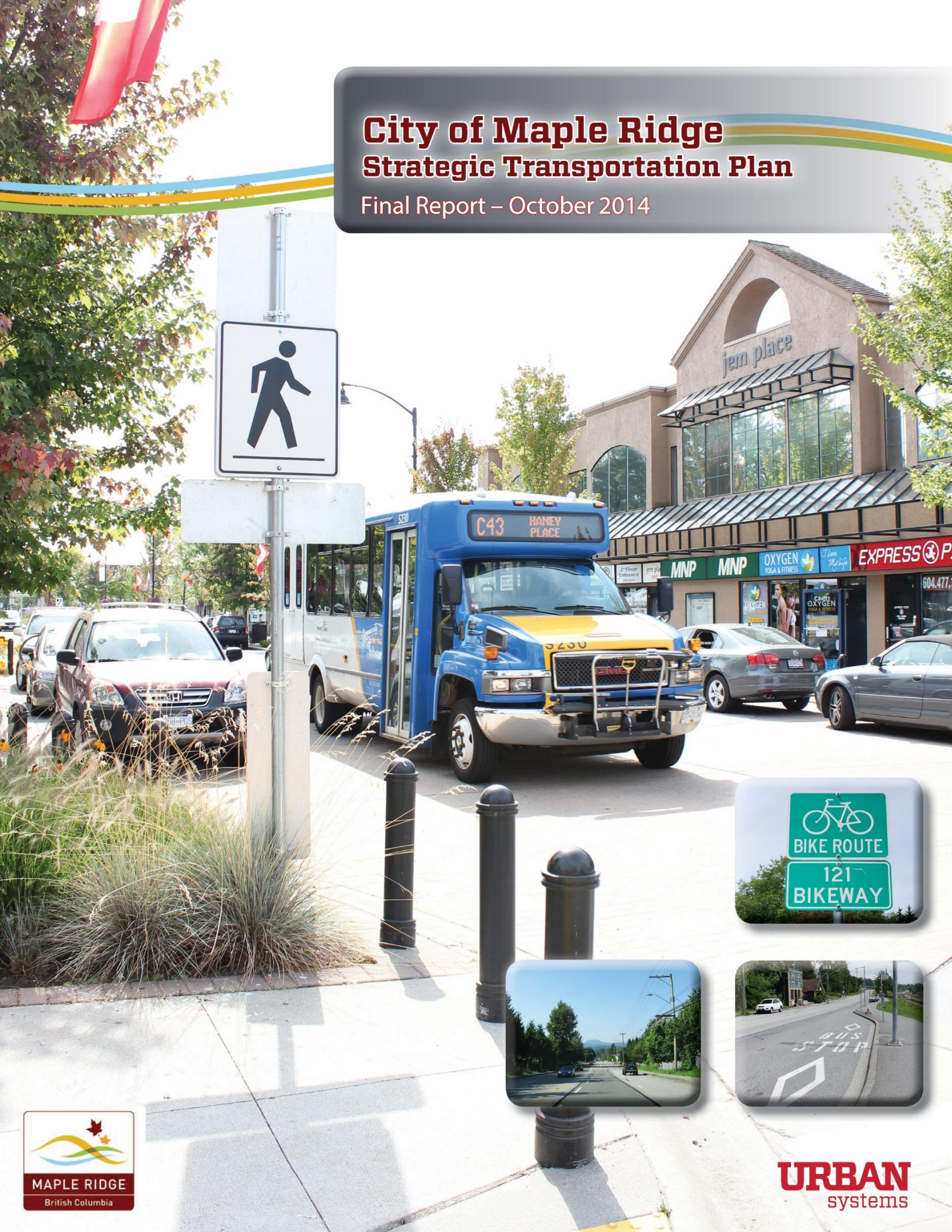


# City of Maple Ridge Strategic Transportation Plan

Final Report – October 2014





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**Appendix A** Detailed Sidewalk Network Priorities

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## Chapter 1

# Executive Summary





Maple Ridge is a dynamic and vibrant community of more than 80,000 residents, with a distinct agricultural and small-town character, along with a vibrant, well-developed urban core that continues to serve a growing local population. The city is known for its rural and natural landscapes, and the outdoor recreational opportunities afforded by lakes, mountains, and numerous regional and provincial parks that are very popular with both residents and visitors to the area.

As one of the fastest growing municipalities in Metro Vancouver, Maple Ridge will need to continue to accommodate a diverse and growing population into the future. Between 1991 and 2011, the population of Maple Ridge increased by almost 60% to 76,000 residents. Over the next 20 years, the city's population is anticipated to grow to nearly 110,000 residents by the year 2031, with thousands of additional jobs also expected. The Town Centre and surrounding areas will likely accommodate most of this future population and employment growth in Maple Ridge; however emerging growth areas, such as Silver Valley, will also accommodate significant growth in the coming years. With this significant growth and development, providing a more interconnected and multi-modal transportation system where residents and employees can conveniently drive, walk, cycle, or take transit to their destinations is becoming increasingly important.

To address the challenges and opportunities facing the transportation system now and into the future, the City of Maple Ridge has developed an updated Strategic Transportation Plan (STP). The development of the STP update involved a detailed review of the existing transportation system in Maple Ridge, along with consultation and engagement with City staff and community members to identify key transportation issues affecting the community. Through this process, a framework was established for the STP to define how Maple Ridge will address its future transportation needs. This framework provides guidance to City staff and Council on transportation-related decisions and investments over the next 20 years. The framework is based on four strategic goals which define the vision for transportation in Maple Ridge. These goals align with the overarching directions contained in the city's Official Community Plan (OCP) and other policy documents, and will guide the city's policies and directions on how to best manage the transportation system into the future. Together, these goals, and their supporting objectives, contribute to creating an efficient, affordable, safe, economically robust, and sustainable transportation system.

### 1.1 Strategic Transportation Goals

The goals and objectives for the STP are designed to provide the foundation for planning the city's transportation system based on historical work with the residents of the city. The overall goals are briefly summarized below.

#### **Access & Mobility**

*Provide for safe, convenient and accessible movement of people, goods and services throughout the city. To provide a variety of mobility choices and accommodating diverse needs, the city seeks a transportation network with strong multi-modal connections, supported by an efficient and safe road network.*

#### **Transportation Choice**

*Provide residents and visitors with attractive choices for moving around the city and connecting with other areas of Metro Vancouver. This includes the provision of an integrated network, supporting connections locally and regionally, with more opportunities for transit, cycling and walking.*



### **Community & Environment**

*Provide transportation infrastructure and services that enhance quality of life in Maple Ridge and the quality of the natural environments in the city. This includes integrating land use and transportation systems, preserving natural areas, and minimizing impacts through supporting alternative travel modes.*

### **Affordable Transportation System**

*Provide transportation infrastructure and services in a cost-effective and efficient manner that makes best use of existing facilities and projected resources. This will include maximizing opportunities to make beneficial investments, improving existing infrastructure, and prioritizing transit.*

## **1.2 Directions of the Plan**

Building on the four goals described above, the STP presents a comprehensive review of all aspects of the transportation system in Maple Ridge, in order to shape and support planned growth 20 years into the future. Although the goals of the Plan and the investment strategies are integrated, the STP document is presented for each mode of transportation: a **Road Network Plan**; **Pedestrian Plan**; **Bicycle Network Plan**; and a **Transit Strategy** - each addressing a distinct part of the city's transportation system. Each of the modal plans is supported by several themes, which describe how the City and other agencies and stakeholders can take action to achieve the STP goals. The four core topics of the STP, as well as their strategies are briefly summarized below:

1. The **Road Network Plan** is designed to address a combination of major and minor road improvements. The Road Network Plan identifies the City's long-term approach to improvements ranging from major corridor projects, such as widening and new roadways, to local area initiatives including neighbourhood traffic management and minor intersection improvements. The six key strategies that shape the Road Network Plan are:



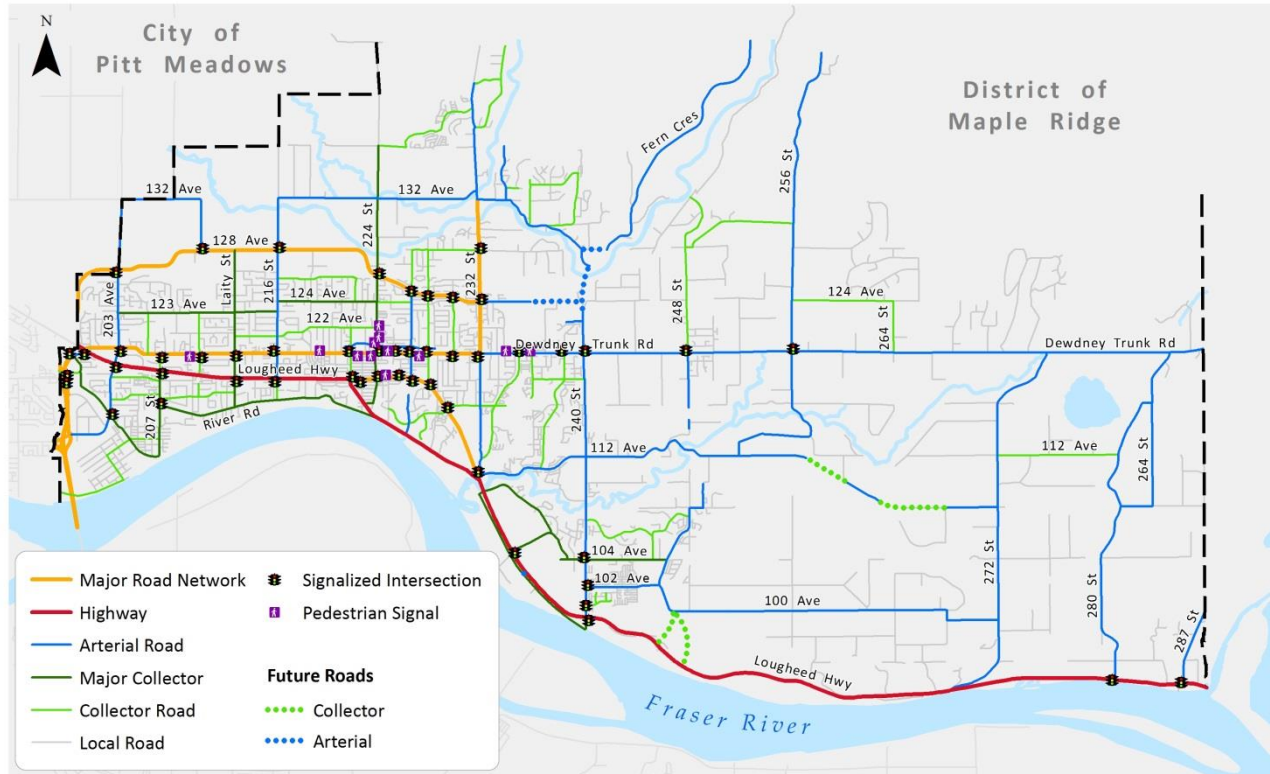
- a) **Major Municipal Roads** outlines long-term improvements to key corridors to increase road network connectivity and accommodate increasing traffic growth pressures. Major municipal road projects contained in this strategy are:
  - **128 St/Abernethy Way:** Widening from two to four lanes and extension of the 128 Avenue/Abernethy corridor between 210 Street and 240 Street.
  - **232 Street:** Widening to 4 lanes from Abernethy Way/124 Avenue to 132 Avenue (east). There are two proposed concepts set out as part of this strategy, with different laning configuration options.
  - **Fern Crescent Realignment / 128<sup>th</sup> Avenue Extension:** Realign Fern Crescent and extend 128<sup>th</sup> Avenue as two lane roadways with pedestrian and cycling facilities, and reclassify Fern Crescent south of 128<sup>th</sup> Avenue to a local road.
  - **East Dewdney Trunk Road:** Widening to four lanes between 240 Street to 248 Street.
  - **240 Street:** A proposed crossing of 240 Street over the Alouette River is identified as the secondary north-south alternative between Abernethy Way and Fern Crescent.



- b) **Regional and Provincial Corridors** focusses on improvement opportunities for Lougheed Highway and Haney Bypass, as well as opportunities for connections with Pitt Meadows via the North Lougheed Connector. These improvements are:
  - a. **Haney Bypass:** Widening to 4 lanes.
  - b. **Lougheed Highway:** Widening east of 272 Street.
  - c. Support further review of the east-west **North Lougheed Connector** in Pitt Meadows, and explore optional connections to Abernethy Way.
  - d. **Lougheed Highway Priority lanes** across Northeast Sector.
  
- c) **Completing the Network** focusses on providing long-term access to rural and emerging growth areas of the city, through road connectors. In particular, these improvements are:
  - a. **112 Avenue - 108 Street Connector** would consist of a new roadway between 252 Street and 268 Street along the slope of Grant's Hill. The road would provide a complete east-west route between Lougheed Highway at the Haney Bypass (via Kanaka Way) and 272 Street.
  - b. **Thornhill Connector** which would connect between the Thornhill area and Lougheed Highway. One option is to extend Jackson Road southward over the escarpment to Lougheed, whereas another option would be to extend 256 Street southward to the highway.
  - c. **Albion Industrial Area Connector.** In an effort to support industrial activity and future growth in Albion, the City will examine alternative access strategies between Lougheed Highway and River Road on the south side of the CP Rail corridor.
  
- d) **Intersection Improvements** focuses on locations where further review is needed to address operational and safety issues. The majority of intersections identified in this strategy are located on Lougheed Highway (provincial jurisdiction), and the City will continue to advocate with the Province on planning shorter-term improvement strategies to reduce delays and improve safety at these locations. Types of improvements may include the provision of turn lanes and/or signal optimization.
  
- e) **Neighbourhood traffic management** speaks to the City's policy (developed in 2012) on maintaining quality of life and safety on local and collector streets through various traffic calming measures and treatments.
  
- f) **Network Classification** captures the projected role and function of roadways within Maple Ridge. The roadway classification system generally provides guidance to planning land uses along the corridor as well as the physical design characteristics based on the intended functions for each class as briefly highlighted below. The long-term road network classification recommended in this strategy is shown in **Map E-1**.



**Map E-1: Long-Term Road Network Classification**

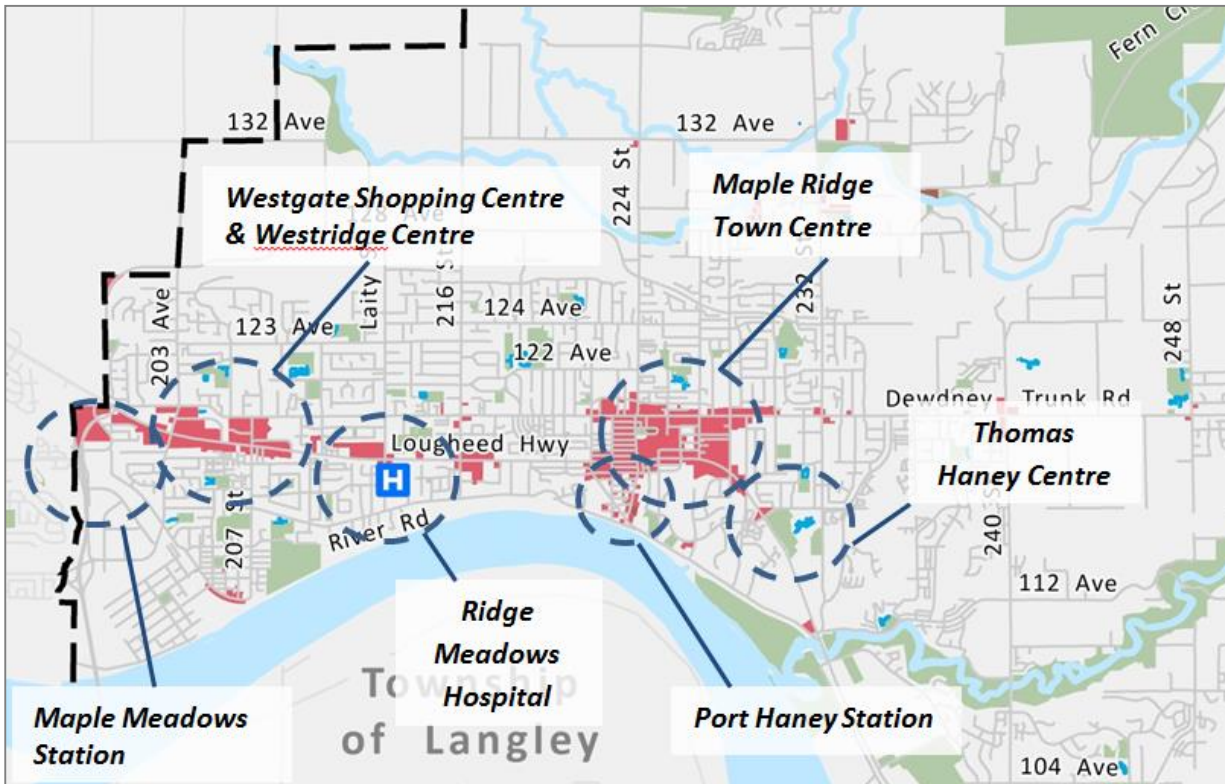


2. The **Pedestrian Plan** identifies facilities and programs needed to make walking within the city a more attractive, safe and convenient option for people of all ages and mobility levels. The Pedestrian Plan seeks to enhance infrastructure and connections in the areas of highest pedestrian activity within Maple Ridge, and to ensure pedestrians connections to future areas of growth. The Pedestrian Plan has five key strategic areas, which are:



- a) **Enhanced Network Coverage** seeks more sidewalk coverage to provide more attractive walking conditions, particularly in the urban areas of Maple Ridge. The ultimate goal is to provide sidewalks on both sides of collector and arterial roads in the urban area, as well as on at least one side of local roads. This strategy identifies six pedestrian areas (see **Map E-2**) where sidewalk improvements can benefit many users, and where the City should prioritize increasing sidewalk coverage. In addition to these six pedestrian areas, bus routes (within the urban area) are also identified as a priority for sidewalk provision, to enable passengers to safely access transit. Within the six pedestrian areas of the city as well as nearby transit stops and exchanges, pedestrian facilities should be designed for people of all ages and mobility levels through universal design standards.

**Map E-2: Pedestrian Areas of Maple Ridge**



- b) **Interim Strategies for Growth Areas** focusses on improving walkability in future growth areas of Silver Valley, Albion, and Thornhill, in order to attract more residents to walk in these areas. This strategy provides approaches to improve pedestrian facilities in these three areas, including providing sidewalks as growth occurs, constructing temporary sidewalks where needed, and striving towards a full sidewalk standard in the long-term.
- c) **Enhanced Town Centre treatments** is a strategy that focusses on enhancing walkability in the core of Maple Ridge, building off successful streetscape initiatives such as those on 224 Street. This includes providing pedestrian realm enhancements such as boulevards, street furniture, wayfinding, and street lighting to make an attractive walking environment in the Town Centre. Particular corridors that are identified within this strategy include Lougheed Highway, Dewdney Trunk Road, 222 Street, 223 Street, 226 Street, 119 Avenue, Edge Street, and Selkirk Avenue.
- d) **Safer Crossings** is a strategy that seeks to enhance pedestrian safety, accessibility, and visibility at crossings within the Town Centre, West Coast Express station areas, employment centres, and around schools and parks. The range of crossing treatments identified includes curb extensions, crosswalk treatments, accessible signals, countdown timers, and curb ramps.
- e) **Support Programs** complement the infrastructure-based strategies, through encouraging softer measures such as information, education and awareness initiatives to enable people to feel more safe and comfortable using active modes to get around.



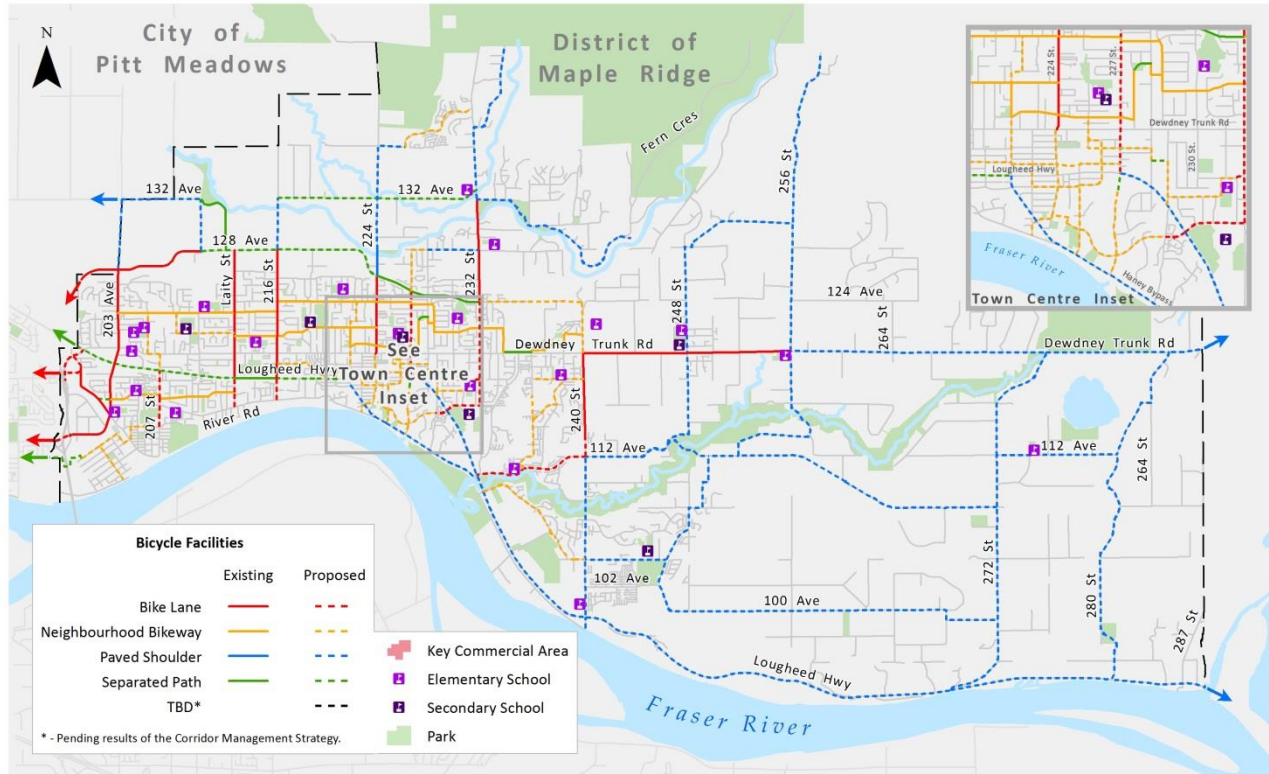
3. The **Bicycle Network Plan** recommends changes to the local bicycle network in order to meet the needs of Maple Ridge's cyclists. Attracting more people to bicycle in and around Maple Ridge necessitates infrastructure and safety measures, including bicycle routes and lanes, bicycle parking, crossing improvements, and supportive programming. The main strategies in the Bicycle Network Plan that will guide the development of the bicycle network over the next 20 years are summarized below:



a) **Comfortable Facilities.** Recognizing that attracting more people to cycle in Maple Ridge will require bicycle facilities that are both safe and comfortable, this strategy identifies a range of different bicycle facilities that can be considered under different conditions in Maple Ridge. The proposed bicycle network is shown in **Map E-3**, with proposed bicycle routes in the following locations:

- **Off-Street Pathways** are recommended to address network gaps and to provide more comfortable east-west routes in Maple Ridge. Pathways are identified adjacent to 132 Avenue (216 Street to 232 Street), Lougheed Highway (west of Laity), and 128<sup>th</sup> Avenue / Abernethy Way (interim). Consideration for enhancing the existing 128 Avenue / 210 Street Dyke Trail is also recommended.
- **Neighbourhood Bikeways** are low cost and low-stress routes designed to connect the city's residential neighbourhoods, and are recommended on: 206/207 Streets, Skillen Street / Wicklund Avenue, Foreman Drive, 105 Avenue / Tamarack Lane, 236 Street / Creekside Street, 227 Street. Within the Town Centre, bikeways are recommended on 116 Avenue, 224 Street, 227 Street, and Selkirk Avenue.
- **Bicycle Lanes (painted)** provide a higher degree of separation between cyclists and motorists, and providing direct on-street links. The recommended routes for bicycle lanes in Maple Ridge include 124 avenue, 207 Street, 232 Street, and Kanaka Way.
- **Shoulder Bikeways** are also proposed for several rural roads within Maple Ridge, including 256 Street, 272 Street, 280 Street, 100 Avenue, and 112 Avenue.

**Map E-3: Recommended Long-Term Bicycle Network**



**b) Crossings** are important to ensuring cyclist safety and comfort, particularly when crossing major streets. This strategy recommends crossing treatments such as the use of bicycle boxes, enhanced pavement markings, and bicycle loop detectors to create safer crossings for cyclists.

**c) Support Strategies** are important complementary measure to spread awareness about the bicycle network and educate residents on cycling skills and road safety. Some key recommended initiatives include establishing more bicycle parking, wayfinding and events and awareness activities that promote active transportation.

4. The **Transit Strategy** within the STP provides broad direction on provision of transit services within the city to support and guide TransLink's service planning initiatives. The Strategy outlines the need for more local and regional transit connections, improved passenger amenities at transit stops, and transit priority treatments along congested areas of the network. In particular, the four transit strategies set out in the STP include:



**a) Enhanced Network of Local and Regional Services** focusses on better local transit connections to the Town Centre, the Haney-Hammond Area and to emerging areas of growth including Silver Valley. Regionally, emphasis is placed on transit connections between Maple Ridge's Town Centre, Coquitlam City Centre, and the planned Evergreen Line.



- b) **Comfortable and Accessible Passenger Facilities** seeks the provision of amenities and accessibility features at bus stops and transit exchanges to improve passenger safety and comfort (and attract new customers). Short-term improvements include sidewalk improvements or construction of concrete pads for wheelchairs at bus stops. Longer-term initiatives include achieving 100% accessible bus stops, and provision of more seating, lighting and customer information at all bus stops, rapid transit stations, and transit exchanges.
- c) **Expanding West Coast Express Service** focusses on supporting TransLink to provide an Albion Station in addition to expanding West Coast Express services to include reverse peak, midday and weekend service. These service expansions can serve to increase travel choices to and from the city.
- d) **Transit Priority Strategies** along corridors and at intersections can enhance the customer experience, reduce bus travel times, improve reliability, and ultimately make transit competitive with driving. In particular, strategies such as queue bypass lanes or queue jumpers may be an effective form of transit priority along some of Maple Ridge's more heavily congested intersections.

### 1.3 Implementation

The STP is intended to provide long-term direction for the city's transportation system. To achieve the goals of the STP, an implementation strategy is necessary to provide a framework for advancing specific transportation improvements. The recommended improvements of the STP considers projects over the short-term (0-5 years), medium-term (5-10 years), and long-term (10 or more years).

Conceptual order-of-magnitude cost estimates were developed for each of the capital investments identified in the STP to provide guidance on the overall transportation investments in current dollars. ***These order-of-magnitude costs are for comparative purposes only, and are based on a conceptual level of design and should be refined to establish funding requirements and project budgets.*** Actual costs for implementation could vary significantly for each initiative as costs change over time and are typically not used for project budgeting purposes.

The level of investment required to implement all improvements recommended in the STP is estimated to be in the range of \$165 million (approximately \$5 million per year for the first 10 years), as summarized below in **Table E-1**. It should be noted that these cost estimates do not include items such as environmental mitigation costs, and utility relocations which can be significant in most projects. Costs to the city can be significantly reduced by pursuing external funding sources and partnership opportunities for many of the identified projects and by leveraging other funding sources within the City. Additionally, the City should consider strategies to coordinate capital investments between modes as well as with other infrastructure rehabilitation projects.

**Table E-1: Projected Capital Costs and Implementation Phasing (2014 \$)**

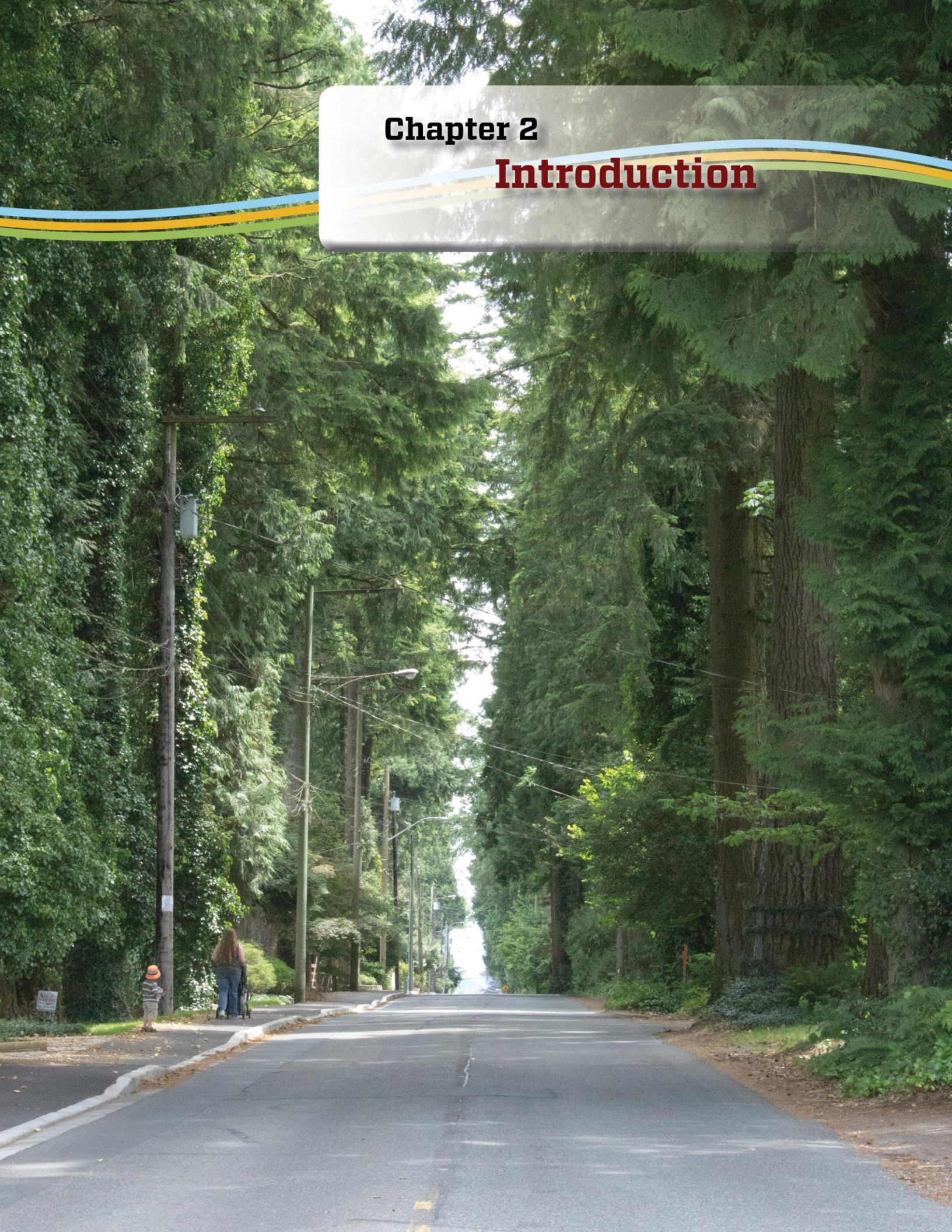
Category of Capital Improvement	Short-Term (<5 yr)	Medium-Term (5 to 10 yr)	Long-Term (10-20 yr)	Total
<b>Road Network Plan</b>	\$26.2 million	\$17.0 million	\$106.9 million	\$150.1 million
<b>Pedestrian Plan</b>	\$1.5 million	\$1.8 million	\$2.1 million	\$5.4 million
<b>Bicycle Network Plan</b>	\$1.0 million	\$3.2 million	\$4.6 million	\$8.8 million
<b>Transit Strategy</b>	\$0.25 million	\$0.25 million	\$0.5 million	\$1.0 million
<b>Total</b>	\$28.95 million	\$22.25million	\$114.1 million	\$165.3 million

*Note: Costs are conceptual in nature (Class D) and are not typically used for budgeting purposes. They do not include any allowance for significant utility relocation, earthworks, driveway reconstruction, landscape restoration and legal cost.*



## Chapter 2

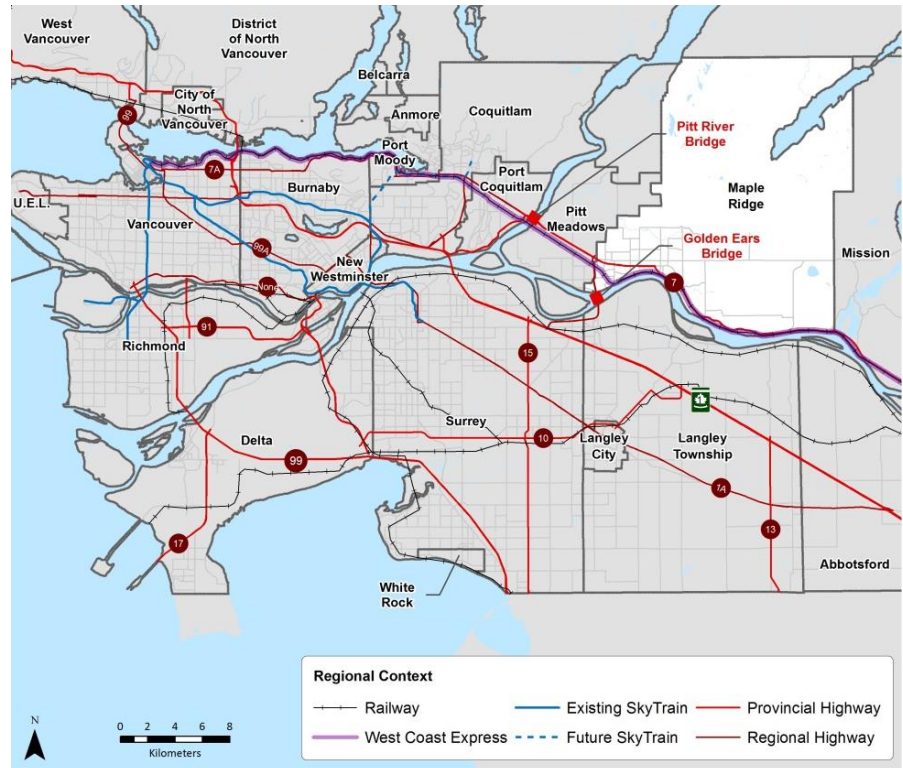
# Introduction





Maple Ridge is a dynamic and vibrant community of approximately 83,000 residents (*source: City of Maple Ridge*), with a distinct agricultural and small-town character, though a modern well-developed urban core that continues to serve a growing local population. The city is known for its rural and natural landscapes, and the outdoor recreational opportunities afforded by lakes, mountains, and numerous regional and provincial parks that are very popular with both residents and visitors to the area.

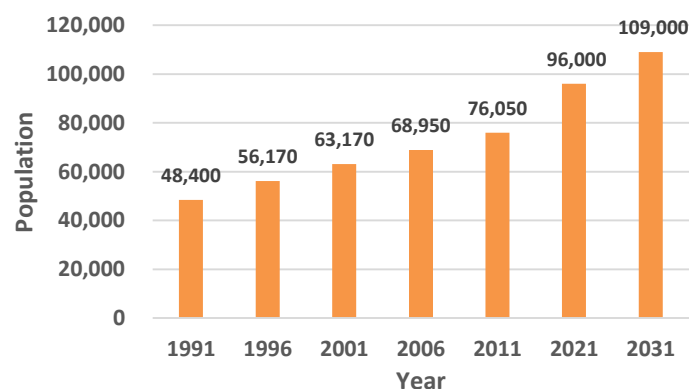
Located on the northeastern corner of Metro Vancouver, the city faces a number of unique transportation issues due to the fact that it is bounded by the Fraser River to the south and mountains to the north. Lougheed Highway is the primary route connecting the city to Pitt Meadows and other the municipalities to the east and west. The widening of Lougheed Highway over the Pitt River Bridge in 2009, has also improved east-west connections between Maple Ridge and the northeast sector municipalities. Constructed in 2009, the Golden Ears Bridge replaced the Albion Ferry, and opened up a critical



north-south connection between Maple Ridge and the Township and City of Langley, Surrey and other communities south of the Fraser River. The Golden Ears Bridge has changed travel patterns in the municipalities it connects, but it has also brought increased economic and growth opportunities.

Despite these external transportation investments, rapid population growth in recent years is placing increasing pressure on the city's transportation system. Since 1991, the city's population has increased by almost 60% - from 48,400 in 1991 to 76,000 people in 2011. Over the past 10 years, employment growth within the city has increased by approximately 5,000 jobs. Looking ahead, the city continues to be a high growth area in Metro Vancouver. Over the next 20 years, the city's population is projected to increase by over 30,000 people to 109,000 residents by 2031. At the same time, employment within the city is expected to increase to approximately 48,000 jobs.

