



# TRANSPORTATION & TRANSIT MASTER PLAN

FINAL PLAN | JUNE 2018







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## EXECUTIVE SUMMARY

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### **A New Transportation and Transit Master Plan for Abbotsford**

The City of Abbotsford has created a new Transportation and Transit Master Plan, that will address the needs of the Abbotsford community as it grows from its current population of 141,000 to 200,000.

Abbotsford's last Transportation Master Plan was adopted in 2007 and provided recommendations for the street network, active transportation, and transit over the short, medium and long-term. Since that time, Abbotsford has seen several significant changes, and the City has made strong progress in implementing many of the recommendations from the plan. The community also faces new challenges and opportunities, and continues to evolve as the population grows and the urban form densities and becomes more diverse.

The new Transportation and Transit Master Plan will guide transportation-related decisions over the next 25 years and beyond. This will ensure that the City invests in the right transportation networks and infrastructure improvements while focusing on sustainability and the environment.

## PURPOSE OF THE TRANSPORTATION AND TRANSIT MASTER PLAN

Abbotsford's geography and land use patterns present several opportunities for the transportation system. The majority of the City's residents live within its urban area, which is relatively compact with a well-connected street network. As Abbotsford grows towards a population of 200,000 residents, the City envisions the development of several medium- and high-density residential and commercial areas at key locations within the City, which can help to support walking, cycling, and transit. In addition, the City has an extensive pathway network, including the Discovery Trail, that helps to support sustainable travel modes.

However, Abbotsford also faces challenges with its transportation system. As the largest municipality by land area in British Columbia, there are challenges in serving all areas of the City, while balancing the needs of urban and rural areas. In addition, industrial lands that are isolated by railways, highways, ALR and steep grades, regional high-volume traffic routes, and automobile-oriented neighbourhoods, particularly in the Sumas Mountain area, all present significant land use and transportation challenges. As a result, Abbotsford is currently a predominantly automobile-oriented community, with 91% of all trips made by private vehicle.

The Transportation and Transit Master Plan presents an opportunity for the City to align with the directions of the new Official Community Plan and Abbotsford to present a refreshed vision for transportation in Abbotsford.

The Transportation and Transit Master Plan was developed in conjunction with broad engagement with the public to ensure the plan addresses transportation issues relevant to the community. There were several opportunities for the stakeholder and public feedback throughout the course of the planning process. Public engagement included surveys, open houses and pop-up information sessions around Abbotsford. Through the entire Transportation and Transit Master Plan, there were over 1,400 touch-points and interactions with the public to help shape the development of the plan.

The Transportation and Transit Master Plan is a key initiative of Council's 2015-2018 Strategic Plan, which is based on the four cornerstones of "Building a Complete Community", "Building a Vibrant Economy", "Achieving Fiscal Discipline", and "Maintaining Organizational Alignment".

## BENEFITS OF TRANSPORTATION

The City of Abbotsford recognizes that transportation plays a significant role in the development of healthy communities, as transportation policies, plans and infrastructure are a fundamental part of the impact of the built environment on residents' health. Transportation can impact community health in a number of ways, including:

**Road Traffic Injuries:** High automobile speeds and traffic volumes all contribute to traffic-related injuries and deaths for pedestrians, cyclists and motorists. Safe road design can improve safety and address citizens' perception of safety.

**Physical Activity, Obesity and Chronic Disease:** Transportation and urban planning policies can effectively encourage physical activity. With more active transportation and transit options, people can be more active. Being more physically active can improve health and reduce rates of obesity, chronic disease, and premature death.

**Air Quality:** Transportation-related air pollutants are the largest contributors to poor air quality and produce greenhouse gas (GHG) emissions, which has negative implications for community quality of life and public health.

**Noise:** Road traffic is the biggest cause of noise in many cities, which can exacerbate stress levels, increase blood pressure, cause sleep disturbance and negatively affect mental health.

**Equity:** Affordable and equitable transit service can enable residents of all incomes and abilities to access necessary services and supports (i.e. employment, education, healthcare, public and social services, and healthy food) that are critical components to health.

**Social Cohesion and Inclusion:** Cycling, walking, and transit have been shown to stimulate physical activity, which leads to increased social interaction and cohesion. Social inclusion can lead to greater cohesiveness and result in positive outcomes such as better health and increased participation in community life.

Managing transportation impacts can help foster more liveable, vibrant, and safe neighbourhoods, and help to support a higher quality of life for Abbotsford residents. This is especially important for vulnerable groups including children, youth, and seniors. Factors such as high traffic speeds, traffic volumes, and inadequate pedestrian and cycling infrastructure can deter these groups from walking or cycling to and from their destinations. It is important that transportation infrastructure allow seniors to be mobile in their community without a vehicle and attracts children and youth to sustainable modes of



transportation early in their lives, as there is opportunity to continue walking and cycling behaviours into adulthood. It is also important that vehicle-based GHG emissions and air quality impacts from the transportation system are mitigated to reduce health impacts on residents, particularly given the City’s context with the Fraser Valley.

## PLAN ALIGNMENT

### ABBOTSFORWARD

In 2016, Council adopted “Abbotsforward”, its new Official Community Plan (OCP). The OCP takes an innovative approach and plans for a specific population—200,000— rather than a defined timeline. Abbotsforward sets out policy directions organized around “7 Big Ideas” to support quality of life and social and economic vitality. The Transportation and Transit Master Plan supports achieving each of these “7 Big Ideas”.



CREATE A CITY CENTRE



MAKE WALKING, BIKING & TRANSIT DELIGHTFUL



ESTABLISH DISTINCT & COMPLETE NEIGHBOURHOODS



MAKE PLACES FOR PEOPLE



IMPROVE NATURAL & BUILT SYSTEMS



ENHANCE AGRICULTURAL INTEGRITY



MAKE THE PLAN WORK

### PLAN200K

The Transportation and Transit Master Plan is part of a larger project called Plan 200K, which was designed to implement the vision of the OCP through a series of plans and studies. Plan 200K also served as an organizing structure to ensure alignment and coordination among all of the City’s plans and studies. Engineering staff regularly collaborate with other City departments to ensure alignment and coordination in the delivery of services. As part of the Plan 200K process, the Transportation and Transit Master Plan coordinated with the following interrelated projects:



## TRANSPORTATION AND TRANSIT MASTER PLAN PROCESS

The Transportation and Transit Master Plan was developed through four distinct phases, including:



**Stage 1: Background Research** summarized existing transportation conditions, issues and opportunities in Abbotsford and provided the City with the data needed to move to the next phase and explore new options.



**Stage 2: Exploring Options** charted the future for transportation in Abbotsford, including establishing a vision, goals, targets and policy options for the future of transportation in Abbotsford.



**Stage 3: Draft Plan** compiled the research and feedback received from Stage 3 to form the base of the draft Transportation and Transit Master Plan.



**Stage 4: Final Plan** involved compiling all the collective feedback and priorities and presenting the final plan to the public and Council.

## VISIONING DIRECTION

The overall vision, goals, and targets for the Transportation and Transit Master Plan were developed as a result of the findings of the Stage 1 community engagement, and align with the City's strategic plans.

### VISION

Abbotsford's multi-modal transportation system will be truly enjoyable and functional for everyone, while supporting a shift towards walking, cycling and transit. This will ensure that people of all ages and abilities have convenient, safe, accessible, and enjoyable transportation options. Walking will be a delightful first choice for shorter trips, while cycling and transit will be convenient and practical choices for longer trips. Goods movement and personal vehicle movement

will also be important parts of the transportation system to ensure the City's continued economic prosperity as the hub of the Fraser Valley. The transportation system will seek to create and support a vibrant, livable, healthy and sustainable community for residents, businesses and visitors alike.

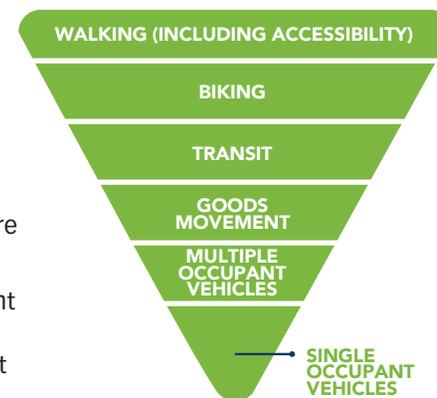
### GOALS

1. Make walking, biking and transit delightful
2. Move people and goods in a way that is safe, accessible and equitable and that supports the City's economy
3. Ensure all modes provide connections to important destinations and areas of future growth and development
4. Ensure that the transportation system supports land use decisions
5. Design streets to be complete destinations that support walking, biking and social interactions
6. Ensure that the transportation system is well-maintained
7. Plan and prepare for changes to the transportation system from emerging technologies

### SHAPING PRIORITIES

The transportation system can support land use patterns with appropriate investments to enable and encourage people to walk, cycle, and use transit. The OCP identified a new modal hierarchy that prioritizes walking, cycling and transit within the Urban Development Boundary. The hierarchy of modes, shown to the right, proposes that the City consider the needs of pedestrians, cyclists, public transit, and goods and services movements before that of private automobiles in the urban area. By considering needs of these priority modes, future transportation plans, programs and projects will provide better, safer and more convenient solutions and encourage over time more people to walk, cycle, and ride the bus.

In areas outside the Urban Development Boundary, the City will make transportation decisions with the intent to balance mobility modes over time.



Although this standard is lower than the urban places, improvements relating to walking, biking and transit are still desirable.

## TARGETS

Measurable targets provide a way to measure progress towards achieving goals and objectives. Targets are an important tool for the City to monitor the results of policies and actions that have been implemented. They will help to ensure that the Plan is implemented as intended, and to determine whether the Plan is achieving its goals. The Plan identifies a primary target to **increase sustainable transportation**.

## ACHIEVING OUR VISION

The Transportation and Transit Master Plan presents the transportation concepts for all modes of transportation in the City of Abbotsford over the next 25 years and beyond. The long-term transportation concepts have been structured into five overarching themes:

- Walking Strategies
- Streets Strategies
- Cycling Strategies
- New Technologies
- Transit Strategies

For each of these themes, this plan includes a series of concepts to provide the City with guidance over the long-term.

## WALKING STRATEGIES

Walking is the most basic form of transportation and is a part of every trip, whether that trip is made by car, transit, or bicycle. Walking can also be a convenient alternative to the automobile for short trips if suitable conditions exist within a community – such as having a complete, connected sidewalk network and major destinations nearby to where people live. Promoting walking can help reduce automobile dependence and greenhouse gas (GHG) emissions, improve public health outcomes, increase social interactions, and help to create more livable and vibrant communities.

The Transportation and Transit Master Plan includes four key strategies to address barriers and gaps and to provide more safe, convenient, and comfortable walking environments throughout Abbotsford. These strategies were developed in response to concerns heard from the community during the transportation survey that was distributed in the summer of 2017.

- a. Create “places for people” through **enhanced street treatments for major destinations** that improve pedestrian connections and create beautiful and interesting public places.
- b. Develop an **expanded network of sidewalks and pathways** to reduce barriers and create a more walkable city for people of all ages and abilities. This includes linking to new and existing trails and pathways, giving residents more places to explore and tying in with the Abbotsford Parks, Recreation, and Culture Master Plan.
- c. Enhance the pedestrian environment through **safety and accessibility improvements** that make it easy and convenient to walk to everyday destinations.
- d. Develop **support programs** and initiatives that encourage people to walk and highlight the benefits of walking, including enhanced wayfinding, walking clubs, and a Safe Routes to School program..

## CYCLING STRATEGIES

Cycling is a convenient, relatively low cost and a practical alternative for vehicle travel for short trips and is an important and growing mobility option for Abbotsford residents. The City of Abbotsford recognizes the benefits of cycling to individuals, the community, and the environment. Cycling is enjoyable, efficient, affordable, healthy, sociable, and a non-polluting form of transportation.

The long-term cycling plan includes three related strategies that are designed to provide cycling facilities and programs to make cycling comfortable convenient and accessible for people of all ages and abilities.

- a. Provide a **complete, comfortable, and connected bicycle network** that places all residents and businesses within close proximity of a bicycle route. In addition, work to design intersection treatments in a way that reduces conflicts with motorists and helps to improve the overall comfort and safety of a city’s bicycle network.
- b. Provide **support facilities** and other bicycle infrastructure improvements to make cycling a more attractive and convenient transportation choice.
- c. Develop **support programs** and initiatives to educate, create awareness, and help bolster cycling activity, in addition to infrastructure improvements.

## TRANSIT STRATEGIES

A convenient and reliable public transit system is crucial to creating a vibrant and sustainable community. Public transit is the primary alternative to automobile travel in Abbotsford and across the region. Transit can often be the only option for people who do not drive, for travelling to jobs, school, shopping areas, and recreational centres. Public transit can also reduce overall environmental and community impacts of vehicle transportation. The Transportation and Transit Master Plan will help make this a reality by providing the City with an opportunity to examine the role of transit within a multi-modal framework to support and shape land use patterns and other City aspirations.

The long-term transit plan includes three related strategies that are designed to make transit a more attractive, reliable, and convenient transportation choice:

- a. Enhance the transit network** by working towards the vision identified in the Abbotsford-Mission Transit Future Plan, including regional and inter-regional connections, direct rapid bus service, and local transit in all areas of the city.
- b. Implement transit priority measures** that prioritizes transit over other vehicles to minimize delays and improve service delivery along transit corridors where congestion exists.
- c. Improve the transit customer experience** by providing information and amenities that increase comfort, safety and satisfaction for existing and new customers.

## STREETS STRATEGIES

The street network is designed to support mobility by all travel modes including automobiles, trucks (goods movement), transit, walking and cycling. However, in most North American communities, motor vehicles are often given preferential treatment, sometimes at the expense of walking, cycling or even transit users. Whether this preferential treatment toward vehicles is merely a reflection of current travel demand patterns, it can certainly influence the shape of the community and the travel modes that people are most inclined to use in addition to the liveability of neighbourhoods and major activity nodes in the City.

The long-term plan includes six related strategies that are designed to improve safety and operations for all road users in Abbotsford.

- a. Major Street Network Improvements**
- b. Safety and Operational Improvements**
- c. Complete Streets Policy and Standards**
- d. Updated Street Network Classification**
- e. Traffic Calming**
- f. Goods Movement**

## NEW TECHNOLOGIES STRATEGIES

We are on the verge of a transportation revolution on a scale rivalling the advent of the streetcar in the late 19th century, the introduction of the automobile, and the construction of highway and freeway networks in the 20th century. Advances in telecommunications and socio-behavioural shifts have already led to the exponential growth of new mobility services such as carsharing, ride-hailing (i.e., Uber and Lyft), and bikesharing in larger cities, the impacts of which are only now beginning to be understood. Further, autonomous vehicle technology is rapidly emerging.

The following emerging technologies will have wide-ranging implications on the way we live and move-about communities, both large and small, and will influence the way we plan for Abbotsford's future.

Four transportation technology groupings are discussed:

- a. Electric Vehicles**
- b. Ride Share**
- c. Intelligent Transportation Systems (ITS)**
- d. Autonomous Vehicles**

While ITS and Electric Vehicles are already present to varying degrees in Abbotsford, new mobility services such as bike sharing, car sharing, and ride hailing are not currently operating in the City.



## IMPLEMENTATION AND PHASING

The strategies and actions developed as part of the Transportation and Transit Master Plan are intended to guide Abbotsford's policy, planning and capital investment decisions as well as on-going operations and maintenance activities related to transportation over the next 25 years and beyond. To achieve the vision and goals of the Plan, an implementation strategy is necessary to provide a framework for advancing specific transportation improvements. The implementation and monitoring strategy outlines the approximate cost to implement the capital components of the plan and includes a phasing strategy identifying recommended improvements over the short-term (0-5 years), medium-term (6-10 years), and long-term (11-25 years).

The level of investment required to implement all improvements recommended in the Transportation and Transit Master Plan is estimated to be in the range of \$390 - 410 million (in 2018 dollars). It should be noted that these cost estimates do not include items such as property costs, environmental mitigation costs, and utility relocations. This budget allocation is consistent with the direction of the OCP. The OCP calls for a mode share target 25% of trips made by walking, cycling and transit by the time the population reaches 200,000. This funding scenario goes beyond this target, with 26% of the cost of the plan allocated to walking, cycling, and transit.

However, 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, such as development cost charges. In fact, over the past decade, a significant portion of transportation funding for projects in the City of Abbotsford have come from other sources, including development cost charges and provincial or federal grant programs and cost-share initiatives.

The City should pursue all available sources of funding for transportation facilities and programs. As funding opportunities change regularly, the information in this section of the implementation plan is subject to change. The City should regularly check with all levels of government to keep up to date on current funding opportunities.

## CLOSING

The Transportation and Transit Master Plan for the City of Abbotsford represents a comprehensive and ambitious program of investments over the next 25 years along five key themes – walking, cycling, transit, streets, and new technologies. The plan will be integrated with other master plans as part of Plan 200K, and delivered in a collaborative manner in order to achieve the "7 Big Ideas" identified in Abbotsforward, the City of Abbotsford Official Community Plan.

Throughout the development of the Transportation and Transit Master Plan, there were significant opportunities for public consultation and stakeholder engagement. Overall, there is public support for Transportation and Transit Master Plan including general support for the Capital Priorities. Ideally, many stakeholders would like to see projects happen faster, so the City will continue to seek partnership and grant opportunities.

The short-term investments will be incorporated into the City's 5-year Financial Plan, and a new long-term (25 year) investment strategy will be developed for all of the master plans as part of Plan 200K. Finally, there will be an annual review as part of the financial planning and municipal budgeting process, with a full review of the Transportation and Transit Master Plan recommended every 5 years.





## 1.0 SETTING THE STAGE

The City of Abbotsford is a growing, vibrant, and family-oriented community in the heart of the Fraser Valley. The City of Abbotsford is the largest city by land area in British Columbia, covering 370 square kilometres, and is home to approximately 140,000 residents, or half the region's population.

Abbotsford is characterized by both urban and rural qualities. A large portion of the City's land area is agricultural, with the majority of these lands falling within the Agricultural Land Reserve (ALR). However, Abbotsford also has a highly populated urban core with 80% of the population contained within the designated Urban Development Boundary.

The City is growing rapidly along with other communities in the Fraser Valley. As the City's population grows from approximately 140,000 to 200,000 people, the City will face increasing pressures on its transportation system. The City is working to ensure it meets these growth pressures by developing a new Transportation and Transit Master Plan to guide transportation-related decisions over the next 25 years and beyond. This will ensure that the City invests in the right transportation networks and infrastructure improvements while focusing on sustainability and the environment.

Abbotsford's current Transportation Master Plan was adopted in 2007 and provided recommendations for the street network, active transportation, and transit over the short, medium and long-term. Since that time, Abbotsford has seen several significant changes, and the City has made strong progress in implementing many of the recommendations from the plan.

## 1.1 PLANNING FOR 200K

The creation of this new Transportation and Transit Master Plan is part of an umbrella project called Plan 200K. The initiative intends to coordinate the various City departments as they update master plans and strategies to reflect the vision and objectives in the 2016 OCP. In this sense, the Transportation and Transit Master Plan and other master plans have an opportunity to work alongside and contribute to the development of 19 other plans. The alignment between departments will ensure implementation is focused, planned, and smooth.



## 1.2 STUDY PROCESS

The Transportation and Transit Master Plan was developed through four distinct stages, including:



**Stage 1: Background Research** summarized existing transportation conditions, issues and opportunities in Abbotsford and provided the City with the data needed to move to the next phase and explore new options.



**Stage 2: Exploring Options** charted the future for transportation in Abbotsford, including establishing a vision, goals, targets and policy options for the future of transportation in Abbotsford.



**Stage 3: Draft Plan** compiled the research and feedback received from Stage 3 to form the base of the draft Transportation and Transit Master Plan.



**Stage 4: Final Plan** involved compiling all the collective feedback and priorities and presenting the final plan to the public and Council.

## 1.3 PLAN OVERVIEW

This document—the Transportation and Transit Master Plan—is the final result of the study process described above. The Transportation and Transit Master Plan is separated into five parts.

**Part 1: Setting the Stage** highlights the overall purpose, process and public engagement activities that have taken place to develop the Transportation and Transit Master Plan.

**Part 2: Shaping Influences** outlines the analysis and considerations that shaped the Transportation and Transit Master Plan's directions and actions. This includes understanding the benefits of a well functioning and multi-modal transportation system, connections to other relevant plans and policies, and land use and demographic trends.



**Part 3: Future Directions** outlines the Transportation and Transit Master Plan's vision, goals and targets, which build on the City's overarching plans and policies. The vision and goals will guide transportation decision-making and actions in Abbotsford as the city moves towards a population of 200,000 people, while the targets will be used to measure progress in achieving these goals.

**Part 4: Moving Forward** describes the long-term plans for each mode and area of transportation that will support sustainable growth and transportation choices

**Part 5: Implementation** outlines the mode-specific implementation plan and monitoring strategy for walking, cycling, transit and streets.

## 1.4 PUBLIC ENGAGEMENT

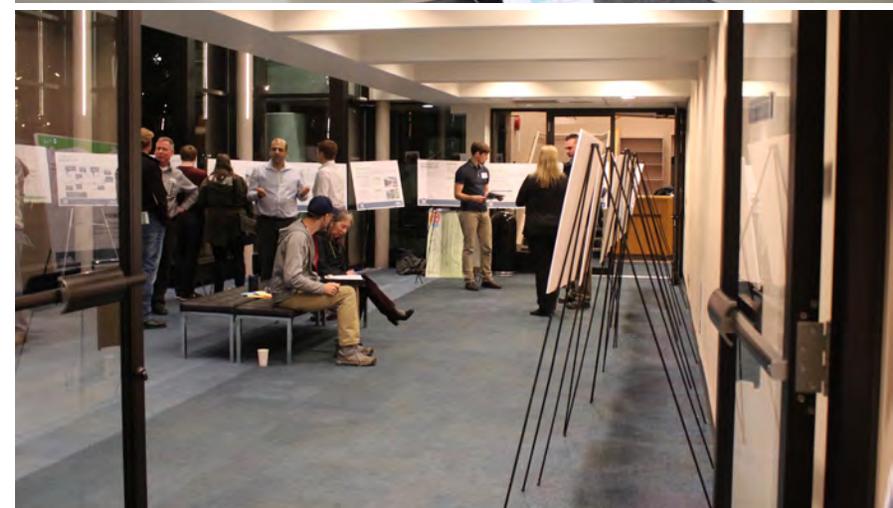
The Transportation and Transit Master Plan was developed in conjunction with broad engagement with the public to ensure the plan addresses transportation issues relevant to the community. There were several opportunities for the stakeholder and public feedback throughout the course of the planning process. Public engagement included surveys, open houses and pop-up information sessions around Abbotsford.

Community engagement during the first phase of the process included several pop-up booths and an on-line survey, which received over 860 responses. This round of engagement began in May, 2017 and focused on gathering input on how residents move around the city, what issues residents encounter when traveling through Abbotsford and opportunities to improve to the transportation network.

During the second round of community engagement, residents were invited to participate in several open houses in February 2018. The purpose of these events was to provide an overview of the process and gather feedback on the preliminary transportation concepts. More than 160 residents participated in second round of engagement.

A series of public events were held at various locations throughout the City during the third round of engagement between April and May 2018. The purpose of this final round of engagement was to obtain input on the draft plan.

Through the entire Transportation and Transit Master Plan, there were over 2,200 touchpoints and interactions with the public to help shape the development of the plan.







## 2.0 SHAPING INFLUENCES

Abbotsford's geography and land use patterns present several opportunities for the transportation system. The majority of the City's residents live within its urban area, which is relatively compact with a well-connected street network. As Abbotsford grows towards a population of 200,000 residents, the City envisions the development of several medium- and high-density residential and commercial areas at key locations within the City, which can help to support walking, cycling, and transit. In addition, the City has an extensive pathway network, including the Discovery Trail, that helps to support sustainable travel modes.

However, Abbotsford also faces challenges with its transportation system. As the largest municipality by land area in British Columbia, there are challenges in serving all areas of the City, while balancing the needs of urban and rural areas. In addition, industrial lands that are isolated by railways, highways, ALR and steep grades, regional high-volume traffic routes, and automobile-oriented neighbourhoods, particularly in the Sumas Mountain area, all present significant land use and transportation challenges. As a result, Abbotsford is currently a predominantly automobile-oriented community, with 91% of all trips made by private vehicle.

## 2.1 WHY FOCUS ON TRANSPORTATION

As part of the development of the Transportation and Transit Master Plan, an on-line survey was conducted to gather input on transportation issues. Some of the top issues identified in the survey indicated that residents found distances between destinations were too great for walking, a lack of bicycle routes kept people from cycling, infrequent transit made the service unreliable, and that traffic congestion and safety were constant concerns.

The City of Abbotsford recognizes that transportation plays a significant role in the development of healthy communities, as transportation policies, plans and infrastructure are a fundamental part of the impact of the built environment on residents' health. Transportation can impact community health in a number of ways, including:

**Road Traffic Injuries:** High automobile speeds and traffic volumes all contribute to traffic-related injuries and deaths for pedestrians, cyclists and motorists. Safe road design can improve safety and address citizens' perception of safety.

**Physical Activity, Obesity and Chronic Disease:** Transportation and urban planning policies can effectively encourage physical activity. With more active transportation and transit options, people can be more active. Being more physically active can improve health and reduce rates of obesity, chronic disease, and premature death.

**Air Quality:** Transportation-related air pollutants are the largest contributors to poor air quality and produce greenhouse gas (GHG) emissions, which has negative implications for community quality of life and public health.

**Noise:** Road traffic is the biggest cause of noise in many cities, which can exacerbate stress levels, increase blood pressure, cause sleep disturbance and negatively affect mental health.

**Equity:** Affordable and equitable transit service can enable residents of all incomes and abilities to access necessary services and supports (i.e. employment, education, healthcare, public and social services, and healthy food) that are critical components to health.

**Social Cohesion and Inclusion:** Cycling, walking, and transit have been shown to stimulate physical activity, which leads to increased social interaction and cohesion. Social inclusion can lead to greater cohesiveness and result in positive outcomes such as better health and increased participation in community life.

Managing transportation impacts can help foster more liveable, vibrant, and safe neighbourhoods, and help to support a higher quality of life for Abbotsford residents. This is especially important for vulnerable groups including children, youth, and seniors. Factors such as high traffic speeds, traffic volumes, and inadequate pedestrian and cycling infrastructure can deter these groups from walking or cycling to and from their destinations. It is important that transportation infrastructure allow seniors to be mobile in their community without a vehicle and attracts children and youth to sustainable modes of transportation early in their lives, as there is opportunity to continue walking and cycling behaviours into adulthood. It is also important that vehicle-based GHG emissions and air quality impacts from the transportation system are mitigated to reduce health impacts on residents, particularly given the City's context with the Fraser Valley.

## 2.2 INTEGRATING WITH OTHER PLANS

The Transportation and Transit Master Plan is closely linked to and will be informed by, many of the City and region's key planning documents that contain active transportation, transit, roadway, goods movement and parking-related policies, plans, goals and visions. Many of these documents and resolutions include broader aspirations for growth and transportation and provide specific directions on how walking, cycling and transit can be balanced with more traditional transportation modes such as private vehicle use and goods movement. The balance of all modes will be critical to help further the goals and policies found in other documents and to ensure the City of Abbotsford continues to develop in a way that supports all modes. The Transportation and Transit Master Plan can reinforce and help further the goals and policies found in other documents.

In particular, the Transportation and Transit Master Plan is guided by and supports the aspirations of two overarching City policies and plans – the **2015-2018 Strategic Plan** and the City's **Official Community Plan (OCP) - Abbotsforward**.

The City's **2015-2018 Strategic Plan** committed to four cornerstones to support its vision that "Abbotsford is the Hub of the Fraser Valley": vibrant economy, complete community, fiscal discipline and organizational alignment. Within the context of complete communities, capitalizing on opportunities around transportation was identified as one of six strategic priorities.



The Strategic Plan identifies the need for the City to take an active role in the development of transportation plans, make efforts to enhance multi-modal systems such as walking, cycling, and transit, and ensure that the City's plans and bylaws speak to transportation issues and are aligned.



In 2016, the City adopted its new OCP, **Abbotsforward**, which presents the community vision, goals and aspirations for future growth and is the City's guiding document for planning and land use decisions. The updated OCP plans for a future city of 200,000 people and focuses 75% of new growth in existing neighbourhoods. The vision presented within the OCP, in turn, have a significant impact on the focus of the Transportation and Transit Master Plan, including aligning the plan with focused priorities like making walking, biking, and transit more delightful, and creating a vibrant and thriving city centre. Policy directions for the plan are organized around '7 Big Ideas' for the future:



The OCP's vision describes Abbotsford as "a city of distinct and increasingly complete neighbourhoods rich with public life". The transportation priorities and policies expressed through Abbotsforward support the main transportation-related goal, which is to make walking, cycling and transit delightful. The OCP supports transportation policy and direction that provides more opportunity for safe and convenient movement around the city, as well as enhanced regional connections.

The OCP includes an Urban Structure Map (**Figure 1**) which shows the overall structure for the urban area and the connection to a Primary Transit corridor which will intensify over time to accommodate increased demand. The preliminary concepts in this report are strongly connected to the City Centre, Urban Centres, and Neighbourhood Centres identified in this map to ensure that each of these centres have walking, cycling, and transit connections.

The OCP aims to make walking, biking, and transit delightful and includes a transportation hierarchy that prioritizes active modes (walking – including accessibility, biking, transit, goods movement, multiple occupant vehicles, and single occupant vehicles), and includes a mode share target of 25% of all trips being made by sustainable transportation within the Plan's life.

The OCP includes a number of policies related to transportation, including:

1. **Prioritize People, Not Cars** includes targets for mode share and funding, creating a wayfinding system, and developing a new way to rethink and redesign streets.
2. **Walking** includes a focus on reducing distances to destinations, improving sidewalk and pathway design, providing public seating, and ensuring signal priority and frequent crossings.
3. **Cycling** includes developing a complete and continuous bicycle network, addressing conflict zones, and providing bike parking and end-of-trip facilities.
4. **Transit** includes working with BC Transit to establish a Frequent Transit Network, improving transit stops, and providing transit priority.
5. **Vehicles and Parking** includes ensuring street design does not encourage speeding, establishing a street hierarchy, reviewing parking supply and management, and considering electric vehicles.
6. **Goods Movement and Emergency Vehicles** includes establishing major truck routes and emergency routes and considering innovative design treatments to accommodate delivery truck movements.

Other key documents that informed the Transportation and Transit Master Plan include:

- Bicycle Master Plan (2003) - City of Abbotsford
- Community Sustainability Strategy (2013) - City of Abbotsford
- City of Abbotsford Development Bylaw (2011) - City of Abbotsford
- Trail Development Strategy (2004) - City of Abbotsford
- BC Transit Futures Plan (2013) – BC Transit
- Regional Growth Strategy – Fraser Valley Regional District

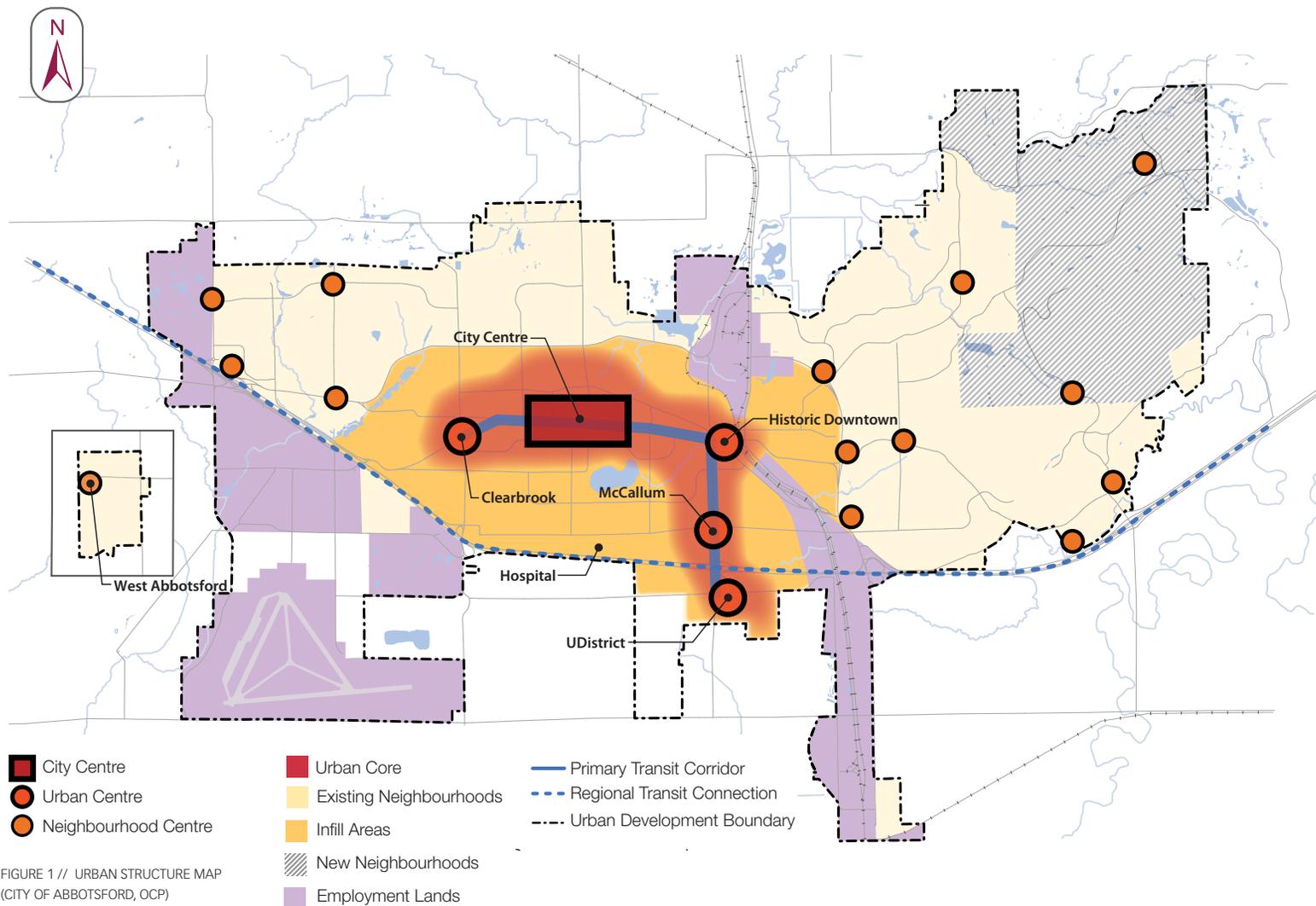


FIGURE 1 // URBAN STRUCTURE MAP  
(CITY OF ABBOTSFORD, OCP)



## 2.3 COMMUNITY PROFILE

### 2.3.1 Demographic Context

Abbotsford is growing rapidly. The City's overall population grew by 7% from 124,258 in 2006 to 133,397 in 2011. The most recent census data (2016) shows a population of 141,397, demonstrating 5.9% growth.

