CITY OF COURTENAY

25 YEAR VISION FOR MULTI-MODAL TRANSPORTATION

Balanced Approach
Complete Streets
Infrastructure Investments
Active Public Realms

Our Roads, Our Places

FINAL REPORT | April, 2014

City of Courtenay

25 Year Vision for Multi-Modal Transportation
Final Report

Our Roads, Our Places

April, 2014

MORRISON HERSHFIELD

PLANNING + DESIGN

Table of Contents

List of Figures

List of Tables

List of Appendices

1 Introduction

The “City of Courtenay – 25 Year Vision for Multi-Modal Transportation” is a long range planning tool that provides a strategy for developing a multi-modal transportation network over the next 25 years.

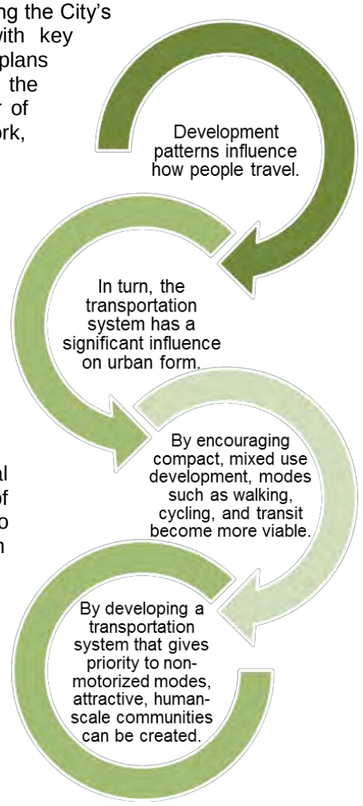
1.1 Overview

The Courtenay Multi-Modal Transportation Strategy provides a blueprint for meeting the City’s transportation needs over the next 25 years. Developed in consultation with key stakeholders and members of the public, the Strategy provides policies and work plans that, over time, will implement a balanced transportation system. In particular, the Strategy identifies deficiencies, prioritizes recommendations, and provides order of magnitude cost estimates for recommended upgrades to the transportation network, inclusive of pedestrian, cycling, and vehicular modes.

In many ways, the Strategy represents a “course-correction” for transportation planning. Traditionally, transportation planning studies have focused exclusively on the auto-vehicle mode. This study was founded on the aspiration of developing a framework for a transportation network which could meet anticipated demand requirements and encourage the modal shift towards City of Courtenay OCP 2020 mode share targets, which include a 19% reduction in the number of single-occupant automobile trips by 2020.

The Strategy recognizes the importance of creating a balanced transportation system that offers choice. Modes such as walking, cycling, and transit not only have environmental benefits, but also support important health, equity, and social objectives. At the same time, driving continues to be an essential mode of transportation for work, school, and recreation purposes, and it is important to provide a transportation system that operates both safely and efficiently, with minimal traffic congestion and delay.

Both shaper of and shaped by land use, transportation plays a significant role in the shape, feel, cost, and livability of our communities. As directed by the Provincial Local Government legislation, through the Regional Growth Strategy, and the Official Community Plan, transportation has been targeted as a key area to shape the future of Courtenay. Acknowledging this complexity and interplay with land use, the Strategy highlights the relationship between the transportation corridor and adjacent land uses. Many of the recommendations included in this Strategy extend beyond the traditional realm of transportation studies, to offer guidance on how to approach OCP reviews, the development of Local Area Plans, and other land use planning initiatives.



Transportation-Land Use Interaction

Roads are a major asset; they support the movement of people and goods, they provide access to key destinations, they define the urban realm. Moving forward, a plan is needed to ensure that roads do not become a liability, but instead become valued public spaces for all residents and all modes, meeting mobility needs both now and in the years to come. This report provides such a plan, and identifies the policies and action items that are needed to create an equitable, efficient, and environmentally responsible transportation system.

It is important to note that the Strategy has received significant public feedback and is an important tool to achieving long-term goals for the City, and the Region as a whole. When the development of this Strategy started 18 months ago, it provided an opportunity to pause and reflect on our transportation choices now and over the 25 year horizon. An unprecedented exercise for Courtenay, the Strategy is sure to have many expectations. It is important to note that this Strategy is an initial step on the course-corrected path, and therefore cannot provide all the levels of analysis and recommendations required to understand the full range of transportation investments required over the next 25 years. In addition, over time, the range of transportation planning tools that the City currently uses will undergo review to ensure that they reflect the Vision established by this Strategy. These detailed implementation steps will take time, many of which will be available for public comment.

The achievement of the Strategy’s Vision will require the on-going participation of its citizens. Many of the people who will be influencing the City’s development in 2037 are only children today. Providing opportunities for on-going dialogue and constructive approaches with the community will be an overarching ethos in all the on-going implementation work that is to occur over time. This is essential to ensure that the community has the best available information to participate in shaping Courtenay’s sustainable transportation path, now and in the future.

1.2 Study Purpose + Objectives

The process of developing a new Transportation Strategy for the City of Courtenay was initiated in June 2012 to support the planning for underground services and utilities (i.e. water and sewer lines). As a result, one of the key objectives of the project was to develop road network recommendations and cross-section requirements for establishing the location of underground infrastructure and ensuring efficient long-term maintenance of infrastructure assets.