**Historical & Forecast Population for Maple Ridge**



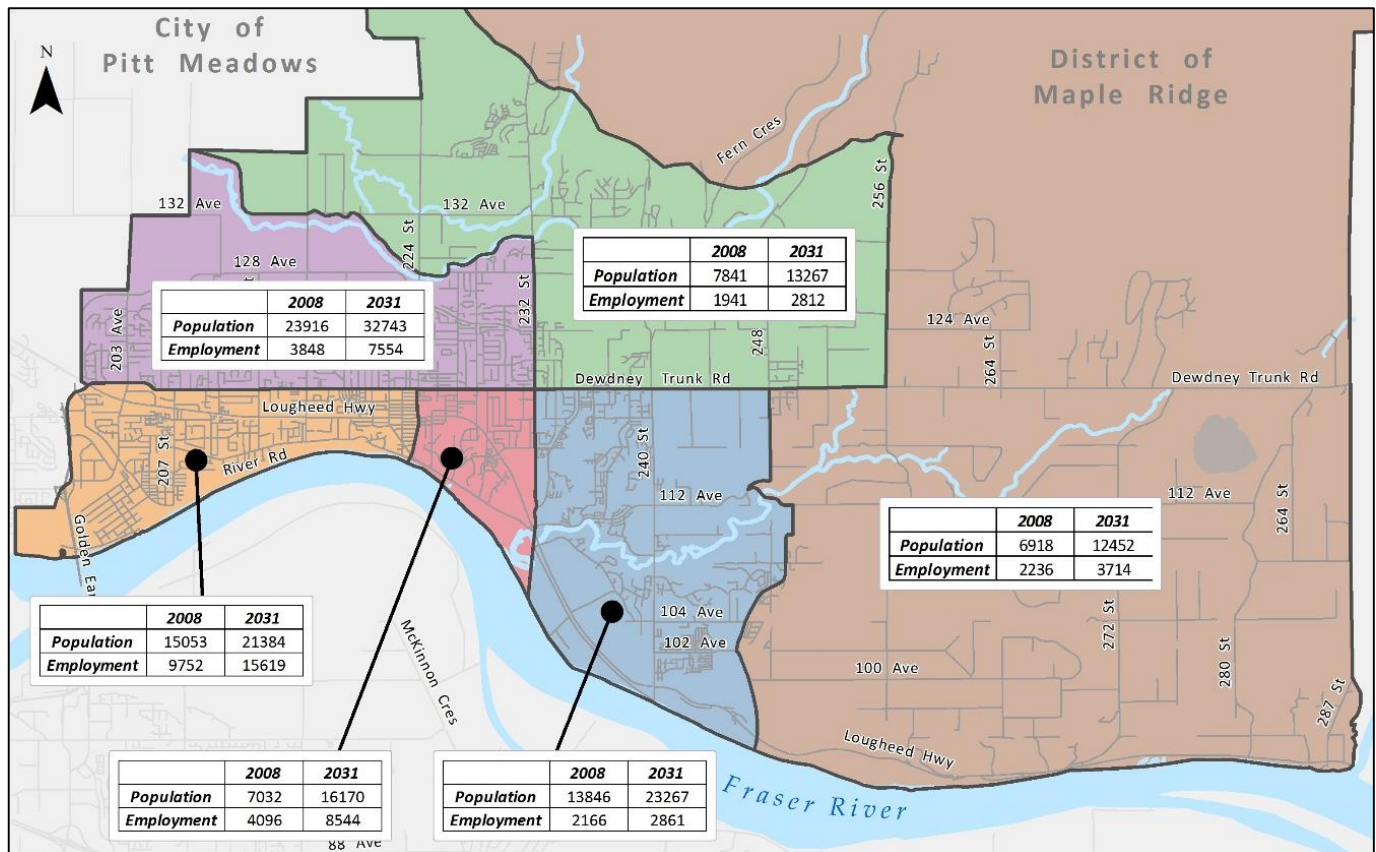


Within the city, this planned growth will continue to preserve the agricultural land base, protect the city's natural features and maintain the community character. Growth will be shaped by goals and principles being used to update the Official Community Plan that include:

- Create a compact urban area;
- Support a sustainable economy;
- Protect the environment and respond to climate change impacts;
- Develop complete communities;
- Support sustainable transportation choices

In particular, the Town Centre and surrounding areas will accommodate the majority of the population and employment growth in the city. Growth within this area is designed to be supported by an attractive and frequent transit service to connect to other areas of the city as well as communities north and south of the Fraser River. The Silver Valley area is also planned to accommodate significant growth over the next 20 years.

### Distribution of Population & Employment Growth



Data Source: Regional Travel Model

## 2.1 Purpose of the Plan

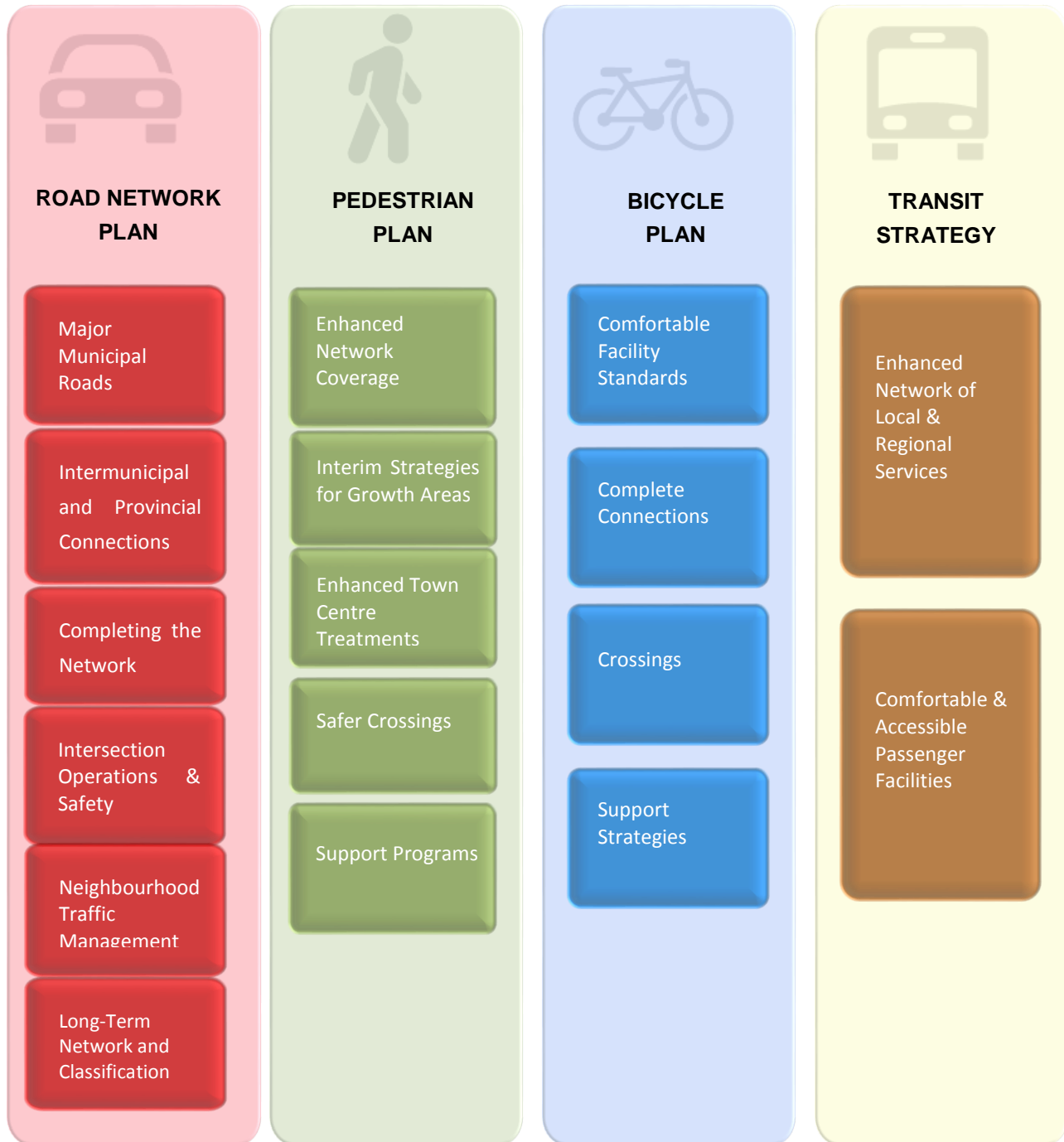
The Strategic Transportation Plan (STP) presents a comprehensive review of all aspects of the transportation system in Maple Ridge in an effort to shape and support planned growth over the next 20 years. In this regard, the Plan provides a clear vision of the multi-modal transportation system to serve local and inter-municipal travel for residents and businesses of the city in the long-term. The Plan also provides a strategy in which to get there over the next two decades.

The STP is separated into distinct parts for each mode of transportation as follows:

- **Road Network Plan** identifies the City's long-term network strategy and improvements based on a comprehensive evaluation of long-term options and input received from stakeholders. These improvements range from new roadway corridors through to minor intersection improvements to address localized operational issues.
- **Bicycle Plan** includes a review of existing and proposed bicycle routes and identifies potential changes to the long-term cycling network to meet the needs of the city's cyclists.
- **Pedestrian Plan** identifies facilities and programs needed to make walking within the city an important component of the transportation system. The Plan is designed to augment the existing sidewalk system by defining key pedestrian areas of the city where sidewalks are needed and the general level of treatments needed to make walking attractive and comfortable in the highest activity areas.
- **Transit Strategy** provides broad direction on long-term services within the city to support and guide TransLink's service planning initiatives. In addition to outlining the overall structure of services that will be desirable to support compact urban growth within the core areas of the city, the Strategy outlines support facilities needed to enhance the customer experience at transit stops and through transit priority treatments along congested areas of the network.

Within each strategic area of the Strategic Transportation Plan, there are specific themes that are presented to support the goals and objectives of the Plan as illustrated on the following page in **Figure 1**.

**Figure 1: Key Features of the Plan**





## 2.2 Study Process

The development of the Strategic Transportation Plan has involved an in-depth review of the existing transportation system in Maple Ridge, and consultation with City staff and community members to identify key issues affecting the city. These issues have been used to direct the identification and evaluation of various improvement strategies for all modes of travel, which have been refined through further consultation to develop the long-term plan. Further, the Strategic Transportation Plan contains an implementation and phasing strategy to identify priorities and a timeline for completion of the improvement strategies, taking into consideration the financial resources available to the City.

Key consultation activities included:

- **Public ‘open houses’.** The first open house was held at the Haney’s Farmers Market on Saturday, **September 8<sup>th</sup> 2012**, where a booth was set up, allowing residents to directly engage with consultants and view panel boards on the transportation system. The purpose of hosting the booth was to gather input on key transportation issues facing the community from residents, and to solicit ideas on potential improvements. Dozens of people circulated through the booth, and surveys were also available at the booth to provide community members an additional opportunity to provide feedback. A second open house was held on **May 22, 2013** at the Municipal Hall, with boards and panels presenting the key features of the Draft Strategic Transportation Plan. In addition to meetings with the broader community, extensive input and guidance was provided by the Bicycle Advisory Committee from the outset of the process. A meeting was also held with the Bicycle Advisory Committee in **May 2013**.
- **Survey.** An online survey was available through the city’s website from **September to October 2012**, in order to gather feedback on existing transportation issues and priorities from Maple Ridge residents. A total of 100 survey responses were received, and over 92% were from residents or business owners in Maple Ridge.
- **Staff Workshops.** Two interactive workshops were held with City staff, representing several municipal departments. The first workshop was held on September 25, 2012 and focussed on walking and cycling. The second workshop was held on October 3, 2012 and focussed on transit and the road network. The purpose of the workshops was to review the 2004 Transportation Plan findings, and then to explore ideas and opportunities with staff for the Strategic Transportation Plan update, as well as key improvement and transportation priorities for the future.





## Chapter 3

# Directions



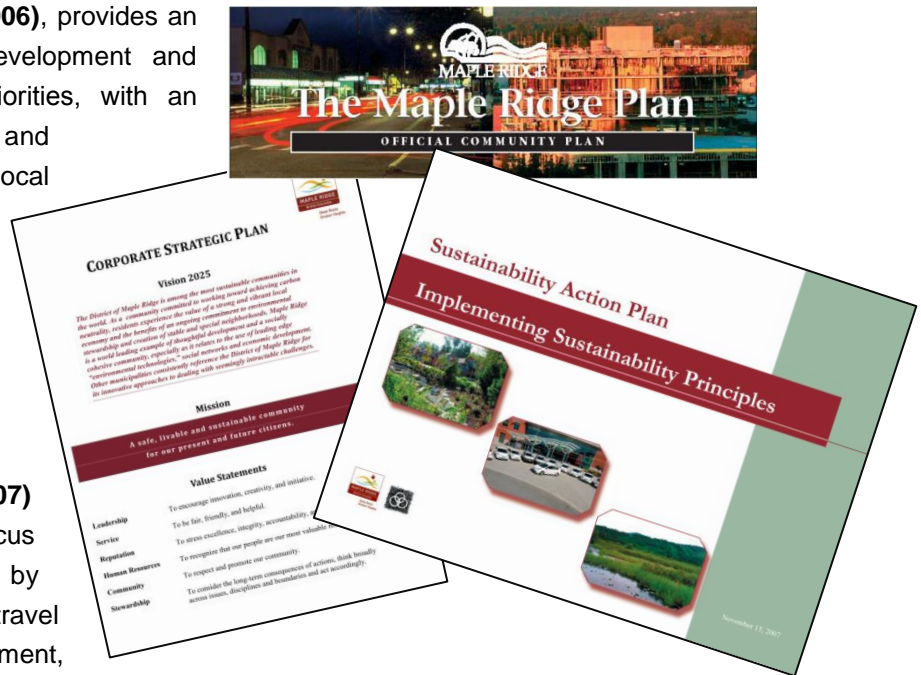


The City has made significant advancements and commitments to livability and sustainability policies and practices through a variety of initiatives in recent years. There are a number of overarching local, regional and provincial plans and policies that have shaped the overall direction of the Strategic Transportation Plan as well as specific initiatives at the neighbourhood level that have influenced the plan, as described below.

### 3.1 Municipal Directions

The City's **Official Community Plan (2006)**, provides an overarching vision for growth and development and speaks to the city's transportation priorities, with an emphasis on with more active and sustainable transportation options for local trips. The OCP policies emphasize an integrated and multi-modal transportation network, supported by active transportation corridors, better transit, and strong regional road connections.

The **Corporate Strategic Plan (2007)** includes transportation as a strategic focus area, and with a 2025 vision supported by multi-modal accommodation, alternative travel options, transit-oriented development, improved road and rail movements, and a walkable downtown.



Following up on this corporate initiative, the City's **Sustainability Action Plan (2007)** builds on the transportation vision for 2025 and identified next steps in increasing transportation choices, including the initiative to create an Active Transportation Plan and a community-wide Smart Commute Program. In general, since the adoption of many of these documents, several major projects have been completed that impact the transportation network in and around the city. These major projects include the Golden Ears Bridge, the new Pitt River Bridge, and the Port Mann / Highway 1 improvements and South Fraser Perimeter Road project.

The City surveys citizens every three years to gain input on municipal services, with the most recent being the **2012 Citizen Survey**. The City has been able to identify key themes on transportation from resident's feedback, which also provides direction into the Strategic Transportation Plan process. In particular, residents indicated that public transit improvements between Maple Ridge and other areas of Metro Vancouver were identified by almost 70% of residents as a high priority when planning for the future.

There have been several initiatives at the neighbourhood level on transportation and road safety. This includes the **Neighbourhood Traffic Calming Program** which focuses on the use of traffic management measures to slow, reduce and/or re-route traffic on local neighbourhood streets. The **Neighbourhood Traffic Safety Campaign** is a resident-run program aimed to inform motorists to slow down and bring education around local street safety. Likewise, the **Speed Watch Program** involves the use of portable radar equipment and electronic signs to remind drivers of their speed and to bring awareness of traffic safety. The **Safer City** October 2014



**Program**, which is a partnership between the City, RCMP, School District No. 42, ICBC, and residents to incorporate road safety into city initiatives, making road safety a priority in the community. The program focuses on achieving safer roads for all road users including motorists, cyclists, and pedestrians. The City also administers the **Safer School Travel Program** to assist parents in developing safer school travel plans for schools, identifying traffic issues and developing a range of tools to reduce problems around school areas.

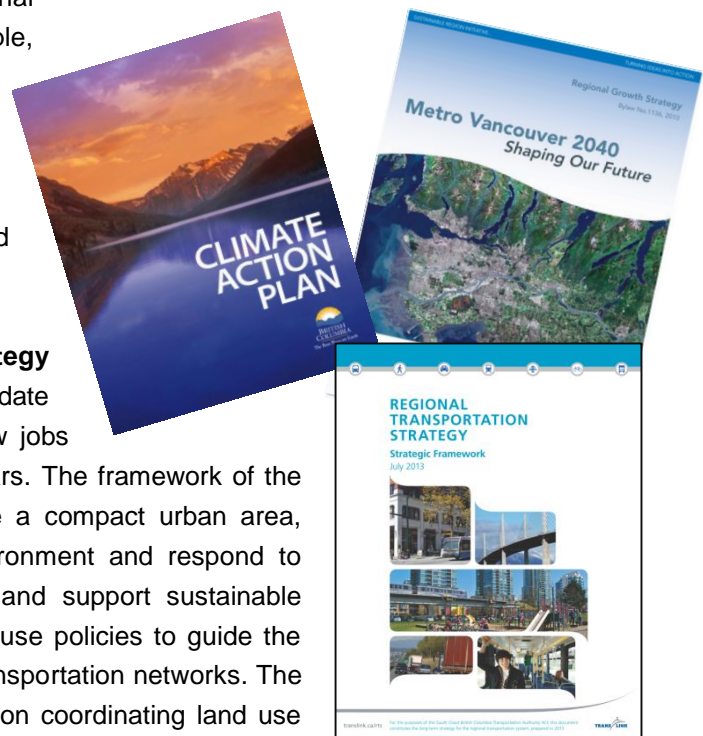
### 3.2 Regional & Provincial Directions

In addition to key municipal plans and policies, the Strategic Transportation Plan is also influenced by several other provincial and regional planning initiatives, including:

**Provincial Government's Climate Action Charter (2007)** was developed with the Union of BC Municipalities, with almost all BC municipalities pledging to be carbon neutral by 2012, committing to measuring and reporting on their community GHG emissions profile, and working to create compact, more energy efficient communities. The subsequent **Climate Action Plan (2008)** sets targets for the province to reduce its GHG emissions by 33% from 2007 levels by 2020, and by 50% by 2050. As on-road transportation is the largest contributor of community GHG emissions in Maple Ridge, the Strategic Transportation Plan update can play a key role in helping to achieve significant GHG reductions.

The **Provincial Transit Plan (2008)** seeks increased transit ridership by increased travel choices, with new fleets, green technology, new rapid transit lines, and new innovative services. The Evergreen Rapid Transit Line is part of this Plan, which would enhance regional connections for Coquitlam and adjacent municipalities such as Port Coquitlam, Pitt Meadows, and Maple Ridge. Lastly, the **2003 Gateway Program** was established by the Province to address regional congestion, and to improve the movement of people, goods and transit throughout Metro Vancouver. Relevant projects within the program that broadly impact the Maple Ridge transportation network include the Pitt River Bridge & Mary Hill Interchange, the South Fraser Perimeter Road, and the Port Mann/Highway 1 Improvement Project.

Metro Vancouver's 2011 **Regional Growth Strategy (RGS)**, provides a framework on how to accommodate an additional one million people and 600,000 new jobs expected in Metro Vancouver over the next 30 years. The framework of the RGS is focussed on the five key goals to create a compact urban area, support a sustainable economy, protect the environment and respond to climate change; develop complete communities; and support sustainable transportation choices. The RGS focuses on land use policies to guide the future development of the region and to support transportation networks. The transportation-related directions of the RGS focus on coordinating land use and transportation to support sustainable modes, and the safe and efficient movement of vehicles for people, goods and services. Identified as a regional city centre, the role of Maple Ridge is as a regional transportation hub within TransLink's Frequent Transit Network strategy. Transit



priority measures include enhanced serve between the centres of Maple Ridge and Langley, and additional transit-supportive infrastructure. For all Metro Vancouver member municipalities, including Maple Ridge, the strategies and actions of the RGS require land use planning and collaborative action to ensure the safe and efficient movement of people and vehicles throughout the region.

**TransLink** has a long-range transportation strategy, **Transport 2040**, for the Region, which provides a framework to accommodate growth. Transport 2040 lays out the challenges facing Metro Vancouver over the next 30 years and contains a set of goals for the future, including that the majority of trips (>50%) are by transit, walking, and cycling. These goals and other supportive land use and transportation goals can only be met through collaboration with municipalities throughout the region. TransLink recently updated Transport 2040 with the Regional Transportation Strategy (RTS). Further, TransLink's **Regional Cycling Strategy (2011)** provides guidance on how cycling can contribute to realizing the goals of Transport 2040. The Strategy focuses on the functionality of the cycling network, bicycle parking, end-of-trip facilities, education initiatives, encouragement strategies, enforcement and legislative approaches. Ultimately, the Regional Cycling Strategy provides a unified regional framework from which all partners and Metro Vancouver members can draw relevant strategies and actions for incorporation into their own transportation plans and programs.

### 3.3 Goals & Objectives – Directions for the Strategic Transportation Plan

The goals and objectives for the Strategic Transportation Plan are designed to provide the foundation for planning the city's transportation system. Goals are broad statements of general direction, whereas objectives are more precise statements of how a goal is to be achieved. Generally, goals may be considered as longer term and objectives as shorter term. The four goals for the plan highlighted below outline the broadest aspirations for the transportation system and are supported by more specific expectations and intentions in the form of objectives.



**Figure 2: Transportation Plan Goals and Objectives**

<b>GOAL #1 - ACCESS &amp; MOBILITY</b> <b>Provide for safe, convenient and accessible movement of people, goods and services throughout the city.</b>		
<b>1.1</b>	Move People, Goods & Services	Evaluate the performance of the transportation system in terms of people movement and goods movement, not just vehicles.
<b>1.2</b>	Promote Accessibility	Ensure that the transportation system is accessible to individuals of all ages and physical abilities.
<b>1.3</b>	Develop multi-modal networks	Develop networks of streets, trails and pathways suited to each mode of travel and for people of all abilities.
<b>1.4</b>	Enhance Safety	Continue to address long-term safety of the city's roadway network.
<b>1.5</b>	Support Regional Connections	Support development of efficient connections between Maple Ridge, key gateways and other regional nodes – such as the Pitt Meadows Airport – to enhance regional mobility.
<b>1.6</b>	Develop Efficient Roadways	Maximize efficiencies of the existing roadway network where possible and plan for new corridors to serve growing areas of the city.
<b>1.7</b>	Maintain Emergency Access	Maintain and improve access for emergency vehicles to all neighbourhoods.
<b>GOAL #2 - TRANSPORTATION CHOICE</b> <b>Provide residents and visitors with attractive choices for moving around the city and connecting with other areas of Metro Vancouver.</b>		
<b>2.1</b>	Integrate Travel Modes	Plan for the integration and balance for all modes on most urban streets within the city.
<b>2.2</b>	Promote Regional and Local Transit Connections	Ensure that the long-term transit system provides attractive options to connect Northeast Sector communities and those South of the Fraser, in addition to meeting needs for local travel.
<b>2.3</b>	Promote Cycling	Expand the network of cycling routes within the city and connections to nearby municipalities.
<b>2.4</b>	Enhance Walking	Provide attractive pedestrian facilities in key pedestrian areas and provide for safe facilities along corridors for growing areas.
<b>2.5</b>	Explore Mobility River Choices	Maintain long-term potential for moving people and goods on the Fraser River.

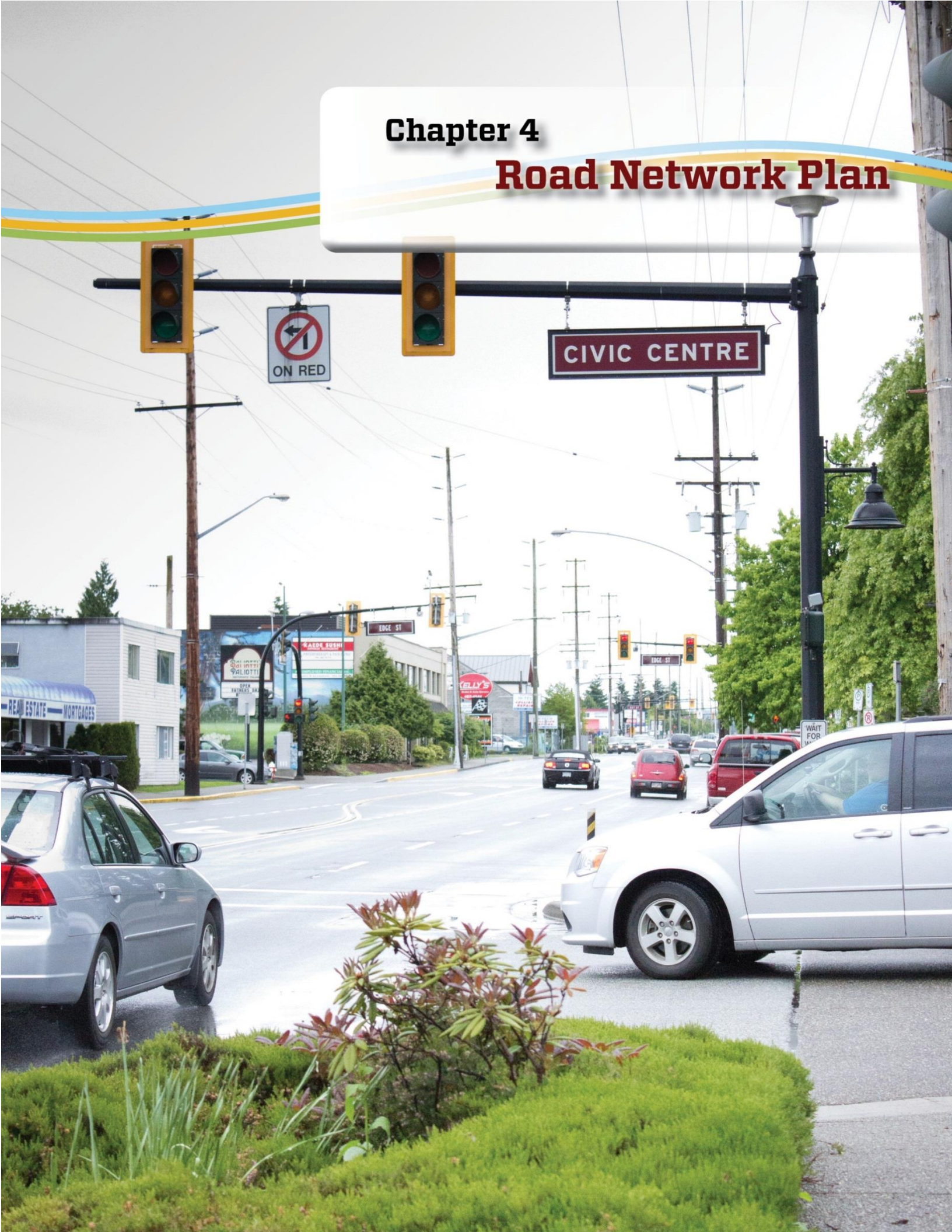
**Figure 2 (Cont'd): Transportation Plan Goals and Objectives**

<b>GOAL #3 - COMMUNITY &amp; ENVIRONMENT</b>		
<b>Provide transportation infrastructure and services that enhance quality of life in Maple Ridge and the quality of the natural environments in the city.</b>		
<b>3.1</b>	Maintain the Road Network Hierarchy	Confirm the long-term classification of roadways that will support the movement of inter-municipal travel, trips between communities within the city and local serving roads that will discourage non-local travel.
<b>3.2</b>	Coordinate with Growth Plans	Ensure that the transportation system serves and supports growth plans within the city and work with the Ministry and TransLink to support regional travel demands.
<b>3.3</b>	Preserve Natural Areas	Minimize impacts on and even enhance natural environments within the city.
<b>3.4</b>	Minimize Emissions	Develop a transportation system that minimizes impacts on the air quality within the city by supporting walking, cycling and transit.
<b>3.6</b>	Support Healthy Lifestyles	Promote walking and cycling where possible to enhance overall quality of urban areas within the city and support healthy living.
<b>GOAL #4 - AFFORDABLE TRANSPORTATION SYSTEM</b>		
<b>Provide transportation infrastructure and services in a cost-effective and efficient manner that makes best use of existing facilities and projected resources.</b>		
<b>4.1</b>	Minimize Infrastructure	Identify cost-effective investments in transportation where the benefits will support the costs.
<b>4.2</b>	Maximize Efficiency	Maximize opportunities to improve existing infrastructure before investing in new facilities and to coordinate rehabilitation with new capital projects.
<b>4.3</b>	Prioritize Transit	Prioritize investments in transit services and facilities that will enhance the overall experience for customers.



## Chapter 4

# Road Network Plan



The most prominent mode of transportation for residents of Maple Ridge is the private automobile. As is the case in most other communities in Metro Vancouver, over 85% of all trips generated from the city are made by car. Maintaining an efficient and well planned road network to serve local travel as well as inter-municipal connections is a priority for Maple Ridge. The Road Network Plan is designed to support all modes of travel, including general purpose traffic, goods movement, transit, walking and cycling. In most communities in North America however, motor vehicles are often given preferential treatment on the roadway network, sometimes at the expense of walking, cycling or even transit. In general, roads in Maple Ridge serve two primary objectives, which are to provide *accessibility* to individual parcels of land and to offer *efficient mobility* to road users.

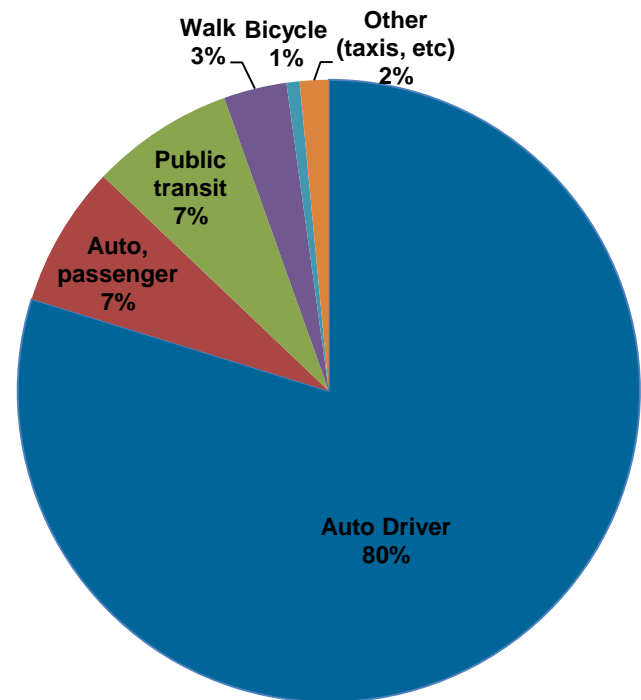
This section of the Strategic Transportation Plan (STP) presents long-term directions for the multi-modal road network in Maple Ridge.

#### 4.1 Shaping Influences and Challenges on the Road Network

There are many issues facing the city's roadway network today and over the next 20 years. Discussions with community stakeholders and a technical review of current and forecast traffic conditions provides insights into the shaping influences on the road network as well as the long-term challenges as briefly highlighted below.

- The network of arterial, collector and local roads within the south-west areas of the city is dense, while the northern and eastern areas are less established (see **Map 1**). The roadway network within the city consists of one Highway along with several major arterial roadways, collectors as well as local streets serving and connecting neighbourhoods. Within the urban areas of the city, the network is generally well developed. In the eastern and northern areas such as in Silver Valley and Cottonwood, the network is concentrated on a few primary roadways and is discontinuous in several locations as a result of significant natural and topographical barriers.

**Daily Travel Mode Choice from Maple Ridge**



##### Shaping Influences and Challenges on City Roads

- Network classification and continuity
- Neighbourhood traffic conditions and impacts
- Existing delays and congestion
- Growth in east-west traffic
- Operational and safety at major intersections
- Silver Valley growth and network expansion
- Town Centre area network congestion
- Waterfront access

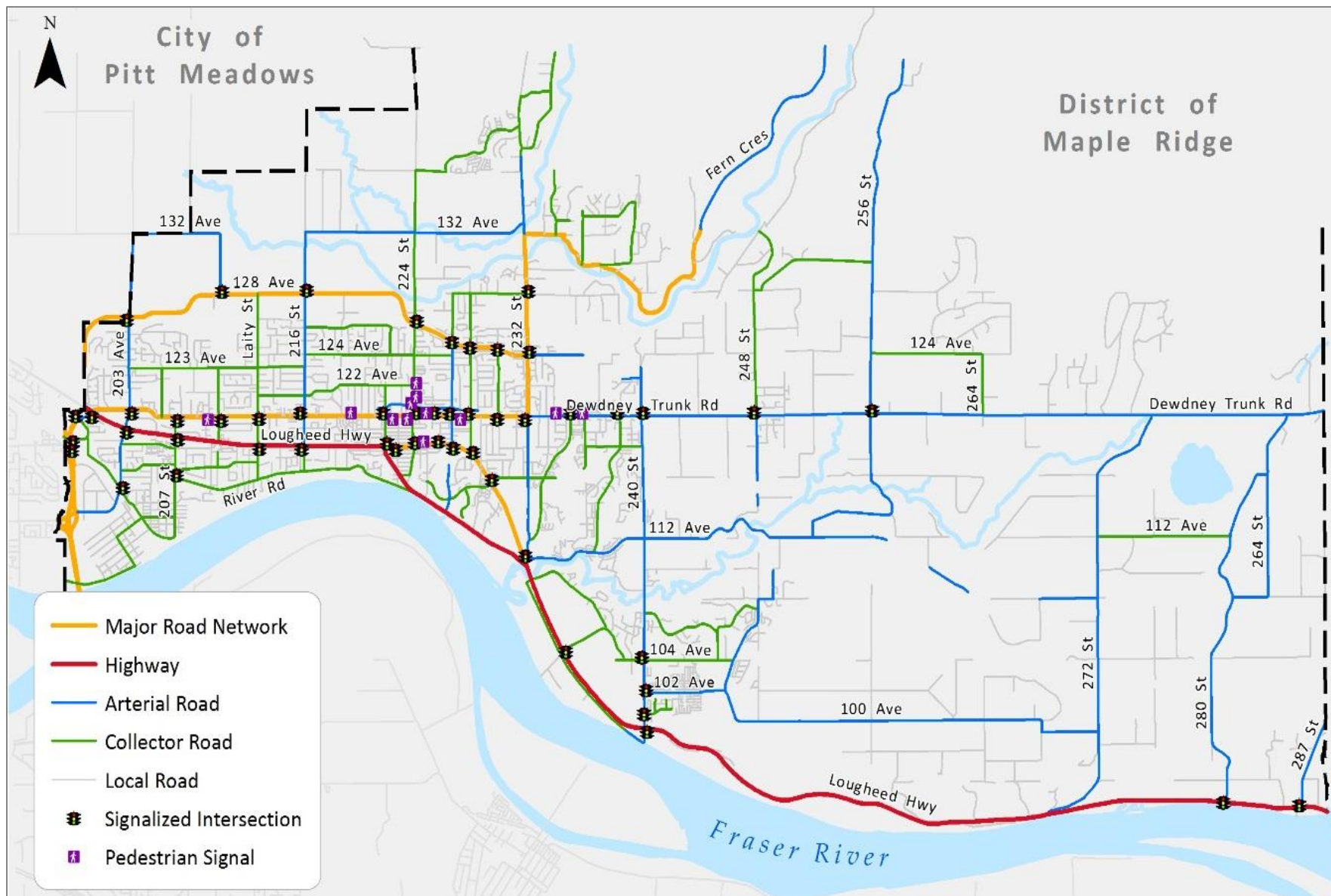


The Ministry of Transportation and Infrastructure (MoTI) is responsible for the primary east-west route through Maple Ridge – Lougheed Highway / Haney Bypass – which is generally a two to four lane corridor connecting Highway 11 in the east to the Mary Hill Bypass and Highway 1 in the west. The Haney Bypass is part of the Provincial Highway system through Maple Ridge, connecting Lougheed Highway on the east and west sides of the Town Centre area. Dewdney Trunk Road, 128/Abernathy, 232 Street, 132 Avenue, Fern Crescent and portions of Lougheed Highway are all part of the Major Road Network (MRN) that serve regional traffic, transit and goods movement. These roadways are owned by the City and jointly operated with cost-sharing on maintenance and rehabilitation from TransLink. The east-west major roadways serve a large portion of inter-municipal travel between the city and other Northeast Sector communities and South of the Fraser River via the Golden Ears Bridge.