A future population of 200,000 is estimated by 2040 taking into account a medium growth scenario of 1.5% per year. The median age in Abbotsford increased from 35.1 years old in 2001 to 36.7 years old in 2006 and 37.8 years old in 2011. Although Abbotsford is aging just like most cities, it has a younger population than in the Fraser Valley Regional District (FVRD) overall at 39.6 years old. Median ages in neighbourhoods throughout the City range from 32.7 years in West Townline to 48.1 years in Mill Lake.

In 2011, approximately 17% of Abbotsford's population was aged 65 and over, a 14.2% increase from the same cohort in 2006. This was the largest population increase of any age group over the same period.

**Figure 2** shows the projected growth to 2040 and how that growth is likely to occur across all age groups within Abbotsford

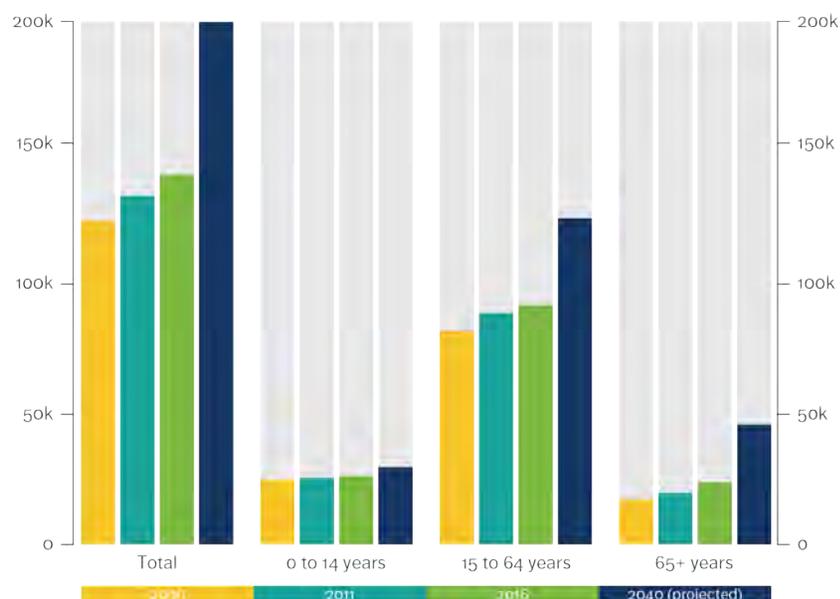


FIGURE 2 // POPULATION AND PROJECTIONS BY CENSUS AGE GROUPS

While the younger portion of the population is expected to increase by 2040, this increase is moderate compared to the older age groups with the most significant increase occurring within the oldest group (65+). This is important as age tends to demonstrate different travel patterns.

As shown in **Figure 3**, travel patterns vary by age, with peak driving years occurring within the 40-49 age group. Younger populations tend to travel by active means or as passengers while aging populations tend to travel as vehicle passengers, and driving alone becomes a less common transportation mode with a drop occurring beyond the age of 60. As the aging population increases in the years to come, understanding and accommodating these travel patterns will be critical to ensuring all resident's transportation needs are addressed, with certain modes requiring additional focus.

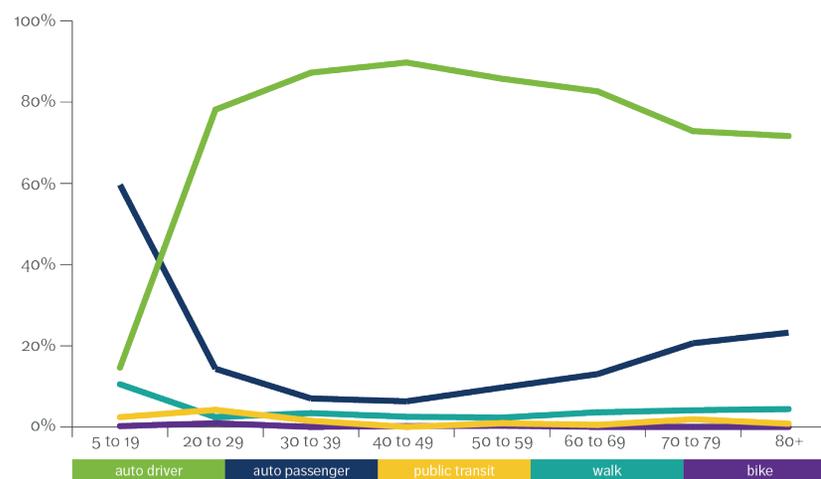


FIGURE 3 // TRAVEL MODE BY AGE (TRANSLINK TRIP DIARY 2011)

### 2.3.2 Land Use Context

The City of Abbotsford has grown significantly throughout its history, with much of this geographic growth has been due to amalgamation. The Village of Abbotsford and the District of Sumas amalgamated in 1971 to become the District

of Abbotsford. In 1995 the District of Abbotsford, in turn, amalgamated with the District of Matsqui and together became the City of Abbotsford.

Today the City of Abbotsford is recognized as the heart of the FVRD, with the City being home to approximately half of the region’s population.

Of this population, 80% is contained within the Urban Development Boundary as shown in **Figure 4**. Land use beyond the Urban Development Boundary is physically constrained to outward expansion due to the ALR, topography in the Sumas Mountain area, and the Canada - United States Border to the south.

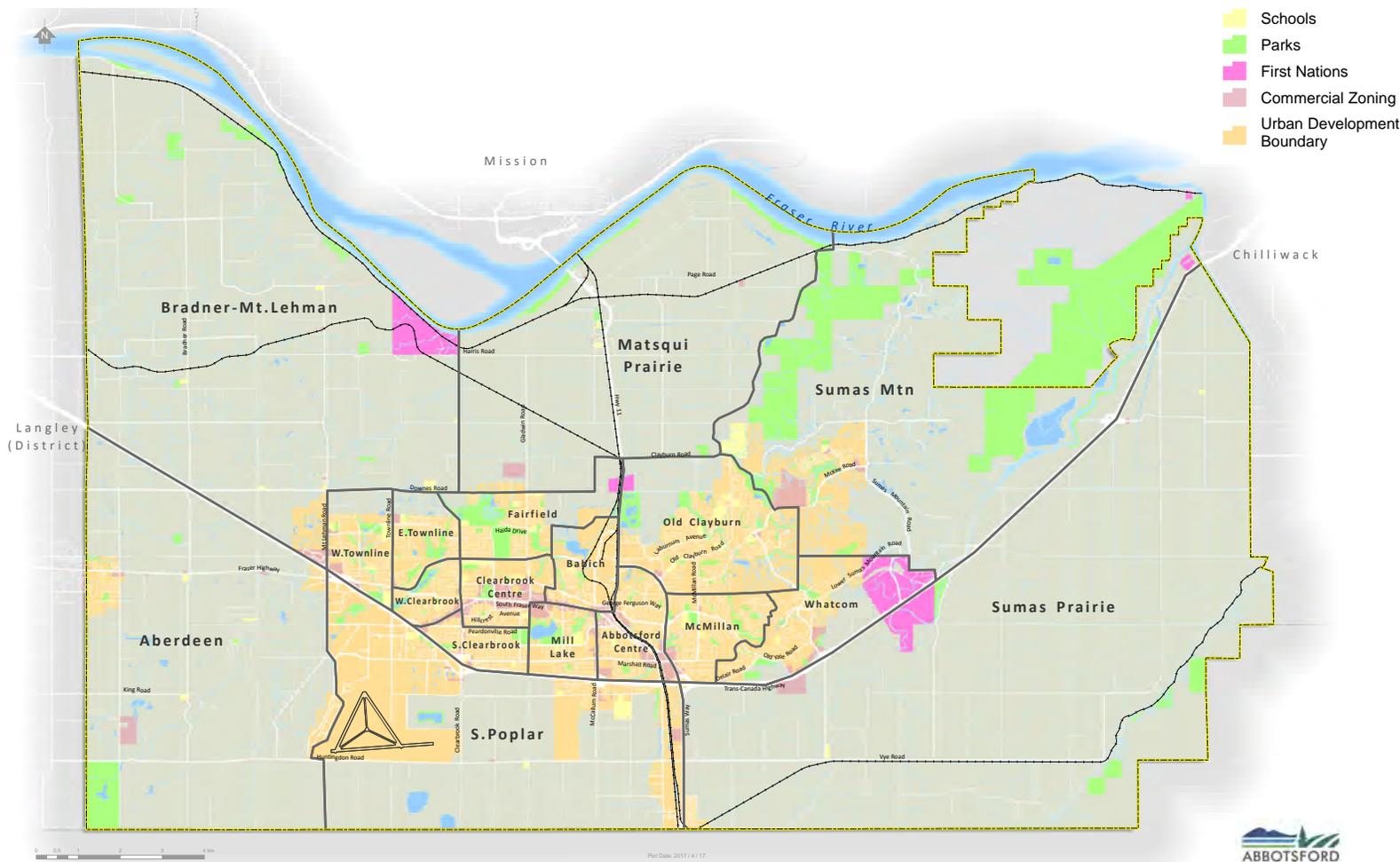


FIGURE 4 // ABBOTSFORD COMMUNITY CONTEXT.



### 2.3.3 Travel Patterns

The road network in Abbotsford has traditionally been designed to accommodate vehicular traffic. According to Statistics Canada’s 2011 National Household Survey, approximately 92% of commute trips to work in 2011 were made by private vehicle (car, van, truck) including both drivers and passengers. The use of public transit, walking and cycling made up the remaining 8% of commute trips.

Compared to several peer communities, Abbotsford has a higher proportion of private vehicle trips and a lower proportion of active trips (Figure 5).

Similarly, the TransLink Trip Diary (2011) indicates that 91% of all trips (not just commute trips) are being fulfilled by private vehicles with the remaining trips being fulfilled by active and sustainable means (Figure 6).

The first survey for the Transportation Master Plan identified trip destinations for all types of trips throughout Abbotsford. For trips taken by all modes, the destinations are shown in Figure 7 with destinations being most concentrated in the City Centre and spreading outwards.

Specific trip destinations by purpose were also identified through the survey. Trips are made for a variety of purposes such as trips for work, recreation, shopping, accessing services, and school trips. The following figures (Figures 8-11) show the distribution of these trips.

Some of the key findings show that residents are travelling to the following destinations for the following purposes:

- **Working** throughout the City with the highest concentration of work trips occurring within the City Centre and spread outwards to Blue Jay Street to the west and extending past McMillan Road to the east.
- **Recreational trips** are primarily focused around Mill Lake.
- **Shopping** for groceries along Sumas Road between Old Yale Road and Marshall Road and along South Fraser Way between Tretheway Street to the west and Gladwin Road to the east.
- **Accessing services** such as medical appointments and banking are concentrated around South Fraser Way and Gladwin.
- **School trips** are mostly focused at the University of Fraser Valley, although it is recognized that school trips occur throughout the city.

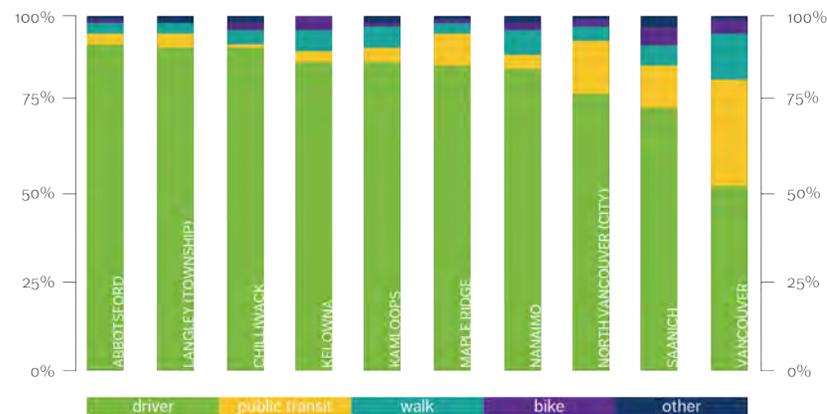


FIGURE 5 // TRAVEL MODE BY COMMUNITY (CENSUS 2011)



FIGURE 6 // ABBOTSFORD MODE SHARE (TRANSLINK TRIP DIARY, 2011)



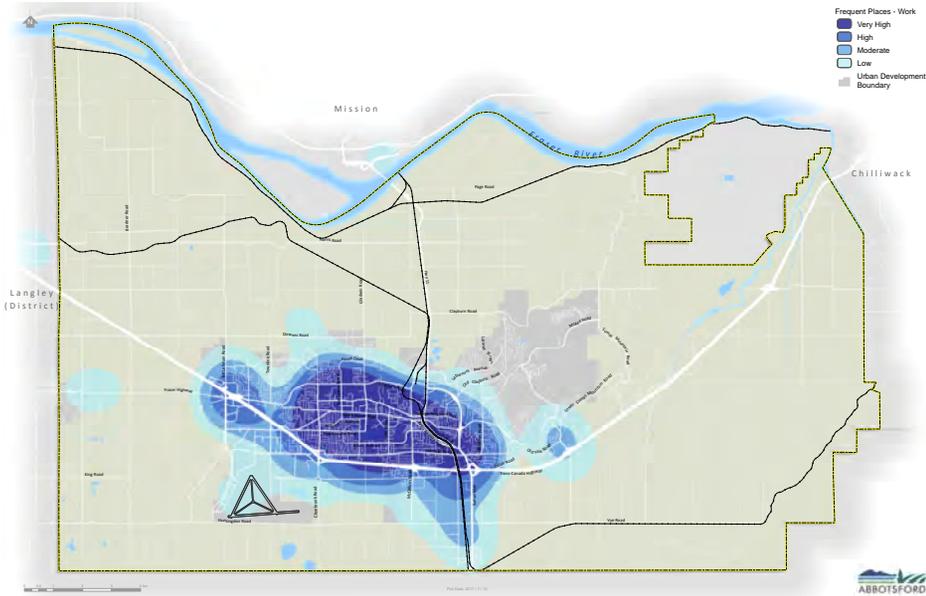


FIGURE 8 // WORK TRIP DESTINATIONS (PLAN FOR 200K TRANSPORTATION SURVEY, 2017)

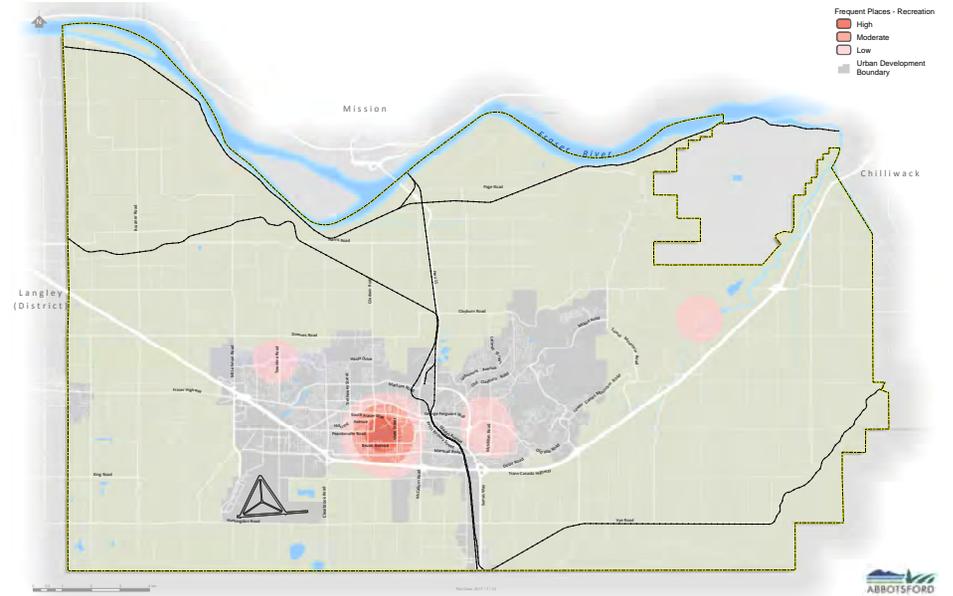


FIGURE 9 // RECREATIONAL TRIP DESTINATIONS (PLAN FOR 200K TRANSPORTATION SURVEY, 2017)

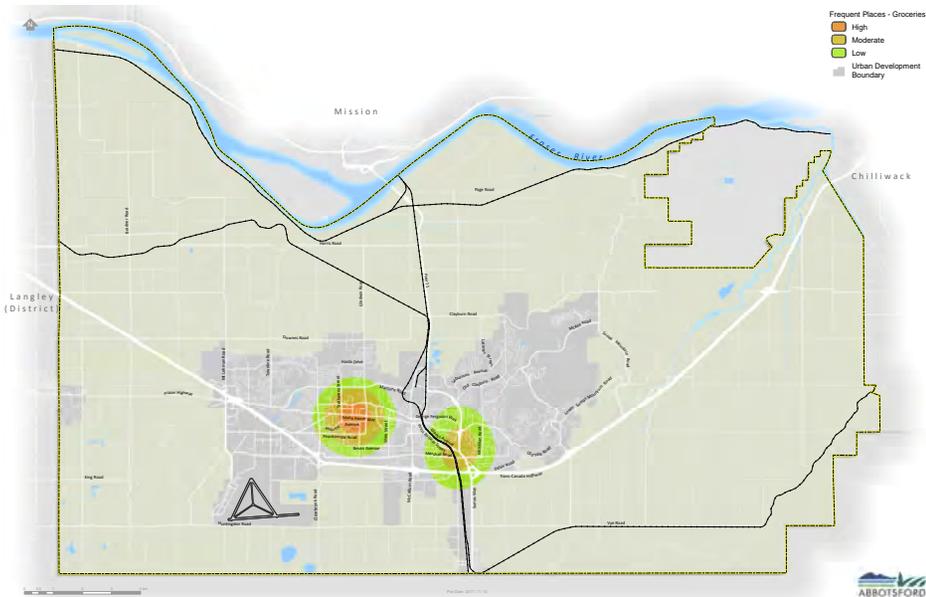


FIGURE 10 // SHOPPING (GROCERY) TRIP DESTINATIONS (PLAN FOR 200K TRANSPORTATION SURVEY, 2017)

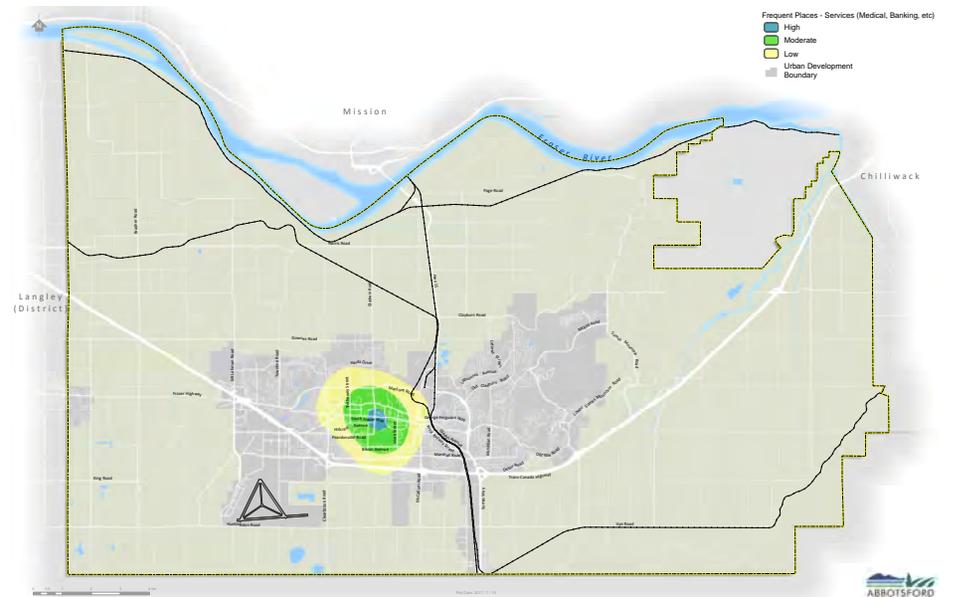


FIGURE 11 // ACCESSING SERVICES (MEDICAL, BANKING, ETC.) TRIP DESTINATIONS (PLAN FOR 200K TRANSPORTATION SURVEY, 2017)





### 3.0 FUTURE DIRECTIONS

The Transportation and Transit Master Plan presents a long-term vision that builds on the transportation vision that was identified in the OCP. The vision was also developed from input received from residents and stakeholders and emphasizes the intention to promote a safe and accessible transit system for people of all ages and abilities.

#### 3.1 VISION STATEMENT

*“Abbotsford’s multi-modal transportation system will be truly enjoyable and functional for everyone, while supporting a shift towards walking, cycling and transit. This will ensure that people of all ages and abilities have convenient, safe, accessible, and enjoyable transportation options. Walking will be a delightful first choice for shorter trips, while cycling and transit will be convenient and practical choices for longer trips. Goods movement and personal vehicle movement will also be important parts of the transportation system to ensure the City’s continued economic prosperity as the hub of the Fraser Valley. The transportation system will seek to create and support a vibrant, livable, healthy and sustainable community for residents, businesses and visitors alike.”*

### 3.2 GOALS

The Transportation and Transit Master Plan includes the following goals to improve the transportation system in Abbotsford:

1. Make walking, biking and transit delightful
2. Move people and goods in a way that is safe, accessible and equitable and that supports the City's economy
3. Ensure all modes provide connections to important destinations and areas of future growth and development
4. Ensure that the transportation system supports land use decisions
5. Design streets to be complete destinations that support walking, biking and social interactions
6. Ensure that the transportation system is well-maintained
7. Plan and prepare for changes to the transportation system from emerging technologies

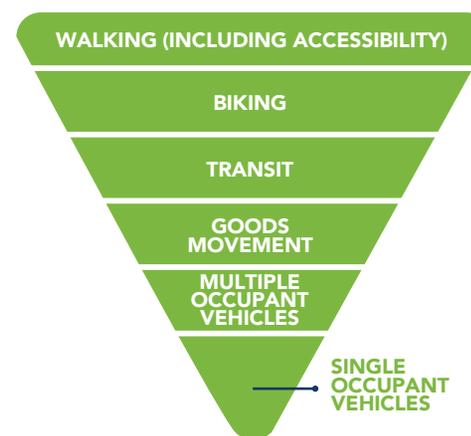
### 3.3 SHAPING PRIORITIES

Like other North American communities, Abbotsford is facing challenges from being an auto-dependent community. Over the last 60 years, the form of most North American cities has evolved from being compact and vibrant places of mixed-use areas where people could choose to live, work, shop, socialize and recreate in close proximity, to having more dispersed and segregated land use patterns. This change in the urban structure and form of cities has made it more difficult to walk and cycle to serve our daily needs, and has made it very difficult to provide attractive transit services within dispersed land use patterns.

The design of most cities has inadvertently fostered a market for auto-oriented land uses (such as single-family housing as well as retail and office space) which, in turn has increased pressures to build more road space in order to support driving for our daily needs. Unfortunately, these decisions have also reduced the vibrancy of urban areas and created sizable barriers to providing attractive transportation choices.

The City of Abbotsford has committed to creating more vibrant communities for a future generation of residents and visitors. In the future, key areas of the City could support increased scale, density and mixture of land uses to serve the housing, economic, social, health, cultural and recreational needs of our community.

The transportation system can support these land use patterns with appropriate investments to enable and encourage people to walk, cycle, and use transit. The OCP identified a new modal hierarchy that prioritizes walking, cycling and transit within the Urban Development Boundary. The hierarchy of modes, shown to the right, proposes that the City consider the needs of pedestrians, cyclists, public transit, and goods and services movements before that of private automobiles in the urban area. By considering needs of these priority modes, future transportation plans, programs and projects will provide better, safer and more convenient solutions and encourage over time more people to walk, cycle, and choose transit.



In areas outside the Urban Development Boundary, the City will make transportation decisions with the intent to balance mobility modes over time. Although this standard is lower than the urban places, improvements relating to walking, biking and transit are still desirable.



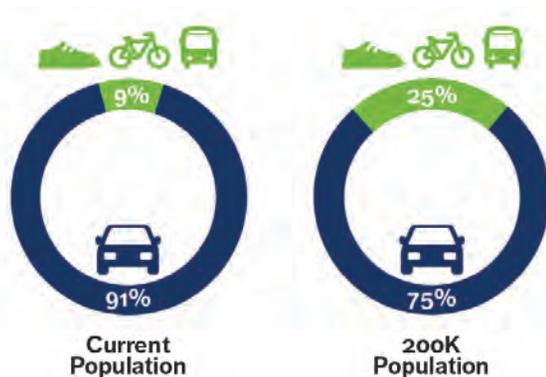
### 3.4 TARGETS

Measurable targets provide a way to measure progress towards achieving goals and objectives. Targets are an important tool for the City to monitor the results of policies and actions that have been implemented. They will help to ensure that the Plan is implemented as intended, and to determine whether the Plan is achieving its goals. The Plan includes one primary target, as described below.

#### 3.4.1 Increase Sustainable Transportation

The OCP sets a target that 25% of all trips will be made by walking, cycling, and transit by the time the city reaches a population of 200,000 residents. As noted previously, however, these modes currently only make up approximately 9% of daily trips. These targets represent a significant and bold change in regards to the City's priorities and investments. A shift to larger proportions of sustainable trips not only indicates changes to transportation choice but are an indicator of how attractive the city is for walking, cycling and using transit. Higher sustainable mode shares are an indicator of how integrated the city's transportation system is with land use patterns. It is also an indication of how investments in sustainable modes can shift the amount of driving in support of a healthier and more vibrant community.

The City of Abbotsford's sustainable mode share target of 25% implies future growth in locally generated trips. As the city grows and is intentional about building great places and safe, accessible transportation networks, more people will make walking, cycling, and transit trips their first choice.



### 3.5 PLAN FRAMEWORK

The key themes and corresponding strategies are shown in the Plan Framework below:

#### WALKING STRATEGIES

1. Enhanced Street Treatments For Major Destinations
2. Expanded Network Of Sidewalks And Pathways
3. Safety And Accessibility Improvements
4. Support Programs

#### CYCLING STRATEGIES

1. Complete, Connected Bicycle Network
2. Support Facilities
3. Support Programs

#### TRANSIT STRATEGIES

1. Enhanced Transit Network
2. Transit Priority Measures
3. Transit Customer Experience

#### STREETS STRATEGIES

1. Major Street Network Improvements
2. Safety And Operational Improvements
3. Complete Streets Policy And Standards
4. Updated Road Network Classification
5. Traffic Calming
6. Goods Movement

#### NEW TECHNOLOGIES STRATEGIES

1. Electric Vehicles
2. Ride Share
3. Intelligent Transportation Systems
4. Autonomous Vehicles





## 4.0 ACHIEVING OUR VISION

### 4.1 WALKING

Walking is the most basic form of transportation and is a part of every trip, whether that trip is made by car, transit, or bicycle. Walking can also be a convenient alternative to the automobile for short trips if suitable conditions exist within a community – such as having a complete, connected sidewalk network and major destinations nearby to where people live. Promoting walking can help reduce automobile dependence and greenhouse gas (GHG) emissions, improve public health outcomes, increase social interactions, and help to create more livable and vibrant communities.

Promoting walking is one of the top priorities for Abbotsford’s transportation future. The City has an extensive walking network that includes more than 400 km of sidewalks and 275 km of off-street trails and pathways. Recreational opportunities such as the Discovery Trail, Mill Lake Park and other parks and green spaces attract people walking for relaxation or exercise. Mixed land uses and high densities planned for the City Centre and other centres identified in the OCP will encourage walking for social and business purposes. Walking accounts for just over 4% of all trips made by Abbotsford residents and approximately 2.7% of all commute trips to work or school. Most walking trips are short: nearly two-thirds of all trips are less than 1 km, which is approximately a ten-minute walk.

The Transportation and Transit Master Plan sets out to increase the walking mode share as a form of sustainable transportation. To achieve this target and to make walking a more viable option for more people, the Transportation and Transit Master Plan includes the following concepts to improve walkability:

- Improving the pedestrian environment in areas with the highest pedestrian demand;
- Enhancing the existing sidewalk and trail network;
- Focusing on safety and accessibility upgrades at pedestrian crossings; and
- Making walking a more enjoyable experience by improving the public realm.

#### 4.1.1 Issues and Opportunities

Through engagement activities related to the Transportation and Transit Master Plan, we have heard a number of key issues and opportunities for walking in Abbotsford.

Some of the top issues that have been identified include:



##### **Distance are too far**

Abbotsford covers a large area. It can be quite far for people to walk to their destination.



##### **Intersection safety**

Many intersections in Abbotsford are designed primarily to make driving more convenient, which can make walking more uncomfortable.



##### **Lack of sidewalks or pathways**

Many places in Abbotsford lack basic walking infrastructure like pathways or trails which makes walking more difficult, indirect and less safe.



##### **Speed and noise of motor traffic**

Frequent road noise and traffic speeds can make walking unpleasant and unsafe.



##### **Conditions of sidewalks**

Many sidewalks around Abbotsford are in need of repair or upgrades to make them more attractive for people who wish to walk.

Opportunities that have been identified to improve walking in Abbotsford include:



##### **Build more trails and pathways**

More trails and pathways give people more places to walk.



##### **Ensure all sidewalks and pathways are well-lit**

Lighting increases safety along sidewalks and pathways.



##### **Widen and improve existing sidewalks**

Wider sidewalks are necessary to provide safer and more accessible conditions for aging adults and people with mobility challenges.



##### **Provide more crosswalks**

Increasing the number of crosswalks can help make walking routes more direct.



##### **Build more sidewalks**

More sidewalks help promote walking by increasing the number of connections and safety of the network.



#### 4.1.2 Strategies and Actions

The Transportation and Transit Master Plan includes four key strategies to address barriers and gaps and to provide more safe, convenient, and comfortable walking environments throughout Abbotsford. These strategies were developed in response to concerns heard from the community during the transportation survey that was distributed in the summer of 2017.

##### WALKING STRATEGIES:

- a. Create “places for people” through **enhanced street treatments for major destinations** that improve pedestrian connections and create beautiful and interesting public places.
- b. Develop an **expanded network of sidewalks and pathways** to reduce barriers and create a more walkable city for people of all ages and abilities.
- c. Enhance the pedestrian environment through **safety and accessibility improvements** that make it easy and convenient to walk to everyday destinations.
- d. Develop **support programs** and initiatives that encourage people to walk and highlight the benefits of walking.

#### a. enhanced street treatments for major destinations

The City of Abbotsford’s goal is to make “Places for People” by improving pedestrian connections and using urban design features to create beautiful and interesting public places. Abbotsford’s OCP and Neighbourhood Plans emphasize certain design interventions, including creating plazas, enhancing the tree canopy, and creating unique gateway treatments at the entrance to special areas such as Historic Downtown. These treatments can help create destinations in and of themselves and produce lively, vibrant, pedestrian-oriented streetscapes.

It is especially important to enhance the pedestrian character near key destinations. Key destinations are intended to support and reinforce the City’s other planning documents. Two types of key destinations have been identified:

- **Urban Nodes**, which include a 5-minute walking distance (400 metres) around the City Centre and each of the Urban Centres and Neighbourhood Centres identified in the OCP. This will help create a delightful walking experience with enhanced treatments to get to these major destinations throughout the City. Urban Node Pedestrian Priority Areas are shown in **Figure 12**.
- **Schools, Parks and Recreation Centres**, which includes a 5-minute walking distance (400 metres) to all schools in the City, as well as all neighbourhood parks and recreation centres. Safe and active transportation to school should be encouraged through a Safe Routes to School program. This recommendation is integrated with the City’s concurrent Parks, Recreation and Culture Master Plan to ensure walking is an attractive option for travel to major community facilities. School, Park, and Recreation Centre Pedestrian Priority Areas are shown in **Figure 13**.

There are a number of urban design features listed on the following pages that can be considered in these areas of higher pedestrian activity. While installing these features is important for creating great places, it is also crucial to ensure that they do not narrow the width of the sidewalk’s through pedestrian zones and impede safety and accessibility.

The Transportation and Transit Master Plan identifies a ‘toolkit’ of improvements to improve the quality of the pedestrian realm. It is anticipated that further details regarding the specific treatments and locations will be developed in related plans such as Neighbourhood Plans.