At the same time, it was recognized that this project represents an opportunity for the City to change course and adopt a more holistic view to transportation planning that considers all travel modes. Accordingly, the study mandate included a comprehensive visioning exercise to ensure that the appropriate policies and infrastructure improvements are put in place to make the City’s vision a reality.

In developing the Courtenay Transportation Strategy, a number of guiding principles were adopted. The Strategy should:

- Reflect the **values and priorities** of the community, as articulated through a comprehensive public consultation process
- Accommodate future **population and employment growth**
- Consider the impact of **demographic trends** and the aging of the population
- Be **inclusive and equitable**, addressing the needs of all road users
- Incorporate transportation principles relating to **safety**, **accessibility**, **mobility**, **affordability** and the **environment**
- Capture the **interaction between transportation and land use** through an integrated planning process
- Encourage **greenhouse gas reductions**
- Support the **modal split goals** as outlined in the Official Community Plan

These guiding principles influenced and informed the study process, and are reflected in the recommendations provided in this report.

1.3 Consistency with Other Policies + Plans

The Transportation Strategy reflects and is guided by municipal and regional planning documents, including the Comox Valley Regional Growth Strategy (RGS) and City of Courtenay Official Community Plan (OCP).

In addition to outlining specific transportation goals, the OCP contains a number of vision elements and strategies that are relevant to transportation, as highlighted in Table 1. A key objective of the plan is to reduce greenhouse gas emissions by 20% below 2007 levels by 2020, in part by encouraging the use of more sustainable travel modes, such as walking, cycling, and transit.

Likewise, the RGS outlines a number of policy measures for developing an "accessible, efficient, and affordable multi-modal transportation network", centred around improvements to public transit use, bicycle and pedestrian infrastructure, and inter-regional transportation.

Figure 1 illustrates the relationship between the RGS, OCP, and new Transportation Strategy for Courtenay, along with the transportation vision and goals outlined in each. Since each document exists within a defined hierarchy, consistency in planning processes, tools, and objectives is achieved.