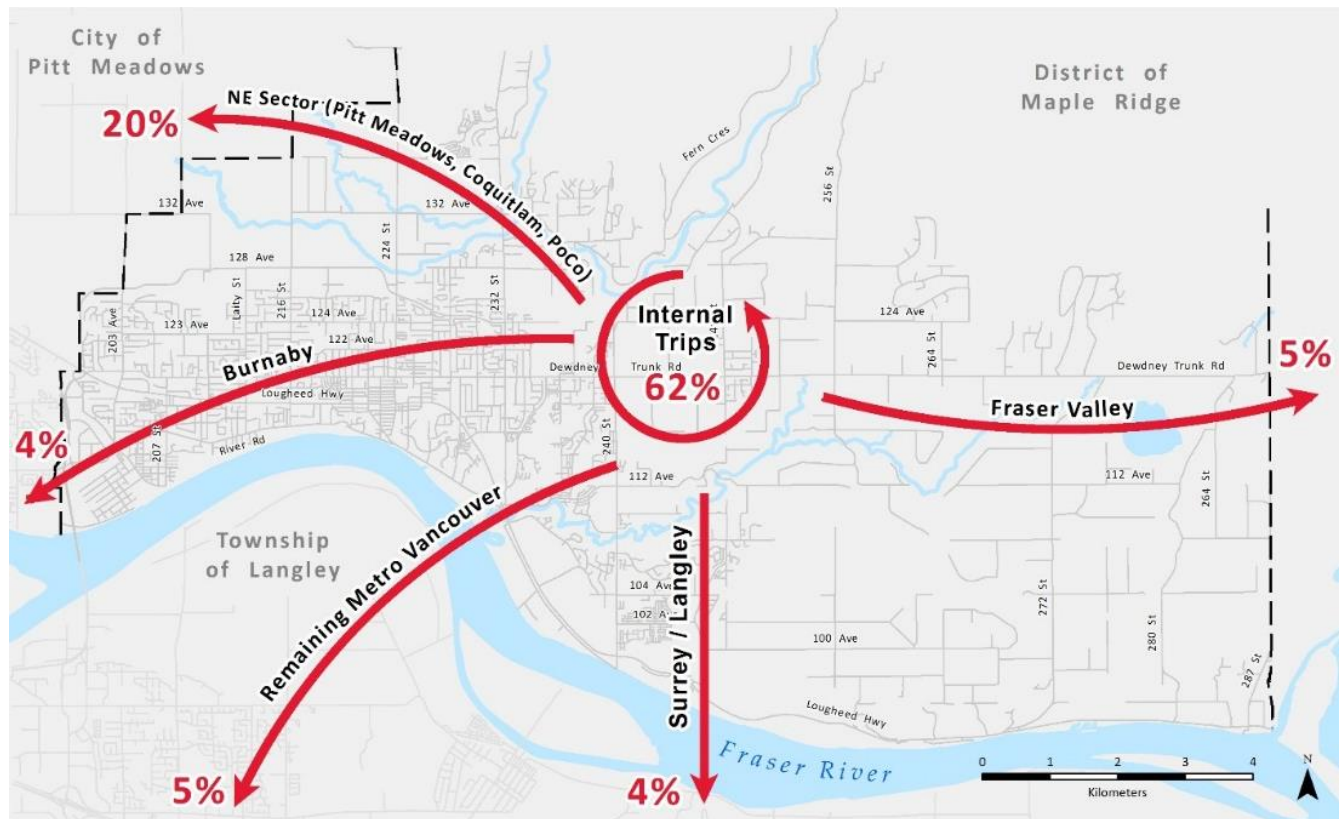
With a majority of local and regional travel being accommodated on a select number of major roads today and in the long-term, the STP will explore and identify potential improvements and new corridors to accommodate overall growth and development.

- **The majority of daily vehicle trips generated from within Maple Ridge stay within the city (see Map 2).** On average, over 60% of vehicle trips that originate within Maple Ridge have a destination within the city, while 20% have a destination in the Northeast Sector including Pitt Meadows, Port Coquitlam and Coquitlam. Approximately 8% of daily vehicle trips are destined for Surrey/Langley and Burnaby, and the remaining trips are distributed between Vancouver, Richmond, Abbotsford and New Westminster.

**Map 1: Existing Roadway Classifications & Signalized Intersections**



**Map 2: Daily Travel Patterns from City of Maple Ridge**



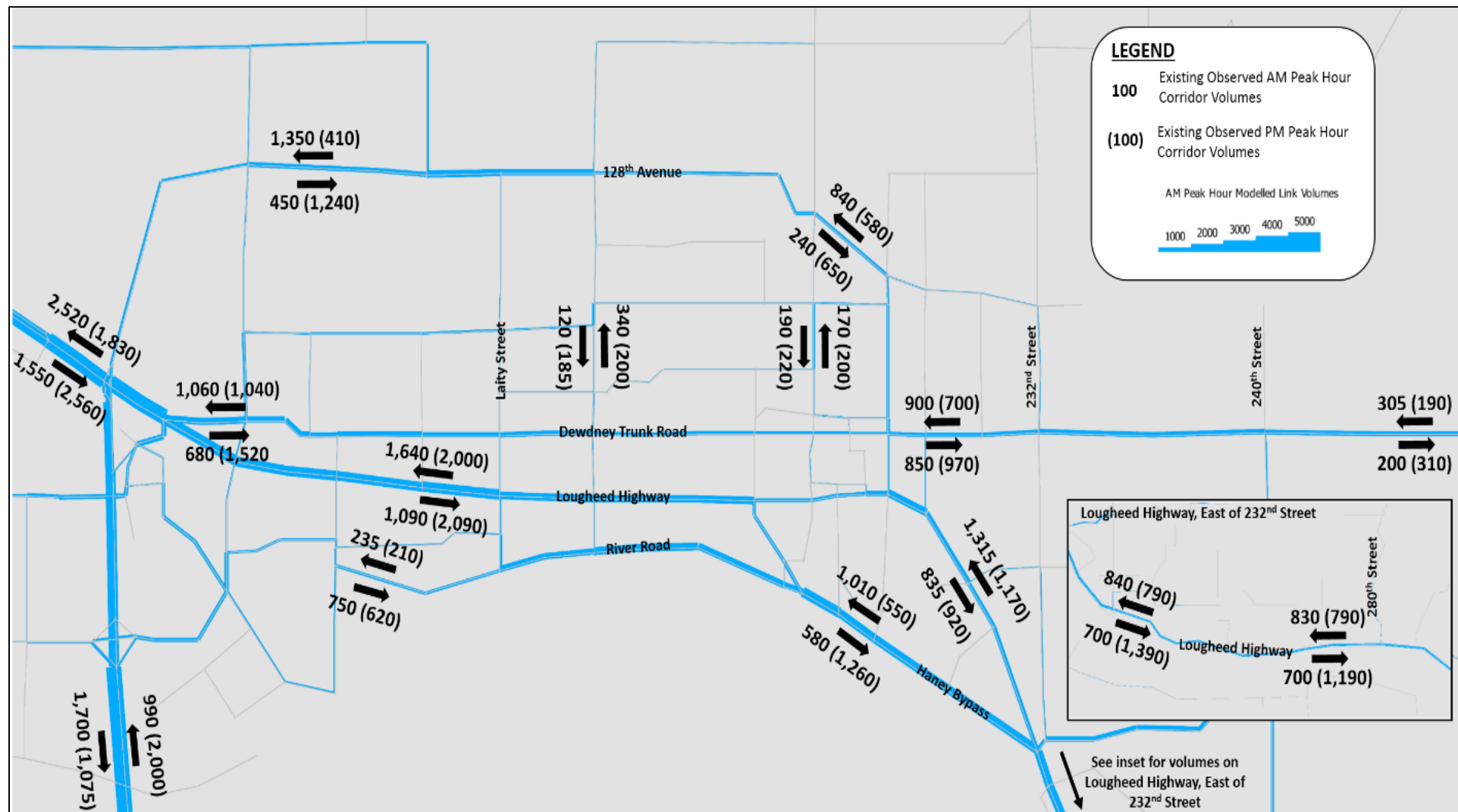
(Data Source: 2008 Regional Household Travel

- **East-west roadways carry the majority of traffic.** As expected, the predominant flow of traffic across the city is concentrated on the east-west corridors of Lougheed Highway and Dewdney Trunk Road as well as 128 Avenue / Abernathy Way to lesser degree. As highlighted in **Map 3**, all three corridors carry up to 4,700 vehicles per hour in the peak directions in the western areas of the city. Peak directional traffic is slightly lower on the east side of the city where Lougheed Highway, Haney Bypass and Dewdney Trunk Road collectively carry less than 3,000 vehicles per hour in the peak directions. Externally, it is estimated that over 70% of all vehicle trips entering and leaving the city to the west using Lougheed Highway and Dewdney Trunk Road and approximately 30% are going to and from the south across the Golden Ears Bridge. Although the Golden Ears Bridge can serve more than 4,000 vehicles per hour per direction, the capacity of east-west corridors is obviously very critical for externally generated vehicle and transit travel.

Within the STP, long-term growth along these major roads within the city will be forecast along and potential improvement strategies will be explored to address areas of significant delay and congestion.

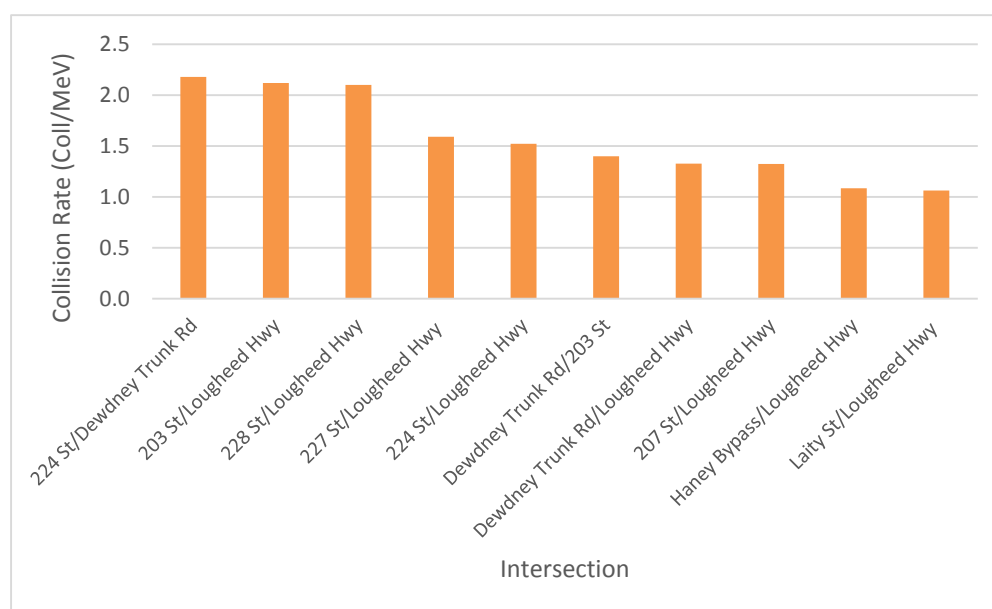


**Map 3: AM (PM) Peak Hour Corridor Traffic Volumes**



- Lougheed Highway intersections have the highest collision rates in the city.** ICBC collects and maintains statistics for all reported collisions in British Columbia. The collisions are classified based on the type of collision as follows: fatality, injury, or property damage only, and also include reported collisions involving pedestrians or cyclists. As shown in **Figure 3**, the highest collision rates throughout the city are generally found at intersections with moderate collision rates on the Lougheed Highway and Dewdney Trunk Road (with rates of anywhere from 1.0 to over 2.0 collision per million vehicles). These corridors and intersections also accommodate the highest traffic volumes in the city.

**Figure 3: Collision Rates of Top Collision Prone Intersections**

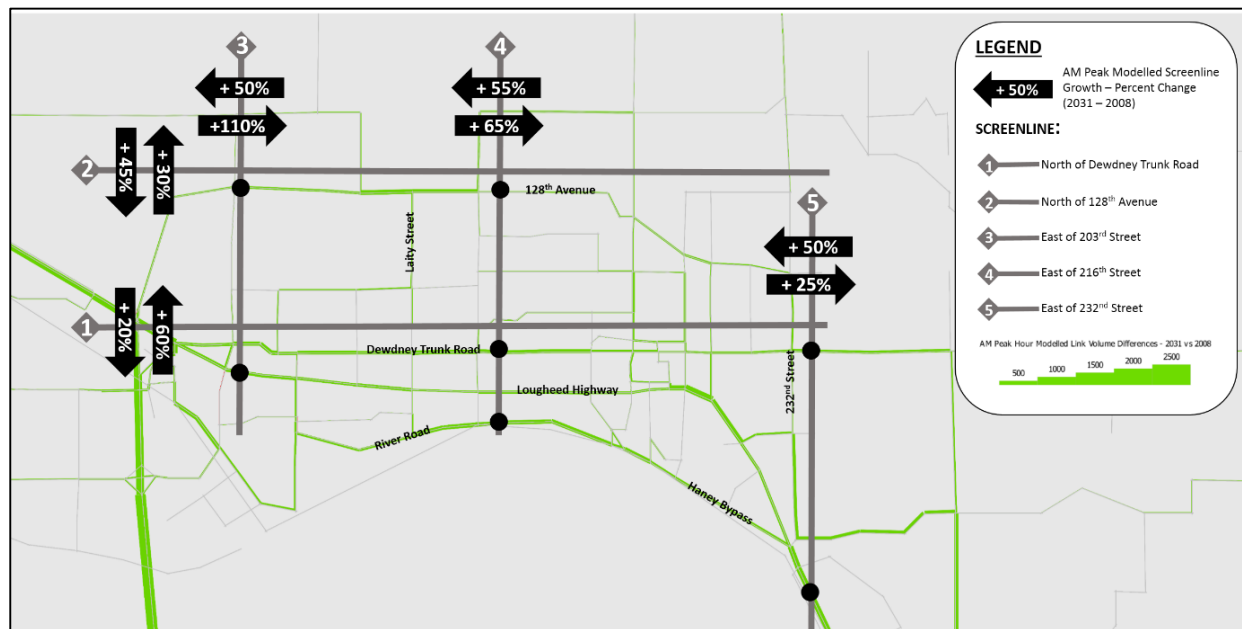


(Data Source: ICBC Safety Data 2007 to 2011)

- Local and regional growth will influence travel patterns and traffic conditions.** Over the next 20 years, population and employment growth within the city and externally will result in increased traffic and congestion. **Map 4** illustrates the percent increase in the morning peak hour traffic crossing key screenlines along major roads in the city. In the western areas where traffic volumes are highest, peak directional traffic demands are projected to increase by 100% over the next 20 years. In other words, westbound peak hour traffic volumes could increase from approximately 4,500 vehicles to over 9,000 vehicles by 2031. In the eastern areas of the city, peak hour traffic is projected to increase by 50% over the same timeframe, placing greater pressure on fewer east-west corridors. Within the core areas of the city, north-south traffic demands are projected to increase by approximately 45% over the next 20 years.

Without improvements to the major roadways in Maple Ridge, the projected growth levels will continue to place greater pressure on a select number of existing roadways that are currently experiencing moderate to more significant delays and congestion, such as along Lougheed Highway, Dewdney Trunk Road and 128 Avenue/Abernethy Way.

**Map 4: AM Peak Hour Traffic Growth by Screenlines Across Key Corridors**



- **Signalized intersections along key east-west corridors will continue to experience increasing delays during peak periods.** Today, signalized intersections are the source of most delay experienced on urban roadways and which are typically measured in terms of Level of Service (LOS). LOS A suggests that there is no delay and LOS F indicates the intersection is failing and that drivers will experience significant delay and vehicle queues. For planning purposes, a LOS D or better is generally used as the minimum target.

Today, most signalized intersections in Maple Ridge are operating at a LOS A to C during the PM peak hour indicating that there are modest levels of delay at many intersections. The primary exceptions occur along Lougheed Highway at 203rd Street, 222nd Street, and Haney Bypass and 232nd Street where delays are more significant during the PM peak hour. Planned growth within and around the city will place greater pressures on the existing roadway network, resulting in greater delays at these and other signalized intersections. In particular, the delays and congestion will worsen along Lougheed Highway and Dewdney Trunk Road. **Map 5** summarizes the existing and forecast PM peak hour intersection levels of service on the left and right sides respectively.



**Map 5: Existing and Forecast 2030 Intersection Levels of Service**



- Growth from the Silver Valley area** is placing greater pressures on an evolving road network to serve the area, and lack of facilities for pedestrians and cyclists make the experience of walking and riding within Silver Valley uncomfortable. The Silver Valley area is approximately 40% developed and is principally served by two lane major roadways such as Fern Crescent, 132 Avenue, 136 Avenue and 224 Street. As of 2013, there were approximately 1,700 homes located within the Silver Valley area of the 4,200 planned units. When Silver Valley is completely developed, the area will generate approximately 3,500 vehicle trips – primarily from the areas east of 232 Street. The STP examines growth pressures on existing major corridors and explores alternative routes to provide capacity and access to the Silver Valley area such as the 240 Street crossing of the Alouette River in addition to emergency vehicle access. In addition to the long-term road capacity needed to serve the area, increased traffic on rural roadways serving the Silver Valley makes it challenging for pedestrians and cyclists along these access routes where there are limited shoulders, lighting and separation from increasing traffic volumes.
- Traffic congestion within the Town Centre.** As growth throughout the city occurs, the primary corridors in the downtown areas of Maple Ridge are serving regional and city-wide travel as well as vehicle trips to, from and within the Town Centre area. In particular, delays and congestion in the downtown area has been a historical issue for residents and business owners. While there is a desire to improve traffic in the core area, there are also concerns about the potential impacts that these

changes may have on the downtown area. For example, one way couplet systems along Dewdney Trunk Road and either Lougheed Highway and Brown Avenue have been identified in past as potential strategies to address area delays and congestion. Although these strategies would potentially reduce delays, the provision of one-way couplet system would generally make access to and driving around the core area of Maple Ridge more difficult. In fact, business owners in some cities where one-way couplets exist are trying to remove them because they make circulation within downtown areas more difficult and can create barriers out of some roadways for pedestrians and cyclists. Rather than examine potential couplet systems for the Town Centre area, improvements to alternative corridors are explored as part of the STP in order to accommodate growth in regional and city-wide traffic.

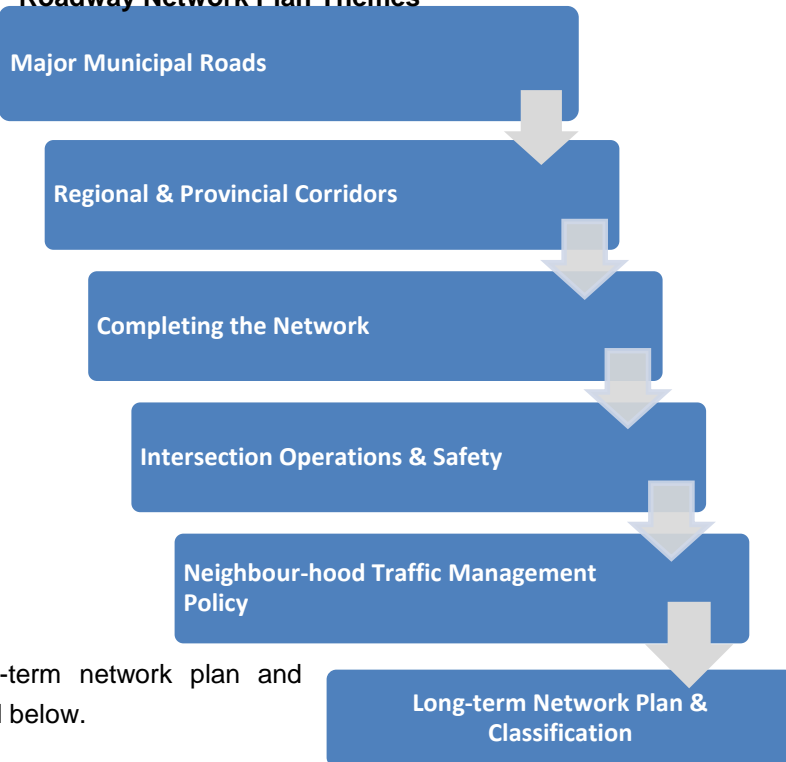
- **Neighbourhood traffic concerns.** With population and employment growth in the city over the last decade, residents living on some collector and local roads are experiencing the impacts of increased traffic volumes and in some cases speeding and short-cutting. For those areas without sidewalks, the impacts of increased traffic volumes are more pronounced as comfort and safety of residents have become a primary concern. In a parallel process to the STP, neighbourhood traffic management strategies are identified to support and maintain quality of life for residents living on collector and local roads. Additionally, pedestrian and cycling facilities are identified as part of the STP for major roads throughout much of the city.
- **Limited alternatives to access the industrial areas along the waterfront south of the CPR corridor.** Some of Maple Ridge's industrial areas – namely the Hammond and Albion areas – are located south of the CPR Mainline, which traverses the city from west to east along the Fraser River. Because there are no grade-separated crossings into and out of these areas, access can be interrupted by passing trains. With increased train activity, the movement of people, goods and services to the waterfront area are impacted.
- **Impacts of heavy truck traffic on rural roads.** A majority of heavy truck trips are generally concentrated on the Lougheed Highway, as it is the primary through route in Maple Ridge and connection with the industrial areas along the waterfront. Beyond this east-west connection across the city, the Major Road Networks within the city are also considered truck routes as regional serving roadways. Although trucks generally utilize the arterial road system, gravel operations and other light industrial uses at the north end of 256<sup>th</sup> Street impact comfort and safety of other modes along the corridor and rural residential properties located south of 130<sup>th</sup> Avenue. Segments of the 256<sup>th</sup> Street corridor contain a separated pathway facility for pedestrians and cyclists as well as equestrian users.

## 4.2 Long-term Road Network Plan

The roadway network in Maple Ridge serves all modes of travel and forms the structure of the transportation systems for cars, trucks, transit, cyclists and pedestrians. Over the next 20 years or so, the roadway network challenges facing the City of Maple Ridge must be addressed with a combination of major and minor improvement strategies that also consider and support other goals for walking, cycling and transit for travel within and outside the community.

The long-term Road Network Plan and network classification system is shaped by the existing conditions and long-term pressures previously described. The Plan identifies a range of strategies from managing neighbourhood traffic to widening and developing new corridors to support growth and development. The improvement strategies may be examined in combination with treatments for pedestrian and bicycle facilities described subsequent sections of the Strategic Transportation Plan. The Road Network Plan is presented in six parts that progress from the major corridor improvements through to the local area initiatives. These improvement strategies are integrated into the long-term network plan and classification system as briefly highlighted below.

### Roadway Network Plan Themes



1. **Major Municipal Roads** will include improvements to the city's arterial and Major Roadway Network. These improvement strategies include both corridor widenings as well as provision of new connections that may be preserved for the very long-term (beyond 20 years).
2. **Regional and Provincial corridors** are principally focused on Lougheed Highway as a Provincial responsibility. Although improvement opportunities for the Lougheed Highway are identified in general terms, the City of Maple Ridge will want to support and work with the Ministry of Transportation and Infrastructure (MoTI) to advance these potential projects. Additionally, connections with Pitt Meadows are also identified to serve local needs and to support external area transportation network improvements.

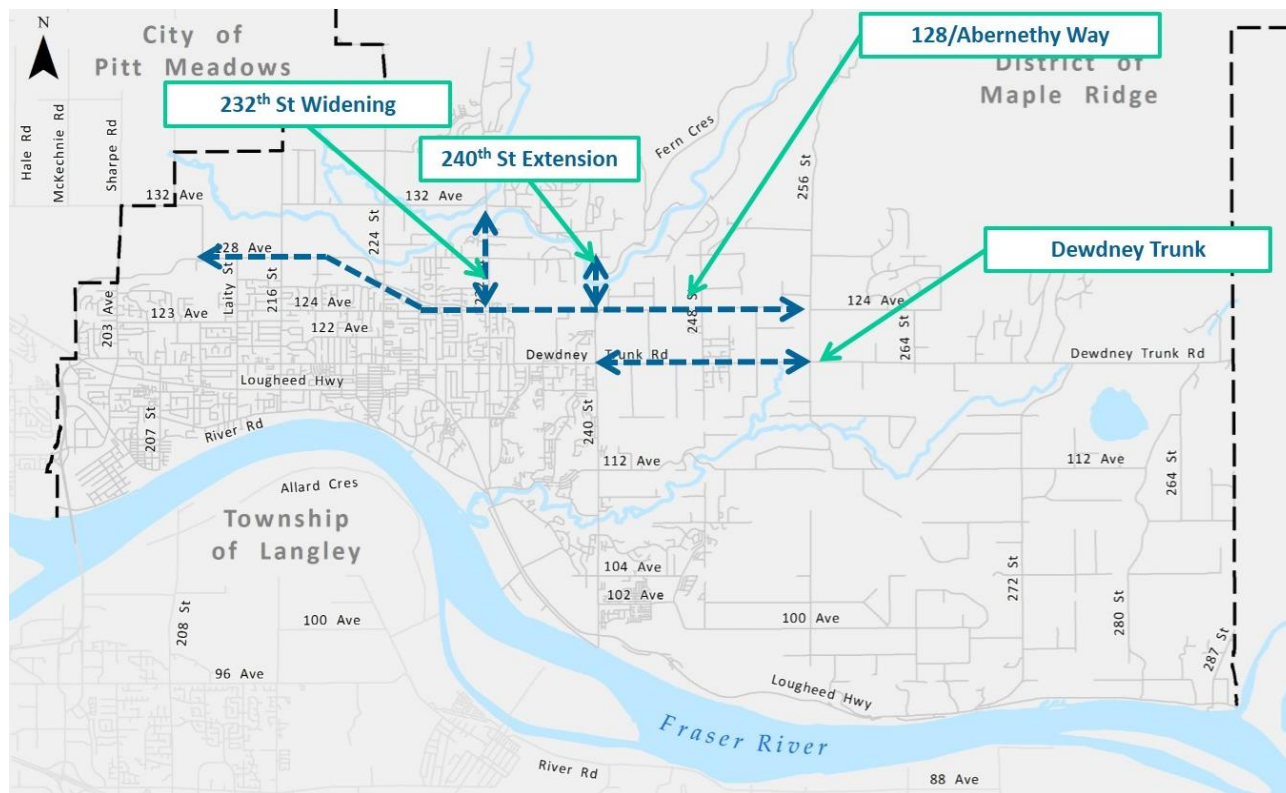


3. **Completing the network** in what are now rural areas of the city, only if and when development occurs, in order to provide access to areas such as to serve Thornhill and Kwantlen in the long-term.
4. **Intersection operational and safety improvements** located along the municipal and provincial roadway system within Maple Ridge are identified for further review by the City in connection with the MoTI as well as ICBC.
5. **Neighbourhood traffic calming policy** created in 2004 was revised in 2012 through a parallel initiative to the STP in order to maintain quality of life and safety on local and collector streets.
6. **Long-term Network Plan and Classification** that captures the historical and projected role and function of roadways within the city and highlights the new connections identified within the Strategic Transportation Plan.

#### 4.2.1 Major Municipal Roads

As part of the long-term Road Network Plan, several major municipal road improvement strategies are explored and recommended as illustrated in **Map 6**. These improvements include both road widenings as well as new corridor connections to serve growing areas of the city and to form the foundation of the city's major corridors for the long-term Road Network Plan.

**Map 6: Candidate Major Municipal Road Improvements**

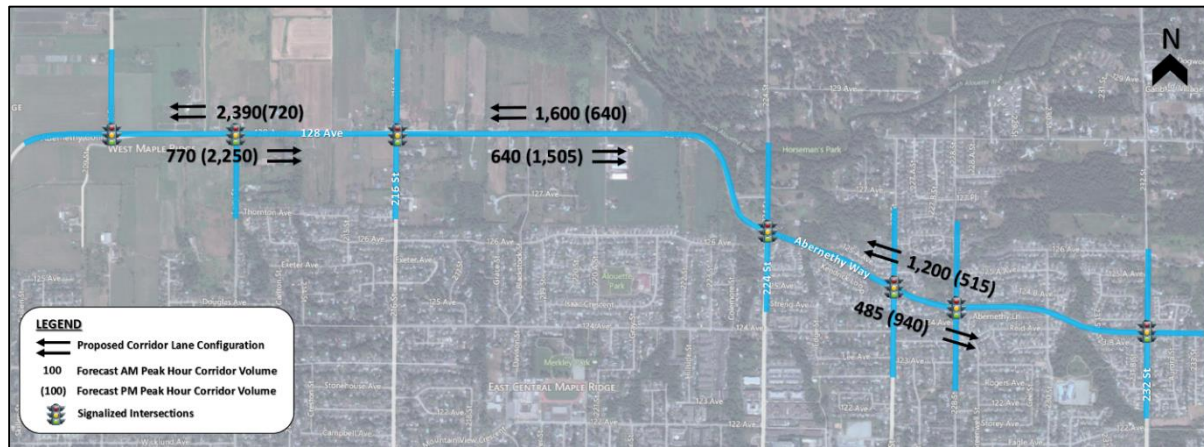


**i. 128 / Abernethy Way**

The 128 Avenue / Abernethy Way corridor is part of TransLink's Major Road Network between the Golden Ears Bridge and the Lougheed Highway through to 232 Street. Today, the western end of the corridor accommodates 1,250 vehicles/hour and 1,350 vehicles/hour in the peak direction during the morning and afternoon peak hours respectively. Between 224 Street and 232 Street, the peak directional volumes are much lower with approximately 350 vehicles and 400 vehicles in the morning and afternoon peak hours respectively.

As regional and city-wide vehicle travel continues to increase, other east-west arterial roadways through the core areas of Maple Ridge will experience significant delays and congestion, particularly in the western areas of the city. In an effort to ensure that the network can support local and regional growth patterns, additional capacity and alternative routes across the city are required. The 128 Avenue / Abernethy Way corridor provides a more northerly alternative connection for existing communities and growth areas such as Silver Valley to access municipalities to the west and south of the Fraser River. **Map 7** illustrates the projected long-term AM and PM peak hour directional volumes along the 128 Avenue / Abernethy corridor between 210 Street and 232 Street.

**Map 7: Projected AM (PM) Peak Hour Corridor Volumes**  
**128/Abernethy Widening (210 Street to 232 Street)**



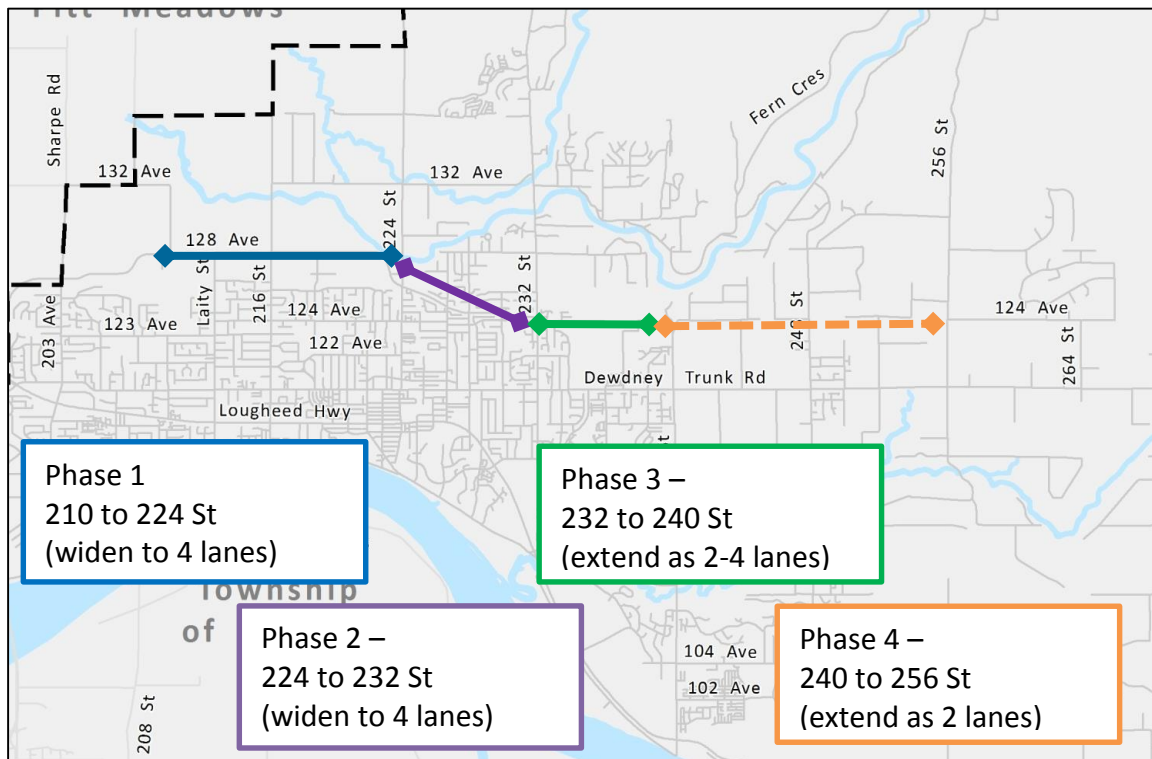
In order to accommodate the 100% increase in east-west travel projected across the western areas of Maple Ridge, the widening from two to four lanes and extension of the 128 Avenue / Abernethy corridor between 210 Street and 240 Street is recommended as part of the STP. The extension of Abernethy Way beyond 240 Street to 256 Street was considered and is not identified as part of the long-term strategy since the Official Community Plan does not anticipate redevelopment of the area. Additionally, the costs and potential impacts would be greater than the benefits of an alternative east-west route in this area of the city. If development were to occur in the area as part of future planning, the City may wish to revisit this option and explore potential alignments for extending the 128 Avenue / Abernethy corridor.

The order-of-magnitude cost estimate for the development of the entire Abernethy Way corridor is estimated to be approximately \$23.3 million for the section between 210 Street and 240 Street as the ultimate four lane corridor. This estimate does not include significant property and other servicing costs, and is based on conventional intersection design (including traffic signals at major intersections) throughout the corridor.

The 128 Avenue/Abernethy Way corridor widening and extension project may be implemented in three phases as illustrated in **Map 8** leading toward a long-term four lane roadway with signals at major intersections. Each phase of the project is briefly described below.



**Map 8: 128<sup>th</sup> Avenue/Abernethy Corridor Improvements**



**a. Phase 1: 210 Street to 224 Street**

In the short-term (less than five years), this 3 km section of 128 Avenue / Abernethy Way should be widened from 2 to 4 lanes between 210 Street to just east of 224 Street in order to accommodate projected long-term traffic demands. At the same time, provisions for turn lanes should be included as part of the widening at key intersections such as Laity Street, 216 Street and 224 Street. Traffic signals should be implemented at each of these locations based on warrants and traffic operational analysis. Implementing signals in advance of these warrants could reduce travel speeds and attractiveness of this east-west corridor as an alternate to Dewdney Trunk Road to the south and 132 Avenue to the north. The conceptual capital cost to widen this section along with intersection improvements is estimated to be approximately \$9.4 million, not including property, utilities and any significant mitigation measures.

**b. Phase 2: 224 Street to 232 Street**

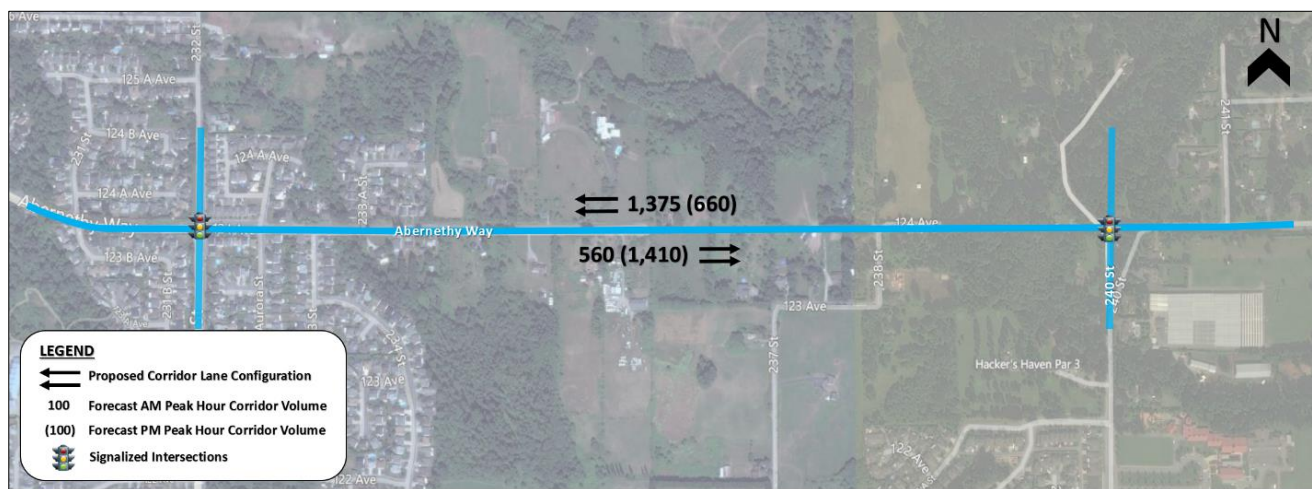
In the medium-term (5 to 10 years), 128 Avenue / Abernethy Way should be widened from 2 to 4 lanes between 224 Street to just east of 232 Street. The conceptual capital cost to widen this section along with intersection improvements is estimated to be approximately \$6.7 million, not including property, utilities and any significant mitigation measures.