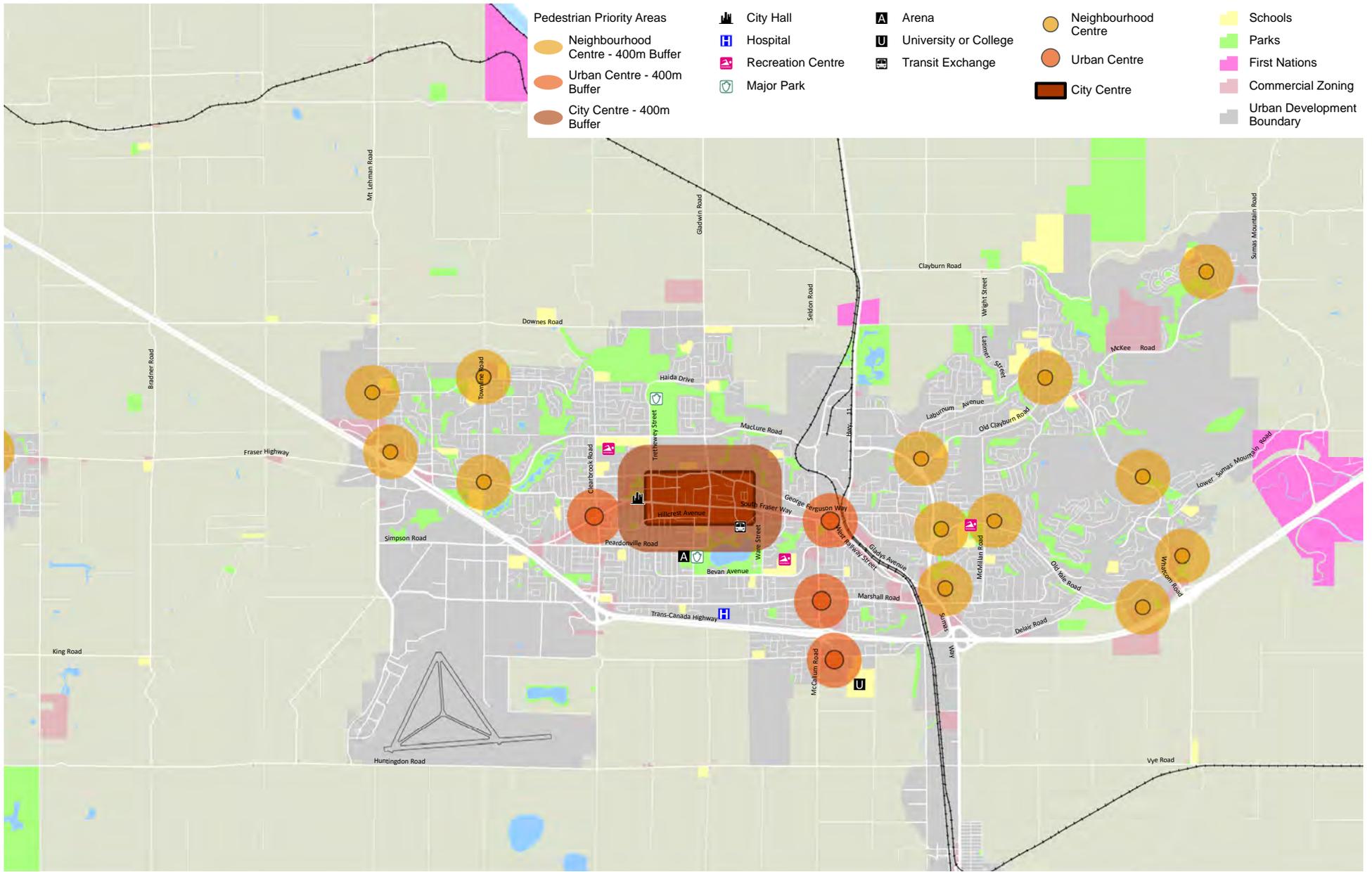


FIGURE 12 // URBAN NODE PEDESTRIAN PRIORITY AREAS



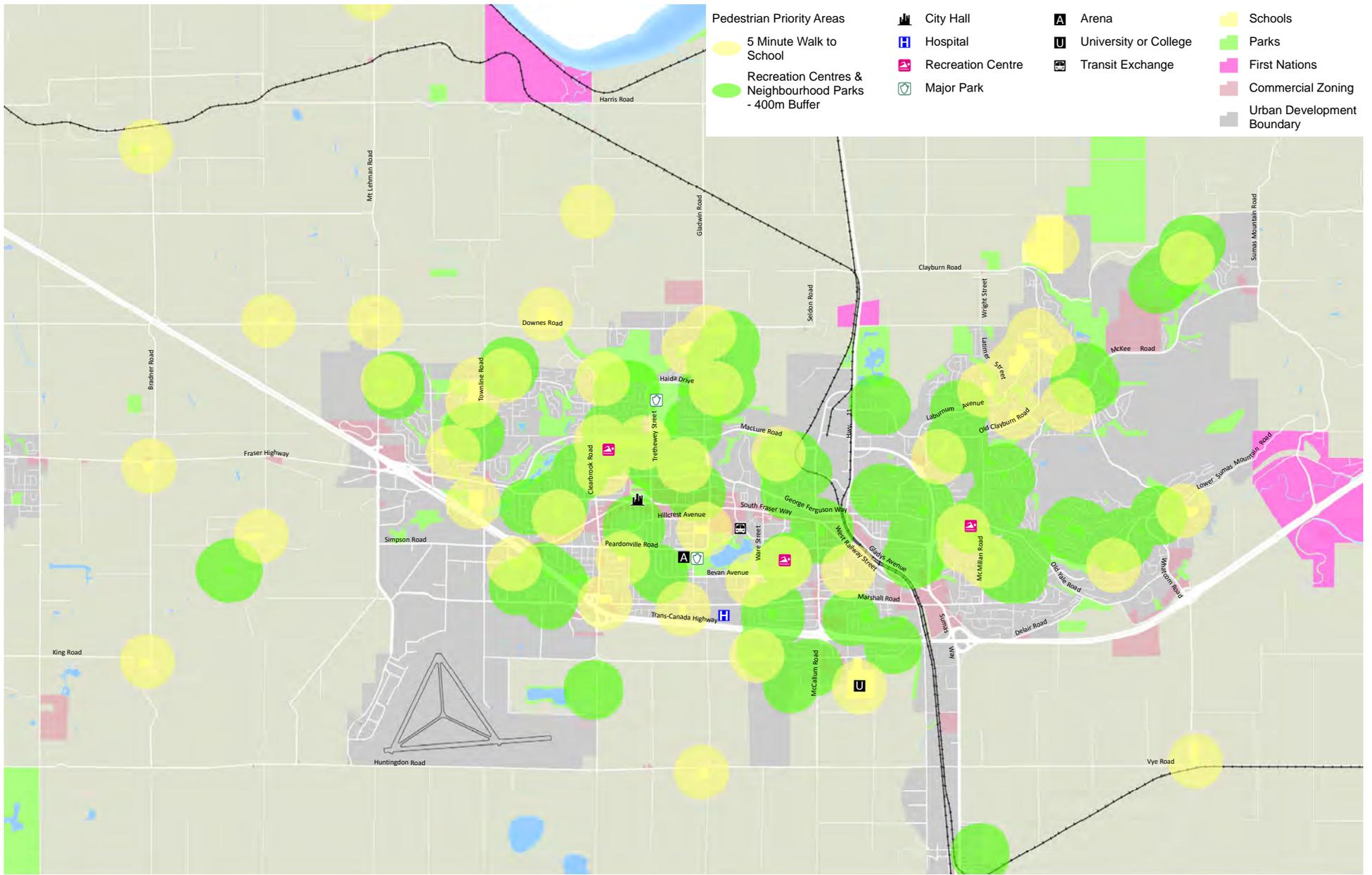


FIGURE 13 // SCHOOL, PARK AND RECREATION CENTRE PEDESTRIAN PRIORITY AREAS



PEDESTRIAN AMENITIES



It is anticipated that many of the recommendations to provide enhanced street treatments will be implemented through redevelopment opportunities.

WIDE SIDEWALKS

Wide sidewalks make walking more comfortable and accessible for everyone, particularly in high activity areas and on commercial streets. Importantly, wider sidewalks create more space for individuals with mobility aids, buggies, or carts. They also provide more room for additional pedestrian amenities.

BOULEVARDS AND CURB EXTENSIONS

Boulevards and curb extensions are buffers that separate people walking from vehicle traffic. These spaces create a more comfortable walking experience and provide space for street trees and other amenities. Curb extensions shorten the crossing distance while creating additional space for appropriate landscaping and amenities. These treatments are recommended, where possible, for routes connecting to key pedestrian generators where walking activity is concentrated.

STREET TREES

Street trees play an important role in increasing the comfort and safety of people walking and should be incorporated into all sidewalks wherever possible. Trees are particularly important for streets with high pedestrian demand or where parking does not provide a buffer between the road and sidewalk. Street trees also help to provide shade in the summer, improve air quality, create wildlife habitat, reduce the urban heat island effect, and act as carbon sinks, absorbing and storing greenhouse gases. As described in Abbotsford’s City Centre Neighbourhood Plan, different species of trees can be used to distinguish unique streets and spaces. Street trees with large, leafy canopies should be promoted, as they provide an abundance of shade and are aesthetically pleasing. The City should consider implementing growing and maintenance techniques to ensure that street trees are healthy and can grow beyond 15 years in order to establish a mature urban forest.

PEDESTRIAN AMENITIES

Pedestrian amenities such as planters, litter and recycling bins, water fountains, and benches help to improve the attractiveness and comfort of the pedestrian environment. These amenities are typically placed outside of the travelled portion of the sidewalk and are essential to creating environments within commercial areas that are comfortable and interesting for pedestrians.

### PUBLIC ART AND HISTORIC FEATURES

Public art, artistic benches, community art projects, and community-based design initiatives can also help to improve spaces for people walking. These features can be used to help showcase Abbotsford's diversity and inclusiveness celebrating the local and historical context of the city.

### WEATHER PROTECTION

Providing continuous protection from rain (which can extend to snow and sun protection) along key pedestrian routes—especially commercial streets—can create more inviting and useable outdoor spaces year-round. Weather protection should be provided within the property lines and should not encroach on public rights-of-way.

### ENHANCED LIGHTING

Pedestrian-scale street lighting can significantly enhance a street's character while also improving its safety and accessibility. Colour, intensity, duration, and orientation are all important elements to consider when designing street lights that limit light pollution while creating a pleasant pedestrian experience.

### WAYFINDING AND PEDESTRIAN-SCALE SIGNAGE

Wayfinding creates a navigable pedestrian environment by identifying pedestrian routes, key destinations, and access to public transit. Wayfinding and signing can be designed to showcase a neighbourhood's or corridor's unique character, which helps to create a sense of place.

### URBAN PARKS AND PLAZAS

These spaces allow people to gather, create unique destinations, and add to the overall character, vibrancy, and visual appeal of the city. Pedestrians can stop, take a break, and enjoy facilities offered.

### ESTABLISH PEDESTRIAN PRIORITY STREETS

Treatments can be used to turn streets into high activity spaces that welcome and prioritize pedestrians in a traffic calmed 'woonerf' environment. These streets can also be designed to stimulate business activity with patios, seating, and other design elements such as public art, lighting, and planters.

## WEATHER PROTECTION



## WAYFINDING



## URBAN PARKS & PLAZAS



## b. expanded network of sidewalks and pathways

Abbotsford has an extensive pedestrian network that includes approximately 429 km of sidewalks throughout the City. However, nearly half (44%) of all streets in Abbotsford have a sidewalk present on one side of the street, while a third (33%) of streets in Abbotsford have no sidewalk at all. This can create connectivity and accessibility issues for pedestrians. Sidewalk coverage and filling in gaps in the network is particularly important within high activity areas, along bus routes, and near parks, schools, hospitals, and other community facilities.

The Transportation and Transit Master Plan recommends a number of ways to enhance sidewalks and pathways, including new sidewalks on existing roads, sidewalks in new developments, sidewalk width, enhancing trails and pathways, and maintaining pedestrian facilities, as described below.

## SIDEWALK REQUIREMENTS FOR NEW STREETS

The City's Development Bylaw outlines current sidewalk requirements for new streets. Sidewalks are required on both sides of all arterial and collector streets as well as local streets with multi-family land uses. Sidewalks are required on one side of all other local streets, except for on cul-de-sacs where sidewalks are not required. The width of sidewalks depends on location. The existing sidewalk requirements in the Development Bylaw are summarized in **Table 1**, along with suggested changes based on best practices from the Transportation Association of Canada (TAC). The following changes to the City's bylaws, including sidewalk requirements for new streets are recommended:

- Update minimum width of all sidewalks to 1.8 metres
- Update minimum width of enhanced sidewalks to 3.0 metres
- Require sidewalks on both sides of all local streets, including local streets with industrial and single family land uses.

ROAD TYPE	EXISTING		PROPOSED	
	SIDES REQUIRED	MINIMUM WIDTH (M)	SIDES REQUIRED	MINIMUM WIDTH (M)
Basic sidewalk	-	1.5	-	1.8
Enhanced sidewalk	-	2.5	-	3.0
Cul-de-sac	0	-	0	-
Urban collector with left turn	2	3.0	2	3.0
Urban collector undivided	2	3.0	2	3.0
Industrial local	1	1.5	2	1.8
Multi-family local	2	3.0	2	3.0
Single-family local	1	1.5	2	1.8
Single-family loaded local	1	1.5	2	1.8
Major arterial with left turn	2	3.0	2	3.0
Major arterial with median	2	3.0	2	3.0
Urban regional road (Fraser Hwy)	2	3.0	2	3.0
Urban arterial with left turn	2	3.0	2	3.0
Urban arterial with median	2	3.0	2	3.0
Urban arterial undivided	2	3.0	2	3.0

TABLE 1 // CURRENT AND RECOMMENDED SIDEWALK REQUIREMENTS



### INCREASE SIDEWALK COVERAGE ON EXISTING STREETS

Sidewalks form the backbone of a well-connected walking network for people of all ages and abilities. As noted previously, there are approximately 429 km of existing sidewalks throughout the City, however there are many streets with no sidewalks or sidewalks on only one side of the street. The City's current annual budget for construction of new sidewalks is \$500,000.

The City should work to strategically invest in completing the sidewalk network. New sidewalks on existing streets should be considered to ensure that sidewalks are provided on both sides of all arterial and collector streets and on bus routes. In addition, sidewalks should be provided on local streets where they are adjacent to schools, parks, community facilities and other important destinations or where they provide important connections to other sidewalks or to trails.

Approximately 100 km of new sidewalks have been identified for consideration in the long-term network. The recommended long-term sidewalk network is shown in **Figure 14**.

New sidewalks can be implemented in three primary ways:

- **City-initiated sidewalks**, which focus on filling in gaps on major streets and on bus routes, as well as connections to parks and schools
- **Developer-initiated sidewalks**, which will be required through redevelopment as per the City's Development Bylaw. These can be triggered in areas of redevelopment as well as through residential infill. For residential infill, the City should consider cash-in-lieu payments for sidewalks to avoid 'leap frog' sidewalk development.
- **Resident-initiated sidewalks**, where residents can request a sidewalk through the Local Improvement Process. Sidewalk requests would undergo an engineering evaluation by City staff and would then go through the City's Sidewalk Evaluation Matrix.

New sidewalks implemented through developer-initiated or resident-initiated process will be identified on a case-by-case basis in the future. High priority City-initiated sidewalks are identified in **Section 5**.

One source of capital for new sidewalks can come from development in the form of Community Amenity Contributions and density bonusing. Amenity contributions come from residential, commercial, and industrial developments throughout the City. Reinvesting this money in transportation will help to create a sustainable, safe, and convenient transportation network.

### ENHANCE TRAILS AND PATHWAYS

Abbotsford has approximately 274 km of off-street pathways and trails, including the popular Discovery Trail. These off-street trails and pathways make up an important part of the city's pedestrian network, attract residents and visitors alike, and are an important recreational activity in Abbotsford.

The City is also developing an updated Parks, Recreation, and Culture Master Plan, as part of Plan for 200K, that will guide City staff and Council on parks and open spaces.

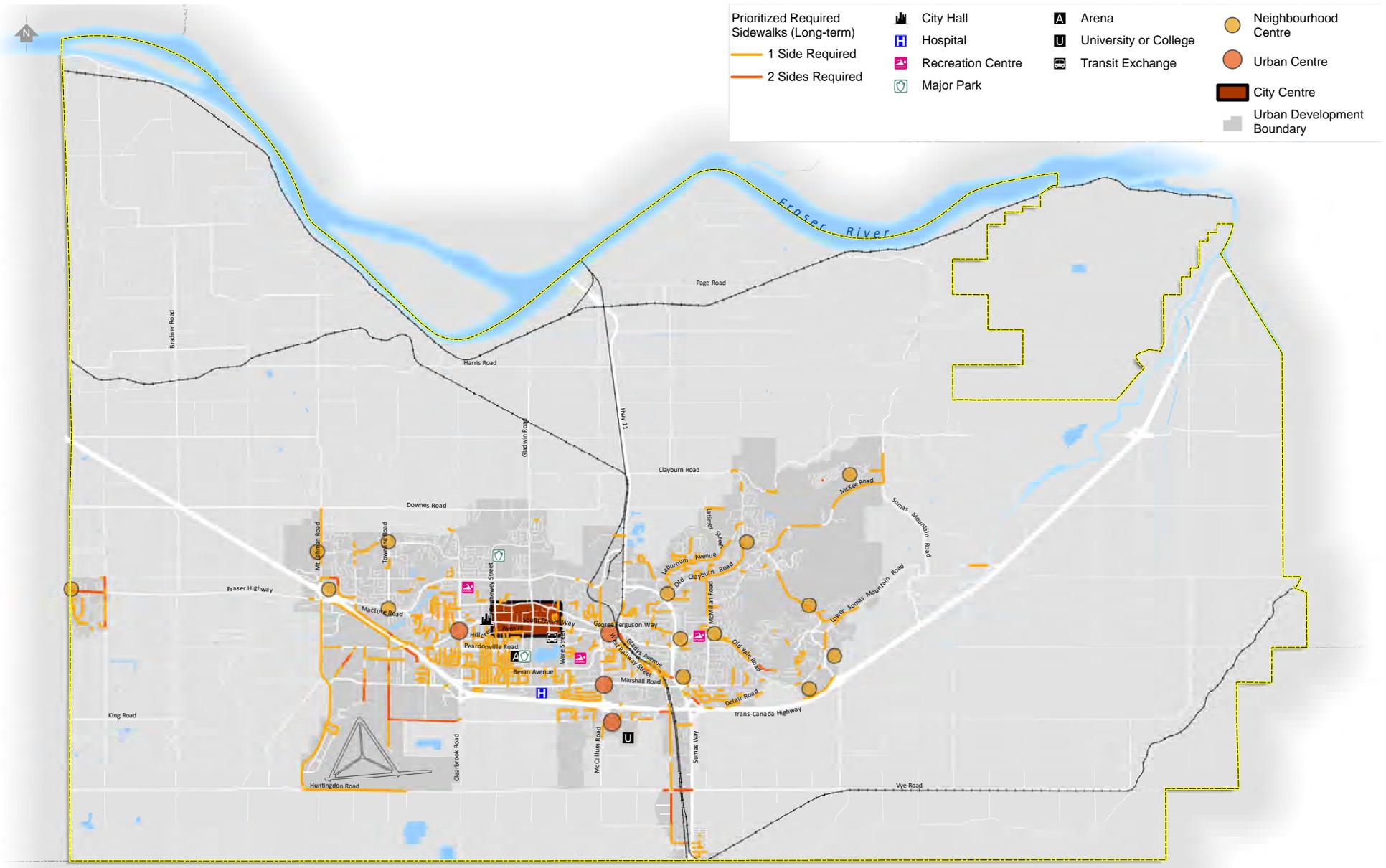


FIGURE 14 // LONG-TERM SIDEWALK NETWORK



**c. safety and accessibility improvements**

Designing city streets with pedestrian safety and accessibility in mind can make it easy and convenient to walk to everyday destinations. It is important that the pedestrian environment be accessible to people of all ages and abilities, including people with disabilities, seniors, and parents with children. The walking environment must, therefore, include accessibility features to accommodate the unique needs of these groups and to provide better pedestrian experience for everyone. Improving accessibility at intersections and crossings is important, as difficult crossings can act as barriers to walking. This can lengthen trips and create safety issues, particularly for seniors, children, and people with physical and cognitive disabilities.

There a range of potential pedestrian crossing treatments, ranging from unmarked crossings to marked crosswalks, signalized crossings, and grade separation.



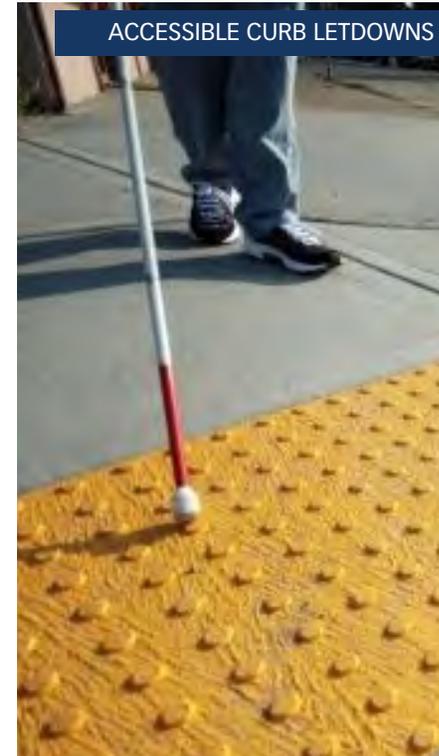
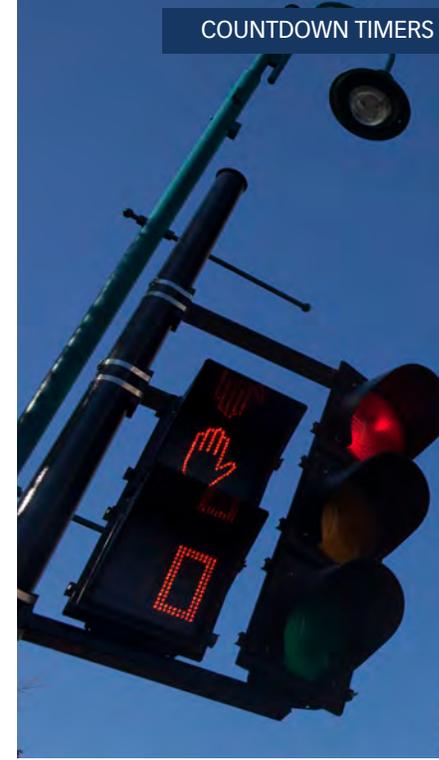
FIGURE 15 // PEDESTRIAN CROSSING TREATMENTS

Recommendations regarding intersections, crosswalks, accessibility treatments, and maintenance are described below.

**ENHANCING EXISTING INTERSECTIONS FOR PEDESTRIAN SAFETY AND ACCESSIBILITY**

There are a number of features that can be used at intersections to improve pedestrian safety and accessibility, including:

- **Pedestrian countdown timers:** Indicate to people walking how much time they have to cross the street at a signalized intersection. Countdown timers may be installed with or without pedestrian push button actuation.
- **Lighting:** Street lighting should be present at all intersections to ensure people walking are clearly visible at night





REDUCED CROSSING DISTANCE



- **Pedestrian activated pushbuttons:** Provide an opportunity for pedestrians to trigger a change to the traffic signal, allowing them to cross the street.
- **Marked crossings:** Enhance the visibility and safety of crossing pedestrians. High visibility crosswalk markings are more visible to approaching vehicles. The crosswalks, while meeting standards, can also be marked with decorative colour designs to create a visually appealing facility and make them stand out visually to motorists.
- **Reduced crossing distances:** Installing curb extensions, bus bulges, and median islands can help reduce pedestrian crossing distances while providing additional spaces for pedestrian amenities, such as landscaping and benches. Changing the curb radius by installing a curb extension can also reduce the speed of turning motor vehicles, making the intersection safer for pedestrians.
- **Audible Pedestrian Signals:** Used at signalized intersections to assist pedestrians with disabilities by communicating when to walk in non-visual formats, including audible tones, speech messages, or vibrating surfaces. Braille can also be found on pedestrian signals.
- **Accessible curb letdowns:** Provides access between the sidewalk and the street at intersections. Where possible, curb letdowns should be aligned with the crosswalk and should include directional guidance for those with visual impairments. Tactile surfaces can also be installed at curb letdowns to provide indicators to pedestrians who are visually impaired that they are approaching the intersection.
- **Pedestrian crossing time and clearance intervals:** Lengthening the pedestrian crossing time allows people more time to safely cross the street. This is especially important for anyone who may require more time to cross, including seniors, people using mobility aids, and people with physical impairments or disabilities.
- **Rectangular Rapid Flashing Beacons:** Rectangular Rapid Flashing Beacons (RRFBs) are a type of active warning beacon with amber lights that flash in an irregular pattern. They make the crosswalk more visible and can significantly improve motor vehicle driver yielding behaviour. RRFBs may be used at mid-block crossings and unsignalized intersections. They can be user activated using a push button or can be activated passively by detecting nearby users.

#### d. walking support programs

Education and social marketing initiatives are another way to help shift travel habits by highlighting the benefits of active transportation modes and providing information to make walking (and cycling) easier. Many programs that encourage and educate people on the benefits of walking are similar to those that also support cycling. Both modes provide great alternatives to short local trips. In many cases, coordination with non-profit organizations, community groups, and other agencies (e.g. ICBC, police, school districts) can help improve the effectiveness of these programs.

Support programs to encourage walking could include:

- **Safe Routes to school program:** Designed to promote walking and cycling among school-aged children to help to encourage safe walking and cycling at a young age. These can include a “Walking School Bus” program where walking routes are coordinated, and students are “picked up” by a group of classmates so they can walk to school together. The City should develop a formal Safe Routes to School Program and develop School Travel Plans for 1-2 schools per year.
- **Walking Clubs:** Forming clubs or groups can help get people active while encouraging social interaction. A common example of a type walking club is a Senior Walking Group, which provide many social and health benefits.
- **Neighbourhood walking maps:** Provide information about local walking routes for transportation and recreation. These maps can be linked with the bicycle network map which is recommended in the cycling section. Maps should be available in hard copy and digital formats. Educational tips can also be provided on the City’s website.
- **Pedestrian Wayfinding:** Better wayfinding information can help support pedestrian-friendly design for people using the City’s sidewalks, trails, and multi-use pathways. Kiosks for pedestrians can display key information such as transit routes, community facilities, and businesses. Maps that show “you are here” information, and a five-minute walking distance can also help give people a sense of scale. Wayfinding signage and kiosks are especially important at the intersection of major pedestrian routes, such as two different multi-use trails.







## 4.2 CYCLING

Cycling is a convenient, relatively low cost and a practical alternative for vehicle travel for short trips and is an important and growing mobility option for Abbotsford residents. The City of Abbotsford recognizes the benefits of cycling to individuals, the community, and the environment. Cycling is enjoyable, efficient, affordable, healthy, sociable, and a non-polluting form of transportation.

Cycling is already a popular recreational activity in Abbotsford, due to the City's natural beauty, great climate, and off-street pathway network, including the Discovery Trail. However, cycling only accounts for a relatively small portion (less than 1%) of all daily trips made by Abbotsford residents. Encouraging more residents and visitors to use their bicycles for short- to medium-distance trips will require developing a safe and comprehensive bicycle network in Abbotsford, with infrastructure and programs that help cycling become more time-competitive with other modes, particularly for short-to-moderate distances. Promoting cycling as an attractive and viable transportation choice encourages healthier lifestyles and reduces greenhouse gas emissions and pollution with a relatively small infrastructure investment.

There are 281 km of bicycle routes in Abbotsford's, including off-street pathways and on-street facilities such as bicycle lanes and paved shoulders. While the city has made progress in adding bicycle infrastructure in key areas, there are still several challenges for cycling in Abbotsford, including several gaps in the bicycle network, and uncomfortable bicycle facilities on many streets.

To achieve the City’s mode share target, the Transportation and Transit Master Plan focuses on creating a network of cycling infrastructure that is comfortable for people of all ages and abilities that connects key destinations throughout the City and places all residents within a short distance of a bicycle route. Supportive facilities, such as bicycle parking, other end-of-trip amenities, bicycle-transit integration, and education, awareness, and marketing campaigns, will also be required to make cycling a safe, comfortable, and convenient transportation choice for Abbotsford residents.

#### 4.2.1 Issues and Opportunities

There are a number of key issues and challenges for cycling in Abbotsford. Some of the top issues that have been identified include:



##### **Lack of Bike Routes**

The majority of existing routes reflect less comfortable cycling environments and are not considered All Ages and Abilities (AAA) facilities.



##### **Gaps in the Bike Network**

There is a lack of connectivity in the existing bicycle network. Barriers to cycling include the railway, highway, and busy streets. A mix of urban and rural settings presents challenge to creating a continuous network.



##### **Bike Routes don’t go where I need them to go**

No bicycle lanes go through the heart of the city’s main commercial area, the most common destination for all trips in Abbotsford.



##### **Intersection Safety**

Major intersections, especially those along South Fraser Way, can be dangerous for people cycling.



##### **Speed and noise of motor traffic**

Many people do not feel comfortable sharing the road with motor vehicles.

Opportunities that have been identified to improve cycling in Abbotsford include:



##### **Build bicycle lanes physically separated from traffic**

Encourages those who are “interested but concerned” to try cycling by increasing safety.



##### **Build more trails and pathways**

Provide safe and pleasant cycling routes and offers exposure to nature.



##### **Build more painted bike lanes**

Provide dedicated space on the road to people cycling and helps to expand the overall bicycle network.



##### **Build more bike routes on quiet streets**

Provides a safe and pleasant cycling experience.



##### **Ensure bike routes are maintained year round**

Enables people cycling to safely make use of dedicated cycling facilities rather than being forced to ride with traffic or on the sidewalk.



## 4.2.2 Strategies and Actions

The long-term cycling plan includes three related strategies that are designed to provide cycling facilities and programs to make cycling comfortable convenient and accessible for people of all ages and abilities.

### CYCLING STRATEGIES:

- a. Provide a **complete, comfortable, and connected bicycle network** that places all residents and businesses within close proximity of a bicycle route. In addition, work to design intersection treatments in a way that reduces conflicts with motorists and helps to improve the overall comfort and safety of a city's bicycle network.
- b. Provide **support facilities** and other bicycle infrastructure improvements to make cycling a more attractive and convenient transportation choice.
- c. Develop **support programs** and initiatives to educate, create awareness, and help bolster cycling activity, in addition to infrastructure improvements.

### GUIDING PRINCIPLES:

To make cycling a safe and comfortable transportation option for people of all ages and abilities, the Transportation and Transit Master Plan recommends developing a complete bicycle network connecting key destinations throughout the city. Principles that have guided the development of the bicycle network plan are described on the following page.

- **A Comfortable Network.** The long-term bicycle network focuses primarily on facilities that are safe and comfortable for people of all ages and abilities (AAA). The network will be designed to focus primarily on facilities that are either physically separated from motor vehicles on busy streets or pathways, or on creating shared spaces on quiet streets that have been designed to slow vehicle speeds and reduce motor volumes. These are complemented by painted bicycle lanes that serve commuter cyclists.
- **A Complete Network.** The long-term bicycle network plan establishes a city-wide 'minimum grid' network of bicycle routes. The plan ensures that bicycle routes are regularly spaced to ensure all residents have access to a bicycle route within a short cycling distance. A complete bicycle network in Abbotsford would ideally place all residents and businesses in the urban area within 400 metres (or four-to-five blocks) of a AAA bicycle facility.

- **A Connected Network.** It is critical that bicycle routes be direct and provide connections to key destinations to promote a convenient experience and to support bicycle travel times that are competitive with automobiles. Recognizing this, the bicycle network plan ensures connections to all key destinations in the City, including commercial areas in the City Centre, urban centres and neighbourhood centres, as well as schools, parks, and community facilities such as libraries and community centres.



FIGURE 16 // FACILITY TYPES

## a. complete, comfortable, and connected bicycle network

### BICYCLE NETWORK

The long-term bicycle network proposes three types of facilities. These facilities complement one another and form a city-wide network that serves people with varying degrees of comfort, confidence, and experience on a bicycle. This long-term network identifies the ultimate long-term network for the City. This network will be developed while considering the City's affordability, and may require transition treatments in the interim.

The recommended long-term bicycle network is shown in **Figure 17** and the long-term AAA bicycle network is shown in **Figure 18**.

- **Signature Corridor:** Establishing a unique Signature Corridor for active transportation is the focal point for the active transportation network and will form an east-west spring along South Fraser Way linking the City Centre with the Historic Downtown. The goal is to transform South Fraser Way into a beautiful, accessible, and convenient transportation corridor for all types of movement, including walking, cycling, and transit. This corridor will include high quality protected bicycle lanes that will be designed for increased comfort and aesthetic enjoyment. Creative and human-centred design will provide a unique transportation experience that will draw people into the City Centre and connect them to other parts of Abbotsford in safety and comfort.
- **All Ages and Abilities (AAA) Facilities** include bicycle facilities that are physically separated from motor vehicles, including off-street multi-use pathways (such as the Discovery Trail), off-street bicycle only pathways, and on-street protected bicycle lanes. AAA facilities also include local street bikeways, which are routes along local streets with low vehicle speeds and volumes in which people cycling share the same space with vehicles. They often include traffic calming measures to keep speeds low and improvements at major road crossings to help cyclists travel through intersections safely.
- **Supporting Facilities** include buffered bicycle lanes, bicycle lanes, and paved shoulders. These facilities are less comfortable to ride on because they do not include physical separation from motor vehicle traffic. Supporting bicycle facilities are typically less expensive and are useful for expanding and connecting the overall bicycle network.

Outside of the proposed long-term bicycle network, there are other important rural and regional cycling connections that should be established or strengthened. A few rural examples outside of Abbotsford include completing the Huntingdon Corridor, Lefeuvre Road from Huntingdon Road to the Fraser Highway, and Bradner Road from the Fraser Highway to 58th Avenue.