Figure 1. Hierarchy of Planning Documents

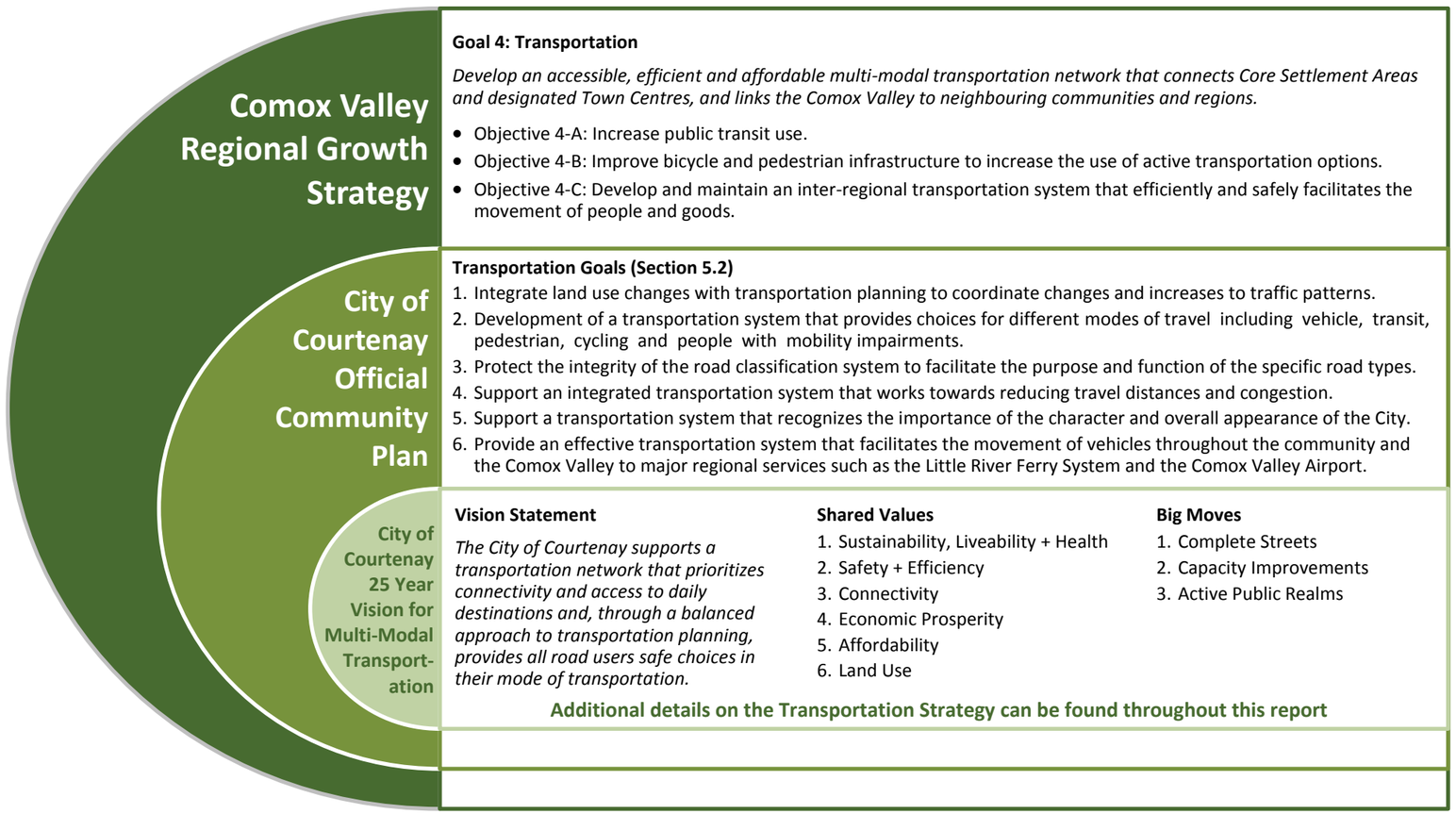


Table 1. Elements of the OCP with Implications for Transportation

VISION	RELEVANT STRATEGIES
A strong downtown	Pedestrian-oriented downtown Integrated, multi-modal transportation planning
An expanding system of parks, natural areas, and greenways	Strengthen the pedestrian environment and address mobility constraints Emphasize walking and cycling to school Continue the development of the Courtenay Riverway Concept along all river frontages in the City Encourage full access to area amenities
Balanced, sustainable development that embraces "smart growth" principles	Create neighbourhoods that are close to daily destinations Select the correct location for density such that new growth enhances the community and supports existing and new services Create more walkways and provide links between green spaces Foster alternative means of transportation Develop walkable neighbourhood guidelines
Highest levels of aesthetic design	Use infrastructure to creates a sense of place Enhance the attractiveness of the southern entry to the City

1.4 Study Process

The development of an effective multi-modal transportation strategy requires an appreciation of existing conditions, a vision for the future, and a roadmap for achieving that vision. For the City of Courtenay, a six-phase study process was adopted, as shown in Figure 2.

In carrying out the study, information was received from a number of sources, including the City of Courtenay Planning and Operational Services Departments, Town of Comox, and the Comox Valley Regional District. This information provided the foundation for developing the Transportation Strategy, and included land use projections, traffic volumes, road and land use mapping, results of previous studies, information on past and present initiatives, and other transportation data.

The study was led by a Steering Committee made up of City representatives, and included extensive public consultation.

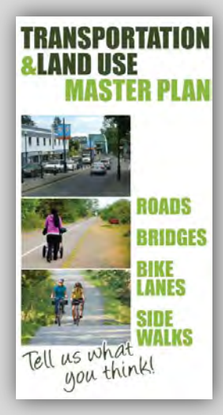
Figure 2. Study Process

1.5 Summary of Public Engagement Activities

Public and stakeholder input are critical to the success of the planning process. Public engagement was undertaken in two stages, as shown in Table 2. In total, over 800 people were engaged in the project, providing in excess of 9,000 ideas, comments, and answers to survey questions. Advertising of public consultation events was designed to attract broad-based participation from the public, with notices placed in the Comox Valley Record and Comox Valley Echo. Events were also advertised through radio and web-based media. A project website was developed and updated throughout the project, and media releases were issued to encourage residents to provide feedback.

Table 2. Public Engagement Approach

STAGE 1: Community Values + Vision	STAGE 2: Plan Direction
Stage 1 Objectives Gather information on three key topics: 1. **Demographic data** to understand who is participating in the study and how citizens and Comox Valley residents use the transportation system. 2. **Issues and opportunities** with the existing transportation system, including the identification of desired changes. 3. **Input on the overall vision** for the transportation system, including directed feedback on a series of proposed organizing principles.	**Stage 2 Objectives** Keep the public informed of plan progress: 1. **Present the draft plan** for public review and comment. 2. **Provide information** on how public input influenced the development of plan policies.
Through October and November 2012: • 1 community open house • 1 workshop for key stakeholder groups • 511 completed questionnaires	Through April and May 2013: • 1 community open house • Circulation of the plan to key stakeholder groups + stakeholder workshop • 303 completed questionnaires
Audience: stakeholders, comprised of organized interest groups, and provincial and municipal government departments and agencies, and members of the public.	



1.6 Putting the Strategy Together

During the initial phase of public consultation, six shared values were identified which speak to the aspects of the transportation system that Courtenay residents view as most important: sustainability, safety + efficiency, connectivity, economic prosperity, affordability, and land use (refer to Section 5). Based on these six values, a vision was developed that structures the Transportation Strategy, and informs the recommendations – or "big moves" – that will implement the Strategy.