**c. Phase 3: 232 to 240 Street**

The widening and further extension of 128 Avenue / Abernethy to 240 Street is included in the STP as a long-term improvement option and is more desirable should the 240 Street crossing be implemented. Although the projected traffic demands do not support this scale of investment (as discussed later) for city growth, it remains in the Plan as a long-term possibility to provide an alternative access to the Golden Ears Provincial Park.

If the crossing were implemented, the third phase of the 128 Avenue/Abernethy corridor improvement includes a four-lane extension from 232 Street to 240 Street as well as a new signalized intersection at 240 Street. As illustrated in **Map 9**, this improvement would accommodate approximately 1,400 vehicles in the peak directions during the morning and afternoon peak hour by 2031 if the 240 Street extension and crossing is implemented. A significant portion of this projected traffic would be diverted from Dewdney Trunk Road, with slightly less traffic generated from the 240 Street crossing. The diversion of traffic from Dewdney Trunk Road would reduce some of the existing and long-term delays and congestion along this east-west corridor through the Town Centre area.

**Map 9: Projected AM (PM) Peak Hour Corridor, 128/Abernethy Widening (232 Street to 240 Street)**



If the 128 Avenue / Abernethy extension was needed, the City will want to explore right-of-way and alignment options east of 134 Street in order to manage community and environmental impacts as well as overall costs. The conceptual capital cost for this 2 km section of the 128 Avenue / Abernethy corridor is estimated to be approximately \$7.5 million, not including property, utilities and any significant mitigation measures that may be required. Provision of the 240 Street crossing and this 4 lane extension of 128 Avenue / Abernethy are considered long-term improvement options (10 to 20 or so years).

**d. Phase 4: 240 to 256 Street**

Dewdney Trunk Road has the capacity to accommodate the projected traffic volumes for the planning horizon. Beyond the next 20 to 25 years, the City may consider and wish to preserve the option of extending 128 Avenue / Abernethy Way east to 256 Street as an alternative access in future.

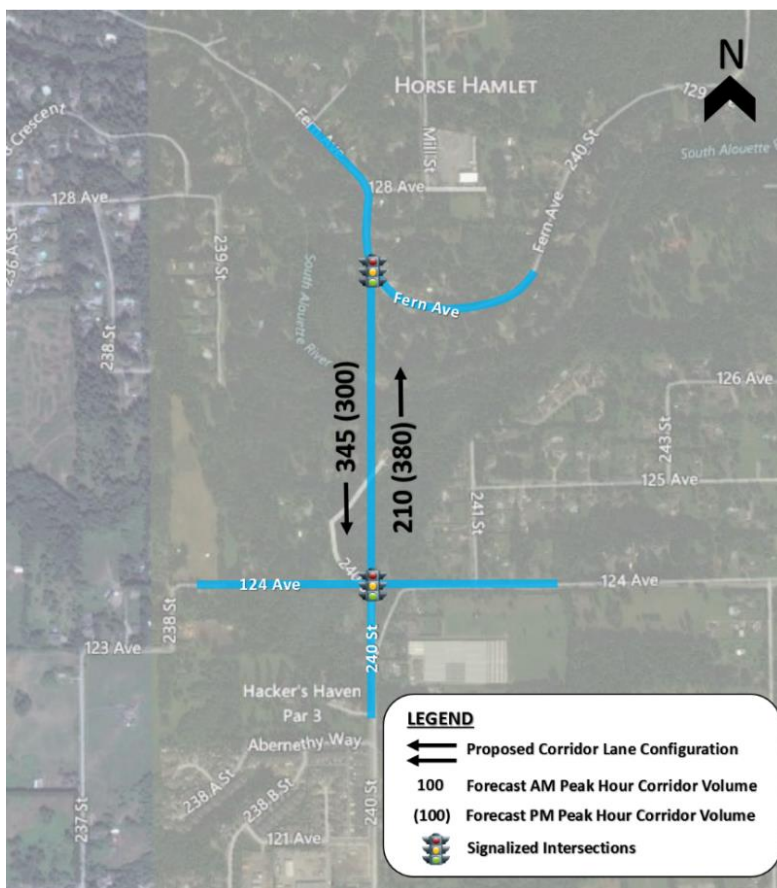
**ii. 240 Extension and River Crossing (Abernethy Way to 132/Fern Crescent)**

The long-term need for additional access routes to and from Silver Valley was identified in the neighbourhood planning work. In addition to 232 Street widening, a 240 Street crossing of the Alouette River was identified as the secondary north-south alternative between Abernethy Way and Fern Crescent, as illustrated in **Map 10**. The connection was also identified as an alternative route for emergency vehicle access to and from the Silver Valley area as well as the Golden Ears Provincial Park.

Projected peak hour directional volumes of approximately 350 vehicles in the morning and afternoon peak hours as illustrated in **Map 10** suggest that only a portion of the overall traffic generated by the Silver Valley area at build-out would utilize the 240 Street connection. In this regard, 232 Street and 132 Avenue are much more direct between Silver Valley and the Town Centre as well as areas west of Maple Ridge. At best, the 240 Street crossing could provide emergency vehicle access to the Silver Valley area and serve as an alternative access the Golden Ear Provincial Park for visitors. Considering the significant cost for this project (estimated to be \$40 million), the traffic demands for the crossing do not warrant this level of investment and should only be partially supported by the City. The City may wish to explore potential interests of senior levels of government to provide a long-term alternative access to the Park and in cost-sharing on the project.

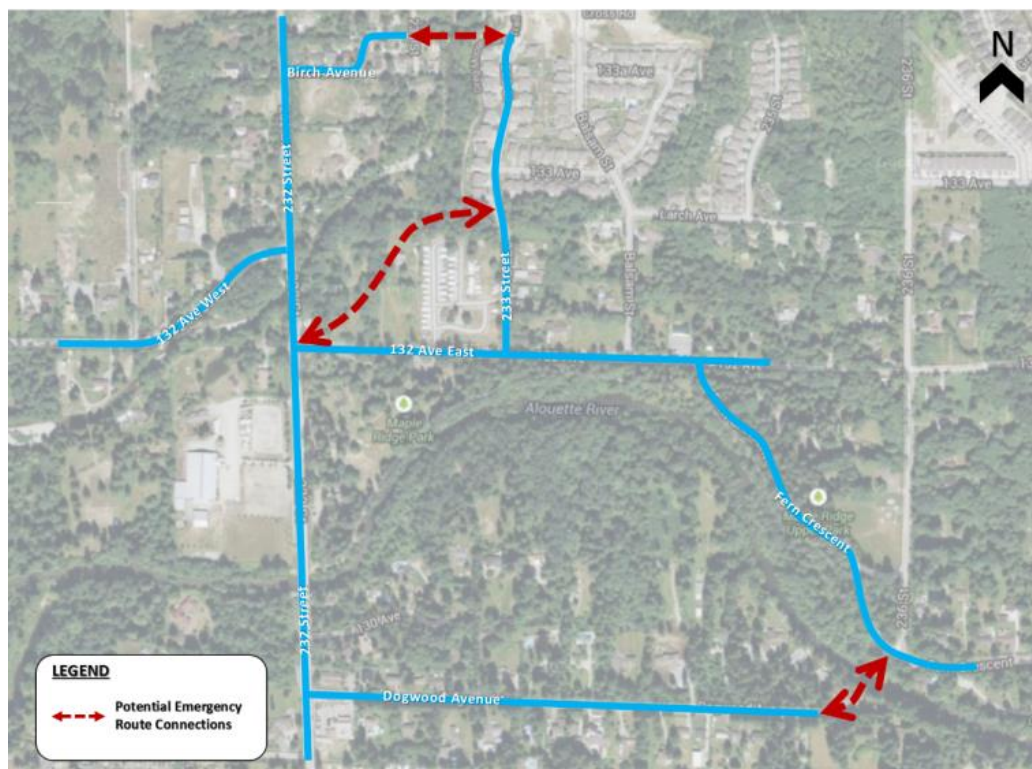


**Map 10: Potential 240 Street Extension and River Crossing**



Recognizing the significant cost of the 240 Street connection, alternative and perhaps more affordable emergency vehicle access alternatives are identified and as illustrated in **Map 11**. The first option is an extension of Birch Avenue to 233 Street across the Alouette River. A single lane connection located approximately 500m north of 132 Avenue East would provide a parallel east-west route for emergency vehicles into the Silver Valley area. Alternatively, a short emergency route could be planned immediately north of 132 Avenue East as areas are developed in the northeast corner of 232 Street/132 Avenue East. This emergency access would connect through to internal roads and to 132 Avenue East. A third alternative for emergency vehicles that may be explored further includes a crossing of the Alouette River to connect Fern Crescent with Dogwood Avenue. The conceptual alignments and costs of these and other emergency vehicle access routes should be explored further by the City before identifying a preferred alignment and configuration to incorporate into future capital plans.

**Map 11: Potential Emergency Route Connections**



**iii. Dewdney Trunk Road Widening to 4 lanes - 240 Street to 248 Street**

Dewdney Trunk Road is currently classified as an arterial roadway supporting east-west travel across the city. West of 240 Street, Dewdney Trunk Road is a four-lane roadway that carries approximately 1,200 westbound vehicles during the morning peak hour and 1,500 eastbound vehicles during the afternoon. Over the next 20 years, the peak directional corridor volumes are expected to increase to as much as 1,800 vehicles per hour. East of 240 Street, Dewdney Trunk Road is a two-lane arterial and accommodates significantly lower volumes – approximately 300 vehicles per hour in the peak direction. By 2031, the peak hour volumes are expected to increase to almost 1,000 vehicles per hour during the AM and PM peaks as illustrated below in **Map 12**.

The order-of-magnitude cost estimate for widening Dewdney Trunk Road from 240 Street to 248 Street is estimated to be approximately \$5.3 million. This estimate does not include property and other significant servicing and hydro relocation costs, and is based on conventional intersection designs (including traffic signals at major intersections) throughout the corridor. This improvement is recommended as a long-term project (10 to 20 years) within the STP.

**Map 12: Proposed Dewdney Trunk Road Widening – 240 Street to 248 Street**



**iv. Dewdney Trunk Road Widening to 4 lanes - 248 Street to 256 Street**

The City will want to preserve options of widening Dewdney Trunk road from 2 to 4 lanes between 248 and 256 Street should future growth in the eastern areas significantly increase east-west travel demands.

**v. 232 Street Widening to 4 lanes - Abernethy Way/124 Avenue to 132 Avenue (East)**

The Silver Valley area is expected to accommodate approximately 12,600 residents and generate as many as 3,500 vehicle trips during the afternoon peak hour by 2031. The majority of these trips will be generated from the central and eastern areas of the development.

Today, access into Silver Valley is limited to a select number of arterial roadways that include 132 Avenue (east and west), Fern Crescent and 232 Street. Immediately to the west, 224 Street serves as an alternate north-south collector route into the Silver Valley area from Abernethy Way via 136 Avenue. As development continues in Silver Valley over the next 20 years, traffic demands on these corridors will continue to increase along with delays and congestion.

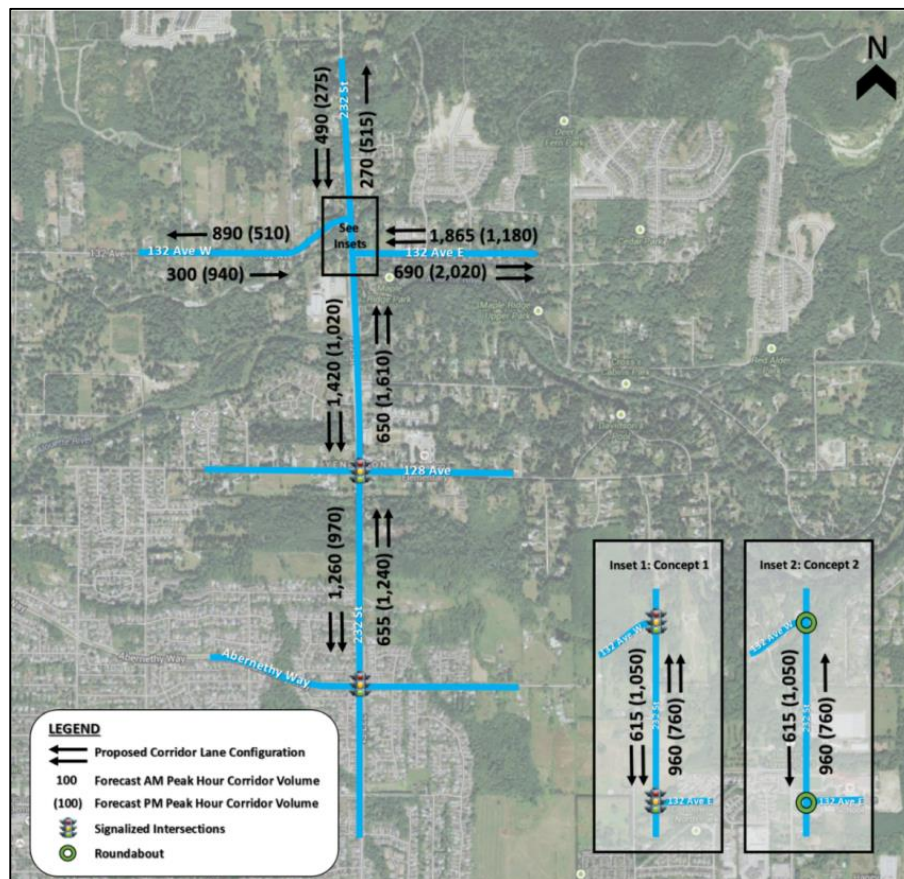
Currently, 232 Street (north of Dewdney) and 132 Avenue (east of 232 Street) are both MRN roads (with a recently widened bridge across the south arm of the Alouette River with the capacity to accommodate four lanes). North of Silver Valley Road, 232 Street is classified as a collector roadway. Under the full build-out of the Silver Valley area, peak directional volumes on 232 Street south of 132 Avenue East are forecast to be as high as 1,600 vehicles per hour as illustrated in **Map 13**. Between 132 Avenue east and west, 232 Street volumes are slightly lower and can generally be accommodated on a two lane roadway, but intersection improvements such as a roundabout will likely be required at 232 Street and 132 Avenue west. For this segment of 232 Street, two concepts highlighted below may be considered through a refined operational analysis as well as a conceptual design and evaluation process:



- Concept 1: 4 lanes between 132 east and west with signals at both intersections, or
- Concept 2: 2 lanes between 132 east and west with roundabouts at both locations. It should be noted that the forecast volumes on 232 Avenue east and from 132 Street suggest that the existing roundabout at 132 Avenue east may need to be widened to two lanes under this option.

The order-of-magnitude cost estimate for widening of 232 Street between 124 Avenue and 132 Avenue (east) is approximately \$8.3 million. This estimate does not include property and other servicing or mitigation costs, and is based on conventional intersection design (including traffic signals at major intersections) throughout the corridor.

**Map 13: Proposed 232 Street and 132 Avenue/Fern Crescent Widening**



**vi. 132 Avenue East widening to 4 lanes (232 Street to Fern Crescent)**

132 Avenue east of 232 Street is currently a two lane MRN roadway and also expected to experience significant pressure from the planned development within the eastern areas of Silver Valley. In the long-term, peak hour traffic is projected to reach almost 1,600 vehicles in the peak direction as previously illustrated in **Map 13**. The widening of 132 Avenue between 232 Street and Fern Crescent is required to provide the necessary capacity needed to accommodate projected

growth in the Silver Valley area. The City will need to explore alternative alignments and configurations in order to secure the right-of-way required to widening 132 Avenue through this area.

The order-of-magnitude cost estimate for a widening of 132 Avenue is estimated to be approximately \$1.2 million. This estimate does not include property and other servicing costs, and is based on conventional intersection design (including traffic signals at major intersections) throughout the corridor.

**vii. 132 Avenue West Corridor Improvements (232 Street to 224 Street)**

The 132 Avenue corridor between 224 Street and 232 Street is classified as an arterial road. This corridor provides the most direct route between Silver Valley and the south-western areas of the city. As illustrated in **Map 13**, the projected long-term traffic volumes along this corridor are projected to reach almost 1,000 vehicles in the peak directions during the morning and afternoon peak hours.

The City has worked with residents along the corridor to develop a plan that addresses traffic concern on the corridor and provides improved pedestrian, bicycle, and equestrian connectivity as traffic volumes continue to grow. These improvements include the provision of a 3.0 m multi-use pathway from 216 Street to 232 Street, and a series of lateral shifts with centre medians intended to reduce 85th percentile speeds. The plan also includes improvements to the intersection of 224 Street & 132 Avenue and four community gateway features (east of 216 Street, east and west of 224 Street and west of 232 Street).

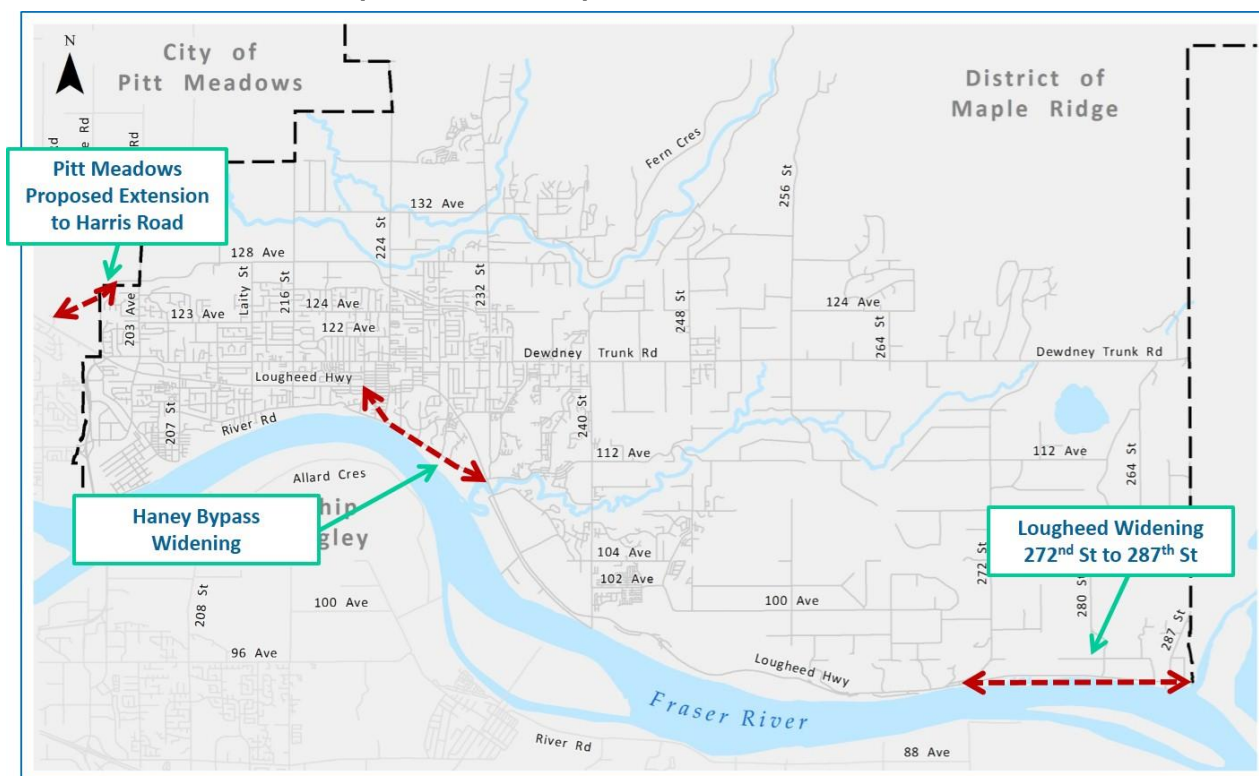
The order-of-magnitude cost estimate for improvements along 132 Avenue west between 224 Avenue and 232 Street is estimated to be approximately \$3.8 million to \$4.3 million. This estimate does not include property and other servicing costs or costs for creek crossings.

**4.2.2 Inter Municipal and Provincial Connections**

The Lougheed Highway serves as the primary alternative to Highway 1 on the north shore of the Fraser River. It provides an important connection for people, goods and services between Highway 11, Golden Ears Bridge and the Mary Hill Bypass connection to Highway 1. The Lougheed Highway corridor also serves an economic role providing connections to key trade and industrial areas north of the Fraser River including the CP Rail yards in Pitt Meadows and Port Coquitlam. As east-west traffic volumes grow, the City wishes to work with the MoTI on the strategies for addressing mobility and safety throughout the corridor as well as those capacity issues along two and three lane segments of the corridor as previously described (including the Haney Bypass). In addition to supporting provincial mobility, the City is also working with the District of Pitt Meadows and TransLink on a requested connection to Golden Ears Way to maintain regional mobility.

**Map 14** illustrates the key projects where the City of Maple Ridge will want to work with other agencies to preserve local, regional and provincial functions of these and other corridors.

**Map 14: Inter-municipal & Provincial Connections**



**i. Haney Bypass Widening from 2/3 lanes to 4 lanes**

The Haney Bypass is generally a two lane roadway east of 227 Street and three lanes to the west (2 westbound and 1 eastbound). The Bypass connects with the Lougheed Highway on both the east and west sides of downtown and serves as an alternative route for through traffic to avoid the downtown area.

Today, directional volumes along the Haney Bypass range anywhere from 1,000 to 1,300 vehicles during the morning and afternoon peak periods – the capacity of a two lane rural road. The delays experienced along Haney Bypass are further exacerbated by the signals at either end. Delays experienced by the westbound left-turns at the eastern intersection with Lougheed Highway and the overall delays at the western intersection are significant during peak periods (LOS E). This will only worsen over time as east-west regional and city-wide travel continues to grow.

Improvements at both eastern and western intersections with Kanaka Way and Lougheed Highway respectively along with the widening of the Haney Bypass to four lanes would result in significant growth and diversion of traffic from the downtown area where congestion and delay will



continue to increase. As shown in **Map 15**, peak directional volumes on the Haney Bypass are projected increase to over 2,200 vehicles per hour in the next 20 years.

**Map 15** also illustrates the general corridor lane geometry and new signalized intersections at Callaghan Avenue, 227 Street and Burnett Street. Once again, the City will want to work with the Ministry on improvement strategies to address these projected travel demands.

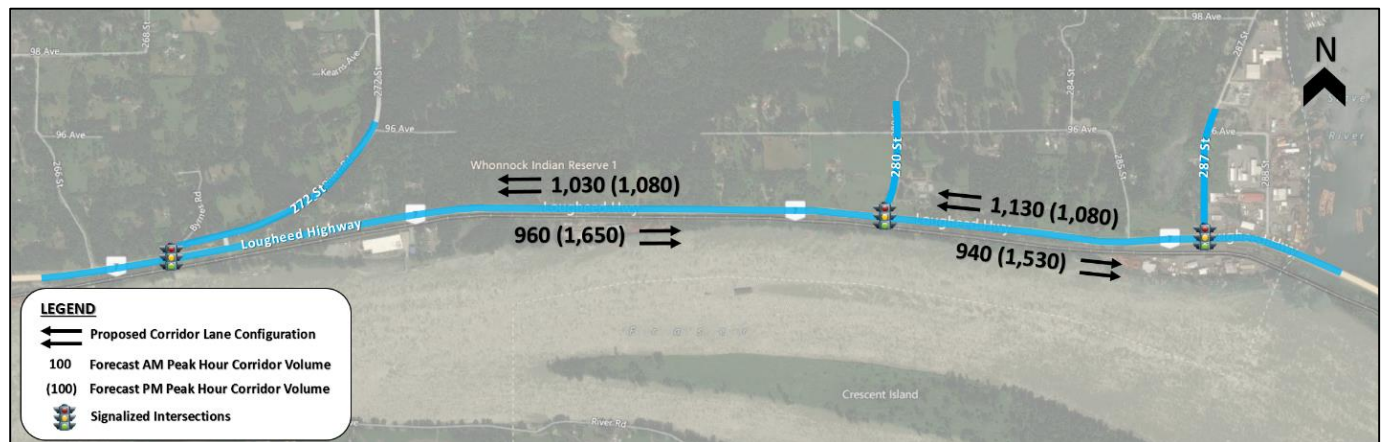
**Map 15: Proposed Haney Bypass Widening**



## ii. Lougheed Highway Widening (east of 272nd Street)

Lougheed Highway is not only an important east-west connector within the city, but it also serves as a vital inter-regional connection between the Fraser Valley and communities north of the Fraser River. Today, the Lougheed Highway is a two lane rural highway with signals at 272<sup>nd</sup> Street, 280th Street and 287th Street. During the peak hours, this eastern section of Lougheed Highway within the City of Maple Ridge supports approximately 1,200 vehicles in the afternoon peak direction. This section of the Lougheed Highway corridor is currently operating at the functional capacity of a two-lane rural road.

## Map 16: Proposed Loughheed Highway Widening



A potential future connection from Abernethy to Harris Road in Pitt Meadows has been requested by the City of Pitt Meadows to support development plans immediately west of Maple Ridge on the north side of Lougheed Highway. This proposed north Lougheed connector would provide direct link between Abernethy Way/Golden Ears Way and Lougheed Highway immediately west of Harris Road. The proposed north Lougheed connector would also be designed to support east-west movement between Maple Ridge and Pitt Meadows, influencing both commuter traffic and the movement of goods. The City of Maple Ridge will want to review optional connections to Abernethy Way as well as functional characteristics of the corridor within Pitt Meadows so that the proposed connection does not adversely impact overall travel to and from the Golden Ears Bridge. Additionally, the City will want to maintain connections to Old Dewdney Trunk Road as this corridor is part of the MRN, and currently serves as an important alternative east-west route north of Lougheed Highway (even with a north Lougheed connector).

As described in the Transit Strategy section of the Plan, Dewdney Trunk Road and Lougheed Highway will serve long-term rapid transit needs for Maple Ridge. This service will connect Maple Ridge downtown to other communities in the Northeast Sector and south of the Fraser River.

West of Maple Ridge, vehicle priority lanes for transit and/or high-occupant vehicles should be considered along Lougheed Highway to increase people moving capacity. The City of Maple Ridge should work with the Ministry of Transportation and Infrastructure, TransLink and other municipalities to explore priority lane strategies.

#### 4.2.3 Completing the Network

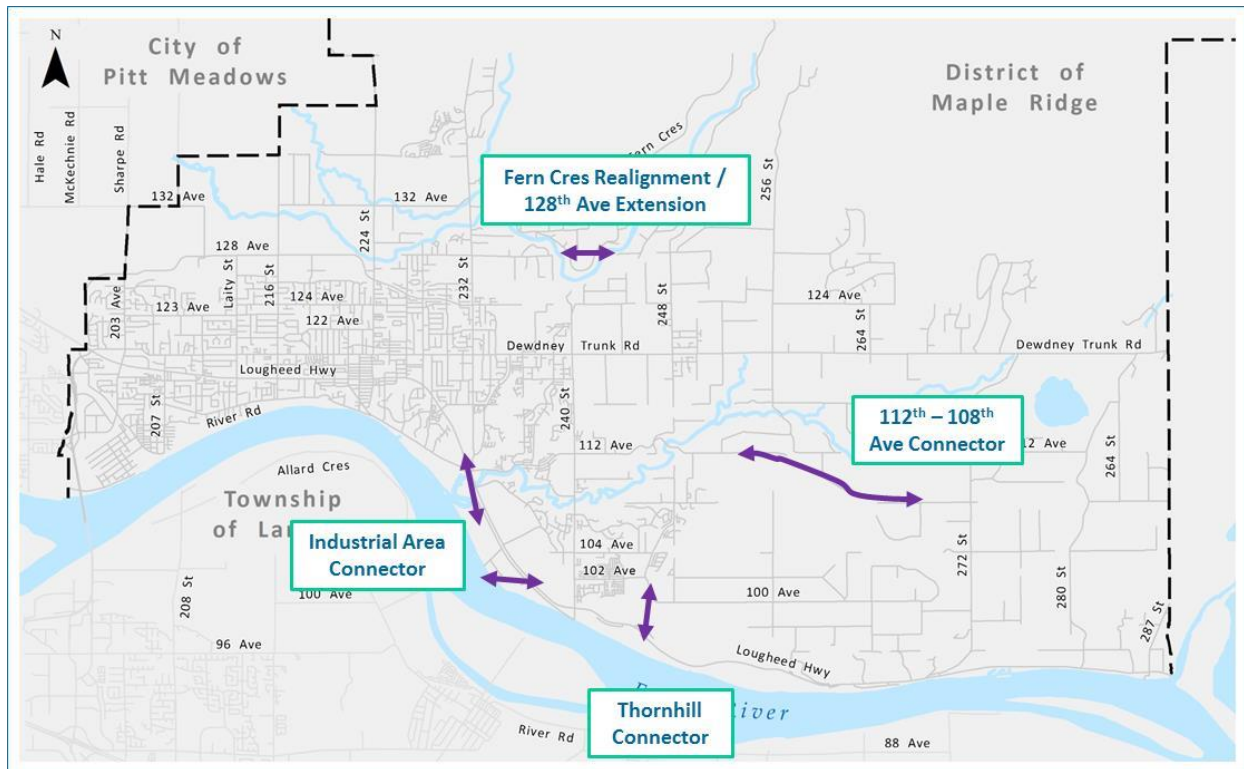
The city's roadway network has evolved over time in response to growth and development. Further, there are several discontinuities that remain in the network as some areas have not been developed and/or topographical barriers make completing the network in some areas challenging. As growth occurs in the eastern areas of Maple Ridge, the City will want to complete the network in those areas illustrated in **Map 17**. These network connections include: Thornhill connector, Industrial Area connector, and 112 – 108 Avenue connector

The completion of these discontinuities would provide several additional benefits to the city, as follows:

- Provide access for residents of the community.
- Reduce travel distance, which influences air quality and road safety by reducing total vehicle-kilometres travelled in the community.
- Improve emergency access.
- Enhance connections for alternative modes, such as walking, cycling, and transit.
- Reduce congestion and delays at key bottlenecks by providing alternate connections to, from, and within key areas of the city.
- Support economic development within the community.
- Improve access to the city's Albion industrial areas.



**Map 17: Completing the Network**



**i. 112 Avenue/108 Avenue.**

There are currently few options for east-west travel in the Thornhill area between Lougheed Highway and Kanaka Creek. The 112 Avenue/108 Avenue corridor has been identified as a potential east-west route in this area. It would require the construction of a new roadway between approximately 252 Street and 268 Street along the slope of Grant's Hill. The road would provide a complete east-west route between Lougheed Highway at the Haney Bypass (via Kanaka Way) and 272 Street. This route is supported by the city's emergency services to enhance access to existing and future development in this area of Maple Ridge. In addition, the route has been identified as a future bicycle route, as it would provide a desirable east-west route across the city that avoids Grant Hill when the area develops. Although there are three creek crossings along this route that would require environmental remediation, the connection would be relatively easy to complete.

The conceptual, order-of-magnitude cost estimate for this connection is approximately \$10 million, assuming a two-lane rural cross-section with paved shoulders for cyclists. This capital cost does not include any bridge structures, property, servicing or any mitigation. Because this connection is to correspond with any redevelopment in the areas, this network link is identified as a long-term improvement.

**ii. Thornhill Connector.**

As the Thornhill area develops, there will become a need for new connections to support access to and from the area. The City has identified a need for at least one new connection from the Thornhill and Albion areas to Lougheed Highway. One option is to extend Jackson Road southward over the escarpment to Lougheed, whereas another option would be to extend 256 Street southward to the highway.

The optional alignment would require a direct southward extension of Jackson Road beyond 100 Avenue. This roadway would be quite steep (up to 11%) in places and would require a culvert crossing of Albion Brook. As such, significant earthworks would also be necessary to construct this connection. Another issue that would need to be dealt with for this option would be crossing the Kwantlen First Nation lands immediately south of 100 Avenue. This option would cost approximately \$5.2 million.

Both of these routes would present significant challenges in many areas, including geotechnical feasibility, grades, environmental remediation, and property acquisition. Neither would be cost-effective unless significant development pressure existed in the Thornhill area. From the perspective of cost and environmental impacts, the second option would likely be preferred. However, from the perspective of property issues in particular, the first option would likely be preferred. The City would have to undertake a more detailed route selection analysis to determine the preferred option.

**iii. Albion industrial area connector.**

The industrial area is located to the south of River Road and Lougheed Highway between Tamarack Lane and 240 Street. The area is currently accessed by two connections with Lougheed Highway, one at Tamarack Lane and the other at 240 Street. The issues associated with the current access configuration include:

- The western access is restricted to right-in and right-out movements, meaning that all vehicles leaving the area and wishing to travel westbound must go to 240 Street along River Road.
- The Canadian Pacific Railway line runs parallel and adjacent to River Road and trains often block access to and from the Albion industrial area.

In an effort to support industrial activity in the area and other growth that may occur, the City will want to examine alternative access strategies that involve a grade-separated connection between Lougheed Highway and River Road on the south side of the CP Rail corridor. Grade-separated connections that may be investigated include directional flyover ramps located east and west of 105<sup>th</sup> Street or a half diamond interchange with a rail overpass in this same area. Depending on

configuration and geotechnical conditions, this connection could cost as much as \$25 to \$30 million.

#### **iv. Fern Crescent Realignment / 128<sup>th</sup> Avenue Extension**

South of 132<sup>nd</sup> Avenue and east of Balsam Street, Fern Crescent continues through the park where the roadway narrows significantly and there is minimal space to accommodate pedestrians and cyclists. Similarly, Fern Crescent south of 128<sup>th</sup> Avenue is also narrow with limited shoulder width. As the area develops, the need for safe and comfortable pedestrian and bicycle facilities along the primary roadways through the area continues to grow. In order to address these issues, the City has identified the potential realignment of Fern Crescent and extension of 128<sup>th</sup> Avenue east. In addition to accommodating the needs for pedestrians and cyclists through these improvements, the new routes would be classified as arterial roads, and Fern Crescent south of 128<sup>th</sup> Avenue would be reclassified as a local road.