Additionally, Abbotsford should support the Experience the Fraser (ETF) project to enhance regional cycling connections to other communities in the Fraser Valley. The ETF project is a joint venture between the Fraser Valley Regional District and Metro Vancouver and sponsored by the Government of British Columbia. It is a unique vision to connect communities, parks, natural features, historic and cultural sites and experiences along the Lower Fraser River, with the Canyon to Coats Trail and the Recreational Blueway as the backbone of the project. The end goals is to connect Hope, BC to the Salish Sea by means of over 550 km of trail and via the Fraser River.

The City's current annual budget for bicycle infrastructure is \$300,000. The City also has an annual budget of \$200,000 up improve rural shoulders for cycling. Over the short-term (0 to 5 years), it is anticipated that annual funding will remain the same. The proposed bicycle route priorities are described in **Section 5**.





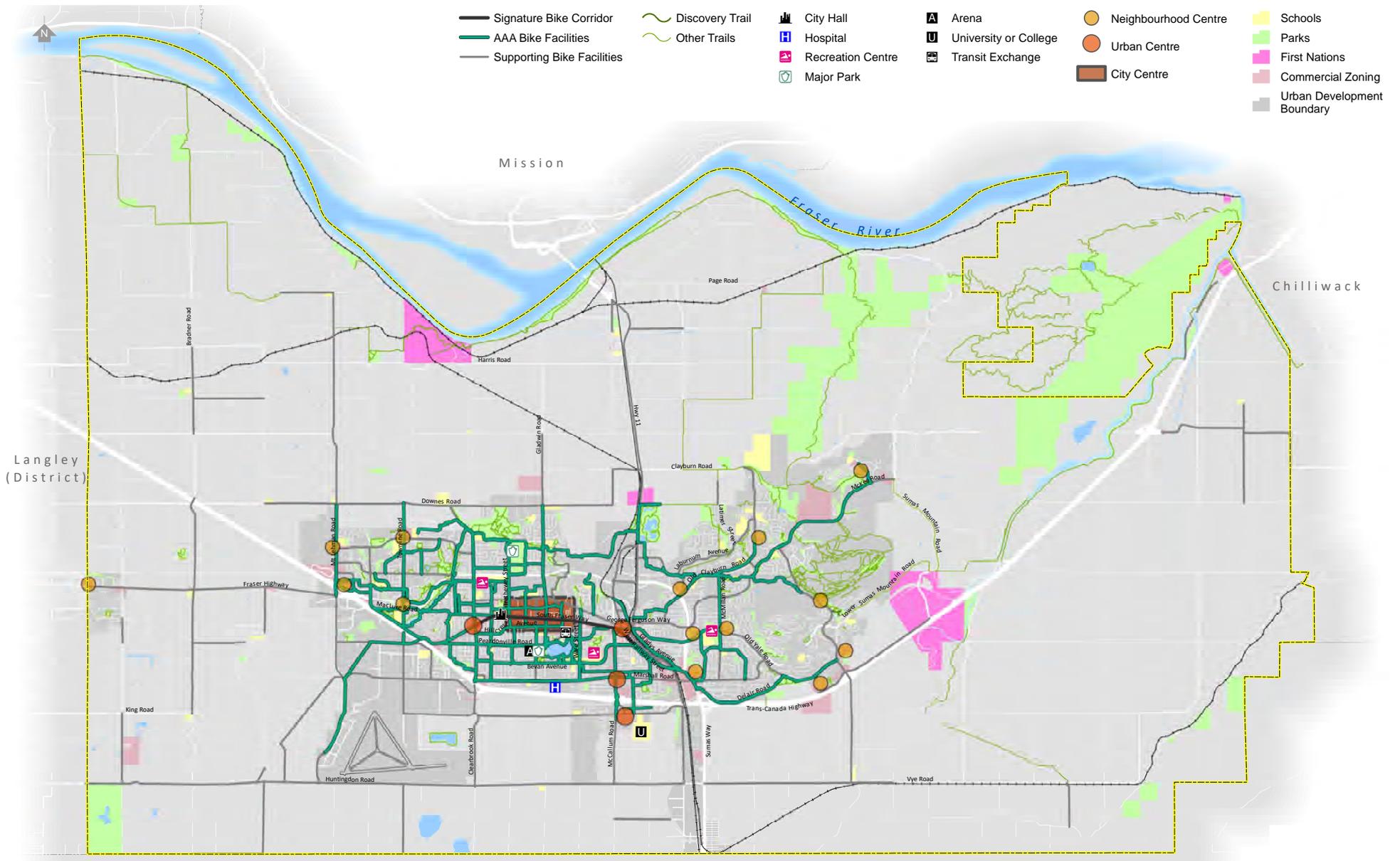


FIGURE 18 // LONG-TERM ALL AGES AND ABILITIES (AAA) BICYCLE NETWORK PLAN



## INTERSECTIONS

In addition to the bicycle network improvements described above, intersections need to be carefully addressed, as these are common locations for cycling collisions. Properly designed intersection treatments can minimize increase cyclist convenience and reduce conflicts with motorists and help to improve the overall comfort and safety of a city's bicycle network. Cycling safety improvements also serve to remove barriers and can help make cycling more attractive to people of all ages and abilities, and help to make cycling a more attractive mode. A brief description of some intersection treatments is provided below:

- **Coloured Conflict Zone Markings** can be used at conflict zones, including intersections and driveways, areas where vehicles are merging across a bicycle lane. Often denoted by the colour green, these markings increase the visibility of cyclists and highlight areas where potential conflict can occur.
- **Dashed Bicycle Lane Markings** through intersections provide direction for where cyclists should be positioned as they travel through an intersection. They also alert vehicle drivers that cyclists may be travelling in these lanes.
- **Bike Boxes** can be used at signalized intersections to provide cyclists with an opportunity to position themselves ahead of queued vehicles, and to proceed through the intersection when the signals turn green in advance of vehicles.
- **Enhanced Bicycle Signal Crossings** can include full signals or pedestrian and bicycle activated signals which can be activated by a cyclist through a range of technologies, such as bicycle loop detectors, bicycle pushbuttons, or video detection at traffic signals. Dedicated bicycle signal heads can also be considered at locations throughout the city where bicycle facilities intersect with signalized intersections.
- **Crossbikes**, pavement markings that indicate a crossing zone in which a cyclist does not need to dismount, may be combined with a pedestrian crosswalk or may be used to indicate a separate bicycle crossing.
- **Protected Intersections** utilize a combination of bicycle signal phases and design elements as well as space allocation to help protect people cycling from turning vehicles. The design of protected intersections include a combination of corner refuge islands, a forward stop bar for bicyclists, a setback bicycle and pedestrian crossing and protected bicycle phasing help protect bicycle users in intersections as they are riding along protected bikeways.





## b. support facilities

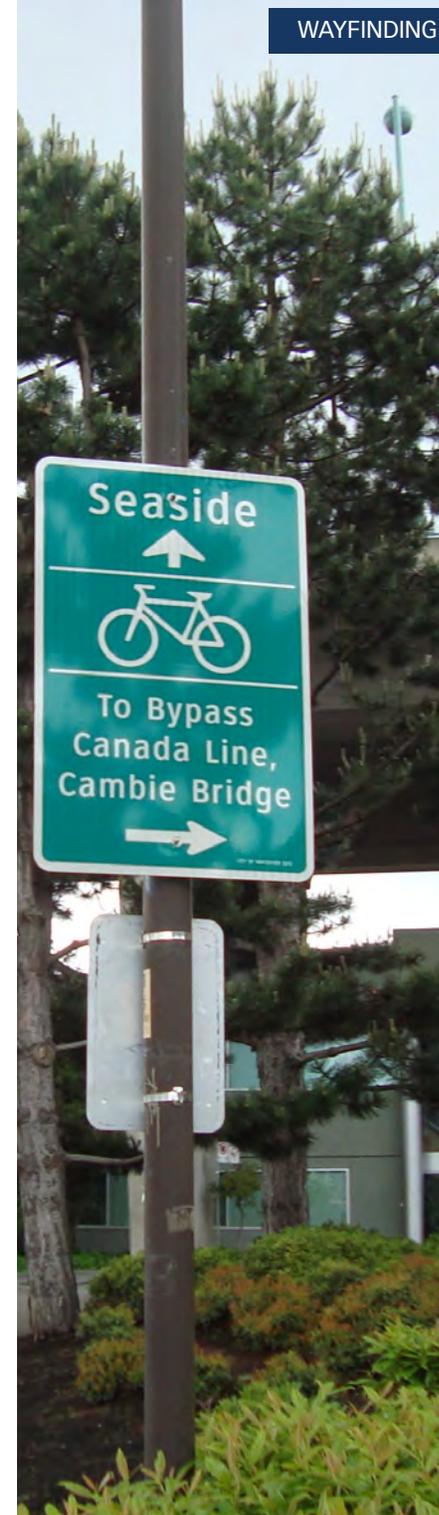
In addition to on-street and off-street network connections, there are other bicycle infrastructure improvements that can make cycling a more attractive and convenient transportation choice. Opportunities include enhanced wayfinding, bicycle parking supply and development requirements, end-of-trip facilities, bicycle-transit integration, and the creation of an online bicycle network map.

### WAYFINDING

While most residents know how to travel through the city by car, it may not be obvious which routes are the best by bicycle. For both experienced and inexperienced cyclists, signage and pavement markings can help riders to find the best routes that match their cycling abilities and comfort levels and to find new routes as they become more confident. Bicycle route signage and pavement markings can also highlight for drivers and other road users where they should expect to see greater concentrations of cyclists, which can help to educate drivers and cyclists and to improve cycling safety.

### BICYCLE PARKING

Providing safe, secure parking for bicycles is an important part of improving cycling conditions throughout Abbotsford. It is important to recognize that the fear of bicycle theft or vandalism is a significant deterrent to cycling. There are many different types of bicycle parking that can be tailored to specific situations. One of the key considerations in providing bicycle parking is to locate the 'right' bicycle parking facility in the 'right' place. The best type of bicycle parking facility for a specific location is driven by user needs (such as the purpose of the trip, length of the trip, and length of stay); and other factors (such as adjacent land uses, available space, and safety). Bicycle parking is typically categorized as either short-term or long-term; the differences between these two categories are summarized in **Table 2**.



CRITERIA	SHORT-TERM	LONG-TERM
Parking duration	Less than two hours	More than two hours
Fixture types	Simple bicycle racks (Post-and-Ring, Inverted U, Coathanger, Artistic racks)	Lockers, racks in secured area
Weather protection	Unsheltered (although providing a limited number of sheltered racks is desired)	Sheltered or enclosed
Security	Unsecured	Secured, active surveillance <i>Unsupervised:</i> "Individual-secure" such as bicycle lockers "Shared-secure" such as bicycle room or cage <i>Supervised:</i> Valet bicycle parking Paid area of transit station
Typical land uses	Commercial or retail, medical/healthcare, parks and recreation areas, community centres, schools	Major transit stops/stations, workplaces, multifamily housing, temporary events (valet parking)
Other considerations	Located in the public right-of-way or on private land. Should be located as close to destinations as possible in convenient locations that are highly visible to users	Oriented towards people who need to park for an entire day or longer. Some secure bicycle parking areas offer access to bicycle repair tools, pumps, showers, or other amenities.

TABLE 2 // TYPES OF BICYCLE PARKING

Recommendations to improve bicycle parking in Abbotsford include:

- The City should work with businesses to provide regularly spaced and sheltered **on-street bicycle parking** in the public right-of-way on all commercial streets and other commercial areas, and should also ensure that bicycle parking is provided at schools, community centres, and other important destinations.
- The City should work with businesses to develop an **on-street bicycle corral program** in areas of high pedestrian and cycling activity such as the Historic downtown near Essendene, to provide on-street bicycle parking as an alternative to bicycle racks on sidewalks.
- The City should consider revising its Zoning Bylaw to require a greater amount of long-term bicycle parking in all developments. For example, the current requirement of 0.25 spaces per dwelling unit means that many residents in multifamily buildings may be unable to safely park their bicycle, which can discourage bicycle ownership and usage.
- Bicycle parking should be addressed as part of **development site parking studies**.
- The City could also develop bicycle parking and development design guidelines to regulate the overall quality and design of bicycle parking facilities. The City could also require that large employers provide secure long-term bicycle parking facilities.
- Work with community groups to provide **temporary event parking**. Temporary parking typically consists of portable racks that meet the demand for an event. Racks are clustered together, providing a higher level of security than if people were to park the bicycles on their own. Event staff can monitor the area, providing people with peace of mind while they are away from their bicycle.



### END-OF-TRIP FACILITIES

End-of-trip facilities such as showers and clothing lockers at workplaces are critical components of making cycling more convenient for employees. Many bicycle commuters have long commutes or are required to wear professional clothing attire and need a place to change before coming into the office. The City should consider requirements for end of trip facilities as part of a Zoning Bylaw requirement.

### BICYCLE-TRANSIT INTEGRATION

Transit integration allows people cycling to make trips that are farther than they may be able to ride and allowing transit riders to reach destinations that are not adjacent to transit routes. Currently, bicycles are supported on all BC Transit buses through carrying racks on the front of each bus. The City can work with BC Transit to continue to ensure transit and cycling are seamlessly integrated by continuing to ensure that all BC Transit buses have bicycle racks and by providing bicycle parking at major transit stations.

### FACILITY MAINTENANCE

Once bicycle facilities are installed, it is important to ensure that bicycle infrastructure is well maintained on a regular basis, all year-round. Riding surfaces should be kept smooth and free of debris, while pavement markings and signage should be visible for all road users. This includes prioritizing road maintenance on bicycle routes and ensuring that durable pavement markings are used to identify bicycle routes. The City should consider developing and implementing maintenance and cleaning guidelines for bicycle routes, prioritizing routes with high ridership.

### CYCLING AMENITIES

The City should also identify opportunities to provide cycling amenities throughout the City. Cycling amenities include drinking fountains with bottle fill stations throughout City and bicycle maintenance stations placed at key locations throughout the City.

The City should also consider opportunities to provide a “bike traffic garden” education park with demonstration infrastructure, display boards/kios, bike racks, repair stand. Possible partners for this bike traffic garden could include the BC Cycling Coalition, ICBC, Fraser Health, Abbotsford Police Department Bike Squad, and Abbotsford School District

### c. cycling support programs

Education, awareness campaigns, events and other incentive and information programs can help bolster cycling activity in addition to infrastructure improvements. While it is understood that the installation of a well-connected network of AAA cycling facilities is likely to help promote cycling within the city, it has also been found that infrastructure alone is often not enough to see higher levels of ridership.

A number of support initiatives are recommended for Abbotsford, as described below. The City should partner with other organizations, agencies, non-profits, and other nearby communities to gain support for these programs and to help make them more effective.

#### CYCLING EDUCATION PROGRAMS

Abbotsford should support education programs in conjunction with partner agencies to provide cycling skills and information to residents. Examples of programs include Share the Road safety campaigns, Safer School Travel Programs, and bike skills courses for both adults and school-aged children. These programs help to instill confidence in new riders, support existing riders, and educate both people cycling and people driving about the rules of the road.

#### PROMOTIONAL EVENTS

Promotional events help to raise awareness and showcase the benefits of cycling as healthy sustainable transportation options. These events can be mixed in with other active transportation events. Bike to Work Week is a fantastic example of an enjoyable community event that simultaneously promotes cycling and provides cycling education.

#### BIKE MAPS

Bike maps enable users to identify designated cycling routes that match their cycling ability and comfort level. The City of Abbotsford should develop a bicycle map that identifies bicycle facility types and includes important local destinations and amenities. The map should be available in both hard copy and digital formats. The City should consider creating an interactive online map or encouraging innovation by releasing open source mapping data.





### 4.3 TRANSIT

A convenient and attractive public transit system is crucial to creating a vibrant and sustainable community. Public transit is the primary alternative to automobile travel in Abbotsford and across the region. Transit can often be the only option for people who do not drive, for travelling to jobs, school, shopping areas, and recreational centres. Public transit can also reduce overall environmental and community impacts of vehicle transportation. The Transportation and Transit Master Plan will help make this a reality by providing the City with an opportunity to examine the role of transit within a multi-modal framework to support and shape land use patterns and other City aspirations.

Abbotsford's existing transit system is operated by BC Transit and is made up of a variety of service types, including local bus service, regional express services, HandyDART, and Taxi-Saver. Public transit accounts for approximately 2.5% of commute trips and 3.2% of all daily trips in Abbotsford. Most transit trips made by Abbotsford residents to work or school, although a significant proportion of transit trips are also made for shopping, personal business, social purposes, or recreation. As mentioned in previous sections, the City of Abbotsford's goal is to increase the sustainable transportation mode share from 7% to 25%. Transit mode share is likely expected to make up a large portion of this increase, so improvements to the transit system are necessary to meet this goal.

A Transit Future Plan was developed for the Abbotsford-Mission region in 2013, and is planned to be updated in 2018.

### 4.3.1 issues and opportunities

There are a number of key issues and challenges for transit in Abbotsford which were discussed in greater detail in Discussion Paper #1. Some of the top issues that have been identified include:



#### Transit is not frequent enough

Infrequent transit means that there are fewer options available to people who would use it if they had the choice.



#### Transit does not go where I need to go

Limited transit route coverage limits users who need to go to un-serviced areas



#### Too many transfers

Transfers take time and add inconvenient stops to people's transit trips



#### Transit is unreliable

Transit does not always operate on schedule, which means people are unable to depend on it.



#### No benches or shelter

Few amenities like shelters or benches make waiting for transit uncomfortable.

Opportunities to improve transit in Abbotsford include:



#### Make transit routes more direct and fast

Improving routes will increase the attractiveness of transit travel



#### Make transit more frequent

Increasing transit frequency gives people more opportunities to get on a bus



#### Provide more transit service on weekends and evenings

Increased evening and weekend transit can help people who work different schedules or are travelling for social, entertainment or shopping.



#### Provide more amenities at transit stops

More benches and shelters can make waiting for transit more comfortable



#### Make it easier to walk to transit

Improving pedestrian connections to transit stops makes transit more accessible to more people

### 4.3.1 Strategies and Actions

The long-term transit plan includes three related strategies that are designed to make transit a more attractive, reliable, and convenient transportation choice:

#### TRANSIT STRATEGIES:

- a. **Enhance the transit network** by working towards the vision identified in the Abbotsford-Mission Transit Future Plan, including regional and inter-regional connections, direct rapid bus service, and local transit in all areas of the city.
- b. Implement **transit priority measures** that prioritizes transit over other vehicles to minimize delays and improve service delivery along transit corridors where congestion exists.
- c. **Improve the transit customer experience** by providing information and amenities that increase comfort, safety and satisfaction for existing and new customers.



### a. enhanced transit network

The Abbotsford-Mission Transit Future Plan was developed in 2013 and included a long-term vision for transit in the Fraser Valley that included both regional and local transit improvements, as shown in **Figure 19** and **20**. The vision includes the following transit services:

- **Regional and Inter-Regional Transit** including connections to Mission to the north, Chilliwack and beyond to the east, and Metro Vancouver to the west. This includes regional RapidBus service, which includes the recently launched Route 66 Fraser Valley Express (FVX) which operates between Chilliwack and the Carvolth Exchange in Langley.

- **Rapid Transit**, including the establishment of a high frequency, direct rapid bus service between the University of the Fraser Valley and Highstreet along South Fraser Way.
- **Frequent Transit**, including increasing transit service levels on many other corridors throughout the City.
- **Local Transit**, which would ensure all areas of the City continue to have transit service provided.

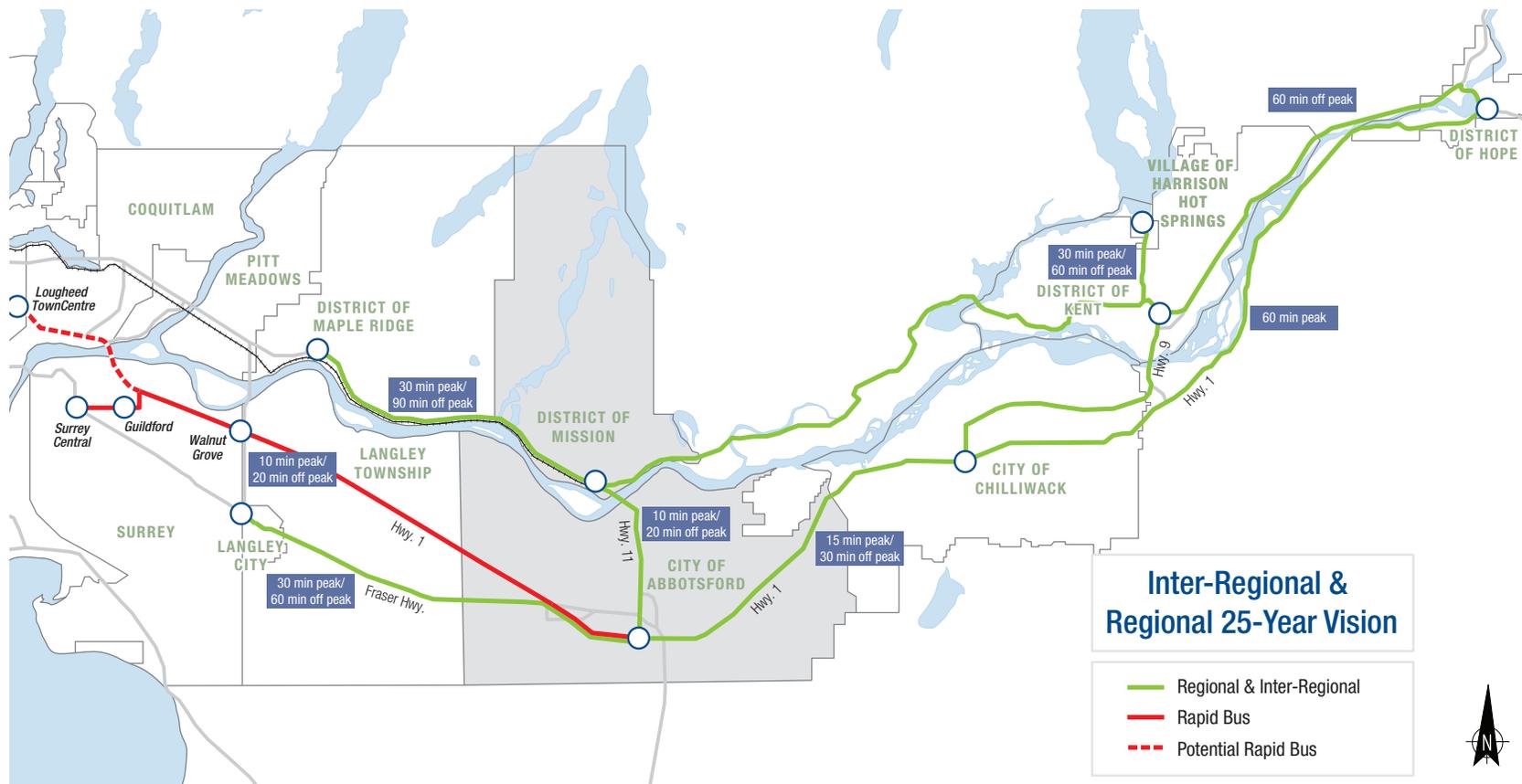


FIGURE 19 // LOCAL TRANSIT VISION

# Abbotsford Transit Network 2020 – 2025

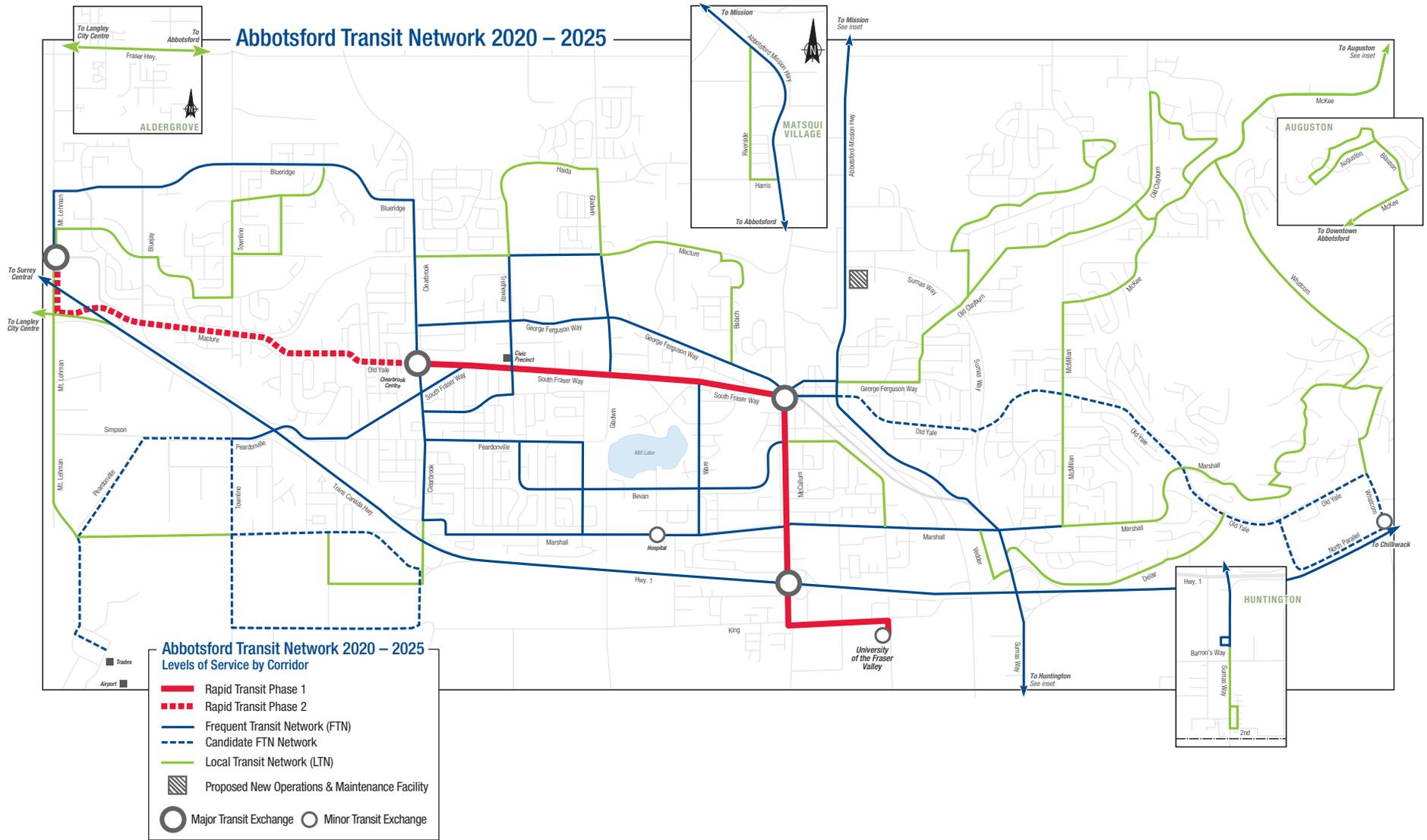


FIGURE 20 // ABBOTSFORD TRANSIT NETWORK 2020-2025



As noted above, there are several notable challenges with the City’s existing transit system.

- **System Area:** Abbotsford is the largest municipality in British Columbia by land area. The City’s current transit system is designed as a coverage based model that attempts to serve all areas rather than adjusting service levels to actual demand
- **Schedule Reliability:** Travel times for buses have increased significantly in recent years due to increases in population, road traffic and resultant congestion; increased in rail traffic; and increases in passenger volumes, which have increased by 23% since 2008 from approximately 1.93 million to 2.37 million passenger rides.

To begin to work towards the vision identified in the Transit Future Plan over the near-term, the Transit Future Plan includes three phases, as summarized in **Figure 21**.



FIGURE 21 // TRANSIT FUTURE PLAN | 25 YEAR VISION

### PHASE 1: ADDRESS CORE ISSUES

The City of Abbotsford has been constrained with limited ability to expand transit services since the existing Transit Operations and Maintenance Facility was at capacity. As a result, the City currently has a relatively low service levels compared to many other similar sized communities throughout British Columbia and elsewhere in Canada. With the opening of a new Transit Operations and Maintenance Facility in 2019, the City will be able to begin to address these service levels. Phase 1 involves the establishment of a core network of higher frequency transit routes to introduce the ultimate Rapid Transit alignment. This will include re-aligning the existing Routes 1, 2 and 3 to improve connectivity and begin to build the Rapid Transit alignment between the University of the Fraser Valley and Highstreet, as shown in **Figure 22**. This will allow the City to focus its existing resources towards serving areas with the highest densities of population and employment, which aligns with the OCP vision, as well as towards areas with the highest existing ridership. This re-alignment of Routes 1, 2 and 3 would not require any additional expansion resources, and would have minimal impacts to existing customers. This phase will set the foundation of the Rapid Transit corridor to allow for additional investment, optimization and restructuring. Infrastructure requirements for this phase would include a new Highstreet Exchange adjacent to the mall to accommodate increased services to the area.