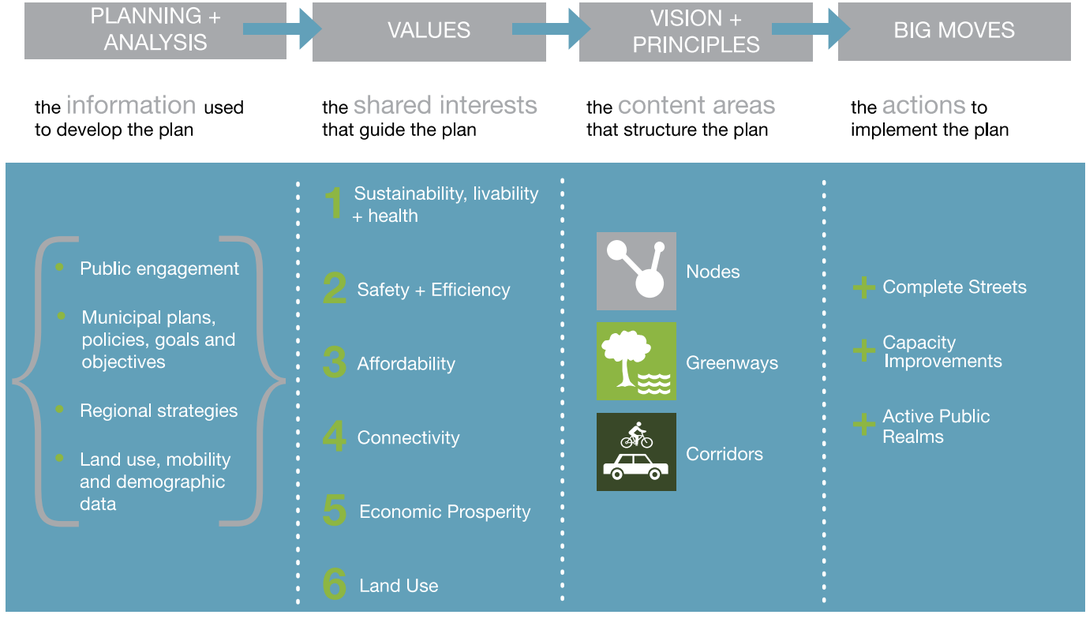
The vision is centered around three organizing principles:

1. **Nodes** | Areas that accommodate residential and commercial development
2. **Greenways** | Connections to and through 'green' areas of the city, including multi-use paths, trails, and street connections
3. **Corridors** | The streets and infrastructure elements that make up the transportation network

The Strategy reflects feedback from the public consultation, existing policies and plans, mode share targets as set in the OCP, development growth projections, and modelling of future travel activity to assess infrastructure needs.

Figure 3 illustrates how the Strategy is put together. Actions that will implement the Strategy are based on a vision for Nodes, Greenways, and Corridors that reflect shared community interests, and are based on careful analysis of information.

Figure 3. Transportation Planning Guide



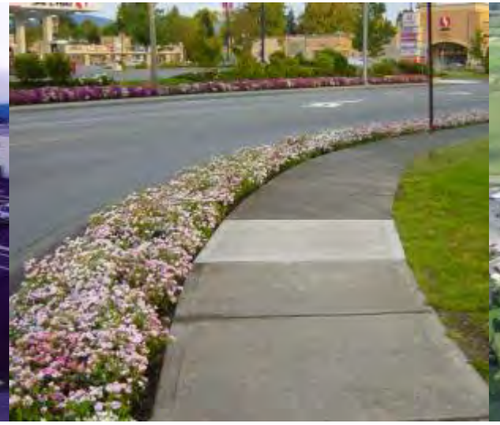
1.7 Organization of This Report

To chart a course for the future, it is first important to understand where Courtenay is today. **Section 2** of the report therefore begins with an overview of existing conditions. Following this discussion, **Section 3** presents key trends which are likely to influence transportation within the city over the coming years. **Section 4** provides a summary of how residents view the transportation system, including current satisfactions levels, issues and opportunities, and priorities moving forward. Based on the community's values and objectives, a Vision Statement for Courtenay was developed. This Vision Statement is presented in **Section 5**, and sets the context for the remainder of the document.

The following sections of the report comprise the heart of the Transportation Strategy. These sections illustrate the vision for nodes (**Section 6**), greenways (**Section 7**), and corridors (**Section 8**) and the three "big moves" (**Section 9**) that will be necessary to achieve these visions – complete streets, capacity improvements, and active public realms.

The final sections of the report describe a number of tools and recommendations to assist the City in moving forward. Taken together, these tools and recommendations provide a road map for achieving the City's vision of a balanced, sustainable, connected transportation system that accommodates and embraces all travel modes.





2 Courtenay Today

2.1 Existing Land Use

As noted on the City's website, Courtenay is a culturally diverse, scenic city located on the east coast of Vancouver Island within the traditional lands of the K'ómoks First Nation. With a population of just over 24,000, the city offers a safe and friendly environment to call home, but also boasts several regional destinations including a lively arts and cultural scene.

The city is blessed with several amenities including an extensive riverfront and an attractive downtown. The community includes a college, and will soon be home to a new hospital.

Residential development tends to favour single-family homes. Development patterns are typically low-density, making it difficult to provide efficient transit service. In newer subdivisions, street layouts are designed to accommodate local residents, but do not necessarily provide a high degree of accessibility for walking, cycling, and transit.

Retail development within the city is characterized by large-format retail stores; "strip" commercial development along Cliffe Avenue, Ryan Road, and Lerwick Road; and smaller-scale shops and services within the downtown.