#### **4.2.4 Intersection Operations & Safety**

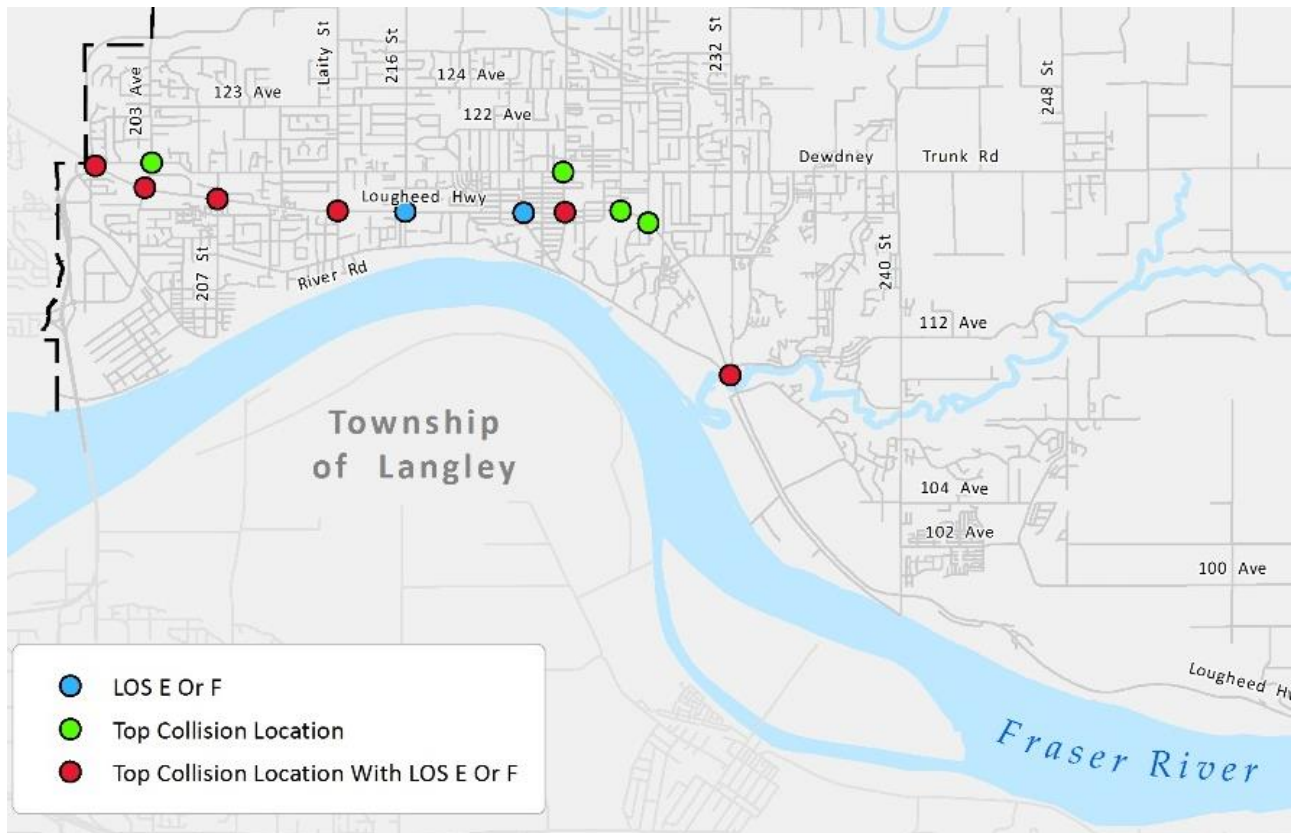
In urban areas such as the City of Maple Ridge, the performance of the roadway network is largely influenced by signalized intersections. With the exception of the Lougheed Highway corridor, most signalized intersections in Maple Ridge are currently operating at a level of service (LOS A to C) indicating no or minimal delays. Over the next 20 years, several signalized intersections in the city will experience increasing delays with the projected growth in traffic.

**Map 18** below highlights intersections that are operating under failing levels of service (LOS E or F) in the future and/or identified as one the top collision location in the city. As the majority of these intersections are located on Lougheed Highway – a Provincial corridor, the City should continue advocate with the Ministry on planning shorter-term improvement strategies to reduce delays and improve safety at these locations. While considering the optimal use of the existing network, some improvement strategies may include, but not limited to:

- Provision of turn lanes where adequate right-of-ways are available
- Signal optimization at intersections to improve overall intersection efficiency and safety



**Map 18: Candidate Safety and Operational Improvements**



#### 4.2.5 Neighbourhood Traffic Management

In 2012, the City updated the 2004 Traffic Calming procedures to address neighbourhood transportation issues. The primary goal of traffic calming is to improve safety and livability along neighbourhood streets (local and collector roads). Traffic calming measures are normally used to achieve these goals by accomplishing one or both of the following objectives:

- **Reducing speed.** When most traffic on a road is travelling faster than the designated speed limit, it can negatively impact both livability and safety.
- **Reducing volume.** Local roads are intended to serve the residents and businesses along that roadway. Collector roads are intended to provide access to local roads. Both types of road are designed to operate best when traffic volumes are under a certain threshold. When traffic that is not destined locally utilizes local or minor collector roads, the traffic volume may be higher than what is generally intended for that roadway type. This generally impacts neighbourhood livability, safety and quality of life.

Traffic calming is one measure for addressing neighbourhood and city-wide traffic issues. Understanding the localized issues and determining context specific traffic calming needs will lead to appropriate

implementation. **Table 1** provides a list of various traffic calming measures that can be applied to a variety of roadway types. The Traffic Calming Policy is a guide and the City should continue to develop traffic calming plans on corridors with identified traffic speed and volume issues.

**Table 1: Types of Traffic Calming Measures**

	Traffic Calming Measure	Minor Collector	Local	Lanes	Transit Route*	Emergency Route*
Vertical	Raised Crosswalk	✓	✓			
	Raised Intersection**	✓	✓			
	Sidewalk Extension**	✓	✓		✓	✓
	Speed Hump		✓	✓		
	Textured Crosswalk	✓	✓		✓	✓
	Speed Cushion		✓		✓	✓
	Chicane (one lane)		✓	✓		
	Curb Extension	✓	✓		✓	✓
	Curb Radius Reduction	✓	✓			
	On-Street Parking	✓	✓		✓	✓
Horizontal	Raised Median Island	✓	✓		✓	✓
	Traffic Circle	✓	✓			
	Road Narrowing / Road Diets	✓	✓		✓	✓
	Gateway Median <sup>1</sup>	✓	✓		✓	✓
	Directional Closure		✓			
	Diverter		✓	✓		
Obstruction	Full Closure		✓	✓		
	Intersection Channelization		✓	✓		
	Raised Median Through Intersection	✓	✓	✓	✓	✓
	Right-in / Right-out Island		✓	✓		

\*Potential measures pending consultation with these stakeholders.

\*\* Unraised sidewalk extensions are suitable for transit routes and minor collectors.

\*\*\* Roadway not to exceed two lanes.

#### 4.2.6 Long-term Network Plan

The long-term network plan illustrated in **Map 19** highlights the updated roadway classification system that incorporates the recommended improvements described in Sections 3.2.1 through 3.2.5. The roadway classification system generally provides guidance to planning land uses along the corridor as well as the physical design characteristics of the road based on the intended functions for each class as briefly highlighted below.

- **Provincial highways** accommodate regional and provincial through traffic. At-grade signalized intersections are widely spaced, and direct access to provincial highways is minimized so as to maximize capacity and minimize delays to through traffic. Posted speeds are typically higher than other urban roadways – generally more than 60 km/h or higher and parking is usually prohibited. Transit service is often limited to express services with relatively few or no stops along the roadway. Within Maple Ridge, Highway 7 is a provincial facility, but it should be noted that the section of Highway 7 within the urban area of the city provides a more local function.
- **Arterial roads / Major Road Network.** The Major Road Network (MRN) is principally composed of municipal arterial roadways that serve a regional function and that accommodate significant truck and/or transit traffic. TransLink has established criteria for designating roadways as part of the MRN, which are eligible for cost-sharing between TransLink and the municipalities for upgrades and maintenance. Although the MRN roads are generally municipal arterials, there are many arterials that are not designated as part of the MRN. The primary objective of arterial roads is to provide mobility. They usually serve regional traffic – travel between major local destinations or between municipalities. Direct access to arterial roads is often limited to commercial driveways, although many arterials in Maple Ridge also provide residential driveway access. Speed limits are generally 50 km/h and on-street parking is limited or not allowed. Arterials are often used for major transit corridors. Examples of arterial roads in Maple Ridge include Dewdney Trunk Road (east of 232) and 216 Street. Dewdney Trunk Road west of 232, 128 Avenue / Abernethy and parts of 232 Street are examples of the MRN within Maple Ridge.
- **Collector** roads typically serve a dual function. They provide mobility for travel between local neighbourhood streets and municipal arterials, but they also offer a high level of access to individual properties. There are many private driveways along collectors. On-street parking is usually permitted if the road is wide enough and transit service is often provided. Posted speeds are usually 50 km/h, although they can be lowered to 30 km/h in school or playground zones. River Road and Laity Street are examples of collectors in Maple Ridge. The recommended road classification includes both a **major collector** classification for streets with higher traffic volumes and which play an important role in the City's road network, as well as a **minor collector** classification for collector roads with lower traffic volumes and a limited network contribution.



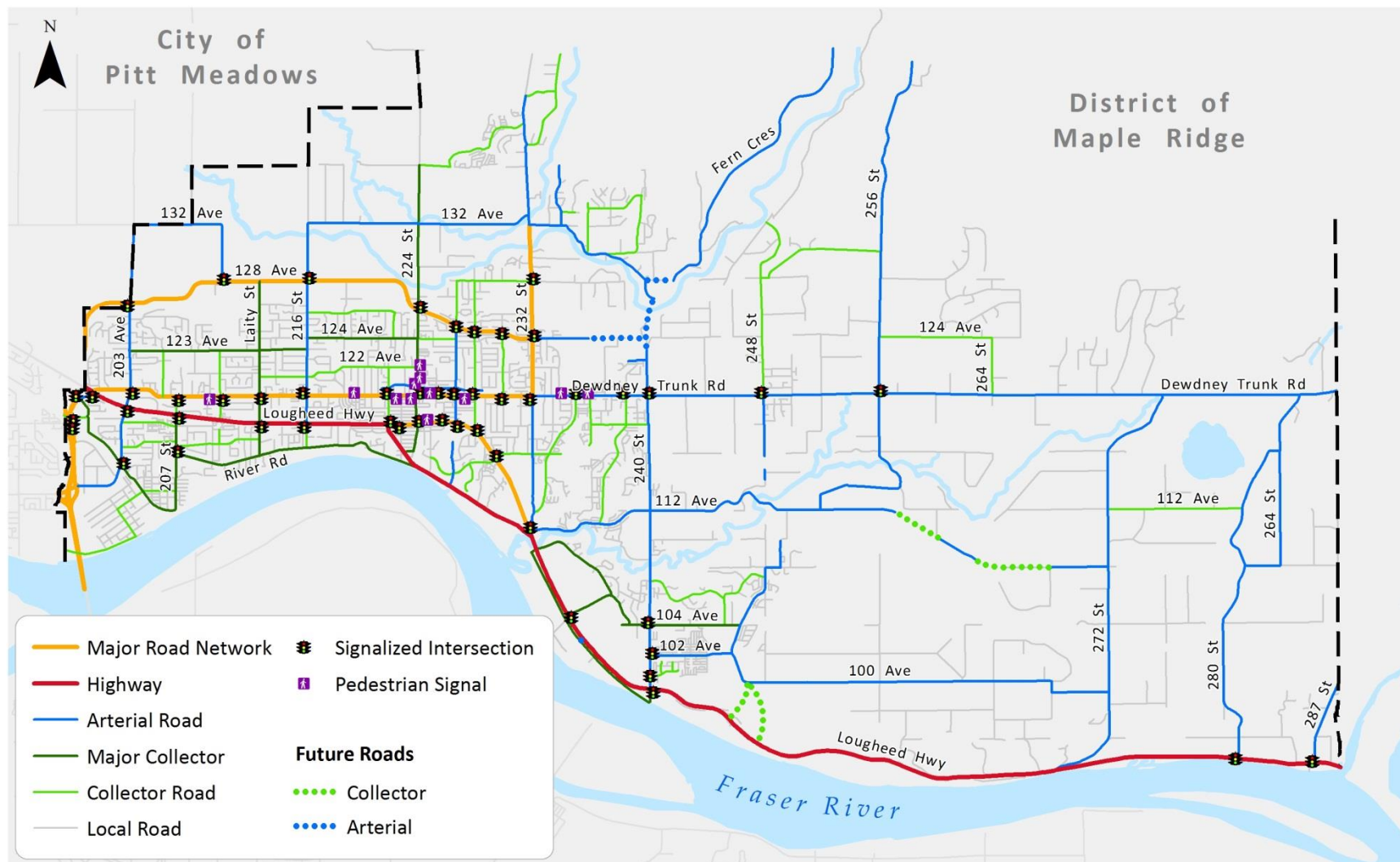
- **Local streets.** The primary objective of local streets is to provide access to private properties. They allow neighbourhood residents to travel to and from the arterial/collector road network, but through traffic is generally discouraged from using them. Speed limits are generally low – not more than 50 km/h – and can be lowered in school and playground zones. Parking is usually permitted and transit service is not normally provided. Traffic calming measures are now commonly used to discourage the use of local streets for through travel.

### 4.3 Capital Costs & Priorities for Major Road Improvements

The capital costs, potential funding partners and overall priorities for all major road improvements described in the road network section of the STP are summarized in **Table 2**. Although the priorities are generally identified based on the overall assessment of existing conditions and planned growth, funding partnership opportunities and property requirements may affect priorities during the timeframe of the Plan.

The order-of-magnitude (Class ‘D’) costs estimates are based on 2014 dollar unit prices and include a 35% contingency allowance, but do not include administration, legal, utility or drainage costs as well as any mitigation that may be required. Allowances for grading and creek crossing have been included as appropriate. Cost estimates provided in **Table 2** should not be used for budgeting purposes until functional planning and design have been undertaken. The City should explore opportunities to coordinate roadway capital projects with improvements planned for other modes as well as ongoing roadway rehabilitation.

### Map 20: Long-Term Road Network Classification



**Table 2: Summary of Major Capital Road Improvement Costs and Priorities (2014 \$)**

Project	Short Term ( <span>&lt;</span> 5 Yr)	Timeframe		Potential Funding Partners		
		Medium Term (5-10 Yr)	Long Term (10-20 Yr)	City	TransLink/ MoTI	Private
Major Municipal Roads						
128 Ave/Abernethy Widening						
210 – 224 St	\$9.4	\$6.7		✓	✓	
224 – 232 St				✓	✓	
232 – 240 St (Option)			\$8.5	✓	✓	
Dewdney Trunk Rd Widening		\$5.6		✓		
240 St to 248 St						
232 St Widening						
Abernethy to 132 Ave	\$9.0			✓	✓	
132 Ave East Widening						
232 St to Fern Cr		\$1.2		✓	✓	
132 Ave West Calming						
224 St to 232 St	\$4.3					
240St Crossing (option)						
Abernethy to Fern Cr			\$40	✓	✓	
Regional & Provincial Corridors						
Haney Bypass Widening	✓				✓	
Lougheed Widening						
272 <sup>nd</sup> St to 287 <sup>th</sup> St		✓			✓	



**Table 2 (cont'd): Summary of Major Capital Road Improvement Costs and Priorities (2014 \$)**

Project	Timeframe			Potential Funding Partners		
	Short Term (<5 Yr)	Medium Term (5-10 Yr)	Long Term (10-20 Yr)	City	TransLink/ MoTI	Private
<b>Network Connectivity</b>						
<b>112<sup>th</sup>/108<sup>th</sup> Ave Extension</b> <i>112<sup>th</sup> Ave to 108<sup>th</sup> Ave</i>			\$12.3	✓		✓
<b>Thornhill Connector</b> <i>Jackson Rd to Lougheed</i>			\$6.0	✓		✓
<b>Albion Industrial Access</b> <i>Lougheed to south</i>			\$25 - \$30	✓	✓	✓
<b>Fern Crescent Realignment / 128<sup>th</sup> Avenue Extension</b>			\$3.1	✓		✓
<b>Other Considerations</b>						
<b>Intersection Operations &amp; Safety Improvements</b>	\$2.5	\$2.5	\$5.0	✓		✓
<b>Neighbourhood Traffic Management Strategies</b>	\$1.0	\$1.0	\$2.0	✓		✓

*Note: Costs are conceptual in nature (Class D) and are not typically used for budgeting purposes. They do not include any allowance for significant utility relocation, earthworks, driveway reconstruction, landscape restoration and legal cost.*



## Chapter 5

# Pedestrian Plan





Walking is the most fundamental form of transportation. Walking can be the mode of choice for an entire trip, and it can comprise a portion of a trip to connect with other modes such as an automobile or transit. Even though walking is so prevalent in our everyday life, policies and designs that encourage and facilitate walking as a mode of transportation within a community have often received lower priority than other improvements. By ensuring that a comprehensive network of sidewalks and walkways is in place and sound planning and design principles are followed, the City of Maple Ridge can provide an accommodating environment for pedestrians and increase the range of transportation choices for residents.



Throughout Maple Ridge, there are several key pedestrian areas and generators where walking can and should be encouraged through the provision of attractive and accessible facilities. The city is home to a well-defined and historic Town Centre with a fine-grained, well-connected street network with densities and diverse land uses that support walking. Maple Ridge also has several important commercial corridors, including Lougheed Highway and Dewdney Trunk Road that include many destinations for pedestrians. Maple Ridge in general offers an abundance of opportunities for walking, hiking, and sightseeing throughout both its urban and rural neighbourhoods.

The Pedestrian Plan provides a strategy to enhance connectivity and accessibility to, from, and within key city-serving pedestrian activity areas, such as commercial areas, city-serving parks, and recreation facilities. In this regard, people of all ages and levels of mobility should be able to easily access the most active areas of the city through pedestrian facilities that support universal design standards and treatments. The Pedestrian Plan also seeks to improve walkability in and around emerging growth areas of Silver Valley, Albion, and Thornhill. Overall, because sidewalks and walkways serve as the primary facilities for accommodating pedestrian travel, steps must be taken to ensure that a continuous network is in place throughout the city. Ensuring linkages to commercial areas, schools, transit, parks and recreation facilities is a top priority of the Pedestrian Plan because these activity areas serve the widest range of pedestrians, both young and old, providing maximum value for residents.

### 5.1 Shaping Influences and Challenges

Beyond the role of pedestrian facilities in creating vibrant, attractive, walkable communities and in supporting other modes of transportation, there are many factors that influence the long-term direction of the development of the Pedestrian Plan for Maple Ridge. These shaping influences and challenges identified by community stakeholders are briefly highlighted below and used to shape the long-term direction for the Pedestrian Plan.

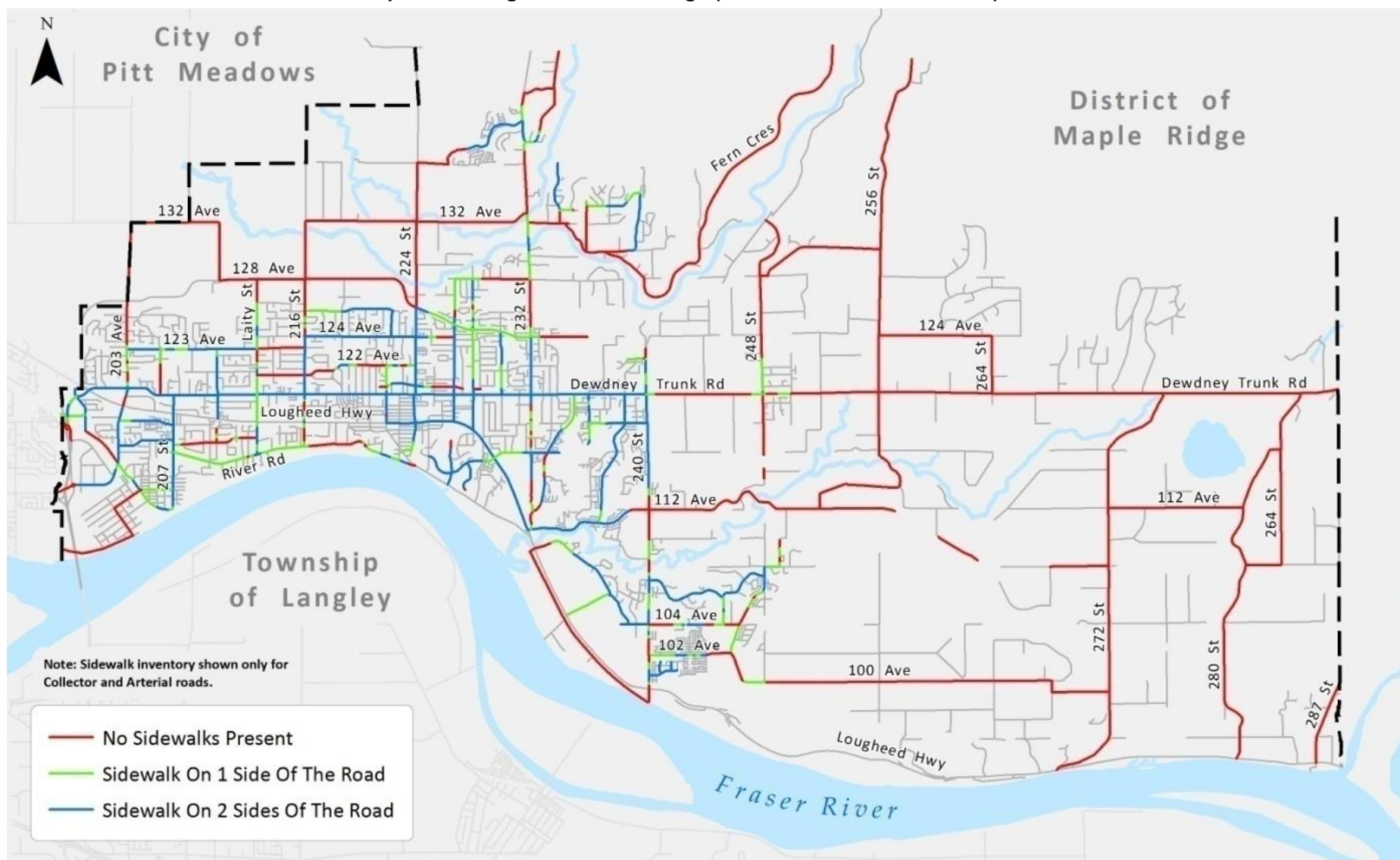
#### Shaping Influences and Challenges on Pedestrian Plan

- In Maple Ridge, walking accounts for 3% of daily commute trips and 10% of all daily trips
- Sidewalk coverage in some areas is limited
- Discontinuous trails and pathways
- Attractive and accessible connections to key pedestrian generators
- Lack of sidewalks on neighbourhood streets



- **Walking Activity.** The 2011 Census reports that 3% of daily commute trips in Maple Ridge are made by walking. TransLink's 2008 Regional Trip Diary Survey reports that 10% of all daily trips (not just commute trips) in Maple Ridge are made on foot. The Trip Diary Survey also reports that most walking trips in Maple Ridge are short, local trips within Maple Ridge's boundaries, as the average walking trip distance is 2 km, with the majority of walking trips less than 3 km. In addition, the most common walking trip purpose in Maple Ridge is to go to and from elementary or secondary school, followed by walking trips made for shopping and recreation. In general, children and youth are responsible for the majority of daily walking trips in the city, as approximately 70% of all walking trips are taken by this age group.
- **Sidewalk coverage is limited in some established areas and some growth areas of the city.** As is the case with most communities, the standards for providing sidewalks have evolved over time to where local guidelines suggest that sidewalks should be located on both sides of all urban arterial and collector roads; and on at least one side of all urban local streets. In addition, rural arterial and collector roads should have a walkway on at least one side of the street, while rural local roads are not required to have a walkway. Maple Ridge currently has approximately 250 km of sidewalks, including 35 km in the Town Centre and 215 km of sidewalks elsewhere in the city's defined urban area. Within Maple Ridge's urban areas that were developed long before the current standards evolved, approximately 65% of all streets have a sidewalk on at least one side of the street. **Map 21** shows the presence of sidewalks on Maple Ridge's roads, whether they are located on one side, both sides, or none at all.
- **Discontinuous trails and pathways.** The city's trail network is popular with local residents and visitors alike. The trail network is used by walkers, hikers, cyclists and equestrians with popular routes such as the Trans-Canada Trail, Golden Ears Provincial Park, Malcolm Knapp Research Forests, Maple Ridge Park, Kanaka Creek, Whonnock lake trails, and Port Haney Heritage Walk. Trails in Maple Ridge are integrated with Pitt Meadows' trail system, with the dyke trail along the North Alouette River providing a connection to trails in north Pitt Meadows along the Alouette and Pitt Rivers. These regional connections also facilitate access to the Pitt River Bridge and Port Coquitlam's trail systems. While the city has an established trail system, the pedestrian network is not very continuous through the community, as trails tend to be limited to park boundaries.

**Map 21: Existing Sidewalk Coverage (Collector and Arterial Roads)**

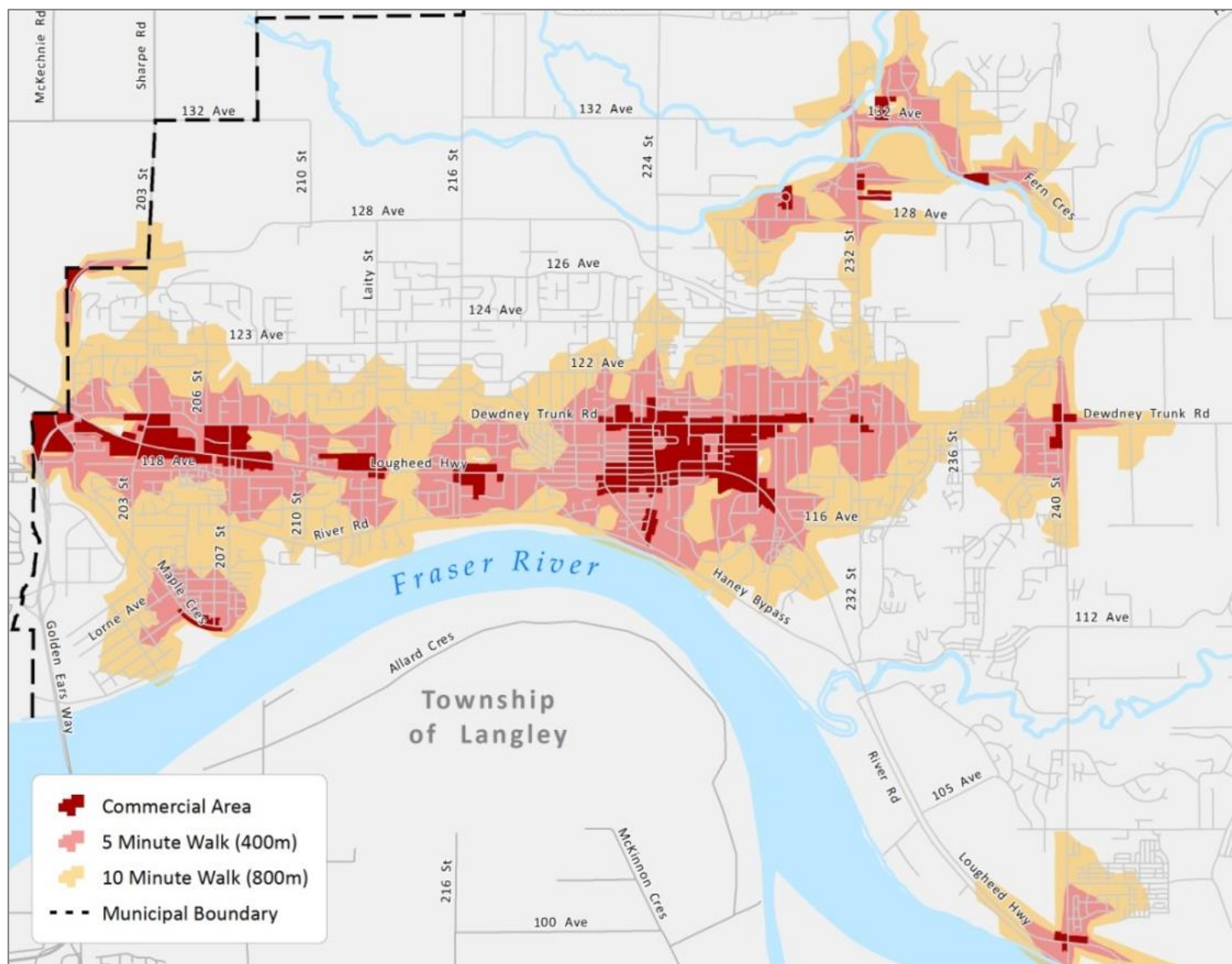


- **Key pedestrian generators require attractive and accessible connections.** There are several important pedestrian destinations within Maple Ridge, including commercial areas, institutions, schools, parks, and transit facilities. These destinations generate a significant amount of pedestrian activity and represent those areas that should be the focus of enhanced and accessible pedestrian treatments. In particular, the Maple Ridge Town Centre generates significant walking activity in Maple Ridge, with businesses, services, amenities, and civic spaces and places all located in close proximity, along with a fine-grained and well-connected street network that supports walking. In addition to the Town Centre, the Port Haney and Maple Meadows West Coast Express stations also generate significant pedestrian traffic at peak hours, as do institutions such as Ridge Meadows Hospital, as well as the five secondary schools and 17 elementary schools, and numerous community parks throughout the city. Each of these areas must be designed to be accessible for a growing population of seniors in Maple Ridge as well as others with physical and cognitive disabilities.

**Map 22** shows the pedestrian walksheds modelled on walking distances from the key commercial areas. This map highlights areas of the community that are within a 400-800m (approximately 5-10 minute walk respectively) radius of key commercial areas in the city. As is apparent, the neighbourhoods within short walking distance of the commercial hubs are found mainly around Dewdney Trunk Road and Lougheed Highway. The most walkable distances are found in and around the Town Centre. This analysis illustrates that residents living in and around the already urbanized areas of Maple Ridge have options to walk short distances to local services and amenities. However, neighbourhoods further north or south are located a much longer walking distance from these key areas, and the use of private vehicles is likely far more convenient to access these services.



**Map 22: Walksheds to Key Pedestrian Generators**

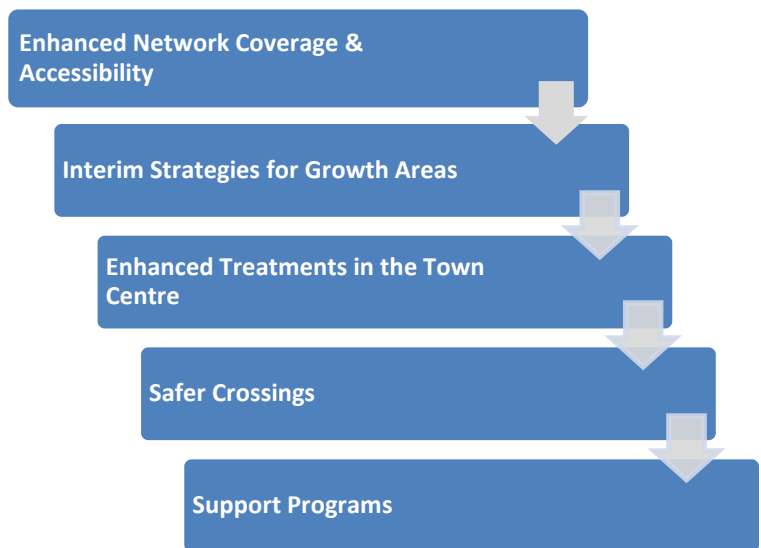


- More people can be encouraged to walk in high activity areas through coordinated land use planning, urban design, and other supportive initiatives. Beyond the provision of attractive and accessible pedestrian facilities, the design of streets in urban areas can be an incentive or disincentive for people to walk. The Town Centre area of the city is planned and designed as a walkable community where streets and the design of buildings provide strong connections for pedestrians. At the peripheral areas of the Town Centre and in other parts of the city, the character of land uses and their design can discourage people from walking as many sites are designed for vehicles.

In addition to the planning and design of pedestrian friendly land uses, support programs can also be used to encourage people to walk in pedestrian areas of the city such as the Town Centre. The City supports and encourages walking through a variety of events and programming including walk/run clubs, self-guided walking tours as promoted through the Maple Ridge and Pitt Meadows Tourism Office, trail maps and resources, and the Safer School Travel program to assist parents in developing safe routes to school plans.

- **A lack of sidewalks on collector roadways in neighbourhoods can contribute toward concerns about pedestrian safety.** In many areas of the city, and as in the case in other communities, a lack of sidewalks can often create perceptions about the lack of safety and comfort due to traffic volumes, speed and short-cutting on neighbourhood streets. While the City's Traffic Calming Policy described in the Road Network Plan section of the Strategic Transportation Plan can be used to address quality of life issues associated with traffic, the lack of sidewalks on neighbourhood collector or arterial streets can often address many of the safety concerns being raised by residents.

#### Pedestrian Plan Themes



## 5.2 Long-Term Pedestrian Plan

The Pedestrian Plan identifies the need to support walkability in key areas of Maple Ridge. It also recognizes that the needs for sidewalks far exceed the financial resources available to the City even with a very aggressive capital program.

In this regard, the focus of the City's efforts in the coming years will be on implementing key elements of the sidewalk network that will support and encourage local trips. The Plan recognizes that certain areas of the city generate more pedestrian activity than others, and there are different levels of priorities and treatments in the areas that will benefit the most. As such, the focus will also be on enhancing pedestrian facilities in areas of higher pedestrian demand. In some areas of the city, such as the Town Centre, where walking is and will continue the priority mode of transportation, special treatments are required to make walking an even more attractive experience. Streetscape treatments within and leading to those areas can go beyond the minimum

standard and provide accessibility for all levels of mobility. In areas of growth and some established areas, interim strategies for wider shoulders or separated facilities may be considered along the busier collector and arterial corridors.

The following discussion highlights the range of pedestrian strategies that are recommended within each of the pedestrian areas to help make the city more walkable. The focus of the City's efforts in the coming years will be on providing an **enhanced sidewalk network**, improved **interim strategies for growth areas**, **enhanced treatments** in the Town Centre, **safer crossings**, and walking **support programs**. The primary features of the Pedestrian Plan are described below:

#### 5.2.1 Enhanced Network Coverage & Accessibility

The ultimate goal of the City should be to provide the following level of sidewalk coverage throughout the municipality:

- Urban Arterial: Both Sides
- Urban Collector: Both Sides
- Local Streets in Pedestrian Areas: Both Sides
- Other Local Streets: One Side

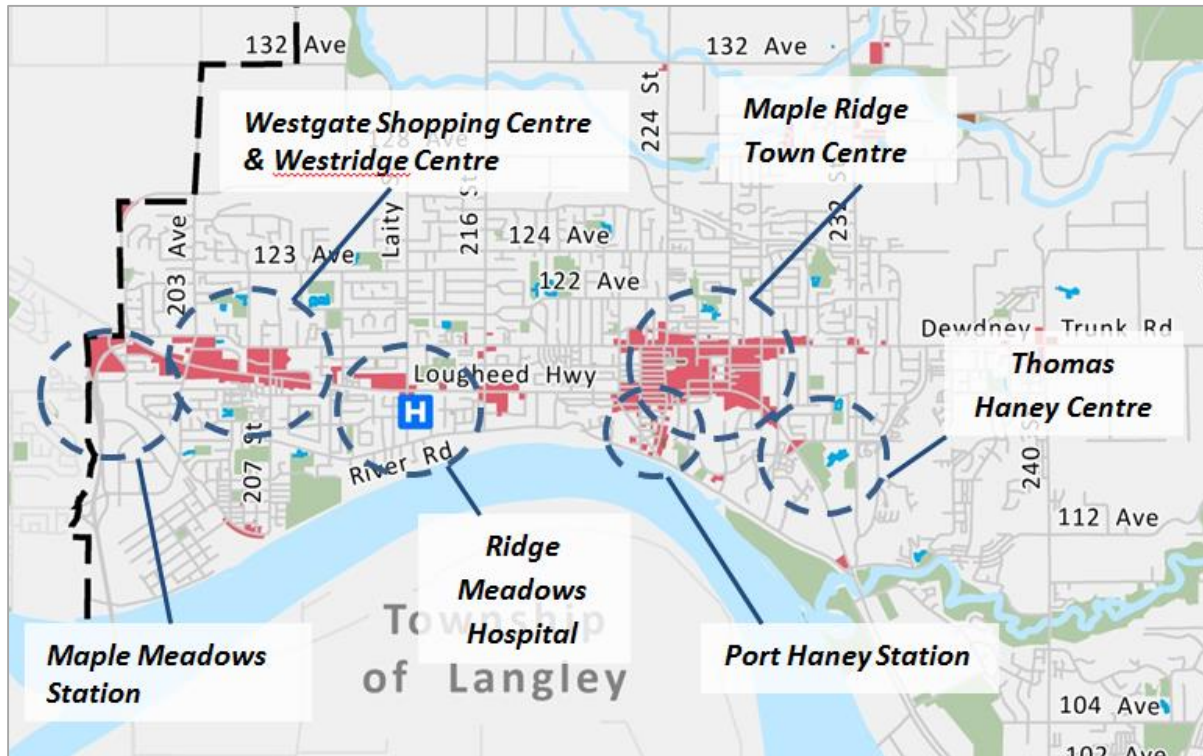
The long-term Pedestrian Plan provides direction on the implementation of sidewalk facilities. This is in addition to ongoing pedestrian improvement initiatives, such as accessibility and crossing improvements. The following discussion identifies the approach that was taken to prioritizing pedestrian improvements throughout the city.

- **Pedestrian Areas.** Six key pedestrian areas have been identified throughout the city, as shown in **Map 23**. These are city-servicing pedestrian areas that represent major community facilities that have the potential for generating significant pedestrian traffic from a broader area of the city. The six pedestrian areas include:
  - Town Centre;
  - Port Haney Station;
  - Ridge Meadows Hospital;
  - Westridge Centre and Westgate Shopping Centre;
  - Maple Meadows Station; and
  - Thomas Haney Centre.

Within each of these areas, a high priority is assigned for all roads, including local streets that currently lack sidewalks on at least one side of the road. Additionally, all pedestrian improvements must utilize universal design standards to support access for people with mobility challenges.