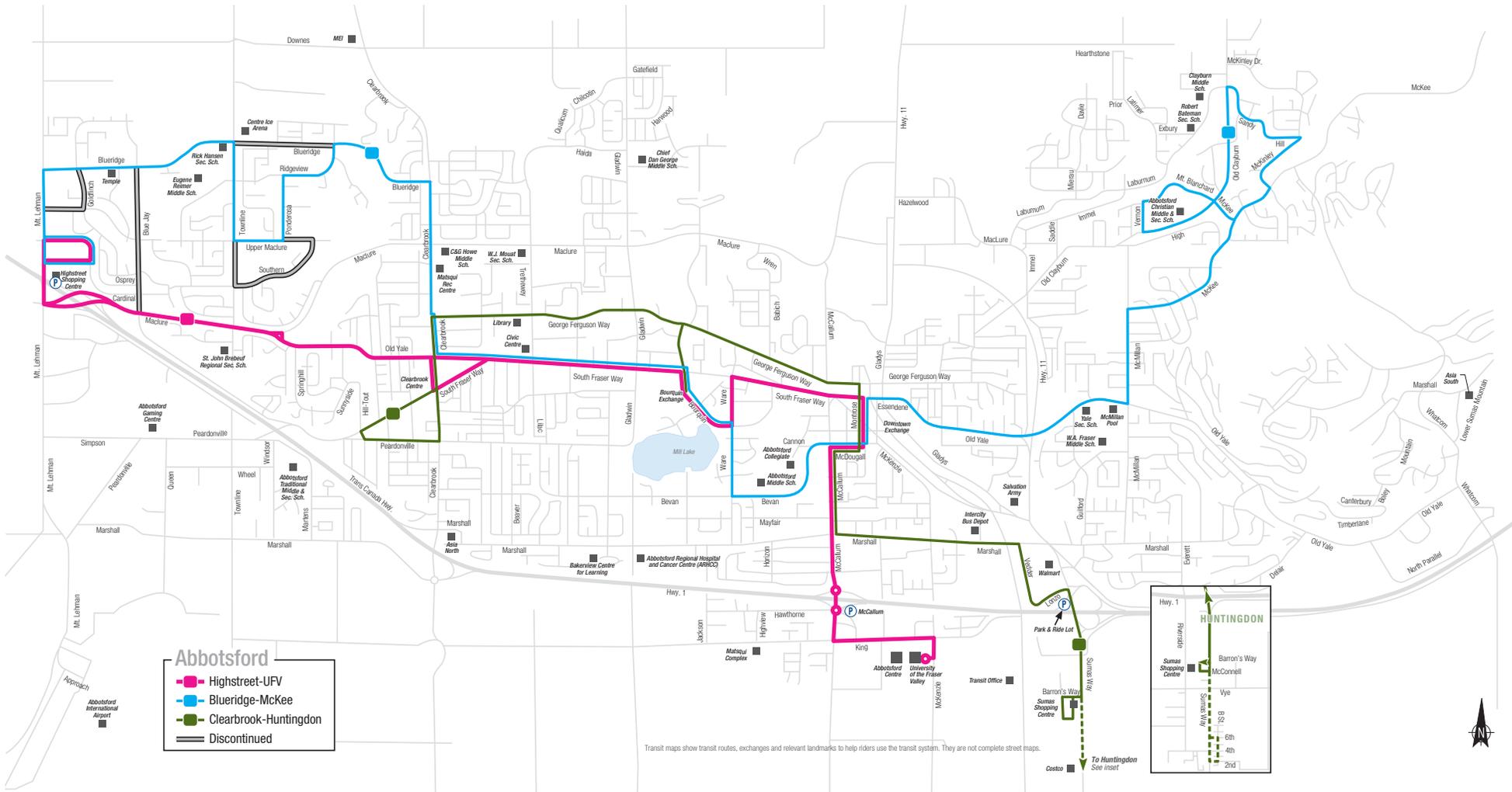


FIGURE 22 // PHASE 1 PROPOSED ROUTE CHANGES (2019)



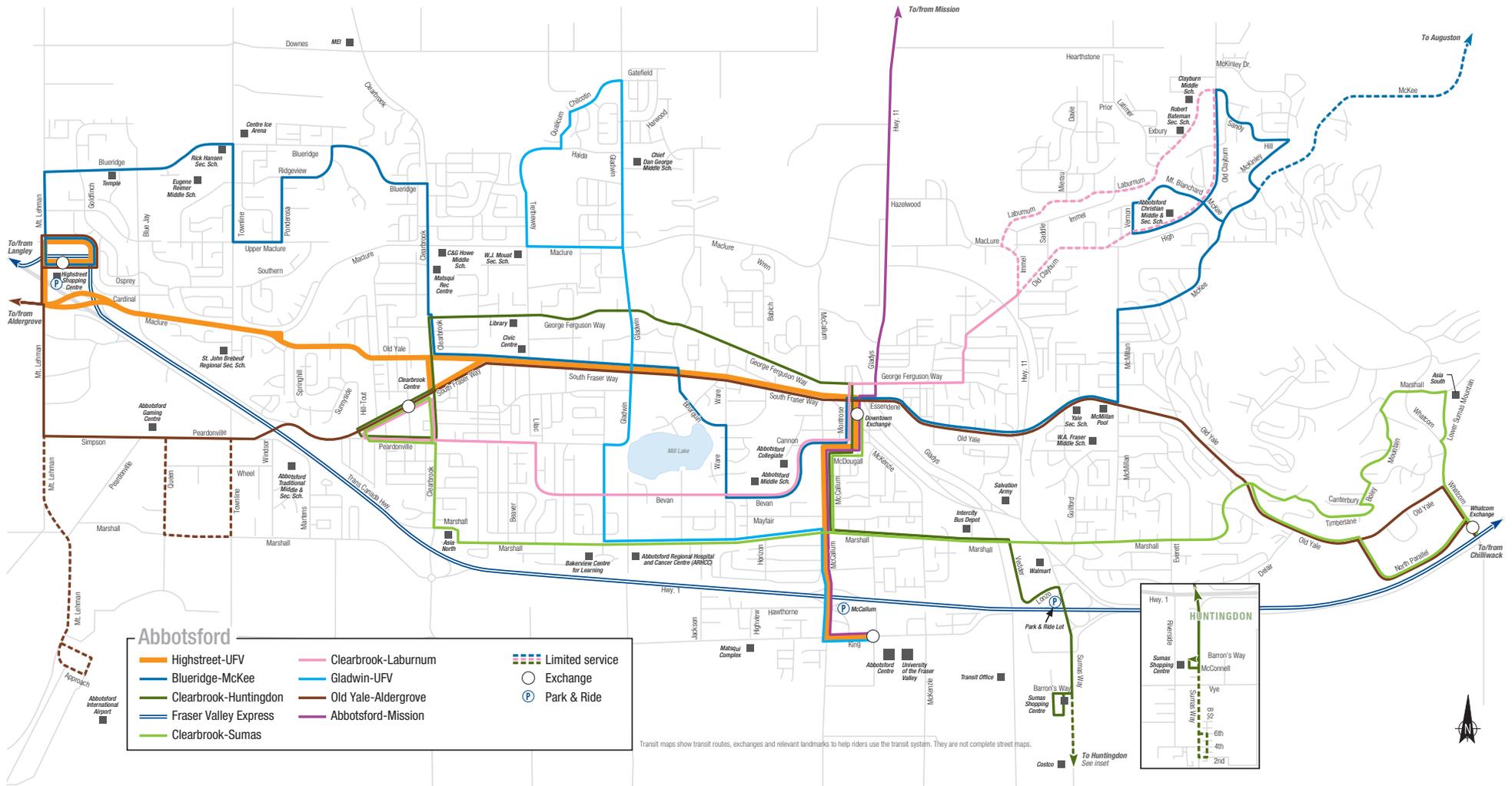


FIGURE 23 // PHASE 2 AND 3 PROPOSED ROUTE CHANGES (2020 – 2024)

### PHASE 2: INCREASE SERVICE LEVELS (2020)

Phase 2 would introduce an additional 10,000 services hours to the system in 2020. This would result in 4 new buses. Resources would be reinvested as follows:

- Improve schedule reliability to ensure buses stay on schedule and adapt to growing congestion and demand
- Improve transit frequencies on the Rapid Transit corridor to provide minimum 15 minute service
- Improve transit frequencies on high-performing east-west frequent transit network routes to provide minimum 20 minute service during peak periods and improved service on evenings and weekends

### PHASE 3: INCREASE SERVICE LEVELS (2021-2024)

In the final phase of the 5-year action plan, annual investments would be continued to made in the transit services to grow and attract new ridership. Key priorities in this phase would include:

- Improving frequencies on Rapid Transit to achieve a minimum 15 minute service, 15 hours a day, seven days per week
- Realign core routes along South Fraser Way in conjunction with enhancement of the Downtown Hub and the phase out of Bourquin Exchange
- Improving frequencies to achieve minimum 15 minute service during peak periods and 30 minute service during off-peak periods
- Undertaking a detailed East Abbotsford Study to accommodate growth in the area and optimize existing resources
- Expanding transit service to the Airport-Industrial area and connectivity with Highstreet Exchange
- Introducing new local transit network service to growing areas
- Improving connectivity with Regional and Interregional transit connectors such as the Fraser Valley Express, Aldergrove service and Mission Connector
- Improving Custom Transit (handyDART) availability and hours of operation
- Improving infrastructure:
  - Introduce improved transit infrastructure at Historic Downtown Exchange, McCallum and Clearbrook
  - Improve Rapid Transit corridor infrastructure including transit priority on South Fraser Way

- Continued route realignments to leverage new infrastructure and support the network

### MEDIUM-TERM (2025 - 2029)

Over the medium-term, additional improvements would include:

- Phase out the Bourquin Exchange
- Expand capacity at the UFV Hub
- Introduce new transit hub at Whatcom Interchange with associated service changes
- Increase connectivity at the Highstreet Hub
- Continued service reliability improvements, investments in the core transit network, and possible service expansions to new areas

### LONG TERM (2030 AND BEYOND)

- Improve service reliability and continue to invest in the Frequent Transit Network
- Identify and develop a more comprehensive plan for the Rapid Transit Corridor and the associated service integration
- Work towards dedicated rapid transit along South Fraser Way, including consideration for opportunities for LRT over the long-term.





## b. transit priority measures

Treatments that offer transit vehicles priority over other vehicles and minimize delays can improve transit service delivery and result in more transit use, reduced GHG emissions, and a more balanced and sustainable transportation system. Establishing transit priority measures in Abbotsford requires working with BC Transit to determine areas where they would be beneficial and developing a framework for transit priority planning.

Transit priority treatments are recommended along existing and proposed transit corridors where delays and congestion exist today or are anticipated to deteriorate in future. These treatments will be required along the Primary Transit Corridor to increase frequencies and implement a Rapid Bus Alignment. Transit priority treatments vary in effectiveness and ease of implementation.

Some examples are described on the following page in order of easiest/least effective to hardest/most effective.

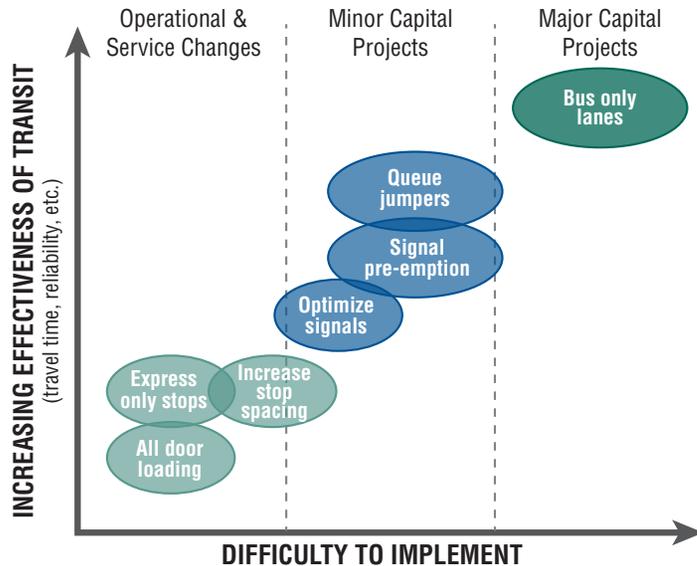


FIGURE 24 // EXAMPLE TRANSIT PRIORITY MEASURES

- **All Door Loading:** Allows users to board the bus from all doors simultaneously. Significantly speeds up the boarding process, resulting in less time wasted at each transit stop and shorter total run times.
- **Express Only Stops:** Provides dedicated space for express buses, reducing conflict with slower buses along the route.
- **Increase Stop Spacing:** Reduces overall travel time because the bus does not need to stop as frequently.
- **Optimize Signals:** Signal progressions that are set to realistic transit travel speeds, meaning that buses will typically get a green light at each intersection they encounter. Delays must be built into the system to accommodate for buses falling behind, as there may be traffic- or stop-related delays.
- **Signal Pre-emption:** Technology that triggers a signal change when a transit vehicle is arriving or has arrived at an intersection, limiting wait time and significantly speeding up the transit trip.
- **Queue Jumpers:** Portion of a travel lane at intersection dedicated to transit. They reduce delay significantly by allowing transit buses to jump to the front of the line when waiting at signalized intersections. They are often combined with a leading bus interval or transit signal priority to allow buses to enter traffic ahead of other vehicles.
- **Bus Only Lanes:** Traffic lanes that are reserved for transit vehicles only. Bus lanes allow for rapid transit to function as buses are not impeded by automobile traffic.

## c. improve the customer experience

Transit popularity is dependent on more than the transit services themselves, as passenger facilities provided at transit stations and bus stops contribute greatly to the transit experience. Amenities that make bus stops and transit exchanges more comfortable can also have a significant impact on passenger safety and satisfaction, in addition to attracting new customers.

### TRANSIT FACILITY AMENITIES

- **Benches and Shelters:** Only 5% of bus stops in Abbotsford currently have both shelters and benches, while 20% of stops have neither of these amenities. Shelters provide protection weather protection, making waits significantly more pleasant. Benches allow people to rest after their walk



to the transit stop and are especially important for seniors and people with physical disabilities.

- **Litter/Recycling Bins:** Help to keep the area clean.
- **Customer Information:** Information on fares, delays, access transit, and safety, with contact information for the transit agency.
- **Transit System Maps:** Assists with wayfinding. Be sure that stops indicate which buses stop at the route.
- **Real-time Updates:** Electronic displays at bus stops indicating the estimated arrival time for each bus. Real-time information can also be provided online and through smartphone apps, although not all transit users will have access to the internet when waiting at a transit stop.
- **Public Art:** Art can beautify and add interest to a transit ride and stop.



#### ENHANCED SAFETY AND ACCESSIBILITY

- All transit stops must be accessible. The street leading up to the stop should be well-maintained and should include the necessary pedestrian accessibility treatments to allow those with differing mobility to safely reach the transit stop. Treatments can include sidewalks, crosswalks near bus stops, and accessible curb letdowns (see Walking section).
- The City should consider providing public washrooms near major transit stops.
- Safety should be enhanced around transit stops. Safety measures can include providing adequate lighting and locating the stop in a location with good visibility of the surrounding street (see CEPTED regulations).
- Safety information should be provided on buses and at transit stops. Passenger emergency call systems should be installed on all transit vehicles.
- Adequate customer information and wayfinding must be provided to assist users in navigating the transit system. For example, people with cognitive difficulties, language barriers, and tourists may need extra assistance using transit.



#### REAL-TIME UPDATES







#### 4.4 STREETS

The street network is designed to support mobility by all travel modes including automobiles, trucks (goods movement), transit, walking and cycling. However, in most North American communities, motor vehicles are often given preferential treatment, sometimes at the expense of walking, cycling or even transit users. Whether this preferential treatment toward vehicles is merely a reflection of current travel demand patterns, it can certainly influence the shape of the community and the travel modes that people are most inclined to use in addition to the liveability of neighbourhoods and major activity nodes in the City.

Traditionally, Abbotsford's street network has been built to accommodate vehicles, and many major streets are unattractive and uncomfortable places for pedestrians, cyclists, and transit users. Improving and developing roads and sidewalks to support walking, biking, transit, and vehicle concurrently is required to shift to a more sustainable transportation system. Future improvements will require consideration of either building more road space, or managing existing road space to support all modes.

#### 4.4.1 Issues and opportunities



Preliminary challenges and opportunities for the street network in Abbotsford include:

- Limited east-west corridors across the City, which will place increasing pressures on the City's network within the Core;
- Addressing areas of localized congestion;
- Growth in the emerging neighbourhoods within the City and surrounding communities, which will place increasing pressures on the City's transportation network;
- Managing the impacts of through traffic on the safety and quality of life on neighbourhood streets;
- Integrating all modes into a comprehensive, multi-modal street network;
- Managing the mobility and safety impacts of at-grade rail crossings on key connections such as Vye Road and McConnell Road.

Opportunities to improve the street network include:

- Improve walking, cycling and transit to provide more transportation choices and reduce the need to drive;
- Intersection improvements to address congestion and safety;
- Widen existing corridors to address local congestion;
- Provide better connections to the provincial network.

#### 4.4.2 Strategies and Actions

The long-term plan includes five related strategies that are designed to improve safety and operations for all road users in Abbotsford.

##### ROAD NETWORK STRATEGIES:

- a. Major Street Network Improvements
- b. Safety and Operational Improvements
- c. Complete Streets Policy and Standards
- d. Updated Street Network Classification
- e. Traffic Calming
- f. Goods Movement

The structure of the improvements to the street network are based on the overarching suggested changes to the major street network and goods movement network.

##### a. major street network improvements

The major street network includes a network of major arterial and collector streets as well as provincial highways (Highway 1 and Highway 11) throughout the City. The major street network represents a critical component of the City's transportation system, as it supports not only automobile traffic, but walking, transit, cycling, and goods movement. This section identifies recommended improvements for major streets within the City. The improvements described in this section bring together many components of the Transportation and Transit Master Plan that have been described elsewhere in this report.

Key observations about transportation patterns in Abbotsford that have shaped the major street network improvement strategies include:

- **Local & regional growth.** Changes in travel demands will be influenced not only by growth and development within the City, but also significant growth that is also expected in the Fraser Valley and neighbouring municipalities including the Langleys and Mission. The City's population is expected to increase to 200,000 residents by 2041, along with rapid growth and development expected in neighbouring municipalities that use



Abbotsford's transportation network. This growth in the City and regionally will place increasing pressures on the City's transportation system.

- **Regional transportation improvement projects.** Forecast travel patterns and traffic conditions within Abbotsford are also influenced by changes to major regional transportation networks. Although some projects are in the planning stages, the key projects assumed within the long-range planning for Transportation and Transit Master Plan include the King Road Connector and the widening of Highway 1 from four to six lanes between Langley and east of the Whatcom Road interchange in Abbotsford.
- **Limited East-West Connectivity.** Within the urban areas of Abbotsford, continuous east-west connections to and from the core are limited. As travel demands across the City continues to grow, additional pressures will be placed on these connections, impacting local travel and overall connectivity and accessibility.
- **Some corridors in key areas are expected to be over capacity.** Planned local and regional growth continues to generate additional traffic within and through the City, placing pressures on the major street network over the next 25 years and beyond. As a result, corridors located in key areas of the City will operate over capacity and experience a significant increase in congestion. As illustrated in **Figure 25 to 27**, key areas of congestion today and in the future include the Fraser Highway/Mt. Lehman area, Sumas Mountain/Whatcom area, and the west of the City Centre. The improvements recommended based on this analysis are as follows:
  - Highway 1 Widening (Langley to east of Whatcom Road)
  - Marshall Road Connector (King Road to Mt. Lehman Road)
  - Mt. Lehman Road 4-Laning
  - McConnell Road Connection (Riverside Road to Highway 11)
- **Multi-modal street network improvements.** One of the key priorities of the OCP is to make walking, cycling and transit delightful. As such, the previous sections of this report have focused on ways to make each of these modes attractive and convenient choices. However, with increased in travel patterns, it is recognized that additional street network enhancements will be required. It is critical that all street network enhancements are designed to accommodate the needs of all users, and not just vehicles.

- **Integration with Neighbourhood Plans.** The City is currently developing several neighbourhood plans. The City Centre, Historic Downtown, and U District Neighbourhood Plans in particular are all focused on prioritizing sustainable forms of transportation and creating major destination streets, such as South Fraser Way and Essendene Avenue. To help achieve the multi-modal priorities of those corridors, broader network improvements are required in other areas of the City to accommodate east-west travel.

This section describes improvements to the City's major streets to address the issues the noted above. Major street improvement strategies have been broken into the following five themes:

- Committed Projects
- Leverage Partnerships
- Improve East-West Alternatives
- Complete Streets
- Other Network Improvements

Specific improvements within each of these themes are described in further detail below. It should be noted that this section is intended to identify the general needs and improvement opportunities within each of these themes.

All major network improvements are shown in **Figure 28** and summarized in **Appendix A**.

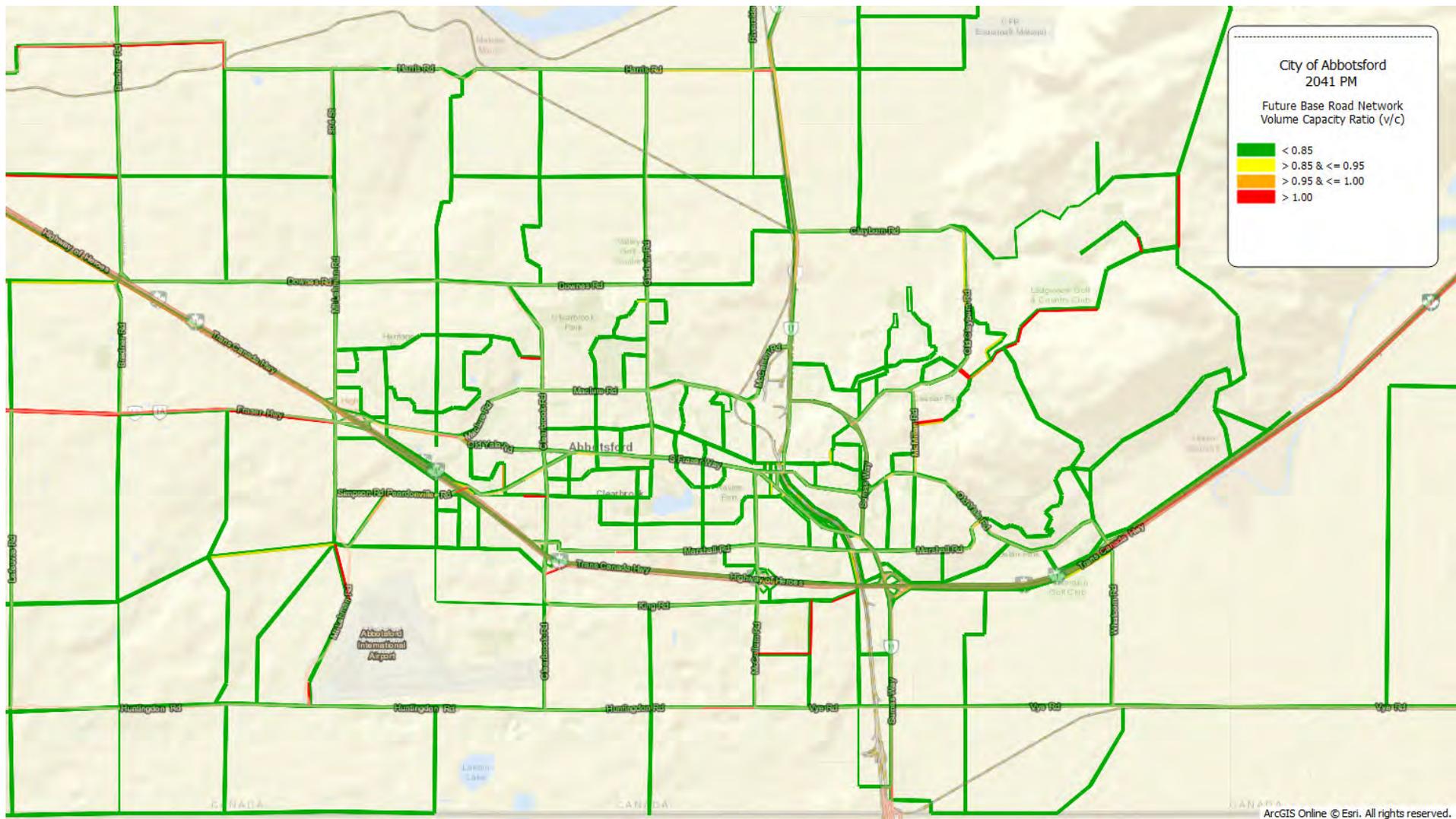


FIGURE 25 // PROJECTED FUTURE VOLUME-TO-CAPACITY RATIOS



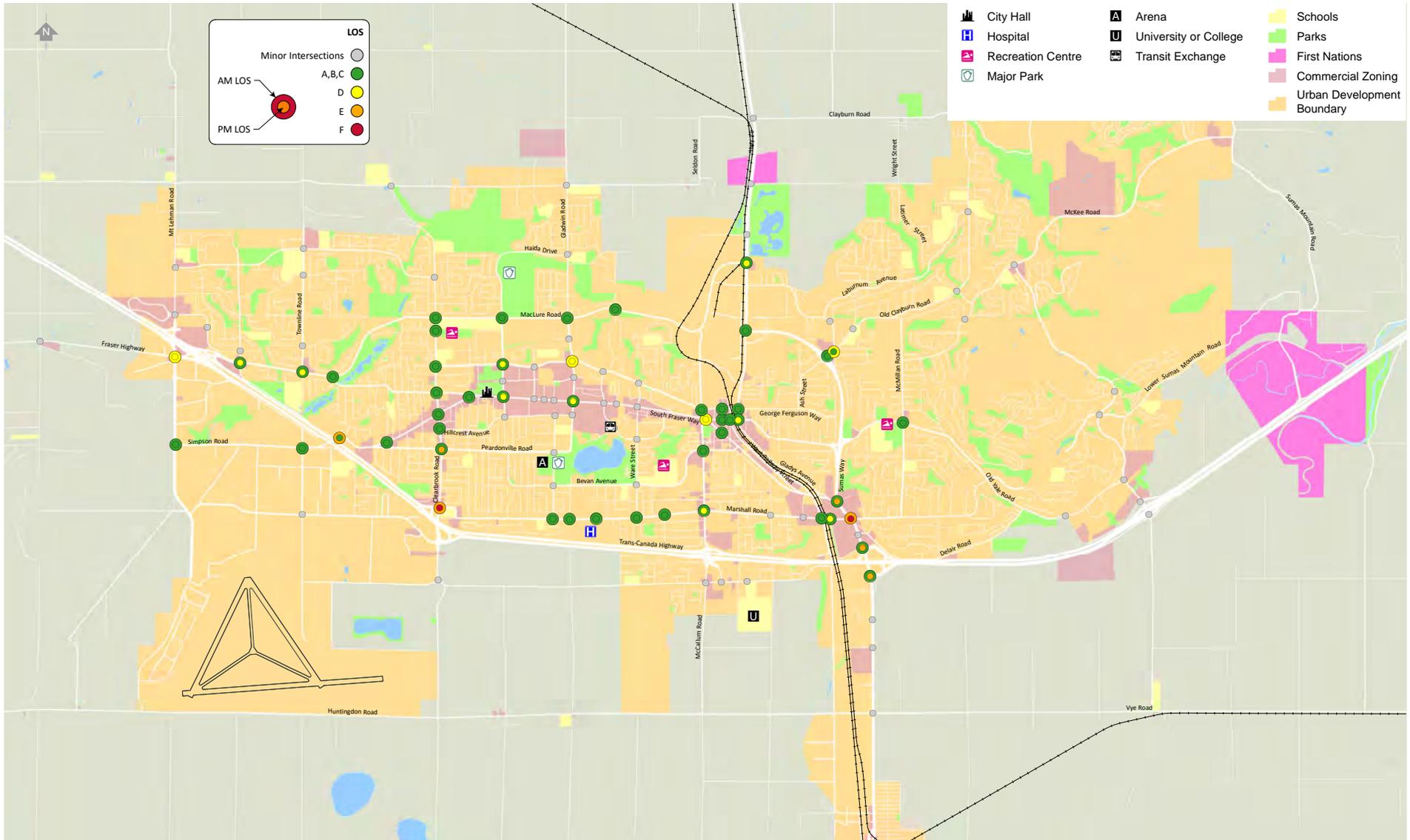


FIGURE 26 // EXISTING LEVEL OF SERVICE (LOS)

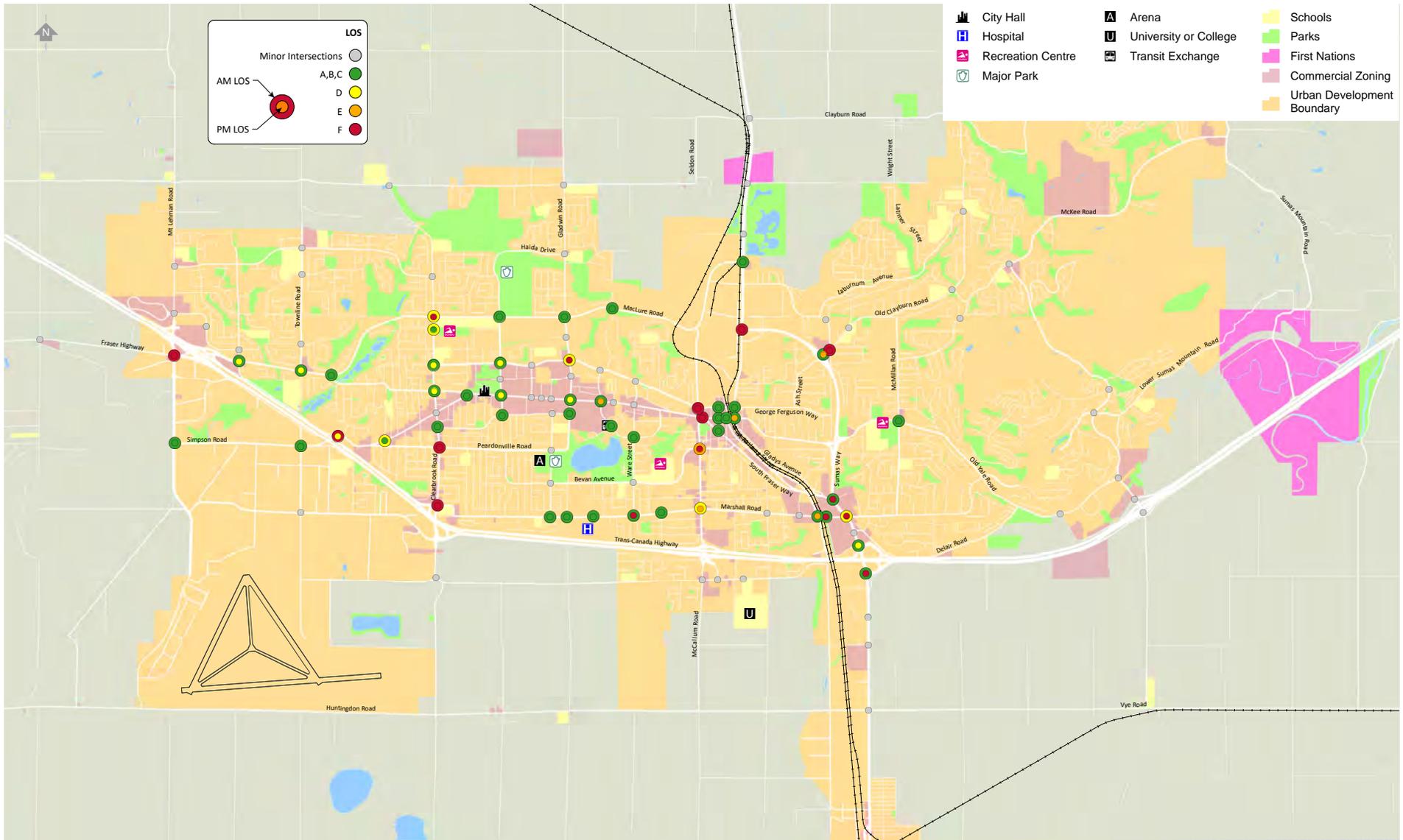


FIGURE 27 // FUTURE LEVEL OF SERVICE (LOS)





## COMMITTED PROJECTS

Committed projects include those major projects that will be, or will be, under construction during the plan horizon, but for which funding has already been committed. The following committed projects have been identified:

### 1A. MARSHALL ROAD CONNECTOR

The new Marshall Road Road Connector, also referred to King Road/Marshall Road Connector, provides an east-west link between Abbotsford, and the 16 Avenue corridor in Langley. The new connection is a 4-lane rural arterial facility with direct access to adjacent agricultural areas and private properties and connects King Road at Bradner Road and Marshall Road at Mt. Lehman Road.

Traffic analysis indicates that the Marshall Road Connector will accommodate approximately 1,400 vehicles per hour in the peak direction over the next 25 years. This new connection is expected to reduce travel times of regional and local traffic, help with the movement of people, goods and services across the region, and function as a direct link to the Abbotsford Airport.

### 1B. FRASER HIGHWAY (PHASE 1)

Fraser Highway provides a critical east-west link between Abbotsford and the Langleys and other areas to the west. Within Abbotsford, Fraser Highway is generally a two-lane rural facility with direct access to adjacent agricultural areas and private properties. At the eastern end, Fraser Highway becomes a six-lane cross section through the signalized intersection with Mt. Lehman Road.

During the peak hours, Fraser Highway accommodates approximately 1,100 to 1,200 vehicles per hour in the peak direction. As the theoretical capacity of this type of facility is generally approximately 800 to 1,000 vehicles per hour per lane, the corridor currently operates at or over capacity during peak conditions.

As regional travel continues to grow, increased pressures will be placed on Fraser Highway. Traffic analysis indicates that Fraser Highway will experience modest growth and see an increase of approximately 500 vehicles per hour in the peak direction over the next 25 years. Without improvements, Fraser Highway will continue to operate well over capacity in the future.

To address this issue, the widening of the Fraser Highway from two to four lanes has been identified by the City and reviewed as part of this Transportation and Transit Master Plan.

The City has approved Phase 1 of improvements to Fraser Highway, which includes left-turn lanes and centre lanes added in the short-term. Over the medium-term, Phase 2 improvements would include widening Fraser Highway to four lanes between Mt. Lehman Road and just west of Ross Road. Over the long-term, Phase 3 improvements would include widening the full extent of Fraser Highway.

### 1C. MT. LEHMAN ROAD

Mt. Lehman Road provides a critical link from Highway 1 south to the Abbotsford Airport. The City has partnered with the Provincial and Federal governments to widen Mt. Lehman Road to four lanes in order to improve safety and efficiency. The project includes widening the corridor from two- to four-lanes, providing dedicated southbound left turn lanes at the Mt. Lehman Road / Simpson Road intersection, converting Mt. Lehman Road and Marshall Road to a full movement signalized intersection, realignment of the Marshall Road extension, providing new pedestrian and cycling facilities, roadway lighting improvements, and drainage and environmental improvements.

### 1D. HIGHWAY 11 NEXUS LANE AND VYE ROAD OVERPASS

The Highway 11 (or Sumas Highway) corridor in Abbotsford serves as a north-south link that connects Mission to the Canada – United States border. South of Highway 1, Highway 11 provides direct access to the Sumas/Huntingdon Border Crossing. MoTI has identified plans to widen Highway 11 from four to six lanes between McConnell Road and Zero Avenue to accommodate cross-border growth and support future improvements at the Sumas/Huntingdon Border Crossing. The City has partnered with the Provincial and Federal governments to improve traffic congestion and safety concerns in this area by widening Highway 11 from four to six lanes for 1.3 kilometres between McConnell Road and Zero Avenue and the US Border.

In conjunction with the Highway 11 Nexus Lane, the City has also partnered with the Provincial and Federal governments to improve traffic congestion and safety concerns by constructing a two-lane overpass on Vye Road between Highway 11 and Riverside Road.



### **1E MARSHALL ROAD EXTENSION**

Within the Whatcom area, Marshall Road is an east-west route that links Highway 11 to Sumas Mountain Road, with a section of Marshall Road that is discontinuous between Timberlane Drive to west of Mountain Drive. East of McMillan Road, Marshall Road is generally a two-lane collector that provides connections to the residential area on either side of the corridor. The segment of Marshall Road between east of McMillan Road and Timberlane Drive carries approximately 500 to 600 vehicles per hour in the peak direction during the peak hour, while traffic volumes reduces to about 100 vehicles per hour in the peak direction on the segment east of Eagle Mountain Drive.

In support of future development in the area and to enhance east-west connectivity, there is a need to widen Marshall Road between McMillan Road and Old Yale Road from two to four lanes and to provide a new four-lane connection between Old Yale Road and Whatcom Road. Future base traffic projections indicate this corridor will experience lower growth over the next 25 years or so than other east-west routes in the area.

### **LEVERAGE PARTNERSHIPS**

This theme refers to highway improvements planned by the BC Ministry of Transportation and Infrastructure (MOTI) to provide additional capacity through widening highways and improving interchanges and overpasses to minimize regional travel on the City's local street network system.

#### **2A. HIGHWAY 1 WIDENING**

Highway 1 serves as a critical east-west link connecting Metro Vancouver and the Fraser Valley and beyond through the BC interior. Within Abbotsford, Highway 1 is currently a four-lane highway with grade-separated connections at Mt. Lehman Road, Clearbrook Road, McCallum Road and east of Whatcom Road. As part of the MoTI's plans to improve Highway 1 between Langley and Abbotsford, there are future plans to widen the highway from four to six lanes through Abbotsford to support regional and provincial growth.

To support the anticipated travel demands and address operational and safety issues, the City should continue working with MoTI to upgrade Highway 1 between Bradner Road and east of Whatcom Road from a four-lane to a six-lane facility and consider this as a candidate improvement to address overall network improvements.

#### **2B. PEARDONVILLE OVERPASS**

Peardonville Road currently has a two-lane crossing over Highway 1. As part of the proposed widening of Highway 1 project, it is recommended that the Peardonville Overpass be widened to four-lanes and that consideration be given to providing access to Highway 1 from the overpass.

#### **2C. SUMAS INTERCHANGE**

A significant number of safety and operational issues have been identified at the Sumas Way interchange along with adjacent intersections, and these issues are expected to increase with increased development. This interchange should be upgraded as part of the Highway widening.