Mixed-use development in Courtenay has been sporadic. Examples of mixed-use development can be found at 3030 Kilpatrick Avenue, 2420-2760 Cliffe Avenue, Rosewall Crescent (Tin Town), and certain downtown streets. While the City has implemented zoning to support mixed-use development, uptake has been slow, and there is opportunity to further encourage mixed-use nodes in new and existing neighbourhoods, including the downtown. The provision of new institutional, office, and residential uses downtown would help to promote a vibrant core. Such infill development would also support increased densities and contribute to a more compact urban form – both key objectives for creating walkable, livable communities.

2.2 Road Network

The City of Courtenay's road network includes a mix of higher and lower order facilities to accommodate **mobility** and **access** needs. The area is also served by several highways and grid roads under the jurisdiction of the BC Ministry of Transportation, including Highway 19 (the Inland Island Highway) and Highway 19A (the Island Highway), which connect communities across Vancouver Island.

- Highway 19A travels through central Courtenay along Cliffe Avenue, and crosses the Courtenay River via the 17th Street bridge
- Highway 19 is located west of the city, with connections provided at Piercy Road in the north and the Comox Valley Parkway in the south. However, the northerly connection has been criticized as being indirect, and requires the use of either the low-capacity Condensory Bridge or single lane bridge over the Tsolum River, depending on the direction of approach.

In addition to serving local travel needs, the Courtenay road network also connects with roads in neighbouring jurisdictions, facilitating inter-regional mobility within the larger Comox Valley.

Within the City of Courtenay, the road network is influenced by the area's natural features and topography, including the Courtenay River, Puntledge River, and Tsolum River. Of these, the Courtenay River has the greatest impact on traffic flow, bisecting the community and creating a barrier to the movement of vehicles, cyclists, and pedestrians. The two existing bridges over the Courtenay River have limited capacity, and the need for a third crossing has been discussed.

Courtenay's transportation system is generally car-dependent and relies on roads to connect commercial and residential land uses. Comments from the public consultation suggest that residents are reasonably happy with personal vehicle travel in the city, implying that most roads are operating well. However, road connections for cyclists and pedestrians are generally viewed less favourably due to a lack of cycling facilities linking key destinations, gaps in the sidewalk network, and safety concerns at crossings and intersections.

To reduce the impact of motor vehicle traffic in residential areas, traffic calming measures have been implemented in several areas of the city. The intent of such measures is to reduce cut-through traffic, control vehicle speeds, and generally create a more friendly environment for cyclists and pedestrians.

2.3 Transit Service

Transit in the Comox Valley currently includes three types of service:

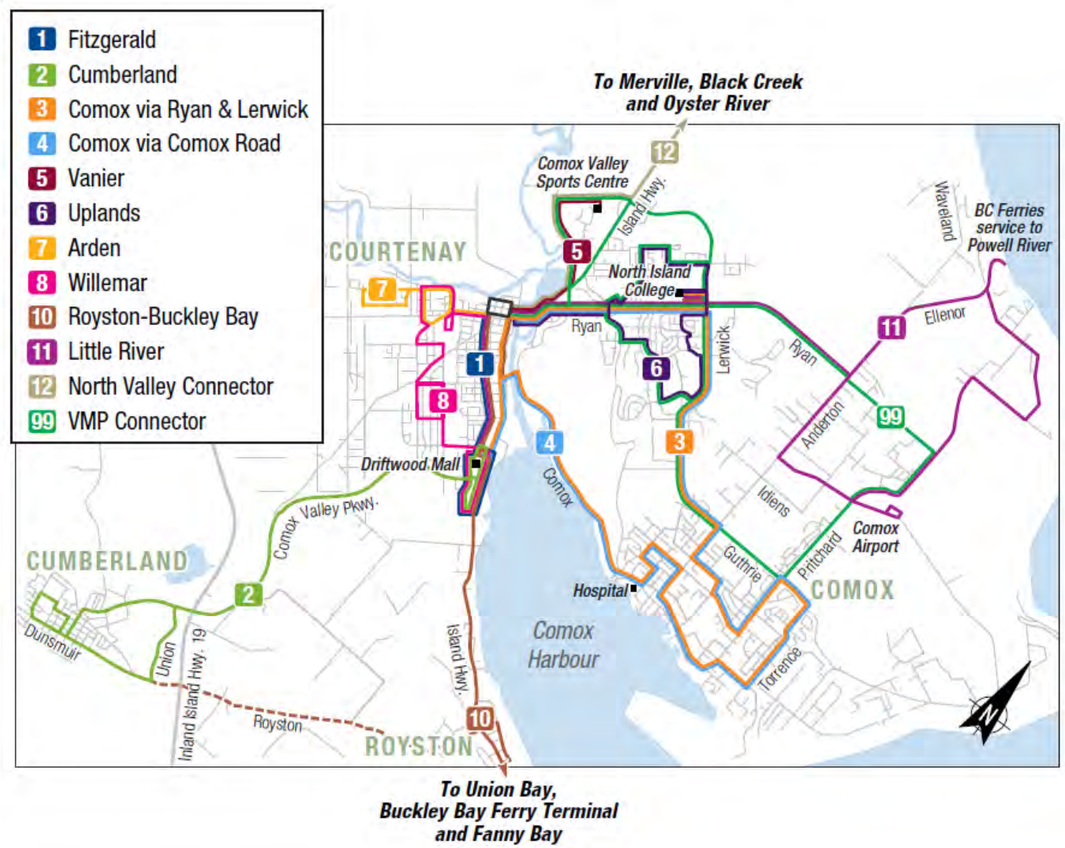
- Fixed-Route Transit – Includes scheduled service to major destinations and residential areas
- Community Bus – Fixed-route service that typically has lower levels of service to lower density areas, and may deviate within a given boundary based on demand
- handyDART – Door-to-door service for people who cannot use regular transit due to a disability