**Map 23 Pedestrian Areas in Maple Ridge**



- **Bus routes.** Because all transit passengers are required to walk at both ends of their trips, it is very important to provide pedestrian facilities (i.e. sidewalks or walkways) on both sides of all bus routes within Maple Ridge. This enhances the safety of pedestrians on bus routes, and makes transit more attractive as a transportation mode. For the purposes of assigning priority within the STP, pedestrian facilities along bus routes are considered medium-term and long-term priorities.
- **Other urban arterials and collectors.** This category includes all other gaps in the sidewalk network along urban arterials and collectors and that do not fall into the preceding categories. Within the Transportation Plan, these gaps were identified as a 'low' priority. This is not to imply that they should be deferred indefinitely. On the contrary, all gaps in the sidewalk network should be completed as soon as possible. However, it is recognized that, given the financial constraints, priorities for completion must be assigned.
- **Developing areas.** In addition to the six pedestrian areas notes above, there are a few neighbourhoods in Maple Ridge identified as current and future growth areas by the City, including Silver Valley, Thornhill, and Albion. The Pedestrian Plan recognizes the need to ensure that attractive and safe pedestrian facilities are provided as development occurs over time within these areas.

As described above, the City should have as its ultimate goal the installation of sidewalks on both sides of all urban arterials and collectors in the city, and on one side of all local streets. Ideally, this standard would incorporate boulevards between the curbs and sidewalks to provide a more comfortable walking environment. It is recognized that it would likely take longer than 20 years to upgrade all local roads in the city to meet this standard of having at least one sidewalk. For this reason, segments of local roads that do not meet these

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standards have not been identified as part of the STP. However, there may be opportunities throughout the 20-year time horizon of the Plan to upgrade local roads to meet the sidewalk standards in locations that have not been identified through the Plan. In this regard, this standard should be considered when local roads are being upgraded through the Local Improvement Program or through other programs or aspects of the Transportation Plan. For example, sidewalks could be installed to meet these standards as part of projects to widen roadways for bicycle facilities.

A high priority has been assigned for the provision of sidewalks within the six identified pedestrian areas. The following discussion identifies the sidewalk needs within these six locations, as well as along collectors and arterials within 500m of these areas. **Table 3** below summarizes the recommended sidewalk provision guidelines, organized by facility type, requirements, and material type (asphalt or concrete).

**Table 3: Sidewalk Provision Guidelines**

	Pedestrian Areas	Bus Routes	All Other Urban Arterials + Collectors Roads	All Other Urban Local Roads	Rural Arterials + Collector Roads	Rural Local Roads
<b>Type of facility</b>	Sidewalks	Sidewalks	Sidewalks	Sidewalks	Walkway	Walkway
<b>Sidewalk requirements</b>	Both sides	Adjacent to stop	Both sides	At least one side	At least one side	N/A
<b>Material</b>	Concrete	Concrete	Concrete	Asphalt or Concrete	Asphalt	N/A

#### i. Pedestrian Areas

A high priority has been assigned for the provision of sidewalks within the six city-serving pedestrian areas identified above. The following discussion identifies the sidewalk needs within the six areas. Further details about specific locations, costs and priorities are provided in **Table 4**.

##### a. Town Centre

The Town Centre supports a diverse mix of higher-density land uses that attract multi-purpose trips, where people can walk between several locations for a variety of needs, such as work, shopping, or day-to-day business. Due to the presence of the many commercial services and amenities (such as 224 Street, Valley Fair, and Haney Place Mall), civic areas and spaces, schools, the Haney Place Transit Exchange, and Port Haney Station, the Town Centre area experiences the highest level of pedestrian demand in Maple Ridge and will continue to be an area of high pedestrian activity. Improvement priorities focussed within this area will benefit a considerable number of pedestrians and further enhance the ability of the Town Centre to attract walking trips. Within the Town Centre area, there are several streets where there are presently no sidewalks. Sidewalks are recommended on both sides of all streets throughout the Town Centre area to support and encourage walking and to enhance the image of the area as the commercial centre of the city. The following streets currently have no sidewalks along at least a portion of the roadway:

- 117 Avenue
- 119 Avenue
- 223 Street
- 224 Street
- 225 Street
- Brown Avenue
- Callaghan Avenue
- Edge Street
- Fraser Street
- Garden Street
- McIntosh Avenue
- Plaza Street
- Selkirk Avenue

**b. Port Haney Station**

There are no critical gaps in the sidewalk network around Port Haney Station to support walking to and from West Coast Express. However, connections between the Port Haney area and the Town Centre should be reinforced. Although there is currently a connection between these areas via the pedestrian tunnel at the Haney Bypass, there are other connections that could be improved. For example, a sidewalk should be developed along 223 Street between Lougheed Highway and the Haney Bypass (included in Town Centre section) and along the north side of River Road.

**c. Ridge Meadows Hospital**

There are relatively few gaps in the sidewalk network around the Ridge Meadows Hospital. In the longer term, the City should pursue the development of sidewalks on both sides of Laity Street between River Road and Lougheed Highway to support pedestrian movements around the hospital. Sidewalks should also be provided on both sides of 117 Ave.

**d. Westridge Centre and Westgate Shopping Centre**

The sidewalk network in areas around the Westgate Shopping Centre is well developed, but there is a need for pedestrian facilities along 119 Avenue between 203 Street and 207 Street. As well, there is no sidewalk on the north side of Lougheed Highway between 119 Avenue and 210 Street. Although this is provincial jurisdiction, the City should pursue improved pedestrian facilities along Lougheed Highway for Maple Ridge residents.

**e. Maple Meadows Station**

The sidewalk network around Maple Meadows Station is relatively well developed, but there are several key gaps in the network that should be pursued. These will support pedestrians walking to and from West Coast Express and the commercial area at the Lougheed Highway/Dewdney Trunk Road intersection. For example, there is limited sidewalk coverage on portions of Dunn Avenue. More importantly, however, there is no sidewalk along Hammond Road between West Street and 203 Street. A sidewalk or a wide paved shoulder to accommodate both pedestrians and cyclists should be developed.



**f. Thomas Haney Centre**

There are sidewalks along at least one side of most roads around the Thomas Haney Centre. However, sidewalks are presently not provided along Adair Street, 117 Avenue, and 232 Street north of 116 Avenue.

**ii. Bus Routes**

It is the City's objective to provide sidewalks along both sides of all existing and proposed transit corridors within Maple Ridge. The following streets have gaps in the sidewalk network that need to be complete in order to support pedestrian travel to and from bus routes. Further details about specific bus route locations, costs and priorities are provided in **Table 5**.

- |                 |                                    |
|-----------------|------------------------------------|
| • 117 Avenue    | • Laity Street                     |
| • 123 Avenue    | • Lorne Avenue                     |
| • 203 Street    | • Maple Crescent                   |
| • 240 Street    | • Princess Street                  |
| • Ditton Street | • River Road (216 St – River Bend) |

**iii. Other Urban Arterial and Collectors**

In the longer term, the City should strive to provide a sidewalk on at least one side of every urban collector and arterial roadway in the municipality. The following discussion identifies other gaps in the city's sidewalk network that do not fall within the preceding categories. Further details about specific locations, costs and priorities are provided in **Table 6**.

- |              |                                  |
|--------------|----------------------------------|
| • 121 Avenue | • 230 Street                     |
| • 122 Avenue | • 232 Street                     |
| • 124 Avenue | • Cottonwood Drive               |
| • 126 Avenue | • Laity Street                   |
| • 203 Street | • Lorne Avenue                   |
| • 206 Street | • River Road (207 St – Laity St) |
| • 228 Street |                                  |

**5.2.2 Interim Strategies for Growth Areas**

Three future growth areas have been identified for special consideration within the Pedestrian Plan, and are identified as Development Areas Precincts. The Silver Valley, Albion, and Thornhill areas are all in areas identified to accommodate portions of future growth in Maple Ridge. While the majority of these developing areas do not currently have many key pedestrian generators, it is recognized that as development occurs over time, more parks, schools, and neighbourhood commercial centres may arise that will require sidewalks and treatments to enhance walkability for current and future residents.

Improving the walkability in the areas of Silver Valley, Albion and Thornhill will serve new and existing residents and will attract more people to these areas. In general, there are three strategies to improving pedestrian facilities in these Developing Areas:

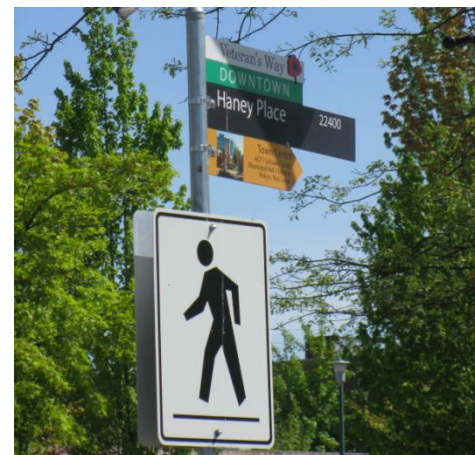
- **Provide sidewalks as growth occurs.** This minimizes the cost to the City, but results in reduced comfort and safety for pedestrians over the short-term and also limits pedestrian access to these areas.
- **Construct temporary sidewalks.** This involves constructing lower cost, temporary sidewalks within the road right-of-way to provide separation for pedestrians, typically using asphalt. This results in moderate to high cost for the City and a lower quality of pedestrian facility, but at least ensures there is a pedestrian facility in place, although it may not be continuous.
- **Provide ultimate sidewalk.** This provides separation for pedestrians as development progresses of a full sidewalk standard, including meeting minimum standards for sidewalks and concrete construction. This results in a higher capital and property cost and may require land acquisition.

Among these strategies, it is recommended that the City examine the potential for temporary shoulder widenings or separated pathways to pedestrians from traffic on arterial and collector roads as growth occurs. This should consist of a flexible design around existing constraints and integrate with equestrian trails. It is also recommended that the City consider integrating bicycle and pedestrian facilities along shoulder areas where moderate amounts walking and cycling occur. This will ensure that these growth areas can support active transportation choices.

### 5.2.3 Enhanced Treatments in the Town Centre

As noted previously, the Town Centre supports a diverse mix of higher-density land uses that attract multi-purpose trips, where people can walk between several locations for a variety of needs, such as work, shopping, or day-to-day business. The City has made significant efforts in recent years in improving the walkability of the Town Centre area, with specific emphasis on improvements on 224 Street. The City should continue to focus on enhancing the pedestrian realm in the Town Centre in addition to the provision of sidewalks noted above. Streetscape and pedestrian realm enhancements should be considered on additional corridors throughout the Town Centre, including Lougheed Highway, Dewdney Trunk Road, 222 Street, 223 Street, 226 Street, 119 Avenue, Edge Street, and Selkirk Avenue. Building upon the OCP Town Centre Area Plan, features that should be considered in the Town Centre include:

- **Boulevards** between the curb and sidewalk. Adjacent to commercial uses, sidewalks should generally extend from the curb to the property line/building face to maximize pedestrian space and to accommodate other amenities, such as street furniture and bicycle parking that can comfortably accommodate demands and do not interfere with walking aids. Street trees may be incorporated into the sidewalks with high pedestrian demands and



where parking does not provide a buffer between the road and sidewalk, as street trees can play an important role in increasing pedestrian comfort and safety.

- **Street furniture** and other pedestrian amenities outside of the travelled portion of the sidewalk are essential to making people places and creating environments within the Town Centre that are comfortable and interesting for pedestrians.
- **Enhanced wayfinding** to guide people to and around the Town Centre. Enhanced wayfinding signage can benefit residents and visitors, to help orient pedestrians to key destinations and commercial areas within the Town Centre. Enhanced signage also benefits all users, and helps to ensure a sense of place at key destinations. Signage standards may support a theme, and should be designed to meet the needs of visually impaired.
- **Accessible bus stops** consistent with TransLink's design guidelines will be implemented to enhance comfort of all transit passengers and to ensure accessibility for all customers.
- **Street lighting** to ensure pedestrian comfort as well as safety and security at all times of day. Street lighting can also be designed to support a particular theme for a given area.
- **Pedestrian safety** will be enhanced with greater application of Crime Prevention Through Environmental Design (CPTED) audits and design practices.

#### 5.2.4 Safer Crossings

Improving the safety and visibility of crossings is an important way to improve walkability and enhance conditions for pedestrians. The potential range of crossing treatments should be considered in all key activity areas, however more extensive crossing treatments should be considered for major pedestrian destinations such as the Town Centre / WCE and Key Employment Area Precincts, and more modest treatments in the Schools & Parks Precincts. The range of crossing treatments include:

- **Narrower crossings** using curb extensions, bus bulges, and median islands wherever feasible in pedestrian precincts. Curb extensions extend the sidewalk across the curbside parking lane. They benefit pedestrians by improving visibility and reducing crossing distances. They also offer opportunities for pedestrian amenities, such as landscaping and benches.
- **Enhanced crosswalk treatments** may include flashing lights which are activated by pedestrians. The flashing lights alert motorists that pedestrians are crossing, and increase visibility of the crosswalk. A flashing light treatment offers advantages over a signalized pedestrian crossing, as there is no delay for pedestrians waiting to cross, and delays to motorists are minimized because as soon as pedestrians clear the crosswalk vehicles can proceed. The City should follow guidance within the TAC Pedestrian Crossing Control Guide to determine when enhanced crossings are warranted.
- **Accessible pedestrian signals** at signalized intersections are increasingly being used and desired in high pedestrian areas to assist pedestrians with disabilities. Research has shown that these treatments



provide a higher degree of confidence to pedestrians crossing major streets and have generally received positive support among all age groups.

- **Countdown timers** at key intersections to provide timing information to all users.
- **Curb letdowns** at all intersections. Where possible, separate curb letdowns should be properly aligned with crosswalks. Designs which incorporate a single ramp that is positioned between the crosswalks will also be considered depending on the intersection configuration.

### 5.2.5 Support Programs

It is not enough to simply provide pedestrian infrastructure, as programs must also be in place to encourage people to walk in Maple Ridge. Education is a considered a 'soft' measure for promoting walking, as it involves no engineered features or design mechanisms, but involves promoting awareness and informational material about walking in the community. Education initiatives can include providing information promoting alternative modes of transportation, local walking networks (such as trail maps that show recommended routes and facilities), and programs that teach road safety skills. In addition, with a relatively compact Town Centre, education and awareness initiatives by the City can emphasize this fact to encourage residents to walk for trips to, from, and within the Town Centre. Often, supportive programming targeted at walking is combined with information for cycling, as the two modes provide alternatives to driving for short-distance and local trips. Through spreading information and awareness about walking and cycling, the City can use cost-effective education initiatives to enable people to feel more safe and comfortable using active modes to get around, while encouraging increased use of pedestrian infrastructure and facilities. As such, specific support programs targeted at walking can include:

- **Walking Education & Awareness** such as Safe Routes to School/Safer School Travel programming, partnerships i.e. ICBC, RCMP, and continuing to support and work with TransLink's TravelSmart Program.
- **Events:** Host and/or promote events such as Open Streets / Sunday Street Closures, World Walking Day, iWalk, Move for Health, and Active Month
- **Parklets**, converting on-street parking spaces into temporary public spaces as a way to bring people out on the streets and sidewalks, it can build community and engage residents and visitors in a fun urban design activity, i.e. within the Town Centre.

## 5.3 Capital Cost and Priorities

The tables below summarize the sidewalk facilities that are recommended in the STP. The recommended improvements include preliminary capital costs for the sidewalk facilities, based on a unit cost of \$150 per metre of sidewalk. This includes curb and sidewalk construction, but does not account for significant driveway rehabilitation or landscaping.

The table also identifies needs-based priority for each treatment. As described in previously, the highest priority is assigned to addressing the sidewalk gaps on roads within pedestrian areas. A medium-term priority is given to sidewalks along bus routes, and the longer-term priority is assigned to gaps along collectors and arterials that are well outside of pedestrian areas and are not located along bus routes.

The total cost to implement the sidewalk priorities is approximately **\$5.4 million** as shown in the tables below. This includes approximately \$1.5 million for sidewalks in pedestrian areas, \$1.8 million for sidewalks along bus routes, and \$2.1 million for sidewalks along other urban arterials and collectors. It should be noted that the ultimate cost of meeting the City's sidewalk requirements would be much higher. These improvement priorities do not include sidewalks along local roads that are adjacent to schools, parks or community centres and the City should work to identify additional local road sidewalk priorities. The costs for constructing sidewalks are summarized below in **Table 4** and detailed further in **Appendix A**. These costs do not include sidewalk construction on urban local roads (outside of pedestrian areas) and rural road walkways, as these are not identified as priorities and would be constructed over time as development opportunities occur.

**Table 4: Sidewalk Priorities**

Location	Short-term (<5 yr)	Medium-term (5-10 yr)	Long-term (10-20 yr)	Total Cost
<b>Pedestrian Areas</b>	<b>\$1.5</b>	-	-	<b>\$1.5</b>
<b>Bus Route Sidewalks</b>	-	<b>\$1.8</b>	-	<b>\$1.8</b>
<b>Urban Collector and Arterials</b>	-	-	<b>\$2.1</b>	<b>\$2.1</b>
	<b>\$1.5</b>	<b>\$1.8</b>	<b>\$2.1</b>	<b>\$5.4 million</b>

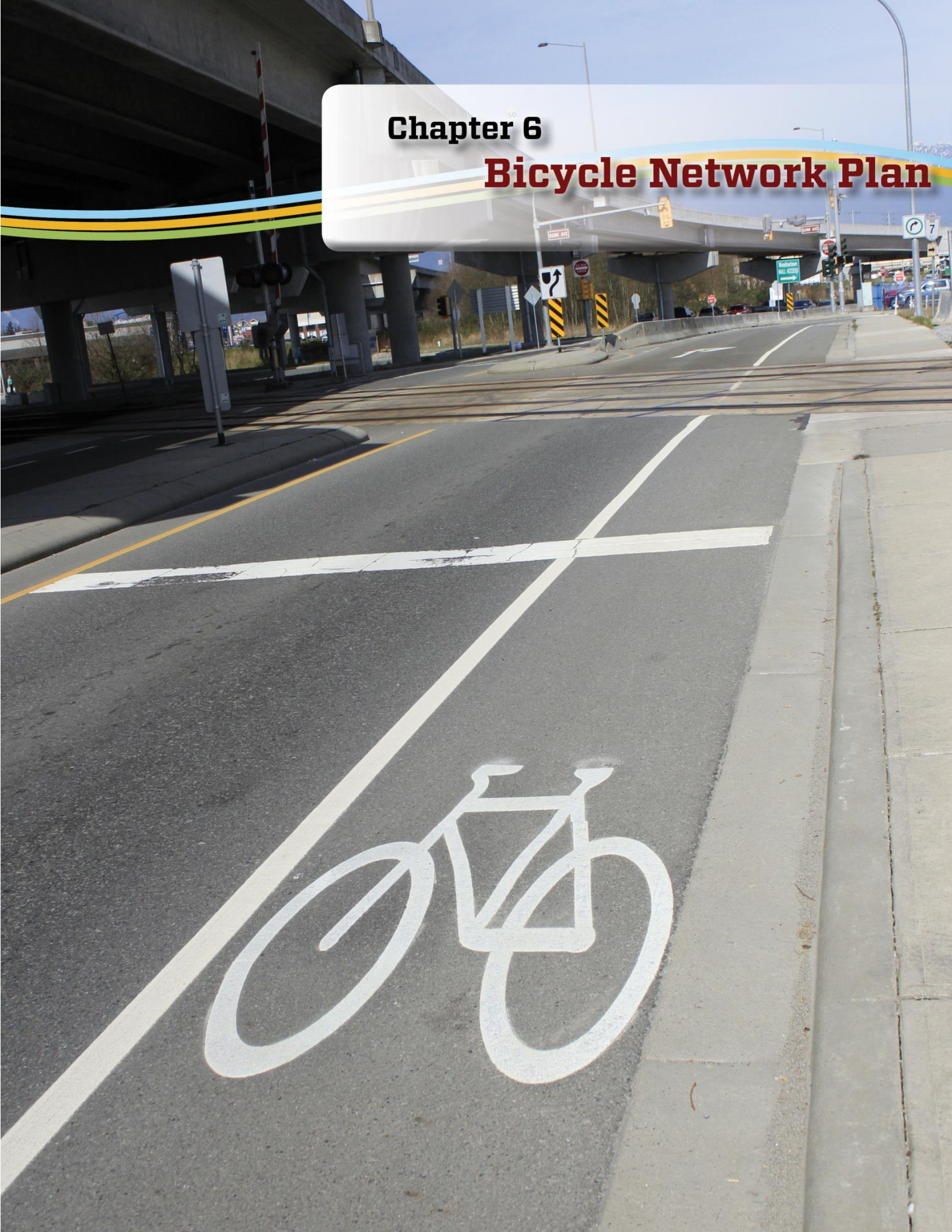
*Note: Costs are conceptual in nature (Class D) and are not typically used for budgeting purposes. They do not include any allowance for significant utility relocation, earthworks, driveway reconstruction, landscape restoration, property and legal cost.*

Recognizing the total capital investments required for cycling and pedestrian facilities identified in the MTP, the City may also consider strategies for integrating facilities for these modes in some areas in order to increase coverage in a shorter period of time and to managed resources.



## Chapter 6

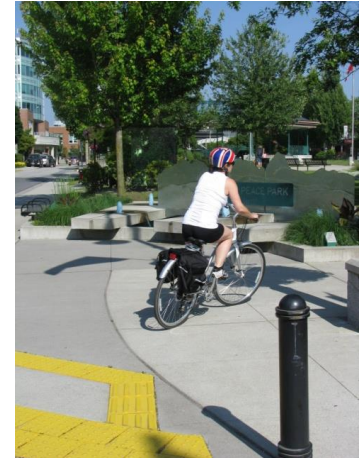
# Bicycle Network Plan





Cycling in the City of Maple Ridge has gained increasing prominence over the past 20 years. Within the context of the transportation system, the role of the bicycle has changed dramatically. Once considered a vehicle predominantly used for leisure and recreation, the bicycle is now seen as a viable mode of transportation for many trip purposes, particularly those within the community.

Developing a safe and comprehensive bicycle network is an important way to support healthy lifestyles and to recognize the positive environmental aspects of cycling as a viable and attractive mode of transportation. Further, cycling is an effective mode particularly for short-distance trips, but a range of facilities are required to support different cyclists' needs. As such, supporting cycling in and around Maple Ridge requires infrastructure and safety measures, such as bicycle lanes, trails, bicycle parking, and safe crossings, as well as support programs to encourage cycling.



## 6.1 Shaping Influences and Challenges for Cycling

Over the past two decades, the joint Maple Ridge/Pitt Meadows Bicycle Advisory Committee has been actively advising on cycling issues and providing guidance on the implementation of city's bicycle network, based on previous plans developed in 1994 and 2004. Looking ahead, the City wants to ensure that investments in cycling facilities and programs continue to increase comfort and safety for people that may be interested in riding their bicycles to work, school and other travel. This section of the Plan examines some of the more significant influences that shape the bicycle plan as well as the challenges to increasing investments in cycling facilities.

- **Cycling makes up a small portion of the overall travel in the city today.** Less than 1% of commute trips in Maple Ridge (i.e. trips to work) are by bicycle, according to the 2011 Canadian National Household Survey. TransLink's 2008 Regional Trip Diary Survey reported similar findings, stating that less than 1% of all daily trips in Maple Ridge are by bicycle. The Trip Diary Survey also found that the majority of bicycle trips in Maple Ridge are made for going to and from work, followed by trips made to go to elementary or secondary school, and shopping. Nearly 75% of bicycle trips in the city are less than 5 kilometres in length, indicating short, local bicycle trips. The opportunity for the City is to focus on targeting shorter distance trips for cycling purposes, including shorter-distance trips that are currently made by automobile and that could be made by bicycle instead. In addition to focusing on short, local trips, the City should continue to focus on regional connections for longer-distance commuting trips, particularly to communities to the west including Pitt Meadows and the Northeast Sector.

### Shaping Influences and Challenges for Cycling

- Cycling makes up a small portion of the overall travel
- The bicycle network includes a basic network of east-west and north-south routes
- The bicycle network can be comfortable for a broader range of the population
- Existing bicycle facilities provide direct connections to other communities
- There are several intersections that are difficult for cyclists to cross

- The bicycle network in Maple Ridge includes a basic network of east-west and north-south bicycle routes.** Maple Ridge's existing bicycle network consists of several east-west and north-south routes that provide access to the Town Centre and to surrounding neighbourhoods. North-south bicycle routes include 203 Avenue, Laity Street, 216 Street, 224 Avenue, and 240 Street. East-west bicycle routes include 123 Avenue, 124 Avenue, 122 Avenue, and 100 Avenue. The bicycle network also contains off-street pathways, which are used by both commuter and recreational cyclists. Although a basic network is in place to accommodate east-west travel across the municipality along with some north-south connections, there is an opportunity to provide increased network coverage. Research has shown that a dense bicycle network is required to make cycling an attractive option, so that cyclists can access routes quickly. A recent study found that cyclists are unlikely to detour more than about 400 metres to find a route with a bicycle facility. As such, a bicycle route network with facilities spaced at least every 500 metres should be the goal in urban areas where there is a desire to increase bicycle ridership.
- The city's bicycle network can be comfortable for a broader range of the population.** Research has shown that a significant segment of the population in Metro Vancouver is interested in cycling more often, but is concerned about the safety of cycling, particularly interacting with automobile traffic. This group, referred to as the "interested but concerned" segment of the population, would cycle more if comfortable facilities were provided, with a preference for off-street pathways, physically separated bicycle lanes, and bicycle routes on low volume street. The city's bicycle network is currently made up primarily of on-street bicycle lanes and shared road bikeways. Some of these have minimal or no separation between cyclists and vehicle traffic, requiring bicyclists to share the road with vehicles. The City can make cycling a more attractive transportation choice by focusing on developing more off-street pathways, separated bicycle lanes, and local street bikeways.
- Existing bicycle facilities provide direct connections to other communities.** As noted above, although the majority of bicycle trips are short distance trips, a significant proportion of Maple Ridge's bicycle trips are made for commuting to work, and involve travel beyond the city's boundaries. The Golden Ears Bridge opened up a major connection via its separated multi-use path, allowing cyclists to connect to the Township of Langley, City of Langley and the City of Surrey. For connections to Pitt Meadows, the shared routes along Lougheed Highway and Dewdney Trunk are currently the most direct route between the two municipalities, with less direct route options on Hammond Road, Golden Ears Way, and Old Dewdney Trunk. There is a need for the City to work with neighbouring municipalities and other agencies such as TransLink and MOTI to ensure regional bicycle connections are provided across municipal boundaries.
- Bicycle-Transit Integration.** All of TransLink's buses are equipped with bicycle racks on the front of busses, with a limit of two bicycles per bus. Bicycles are also allowed on the West Coast Express trains for a fee, with each train having tie-downs for two bicycles. There is an opportunity to provide enhanced bicycle parking at key transit stations and exchanges as deemed necessary.

- End of Trip Requirements.** The City's Off-Street Parking and Loading Bylaw contains requirements for bicycle parking in the Town Centre, applicable to all properties in the area excluding heritage buildings, churches, and child care centres, as shown in **Table 5**. The bylaw distinguishes between short and long-term bicycle parking requirements. Short-term bicycle parking areas are typically at the main or public entrance to a building, suitable for visitors or patrons. Long-term bicycle parking requirements refer to secure storage facilities in buildings that are intended for resident or employee use. The City of Maple Ridge bicycle parking requirements are as follows:

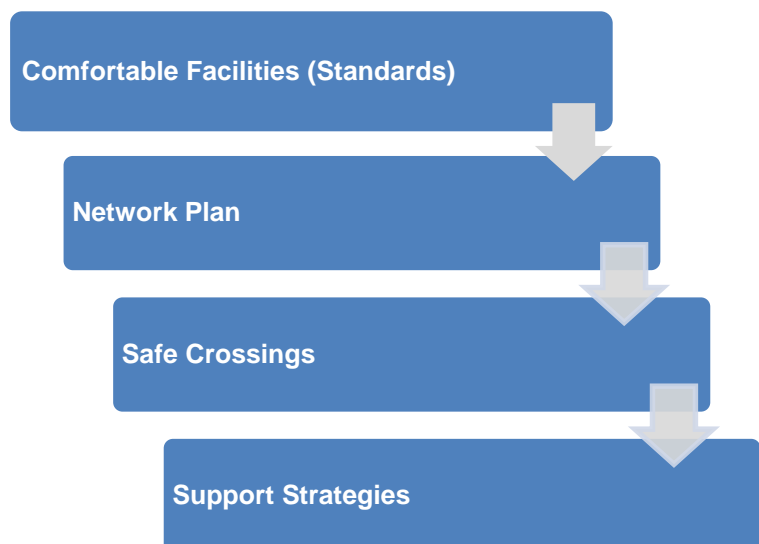
**Table 5: Existing Bicycle Parking Requirements**

Building Type	Long-Term Bicycle Parking	Short-Term Bicycle Parking
Townhouse, Rowhouses	Storage provided inside individual units	3 spaces per 20 units
Low, Medium, High – Rise Residential	1 per 4 units	6 spaces per 20 units
Senior Independent Living / Assisted Living	0.1 space per unit	2 spaces per 20 units
Care Facility	0.05 space per unit / room	2 spaces per 20 units
Commercial / Office Use	1 per 750m <sup>2</sup> GFA	6 spaces per 1,500 m <sup>2</sup> GFA
Hotel	1 per 30 rooms	1 space per 20 rooms
Institutional	15% of required number of automobile spaces	6 spaces per 1,500 m <sup>2</sup> GFA

## 6.2 Long-Term Bicycle Plan

The Bicycle Plan identifies the recommended long-term bicycle network throughout Maple Ridge. The Plan includes both on-street and off-street cycling facilities that will fill various gaps in the existing network, provide access to a range of community destinations and neighbourhoods, and provide safe and comfortable connections. The Plan also provides guidelines for bicycle facilities and signage, and identifies priorities for implementation. The Bicycle Plan focusses on connecting Maple Ridge neighbourhoods with each other and the Town Centre. The City's OCP envisions the Town Centre as an area with increasing density and land use mix over time, and where more people will choose to walk, cycle or take transit to in the future. As such, the STP Bicycle Plan

### Bicycle Plan Themes





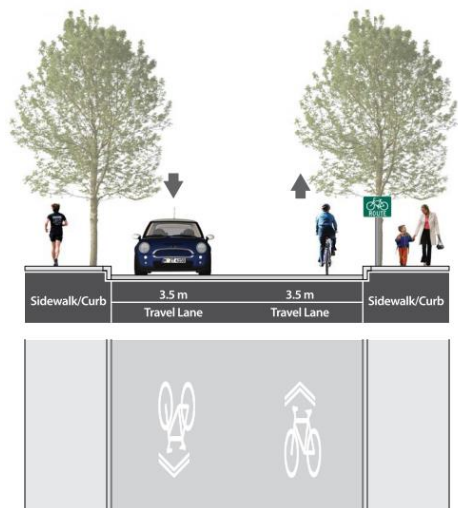
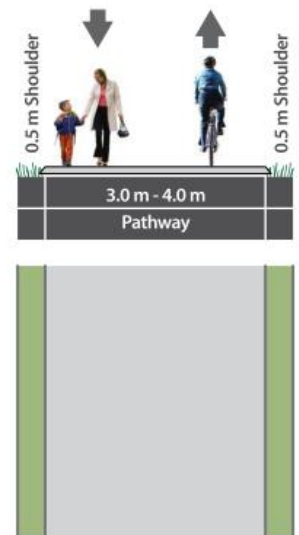
builds off the bicycle network envisioned in the OCP for the Town Centre area, and seeks to provide interconnected bicycle routes to surrounding neighbourhoods and destinations. The primary features of the long-term Bicycle Plan are described below.

### 6.2.1 Comfortable Facility Standards

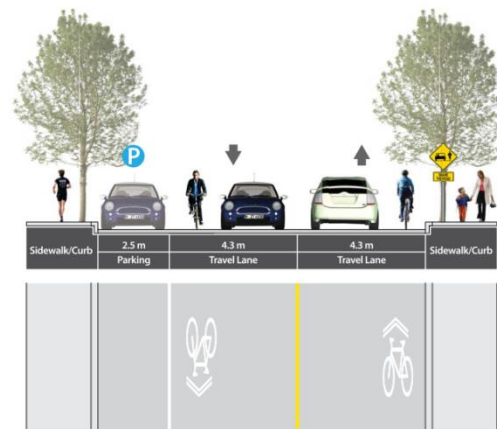
As noted previously, there is a significant opportunity to increase bicycle use by targeting improvements towards the segment of the population that may be interested in cycling more often, but is concerned about the safety of cycling. To attract these individuals, bicycle facilities should be safe and comfortable so bicyclists of all ages and abilities can feel safe using their bicycle for transportation.

The Bicycle Plan includes a range of different bicycle facilities that can be considered under different conditions as described below:

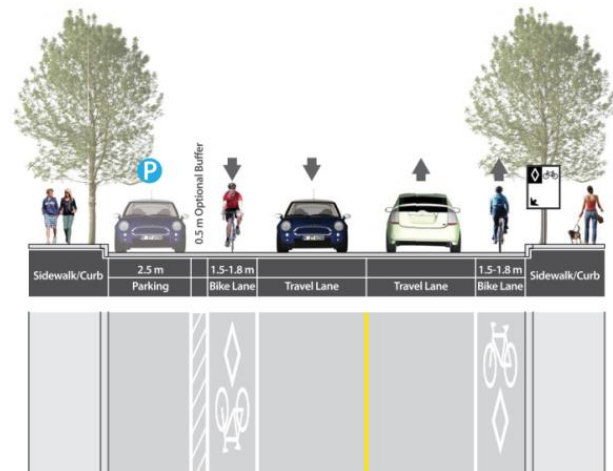
- Off-Street Pathways** are physically separated from the roadway and are comfortable for the interested but concerned segment of the population. Examples in Maple Ridge include the paved pathway on the north side of Lougheed Highway (216 Street to Laity Street), the paved path parallel to Abernethy Way, 122 Avenue (216 Street to 222 Street) and on 227 Street (116 Avenue to Haney Bypass). Off-street pathways are generally intended to be shared among multiple users and should be designed to accommodate a range of types of users, with different trip purposes, speeds, and experience levels. This includes ensuring that off-street pathways are hard-surfaced, preferably using asphalt, to comfortably accommodate the range of users. Off-street pathways should be a minimum of 3.0 metres wide, and 4.0 metres or more in width in high-use areas. Off-street pathways can also have other amenities, including benches, lighting, and garbage cans.
- Neighbourhood Bikeways** are located on local streets with lower traffic volumes and speeds, and where cyclists and motor vehicles can comfortably share the road. Neighbourhood bikeways in Maple Ridge currently include 123 Avenue and 124 Avenue. These bikeways may be shared with traffic calming treatments to lower vehicle volumes and speeds and to improve the safety and comfort for cyclists sharing the road with motorists. Neighbourhood bikeways provide a broad level of appeal to a variety of cyclists, including commuter cyclists and less experienced cyclists (who may not be comfortable cycling on higher volume roads). For less experienced cyclists, neighbourhood bikeways can also serve as “stepping stone” facilities that help increase their comfort level using on-road facilities.



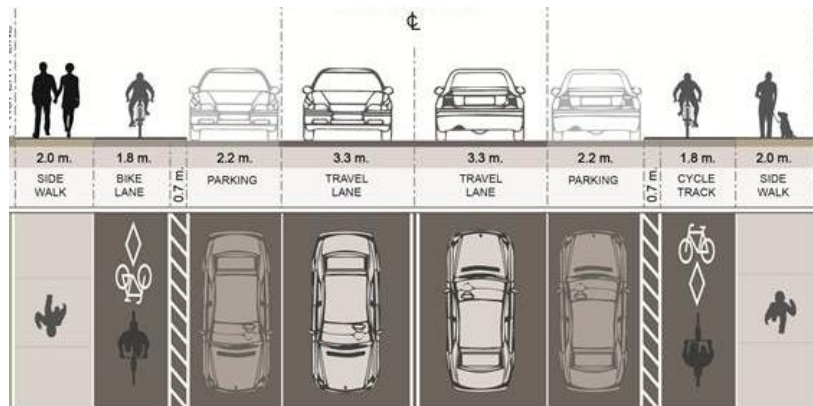
As part of Neighbourhood Bikeways, shared use lanes may also be used as on-street bicycle facilities with a shared bicycle and motor vehicle travel lane that includes signage and pavement markings to indicate where cyclists should position themselves in relation to the curb or parked cars. Shared use lanes are typically located on arterial and collector roads with higher traffic volumes and speeds, and where there is insufficient space to provide a painted bicycle lane. Shared use lanes should be a minimum 4.3 metres wide, which is 60 cm to 80 cm wider than a typical travel lane. This allows sufficient width for an automobile to safely overtake a bicycle, without crossing into the adjacent or oncoming travel lane. Shared use lanes should include “sharrow” markings, which consist of a bicycle stencil with chevron markings, to indicate to cyclists and motorists where cyclists should position themselves in the travel lane, and to raise awareness to motorists that they may expect to see cyclists. In general, many interested but concerned cyclists do not feel as comfortable on shared use lanes as compared to off-street pathways, bicycle lanes, or local street bikeways. As such, applications of shared use lanes should be limited to short sections where there are physical constraints that do not provide the space required for painted bicycle lanes, but where a facility is required for network connectivity and wayfinding purposes.



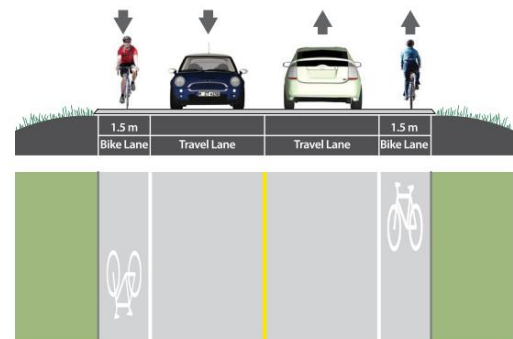
- Painted Bicycle Lanes** are separate travel lanes designated exclusively for bicycles. Painted bicycle lanes are typically located on arterial and collector roads with higher traffic volumes and speeds. In Maple Ridge, bicycle lanes are on many north-south streets including 203 Avenue, 216 Street, 232 Street, and Laity Street. Bicycle lanes in Maple Ridge are located adjacent to motor vehicle travel lanes, with bicycle flow usually one-way and typically in the same direction as traffic. Some communities have placed bicycle lanes adjacent to curbside parking lanes. Bicycle lanes should be a minimum of 1.5 metres wide, with a desired width of 1.8 metres. Bicycle lanes are typically identified by signage and pavement markings along with a painted with a solid white line.



On busier roadways with higher traffic volumes and speeds, the City may consider enhanced bicycle lane treatments, including buffered bicycle lanes with parked vehicles separating cyclists from traffic as well as physically separated bicycle lanes.



- Shoulder Bikeways** are most appropriate for roadways that have higher motor vehicle traffic volumes and speeds and which are located on highways and roads without curbs and gutters. Similar to bicycle lanes, shoulder bikeways are separate travel lanes designated for the shared use of bicycles, separated from travel lanes by a painted line. In areas where adjacent ditches make it difficult to extend shoulders, separated pathways may be provided to manage costs and impacts.



These on and off-street bicycle facilities can be considered throughout the city, recognizing the different markets attracted to each type. As conceptually illustrated on the next page, each type of bicycle facility can be considered along a hierarchy based on user comfort. Facilities that are physically separated from vehicle traffic, such as off-street pathways and separated bicycle lanes, are the most comfortable and attractive to both existing and potential cyclists. The least comfortable facilities are shoulder bikeways (typically found on high-speed roads) and shared use lanes, which typically only the most confident cyclists feel safe using.





### 6.2.2 Network Plan

The existing bicycle network in Maple Ridge has several important gaps, including a need for more east-west connections, improved access to rural areas and neighbourhoods, and more options to connect with the District of Pitt Meadows' bicycle network. The long-term Bicycle Plan identifies a comprehensive city-wide network of facilities that link local destinations throughout Maple Ridge as well as regional connections to surrounding municipalities. The recommended bicycle network plan has been developed based on previous plans identified in the 1994 Bikeways Plan and 2004 Transportation Plan. However, the network plan has been refined based on public input to provide increased emphasis on facilities that are more comfortable for the "interested but concerned" segments of population by including off-street pathways and local street bikeways.

A number of guiding principles were considered in establishing the updated bicycle network plan. In particular, bicycle facilities must be direct and provide adequate connections to key destinations within the community, including connections to key commercial areas, schools, parks and community facilities. In addition, streets on which traffic volumes are lower and provide adequate width to safely accommodate cyclists were typically favoured over streets with higher traffic volumes or narrower width that would not provide the necessary space requirements for bicycle travel. In some cases, however, higher volume streets with adequate pavement width provided the only available link between two areas of the city. In these situations, appropriate measures were proposed to ensure that both cyclists and motorists would be able to share the roadway safely and effectively. Where the on-street bicycle network does not provide connections to some areas of the city, the off-street pathway network provides the necessary linkages. The bicycle network plan connects with or parallels both the Trans-Canada Trail within the built-up area of the city, and the equestrian trail network within the rural area of the community.

The layout of the on-street bicycle network ensures that cyclists from almost all areas of the city can easily access a bicycle route. It is important to note, however, that the designation of a street as a bicycle route does not exclude the use of other streets by cyclists. In fact, all city roads should be considered bicycle streets, and all road users should be educated to share the road with each other in a safe manner.

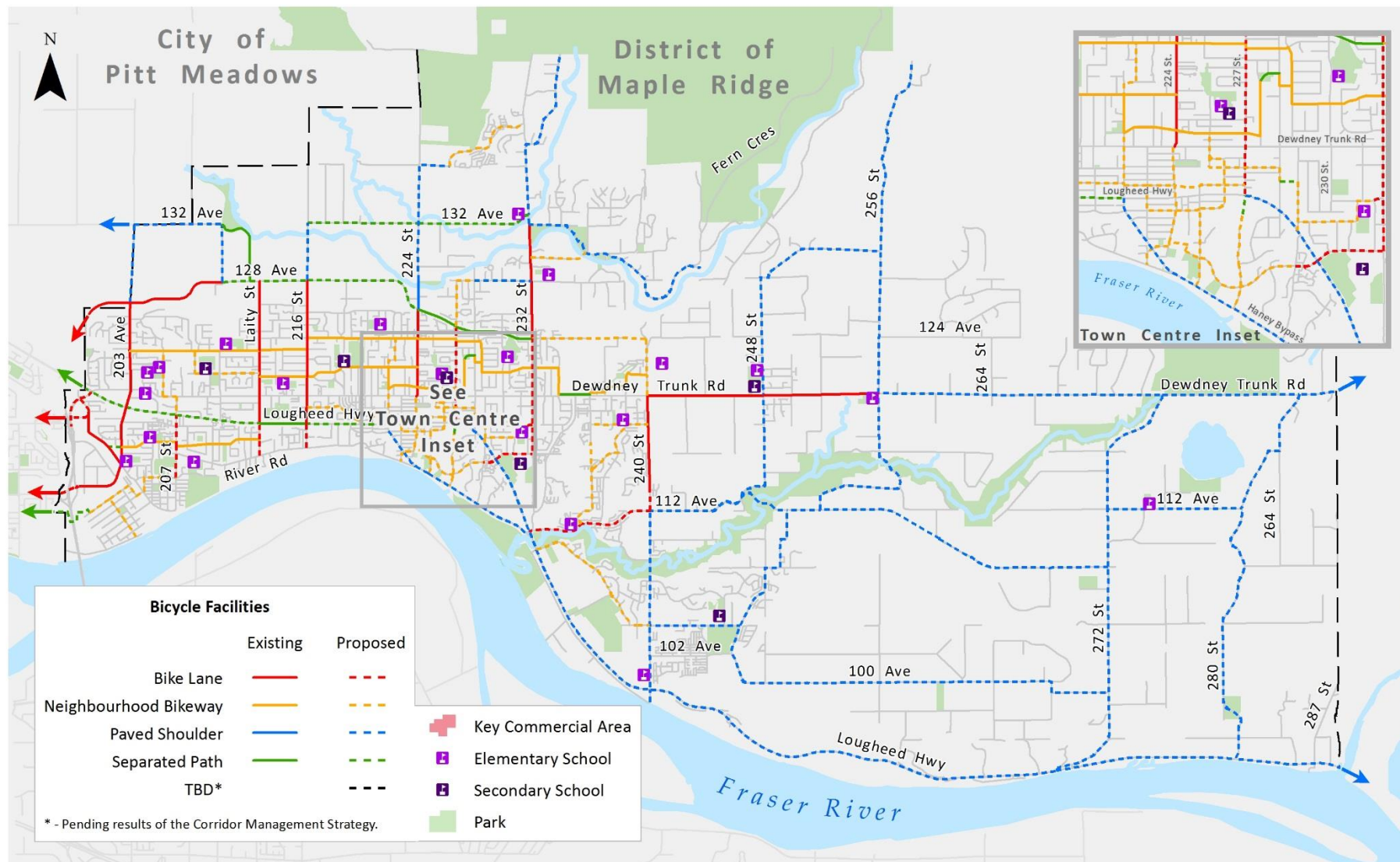
Furthermore, when roads are upgraded to urban standard or widened, and when any new roads are constructed, bicycle facilities should be incorporated.

The bicycle network plan described below identifies a broad framework of alignments for bicycle routes and does not identify site-specific improvements that may be required to effectively connect individual routes with each other and major destinations. Although alignments have been identified within the bicycle network plan, final route selection and design (including key connections and crossings) will be considered in greater detail through corridor specific strategies. The implementation of corridor-specific initiatives will offer more opportunities for members of the public, as well as the Bicycle Advisory Committee, to provide input on the city-wide cycling network. These routes, however, identify an optimal series of alignments for providing direct access to all areas of the city and other parts of the region. From this core network, the City can specifically address operation and design issues through subsequent bicycle facility design to complete the on-street bicycle network – in coordination with off-street facilities – and maximize connections to major destinations.

The existing and proposed bicycle network in Maple Ridge is shown in **Map 24** and described in further detail below.

- **Off-Street Pathways** are primarily recommended to address network gaps, to provide more comfortable east-west routes through Maple Ridge.
  - **132 Avenue.** A Corridor Management Study for 132 Avenue identified a long-term plan for 3m multi-use pathway, between 232 Street and 216 Street. The pathway is to be separated from the roadway by a 0.5 m buffer, and is intended to accommodate cyclists, pedestrians, and equestrians. While surface material is yet to be determined, road cyclists may also choose to use the road if the pathway is not paved. The City will be constructing a crushed-gravel pathway along the general alignment of the future pathway, to accommodate users in the interim.
  - **Lougheed Highway.** The primary off-street pathway connection is proposed along Lougheed Highway, extending between 216 Street and Haney Bypass. The MoTI and City recently constructed a 650m off-street pathway on the north side of Lougheed Highway between Laity Street and 216 Street. This off-street pathway forms a critical link, enhancing east/west connectivity for cyclists through the existing neighborhood cycle routes on 117 Avenue. The City should work with MOTI to consider the extension of this off-street pathway further east on Lougheed Highway to the urban centre of Maple Ridge.
  - **128 Avenue / Abernethy Way.** An extension of the pathway along Abernethy Way can provide a continuous cycling route across Maple Ridge and Pitt Meadows, providing an attractive alternative to cycling on Lougheed Highway. Currently, an interim off-street pathway already exists on the north side of Abernethy Way between 224 Street and 232 Street. A 3km extension of this pathway westward to 210 Street along 128 Avenue can provide a continuous connection, and link into the existing bicycle lane at the west end of the corridor. The City intends to provide an interim pathway before final completion. This connection also would link up to several north-south bicycle routes, providing access to the Haney-Hammond area and to the Silver Valley area.

**Map 24: Long-Term Bicycle Network**





- **Ospring Street / South Bonson.** An off-street pathway is recommended to connect between Ospring Street in Hammond to South Bonson in Pitt Meadows. There are already informal pathways in this area adjacent to the Golden Ears Bridge; however the Golden Ears Bridge prevents complete connectivity between these two nearby neighbourhoods. Establishing an east-west pathway can facilitate connectivity for cyclists between south Maple Ridge and south Pitt Meadows and can allow cyclists in these areas an alternate access to Airport Way.
- **128 / 210 Street Dyke Trail.** Currently an existing gravel trail along the dyke connects between 128 Ave and 210 Street. Future consideration should include enhancing this existing trail through the provision of a paved surface.
- **Neighbourhood Bikeways.** The majority of proposed bicycle network improvements are in the form of neighbourhood bikeways, which are low cost and low-traffic routes designed to connect the city's residential neighbourhoods to each other and to key destinations in the Town Centre.
  - **Skillen Street / Wicklund Avenue bikeway,** provides a 1.2km alternate route off the 123<sup>rd</sup> Avenue bikeway, providing access to Westview Secondary School and Westview Park, connecting with the bicycle lane on Laity Street.
  - **Foreman Drive bikeway,** between 136 Avenue and 232 Street provides a 1.4 km bicycle route within the heart of Silver Valley's residential neighbourhoods.
  - **105 Avenue / Tamarack Lane bikeway** provides a 2.2km key link and alternate route to Lougheed for cyclists through the Albion area. With future development anticipated in southeast Maple Ridge this route can facilitate cyclists to connect between neighbourhoods in the south and the Town Centre.
  - **236 Street / Creekside Street** is identified as a bikeway to connect Kanaka Way to Dewdney Trunk Road in the north. This provides a quieter alternative to 240 Street and connects directly to both Kanaka Creek Elementary and Alexander Robinson Elementary schools.
  - **227 Street** north of Abernethy Way is identified as a neighbourhood bikeway to connect between the proposed bicycle lanes in the south to the bicycle facilities on 128 Avenue in the north.
  - **Town Centre Bikeways.** Several neighbourhood bikeways are proposed in the city's Town Centre to provide frequent and low-stress connections between the adjacent residential neighbourhoods and the centre. Bikeways in the Town Centre are spaced approximately every 400-500m to provide a higher degree of access to the bicycle network. Some of the primary bikeways in the Town Centre include:

- **116 Avenue** between Haney Bypass and Lougheed Highway is recommended as a bikeway, to provide a low-stress east-west route, and to connect the low to medium density residential neighbourhoods in the south to the Town Centre. Bisected by north-south bikeways on 224 Street and 227 Street, this route on 116<sup>th</sup> Ave forms the southern edge of the bikeway grid around the Town Centre.
  - **224 Street** south of Dewdney Trunk Road is identified as bikeway to bring the north-south bicycle link on 224 Street as far south as Haney Bypass. Previous streetscaping improvements along this corridor have resulted in a more calmed traffic environment, with a combination of measures such as landscaped boulevards, street trees, wider sidewalks, and curb extensions creating a 'slow zone' effect. As 224 Avenue supports many services and amenities of the Town Centre, providing cyclists a facility on this corridor can improve the ease and convenience of accessing key destinations by bicycle in Maple Ridge.
  - **227 Street** to connect to Haney Bypass, allowing users to make a complete north-south connection between Haney Bypass to 128 Ave in the north. 227 Street is a bikeway in the southern residential neighbourhoods, and transitions to a bicycle lane through the Town Centre, and then reverts back to a bikeway north of Abernethy Way.
  - **Selkirk Avenue** bikeway provides an east-west route and transitions from a primarily residential neighbourhood to a service road for commercial destinations within the Town Centre, providing convenient access to many Town Centre services and amenities.
- **Bicycle lanes** have the benefit of providing a higher degree of separation between cyclists and motorists than bikeways, while still providing direct on-street links between residential areas, community destinations, and commercial services and amenities throughout Maple Ridge. Bicycle lanes are proposed on city roads including:
    - **124 Avenue**, east of 232 Street, to bring an extension of the Abernethy Way bicycle facilities further east. This facility would be contingent on if future development activity on 124 Avenue would provide a roadway to connect 124 Street to 237 Street.
    - **207 Street**, south of Lougheed Highway provides a north-south route though Hammond and Haney in addition to the 203<sup>rd</sup> Street bike lanes. This route directly provides cyclists access to key destinations such as Hammond Stadium, Hammond Community Centre, and also Maple Ridge Elementary School on River Road.
    - **232 Street** between Abernethy Way and 116<sup>th</sup> Avenue bisects many east-west routes and enhances network connectivity between the areas of Yennadon, the Town Centre, and Kanaka Creek. South of Abernethy Street, the 232 Street corridor has an elementary school, secondary school, recreational club, and a church, and a dedicated bicycle facility can allow a more comfortable connection for cyclists traveling north to south through east Maple Ridge.

- **Kanaka Way** provides an east-west link between 240 Street and Lougheed Highway, connecting the bicycle facilities on each of these corridors, and providing access to Kanaka Creek Elementary School.
- **Shoulder bikeways** are proposed for several rural roads within the city. There are numerous rural roadways throughout the city that should accommodate cyclists, including Dewdney Trunk Road east of 256 Street, 256 Street, 272 Street, 280 Street, 100 Avenue, 240 Street, 112 Avenue, and Lougheed Highway, among others. These routes are attractive for both commuting and recreational cycling because they tend to be less busy and more scenic than urban roads. In most cases, shoulder bikeways are the most appropriate treatment for accommodating cyclists. It is recognized that widening all of the identified roadways to accommodate 1.5-m (posted speed less than 70 kph and daily traffic less than 5,000) or 2.0-m (posted speed 70 kph or higher and daily traffic in excess of 5,000) shoulder bikeways would require significant capital and that the City would likely develop this network of rural bicycle facilities over a longer period of time. Where significant ditches restrict the widening of shoulders – such as along 240<sup>th</sup> Street and 216<sup>th</sup> Street north as well as 232<sup>nd</sup> Street, separated pathways may be considered as an alternative to shoulder bikeways as previously indicated. Ultimately, these shoulder bikeways and pathways create a large grid of routes for cyclists in rural areas, capitalizing on the main spines in Maple Ridge's rural road network.

When complete, the city's bicycle network would more than grow from approximately 35 km today, to 160 km upon full build out. This includes approximately 40 km of facilities within urban areas and approximately 80km of shoulder bikeways in rural areas of Maple Ridge (to be developed in the long-term). These improvements are detailed in **Table 6** and in **Map 23**.

**Table 6: Bicycle Network Improvements**

Bicycle Network Improvements			
	Existing (km)	Proposed (km)	Total (km)
<b>Off-street pathways</b>	4	6.5	10
<b>Local street bikeways</b>	16	22	36
<b>Bicycle lanes</b>	16	15	32
<b>Shoulder bikeways (widening required)</b>	0.5	80	81
<b>TOTAL</b>	36	124	159



### 6.2.3 Crossings

While bicyclists tend to cross in many of the same areas as pedestrians, there are less cyclist crossing features currently available in Maple Ridge. Crossings improvements that can enhance the safety and comfort for cyclists include:

- Bicycle Boxes.** These can be used at signalized intersections to provide cyclists an opportunity to proceed through the intersection when the signals turn green in advance of vehicles. This reduces conflicts between cyclists and motorists and improves safety for cyclists. Bike boxes are beneficial where cyclists turn left from a traffic lane shared with left-turning and through traffic, and where cyclists travel straight through an intersection in a traffic lane shared with through and right-turning traffic. Green is the preferred colour to be used, and the standard surfacing material is methacrylate anti-skid.


- Enhanced Pavement Markings.** Bicycle lane markings may be provided through complex intersections to guide cyclists through these locations and to alert motorists to the presence of a bicycle route through the intersection. Bicycle lane markings are dashed through the intersection to connect with the far-side bicycle lane, either in through movements or left-turning movements. Coloured bicycle lanes can be used at intersections to position cyclists appropriately with respect to other traffic, especially right turning vehicles and motorists, and to highlight the area of potential conflicts. As with bicycle boxes, green is the preferred colour to be used for pavement markings, along with thermoplastic material.


- Bicycle detection at signalized intersections.** Bicycles should be able to activate a traffic signal using a range of technologies, such as bicycle loop detectors, bicycle pushbuttons, or video detection at traffic signals. If bicycle loop detectors are used, they should be marked so that cyclists know where to position their bicycles to activate the detector. In many cases, the same detector that is used for automobiles can be used for bicycles. At intersection with bicycle lanes, additional detectors may be required in the bicycle lane.

#### 6.2.4 Support Strategies

In addition to providing a complete, comfortable, connected network of bicycle facilities with attractive crossings, support facilities are required to make cycling more convenient. Similarly, support programs are required to spread awareness about the bicycle network and educate people on cycling skills and road safety.

- **Advisory Committee.** The joint Maple Ridge/Pitt Meadows Bicycle Advisory Committee (BAC) had been in place since 1997, with the main task of implementing the recommendations of the 1994 Bikeways Plan although it was disbanded in 2013. Looking ahead, the City may consider the ongoing role of an advisory committee that is also connected to other transportation matters in the City.
- **Bicycle Parking.** Every bicycle trip requires bicycle parking at the destination. The fear of theft or vandalism is a significant deterrent to cycling, as is the lack of bicycle parking altogether. Thus, the provision of safe and secure parking at key locations throughout the city is an important way to encourage cycling, and has the added benefit of being cost-effective and a positive “quick win”. A mix of both short and long-term bicycle parking facilities should be available. **Short-term bicycle parking** is where bicycles are left for shorter time periods, such as a few minutes or hours. This type of parking involves a high degree of convenience, with racks situated as close to destinations as possible. **Long-term bicycle parking** is needed when bicycles will be left for longer periods of time, such as for the duration of an entire work day, or overnight. This type of parking requires a high degree of security and weather protection, with well-designed racks in covered areas, lockers, storage rooms, or fenced areas with restricted access.

Additional and/or improved bicycle parking is recommended in both private and public realm areas of Maple Ridge including the Town Centre, Lougheed Highway commercial areas, the transit exchange, civic facilities and spaces, schools, parks, and trailheads. In the public realm, the City can work to implement bicycle parking where possible within the road right-of-way. This can take place either on sidewalks, while ensuring that sufficient clear width is provided for pedestrians or on-street by considering replacing an on-street motor vehicle parking stall with an on-street bicycle corral. For bicycle parking within the private realm, the City's *Off-Street Parking and Loading Bylaw* contains bicycle parking requirements for Town Centre developments. It is important to explore opportunities for additional bicycle parking in private developments outside of the Town Centre when possible, especially in high activity areas and key cycling destinations. In most cases, long-term parking facilities at employment centers are provided by employers, whereas at transit facilities they are provided by TransLink. Therefore, the City must work with these other agencies to encourage the development of bicycle parking at these employment centers, transit stations and bus exchanges.



- **Wayfinding** is an important feature to integrate into the city's network to improve conditions for cyclists. Signage is a relatively cheap and effective measure to make cycling more convenient and comfortable, through the provision of simple and consistent signs and wayfinding to assist cyclists navigating to their destination. Signage is especially important to make cycling more attractive and

convenient for two distinct types of cyclists, including the inexperienced cyclist who requires information about how to make their cycling journey, and experienced cyclists who could ride further and more often if better information is provided on route options. A clear sign and wayfinding system can benefit cyclists through guiding them off heavy traffic routes and onto alternative, lower-volume routes, can prevent cyclists from making a wrong turn and wasting time, and can help cyclists keep momentum and make smooth manoeuvres. Wayfinding can include direction signs, confirmation signs, and turn signs. TransLink, recently released *Regional Bicycle Wayfinding Guidelines* for Metro Vancouver, which provide a clear direction on how to approach signage and wayfinding, and it is recommended that wayfinding approaches in the city align with these guidelines.

- **Support Programs.** In addition to bicycle infrastructure development, the City should also promote or have supportive programs for cyclists. This can include a range of educational and promotional initiatives such as:
  - Continued promotion and support of Bike to Work Week & Month and TransLink's TravelSmart program;
  - Developing a bicycle user map and informational materials;
  - Implementing Ciclovía / Sunday Street Closures;
  - Encouraging cycling skills and education courses (i.e. encourage cycling skills incorporation into school curriculum, promotion of training courses);
  - Create cycling campaigns aimed at City employees (which can include lending out bicycles, electrical-assist bicycles, information on cycling network); and
  - Safe routes to school / School Safer Travel Programs.

### 6.3 Capital Costs & Priorities

The conceptual capital costs for the bicycle network plan were developed based on standard unit cost assumptions summarized in **Table 7** below.

**Table 7 – Unit Capital Cost Assumptions**

Facility Type	Unit Rate
<b>Bicycle Lane (no widening required)</b>	\$30,000/km
<b>Paved Shoulder (widening required)</b>	\$300,000/km
<b>Local bikeway (new route)</b>	\$40,000/km
<b>Off-Street Pathway (new route)</b>	\$500,000/km

**Table 8** on the following pages highlights the individual project segment costs as well as the overall priorities for implementing bicycle facilities. It should be noted that the actual cost for the implementation of bicycle facilities could vary significantly for each project, depending on various site-specific characteristics. For example, the unit costs stated above allow for sub-base and base construction, as well as asphalt pavement, and they also include contingency and an allowance for engineering. For urban cross-sections, they also include the cost to relocate curbs and sidewalks. However, the unit costs do not include any allowance for significant earthworks, driveway reconstruction, landscape restoration, property and legal



costs, significant utility relocation, administration, and taxes, all of which could add significantly to the cost. These unit costs also do not include any allowances for crossing treatments, such as signals and/or median refuges. As such, the cost estimates provided in this section are for planning purposes only and should not be used for detailed budgeting.

Priorities are also assigned to bicycle facility projects for implementation in the short, medium or long-term. Short-term priorities have been identified as all neighbourhood bikeways and bicycle lane projects that directly serve the Town Centre. Short-term implementation indicates a horizon of approximately 1- 5 years, and it is estimated that the highest priority projects for implementation in Maple Ridge over the short-term would cost approximately \$1.0 million, as shown in **Table 8**. This is equivalent to an annual investment of approximately \$200,000 over the next 5 years. Medium-term priorities are identified as bicycle lanes outside of the Town Centre, and longer-term priorities are identified as all rural shoulder bikeways.

Order-of-magnitude cost estimates have been developed for the long-term bicycle network based on unit costs and are summarized in **Table 8** below. The total cost to complete the long-term bicycle network is approximately \$24 million. It should be noted that more than \$15 million of this amount is for rural roadway shoulder widenings in the eastern areas of the city. Although these facilities could potentially be incorporated into any road rehabilitation project, investments in these facilities would be likely tied to any growth in the eastern areas of Maple Ridge which is not planned within the next 20 years. Excluding the paved shoulders in the eastern areas of the city, the total cost to implement the urban bicycle network is approximately \$8.8 million over the next 20 years.

Additional details on bicycle network are provided in **Appendix B**.

**Table 8: Bicycle Network Cost Estimates (\$ million)**

Facility Type	Short-term (<5 yr)	Medium - Term (5-10 yr)	Long-term (10-20 yr)	Long-term (20+ yr)	Total Cost
<b>Bicycle Lane</b>	\$0.1	\$0.2	-		\$0.3
<b>Paved Shoulder</b>	-	-	\$4.6	\$15.2	\$19.8
<b>Local bikeway</b>	\$0.9	-	-		\$0.9
<b>Off-Street Pathway</b>	-	\$3.0	-		\$3.0
<b>TOTAL</b>	<b>\$1.0</b>	<b>\$3.2</b>	<b>\$4.6</b>	<b>\$15.2</b>	<b>\$24.0 Million</b>

*Note: Costs are conceptual in nature (Class D) and are not typically used for budgeting purposes. They do not include any allowance for significant utility relocation, earthworks, driveway reconstruction, landscape restoration, property and legal cost.*

It should be noted at the time of preparing the Plan, that TransLink has been funding 50% of most bicycle projects on the Major Road Network and some municipal arterial and collector roads. Recognizing the total capital investments required for cycling and pedestrian facilities identified in the MTP, the City may also consider strategies for integrating pedestrian and bicycle facilities as well as on road widening projects in order to increase coverage in a shorter period of time and to managed financial resources.



## Chapter 7

# Transit Strategy





Public transit provides not only a travel choice for local and inter-municipal travel, but can also shape land use patterns. For those who do not drive, transit may be the only option for getting to jobs, school, shopping areas and recreational centres. Whereas choice riders that have access to a vehicle will be more inclined to use transit where service is frequent, direct, fast, comfortable and reliable.

The existing transit system in Maple Ridge is made up of a variety of transit services that provide both local and regional connections for Maple Ridge residents (see **Map 25** below). The types of transit service in the city include:

- **Local service**, providing fixed-route local area service within the city. The majority of local routes in the city are served by community shuttle vehicles suitable for local, neighbourhood streets.
- **Regional** service, such as the Frequent Transit Network, provides fixed-route service using conventional buses within Maple Ridge and connecting to surrounding municipalities such as Pitt Meadows, Port Coquitlam, and the Langleys.
- **HandyDART** provides door-to-door custom transit service for people with physical or cognitive disabilities who are unable to use the conventional system.
- **West Coast Express** commuter rail service provides Maple Ridge residents with service between Vancouver and Mission. With two stations in Maple Ridge (Port Haney and Maple Meadows) West Coast Express runs only Monday to Friday during peak hours, in the peak direction only. TrainBus, a supplemental coach bus service to the West Coast Express, runs at select times outside of peak hours, emulating the train route and serving all West Coast Express stations.

### 7.1 Shaping Influences and Challenges for Transit

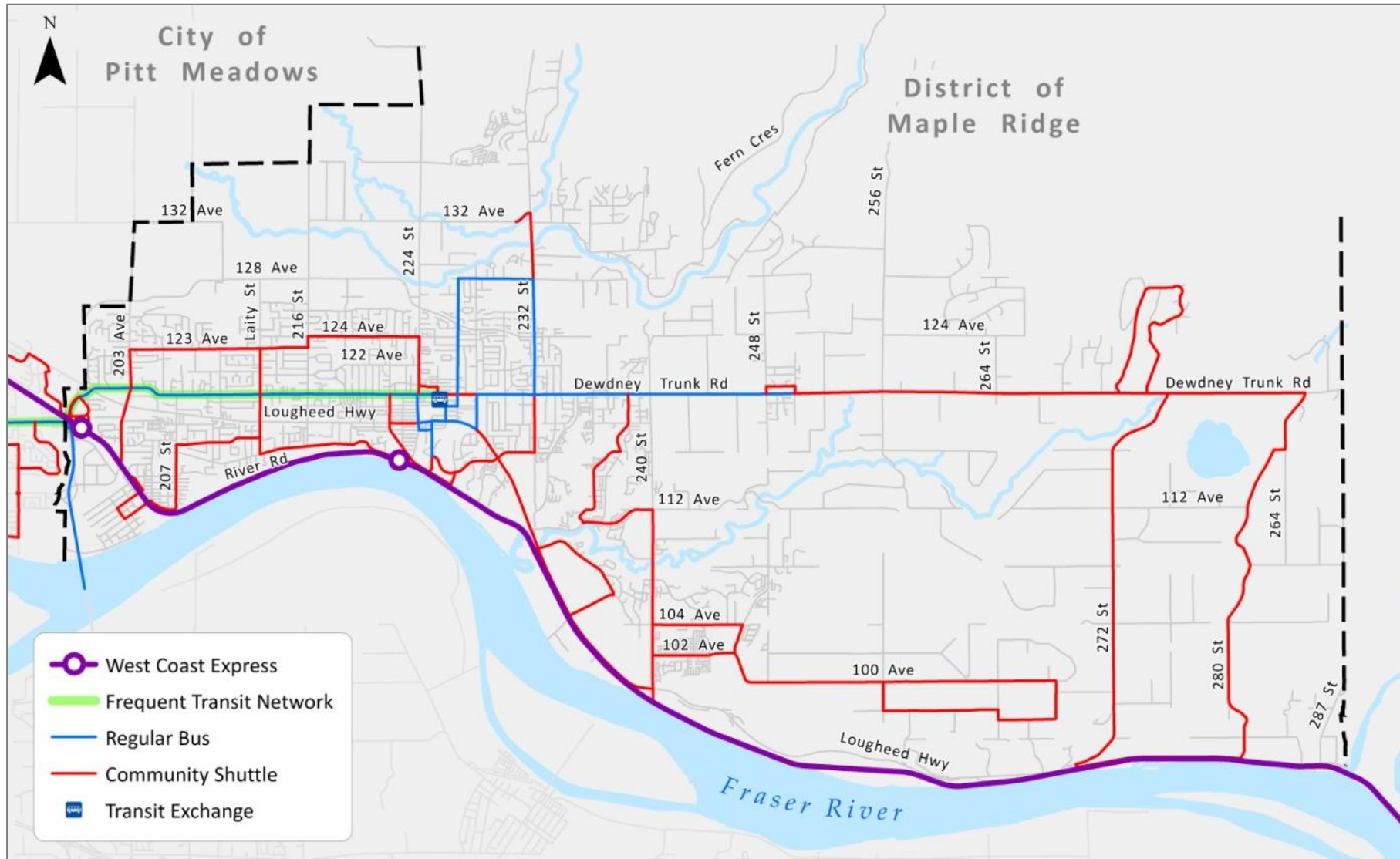
There are several factors that shape the success of transit in Maple Ridge as briefly highlighted in this section of the Plan.

- **The transit mode share for Maple Ridge is relatively low at 4% of all daily travel** (based on the Regional Trip Diary Survey). The majority of transit trips originating in Maple Ridge have a destination in the City of Vancouver (37%), with other major destinations including Burnaby (10%), Pitt Meadows (8%), and Coquitlam (6%). The 2006 Census report indicate that 8% of all work-based commute trips from Maple Ridge are by transit. Similarly, the 2011 National Household Survey indicates a slight increase with 9% of trips to work from Maple Ridge made on transit. Of the daily transit trips originating in Maple Ridge, over half (52%) are by bus (conventional bus and/or community shuttle), with the remainder of transit trips on West Coast Express.

#### Shaping Influences and Challenges for Transit

- Transit mode share is relatively low.
- Network structure and coverage in the core area is effective.
- Low density and mixture land use patterns makes is a barrier to attractive service.
- Peak frequencies can be modest along many corridors.

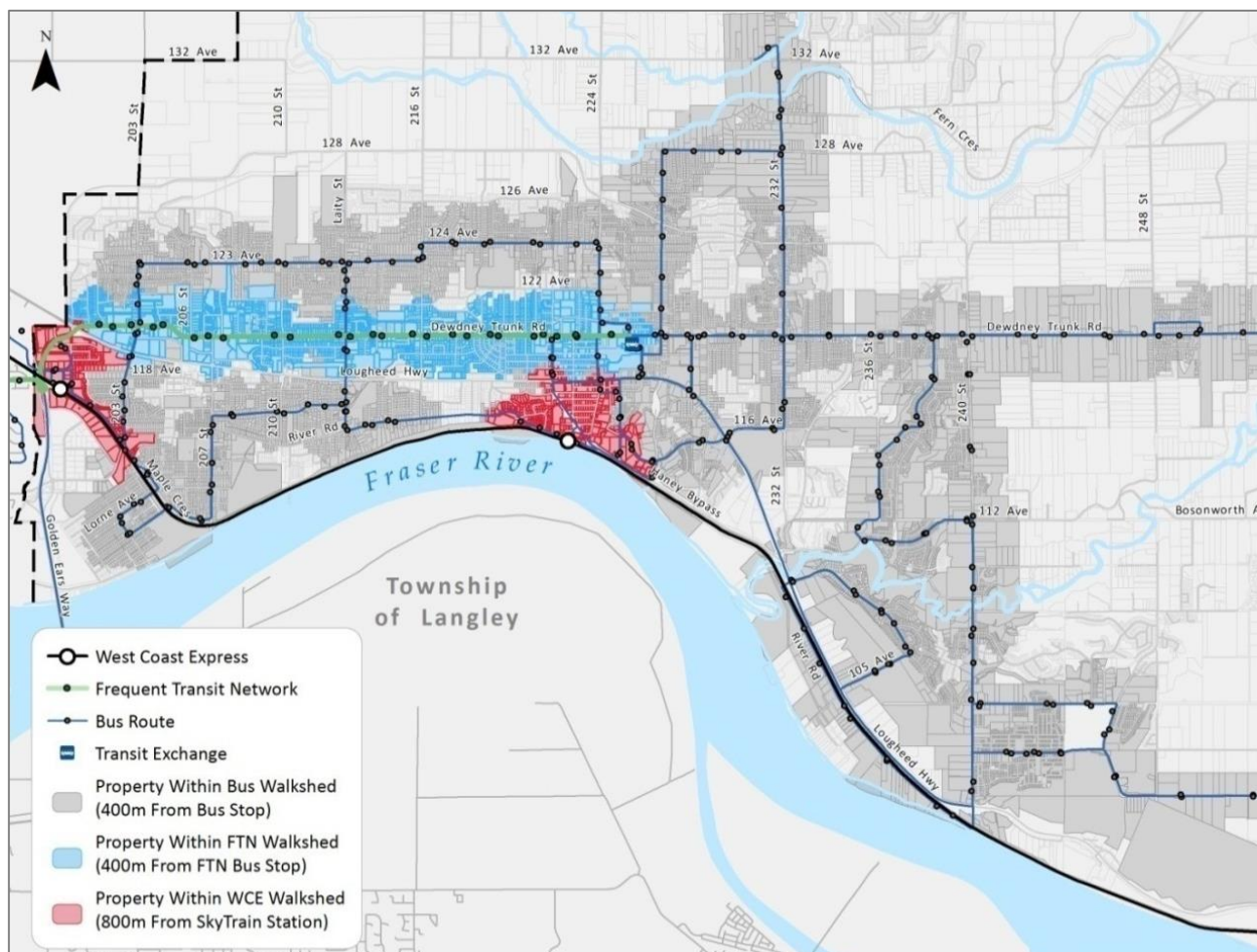
**Map 25: Existing Transit Service Structure**





- Network Structure and coverage within the core area of the city is effective.** Transit in Maple Ridge generally has an east-west service structure, with Dewdney Trunk Road (and Lougheed Highway to a lesser extent) as the spine of the network. The transit system is largely concentrated in the Town Centre area and neighbourhoods south of Dewdney Trunk Road (see **Map 26**). Community shuttle routes serve neighbourhoods north and south of Dewdney Trunk Road. There are transit connections to the West Coast Express stations, Ridge Meadows Hospital, Meadowtown (in Pitt Meadows), and the neighbourhoods of Albion and Cottonwoods. The most northern reach of transit service in Maple Ridge is the Yennadon Loop, just west of 232 Street. In September 2012, TransLink made service changes to the 595 bus route, eliminating service to Port Haney Station, requiring passengers to transfer. This was also accompanied with a service extension to Route 701, which was extended east along Dewdney Trunk road, instead of terminating at Haney Place.

**Map 26: Key Land Use Patterns around Frequent Transit Service**



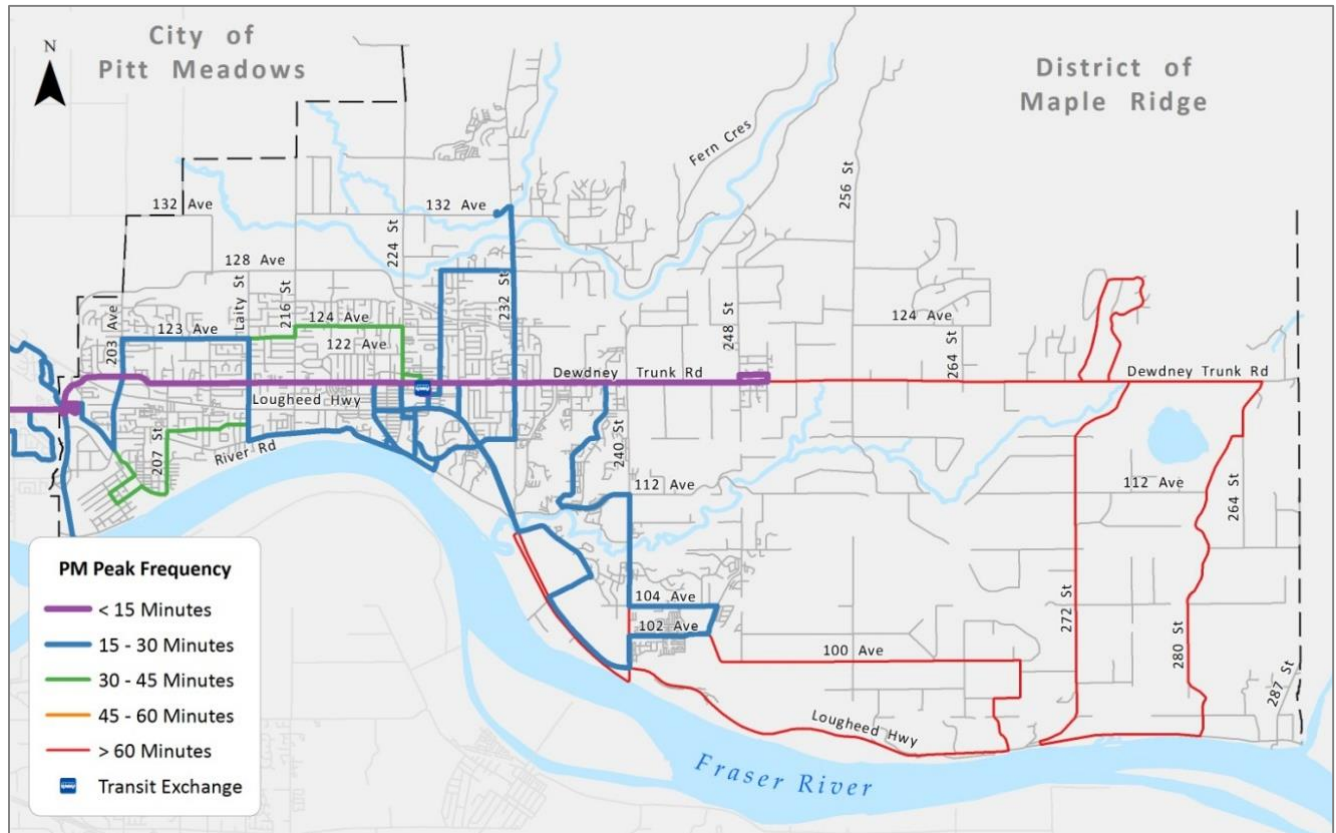
- Land use patterns, such as type, density, and form influence the overall pattern of travel in a region and also the success of transit.** For example, higher density mixed-use areas such as the downtown area in Maple Ridge can generate more transit ridership, which supports attractive levels of service. Conversely, low-density and single-use areas with curvilinear street patterns such as found in

the Silver Valley neighbourhood typically generate single-purpose trip making and increased travel times. These characteristics make transit more costly to provide and generate low ridership, which can discourage providing high frequency service and use of transit overall.

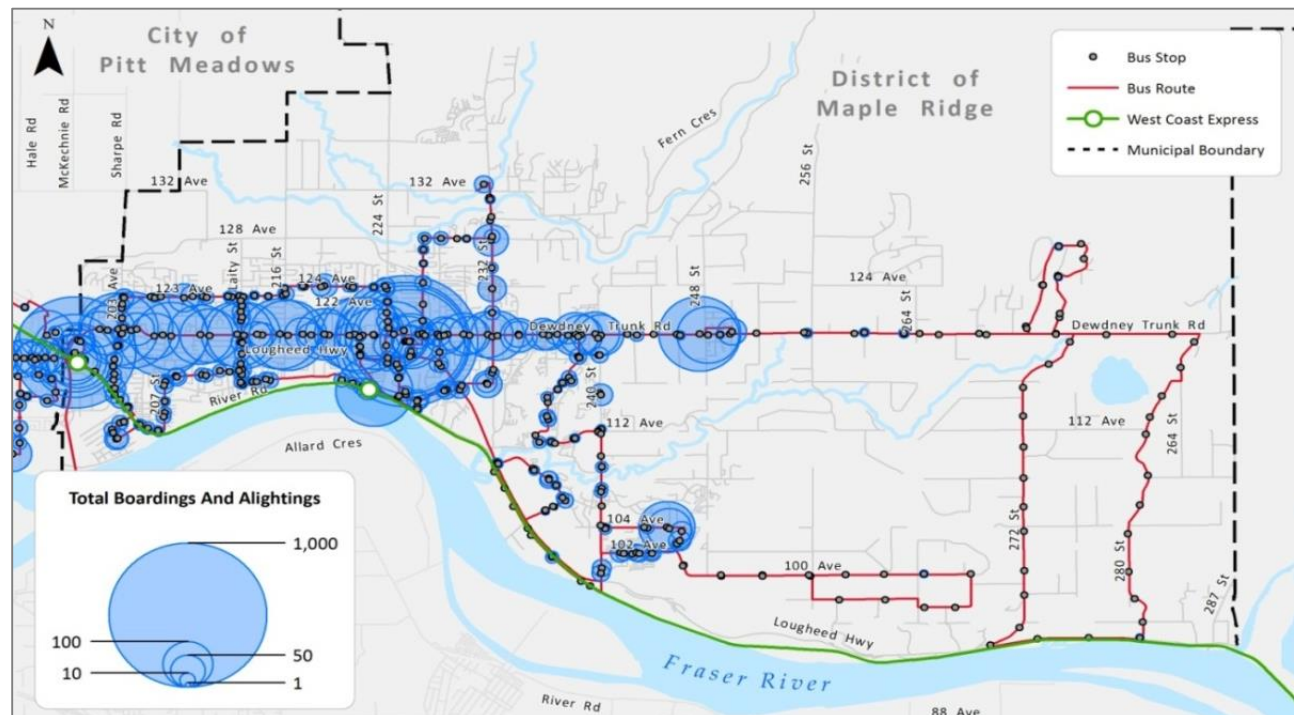
Outside the core areas of Maple Ridge, residents identified concerns regarding limited network coverage and frequency of transit service in areas such as Silver Valley. Alternative service models may be considered for low density, suburban neighbourhoods of the city in order to encourage early use of transit for growing populations.

- **Peak service frequencies can be modest along many corridors.** Bus service in Maple Ridge is provided seven days a week, with regular bus service typically commencing early in the morning (typically between 5:00 am – 6:00 am) and continuing to early evening, with a few routes providing evening service. Headways during peak hours are generally between 15 and 30 minutes for conventional service, while more than 30 minutes for community shuttle routes, with headways increasing in evenings and on weekends. Dewdney Trunk Road is part of TransLink's *Frequent Transit Network*, which indicates that it has transit service every 15 minutes or better at most times seven days a week. The West Coast Express only has service Monday to Friday, during the morning and afternoon peaks, with the TrainBus service providing a few off-peak runs. **27** illustrates the typical transit frequencies for regular bus and rail routes serving Maple Ridge.
- **Transit ridership is largely concentrated in the core areas of the city.** As noted previously, several conventional bus and community shuttle routes converge at these exchanges, with the Haney Place exchange as the central hub for residents in both east and west Maple Ridge. Transit usage, as reported by estimates of daily boardings and alightings, is highest at the Haney Place and Maple Meadows transit exchanges, which experience approximately 1,000 boardings and alightings per day, as shown in **Map 28**. It is clear that Dewdney Trunk Road is the spine of the city's transit network, as ridership activity is most active along this corridor, with smaller scale transit activity in the neighbourhoods north and south of Dewdney Trunk.

**Map 27: Existing Transit Service Frequencies**



**Map 28: Daily Transit Passenger Boardings and Alightings by Stop**





- **Transit Accessibility.** TransLink tracks the accessibility of all bus stops in Maple Ridge as well as other communities in Metro Vancouver. An accessible bus stop is identified by a wheelchair accessible decal on the bus stop ID sign or bus stop plate. In order for a stop to be designated as wheelchair accessible, it must meet requirements specified under TransLink's *Transit Infrastructure Design Guidelines*. These include raised passenger landing area with specific minimum dimensions that would allow busses in the current fleet to safely deploy a mechanical ramp or lift that drops from the bus front or rear door to allow wheelchair patrons to board or alight busses. At the end of 2012, approximately 50% (150 out of 306) of the bus stops in Maple Ridge were classified as accessible.
- **Passenger comfort and security** at transit stops is an important ingredient to make transit an attractive alternative to driving. Amenities such as seating, weather protection shelters, lighting, customer information and other amenities are required to make transit more attractive. Transit stops with the highest passenger activity – such as along the Dewdney Trunk corridor – should be the focus of transit supportive investments in the city.



Through the results of the online survey and the booth held at the Farmers Market, Maple Ridge residents were able to provide input and feedback on transportation issues and opportunities. In addition to the above noted shaping influences, residents also identified other barriers to using transit that include:

- **Limited West Coast Express service**, only serving peak hour, weekday demands;
- **Overcrowding** on the West Coast Express;
- Lack of a **park-and-ride** lot in Maple Ridge;
- **Improved connections** between neighbourhoods and major transit/West Coast Express exchanges;
- **Improved local service coverage**, including to neighbourhoods with no coverage such as Albion and Silver Valley;
- **More transit service** in the evenings and weekends.

## 7.2 Long-Term Transit Strategy

Transit represents an important part of the city's transportation system by providing an alternative to driving for persons that have the choice to drive, who choose not to drive for all or some trips, and for those without access to a private vehicle. The City's Official Community Plan calls for improvements to local transit service and facilities, stronger transit connections to key community destinations, and better pedestrian amenities.

As the existing transit system in Maple Ridge is funded and planned by TransLink, and operated by Coast Mountain Bus Company, the long-term Transit Strategy provides guidance on the overall aspirations for transit in Maple Ridge based on community input, and recommends facilities and support programs that may be

implemented by TransLink, the City of Maple Ridge and other agencies. The following discussion outlines the strategic directions for transit in the city over the next 20 years.

### 7.2.1 Enhanced Network of Local and Regional Services

In the long term, the City will want to enhance and expand transit services and facilities to meet the growing demands of the community. Within existing developed areas, the STP includes more attractive service levels (frequencies) and a wider range of local and regional services and connections. In new growth areas, such as Silver Valley, the City will want to ensure the provision of attractive and cost-effective connections to the Town Centre and other regional bus services in the long-term, and will want to provide attractive options to driving as the community expands. The structure of the long-term services for Maple Ridge is illustrated in **Map 29**.

In general, the hub-and-spoke route structure serves regional travel relatively well, but is less able to serve local trips between origins and destinations within Maple Ridge. For some short local trips, transit riders would have to travel to the Haney Place exchange, then transfer to a second route, which may not operate as frequently.

Planned growth and development of the city suggest that the existing regional route structure should largely be maintained, as the regional services to and from other communities are well suited to competing with the private automobile. In fact, Maple Ridge's Town Centre should be connected to the Coquitlam City Centre and Evergreen Line with a rapid transit service operating along the Lougheed Highway corridor. The service should provide frequent, fast and direct access to rapid transit to other parts of Metro Vancouver. Additionally, a rapid transit connection to the Highway 1 rapid bus services as well as Langley City Centre should be accommodated in the long-term.

Additionally, as the community becomes more densely populated in the existing urban area, the City wants to move toward a grid pattern of local transit services that reduce the need for circuitous trips via the Town Centre exchange. The City will also want to encourage attractive service levels to ensure that transit is an attractive alternative and also to support growth and development in the Haney-Hammond area.

### 7.2.2 Comfortable and Accessible Passenger Facilities

Although providing attractive bus services with connections to desired destinations both locally and regionally is critical to the success of transit, passenger accessibility and facilities at bus stops and transit exchanges can have a significant impact on passenger safety and comfort in addition to attracting new customers. Improving customer information, seating, shelters and the accessible design of stops or exchanges provides transit riders with a safe, pleasing and comfortable experience.

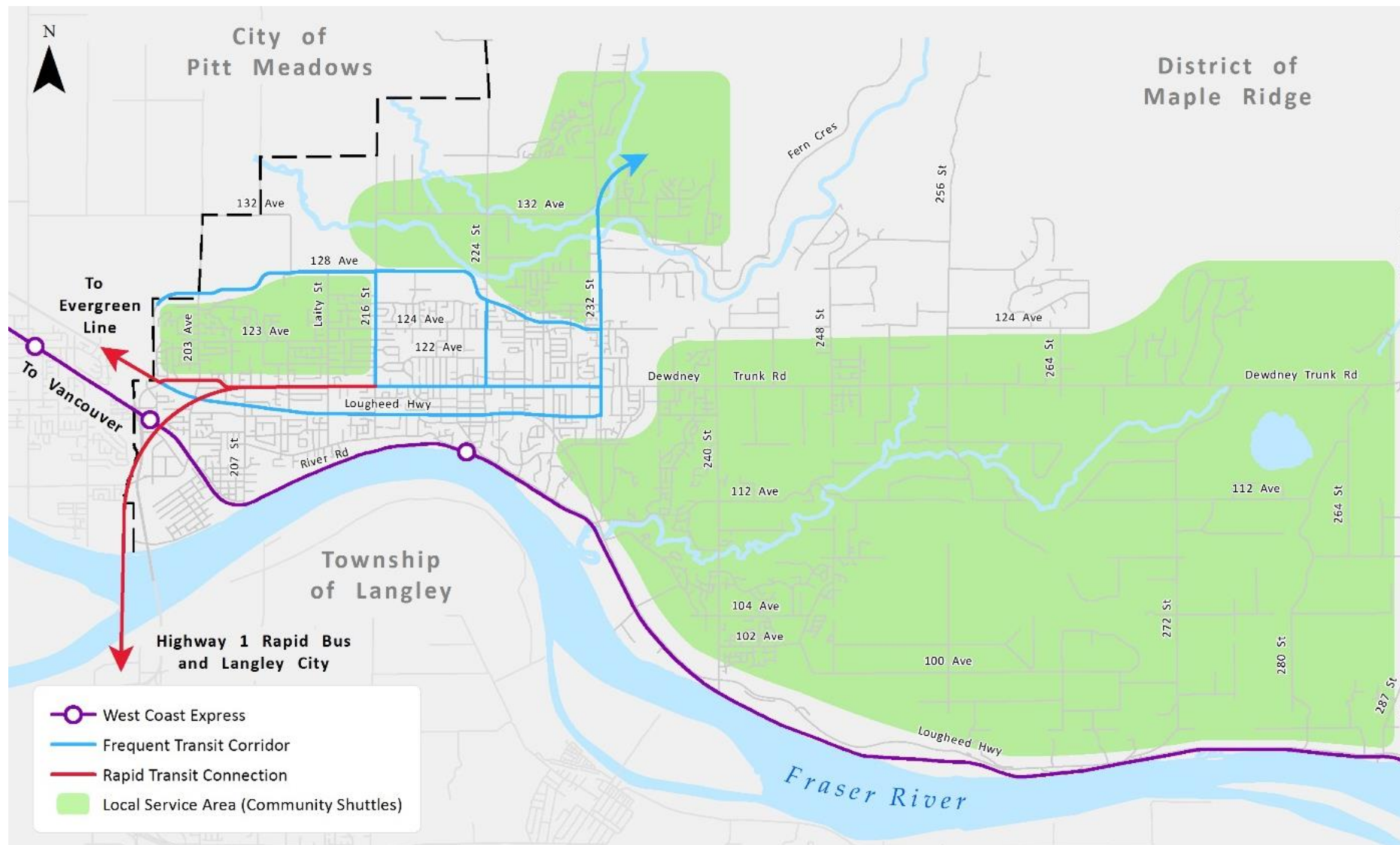
Currently, approximately 50% of the city's 306 bus stops are deemed to be accessible. Over the long-term, the City should strive to have 100% of its bus stops fully accessible and this can be achieved by improving approximately five or more bus stops per year. In the short-term, and in order to maximize the effectiveness of infrastructure improvements, non-accessible bus stops should be prioritized according to existing passenger activity as previously described. The short-term improvements may include existing sidewalk improvements or construction of concrete pads for wheelchairs within boulevard space.

In addition to increasing accessibility of transit stops for all customers, other passenger amenities needed at transit stops include shelters, benches, trash receptacles, as well as system maps and wayfinding. In the long-term, the City should strive to provide seating, lighting and customer information at all bus stops, rapid transit stations, and transit exchanges in Maple Ridge. In addition, shelters are desirable in areas of higher pedestrian activity such as in the Town Core, and at high activity bus stops along Dewdney Trunk Road (a frequent transit corridor). An investment in five new bus shelters a year would more than double the number of bus stops with shelters. The capital cost of improving five bus stops a year is estimated to be approximately \$35,000 to \$40,000 per year, while the cost of providing five shelters a year would require an annual budget of approximately \$75,000 per year.





**Map 29: Long-term Transit Route Structure**



### 7.2.3 Expanding West Coast Express Services (daytime & weekend) and Station

The West Coast Express provides a critical role in expanding travel choices for Maple Ridge residents, particularly those travelling to downtown Vancouver. Today, over 2,000 daily trips originate from or are destined to the two Maple Ridge stations.

In order to address overcrowding issues on West Coast Express identified by residents and to increase flexibility of transit travel, there is increasing demand for expanded West Coast Express service. Expanding midday and weekend West Coast Express services would capitalize on its success and make it a more convenient alternative to commuting to and from downtown and other parts of Vancouver. In support of the economic growth of the Maple Ridge, reverse peak service has also been identified as a high priority to bring commuters from other parts of the region to the city, as well as midday train services to augment TrainBus and weekend train service. These service and capacity expansions should be explored further with TransLink and other Northeast Sector communities.

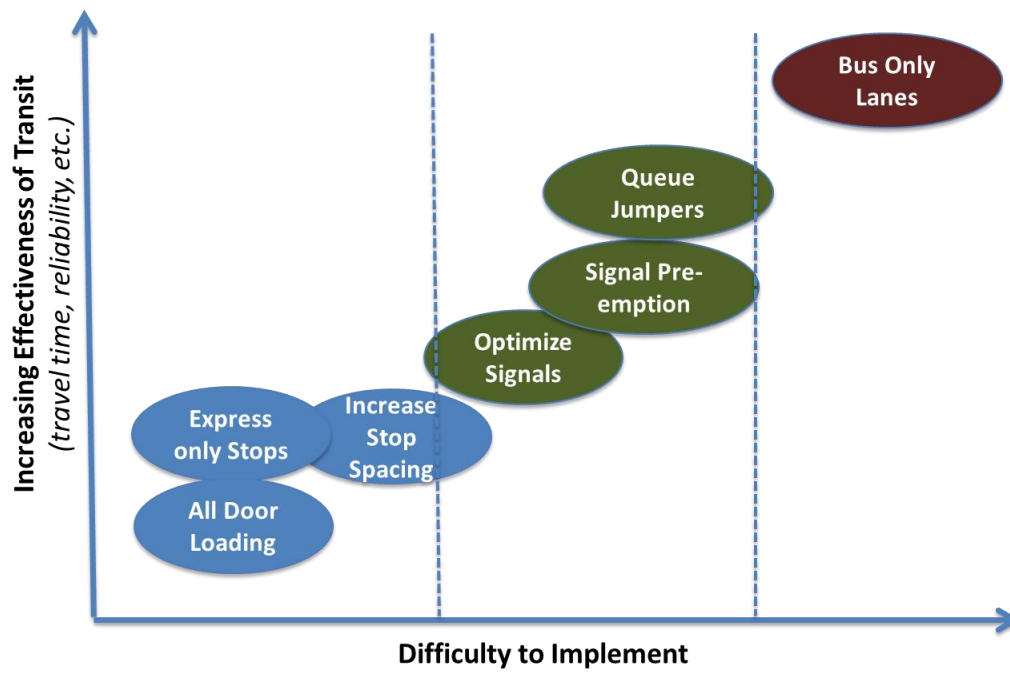
With increasing demands at park-and-ride facilities in Pitt Meadows and limited access to the West Coast Express Station in Maple Ridge, an eastern Albion Station should be examined in order to support the long-term travel demands to the core areas of Metro Vancouver. Transit-oriented development may be explored at this location to further enhance the success of transit.

### 7.2.4 Transit Priority Strategies

In order to enhance the potential of rapid transit services (and person capacity of the transportation system), transit priority strategies should be considered within Maple Ridge and across the Northeast Sector of the region. Transit priority treatments along corridors and at intersections can enhance the customer experience, reduce bus travel times, improve reliability and ultimately make transit competitive with driving. Although many of these treatments could impact vehicle travel, they are critical to supporting long-term transit ridership by prioritizing transit over vehicles.

A wide variety of transit strategies have been implemented in North American to enhance transit travel times. These strategies include changes to bus services as well as physical measures to allow transit to bypass areas of congestion as graphically illustrated in **Figure 4** below. In particular, **queue bypass lanes or queue jumpers** are an effective form of transit priority at heavily congested intersections. Bus only lanes may be used to enable buses to proceed through the intersection ahead of general purpose traffic. Alternatively, right-turn lanes can be designated as 'right-turn only except buses' to allow buses to continue straight through the intersection. Some geometric modifications may be required to facilitate the through movement.

**Figure 4: Strategies to Enhance Transit Travel Times**





## **APPENDIX A**

### **Detailed Sidewalk Network Priorities**

**Table A-1: Pedestrian Area Sidewalk Priorities**

Street	To - From	Cost
<b>Town Centre</b>		
<b>117 Ave</b>	Haney Bypass – near 224 St	\$42,000
<b>119 Ave</b>	226 St – 227 St, 227 St – 228 St	\$87,000
<b>223 St</b>	North Ave–117 Ave, 117 Ave –Haney Bypass	\$52,500
<b>223 St</b>	Dewdney Trunk Rd – Brown Ave	\$40,500
<b>224 St</b>	Callaghan Ave – St. Anne Ave	\$15,000
<b>225 St</b>	Brickwood Close – 116 Ave	\$15,000
<b>Brown Ave</b>	224 St – Edge St	\$37,500
<b>Brown Ave</b>	Edge St – 227 St	\$78,000
<b>Brown Ave</b>	222 St – Plaza Ave	\$18,000
<b>Callaghan Ave</b>	Haney Bypass – 224 St	\$15,000
<b>Edge St</b>	Dewdney Trunk Rd – Lane	\$12,000
<b>Edge St</b>	Lane – Brown Ave	\$6,000
<b>Fraser St</b>	North Ave - mid-block	\$12,750
<b>Fraser St</b>	Mid-block – end	\$25,500
<b>Garden St</b>	Dewdney Trunk Rd – Brown Ave	\$39,000
<b>McIntosh Ave</b>	226 St – 227 St	\$42,000
<b>Plaza St</b>	Dewdney Trunk Rd – Brown Ave	\$39,000
<b>Selkirk Ave</b>	225 St – 226 St	\$54,000
<b>Selkirk Ave</b>	226 St – 227 St	\$22,500
<i>Total</i>		\$653,250
<b>Port Haney</b>		
<b>River Rd</b>	West of 223 St	\$16,500
<b>223 St</b>	River Rd – Haney Bypass	\$16,500
<i>Total</i>		\$33,000
<b>Hospital</b>		
<b>Laity St</b>	River Rd – Hospital access	\$25,000
<b>Laity St</b>	South of Lougheed Highway	\$6,000
<b>117 Ave</b>	Laity St – River Wynd	\$60,000
<i>Total</i>		\$91,000
<b>Westgate / Westridge</b>		
<b>119 Ave</b>	Lougheed Highway – mid-block	\$63,000
<b>119 Ave</b>	Mid-block – 207 St	\$28,500

<b>119 Ave</b>	Lougheed Hwy – mid-block	\$168,750
<i>Total</i>		\$260,250
<b>Maple Meadows</b>		
<b>Hammond Rd</b>	West St – 203 St	\$180,000
<b>Dunn Ave</b>	Maple Meadows Way- West St	\$33,000
<i>Total</i>		\$213,000
<b>Thomas Haney Centre</b>		
<b>116 Ave</b>	Lougheed Hwy – 232 St	\$60,000
<b>117 Ave</b>	Burnett St – 231 St	\$135,000
<b>232 Ave</b>	116 St – 117 St	\$57,000
<i>Total</i>		\$252,000
<b>Grand Total</b>		<b>\$1,502,500</b>

**Table A-2: Bus Route Sidewalk Priorities (Medium Term)**

Street	To-From	Cost
<b>117 Ave</b>	203 St – River Wynd	\$291,000
<b>123 Ave</b>	206 St – 208 St	\$49,500
<b>123 Ave</b>	Laity St – 216 St	\$198,000
<b>203 St</b>	Dewdney Trunk Rd – 123 Ave	\$150,000
<b>240 St</b>	110 Ave – 112 Ave	\$72,000
<b>240 St</b>	112 Ave – Kanaka Creek Rd	\$40,500
<b>240 St</b>	Kanaka Creek Rd – McClure Ave	\$87,000
<b>240 St</b>	Hill Ave – 103 Ave	\$132,000
<b>240 ST</b>	103 Ave – 104 Ave	\$28,500
<b>Ditton St</b>	Maple Cres – Princess St	\$66,000
<b>Laity St</b>	Lougheed Hwy – 121 Ave	\$96,000
<b>Laity St</b>	Campbell Ave – 123 Ave	\$39,750
<b>Lorne Ave</b>	Maple Cres – Princess St	\$64,500
<b>Maple Cres</b>	203 St – Westfield Ave	\$42,000
<b>Maple Cres</b>	Ditton St – Dartford St	\$22,500
<b>Princess St</b>	Lorne Ave – Ditton St	\$27,000
<b>River Road</b>	Laity St – 216 St	\$99,000
<b>River Road</b>	216 St – River Bend	\$336,000
<b>Total</b>		<b>\$1,841,250</b>



**Table A-3: Urban Collector and Arterial Sidewalk Priorities (Long-term)**

Street	To-From	Cost
<b>Other Arterials and Collectors</b>		
<b>121 Ave</b>	Laity St – 216 St	\$198,000
<b>122 Ave</b>	216 St – 218 St	\$60,000
<b>122 Ave</b>	Dover St – 224 St	\$270,000
<b>124 Ave</b>	Edge St – 227 St	\$96,000
<b>126 Ave</b>	216 St – Blackstock St	\$78,000
<b>203 St</b>	123 Ave – Golden Ears Way	\$195,000
<b>206 St</b>	Dewdney Trunk Rd – Tyner Ave	\$147,000
<b>206 St</b>	Tyner Ave – 123 Ave	\$18,000
<b>228 St</b>	North of Dewdney Trunk Rd – Abernethy Way	\$103,500
<b>230 St</b>	Dewdney Trunk Rd – Storey Ave	\$60,000
<b>232 St</b>	117 Ave – Stager Ave	\$70,500
<b>232 St</b>	112 Ave north	\$195,000
<b>Cottonwood Dr</b>	114a Ave – 116 Ave	\$96,000
<b>Cottonwood Dr</b>	Cottonwood Dr – Dewdney Trunk Rd	\$82,500
<b>Laity St</b>	123 Ave – 124 Ave	\$22,500
<b>Laity St</b>	Douglas Ave – Thornton Ave	\$56,250
<b>Laity St</b>	Thornton Ave – 128 Ave	\$96,000
<b>Lorne Ave</b>	Maple Cres – 207 St	\$66,000
<b>River Rd</b>	207 St – Laity St	\$180,000
<b>Total</b>		<b>\$2,090,250</b>

## **APPENDIX B**

### **Detailed Bicycle Network Priorities**

**Table B-1: Summary of Bicycle Facilities (Short-term)**

Project	From	To	Conceptual Cost
<b>Bicycle Lanes</b>			
<b>227 Street</b>	Abernethy Way	Lougheed Hwy	\$39,480
<b>232 Street</b>	124 Ave/ Abernethy	116 Ave	\$36,270
<b>Neighbourhood Bikeways</b>			
<b>Ospring / Lorne Street</b>	205 <sup>th</sup> Street	Kingston Street	\$40,000
<b>205<sup>th</sup> Street / Westfield Avenue</b>	Lorne Ave	Westfield Ave	\$24,000
<b>Princess Street</b>	Fraser Way	Ospring St	\$26,040
<b>207<sup>th</sup> / 206<sup>th</sup> Street</b>	Lougheed Hwy	123 <sup>rd</sup> Ave	\$43,280
<b>Wicklund Avenue / Skillen Street</b>	123 <sup>rd</sup> Ave	Laity Street	\$49,000
<b>Donavan Avenue / Wicklow</b>	216 Street	222 Street	\$51,400
<b>Selkirk Avenue</b>	222 Street	227 Street	\$38,000
<b>222<sup>nd</sup> Street</b>	Selkirk Ave	Church Ave	\$16,280
<b>223<sup>rd</sup> Street</b>	Selkirk Ave	North Ave	\$7,800
<b>North Ave/Royal Crescent/226 Street</b>	223 Street	Edge Street	\$43,200
<b>Edge Street</b>	Brown Ave	119 Ave	\$10,680
<b>119 Ave</b>	Edge St	228 St	\$21,960
<b>224 Street</b>	Dewdney Trunk	Callaghan Ave	\$36,520
<b>Callaghan Avenue/223 Street</b>	224 Street	River Road	\$12,320
<b>116 Ave</b>	224 Street	Burnett Street	\$49,720
<b>227 Street</b>	Haney Bypass	Path	\$29,960
<b>Burnett Street</b>	Path	Lougheed Hwy	\$15,440
<b>117 Avenue/231 Street/118 Ave</b>	Burnett Street	231B Ave	\$29,880
<b>225 Street</b>	North Ave	Haney Bypass	\$13,640
<b>222 Street/Hillside Street</b>	122 Ave	124 Ave	\$19,400
<b>227 Street /128 Ave</b>	Abernethy Way	228 Street	\$35,680
<b>Foreman Drive</b>	136 Ave	232 Street	\$55,960
<b>Tamarack Lane</b>	Lougheed Hwy	240 Street	\$88,720
<b>236 Street/116 Ave/Creekside Street</b>	Kanaka Way	118 Ave	\$72,000
<b>236 Street (north)</b>			\$15,400
<b>118 Ave</b>	236 Street	240 Street	\$19,760
<b>240 Street</b>	Dewdney Trunk	121 Ave	\$12,520
<b>TOTAL SHORT-TERM</b>			<b>\$954,310</b>

**Table B-2: Summary of Bicycle Facilities (Medium-term)**

Project	From	To	Conceptual Cost
<b>Bicycle Lanes</b>			
<b>Maple Meadows Way</b>	Lougheed Hwy	Golden Ears Way	\$19,410
<b>Dunn Ave</b>	Maple Meadows Way	Maple Meadows Way	\$15,540
<b>113B Ave</b>	Kingston Street	Airport Way	\$12,630
<b>207 Street</b>	Westfield Ave	Lougheed Hwy	\$26,640
<b>Laity Street</b>	Lougheed Hwy	River Road	\$13,560
<b>216 Street</b>	Lougheed Highway	River Road	\$10,110
<b>124 Avenue</b>	232 Street	240 Street	\$48,000
<b>240 Street</b>	124 Ave	121 Ave	\$15,150
<b>240 Street</b>	112 Ave	113 Avenue	\$8670
<b>Kanaka Way / 112 Ave</b>	Lougheed Hwy	240 St	\$54,090
<b>Off-Street Pathways</b>			
<b>132 Avenue</b>	232 Street	216 Street	\$3 million*
<b>Lougheed Highway</b>	Laity Street	Western boundary	\$1.3 million
<b>Lougheed Highway</b>	216 Street	Haney Bypass	\$550,000
<b>Abernethy Way</b>	224 Street	210 <sup>th</sup> Street	\$1.35 million*
<b>Thorne Avenue</b>	203 <sup>rd</sup> Street	Hammond	\$93,000
<b>Ospring Street – South Bonson</b>	Ospring Street	Golden Ears Way	\$385,000
<b>128 / 210 Street dyke trail</b>	128 Street	210th Street	\$553,000
<b>227 Street</b>	Haney Bypass	Lougheed Highway	\$73,000
<b>TOTAL MEDIUM-TERM</b>			<b>\$3,177,800</b>



**Table B-3: Summary of Bicycle Facilities (Long-term)**

Project	From	To	Conceptual Cost
<b>Paved Shoulders</b>			
<b>1203 Street</b>	128 Ave	132 Ave	\$330,000
<b>132 Ave</b>	203 Street	210 Street	\$369,900
<b>210 Street</b>	132 Ave	128 Ave	\$240,600
<b>216 Street</b>	128 Ave	132 Ave	\$241,200
<b>224 Street</b>	136 Ave	224 (South)	\$486,600
<b>136 Ave</b>	224 Street	Foreman Drive	\$129,600
<b>128 Ave</b>	228 Street	232 Street	\$239,700
<b>232 Street/ Silver Valley Rd</b>	132 Ave	North Silver Valley Road	\$747,000
<b>132 Ave/Fern Crescent</b>	232 Street	Fern Crescent	\$961,200
<b>Haney Bypass</b>	Lougheed Hwy	Lougheed / Kanaka Way	MoTI
<b>Lougheed Hwy</b>	227 St	Mission	MoTI
<b>240 St</b>	112 Ave	River Road	\$810,600
<b>TOTAL LONG-TERM</b>			
<b>\$4,556,400</b>			

**Table B-4: Summary of Bicycle Facilities (20+ Years)**

Project	From	To	Conceptual Cost
<b>Paved Shoulders</b>			
<b>240 St</b>	112 Ave	River Road	\$810,600
<b>112 Ave/Bosonworth Ave/108 Ave</b>	240 St	272 St	\$2,056,800
<b>Lockwood Street/249 Street/Jackson Road</b>	Bosonworth Ave	104 Ave	\$608,700
<b>Jackson Rd/100 Ave</b>	104 Ave	272 Street	\$1,840,200
<b>272 Street</b>	Lougheed Hwy	Dewdney Trunk	\$1,824,000
<b>112 Ave</b>	272 St	280 St	\$566,100
<b>284 Street/280 Street</b>	Dewdney Trunk	Lougheed Hwy	\$1,727,100
<b>Dewdney Trunk</b>	256 St	284 St	\$1,931,100
<b>256 St</b>	Bosonworth Ave	North	\$2,281,800
<b>130 Ave/248 Street</b>	256 Street	112 Ave	\$1,551,900
<b>TOTAL LONG-TERM</b>			<b>\$15,198,300</b>