#### **2D. WHATCOM INTERCHANGE**

The proposed widening of Highway 1 is recommended to extend to the Whatcom interchange. A number of safety and operational issues have been identified at this interchange. This interchange should be upgraded as part of the Highway 1 widening. This interchange improvement should also include a future park-and-ride / future transit exchange for the FVX Roue 66.

### IMPROVE EAST-WEST ALTERNATIVES

The City has a desire to transform key corridors such as South Fraser Way and Essendene Avenue into complete streets that are attractive, accessible, and convenient transportation corridors for all modes, including walking, cycling, and transit. With that in mind, it is important that through travel across the City, particularly in the east-west direction, is managed in such a way that overall demand on the City's network is balanced between parallel routes.

This theme includes major network improvements to enhance east-west city-wide mobility across Abbotsford. This includes new connections and corridor improvements aimed to improve circulation and connectivity within the City, as well as to the broader region along the City's primary east-west corridors within the Urban Development Boundary, namely: Maclure Road, George Ferguson Way / McKee Road, and Marshall Road. . By improving east-west City-wide mobility, other corridors within the City such as South Fraser Way and Essendene Avenue can take on different roles in the City's transportation network consistent with other neighbourhood plans (as described in the following theme for Complete Streets improvements).

#### 3A. MACLURE ROAD CONNECTOR

Maclure Road is the City's primary east-west arterial street in the north of the urban area, providing a connection from Highway 1 / Fraser to Highway 11 via McCallum Road. However, there is a gap between McCallum Road and Highway 11 with this bypass. The Maclure Road Connector is recommended to provide more direct east-west connections to and from the City's core area. The improvement would include a new four-lane urban arterial connecting Maclure Road to Sumas Highway with an overpass over Highway 11. This improvement would support Complete Streets developments in the Historic Downtown and the City Centre.

#### 3B. GEORGE FERGUSON WAY WIDENING

George Ferguson Way is the City's primary east-west arterial street in the central portion of the urban area, providing a connection from Clearbrook Road to Beck Road. For the most part, George Ferguson Way is a four-lane roadway; however, between Gladys Avenue and Beck Road, George Ferguson Way narrows to two lanes. With the proposed McKee Connector, there will be a need to upgrade George Ferguson Way to four lanes to extend the same level of vehicle capacity from the Historic Downtown and City Centre east to Sumas Mountain.

#### 3C. MCKEE ROAD EXTENSION

McKee Road serves as the primary east-west link in the Sumas Mountain area, but does not have a direction connection into the City's core area. A connection to the core area from McKee Road would be made through other parallel east-west routes that have direction connections such as Old Clayburn Road in the north and Old Yale Road in the south. As growth and development continues in the Sumas Mountain and Whatcom area, greater pressures will be placed on the connections to and from the core area. To address this issue, a new four-lane connector is recommended to link McKee Road to George Ferguson Way to provide a direct connection into the Historic Downtown and beyond to the City Centre. The connector would be grade-separated at Highway 11.

#### 3D. MCKEE ROAD CAPACITY IMPROVEMENTS

McKee Road is the primary east-west link in the Sumas Mountain area and connects to the City Core via parallel east-west routes. Between McMillan Road and Sumas Mountain Road, McKee Road is a two-lane road providing direct connections to the neighborhoods within Sumas Mountain. The intersections on both ends of the corridor are stop controlled.

McKee Road currently carries approximately 500 to 600 vehicles in the peak direction during the peak hour. As development continues in the area, travel demands are expected to increase, placing greater pressure on this important link. Future base projections indicate that McKee Road will experience modest to significant growth with new development and see an increase of more than 800 vph in the peak direction over the next 25 years. Without improvements, McKee Road will be expected to operate well over capacity over the long-term. To address these changes, the reallocation of road space on McKee Road from two to four lanes has been identified by the City and reviewed as part of this Transportation and Transit Master Plan. This recommendation to reallocated road space to provide four vehicle lanes is only anticipated to be required over the long-term along with future growth and development. Over the short- and medium-term horizons, McKee Road is expected to function as a two-lane roadway.



### **3E. MARSHALL ROAD RAIL OVERPASS**

Marshall Road is primary east-west arterial street in the south portion of the urban area, providing a connection from Clearbrook Road and Old Yale Road, and ultimately beyond to Whatcom Road. One of the crucial locations along Marshall Road is the at-grade railway crossing between Riverside Road and Vedder Way, which can lead to congestion when trains are crossing. To address this issue and ensure Marshall Road is an efficient corridor at all times of day, it is recommended that a rail overpass be constructed at this location.

### **3F. OLD YALE ROAD**

Within the Whatcom area, Old Yale Road serves as an east-west link connecting Highway 11 to Whatcom Road and provides direct connections to the residential area located on either side of the corridor. Old Yale Road is generally a four-lane arterial, with the exception of the segment between east of McMillan Road to Eagle Mountain Drive, where it becomes a two-lane roadway. Peak directional volumes on Old Yale Road are approximately 600 vph during the peak hour.

Future base traffic projections indicate this corridor will experience modest of growth and see an increase of approximately 300 vehicles per hour in the peak direction in the next 25 years. Based on these projections, the two-lane section of Old Yale Road will experience increased congestion and operate at the functional capacity (800 to 1,000 vehicles per hour) of a typical arterial.

As development continues in this area, it is important that the function of this roadway is maintained. The remaining two-lane section of Old Yale Road can be widened from two to four lanes to provide enhanced east-west connectivity in the Lower Sumas Mountain/Whatcom area as well as to complete its function as a four-lane connector.

### **COMPLETE STREETS**

Complete Streets is an approach to street design that considers the surrounding context, land use and all street users within the street design process. In a complete street, the design and operation of the entire road right-of-way is considered to support all road users, including pedestrians, bicyclists, motorists, commercial vehicles and transit riders. This balanced approach results in streets that function better for more street users in comparison to historic designs that emphasized motor vehicle operations. Complete streets can reduce collision rates (particularly for vulnerable road users such as pedestrians and cyclists), better support adjacent land uses (both businesses and residents), support shifts to sustainable transportation travel modes (walking, cycling and transit) and improve the quality of streets as positive public spaces within communities.

### **4A. SOUTH FRASER WAY**

South Fraser Way currently plays a critical function in the City's transportation network to provide mobility options most modes. South Fraser Way is a multi-modal street that currently carries approximately 28,000 vehicles per day. It is also an important transit route with six bus routes travelling along the corridor. Although an important corridor for mobility, it is also an increasingly important destination within the City, with an increased concentration of retail, shopping, and jobs.

The City Centre Neighbourhood Plan identifies the potential to re-think the role and function of South Fraser Way within the City's transportation network. By improving mobility on other east-west alternatives on parallel corridors such as Maclure Road, George Ferguson Way, and Marshall Road, South Fraser Way can play a different role within the City's multi-modal transportation network. This re-imagining of South Fraser Way would change its role from a street for mobility, to a place for people, where walking, cycling and transit are prioritized. To accommodate this refreshed vision, South Fraser Way is envisioned to have high quality facilities for people walking, cycling and using transit, while maintaining the existing four motor vehicle lanes and left turn lanes at intersections to accommodate vehicle traffic.

The vision for the future of South Fraser Way includes creating a high quality 'signature corridor' with quality and iconic placemaking to create a unique and recognizable destination within the City. Key features of the future of South Fraser Way would include:

- Establishing a frequent transit corridor over the short-term, and working towards rapid transit over the long-term;

- Providing high quality cycling facilities that are physically separated from motor vehicle traffic comfortable for people of all ages and abilities;
- Building wide sidewalks to allow people to stroll along the corridor;
- Providing seating areas throughout the corridor to provide opportunities to linger;
- Ensuring new developments have active street frontages that face South Fraser Way;
- Increasing vegetation and green space.

The specific cross-section elements for South Fraser Way will be further defined through the City Centre Neighbourhood Plan.

#### **4B. ESSENDENE AVENUE**

Essendene Avenue is located in the heart of Abbotsford’s Historic Downtown and is an important shopping destination within the City. The Historic Downtown Neighbourhood Plan envisions the evolution of Essendene Avenue to a more vibrant retail street that is a destination for shopping and gathering, and not primarily for through vehicle traffic. By improving mobility on other east-west alternatives on parallel corridors such as Maclure Road, George Ferguson Way, and Marshall Road, Essendene Avenue can play a different role within the City’s multi-modal transportation network. This re-imagining of Essendene Avenue would involve reducing the number of vehicles lanes to one lane in each direction along with left turn lanes, and increasing the amount of space for sidewalks, physically separated bicycle lanes that are comfortable for people of all ages and abilities, street trees, and increased opportunities for outdoor retail and patios.

The specific cross-section elements for Essendene Avenue will be further defined through the Historic Downtown Neighbourhood Plan. The timing of this improvement is dependent on the George Ferguson Way widening and/or Maclure Connector projects being constructed first.

#### **4C. McCALLUM ROAD**

McCallum Road provides an important north-south connection between the University of the Fraser Valley and the UDistrict neighbourhood to the Historic Downtown and beyond to the City Centre. As such, the corridor is linked by significant anchor points at both ends that are anticipated to generate significant numbers of trips. Currently, McCallum Road consists of four lanes for motor vehicle traffic with narrow sidewalks on both sides of the street. The long-term transit strategy envisions establishing a frequent transit corridor over the short-

term, and working towards rapid transit over the long-term. In addition, the corridor is anticipated to undergo significant redevelopment in the future. As such, there is an opportunity for the City to re-imagine the role of McCallum Road as an important multi-modal corridor with high quality walking, cycling and transit facilities.

#### **4D. CITY CENTRE NEW STREET CONNECTIONS**

Abbotsford’s City Centre is currently made up of large blocks that are broken up by major streets. This places significant pressure on the arterial streets within the neighbourhood. The City Centre Neighbourhood Plan includes a concept to provide new multi-modal street connections within the City Centre to break up these large ‘super-blocks’ to provide a fine-grained street network. This fine-grained street network will help to reduce pressures on arterial streets by providing more options for vehicles to access local destinations, as well as improved connections for all road users. This fine-grained street network will also significantly help to improve the walkability and vibrancy of the City Centre, and would serve as the foundation for increasing connectivity and creating vibrant, human-scale environments. Adding these new streets would be achieved through dedication as redevelopment occurs.

#### **OTHER NETWORK IMPROVEMENTS**

In addition to the major street network improvements described above, the Transportation and Transit Master Plan identifies a number of other street network improvements that will be required to address growth and development. There are a range of types of projects that have been identified for other street network improvements. These other network improvements generally include the following types of measures:

- Additional road widenings
- New roads
- Rail crossing improvements
- New traffic signals
- Intersection improvements



## b. Safety and Operational Improvements

There are a number of locations throughout Abbotsford that have been identified to have safety issues and/or existing or projected operational issues. The City should undertake spot improvements to improve intersection safety and operations at these locations. Spot improvements are typically small scale targeted projects that address specific safety and operational issues at intersections. At most locations, improvements involve intersection modifications to improve traffic operations, such as adding in turn lanes, installing new traffic signals, installing pedestrian and bicycle signals, crosswalk upgrades, and/or installing new crosswalks throughout the City.

Based on an analysis of collision records at intersections throughout the City as well as an analysis of existing and projected Level of Service at major intersections throughout the City, a number of intersections have been identified as potential candidates for spot safety improvements.

These small improvements can mitigate existing safety issues and extend the life of infrastructure, helping to delay larger, more expensive improvements. Intersections recommended for safety performance reviews are shown in **Table 4**.

Road safety is supported by ICBC through their Road Safety Improvement Program and could be a source of funding for spot safety improvements in Nanaimo. Over the last 5 years, ICBC has contributed over \$450,000 to the City for road safety improvements. It is recommended that the City continue to invest in road safety through its partnership with ICBC.

In addition to these minor intersection improvements, the City should conduct a study to improve the intersection of South Fraser Way and Essendene Avenue, and McCallum Road. This is one of the most complex intersections in the City with significant safety and operational issues, and would benefit from improvements for all users.

Every five years, the City should conduct a study to update its projected traffic signal requirements with updated signal warrant analyses.

### LOCALIZED INTERSECTION SAFETY IMPROVEMENTS

There are a number of intersections throughout Abbotsford that have safety or operational issues. At most locations, improvements involve intersection modifications to improve traffic operations. A number of intersection improvements have been identified, including new traffic signals, pedestrian and bicycle signals, crosswalk upgrades, and new crosswalks throughout the City.

INTERSECTION	2017		2041		TOP 10 COLLISION LOCATION
	AM	PM	AM	PM	
<b>SHORT-TERM: EXISTING OPERATIONAL AND/OR HIGH SAFETY ISSUES</b>					
Clearbrook Road & Peardonville Road	C	E	F	F	
*Clearbrook Road & Marshall Road	E	F	F	F	
*Sumas Way & Highway 1	C	E	C	F	✓
Bourquin Crescent & South Fraser Way	B	E	C	D	
Sumas Way & South Fraser Way	C	E	C	F	
Gladwin Road & South Fraser Way	C	D	C	D	✓
*Mt. Lehman Road & Highway 1					✓
*Sumas Way & Marshall Road	D	F	D	F	✓
<b>MEDIUM-TERM: SAFETY ISSUE</b>					
Tretheway Street & South Fraser Way	C	D	C	D	✓
Clearbrook Road & South Fraser Way					✓
*Mt. Lehman Road & Fraser Highway	D	D	F	F	✓
*Highway 1 & Whatcom Road					✓
Gladwin Road & George Ferguson Way	D	D	D	F	✓
McCallum Road & Marshall Road	C	D	D	E	✓
<b>LONG-TERM: FUTURE OPERATIONAL ISSUE</b>					
Clearbrook Road & MacLure Road	C	C	D	F	
Gladwin Road & MacLure Road	C	C	E	F	
Gladwin Road & George Ferguson Way	D	D	D	F	
Marshall Road & Ware Street	B	C	B	F	
Immel Street & Old Clayburn Road	D	D	F	F	
McCallum Road/Essendene Avenue & South Fraser Way	D	D	D	E	
McCallum Road & McDougall Avenue	B	B	E	F	
Riverside Road & Marshall Road	B	C	C	E	
Gladys Avenue & Essendene Avenue	B	D	B	E	
Vedder Way & Marshall Road	B	D	B	F	
*Highway 1 Ramp & Old Clayburn Road	A	C	B	E	
*Gladys Avenue/Abbotsford Mission Highway & Sumas Way	B	B	F	F	

TABLE 3 // INTERSECTION SAFETY PERFORMANCE REVIEW

\* MOTI Intersection

### c. Complete Streets Policy and Standards

Streets are the largest public space in the City, and directly influence how we travel. In the past, most streets in Abbotsford have been designed mainly to accommodate vehicle travel; however, streets should be comfortable places for all road users – places that feel safe, interesting and convenient to travel, whether by car, foot, bicycle or bus. The concept of Complete Streets encompasses many of these ideas and seeks to make streets comfortable for users of all ages, abilities and transportation modes. The City should develop a complete streets policy and update its street design standards to include complete street principles into future design guidelines and standards and to integrate complete streets principles into all new street construction. This will ensure that future infrastructure will help the shift towards a more sustainable transportation system.

### d. Updated Street Network Classification

The City should conduct a study to review its street classifications. This will ensure that all streets are functioning as intended. This could also include identifying new road classifications to reflect a focus on complete streets. In particular, there are a number of streets in the City that have been classified as local streets, but which have been designed to a collector standard and carry more vehicles than a typical local road would. Examples of such streets include:

- Upper MacLure Road
- Ridgeview Drive
- Trafalgar Street
- McKenzie Road
- Babich Street
- Eagle Mountain Drive
- Goodbrand Drive
- Regal Parkway
- Sandpiper Drive
- Saddle Street

This Road Network Classification study should examine and update the role and function of all streets within the City.

In addition, upon adoption of the Transportation and Transit Master Plan, the City should conduct a study to identify the right-of-way requirements for all collector and arterial streets to achieve the vision and strategies identified in this plan. This includes identifying road widths and creating road cross sections for collector and arterial streets. The study will provide guidance to the City and to developers about the required right-of-way widths required to achieve the directions of the plan.





## e. Traffic Calming

Many Abbotsford residents are concerned about speeding, traffic volumes, and short-cutting traffic through their neighbourhoods – concerns which can be addressed through the development of traffic calming. Though the City has traffic calming guidelines in place and allocates \$100,000 per year for traffic calming improvements that are requested by the public, an updated and more flexible tool is recommended for the City to work together with residents to develop traffic calming improvements where warranted. The City should develop updated neighbourhood traffic calming guidelines and a defined process for developing neighbourhood traffic calming. These updated guidelines can provide direction to proactively identify and prioritize neighbourhoods for traffic calming plans and solutions. Updated neighbourhood traffic calming guidelines should:

- **Incorporate a proactive approach to identify traffic calming considerations.** Neighbourhood traffic calming may either be initiated by residents, businesses or staff through the identification of issues. The process should include mechanisms for targeted and area-wide traffic calming plans (i.e. with multiple streets or a whole neighbourhood).
- **Identify and prioritize traffic calming improvements.** To assist staff in identifying areas where traffic calming is needed, and to prioritize existing requests, a number of criteria should be used to evaluate different locations, including reported collisions, vehicle speeds, traffic volumes, proximity to schools/parks and pedestrian and cycling activity.
- **Consider several types of treatments** appropriate for local and neighbourhood streets, and provide information to residents on the range of treatments.
- **Include traffic calming in new neighbourhood designs.** The inclusion of traffic calming elements within new subdivision road design, and the development of street networks that support efficient movement of vehicles, pedestrians, and cyclists can be a cost-effective way to prevent future traffic-related issues before they develop.
- **Provide accessible information** to the public that describes the process for neighbourhood traffic calming, how they can get involved, how projects are prioritized and the range and impact of available traffic calming treatments.

## f. Goods Movement

Major Truck Routes Limit heavy vehicle movement to designated Provincial and Municipal Truck Routes. An effective truck route network is an essential component of the Transportation and Transit Master Plan as the movement of goods throughout the city is critical for the economic health of the City. Currently, the City has a defined truck route network that traverses the city and minimizes the impacts of goods movement.

The effective movement of goods in Abbotsford helps to reduce truck travel times, reduces congestion and operational issues related to high truck volumes, increases safety at intersections not designed to accommodate wide turning movements and helps preserve alternate routes from deterioration that can be caused by heavy truck loadings. The existing truck network has also been implemented with consideration of the existing truck routes in Langley and Chilliwack to ensure the entire goods movement system is efficient and avoids circuitous routes throughout the region.

**Figure 29** illustrated proposed changes to the City's truck network. The proposed changes include:

- Removing a portion of King Road from the designated truck network between McCallum Road and Riverside Drive in conjunction with the U District Neighbourhood Plan
- Adding a new segment to the designated truck network on McCallum Road between King Road and Huntingdon Road
- Adding a new segment to the designated truck network on Whatcom Road between Highway 1 and Vye Road



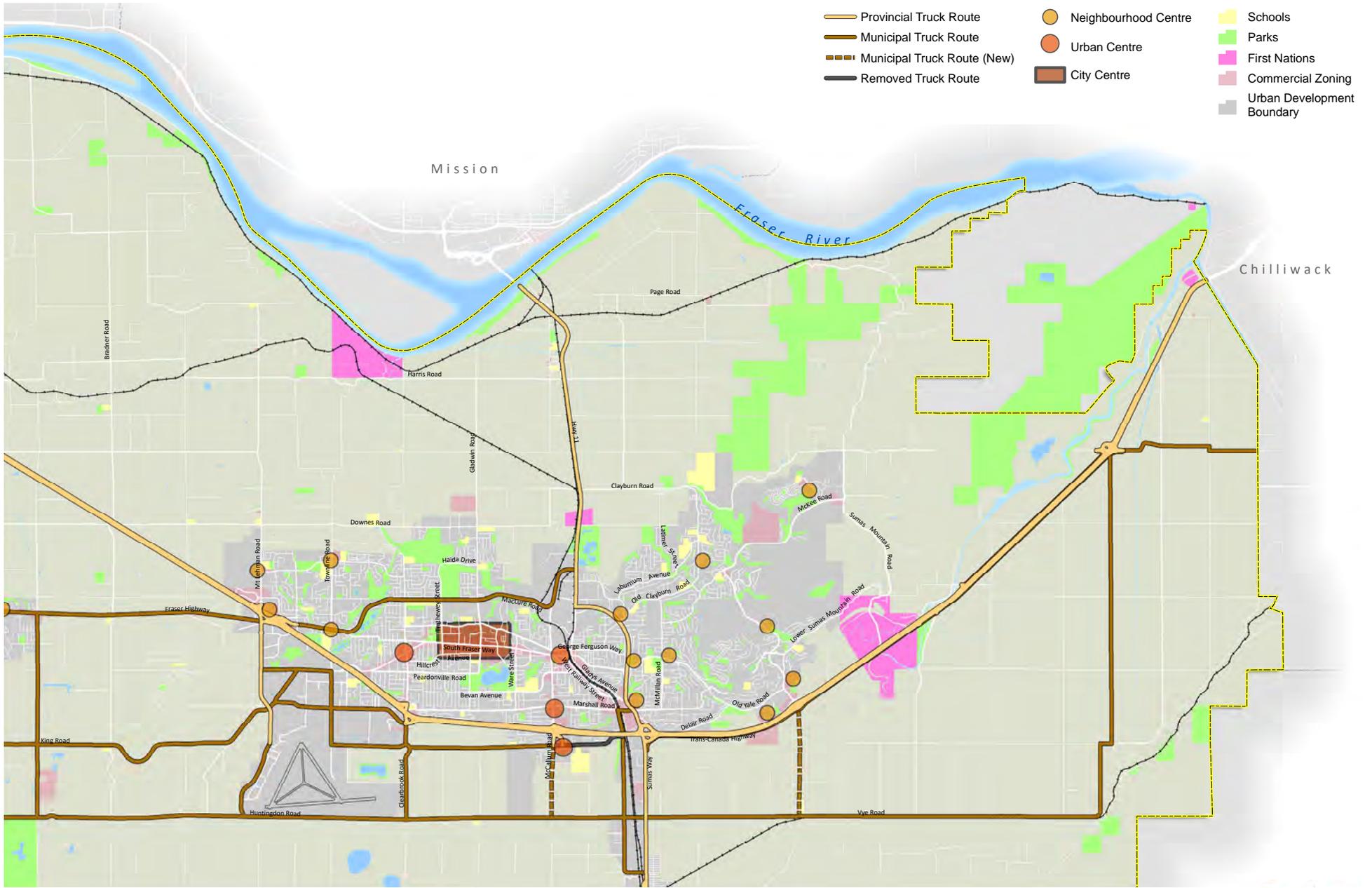


FIGURE 29 // PROPOSED GOODS MOVEMENT NETWORK





#### 4.5 NEW TECHNOLOGIES

We are on the verge of a transportation revolution on a scale rivalling the advent of the streetcar in the late 19th century, the introduction of the automobile, and the construction of highway and freeway networks in the 20th century. Advances in telecommunications and socio-behavioural shifts have already led to the exponential growth of new mobility services such as carsharing, ride-hailing (i.e., Uber and Lyft), and bikesharing in larger cities, the impacts of which are only now beginning to be understood. Further, autonomous vehicle technology is rapidly emerging.

#### 4.5.1 Strategies and Actions

The following emerging technologies will have wide-ranging implications on the way we live and move-about communities, both large and small, and will influence the way we plan for Abbotsford's future.

##### EMERGING TECHNOLOGY STRATEGIES

Four transportation technology groupings are discussed:

- a. Electric Vehicles
- b. Ride Share
- c. Intelligent Transportation Systems (ITS)
- d. Autonomous Vehicles

While ITS and Electric Vehicles are already present to varying degrees in Abbotsford, new mobility services such as bike sharing, car sharing, and ride hailing are not currently operating in the City.

##### a. Electric Vehicles

Electric, hybrid, and alternative energy vehicles are becoming more common and affordable in today's fast changing automobile market. Although the technology is steadily advancing, allowing vehicles to travel further on a single charge, wide scale proliferation of electric cars has not yet occurred, which may in part be limited by a lack of conveniently located and readily accessible charging stations.

Plug-in electric vehicles are recharged by plugging into the electricity grid. Three charge types are available:

- **Level 1** (One Hour of Charge – 8 km of Range). Standard cord-set that plugs into a regular wall socket.
- **Level 2** (One Hour of Charge – 30 km of Range). The most common level for public charge stations. Requires 4 to 6 hours to fully charge an EV.
- **Level 3** (One Hour of Charge – 250 km of Range). Requires 30-45 minutes to fully charge an EV.

There are over 4,500 public charging stations in Canada. They can be found in a variety of places including malls, restaurants and office towers. Public charging stations are either free to use or pay per use. Free to use stations do not require

payment, however, some are only available to customers, can only be used for a set amount of time, and / or are located in parkades and parking lots with associated parking fees. Pay per use stations vary in cost from one location to another and there is no industry standard, but typically Level 2 stations cost \$2.50 flat rate or \$1.00 / hour and Level 3 stations cost \$15.00 / hour.

As shown in **Figure 30**, there are currently 13 public charging station locations in Abbotsford, some with multiple plug-ins. Charging stations are located at the Abbotsford Automall, UFV campus, Abbotsford Regional Hospital, Abbotsford Arts Centre, City Hall, as well as at a select number of shops. Publicly available charging stations are not provided in the Historic Downtown or at Seven Oaks Shopping Centre.

The City of Abbotsford has committed to installing ten Level 2 electric vehicle charging stations at its facilities over the next five years, at a cost of \$250,000.

Electric Vehicles are projected to comprise 35 to 50% of the total vehicle fleet by 2040<sup>1</sup>. To support the necessary infrastructure required for the future, many cities have begun requiring that new buildings provide electric outlets to service residential parking. Select cities in the Lower Mainland now require new multi-family buildings to wire at least 20% of parking stalls for Level 1 charging, while the City of Vancouver is contemplating requiring 100% of new parking stalls in strata buildings be equipped with electric outlets. Additionally, select municipalities are requiring that a share of new commercial and industrial parking stalls be wired for Level 2 charging.

To encourage greater uptake of electric vehicles new infrastructure is needed, including public charging stations and designated parking to make everyday use possible. Transportation policy, business, and tax incentives may also be considered in promoting these types of vehicles. Supporting electric vehicle infrastructure is well aligned with the City's goal to reduce greenhouse gas emissions by 20% by 2025 and 40% by 2040.

<sup>1</sup> Bloomberg New Energy Finance (2017)



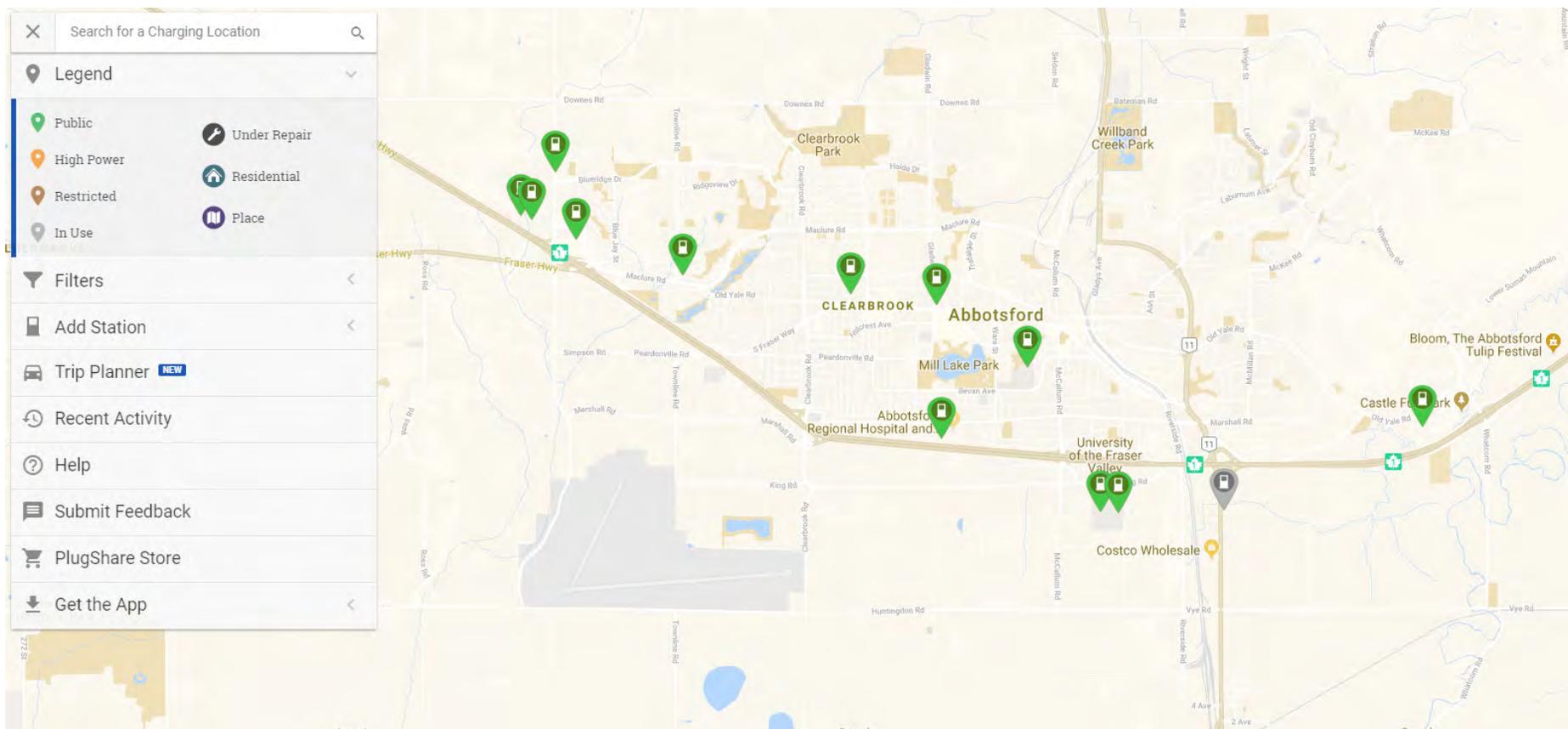


FIGURE 30 // LOCATION OF PUBLIC AND HIGH POWER CHARGING STATIONS IN THE ABBOTSFORD AREA (SOURCE: PLUGSHARE.COM)

The City should consider the following to encourage the use of Electric Vehicles within the municipality:

- Work closely with businesses and community partners to identify and potentially incentivize future locations for public charging stations, including identifying candidate locations for Level 3 charging stations;
- Develop policies to locate charging stations in desirable and visible parking spots to incentivize local residents to consider purchasing an electric or alternative energy vehicle;
- Change parking requirements to include provision of charging facilities at new residential and business/commercial locations;
- Incorporate more electric and alternative energy vehicles into the City’s vehicle fleet, which by their presence, demonstrates the City’s commitment to this objective.

## b. Ride Share

Advances in information technology have provided travel consumers with the ability to access, plan, reserve, and pay for travel options at the push of button. Powered by real time information, travel consumers can now choose the optimal mode for each trip or trip segment from a suite of options. In a fully developed mobility system, these options can consist of walking, public transit, bike-share, car share, or ride-sharing (ride-hailing). A traveller may choose to take public transit for one trip and may later choose to take a car-share to run errands. This way of interacting with the transportation system represents a shift from viewing one's mobility options as relatively unchanging to relating to mobility as a service, as displayed in **Figure 31**.

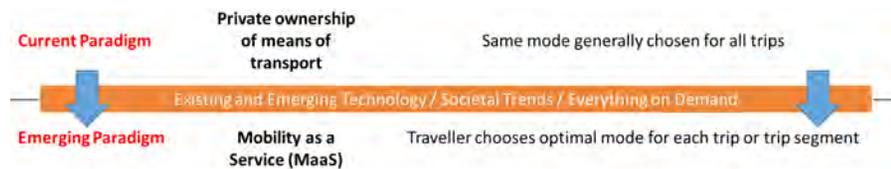


FIGURE 31 // THE EMERGING PARADIGM OF MOBILITY AS A SERVICE

The availability of real time information and the societal proliferation of smart personal devices have resulted in the exponential growth of new mobility service offerings over the past decade, including the emergence of urban bike sharing, as well as the sharp rise of car sharing and ride-hailing. While growth in new mobility services have mainly occurred to this point in larger cities, these services could additionally be hugely beneficial to mid-sized cities such as Abbotsford.

Three new mobility services are profiled as they relate to Abbotsford: bike sharing, car sharing, and ride-hailing.

### BIKE SHARING

Bike sharing is a sustainable transportation initiative that allows individuals to borrow bicycles on a short-term basis for a fee, similar to a car sharing system. There are various bike share systems operating across North America and internationally, including the Mobi bike share system operated within the City of Vancouver. Modern bike share systems are typically comprised of bike share stations, a maintenance centre, and transport vehicles to move bikes between stations and the maintenance facility. Users can pick up a bike and helmet at one station and drop it off at another, which supports one-way trips and return trips.

More recently, station-less (or dockless) bike share systems have been implemented in cities such as Hamilton, ON, which can significantly reduce the upfront capital costs of establishing a bike share. A dockless service can also eliminate the need for street space that would otherwise have to be allocated to a permanent docking station, reducing potential parking or sidewalk impacts.

Bike share services are typically priced to encourage short trips, with rates per hour typically mounting the longer a bike is rented. Some services charge significant membership fees and offset these charges with low per-use fees, while other systems charge flat usage fees with very limited membership charges.

Bike sharing can accommodate many types of trips, whether it be the primary mode of transportation for a trip, or the beginning and end mode of transportation for a trip (i.e. walk, transit, bike share to/from destination). Bike sharing can also support local tourism in the City by allowing visitors to easily pick a bike and see what the City has to offer in terms of parks, shopping, sight-seeing and more.

Bike share infrastructure is best suited on existing active transportation routes and in higher density centres. In Abbotsford, this infrastructure could be located in the core area of the City near major institutions such as the hospital and UFV campus.

The City should consider the following:

- Explore the suitability and viability of bike sharing in Abbotsford including a range of technology options for the provision of bike share services, particularly with the construction of the Signature Corridor and other bicycle network improvements.
- Explore the impact of bike sharing on achieving Abbotsford's sustainable transportation goals identifying high impact areas for the establishment of a bike share system.
- Work closely with business and community partners to identify opportunities for partnerships.

### CAR SHARING

As North American cities evolve and mature, car sharing has become an emerging transportation alternative that has begun to play a much larger role in the overall transportation network in many cities, including in the Lower Mainland. Car sharing can satisfy a variety of different micro and macro goals, from deferring the purchase of a first or second vehicle to reducing the need for parking. Car sharing provides a more efficient use of vehicles and the street itself. Unlike private automobiles that remain parked for the vast majority of the time, car sharing



pairs vehicles with trip makers, allowing vehicles to be used (and parking space unoccupied) for a greater share of the time.

Car share services:

- Increase mobility and travel options for residents;
- Improve accessibility to all parts of the municipality for those who do not have access to a private automobile;
- Improve livability / affordability for select families who can decrease total household vehicle ownership as a result of membership within a car share program; and,
- Promote sustainable transportation choices.

There are two car share service types: Round trip and free floating car shares. The two service types result in very different car share trips and cater to different markets. The pricing and rental structure of round trip car shares are geared towards customers who want an easily available short-term vehicle for a set period of time. Round trip car shares are not geared towards commuting and are more suitable for leisure or special interest trips. By comparison, free floating car shares offer point-to-point travel with billing by the minute, giving the traveller the flexibility of using a car when it is most needed, and discarding it in favour of public transit or walking where it is less efficient.

In the Lower Mainland, round trip car share services are provided by Modo and Zipcar. Free floating car share services are provided by car2go and EVO (BCAA). Experience has shown that both round trip and free floating car sharing can have significant impacts on net vehicle holdings. Martin and Shaheen (2016) found that 1 car share vehicle typically replaces anywhere from 9 to 11 private vehicles, which accounts for both vehicles sold and vehicle purchase suppression. Research has additionally shown that car sharing has a significant positive impact on congestion and GHG emissions. Because of the number of private vehicles that are removed, each additional car share vehicle removes between 20,000 and 70,000 vehicle kilometres from the road each year. This corresponds to between 4 and 10 tonnes of GHG emissions removed per car share vehicle.

Car sharing services strongly align with the City's strategic goals. With both round trip and free floating car sharing well entrenched in neighbouring Metro Vancouver, it is recommended that the City of Abbotsford work with Metro Vancouver-area car share operators to explore ways to expand their existing networks to serve Abbotsford. Further, the City should consider the following to encourage car sharing within the municipality:

- Seek strategic partnerships to encourage car share operations to come to Abbotsford. The City could incentivize this by reducing and replacing part of its vehicle fleet with car shares located near City operated facilities.
- Develop an approach to on-street and off-street public parking that includes incentives for car share vehicles (i.e. priority parking, free parking at parking meters).
- Investigate the potential for parking variances if developers provide and support car share services. This provision is based on research that car share vehicles can significantly reduce the need for private vehicle ownership.
- Reserve a supply of priority parking spaces in higher density areas already well served by transit. This could include locations within the historic downtown, Clearbrook Commercial area, the UFV campus, and Highstreet Shopping Centre.

#### RIDE HAILING

Ride hailing is powered by technology that matches travellers with vehicles and drivers. Customers use ride-hailing apps to enter their origin, destination, and desired departure time (alongside any other specifications). These inputs are then matched with a fleet of independent drivers and assigned based on specifications. While these services are not yet legal in British Columbia, ride hailing service providers (Transportation Network Companies), such as Uber and Lyft, have become major players in transportation ecosystems around the world.

The Province's Select Standing Committee on Crown Corporations is currently examining the implications of Transportation Network Companies in BC and have agreed that TNCs should be permitted to operate in BC within a provincial regulatory regime. It is anticipated that enabling legislation will be tabled in the near future.

Like traditional taxi services, the presence of effective ride hailing helps support a private vehicle free lifestyle by providing Abbotsford residents with additional travel choices. As such, the presence of effective ride hailing may allow select residents, such as teenagers over the age of 16, who may otherwise own a vehicle to primarily walk, cycle, and take public transit; using ride hailing when necessary.

While Provincial legislation is required to enable Transportation Network Companies to legally operate and will likely regulate aspects such as customer safety, pricing, accessibility requirements, licensing, insurance, and operations, the

City of Abbotsford should consider the following once ride-hailing is legalized:

- Study the impacts of ride hailing in Abbotsford. To accomplish this task, the City should seek to acquire data from Transportation Network Companies on a periodic basis, such as length of trips, time of day, customer wait times, trip distributions (origins and destinations), and accessible versus non-accessible vehicle statistics. This data will allow the City to effectively assess the impacts of ride hailing in Abbotsford, as well as identify areas for improvement.
- Explore the need for support infrastructure including designated pick-up / drop-off zones at key locations and the relationship to established taxi infrastructure such as taxi stands.
- Work with BC Transit to explore whether ride hailing could be used to expand basic transit provision to zones outside the current service area.

### c. Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) involve the implementation of advanced technology on transportation operations. This emerging area is beneficial in reducing congestion and increasing road safety. ITS technology can create a communication link between the various vehicles and road systems including traffic signals, transit vehicles, and all other travellers providing drivers (and autonomous vehicles in the future) with advance warning about changing or upcoming travel conditions.

The communication of current conditions and unexpected incidents to drivers allows people to make informed decisions of routes and travel methods which improve traffic movement on the road network. Maintaining streams of communication to the public is important in reducing congestion in unexpected events.

The City should consider undertaking a comprehensive examination of the practical applications for ITS in Abbotsford, which could include the provision of real time information to drivers, dynamic corridor signal coordination, transit signal prioritization, as well as future oriented applications such as vehicle to infrastructure technology.

### d. Autonomous Vehicles

Autonomous Vehicle (AV) technology is rapidly emerging and is poised to represent a US\$42 Billion global market by 2025<sup>2</sup>. Currently most major auto manufacturers and tech giants such as Google and Uber are racing against one another to fine-tune the technology with vehicles already being trialled to varying degrees on city streets. Over the next several years, industry analysts expect fully autonomous vehicles to be available for purchase with market adoption occurring over the next 30 years.

The scale of technological change amounts to a revolution in urban transportation that can radically reshape the way we live and move about communities. Like previous urban transportation revolutions, such as the invention of the automobile, a new AV reality will both broaden possibilities and present new threats to the established order.

Amongst other implications, autonomous vehicles could extend the freedom of personal mobility to those who cannot or are unwilling to drive such as the visually impaired and youth under the age of 16; additionally, AVs could provide new mobility options for those without access to an automobile. As 90% of vehicle collisions are a result of human error, research suggests that autonomous vehicles may be able to significantly reduce the 112,000 fatal and personal injury collisions that occur across Canada each year<sup>3</sup>. Further, autonomous vehicles are projected to significantly improve roadway operations. As an example, by allowing for a significant reduction in vehicle following distance, research suggests that full AV operations can theoretically increase freeway lane capacities by 80%<sup>4</sup>.

Perhaps the most far-reaching implication, however, is how the technology will enable people to reclaim their time. Instead of driving, travellers could spend their travel time reading, communicating with friends via their smart devices, preparing for meetings, or even sleeping. While this may be a boon on a personal level, collectively this may result in reduced distance friction and significantly greater pressure on roadways as individuals rethink whether it's necessary to live within or near urban cores.

While the specifics of what Abbotsford's transportation system looks like in 25 years is ambiguous, what is eminently clear is that the way people will get around in 25 years will be very different from the way people are getting around today. These changed realities will have significant impacts on land use patterns, vehicle ownership, travel demand, and public transit systems, all of which have implications for long range infrastructural decisions being made today.

<sup>2</sup>Bloomberg Technology. January 8, 2015. [www.bloomberg.com/news/articles/2015-01-08/driverless-car-global-market-seen-reaching-42-billion-by-2025](http://www.bloomberg.com/news/articles/2015-01-08/driverless-car-global-market-seen-reaching-42-billion-by-2025)

<sup>3</sup>Transport Canada: Canadian Motor Vehicle Traffic Collision Statistics (2014).

<sup>4</sup>Preparing a Nation for Autonomous Vehicles. Fagnant and Kockelman (2015).



Municipalities wishing to take a pro-active approach are studying the implications of an autonomous future with the aim of leveraging this new technology in support of their visions and goals. **Table 5** outlines AV-related work occurring in other select municipalities and urban regions across Canada as of January, 2018.

MUNICIPALITY / REGION	MUNICIPAL WORK ON AUTONOMOUS VEHICLES
Edmonton	The City of Edmonton presented their annual report to Urban Planning Committee on Automated and Connected Vehicle Technology on October 19, 2016. Committee moved that Administration return with another report in Q1 2017, outlining a framework for incorporating new technology and emerging mobility options into planning efforts across the organization.
Mississauga	Mississauga is developing their first formal Transportation Master Plan and a Parking Master Plan with AV technology in mind. They are working with University of Toronto masters students to research the impacts of AVs on parking.
Ottawa	Ottawa is preparing a white paper on the impacts of disruptive technologies and behaviour/demographic changes on the urban form and infrastructure investments.
Toronto	The City of Toronto is involved in a number of actions in regards to AV technology including: the completion of a 3 year AV work plan; reporting to their Public Works Infrastructure Committee and City Council on how to best prepare for the introduction of autonomous vehicles; hosting AV workshops; working with departments throughout their City and; working with the University of Ryerson on public surveys and transportation modelling work.
Greater Toronto Area (Metrolinx)	Metrolinx in conjunction with consulting firm WSP has produced a background paper on AVs and shared mobility and is looking to integrate the concepts into their regional planning.
Metro Vancouver	TransLink has completed its Future of Driving report that has been endorsed by their Board and directed staff to implement recommended actions.
Winnipeg	In September 2016, City Administration was directed by City Council to conduct a cross-jurisdictional analysis on self-driving vehicle planning and report back in 2017.
Calgary	Draft report in circulation to select industry members. Release Q1 2017 to Council.

TABLE 4 // TYPES OF BICYCLE PARKING

To ensure Abbotsford takes a pro-active approach to new trans-formative transportation technologies, the City should consider:

- Undertake a strategic study to examine the various implications of autonomous vehicle technology in Abbotsford including potential impacts on accessibility, safety, mobility, parking demand, public transit, multi-modality, and land-use; the study should develop a long-range strategic vision for AVs and examine tools and policies required to leverage this vision while mitigating negative externalities.
- Develop a multi-scenario approach to long-range transportation modelling that incorporates degrees of uncertainty posed by changing technologies.
- Commit to undertaking regular updates to the City’s Transportation Master Plan in recognition of the high degree of long-term uncertainty posed by changing technologies, as displayed in **Figure 32**. In a context of rapidly evolving transportation technologies, in addition to a broader context of change, a business-as-usual approach to transportation network planning is no longer appropriate. Simply put, due to the pace of advancement in transportation technology, business-as-usual long-term transportation models represent scenarios that will likely never exist.

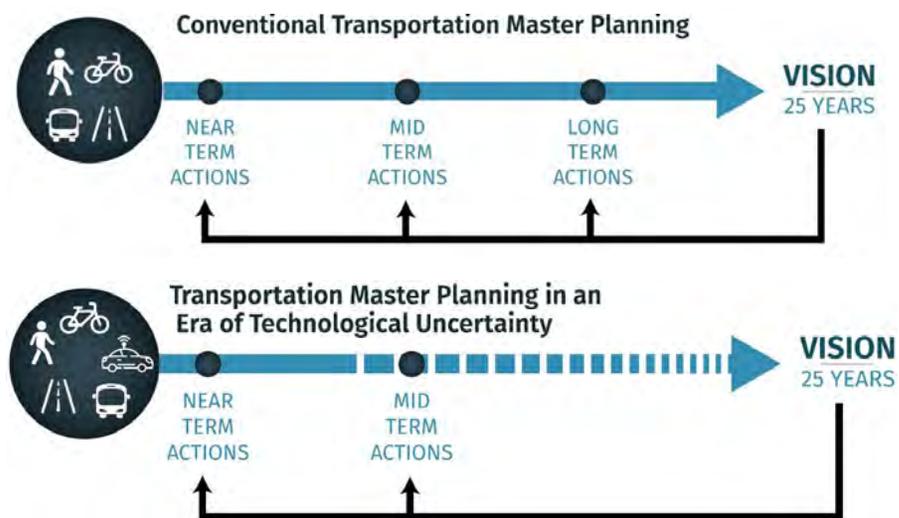


FIGURE 32 // SHIFTING FOCI FOR TRANSPORTATION PLANNING





## **5.0 IMPLEMENTATION AND MONITORING**

The strategies and actions developed as part of the Transportation and Transit Master Plan are intended to guide Abbotsford's policy, planning and capital investment decisions as well as on-going operations and maintenance activities related to transportation over the next 25 years and beyond. The Transportation and Transit Master Plan is intended to provide long-term direction for the City's transportation system. To achieve the vision and goals of the Plan, an implementation strategy is necessary to provide a framework for advancing specific transportation improvements. This chapter presents an implementation and monitoring strategy for the Transportation and Transit Master Plan.

## 5.1 IMPLEMENTATION STRATEGY

The implementation and monitoring strategy outlines the approximate cost to implement the capital components of the plan and includes a phasing strategy identifying recommended improvements over the short-term (0-5 years), medium-term (6-10 years), and long-term (11-25 years).

### 5.1.1 The Approximate Cost of the Long-Term Plan

Conceptual order-of-magnitude cost estimates were developed for each of the capital investments identified in the Transportation and Transit Master Plan to provide a sense of the potential overall future levels of transportation investment for the City in current (2018) dollars. These order-of-magnitude costs are for comparative purposes and are based on a conceptual level of design and should be refined to establish 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. In addition, possible contributions from other agencies and the private sector are not possible to estimate.

The level of investment required to implement all improvements recommended in the Transportation and Transit Master Plan is estimated to be in the range of \$390 - 410 million (in 2018 dollars), as summarized below. It should be noted that these cost estimates do not include items such as property costs, environmental mitigation costs, and utility relocations. This budget allocation is consistent with the direction of the OCP. The OCP calls for a mode share target 25% of trips made by walking, cycling and transit by the time the population reaches 200,000. This funding scenario goes beyond this target, with 26% of the cost of the plan allocated to walking, cycling, and transit.

CATEGORY OF CAPITAL IMPROVEMENT	LEVEL OF INVESTMENT
Walking Facilities	\$40 – 50 Million
Bicycle Facilities	\$50 – 60 Million
Transit Facilities*	\$10 Million
Street Network	\$290 Million
<b>TOTAL</b>	<b>\$390 - 410 Million</b>

TABLE 5 // ESTIMATED LEVEL OF INVESTMENTS FOR CAPITAL IMPROVEMENTS

\*Transit costs reflect shelter and transit hub costs only

However, 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, such as development cost charges. In fact, over the past decade, a significant portion of transportation funding for projects in the City of Abbotsford have come from other sources, including development cost charges and provincial or federal grant programs and cost-share initiatives.

### 5.1.2 Implementation Principles

Recognizing that the long-term plan will take significant financial investment over the next 25 years and beyond, there is a need to identify priorities over the short-term (0-5 years), medium-term (6-10 years), and long-term (11-25 years). The implementation plan was developed based on the following guiding principles:

- The Transportation and Transit Master Plan is one step towards implementing the vision for transportation in Abbotsford; it is not the last step.** The strategies in the Transportation and Transit Master Plan are intended to lay the groundwork for implementation over the long-term. It is important to recognize that implementation will require significant investment and resources, as well as a shift to prioritize walking, cycling, and transit to meet the vision, goals, and targets of the Plan. The Plan includes significant investments in new infrastructure, upgrades to existing infrastructure, ongoing maintenance of existing and new facilities, resources for development of new standards and policies, funding for new programming and public education, and staff resources. It will require ongoing support from the City and its partners, along with sustained investment in all transportation modes.
- The Transportation and Transit Master Plan is a flexible and living document.** For each long-term network plans, there is some level of flexibility for the specific locations and corridors that are recommended. The Plan presents recommendations based on public input and technical analysis; however, the City will need to review the feasibility and desirability of each infrastructure project. As this Plan is a long-term, strategic document, it is anticipated that additional projects will emerge over time to reflect changing priorities.
- The City should monitor, review, and update the Transportation and Transit Master Plan on a regular basis, as needed.** As the City begins implementing the strategies and actions of the Transportation and Transit Master Plan, a monitoring and reporting strategy will be needed to measure



and communicate progress towards achieving the vision, goals, and targets. Reporting back on the indicators identified in the Monitoring Plan outlined in this document is one of the ways the City can report on progress made in implementing the Plan. As the City moves forward with implementing the Plan, the document will need to be updated to reflect the changing priorities and conditions over time.

- **The City will engage in further public consultation to implement the recommendations included in the Transportation and Transit Master Plan.** Many of the initiatives require more detailed input and technical work. The City should work closely with partners, residents and stakeholder groups to move forward with priorities in the Active Transportation Plan.
- **The short-term investments will be incorporated into the City's 5-year Financial Plan, and a new long-term (25 year) investment strategy will be developed for all of the master plans as part of Plan 200K.** Finally, there will be an annual review as part of the financial planning and municipal budgeting process, with a full review of the Transportation and Transit Master Plan recommended every 5 years.
- **The City should develop an Infill Strategy Study** to address City infrastructure issues related to redevelopment of residential properties.

### 5.1.3 Phasing Strategy

All the transportation improvements identified in the previous chapters of the Transportation and Transit Master Plan included approaches to phasing for each mode of transportation. Based on this approach to phasing for each mode, priority projects were identified for each mode to be implemented over the short-term (0-5 years), medium-term (6-10 years) and long-term (11 to 25 years).

**Figures 33 to 35** show the proposed improvements by mode for the short-term (**Figure 33**), medium-term (**Figure 34**), and long-term (**Figure 35**).



### PROPOSED SHORT-TERM IMPROVEMENTS

- Intersection Improvement
- Bicycle Network Improvement
- City Centre
- Street Improvement
- Pedestrian Network Improvement
- Urban Development Boundary

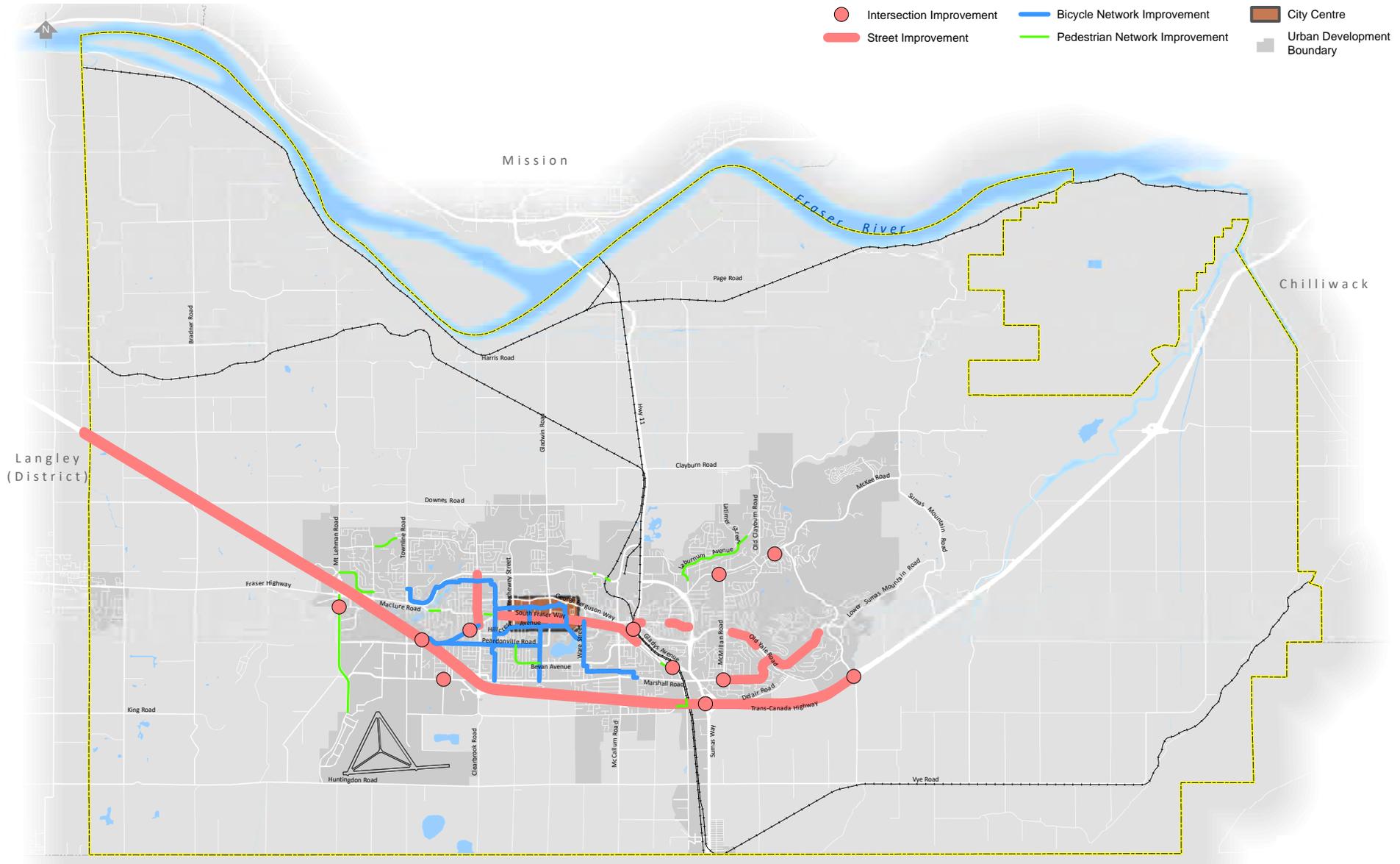


FIGURE 33 // PROPOSED SHORT-TERM IMPROVEMENTS



### PROPOSED MEDIUM-TERM IMPROVEMENTS

- Intersection Improvement
- Bicycle Network Improvement
- City Centre
- Street Improvement
- Pedestrian Network Improvement
- Urban Development Boundary

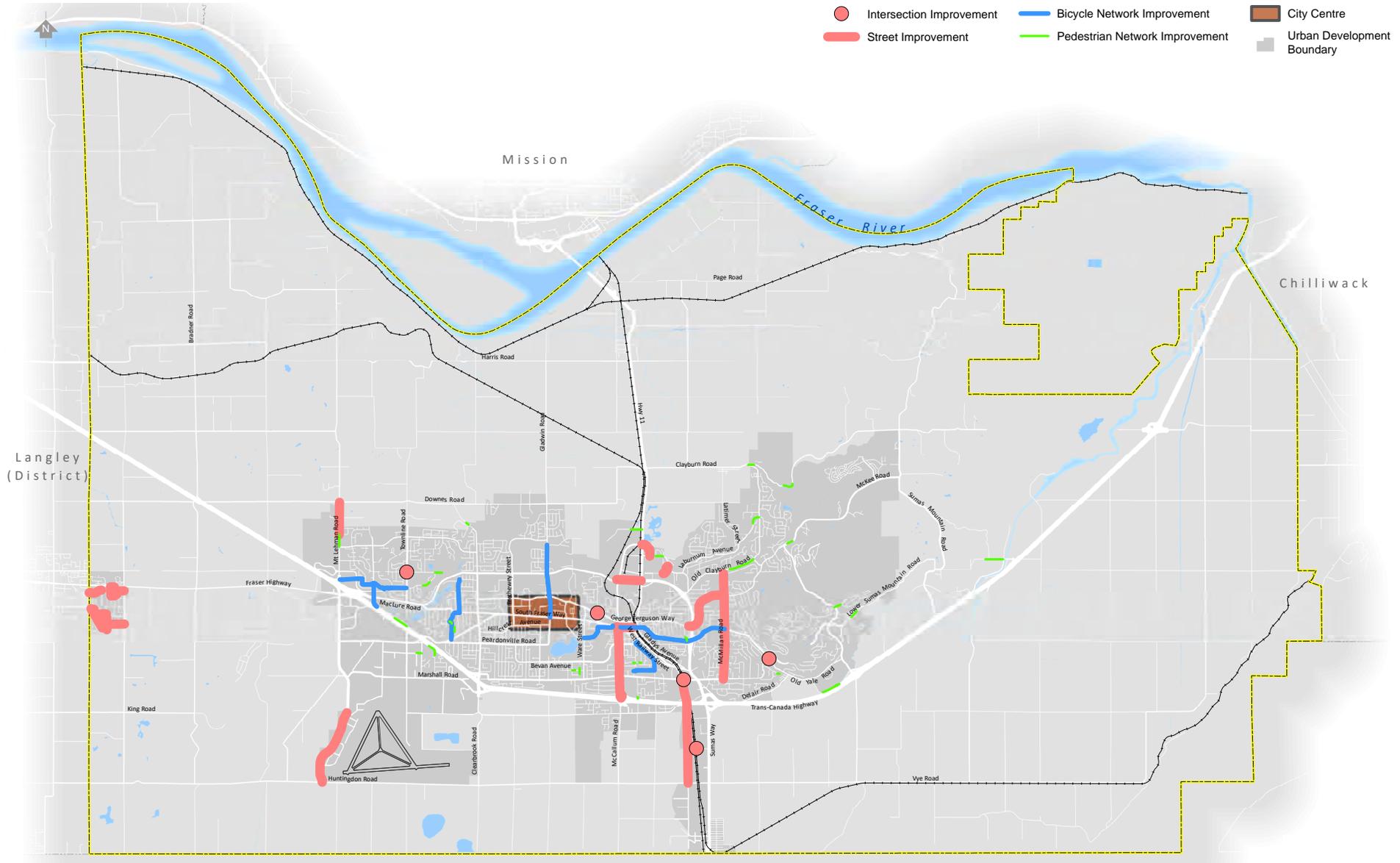


FIGURE 34 // PROPOSED MEDIUM-TERM IMPROVEMENTS

### PROPOSED LONG-TERM IMPROVEMENTS

- Intersection Improvement
- Bicycle Network Improvement
- Street Improvement
- Pedestrian Network Improvement
- City Centre
- Urban Development Boundary

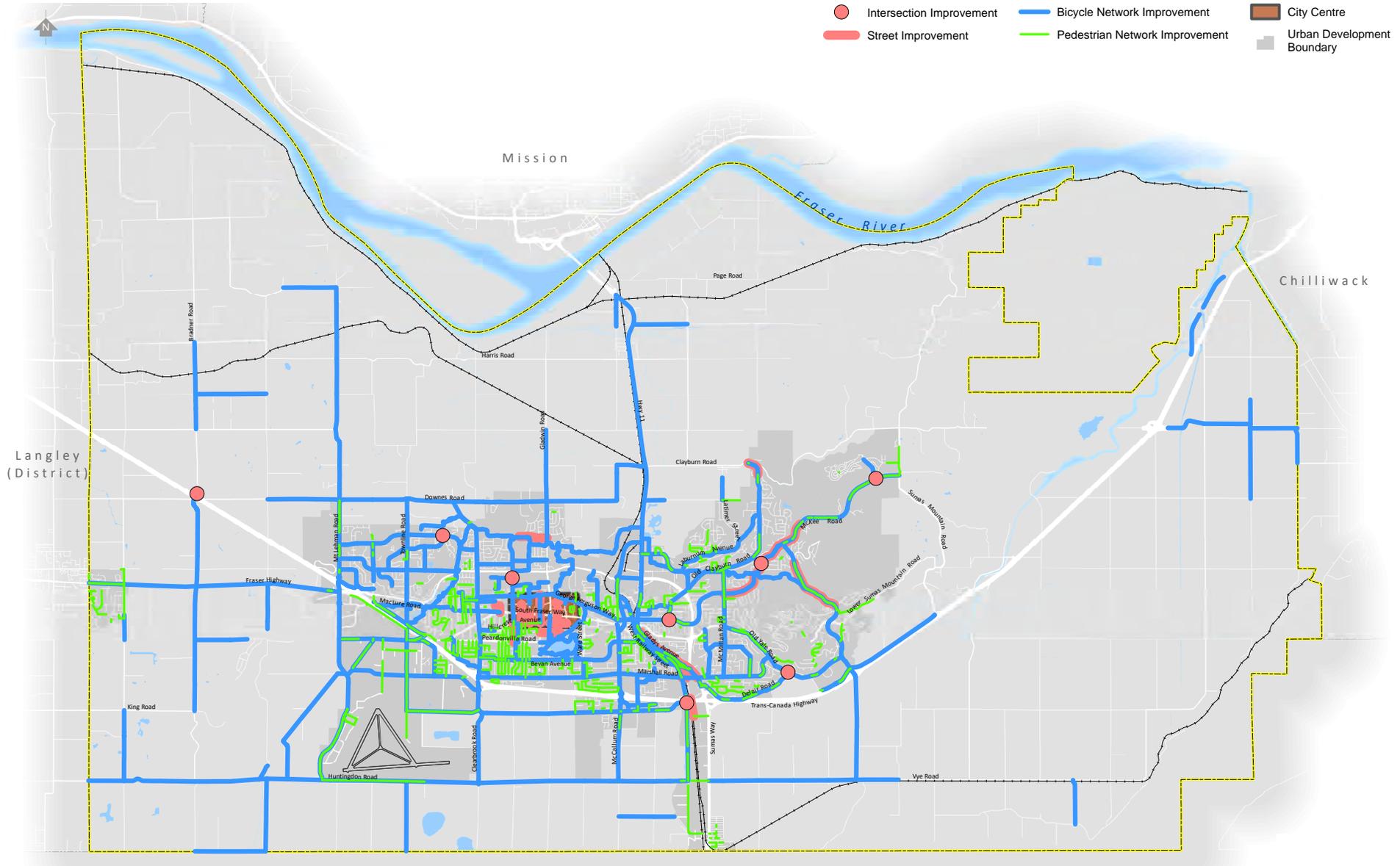


FIGURE 35 // PROPOSED LONG-TERM IMPROVEMENTS



Individual phasing strategies have been developed for each mode of transportation:

### WALKING

The total long-term cost for walking improvements over the life of this plan is \$40 – 50 million (2018 dollars). **Figure 36** shows a breakdown of yearly funding levels for all walking improvements in Abbotsford. It should be noted that these funding levels will not result in a full build-out of the proposed long-term sidewalk network over the 25 year lifespan of the plan.

Over the **short-term** (2019-2023), existing funding levels of \$500,000 per year for the construction of new sidewalks will be maintained. This funding will result in the construction of approximately 4 – 6 km of new sidewalks over the next 5 years. The City should encourage additional new sidewalks to be constructed through redevelopment. The City should also consider dedicating additional funding for enhanced street treatments, safety and accessibility improvements, and support programs (i.e. Safe Routes to School).

Over the **medium-** and **long-term**, the City should consider incrementally increasing pedestrian funding by allocating an additional \$100,000 per year every 5 years for walking improvements, beginning in 2024 (see **Figure 36**). Over 25 years, these incremental increases will add up to an additional \$5 million in funding. This additional funding can be used for enhanced street treatments, safety and accessibility improvements, and support programs, in addition to sidewalk construction. Depending on the amount of funding that is dedicated to

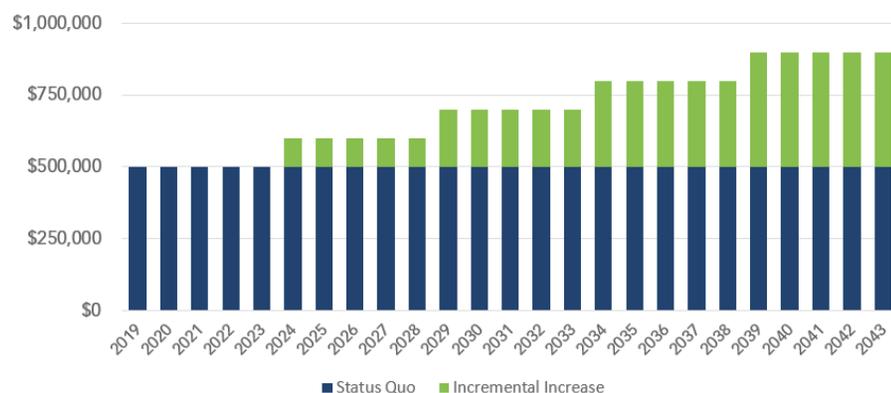


FIGURE 36 // IMPLEMENTATION PLAN FOR WALKING IMPROVEMENTS

sidewalk construction, approximately 40 km of sidewalks could be constructed over the next 25 years.

In addition to this incremental funding increase, the City should still consider further increasing funding for new sidewalks to close the gap and promote active transportation, pending Council priorities, resources, and available funding. The City should leverage all available opportunities to build out more of Abbotsford’s sidewalk network and making the city safer, more convenient, and more accessible for all community members. This includes encouraging pedestrian upgrades through infill and new development in Abbotsford, including considering requiring frontage works for building permits..

The implementation strategy described above is based on incremental increases to existing funding levels, but will not achieve the long-term vision for walking within the 25-year lifespan of the plan. As such, the City should review and revisit funding levels for pedestrian improvements as part of the 5-year Financial Plan and the long-term implementation strategy to identify opportunities to increase funding levels and accelerate the build-out of the sidewalk network.

### CYCLING

The total long-term cost for cycling improvements over the life of this plan is \$50 – 60 million (2018 dollars). **Figure 37** shows a breakdown of yearly funding levels for all cycling improvements in Abbotsford.

The City should follow a phased approach to funding and prioritizing bicycle facilities. The **short-term** (2019-2023) priority is to establish a core bicycle network in Abbotsford’s City Centre, which will then be upgraded to AAA facilities over the medium- and long-term. Over the short-term, existing funding levels of \$300,000 per year for the construction of high priority bicycle routes will be maintained. The City should leverage grant funding from Provincial (e.g. Bike BC) and Federal sources to maximize funding opportunities.

This Plan assumes that the City will be able to increase spending on bicycle facilities by approximately 40% each year over the life of the Plan. For example, it is assumed that in the short-term, the City will be able to spend approximately \$420,000 per year, including grant opportunities. This funding will result in the construction of approximately 15 km of new bicycle facilities over the next 5 years, including bike lanes, neighbourhood bikeways, and off-street paths. The construction of bicycle facilities should be coordinated with development opportunities to provide AAA facilities. The City should consider adding additional funding dedicated to support facilities and support programs for cycling.

Over the **medium-** and **long-term**, the City should consider incrementally increasing funding by allocating an additional \$100,000 per year every 5 years for cycling improvements, beginning in 2024 (see **Figure 37**). Over 25 years, these incremental increases will add up to an additional \$5 million in funding. In the medium-term, the City can use this additional funding to begin upgrading existing non-AAA bicycle lanes into AAA protected bicycle lanes. Over the long-term, the City can continue making AAA facility upgrades in order to make Abbotsford's bicycle network safe, comfortable, and convenient for people of all ages and abilities. Assuming that the City can leverage grant opportunities and spend an additional 40% on bicycle facilities, approximately 50 km of bicycle facilities could be constructed over the next 25 years in Abbotsford.

In addition to being used to fill key gaps in the cycling network and upgrading to AAA bicycle facilities, the incremental funding increases can also be used to enhance cycling support facilities and support programs. The City should consider further increasing funding for bicycle facilities, support programs, and support facilities in order to close the gap and promote active transportation, pending Council priorities, resources, and available funding. The City should leverage all available opportunities to build out more of Abbotsford's bicycle network, including leveraging on-going development to create AAA facilities.

The implementation strategy described above is based on incremental increases to existing funding levels, but will not achieve the long-term vision for cycling within the 25-year lifespan of the plan. As such, the City should review and revisit funding levels for cycling improvements as part of the 5-year Financial Plan and the long-term implementation strategy to identify opportunities to increase funding levels and accelerate the build-out of the cycling network.

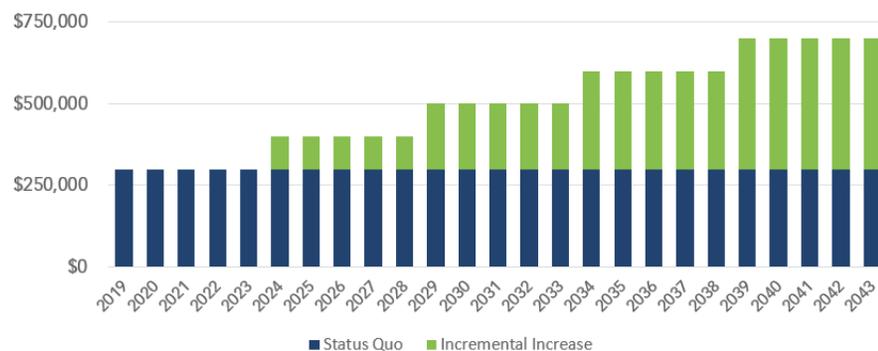


FIGURE 37 // IMPLEMENTATION PLAN FOR CYCLING IMPROVEMENTS

## TRANSIT

The total long-term cost for transit improvements over the life of this plan is \$15 million. **Figure 38** shows a breakdown of yearly funding levels for transit improvements in Abbotsford.

Over the **short-term** (2019-2023), \$100,000 per year should be allocated to installing transit shelters and accessibility improvements. This funding will enhance two bus stops per year. There will be no short-term resources allocated to new transit routes in 2019, with the focus being on realigning existing routes instead. However, there will be increased operating funding over the short-term. The Downtown Hub is the major short-term transit project, with an estimated cost of \$2-4 million in 2022.

Over the **medium-** and **long-term**, the City should incrementally increase funding by allocating an additional \$50,000 per year every 5 years for shelter and accessibility improvements, beginning in 2024 (see **Figure 38**). Service hours should continue to be increased, and other exchange improvements completed, including at UFV, Highstreet and Whatcom. These three upgrade projects are estimated to cost \$1 – 2 million each over the medium- and long-term.

The implementation strategy described above is based on incremental increases to existing funding levels, but will not achieve the long-term vision for transit within the 25-year lifespan of the plan. As such, the City should review and revisit funding levels for transit improvements as part of the 5-year Financial Plan and the long-term implementation strategy to identify opportunities to increase funding levels and accelerate transit investments.

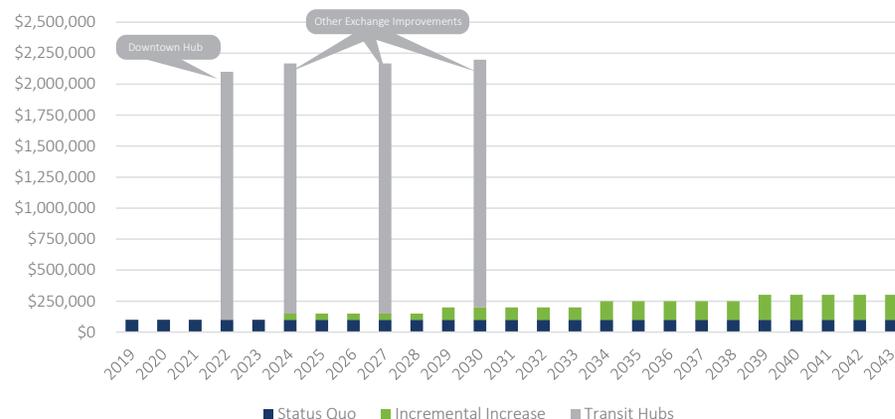


FIGURE 38 // IMPLEMENTATION PLAN FOR TRANSIT IMPROVEMENTS



## STREETS

The total long-term cost for street improvements over the life of this plan is \$290 million. **Figure 39** shows a breakdown of yearly funding levels for all street improvements in Abbotsford, and provides an illustrative example of how funding could be allocated on annual basis over the next 25 years, including committed annual funding along with project specific funding for major projects in individual years. This graphic is not intended to indicate that each project will actually be implemented in a specific year, but is intended to show the approach to funding street network improvements.

In the **short-term**, the City should encourage MOTI to prioritize provincial highway investments to widen Highway 1 and improve interchanges. The City should also work towards the reconfiguration of South Fraser Way by leveraging development opportunities. Planning for the McKee Connector project will begin over the short-term. Additionally, the City should allocate dedicated annual funding for the installation of new traffic signals each year, continue to funding to improve rail crossings over the short-term, and work to complete minor intersection improvements throughout Abbotsford.

Over the **medium-** and **long-term**, a number of key projects will be completed, as shown in **Figure 39**. Additionally, numerous other street improvements will be completed as funding allows each year.



FIGURE 39 // IMPLEMENTATION PLAN FOR STREET IMPROVEMENTS

The phasing approach in this section is intended to aid the City in its future decision-making and capital budget planning. However, it should be noted that there are number of factors that will continually shape and influence the ultimate development of the City’s transportation system over time. Although the implementation of the Transportation and Transit Master Plan may be affected by unforeseen changes, the general direction and balance of investments in the transportation system should not be significantly altered. In addition, the priorities are intended to be flexible and can be adjusted based on changing circumstances. For example, in some cases, an initiative with a lower priority may be implemented prior to a one with a higher score if an opportunity presents itself (i.e. as redevelopment or grant opportunities arise). Conversely, a project with a higher priority may be implemented later than one with a lower priority if the costs are prohibitive and if cost-sharing opportunities are not available.

**Figures 40 to 42** illustrate the short-term, medium-term, and long-term capital improvements for walking, cycling, and street network projects as shown in **Table 6**. It should be noted the capital investment projects are dependent on redevelopment opportunities as well as City priorities.

CATEGORY OF CAPITAL IMPROVEMENT	LEVEL OF INVESTMENT		
	SHORT-TERM (0-5 YEARS)	MEDIUM-TERM (5-10 YEARS)	LONG-TERM (10+ YEARS)
Walking Facilities	\$2.9 Million	\$2.4 Million	\$44.1 Million
Bicycle Facilities	\$2.5 Million	\$2.8 Million	\$44.5 Million
Transit Facilities*	\$2.5 Million	\$2.8 Million	\$4.8 Million
Street Network	\$58.2 Million	\$113.4 Million	\$121.9 Million
<b>TOTAL</b>	<b>\$66.1 Million</b>	<b>\$121.4 Million</b>	<b>\$215.3 Million</b>

TABLE 6 // HORIZON OF CAPITAL IMPROVEMENT PROJECTS

\*Transit costs reflect shelter and transit hub costs only

### PEDESTRIAN NETWORK PLAN PHASING STRATEGY

- |  |                   |                       |                      |                            |
|--|-------------------|-----------------------|----------------------|----------------------------|
| Prioritized Required Sidewalks (Implementation Plan) | City Hall         | Arena                 | Neighbourhood Centre | Schools                    |
| 1 - Short-term                                       | Hospital          | University or College | Urban Centre         | Potential Infill Area      |
| 2 - Medium-term                                      | Recreation Centre | Transit Exchange      | City Centre          | Urban Development Boundary |
| 3 - Long-term  | Major Park        |                       |                      |                            |

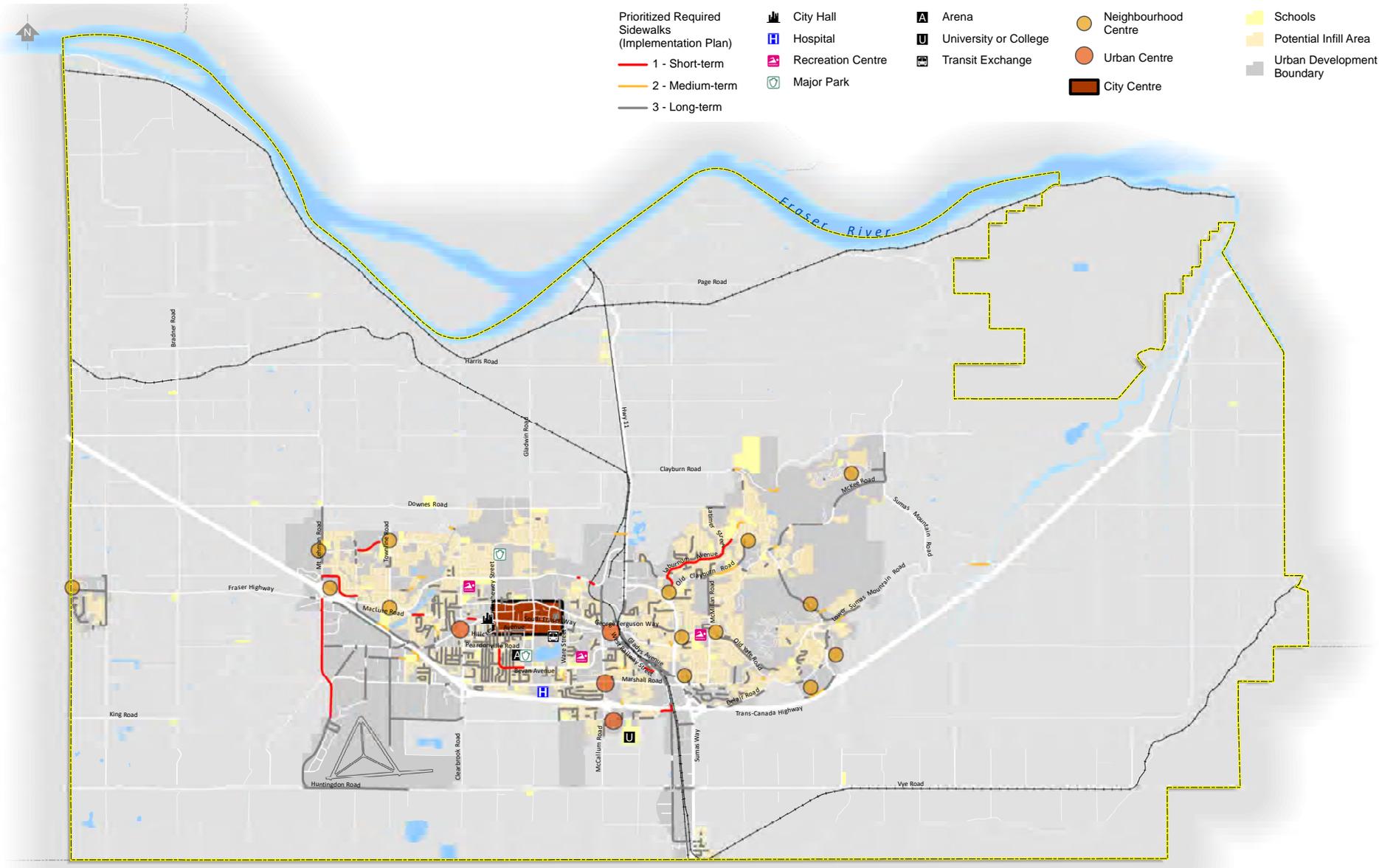


FIGURE 40 // PEDESTRIAN NETWORK PLAN PHASING STRATEGY





STREET NETWORK PLAN PHASING STRATEGY

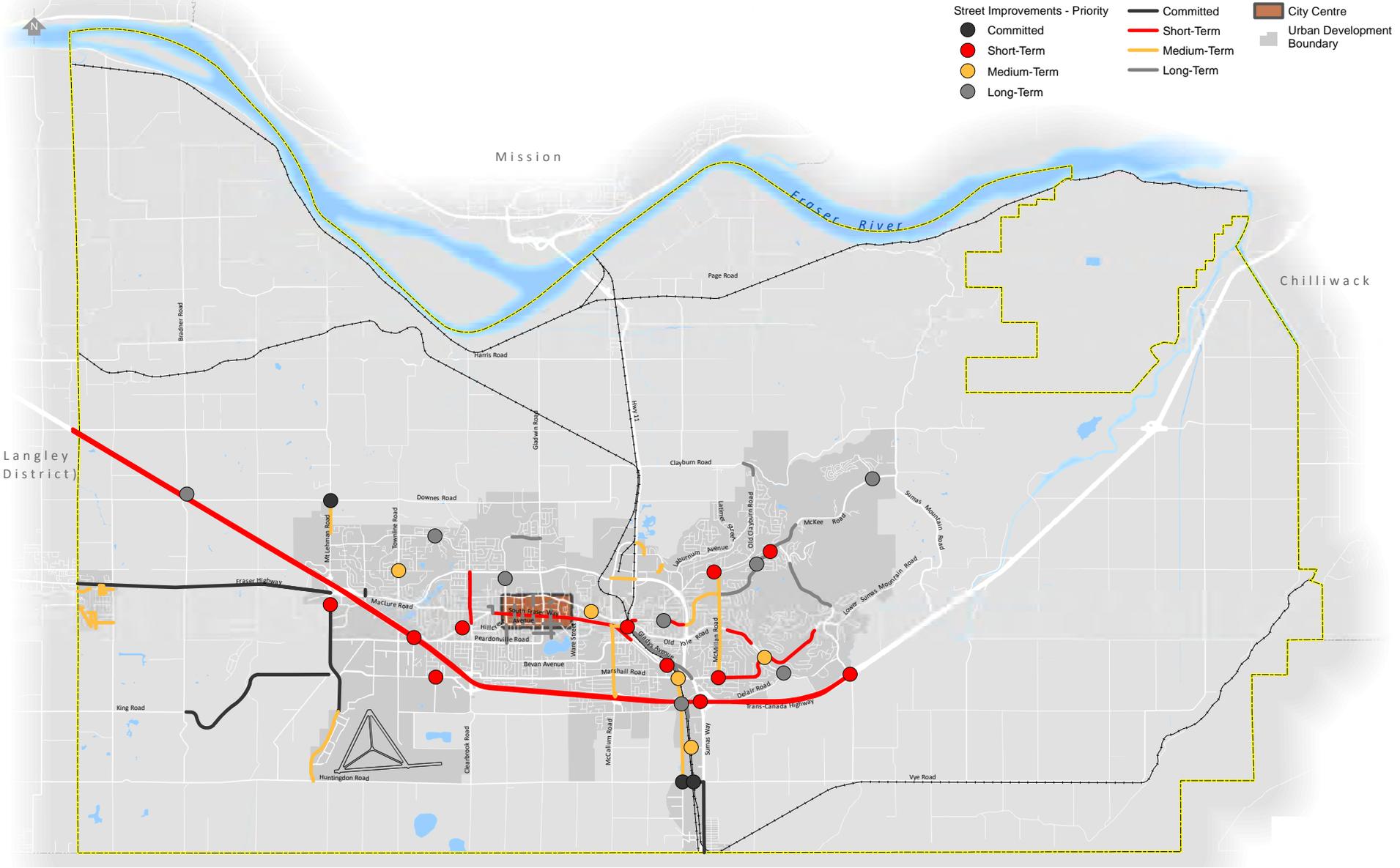


FIGURE 42 // STREET NETWORK PLAN PHASING STRATEGY



### 5.1.4 Funding Strategies

While the Transportation and Transit Master Plan is estimated to cost approximately \$390 - 410 million over the next 25 years and beyond, these costs can be shared by pursuing external funding from other levels of governments, partnerships with other organizations and the development industry, and integration of improvements with other plans and projects. This section describes several strategies that the City may consider to help leverage its investments and to maximize its ability to implement transportation improvements.

The City should pursue all available sources of funding for transportation facilities and programs, including the programs identified below. As funding opportunities change regularly, the information in this section is subject to change. The City should regularly check with all levels of government to keep up to date on current funding opportunities.

- **Capital Planning:** The City should incorporate the recommendations from the Transportation and Transit Master Plan into its short-, medium-, and long-term budgeting plans to ensure that the projects are accounted for in the City's capital planning process. To accommodate this, the City may seek changes to its capital budget to fund the implementation of this Plan over the medium- and long-term. The City should also seek to integrate transportation improvements with other capital projects, such as utility projects.
- **Developers:** An important component of the implementation of the Transportation and Transit Master Plan will be the City's ability to leverage transportation investments during planning of new development projects. Other ways in which transportation investments can be leveraged through developers include:
  - Voluntary public realm improvements;
  - Community amenity contributions;
  - Density bonusing contributions;
  - Funding in lieu of parking; and
  - Providing high quality bicycle parking facilities.

The City should also formalize the process for Developer Amenity Charges per unit for walking/cycling/transit infrastructure to include these charges not only at the rezoning stage but at other points in the development process

- **Provincial Programs and Initiatives:** The Provincial Government administers the BikeBC program, which promotes new, safe, and high-quality cycling infrastructure through cost-sharing with local governments. Some possible projects include new bicycle trails and bicycle lanes, improvements to existing cycling infrastructure, and providing for bicycle lockers and other equipment that makes cycling a safer and more convenient option for travellers. The BikeBC program provides funding for infrastructure which forms part of a bicycle network plan adopted by a BC local government. To ensure maximum success at obtaining grant funding, the District should have grant-ready concepts pre-developed for application.
- **Federal Funding:** There are several programs that provide funding for environmental and local transportation infrastructure projects in municipalities across Canada. Typically, the federal government contributes one third of the cost of municipal infrastructure projects. Provincial and municipal governments contribute the remaining funds, and in some instances, there may be private sector investment as well.
- **Green Municipal Funds:** The Federation of Canadian Municipalities manages the Green Municipal Fund, with a total allocation of \$550 million. This fund is intended to support municipal government efforts to reduce pollution, reduce greenhouse gas emissions, and improve quality of life. The expectation is that knowledge and experience gained in best practices and innovative environmental projects will be applied to national infrastructure projects.
- **Carbon Tax Rebate:** Each municipality that has signed the Climate Action Charter receives an annual rebased based on completion of the CARIP form. The City could choose to direct this funding towards sustainable transportation projects, such as funding bicycle, pedestrian, and transit infrastructure.
- **ICBC:** ICBC provides funding for road improvements, including pedestrian and bicycle infrastructure, particularly where these have the potential to reduce crashes, improve safety, and reduce claims costs to ICBC. Funding is available through ICBC's Road Improvement Program, and other ICBC programs include the Speed Watch Program (through the Community Policing Centres), Speed and Intersection Safety Program, Counter Attack, Operation Red Nose, and Road Sense Speaker Program for Schools.

- **Private Sector:** Many corporations wish to be good corporate neighbours—to be active in the community and to promote environmentally-beneficial causes. Bicycle and pedestrian routes and facilities in particular are well-suited to corporate sponsorship and have attracted significant sponsorship both at the local level and throughout North America. Examples in BC include Construction Aggregates in Sechelt, which constructed an overpass over a gravel conveyor to provide a link for pedestrians and cyclists, and 7-Eleven and Molson Breweries, which have sponsored multi-use pathways in Metro Vancouver.
- **Development Cost Charges:** The City has a DCC bylaw that should be updated to include projects identified in the Transportation and Transit Master Plan. It should be emphasized that DCC eligible projects should not only include street network projects but can also include active transportation and transit projects that benefit new growth in the community.

## 5.2 MONITORING STRATEGY

A monitoring strategy is essential to ensure that the Transportation and Transit Master Plan is implemented as intended, and to determine whether the plan is achieving its goals. A monitoring program will also enable City staff to justify continued expenditures and allocation of resources to implement prioritized initiatives of the Plan. Monitoring also provides a means of identifying changing conditions which would require changes to the Plan.

The monitoring program needs to be:

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

The monitoring strategy focus on two components: first, the degree of progress in implementing the plan, and secondly, the outcomes of the plan, as summarized below. It is recommended that the City of Abbotsford monitor progress in each of these areas every 1-2 years, based on data availability.

### 5.2.1 Implementation Progress

#### NUMBER OF COMPLETED PROJECTS IDENTIFIED IN THE STP

- Sidewalks (# projects)
- Bicycle Route (# projects)
- Transit (# projects)
- Street Network (# projects)

#### ANNUAL INVESTMENT LEVELS

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

#### NETWORK DEVELOPMENT

- Sidewalk network (km of existing facilities)
- Bicycle Network (km of existing facilities)
- Transit Network (km of frequent transit corridors)

### 5.2.2 Outcomes

#### MODE SHARE OF WORK TRIPS

- Walking (%)
- Cycling (%)
- Transit (%)

#### GHG EMISSIONS

- Transportation-related GHG emissions (tonnes)

#### SAFETY

- Total number of reported vehicle collisions per year
- Number of reported vehicle collisions per year resulting in injuries or fatalities
- Number of reported vehicle collisions per year involving pedestrians and cyclists

#### PROXIMITY

- Walking (% of road network with sidewalk)
- Cycling (% of City within 400 metres of existing bicycle route)
- Transit (% of City within 400 metres of transit route)





# **APPENDIX A:**

## **DETAILED STREET NETWORK PROJECTS**

PROJECT ID	PROJECT NAME	DESCRIPTION	PROJECT THEME	HORIZON	ESTIMATED COST	COMMENTS
1a	Marshall Road Connector (King Road to Mt. Lehman Road)	Major Connection	Committed Projects	C	-	Cost not show for committed projects
1b	Fraser Highway (Phase 1)	Major Connection	Committed Projects	C	-	Cost not show for committed projects
1e	Marshall Road Extension (Timberlane Drive to Mountain Drive)	Major Connection	Committed Projects	C	-	Cost not show for committed projects
1g	Marshall Road Extension (Old Yale Road to Timberlane Drive)	Road Widening	Committed Projects	C	-	Cost not show for committed projects
1f	Blue Jay Street (Maclure Road to Cardinal Avenue)	Capacity Improvements	Committed Projects	C	-	Cost not show for committed projects
5w	Downes Road at Mt. Lehman Road	New Traffic Signal	Committed Projects	C	-	Cost not show for committed projects
5z	Marshall Road at Foy Street	New Traffic Signal	Committed Projects	C	-	Cost not show for committed projects
5ff	South Fraser Way at Abbotsford Way	New Traffic Signal	Committed Projects	C	-	Cost not show for committed projects
3a	Maclure Connector (Highway 11 to McCallum Road)	Overpass Over Highway 11 and Interchange	Improve East-West Alternatives	MT	\$45,000,000	City and MOTI partnership
3b	George Ferguson Way	Capacity Improvements	Improve East-West Alternatives	ST	\$4,000,000	
3c	McKee Road Extension (Beck Road to McMillan Road)	Overpass Over Highway 11	Improve East-West Alternatives	MT	\$15,000,000	
3d	McKee Road (McMillan Road to Ledgeview Drive)	Capacity Improvements	Improve East-West Alternatives	LT	\$6,500,000	
3e	Marshall Road Rail Overpass	Overpass Over Railway	Improve East-West Alternatives	LT	\$50,000,000	FED and RR partnership
3f	Old Yale Road (Cameron Crescent to Eagle Mtn Drive)	Other Improvement - Road Widening	Improve East-West Alternatives	ST	\$4,000,000	
4a	South Fraser Way (Langdon Street to McDougall Ave)	Road Rebuild	Complete Streets	ST	\$19,800,000	
4b	Essendene Ave (South Fraser Way to West Railway Street)	Road Rebuild	Complete Streets	MT	\$1,500,000	
4c	McCallum Road (South Fraser Way to Highway 1)	Add Turn Lanes throughout, plus 4 Lanes	Complete Streets	MT	\$6,000,000	

**LEGEND:**

**C:** Committed  
**ST:** Short-term  
**MT:** Medium-term

**LT:** Long-term  
**MOTI:** Project funded by the Ministry of Transportation and Infrastructure

**NOTE:**

Property acquisition costs were not included in cost estimates listed above.

PROJECT ID	PROJECT NAME	DESCRIPTION	PROJECT THEME	HORIZON	ESTIMATED COST	COMMENTS
4d	Tretheway Street Extension (Hillcrest Avenue to Peardonville Road)	Major Connection	Complete Streets	LT	\$4,000,000	
4e	New Local Streets in City Centre Neighbourhood Plan	New Roads	Complete Streets	LT	\$9,000,000	
5a1	Fraser Highway (Phase 2)	Major Connection	Other Improvements	MT	\$18,000,000	
5a2	Fraser Highway (Phase 3)	Major Connection	Other Improvements	LT	\$28,000,000	
5b	Clearbrook Road (South Fraser Way to Maclure Road)	Add Turn Lanes throughout, plus 4 Lanes	Other Improvements	ST	\$3,400,000	
5c	Mt Lehman Road (Threshold Drive to Huntingdon Road)	Capacity Improvements	Other Improvements	MT	\$5,000,000	
5d	Highway 11 at McCallum Road (Connection to Hazelwood Avenue)	New Road	Other Improvements	MT	\$2,000,000	
5e	Vedder Way (McClary Avenue to Lonzo Road under Hwy 1)	New Road	Other Improvements	LT	\$8,300,000	
5f	Gladys Avenue (Lumar Place to Marshall Road)	Other Improvement - New Road	Other Improvements	LT	\$3,500,000	
5g	Gladys Avenue (Cyril Street to Marshall Road)	Other Improvement - Road Widening	Other Improvements	LT	\$4,600,000	
5h	Haida Drive (Ag-Rec to Gladwin Road)	Other Improvement - Road Widening	Other Improvements	LT	\$370,000	
5i	Marshall Road (McMillan Road to Old Yale Road)	Other Improvement - Road Widening	Other Improvements	ST	\$3,500,000	
5j	McMillan Road (Marshall Road to Old Clayburn Road)	Other Improvement - Road Widening	Other Improvements	MT	\$7,900,000	
5k	Mt. Lehman Road (Heritage Drive to Downes Road)	Other Improvement - Road Widening	Other Improvements	MT	\$2,000,000	
5l	Old Clayburn Road (S of Straiton Road)	Other Improvement - Road Widening	Other Improvements	LT	\$1,900,000	
5m	Blauson Boulevard at McKee Road	New Traffic Signal	Other Improvements	LT	\$300,000	
5n	Riverside Road (Huntingdon Road to Marshall Road)	Other Improvement - Road Widening	Other Improvements	MT	\$7,100,000	
5o	Whatcom Road (Westview Boulevard to Sandringham Drive)	Other Improvement - Road Widening	Other Improvements	LT	\$3,100,000	
5p	McConnell Road Rail Crossing	Rail Crossing	Other Improvements	MT	\$2,300,000	

**LEGEND:**

**C:** Committed  
**ST:** Short-term  
**MT:** Medium-term

**LT:** Long-term  
**MOTI:** Project funded by the Ministry of Transportation and Infrastructure

**NOTE:**

Property acquisition costs were not included in cost estimates listed above.

PROJECT ID	PROJECT NAME	DESCRIPTION	PROJECT THEME	HORIZON	ESTIMATED COST	COMMENTS
5q	Barrons Way Extension to McClary Avenue	New Road	Other Improvements	LT	\$300,000	
5r	Maclure Road (Park Lane to Elmwood Drive)	New Road	Other Improvements	MT	\$600,000	
5t	Blueridge Drive at Ridgeview Drive	New Traffic Signal	Other Improvements	LT	\$300,000	
5u	Delair Road at Old Yale Road	New Traffic Signal	Other Improvements	LT	\$300,000	
5v	Downes Road at Bradner Road	New Traffic Signal	Other Improvements	LT	\$300,000	
5w	Downes Road at Mt. Lehman Road	New Traffic Signal	Other Improvements	C	\$190,000	
5x	George Ferguson Way at Ash Street	New Traffic Signal	Other Improvements	LT	\$300,000	
5y	King Road at Riverside Road	New Traffic Signal	Other Improvements	LT	\$300,000	
5z	Marshall Road at Foy Street	New Traffic Signal	Other Improvements	C	\$200,000	
5aa	Marshall Road at McMillan Road	New Traffic Signal	Other Improvements	ST	\$300,000	
5bb	McKee Road at McKee Drive	New Traffic Signal	Other Improvements	LT	\$300,000	
5cc	Mouat Drive at Tretheway Street	New Traffic Signal	Other Improvements	LT	\$300,000	
5dd	Old Clayburn Road at High Drive/ McMillan Road	New Traffic Signal	Other Improvements	ST	\$300,000	
5ee	Old Yale Road at Marshall Road	New Traffic Signal	Other Improvements	MT	\$300,000	
5ff	South Fraser Way at Abbotsford Way	New Traffic Signal	Other Improvements	C	\$190,000	
5gg	Upper Maclure Road at Townline Road	New Traffic Signal	Other Improvements	MT	\$300,000	
5hh	Vye Road at Riverside Road	New Traffic Signal	Other Improvements	MT	\$300,000	
5ii	George Ferguson Road at Babic Street	New Traffic Signal (Upgrade from Pedestrian Signal)	Other Improvements	MT	\$150,000	
5jj	McKee Road at McKinley Drive	New Traffic Signal (Upgrade from Pedestrian Signal)	Other Improvements	ST	\$150,000	
5kk	South Fraser Way at Countess Street	New Traffic Signal (Upgrade from Pedestrian Signal)	Other Improvements	ST	\$150,000	
5ll	Montvue Avenue at West Railway Street	Other Improvement - Intersection Improvement	Other Improvements	ST	\$400,000	
5ll	Montvue Avenue at West Railway Street	Other Improvement - Intersection Improvement	Other Improvements	ST	\$400,000	
TOTAL COST					\$293,420,000	Includes City contributions to MOTI projects (see next page)

**LEGEND:**

**C:** Committed  
**ST:** Short-term  
**MT:** Medium-term

**LT:** Long-term  
**MOTI:** Project funded by the Ministry of Transportation and Infrastructure

**NOTE:**

Property acquisition costs were not included in cost estimates listed above.

## Projects with MOTI Connection:

PROJECT ID	PROJECT NAME	DESCRIPTION	PROJECT THEME	HORIZON	ESTIMATED COST	COMMENTS
1c	Mt. Lehman Road (Great Northern to Airport)	Major Connection	Committed Projects	C	Committed	MOTI-led project
1d	Highway 11 NEXUS and Vye Overpass	Road Widening and Railway Overpass	Committed Projects	C	Committed	MOTI, FED, and RR Partnership
2a	Highway 1 Widening	Other Improvement - Road Widening	Leverage Partnerships	ST	TBD - See comments	Funding, agreement, schedule, and design to be determined
2b	Highway 1 Peardonville Overpass	Overpass Over Highway 1	Leverage Partnerships	ST	\$15,000,000	Estimated City contribution: \$15,000,000 Estimated total project cost: \$45,000,000
2c	Highway 1 at Highway 11 Interchange	Interchange	Leverage Partnerships	ST	TBD - See comments	Funding, agreement, schedule, and design to be determined
2d	Highway 1 at Whatcom Interchange	Capacity Improvements	Leverage Partnerships	ST	\$7,000,000	Funding, agreement, schedule, and design to be determined
TOTAL COST					\$22,000,000	

### DISCLAIMER:

PROJECTS INVOLVING THE MINISTRY OF TRANSPORTATION WILL INVOLVE THE INTERESTS OF BOTH THE MINISTRY OF TRANSPORTATION AND THE CITY OF ABBOTSFORD. THESE PROJECTS ARE ONLY SHOWN IN ORDER OF THEIR "POTENTIAL" IMPORTANCE, HOWEVER, THE SCHEDULE CANNOT BE DETERMINED WITHOUT AGREEMENT FROM BOTH STAKEHOLDERS.

### LEGEND:

**C:** Committed  
**ST:** Short-term  
**MT:** Medium-term

**LT:** Long-term  
**MOTI:** Project funded by the Ministry of Transportation and Infrastructure



plan <sup>FOR</sup>   
200K

BUILDING THE HUB  
OF THE FRASER VALLEY