The fixed-route service operates regionally, and includes twelve bus routes which cover the City of Courtenay and the Town of Comox, as well as the Village of Cumberland and Electoral Areas. Transit exchanges are located at

Driftwood Mall, downtown Courtenay, North Island College, and the Comox Valley Sports Centre, with transit routes generally radiating outward from these locations.

Transit ridership rates in the City are low, with fewer than 3% of workers using transit to travel to work based on Statistics Canada data from 2011. Comments from the public suggest that more people would use transit if the service was more convenient, frequent, and reliable.

Funding for Comox Valley Transit is cost shared between the Comox Valley Regional District (CVRD) and BC Transit, with a portion of the funding derived from transit fares. The CVRD and BC Transit are currently in the process of preparing a Transit Plan for the Comox Valley.



2.4 Active Transportation

The proportion of work trips made by walking and cycling in Courtenay is relatively high compared to other communities in British Columbia with a similar labour force, and it would appear that the City is on the right track to creating a sustainable, multi-modal transportation system. However, network gaps and other barriers need to be addressed, especially if the City is to realize further increases in walking and cycling as called for in the Official Community Plan.

The City of Courtenay has a well-used and well-appreciated riverfront trail system which is a major asset to the community. A number of neighbourhoods, particularly newer ones, provide greenway or sidewalk linkages to promote pedestrian circulation within the neighbourhood; however, they are not cohesively connected to key destinations. Cycling routes have been identified, although few provide dedicated cycling infrastructure. Cyclists are generally integrated with traffic or accommodated on shoulders of varying widths and surface treatments. Some bicycle lanes are provided to separate cyclists from vehicle traffic, but a more extensive on-road network is needed to complement the city's off-road network. Key issues noted by the public include:

- Poor walking and cycling connections to major destinations (such as North Island College);
- Lack of safe pedestrian and cycling connections across the river;
- Lack of safe cycling routes and pedestrian crossings along busy roads; and
- Poor connectivity to cycling facilities in other jurisdictions.

To improve the provision of cycling routes throughout the Comox Valley, the City of Courtenay is working in partnership with the Town of Comox, Village of Cumberland, and Comox Valley Regional District. The Comox Valley Cycling Task Force is leading this work with input from the Cycling Public Advisory Committee.

3 Transportation Trends

3.1 Demographics

The transportation system exists within a unique socio-economic environment. Changes in this environment can thus have a significant impact on how the transportation system operates. One of the key socio-economic trends that is likely to have a major impact on transportation is the aging of the population. Demographic data for the City of Courtenay shows a disproportionately high number of senior citizens living in the city compared to the province as a whole. In the future, the number of seniors living in Courtenay is expected to become even more pronounced; by 2036, BCStats predicts that over 25% of the population in the city will be 65 or older. From a transportation perspective, the implications of this demographic shift are far-reaching:

- Data consistently shows that people aged 65 and older make fewer **trips per day** than their younger counterparts. For example, 2012 data from Metro Vancouver suggests that women in their forty's make between 3 and 3.5 trips per day on average, while women in their sixty's make just over 2.5 trips per day. By eighty, this figure has dropped to under two trips per day. A similar trend holds for men. Thus, as the proportion of seniors increases, the pressure on transportation facilities may be less than would otherwise be expected for a similar level of population growth.

- Seniors have different travel needs which influence **trip timing**. Some trips will be virtually eliminated, such as work trips, reducing demand on the road network when traffic tends to be greatest. Other trip types may increase. Trip **origin and destination patterns** will likewise be affected.

- Information from a 2005 Edmonton travel survey showed a change in **travel mode** as residents age. Interestingly, the proportion of travel by walking and transit by residents 65 years and older was generally similar to residents in the 45 to 65 year age category. However, the proportion of trips made by driving was noticeably lower, with a corresponding increase in the proportion of trips made as a car passenger. Such findings imply that seniors continue to enjoy active modes of transportation as they age, but may be less comfortable driving a vehicle – a task which requires visual, cognitive, and physical acuity.

- For those seniors who continue to drive, **route choice decisions** may be affected, for example, avoiding busy corridors in favour of lower-volume roads. Since seniors often have more flexibility than other residents, they may also choose to travel during less congested times.

- An aging demographic leads to an increased demand for **accessible transportation services**, including fully accessible conventional transit and more specialized services such as handyDART.

Transportation allows seniors to participate in society; for those seniors dependent on a car, isolation and loss of independence are a real concern if the ability to drive is lost. In British Columbia, all drivers over the age of 80 are required to have a Driver Medical Examination Report completed every two years. Based on the results of this report, further assessment may be required, including a driver re-examination (road test). Seniors who fail these tests have their driver's license revoked, significantly impacting their mobility.

A 2011 United Way study for the Lower Vancouver Mainland cites research claiming that the overall mobility of older adults is facilitated by access to a private vehicle. In one study, older non-drivers were found to make only half the number of trips as older drivers; in another study, non-drivers were fifteen times more likely to report that they frequently missed activities due to a lack of transportation. To address these issues, planning for seniors requires careful consideration of both the needs and abilities of older residents.

- As more people require mobility aids such as walkers, scooters, and wheelchairs, **accessibility** becomes a key consideration, influencing all aspects of the transportation system from design of parking facilities to sidewalks.

- **Pedestrian timing** at signalized intersections may need to be adjusted to reflect slower walking speeds.

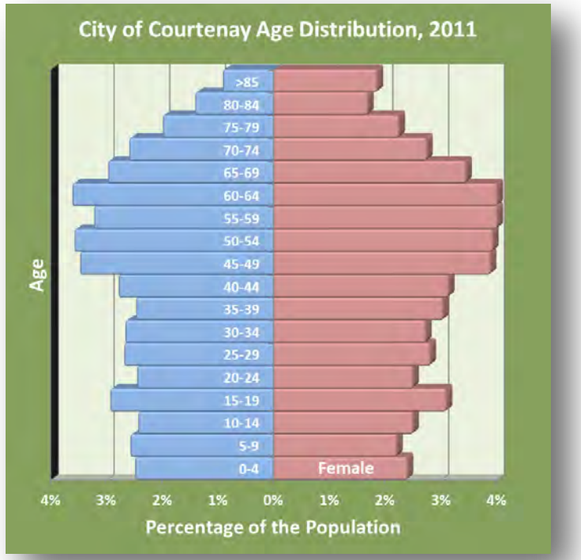
- **Benches** on trails will become more important to allow for convenient rest stops.

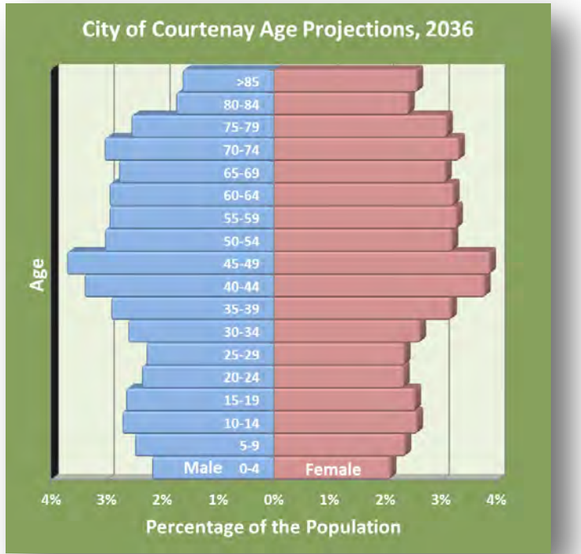
- Given the physical limitations of older drivers, improvements to **signage and wayfinding** may be necessary to improve legibility.

- To ensure equitable access to transportation, **transit service** is critical for seniors who are no longer able (or willing) to drive. For such service to be effective, route adjustments may be needed to better serve seniors' destinations.

Moving beyond transportation, it will be important to develop urban design and land use policies that address the needs of older residents. In particular, policies are needed that encourage compact, mixed-use, walkable communities. Seniors housing should be located in close proximity to shops and services, and well-served by transit. In developing policies for seniors, the location of seniors' destinations is key. In the case of Courtenay, some of the main destinations include:

- Downtown Courtenay: Numerous shops & services, Florence Filberg Centre (Evergreen Seniors Club), Vancouver Island Regional Library
- Lerwick Road / Ryan Road area: North Island College (ElderCollege), Comox Valley Hospital (under construction)
- Ryan Road / Island Highway area: The Lewis Centre
- Driftwood Mall / Anfield Road commercial area





3.2 Fuel Prices

Another key factor likely to influence travel behaviour is fuel price. As the cost of fuel increases, the amount of travel by motor vehicles tends to decrease as drivers choose to combine or forgo certain trips, shift travel modes, or reduce the trip length. To assess the net effect on vehicular activity, it is necessary to know how fuel prices are expected to change over time, and the likely impact of such changes on travel demand.

- Studies have shown that a 10% increase in fuel price will lead to a reduction in vehicular travel in the order of 0.5 to 1% in the short term, and 1.5 to 3% percent in the long term.

- The extent of the increase in the long term price of crude oil is uncertain. According to Natural Resources Canada, crude oil prices are widely anticipated to increase over the coming decades, but there is no clear consensus on future oil prices. Taking a conservative (low) approach, an increase in gasoline prices in the order of 25% to 50% from current levels would seem to be reasonable within the horizon of this Transportation Strategy.[1]

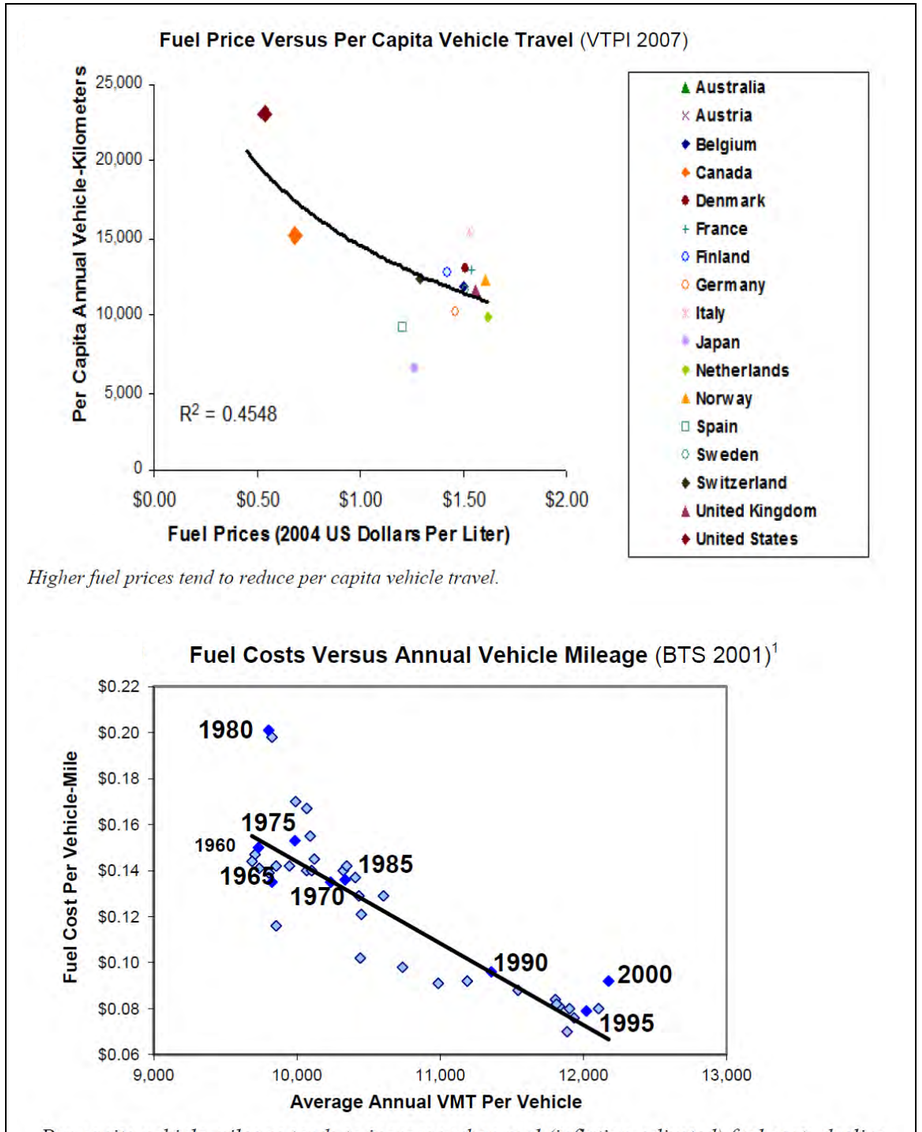
Should the above trends be realized, a long-term reduction in vehicle travel activity in the order of 4% to 15% would be anticipated. Since research has also shown a correlation between fuel cost and transit ridership, any reduction in vehicle travel would likely be accompanied by an increase in transit use. Depending on trip lengths, walking and cycling activity may also increase.

The above calculations do not account for the effect of other external factors that may influence the price motorists pay at the pump, such as federal or provincial tax regimes. Changes to vehicle insurance and registration fees, parking rates, or other similar measures may likewise increase the cost of operating a vehicle, and a corresponding impact on travel activity would be expected. At the same time, technology measures aimed at reducing fuel consumption (such the adoption of hybrid or electric vehicles) may dampen the price effect to a certain extent.

[1] Based on data from Natural Resources Canada, crude oil predictions for 2025 vary widely, from roughly $90 per barrel (in 2008 U.S. dollars) to over $150 per barrel. Compared to the 2010 projections reported by NRCan, this represents a potential increase of between 50% and 200% (Canadian Crude Oil, Natural Gas and Petroleum Products: Review of 2009 and Outlook to 2030, May 2011, Petroleum Resources Branch, Energy Sector, Natural Resources Canada).

The U.S. Energy Information Administration's 2013 *Annual Energy Outlook* suggests that motor gasoline prices will grow by 0.8% per year between 2011 and 2040 (measured in 2011 dollars), for an overall net increase of 26%. At the same time, crude oil prices over this interval are expected to roughly double. These values are based on the "reference scenario" – a high and low scenario are also defined.

Figure 4. Correlation Between Fuel Price and Vehicle Travel Activity



Source: *Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior*, Sept. 10, 2012, Todd Litman, Victoria Transport Policy Institute, Figures 8 and 10.

3.3 Sustainability & Greenhouse Gas Reduction

The Official Community Plan (OCP) for the City of Courtenay recognizes the need to address climate change in order to support both global and local sustainability objectives. