions for Walk / Bike to School week, and participation in International Walking Day (iWalk).

Action Area 5.3: Wayfinding

A seamless, consistent and easy-to-understand city-wide system of wayfinding, signage and trip planning tools for both walking and is important to make the local network easier to navigate. The City of Quesnel has a variety of wayfinding, signage currently in place particularly in the city’s downtown core. Wayfinding should be simple, easy to read, intuitive,

and provide pedestrians and cyclists with a level of confidence that they are travelling the most efficient and accessible route.

As the City works to providing more walking and cycling facilities throughout the city it should consider developing and implementing a wayfinding program and guidelines. This can include a plan for the installation of wayfinding throughout the City as well as agreed-upon protocols for route naming and identification of destinations, consistent design and application of route markings and cycling signage. The guidelines should provide information on all wayfinding signs available, including decision, confirmation, and turn signs.

Action Area 5.4: Community Events

The City of Quesnel can host events that bring awareness to walking and cycling in the city. Some of the support programs can include, working with partners to organize a winter cycling event, street closures for special events or markets, Bike to Work Day/Week, Walk to Work Day/Week, International Walk to School Day, and other events that encourage walking and cycling and increase momentum for active transportation.

Education and Awareness: Summary of Actions

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

- ▶ Develop and support active transportation education and awareness programs and initiatives within the City
- ▶ Promote and support a Safe Routes to School program within the City
- ▶ Develop and implement a wayfinding program and guidelines for pedestrians and cycling
- ▶ The City of Quesnel can host events that bring awareness to walking and cycling in the city



Section 5.0
PLAN IMPLEMENTATION



The City of Quesnel Active Transportation Plan provides the long-term actions including projects and policy directions to enhance and encourage walking and cycling within the city. Recognizing that the long-term vision will require significant investment, an implementation strategy is required to prioritize improvements and identify priority projects. This section presents the next steps of the Plan in terms of project implementation, phasing as well as funding options.

5.1 Implementation Priorities

The City of Quesnel Active Transportation Plan groups pedestrian and cycling improvements into the five key action areas of Connections, Safety and Security, Maintenance and Accessibility, Amenities, and Education and Awareness. The most significant capital contribution is associated with the first Action Area, **Connections**. It is important that the implementation of the Active Transportation Plan corresponds with and can be incorporated into the City’s Capital Re-Investment Program Quesnel Works. Conceptual capital costs for the actions outlined in the Plan were developed based on the unit cost assumptions summarized in **Table 2** below, which do not include any detailed engineering.

Table 2: Unit Capital Cost Assumptions

Facility Type	Unit Rate
Proposed Quiet Street Bikeway	\$ 20,000 per/km
Proposed Bicycle Lane	\$ 65,000 per/km
Proposed Paved Multi-Use Pathway	\$ 600,000 per/km
Proposed Shared Use Lane	\$ 20,000 per/km
Proposed Quiet Street Bikeway	\$ 20,000 per/km
Sidewalk w/ curb and gutter (incl. base & sub-base)	\$ 300 per/metre
Sidewalk (incl. base & sub-base)	\$ 150 per/metre
Signage	\$ 500 each
Stencil	\$ 350 each
Crosswalk	\$ 4,000 each
Curb Letdown	\$ 1200 each
Concrete Roadside Barrier	\$ 200 each
Lighting	\$ 300 per linear metre

Based on these unit costs, **Table 3** below outlines the projects identified in the Active Transportation Plan that the City of Quesnel, MoTI and other partner organizations can pursue in the short to long-term. Capital cost estimates provided in **Table 3** are for planning purposes only and should not be used for detailed budgeting. There are also a number of other projects that have been identified as part of other city-wide plans and required work, as a result the cost estimates for these projects has not been included.

In general, short term priority projects are mainly identified as less infrastructure intensive projects, such as small-scale intersection improvements, quiet streets, or short multi-use pathway extensions.

As described in the following **Section 5.2**, there are a variety of funding options that can be pursued to allow some of this cost to be shared with other agencies and organizations.

Table 3: Quesnel Active Transportation Plan – Implementation and Phasing

Description	Unit Cost	Responsibility			Priority			Capital Cost Estimate
		City of Quesnel	MOTI	Other*	Short (1 to 5 years)	Medium (5 to 10 years)	Long (10+ years)	
Action Area 1 - Connections								
Portion of McLean Street (Bowron to Shepherd Avenue) - New sidewalk	\$ 300	✓					✓	\$ 120,000
Shepherd Avenue (Reid Street and Kinchant Street) - New sidewalk	\$ 300	✓				✓		\$ 50,000
Callanan Street (Quesnel Junior High School) - New sidewalk	\$ 300	✓				✓		\$ 60,000
St Laurent Avenue (Jones Street and Wilson Street) - New sidewalk	\$ 300	✓					✓	\$ 20,000
Graham Avenue (Carson Elementary School) - New sidewalk	\$ 300	✓				✓		\$ 30,000
Pave the portion of the pathway that travels along Sugarloaf Park	\$ 600,000	✓				✓		\$ 230,000
Multi-Use Pathway north side of Marsh Drive	\$ 600,000	✓					✓	\$ 240,000
Moffat Avenue Quiet Street (Johnston Ave S to Johnston Ave N)	\$ 20,000	✓				✓		\$ 30,000
Rolph Street / West Riverside Quiet Street	\$ 20,000	✓				✓		\$ 30,000
Nadeau Street Quiet Street	\$ 20,000	✓					✓	\$ 30,000
Adam/Allard/Bettcher Street / Larck Avenue Quiet Street	\$ 20,000	✓				✓		\$ 40,000
Pentland Crscent / Pierce Crescent Quiet Street	\$ 20,000	✓					✓	\$ 20,000
Kinchant Street Quiet Street (Bowron Avenue - North)	\$ 20,000	✓					✓	\$ 10,000
Reid Street / McNaughton Avenue Shared Use Lane	\$ 20,000	✓				✓		\$ 10,000
Barlow Avnenu / Kinchant Street Shared Use Lane	\$ 20,000	✓				✓		\$ 10,000
Vaughan Street Shared Use Lane (Shephard Avenue to Barlow Avenue)	\$ 20,000	✓				✓		\$ 10,000
Shepard Avenue Shared Use Lane (Trail to Reid Street)	\$ 20,000	✓				✓		\$ 20,000
Flamingo Street Shared Use Lane (Lark Avenue to Pentland Crescent)	\$ 20,000	✓					✓	\$ 10,000
Johnston Street / North Star Road Shared Use Plane	\$ 20,000	✓				✓		\$ 30,000
Anderson Drive Bicycle Lane (Doherty to Proposed Multi-Use Pathway)	\$ 65,000	✓					✓	\$ 80,000
Doherty Drive Bicycle Lane (Anderson Drive to Wilkinson Street)	\$ 65,000	✓				✓		\$ 20,000
Carson Street Bicycle Lane (Kinchant Street to Front Street)	\$ 65,000	✓					✓	\$ 20,000
Davie Street Bicycle Lane	\$ 65,000	✓				✓		\$ 10,000
Chew Road/Rita Road Bicycle Lane	\$ 65,000	✓					✓	\$ 100,000
Provide a pathway to enhance the connection between Anderson Drive and Rolph Street and provide access to the indoor soccer fields.	\$ 600,000	✓			✓			\$ 180,000
Connect the existing multi-use pathway with Barlow Avenue parallel to Gary Avenue	\$ 600,000	✓			✓			\$ 70,000
Two Mile Flat active transportation corridor / St Ann's pathway	\$ 600,000	✓					✓	Alignment Unknown
Quesnel Hydraulic Road to Highway 97 pathway connection	\$ 600,000	✓					✓	Alignment Unknown
Reid Street between Shepherd Avenue and Carson Avenue - Enhanced Sidewalk	\$ 250	✓				✓		See Downtown Development Plan
Barlow Avenue – Reid Street to Vaughan Street - Enhanced Sidewalk	\$ 250	✓					✓	See Downtown Development Plan
Enhance the pathway that connects Anderson Drive and Doherty Drive	\$ 600,000	✓			✓			Part of Previously Approved Project

Description	Unit Cost	Responsibility			Priority			Capital Cost Estimate
		City of Quesnel	MOTI	Other*	Short (1 to 5 years)	Medium (5 to 10 years)	Long (10+ years)	
Westland Road Paved Shoulder	\$ 250,000	✓					✓	See Capital Reinvestment Plan
Coach Road Paved Shoulder	\$ 250,000	✓			✓			See Capital Reinvestment Plan
Galvin Road Paved Shoulder	\$ 250,000	✓			✓			See Capital Reinvestment Plan
South Phillips Road Paved Shoulder	\$ 250,000	✓			✓			See Capital Reinvestment Plan
Neighbour Road Paved Shoulder	\$ 250,000	✓			✓			See Capital Reinvestment Plan
Thompson Road Paved Shoulder	\$ 250,000	✓			✓			See Capital Reinvestment Plan
Sanderson Road Paved Shoulder	\$ 250,000	✓			✓			See Capital Reinvestment Plan
Action Area 2 - Safety and Security								
Johnston Street Bridge Deck		✓			✓			TBD - Pending completion of grant application
Davie Street Railway Overpass (North Side)		✓				✓		\$ 30,000
Davie Street Railway Overpass (South Side)		✓				✓		\$ 5,000
Johnston Street Access (South Side)		✓					✓	\$ 30,000
Highway 97 (Front Street) and McNaughton Avenue		✓	✓		✓			Futher discussion with MoTI
Highway 97 (Front Street) and Carson Avenue		✓	✓		✓			Futher discussion with MoTI
Multi-Use Pathway Crossing at Nadeau Street		✓						\$ 20,000
Quesnel River Bridge Access (East Side)		✓	✓		✓			Futher discussion with MoTI
Provide lighting along pathways, walking and bicycle routes where appropriate.		✓				Ongoing		\$300/linear metre
The City should consider CPTED design principles when designing and implementing new or enhancing existing active transportation facilities		✓				Ongoing		Operations and Programing
Action Area 3 - Maintenance and Accessibility								
Continue to inspect sidewalks and pathways regularly to ensure they are well maintained		✓				Ongoing		Operations and Programing
Consider the adoption of a Sidewalk Maintenance Policy.		✓			✓			Operations and Programing
Review the City's standards for the timely removal of debris such as gravel and sand on paved shoulders and future designated bicycle routes.		✓	✓		✓			Operations and Programing
Review existing standards for efficient and timely snow clearing of sidewalks and multi-use pathways and bicycle routes		✓			✓			Operations and Programing
Ensure new bicycle routes are designed to facilitate snow removal, snow storage and drainage.		✓				Ongoing		Operations and Programing
Provide accessible curb ramps at all intersections.		✓	✓			Ongoing		Operations and Programing
Consider developing Accessibility Guidelines for walking and cycling facilities.		✓			✓			Operations and Programing
Continue to ensure that multi-use pathways within Quesnel are accessible.		✓				Ongoing		Operations and Programing
Work with the Ministry of Transportation and Infrastructure to upgrade all traffic signals in Quesnel to Accessible Pedestrian Signals.		✓	✓			Ongoing		Operations and Programing

Description	Unit Cost	Responsibility			Priority			Capital Cost Estimate
		City of Quesnel	MOTI	Other*	Short (1 to 5 years)	Medium (5 to 10 years)	Long (10+ years)	
Work with the Ministry of Transportation and Infrastructure to install pedestrian countdown timers at warranted locations within the city.		✓	✓		Ongoing			Operations and Programming
Review pedestrian clearance intervals		✓	✓		Ongoing			Operations and Programming
Action Area 4 - Amenities								
Develop requirements for short-term and long-term bicycle parking and other end-of-trip facilities for new developments.		✓			✓			Operations and Programming
The City can work with the Quesnel Downtown Association, business, the School District to implement more short-term bicycle parking		✓		✓	✓			Operations and Programming
The City of Quesnel should demonstrate leadership and ensure adequate bicycle parking is provided at all City of Quesnel owned and operated facilities		✓			✓			Operations and Programming
Work with BC Transit to inventory the existing bus stops and identify priorities for shelters and accessibility upgrades		✓		✓	Ongoing			Operations and Programming
Continue to support the installation of public amenities		✓		✓	Ongoing			Operations and Programming
Action Area 5 - Education and Awareness								
Develop and support active transportation education and awareness programs and initiatives within the City		✓		✓	✓			Operations and Programming
Promote and support a Safe Routes to School program within the City		✓		✓	✓			Operations and Programming
Develop and implement a wayfinding program and guidelines for pedestrians and cycling		✓				✓		Operations and Programming
The City of Quesnel can host events that bring awareness to walking and cycling in the city		✓		✓	✓			Operations and Programming
* - 'Other' can include BC Transit, School District No. 28, ICBC, RCMP and/or the Private Sector								

5.2 Funding Strategies

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

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

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

- ▶ **Federal Funding.** There are several programs that provide funding for environmental and local transportation infrastructure projects in municipalities across Canada. Typically, the federal government contributes one-third of the cost of municipal infrastructure projects. Provincial and municipal governments contribute the remaining funds, and in some instances, there may be private sector investment as well.
- ▶ **Green Municipal Funds.** The Federation of Canadian Municipalities manages the Green Municipal Fund, with a total allocation of \$550 million. This fund is intended to support municipal government efforts to reduce pollution, reduce greenhouse gas emissions and improve quality of life. The expectation is that knowledge and experience gained in best practices and innovative environmental projects will be applied to national infrastructure projects.
- ▶ **Carbon Tax Rebate.** Each municipality that has signed the Climate Action Charter received an annual rebased based on completion of the CARIP form. The City of Quesnel could choose to direct this funding towards sustainable transportation projects, such as funding bicycle and pedestrian facilities.
- ▶ **ICBC** provides funding for road improvements, including pedestrian and bicycle facilities, particularly where these have the potential to reduce crashes, improve safety, and reduce claims costs to ICBC. Funding is available through ICBC's Road Improvement Program, and other ICBC programs include the Speed Watch Program (through the Community Policing Centres), Speed and Intersection Safety Program, Counter Attack, Operation Red Nose, and Road Sense Speaker Program for Schools.

- ▶ **Developers.** Quesnel should explore opportunities for road improvements to be constructed as development occurs within the City. This process could be formalized through an update to the *Subdivision Development Servicing Bylaw* or through individual negotiations.
- ▶ **Private sector.** Many corporations wish to be good corporate neighbours — to be active in the community and to promote environmentally-beneficial causes. Bicycle and pedestrian facilities are well-suited to corporate sponsorship, and have attracted significant sponsorship both at the local level and throughout North America. Examples in B.C. include Construction Aggregates in Sechelt, which constructed an overpass over a gravel conveyor to provide a link for pedestrians and cyclists, and 7-Eleven and Molson Breweries, which have sponsored multi-use pathways in Metro Vancouver.
- ▶ **Development Cost Charges.** Opportunity to update the DCC bylaw to incorporate active transportation projects that benefit new growth in the community.
- ▶ **Service Clubs.** In many communities, service clubs have been involved in funding and building bicycle facilities including rails with trail and bicycle parking.
- ▶ **Advertising.** If the City is creating a bicycle route map it may want to work with local business who would be interested in providing advertising and therefore revenue to cover some or all of the cost of advertising.

Appendix A: Survey Results

Quesnel Active Transportation Plan

Survey Summary

In December 2015, the City of Quesnel gathered input from residents through an online survey (also available in hardcopy) to help inform the development of the City’s Active Transportation Plan. The survey served as the first opportunity for residents to become involved in improving walking and cycling in Quesnel.

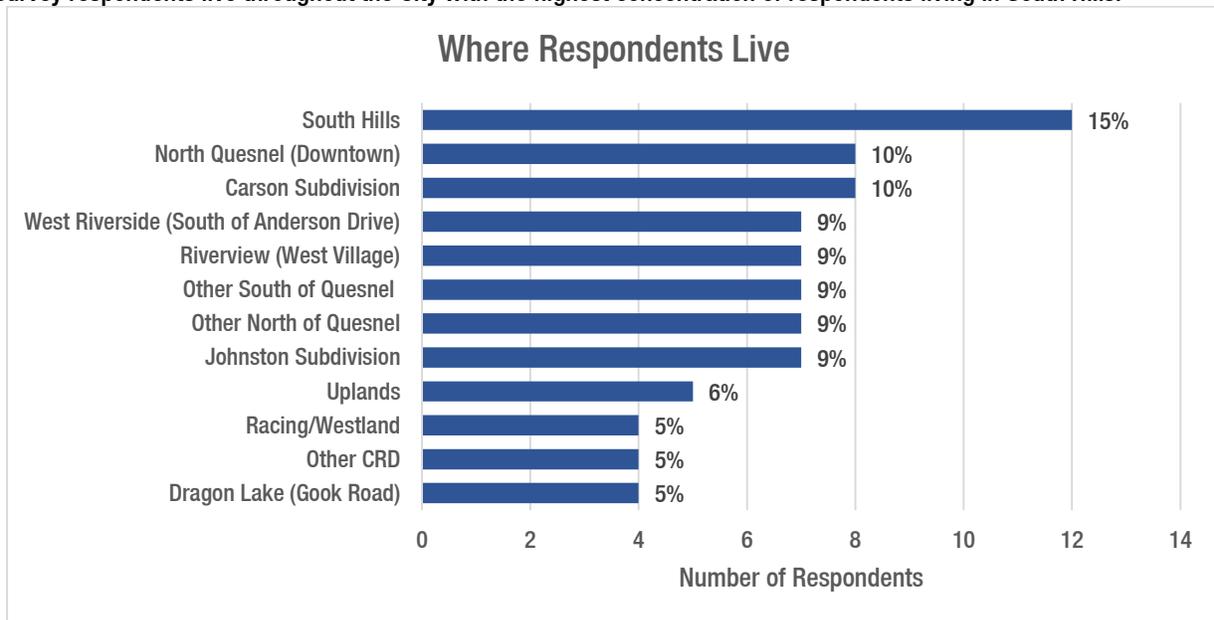
Through the survey, participants provided a snapshot of their walking and cycling habits and feedback on what the City should do to encourage and improve active transportation in Quesnel. The feedback is being used to better understand current walking conditions and help determine where investments should be made in new infrastructure. The survey was filled out by 96 respondents, 62% completed the survey based on their own travel behaviours and 39% provided information for their family. The results of the survey are summarized below.

Who We Heard From

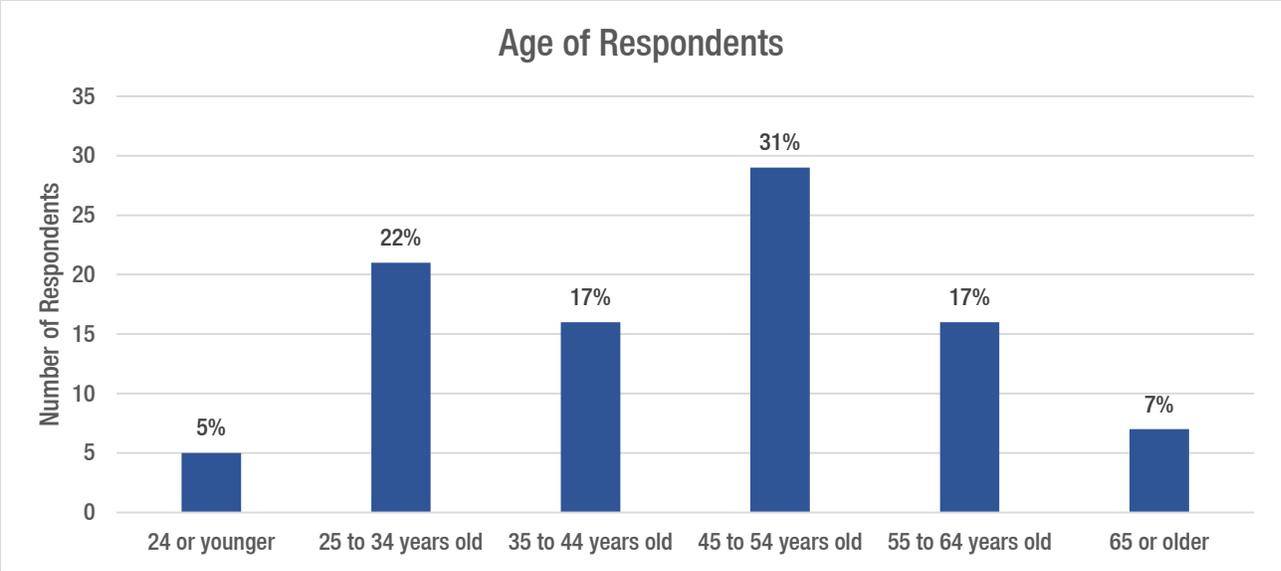
The survey posed a series of a questions to better understand who completed the survey. Most respondents (62 (65%)) identified themselves as a resident of Quesnel. Survey respondents also identified themselves as:

- A resident of the CRD: 37 respondents (38.9%)
- A business owner in Quesnel: 9 respondents (9.5%)
- A business owner in the CRD: 3 respondents (3.2%)
- A student: 5 respondents (5.3%)
- Other: 2 respondents (2.1%)

Survey respondents live throughout the City with the highest concentration of respondents living in South Hills.



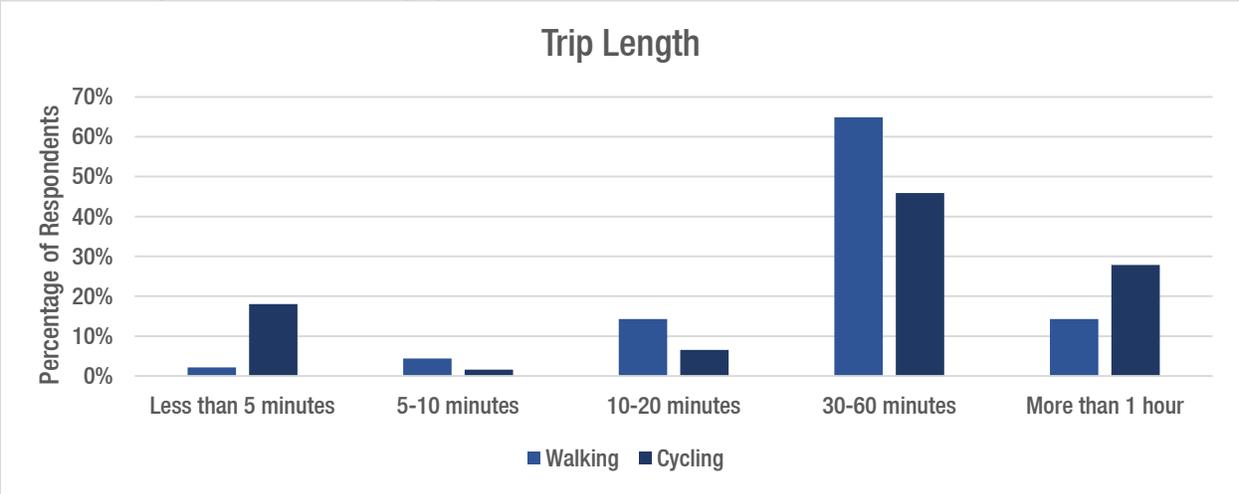
Survey respondents were somewhat evenly distributed between ages 25 and 64. There were slightly more in the 45-54 age group (31%). The survey received the lowest number of responses from those 24 years and younger.

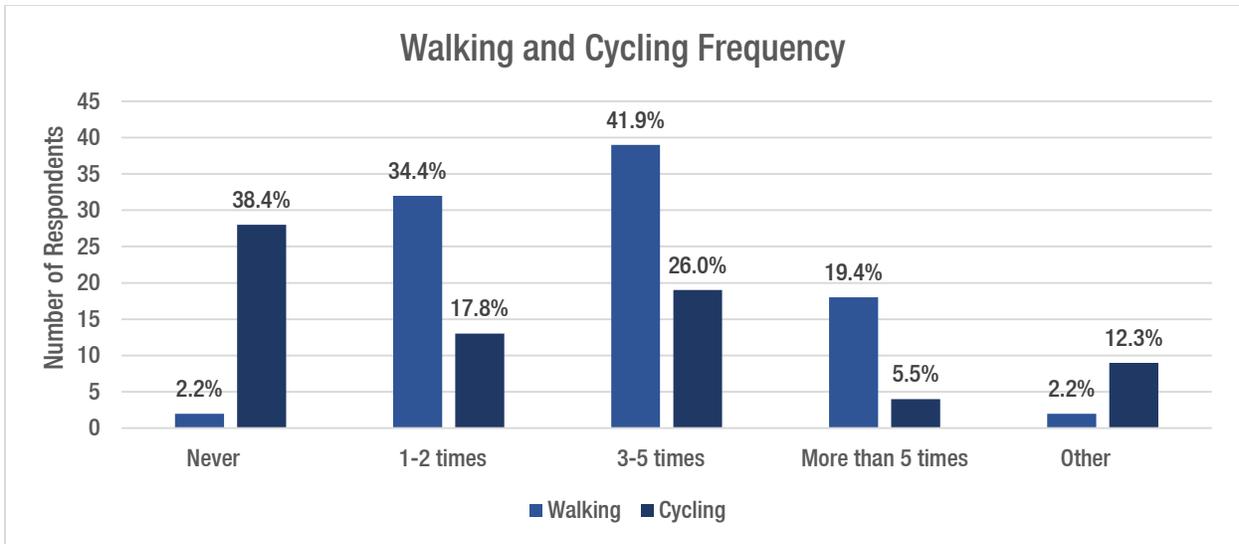


Survey respondents were asked if they considered themselves an active commuter, 47% do consider themselves an active commuter whereas 53% do not.

Walking and Cycling habits

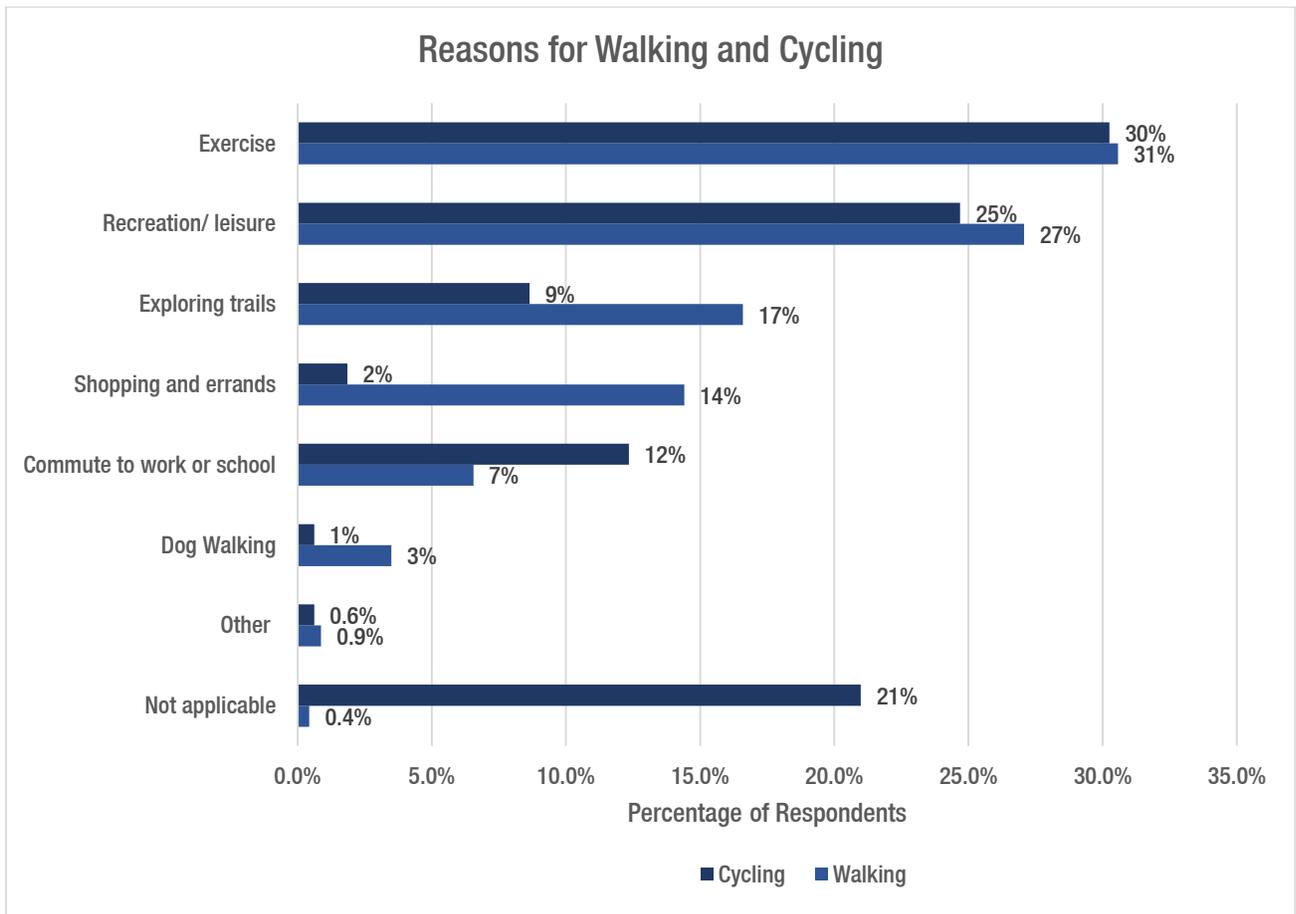
The survey asked respondents to identify their habits related to walking and biking in Quesnel. Two questions asked about trip length and frequency. Most respondents said that they spend about an hour or more on their typical walking or cycling trip. For trip frequency, the most common response for walkers was 3 to 5 times a week. The most common response for cycling was never, followed by 3 to 5 times a week, as shown on the graph below. Most people seem to either walk or cycle between 1 and 5 trips per week.





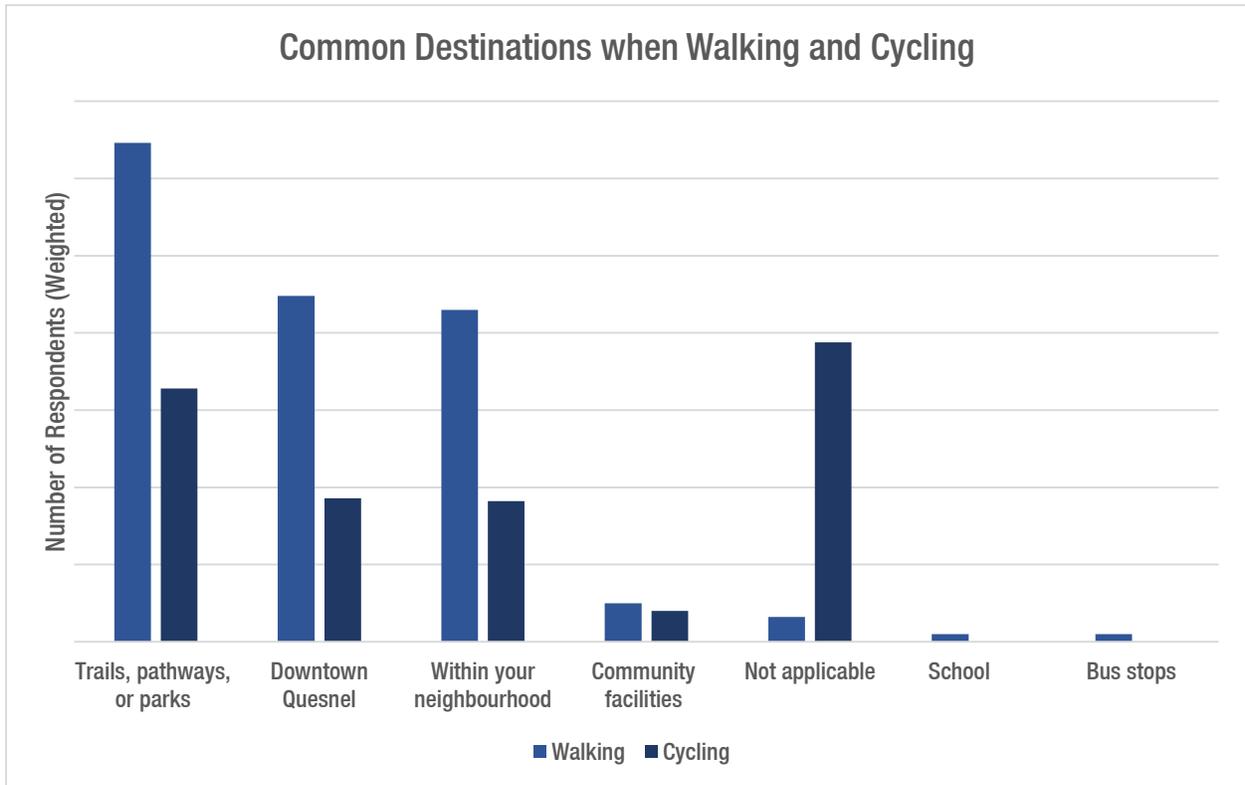
Reasons for walking and cycling

The survey asked respondents to indicate the main purpose of most of their walking and cycling trips. Exercise was found to be the top reason for both walking and cycling in Quesnel, followed by recreation and leisure as shown on the graph below.

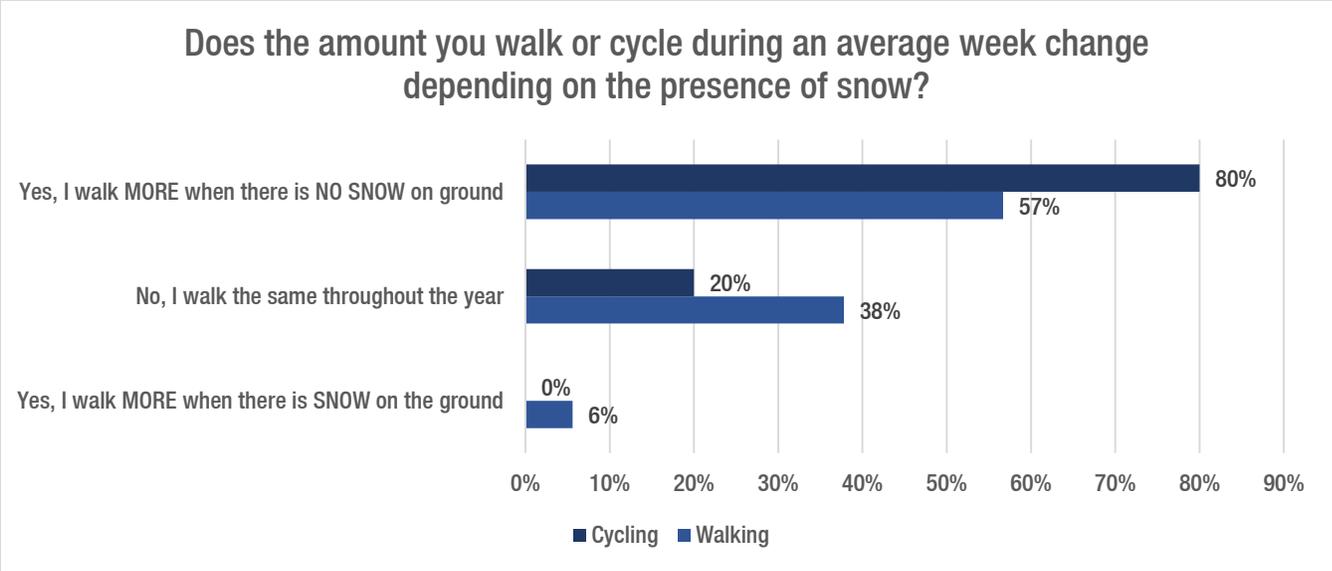


Common destinations when walking and cycling

Respondents were then asked to identify the top three most common destinations they visit when walking and cycling locally. Responses were weighted, so that destinations that were ranked No.1 scored higher than designations ranked No.2 etc. The top three destinations were identified as trails, pathways or parks, downtown Quesnel and within respondents' neighbourhood. The most common destinations are summarized in the chart below (results are weighted).



Respondents were asked how the presence of snow affect their travel plans. The results as displayed on the chart below. Predictably, most people responded that they walk more when there is no snow on the ground. Few people walk more when there is more snow on the ground. For 20% of cyclists and 38% of walkers, the presence of snow does not alter their behaviour.

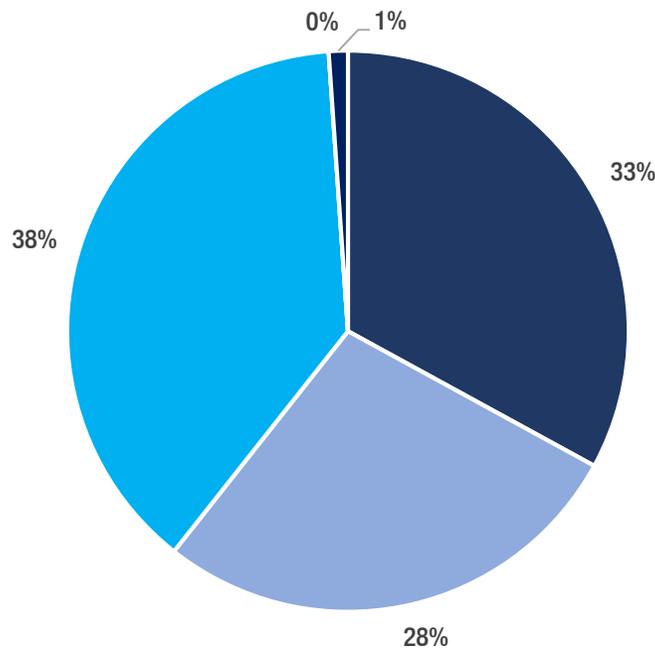


Walking in Quesnel

The survey asked respondents to indicate which aspects they like the most about walking in Quesnel. Respondents indicated that the trail network, scenery, and being social are some of the key features that make Quesnel an enjoyable place to walk, a more detailed list of features can be found in the table below.

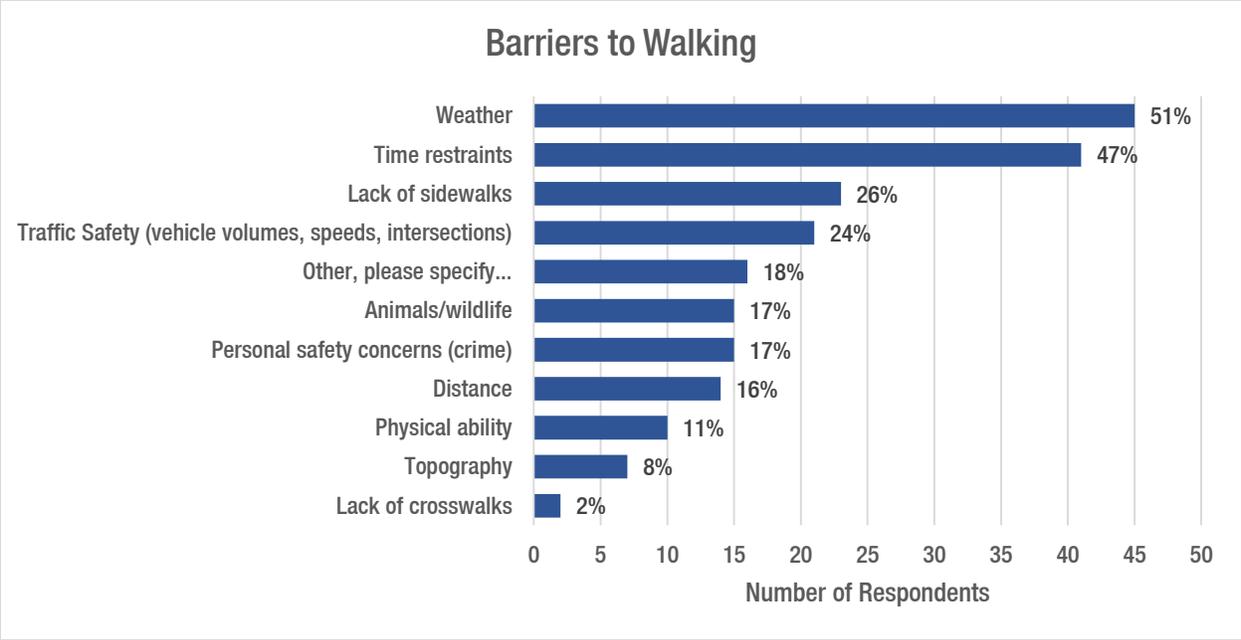
Features that Make Walking Enjoyable:	# of Mentions
Trail Network	29
Scenery / Being Outside	27
Being Social	11
Access to Services / Accessibility	10
Peacefulness	6
Natural Setting / Environment	6
Lighter Traffic Away from Busy Areas	5
Exercise	5
Well Maintained Trails	3
Feeling of Safety	3
Dog Walking	2

Respondents were also asked about their attitudes towards walking. Although the top answer to this question was that people were already walking as much as they wanted to, about half of respondents replied that they would like to walk more than what they currently walk.



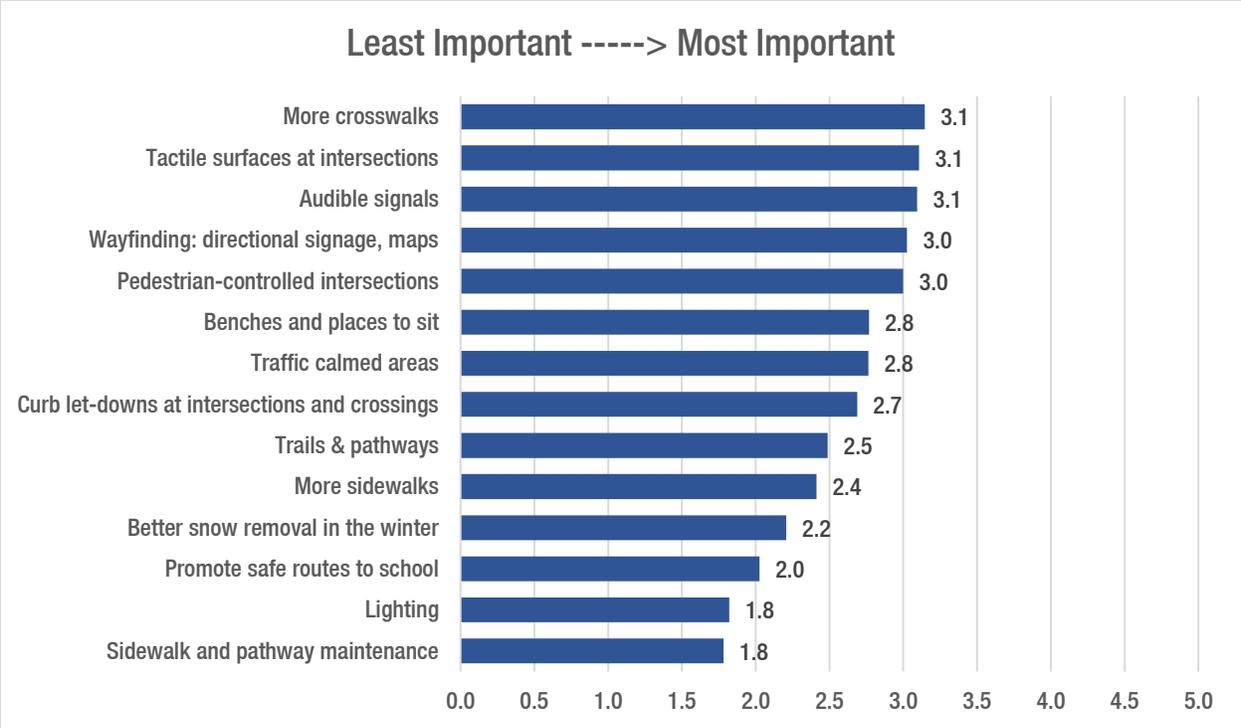
- I walk a lot, but would like to walk more
- I do not walk often, but would like to walk more
- I already walk as often as I want to
- I have no interest whatsoever in walking as a form of transportation
- I don't know

Respondents were also asked what barriers prevent them from walking or walking more frequently in Quesnel. Weather, time restraints, and lack of sidewalks were identified as the top issues for people walking, as well as traffic safety. A number of survey participants identified “other” barriers to walking in Quesnel. Those responses have been categorized into themes and have been included in the table below. Network connectivity including access to different neighbourhoods and bridge crossings, inadequate lighting and the need for more pedestrian infrastructure such as sidewalks and crosswalks were identified as other barriers to walking.



Other Barriers to Walking:	# of Mentions
Connectivity (including bridges and neighbourhoods)	13
Inadequate Lighting	8
More Sidewalks / Crosswalks	8
Personal Safety Concerns	7
Maintenance - Snow Clearing - Sanding -Trail maintenance	6
More Trails	4
Improved Signage	4
Accessibility	2
Steep Grades	2
Traffic Safety	2
Don't Like Walking	2

The survey then asked respondents to rank a list of options for improving the walking environment (1 being the most important and 5 being least important). The input has been weighed on a five point scale with the graph below representing the average ranking for each option. As shown below respondents felt that adding more crosswalks, increasing the amount of tactile surfaces at intersections, and installing audible signals were the most important priorities for the City to focus on to improve the walking environment.

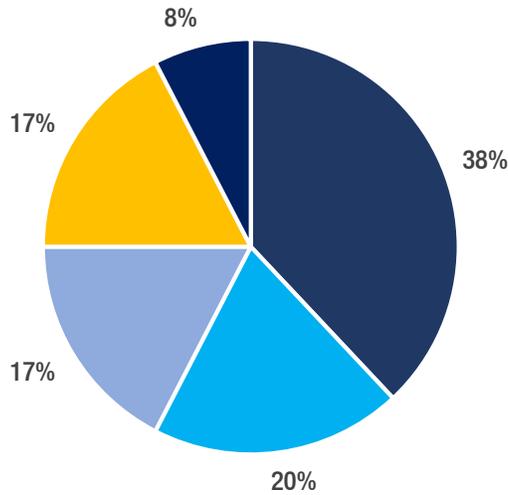


Cycling in Quesnel

The survey asked respondents to indicate what they like the most about cycling in Quesnel. Respondents indicated that the trail/pathway network, scenery, and access to services were key features that make Quesnel an enjoyable place to bicycle, the complete list of features can be found in the table below.

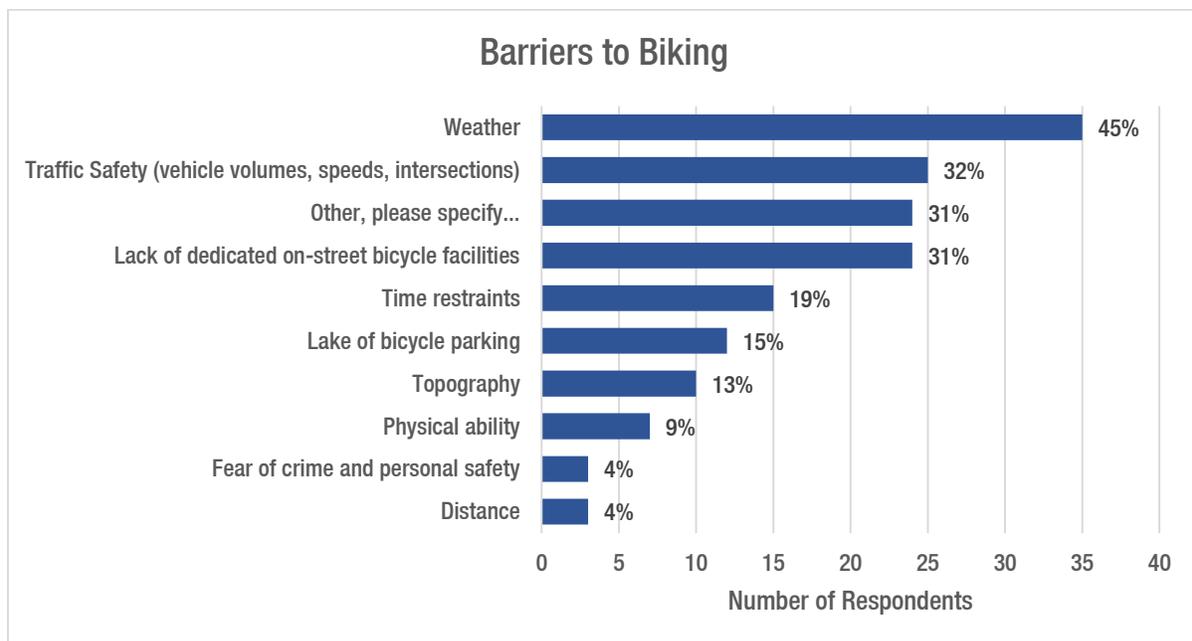
Features that make Biking Enjoyable:	# of Mentions
Trail Network	17
Scenery / Being Outside	7
Access to Services	6
Lighter Traffic Away from Busy Areas	5
Lots of Choices	3
Exercise	2
Terrain	2

People were also asked about their attitudes towards cycling, the answers were more complex than attitudes to walking. The top answers were that people who either ride a lot, or don't ride often would like to ride even more. It was also found that 17% of people had no interest what so ever in cycling, and another 17% rode as much as they wanted to already.



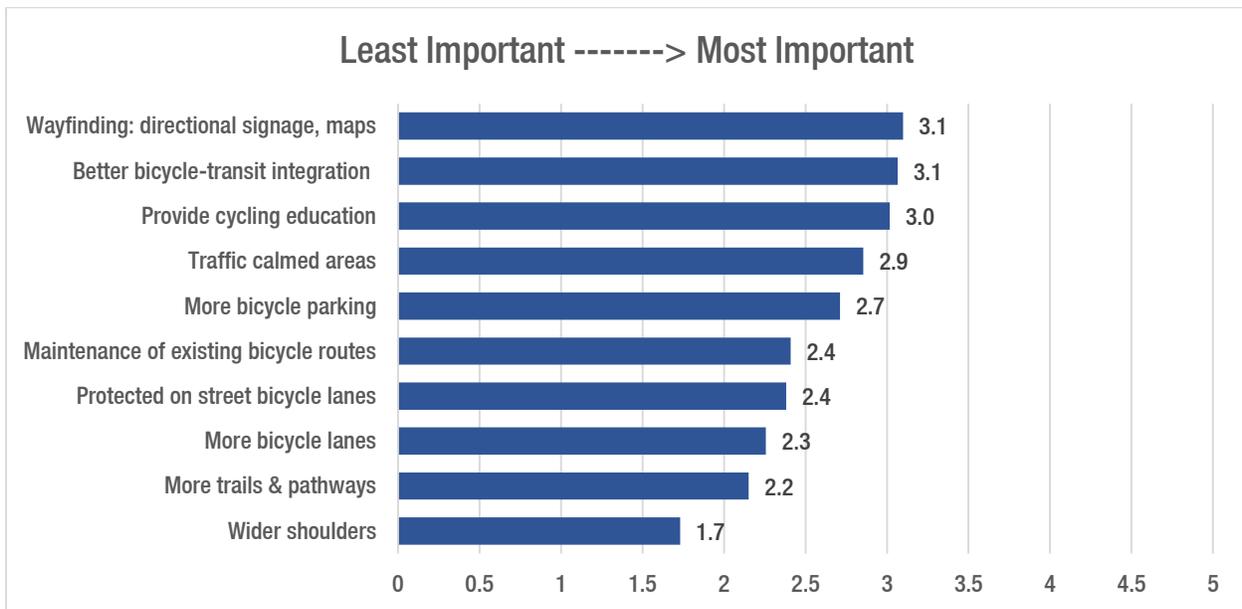
- I do not ride a bike often, but would like to ride more
- I ride a bike a lot, but would like to ride more
- I already ride a bike as often as I want to
- I have no interest whatsoever in riding a bike
- I don't know

Respondents were also asked what barriers prevent them from biking or biking more frequently in Quesnel. Weather, traffic safety, and lack of dedicated on street bicycle facilities were identified as the top issues for cyclists. A number of survey participants identified “other” barriers to biking in Quesnel, the responses they provided have been categorized into themes that are included in the table below.



Other Barriers to Biking:	# of Mentions
Connectivity	8
More dedicated pathways and lanes	8
Not Interested	6
Increased Traffic Safety	5
More driver and cyclist education	4
Don't have a bike	4
Clearing road debris	3
Lack of Personal Knowledge	2

The survey then asked respondents to rank a list of options for improving the cycling environment (1 being the most important and 5 being least important). The input has been weighed on a five point scale with the graph below representing the average ranking for each option. As shown below, respondents consider wayfinding, better bicycle-transit integration, and providing more cycling education as the most important priorities for the City to focus on to improve the cycling environment. Wider shoulders were identified as the least important improvement although they were mentioned repeatedly in more open ended questions.



The final question of the survey asked respondents to identify any specific locations, potential neighbourhood connections or policy issues that couple be improved or created for pedestrians and cyclists. The responses were grouped into themes which are outlined in the table below:

Themes	# of Mentions
New Infrastructure Recommendations	7
Existing Infrastructure Improvements	5
Accessibility Recommendations	2
Lighting and Personal Safety	2
Steep Slopes	2
Traffic Safety	2
Attitudes and Behaviours	1
Expand Trail Network to Accommodate Tourism	1
Maintenance and Snow Removal	1
More promotions and Mapping of trail network	1
Sidewalks	1
Transit Recommendations	1

Some of the key locations that were identified include:

Main connections of concern:

- 2 Mile Flats connection north to employment centers and northern residential and recreation sites.
- Complete the connection to Carson Sub and improve the pedestrian/cycling crossing of the Quesnel River Bridge.

Other points of Concern:

- Front Street highway traffic – Speed and trucks
- Crosswalk below River Rock Pub is hidden to oncoming traffic
- Add crosswalks at half block intervals along Reid St.
- Improve walking and crosswalk connections to Moffat Bridge
- Personal safety concerns around river front pedestrian bridge (harassment)

General themes and survey findings:

- **Highway Truck Traffic:** Large vehicles moving along the highway through town create a dangerous walking and cycling environment. Truck traffic often moves too fast and vehicles take up lots of room which leaves little space for cyclists.
- **Lack of sidewalks and rural shoulders** make for a fragmented walking network and an unpleasant walking experience. Places identified where walking infrastructure was lacking or unsafe included South Hills and other areas. Shoulders along highways were said to be either missing in many parts or too cluttered with debris to be useable
- **Insufficient lighting** in areas along the River Walk, such as the dyke trails and sidewalks was a concern for many, as respondents feel unsafe walking in the evening where visibility is limited; and
- **Unsafe crossings or lack of crossings**, throughout the city were cited as a concern for many respondents. Unsafe crossings and connections around bridges was a common concern.

Based on feedback from the survey and public consultation activities, residents indicated that walking in Quesnel could be improved by providing the following:

- **More sidewalks**, or shoulder facilities in rural areas, to allow for safer separation between cars and pedestrians;
- **More off-street pathways** and **shortcuts** that address the missing pathway links;
- **Improved lighting** on pathways, as well as landscaping treatments to improve visibility and safety after dark; and **Accessibility considerations**, such as curb let-downs and gentler grades on hills.

Appendix B: Bicycle Facility Design Guidelines

The purpose of this section is to provide the City of Quesnel with design guidelines for both on street and off street bicycle facilities including:

- ▶ Multi-Use Pathways
- ▶ Conventional Bicycle Lanes (including buffered bicycle lanes)
- ▶ Quiet Street Bikeways
- ▶ Shared Use Lanes
- ▶ Paved Shoulders

For each type of facility type a definition of the facility is provide along with examples of design guidelines from existing North American manuals. The manuals reviewed include:

- ▶ Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads
- ▶ American Association of State Highway Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities
- ▶ Ontario Traffic Manual (OTM) Book 18
- ▶ Vélo Quebec Planning and Design for Pedestrians and Cyclists
- ▶ Cycling Embassy for Denmark
- ▶ CROW manual
- ▶ NACTO Urban Bikeway Design Guide

Based on a review of these manuals recommendations for the City of Quesnel were provided for each facility type.

1.0 Multi-Use Pathways

Multi-Use Pathways are physically separated from motor vehicles. In some cases, pedestrians, cyclists and other users may share the same travel space, where in other cases, these users may be separated.

- ▶ **Width** - There are a number of North American manuals that provide recommendations for off-street pathways, including both bicycle only and multi-use pathways. Four in particular provide guidelines for the width of off street multi-use pathways. **Table E-1** below outlines the minimum and desired widths for off street pathways as identified in these manuals.

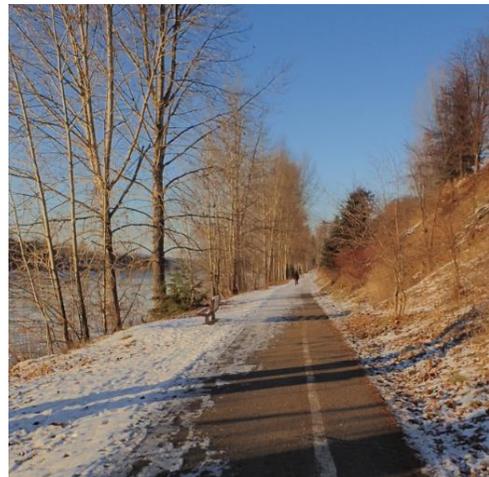


Table E-1: North American Guidelines Off-Street Pathways

Manual	Multi-Use	Bicycle Only
TAC	- One-way - 2.0 m – 3.0 m - Two-way - 3.0 m - 4.0 m	- One-way – 1.5 m – 2.0 m - Two-way – 2.5 m – 3.5 m
AASHTO	- Two-way – 3.0 m – 4.3 m	- N/A
OTM Book 18	- Two-way - 3.0 m - 4.0 m	- One-way – 1.8 m – 2.0 m - Two-way – 3.0 m – 4.0 m
Vélo Quebec	- Two-way - 3.0 m - 4.0 m	- One-way – 1.5 m – 2.0 m - Two-way – 3.0 m – 4.0 m

Based on these guidelines, **Table E-2** outlines guidelines for the width of off street pathways in the City of Quesnel.

Table E-2: City of Quesnel Guidelines – Off-Street Pathway

Design Feature	Minimum (m)	Desired (m)
Off-Street Bicycle-Only Path, One-Way	1.5 m	2.0 m
Off-Street Bicycle-Only Path, Two-Way	3.0 m	4.0 m
Off-Street Multi-Use Path, Two-Way	3.0 m	4.0 m
Buffer separating pedestrians and bicycles (if applicable)	0.5 m	1.0 m

- ▶ **Separating Bicycles and Pedestrians** - Many of the existing guidelines state that when the volume of bicycles and/or pedestrians is high, and when existing facilities are already between the desired 3.0 metres – 4.0 metres in width, then separating bike riders and people walking is recommended. However, few documents provide guidance on specific thresholds at which pathways should be wider and/or pedestrian and cyclists should be separated.

When designing new facilities where existing volumes are not known, then it is important to look at the existing bicycle network volumes, and how the proposed route fits within the network. Based on existing counts (if available), it may be possible to estimate potential volumes. Based on best practices in the City of Vancouver and other guidelines it is recommended in general that if bicycle and pedestrian volumes are greater than 1,500 users respectively per day, and if space is available, then separation of pedestrians and cyclists is recommended.

- ▶ **Design Speed** - It is important that the multi-use pathways in the City of Quesnel accommodate cyclists of all ages and abilities, is comfort for those travelling at a slower pace and is designed for individuals using the facilities for recreational purposes.
- ▶ **Clearances** - A horizontal clearance of 0.6 metres is generally recommended between a pathway and any lateral obstruction. A vertical clearance of 3.6 metres is recommended for tunnels and underpasses.
- ▶ **Striping** - Multi-use pathways can be divided with a striped centerline, to separate opposite directions of travel. Although the use of a painted centerline can reduce the possibility of a conflict between cyclists travelling in different directions, they can contribute to conflicts that arise when faster moving pathways users cross the centerline to pass slower moving users. Many pathway users also disregard centerlines, which also creates conflicts. In addition, a centerline implies a “rule” that is likely to generate complaints but not be enforced.

The observed effect of divided paths on traffic flow is worth considering in situations where the facility is intended for commuting purposes, where traffic flow may be a high priority. Divided paths are generally endorsed in constrained areas where passing may be dangerous, such as around curves where sight distance is impaired, on trails with a high number of users and where passing behaviours need to be regulated, or as a means for wayfinding, such as at intersections where it might otherwise be difficult to find where the path continues. In many cases, the best design for a multi-use path may be to divide it with a centerline in areas with the conditions mentioned above, and leave it undivided in sections with ample width and sight distance.

It is recommended that multi-use pathways in Quesnel are not striped unless they are located on hills steeper than 5%, at locations where passing is dangerous due to space constraints and locations with limited visibility.

- ▶ **Access Restrictions** - Off-street pathways should be clearly designated and provide space for the 'desired users' access as opposed to motor vehicles. Motor vehicle access can be restricted in a number of ways, including bollards. Bollards can be placed at path or roadway crossings to permit bicycle or pedestrian access while restricting motor vehicle access. Removable or lockable bollards should be used rather than gates along existing paths, as gates prevent safe and convenient trail access for cyclists and mobility-impaired users. Removable and lockable bollards also maintain easy path access for maintenance and emergency vehicles. The placement of bollards should ensure a 1.6 metre clearance for cyclists, and should be placed some distance from the intersection so that users are focused on cross-traffic rather than the obstruction. Some communities are beginning to reduce the use of bollards and gates as motorized users become more familiar with paths and their function.

Recent research conducted by the Cycling in Cities research program at UBC has found that the use of bollards on multi-use pathways can create safety issues and they have been attributed to cyclist injuries.

Bollards should be used sparingly with the minimum number possible, and should be used in odd numbers i.e. one bollard or three bollards instead of two. Bollards should only be used at locations where it is deemed necessary as vehicle access is a significant concern. As an alternative to metal removable bollards, the City may choose to use plastic flexible bollards. However, flexible bollards may not be appropriate in areas where service or emergency vehicles would enter the path, as it may cause vehicle damage. Bollards should be brightly coloured to ensure they are highly visible to cyclists, and reflective tape should also be installed on the bollards. Bollards should be not be spaced closer than 1.5 m.

- ▶ **Grades** - Off-street pathways on grades greater than 5% should be avoided whenever possible. In cases where grades are 5% to 8% for longer than 100 metres, the City should consider adding some slight curve or meander in the pathway to encourage slower speeds, installing signage warning users of the steep grade, ensuring that off-street pathways are free of obstructions, and ensuring that uphill facilities are wider than the minimum recommended widths to account for slower cyclists travelling uphill. It should be noted that the City tries to avoid grades greater than 8%, but that is not always feasible given the city's topography.

2.0 Conventional Bicycle Lane

Conventional bicycle lanes are separate travel lanes designated for the exclusive use of bicycles. In most cases, they are located on the right-hand side of the road adjacent to the curb, and are identified with a solid white line and by signage and pavement markings placed at regular intervals. Bicycle traffic in a conventional bicycle lane is typically one-way in the same direction as the adjacent travel lane.

- **Width** - A number of manuals provide recommended and desired widths for on street bicycle lanes, both for applications without on street parking and with on street parking. Recommended widths for conventional bicycle lanes on streets without on-street parking are shown in **Table E-3**. Recommended conventional bicycle lane widths, parking lane widths, and buffer widths (if recommended) are shown in **Table E-4**. While both tables provide the minimum and maximum widths for conventional bicycle lanes, in most cases the desired width for bicycle lanes is 1.8 metres.



Table E-3: Conventional Bicycle Lane (No On Street Parking) Guidelines

Manual	Minimum	Maximum
TAC	1.2 m	2.0 m
NACTO Urban Bikeway Design Guide	0.9 m	1.8 m
Vélo Quebec Planning and Design for Pedestrians and Cyclists	1.5 m	2.0 m
Ontario Traffic Manual Book 18	1.5 m	2.0 m
Cycling Embassy for Denmark	1.5 m	1.7 m
CROW manual	1.5 m	2.5 m

Note that all Conventional bicycle lane widths exclude gutter and any buffers.

Table E-4: Conventional Bicycle Lanes with (On Street Parking) Guidelines

Manual	Bicycle Lane Width	Parking Lane Width	Buffer Width
TAC	1.5 m to 2.0 m	2.5 m	Not specified
NACTO Urban Bikeway Design Guide	1.5 m to 1.8 m	2.1 m to 2.9 m	0.5 m to 0.9 m
Vélo Quebec Planning and Design for Pedestrians and Cyclists	1.5 m to 1.8 m	2.1 m to 2.5 m	0.5 m minimum
Ontario Traffic Manual Book 18	1.5 m to 1.8 m	2.0 m to 2.5 m	0.5 m to 1.0 m
Cycling Embassy for Denmark	2.0 m	2.5 m	1.0 m minimum
CROW manual	Not Recommended	Not Recommended	Not Recommended

Note that all Conventional bicycle lane widths exclude gutter and any buffers.

Table E-5 summarizes recommendations for designing bicycle lanes in the City of Quesnel, including requirements for bicycle lane, and parking lane widths.

Table E-5: City of Quesnel – Conventional Bicycle Lane Recommendations

Facility	Width (minimum)	Width (desired)
Bicycle lane – No on-street parking	1.2 m	1.8 m
Bicycle lane – With on-street curb side parking (parallel)	1.5 m	1.8 m
Parking space width (local streets)	2.1 m	2.4 m
Parking space width (collector and arterial streets)	2.4 m	2.5 m

- ▶ **Pavement Markings** - TAC and other manuals provide guidelines for bicycle lane pavement markings. The following guidelines for bicycle lane pavement markings are provided by TAC:
 - Bicycle lane lines are solid, white in colour with a width of 100 mm.
 - Where motor vehicles are permitted to move into or cross the bicycle lane to perform a turning movement, broken line segments should be used. In such situations, a 15 metre minimum broken line is used.
 - Bicycle lanes should include bicycle and diamond symbols spaced at 75 metres or as conditions dictate, and approximately 10 metres downstream from an intersection or crosswalk. Directional arrow markings may also be used to identify the correct direction of cyclist movement in a bicycle lane.

3.0 Quiet Street Bikeways

Quiet street bikeways refers to shared bicycle routes that are typically located on local streets with lower traffic volumes and speeds and that have been optimized to varying degrees to prioritize bicycle traffic. In cases where traffic volumes and speeds are relatively low, cyclists and motorists are able to comfortably share the road without the need for significant physical improvements to the roadway if the street is of sufficient width to allow safe passing between cyclists and motor vehicles. In those cases with relatively



low traffic volumes and speeds, the only improvements required may be signage and pavement markings identifying the road as a bicycle route, and crossings where the quiet street bikeways intersect major roads. However, they can be further enhanced with traffic calming measures such as traffic circles and speed humps.

- ▶ **Width** - The navigable width on a Quiet Street Bikeway is particularly important to ensure the comfort of people cycling along the route. A neighbourhood bikeway (excluding parking lanes) between 4.0 metres – 6.0 metres in width is most comfortable for cyclists using the route. However, if a neighbourhood bikeway is too narrow (less than 4 metres), then there is insufficient space for bicycle and motor vehicles to comfortably share the road. If a neighbourhood bikeway is too wide (greater than 6 metres), it may encourage higher motor vehicle volumes and speeds.
- ▶ **Signage** - On roads with no paved shoulder, it is recommended that “share-the-road” signage should be provided to indicate to motorists that cyclists and pedestrians may be present on the roadway and that vehicles must yield. Also, providing “yield to cyclists” and/or “yield to pedestrians” signage at key crossings is recommended. Generally, the assumption of 2 signs every 150m (one facing either direction) would be sufficient.
- ▶ **Pavement Markings** – Provide Shared Use Lane Symbols ‘sharrows’ (double chevron with a stencil of a cyclist to indicate a shared roadway) or stencils of cyclists and pedestrians on the roadway surface to indicate that these are walking and cycling routes. Roadway stencils can also include the shapes of pedestrians and cyclists, or text such as “Slow Down” or the speed limit. Design guidance suggests that low volume routes should have a shared lane pavement markings spaced approximately every 80m.
- ▶ **Traffic Calming** - Traffic calming measures consist of devices that provide either a horizontal or vertical deflection in order to reduce motor vehicle speeds and volumes and improve cycling safety. This category refers to measures that do not restrict motor vehicle access, but are effective in reducing speeds and volumes. Traffic calming measures should be considered on all neighbourhood bikeways with 85th percentile vehicle speeds 50km/h and greater. There are several typical traffic calming measures that can be considered, including: traffic circles, speed humps, speed cushions, and curb extensions.

4.0 Shared Use Lane

Shared use lanes involve the use sharrows as road markings to indicate a shared lane environment between bicycles and automobiles. Shared use lanes can be considered on streets with travel lanes that are wide enough for side-by-side bicycle and vehicle operation, but that are not wide enough to provide a standard bicycle lane. While shared use lanes are often designed for side-by-side operation to allow sufficient width for an automobile to safely overtake a bicycle without crossing over into the adjacent or oncoming motor vehicle traffic lane, this is not always the case. In some locations bicycle users and motor vehicles are required to ride single file.

- **Width** - A summary of guidelines on appropriate road widths and posted speeds for side by side and single file shared use lanes can be seen in **Table E-6**.

Table E-6: Shared Use Lane Guidelines on Road Width and Posted Speeds

Manual	Side by Side Operation	Single File Operation
TAC	Road Width: 4.3 m to 4.5 m Posted Speed: < 60 km/h	Road Width: < 4.0 m (no parking) < 4.3 m (with parking) Posted Speed: < 50 km/h
Ontario Traffic Manual Book 18	Road Width: 4.0 m to 4.5 m Posted Speed: Not specified	Road Width: 3.0 m to 4.0 m Posted Speed: Not specified

In cases where it has been determined that shared use lanes are an appropriate treatment, in **Table E-7** below outlines the recommended lane width, vehicle speeds, and vehicle volumes for shared use lanes in the City of Quesnel.

Table E-7: City of Quesnel – Shared Use Bicycle Lane Recommendations

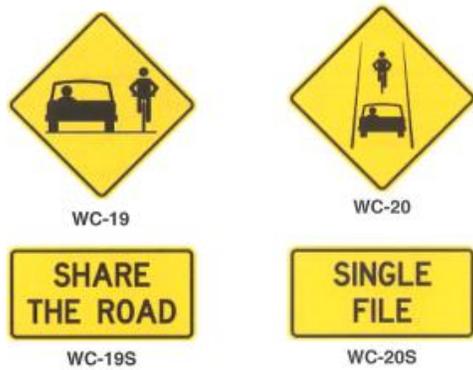
Classification	Lane Width	85 th Percentile Speed	Volume (AADT)
Shared Use Lane – Side by Side	4.3 m	< 60 km/h or below	< 5,000
Shared Use Lane – Single File	< 4.0 m (no parking) < 4.3 m (with parking)	< 50km/h	< 5,000

Other Considerations:

- **Signage** - Signage along shared use lanes can help to convey to both bicycle users and drivers that the route is shared. They can help warn motorists that they are to provide adequate driving space for cyclists and other vehicles on the road, or that they much travel in single file. TAC identifies two signs and their supplementary tabs that should be considered along shared use lanes, as seen in **Figure E-19**.

Figure E-19: Shared Use Bicycle Lane Signage

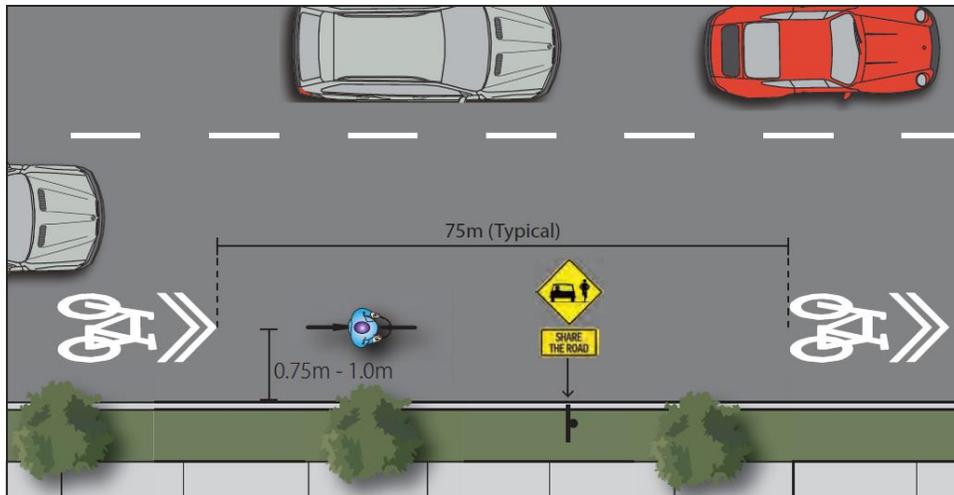
Source: TAC, Bikeway Traffic Control Guidelines for Canada



- ▶ **Pavement Markings** - Shared use lanes are identified by a bicycle symbol with two chevron markings, also known as a 'sharrow'. TAC's Bikeway Traffic Control Guidelines states that these symbols should be spaced every 75 metres or as conditions dictate, as well as immediately after an intersection and 10 metres before the end of a block. The figures below identify the placement of sharrow pavement markings and signage based on the type of shared use lane and the presence of parking.

Figure E-20: Shared Use Lane (Side by Side) Without Parking

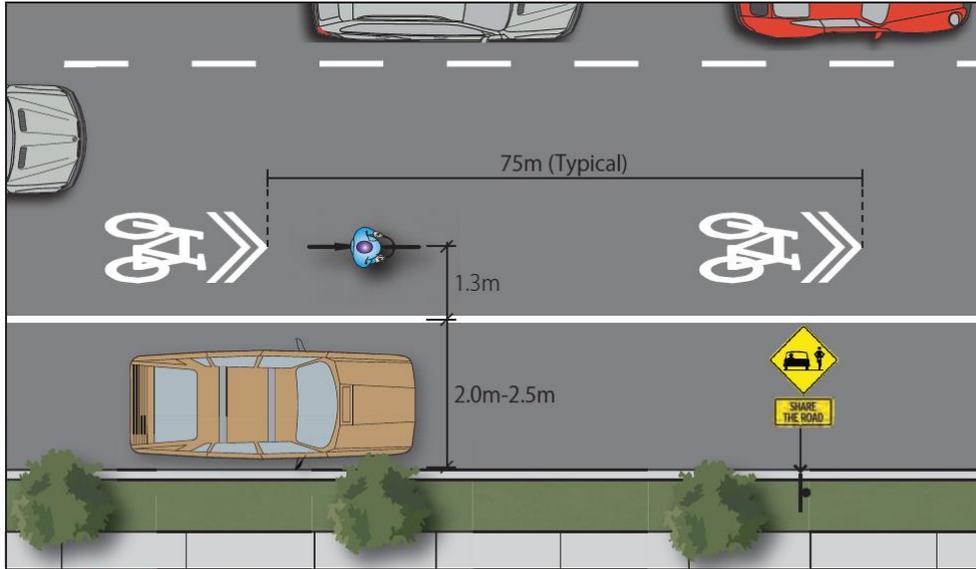
Source: OTM Book 18 2014



Source: MMM/ALTA, 2013

Figure E-21: Shared Use Lane (Side by Side) With Parking

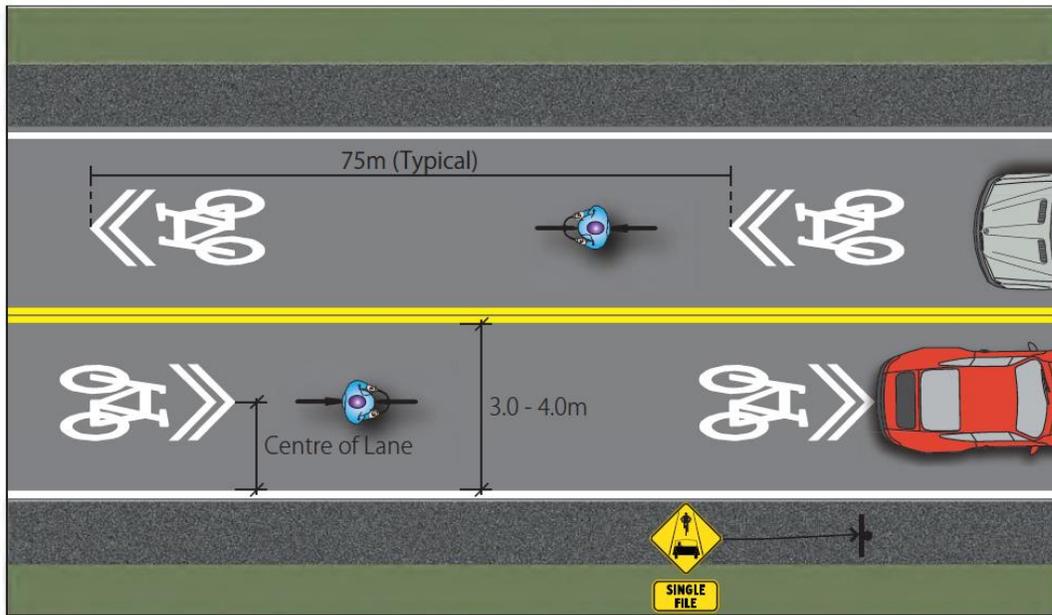
Source: OTM Book 18 2014



Source: MMM/ALTA, 2013

Figure E-22: Shared Use Lane (Single File) Without On Street Parking

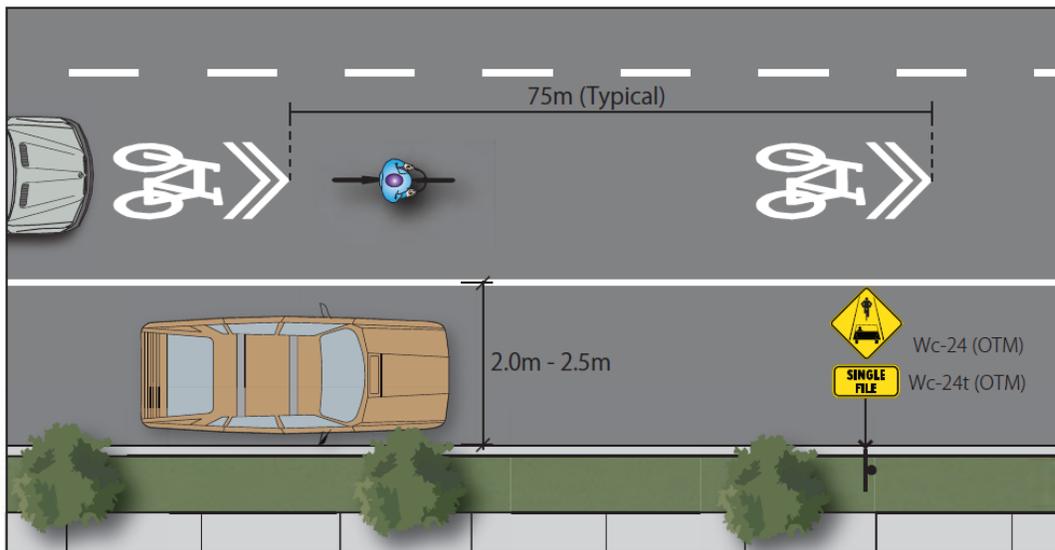
Source: OTM Book 18 2014



Source: MMM/ALTA, 2013

Figure E-23: Shared Use Lane (Single File) With On Street Parking

Source: OTM Book 18 2014



Source: MMM/ALTA, 2013

5.0 Paved Shoulders



- ▶ **Width** - The Transportation Association of Canada (TAC) recommends shoulder widths of 1.5 to 2.0 metres depending on road speed and traffic volumes.

In particular, TAC guidelines state that shoulder bikeways should be a minimum of 1.5 metres wide on roads with speeds less than 70 km/hr. When design speeds are greater than 70 km/hr, and daily vehicle volumes exceed 5,000, a minimum 2.0 metre shoulder should be provided. When speeds exceed 80 km/hr and daily traffic volumes exceed 10,000 vehicles, a shoulder width of 2.5m should be provided. However, once speeds exceed 70 – 80 km/hr, conditions may be relatively uncomfortable for non-motorized users despite a wider shoulder, and it is recommended to consider a multi-use pathway to provide even more separation from traffic.

6.0 Un-Designated Facilities

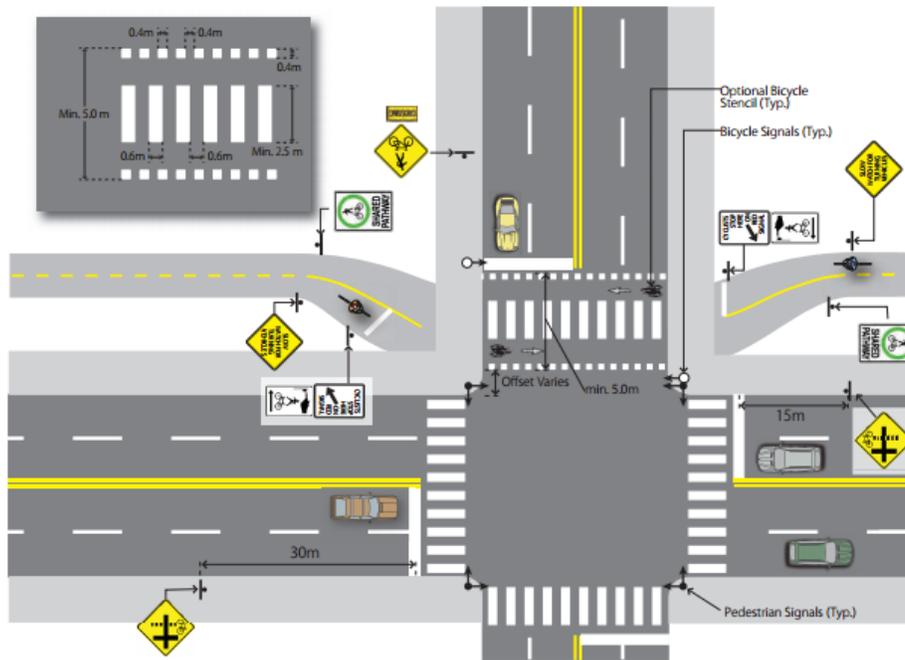
Other municipalities have bylaws and policies that state that if there are no designated bicycle facilities along a street that a person operating a bicycle shall use only the portion of the street as is intended for the passage of motor vehicles. Within that space they should be positioned as close as reasonably practicable to the right hand curb except when approaching intersections to make a turning movement.

7.0 Multi-Use Crossings

Elephant's feet pavement markings are placed on either side of the pedestrian zebra markings permitting both cyclists and pedestrians to use the same space for crossing the intersection. Cyclists are permitted to ride across the combined crossing, but are required to ride in between the elephant's feet and the zebra markings.

Figure E-24: Multi Use Crossing Examples

Source: OTM Book 18 2014



Source: MMM/ALTA, 2013



Source: TAC Bikeway Traffic Control Guidelines for Canada, 2012 (Table 7-1)

8.0 Designing for Winter

As outlined in Action area 3, when the City is designing new bicycle route they should ensure that the designs facilitate snow removal. One of the best ways to facilitate the removal of snow from bicycle routes is thoughtful roadway and bicycle facility design. Unfortunately, with roadways that include typical, unprotected bicycle lanes at the edge of the roadway, the bicycle lane often becomes the area for snow storage on the roadway. This leaves people cycling either trying to share the car lanes or riding on the edge of the road while trying to avoid piled-up snow— both of which are unsafe and uncomfortable. There are several roadway planning and design considerations that can be taken to avoid this situation, including:

- ▶ Plan new or renewed roadways with sufficient right-of-way to provide enough right-of-way for a bicycle lane and an adequately sized storage space on the road side. This would allow a typical truck-mounted snowplow to plow snow into the storage space rather than the bicycle lane. A 1.8 m bicycle lane would also allow for some narrowing of the bicycle lane due to adjacent snow storage, while still maintaining functionality.
- ▶ Provide a wide bicycle lane buffer. Where feasible, a wide protected or unprotected bicycle lane buffer can provide ample storage space for snow, while providing cyclists protection from vehicles. A minimum 1.5 metre buffer is preferable to accommodate moderate snowfall with minimum encroachment upon the bicycle lane. This design would require the use of a smaller bicycle lane snow plow to clear this portion of the roadway.
- ▶ Restrict on-street parking during snow events. Where a bicycle lane is located between on-street parking and the vehicular lane, parking along the roadway can be restricted during snow events to allow this space to become snow storage space. While this isn't an option for all roadways, it could be utilized along priority bicycle routes in the winter.
- ▶ Provide Enough Width for Small Truck Snowplows or ATV mounted snowplows. The City has small, specialized snow removal vehicles that could be used to clear bicycle routes.

Appendix C: Bicycle Parking Bylaws

Bicycle Parking Bylaws

A Snapshot of Bylaws throughout North America that Require Bicycle Parking Through the Development Process

	Multi-Family	Office	Shopping Centre	Industrial	Schools	Further land use categories?	Design Standards or Guidelines in Bylaw?	End of trip facilities required?
Victoria								
Bicycle Parking Requirements:	1 per unit plus a 6 space rack at each apartment entrance	1 per 250m ² of gross floor area (GFA) for the 1 st 5000 m ² , plus 1 per 500m ² of additional GFA	1 per 250m ² of gross floor area (GFA) for the 1 st 5000 m ² , plus 1 per 500m ² of additional GFA	1 per 950 m ² of GFA	1 per 5-10 students ¹ and 1 per 10 employees	Yes – other institutional uses as well as cultural and recreational	No	NO
Class 1	1 per unit	50%	30%	80% of total required	Employee parking	n/a	n/a	n/a
Class 2	6 space rack	50%	70%	20% of total required	Student parking	n/a	n/a	n/a
Edmonton								
Bicycle Parking Requirements:	5% of the number of vehicular parking spaces to a maximum of 50 spaces with a minimum of 5.	5% of the number of vehicular parking spaces to a maximum of 50 spaces with a minimum of 5.	5% of the number of vehicular parking spaces to a maximum of 50 spaces with a minimum of 5.	5% of the number of vehicular parking spaces to a maximum of 50 spaces with a minimum of 5.	Bicycle parking equivalent to 10% of vehicular parking requirements	No – only residential vs non-residential	Yes	No
Class 1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Class 2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Richmond								
Bicycle Parking Requirements:	1.25 spaces per unit of class 1 and 0.2 spaces per dwelling unit of class 2	- 0.27 Class 1 spaces per each 100m ² of gross leasable floor area (GLFA) greater than 100m ² - 0.4 Class 2 spaces per each 100m ² of GLFA greater than 100m ² .	- 0.27 Class 1 spaces per each 100m ² of gross leasable floor area (GLFA) greater than 100m ² - 0.4 Class 2 spaces per each 100m ² of GLFA greater than 100m ² .	- 0.27 Class 1 spaces per each 100m ² of GLFA greater than 100m ² . - 0.27 Class 2 spaces per each 100m ² of GLFA greater than 100m ² .	Elementary: - 1 space/3 staff (Class 1) - 2 spaces for each 10 students (Class 2) Secondary: - 1 space/3 staff (Class 1) - 3 spaces for each 10 students (Class 2) University - 1 space/4 staff (Class 1) plus 1 space per 10 students - 1 spaces for each 10 students (Class 2)	Yes	Yes	No
Class 1	1.25 per unit	0.27 per 100m ²	0.27 per 100m ²	0.27 per 100m ²	Elem: 1/3staff Sec: 1/3 staff Uni: 1 per 4 staff and 1 per 10 students	n/a	n/a	n/a
Class 2	0.2 per unit	0.4 per 100m ²	0.4 per 100m ²	0.27 per 100m ²	Elem: 2 per 10 students Sec: 3/10 students Uni: 1 per 10 students	n/a	n/a	n/a
Saanich								
Bicycle Parking Requirements:	1 per unit plus six space rack at each apartment entrance	One per 250m ² GFA for the first 5000m ² and 1 per 500m ² for any additional area	1 per 250m ² of gross leasable area for the 1 st 5000 m ² , plus 1 per 500m ² of additional GFA	1 per 950 m ² of GFA	1 per 5-10 students ² and 1 per 10 employees	Yes	Yes	No
Class 1	1 per unit	50%	30%	80%	All employee bicycle parking	n/a	n/a	n/a
Class 2	6 space rack	50%	70%	20%	All student bicycle parking	n/a	n/a	n/a

¹ Depending on school type (elementary, middle, secondary, college and university)

² Depending on school type (elementary, middle, secondary, college and university)

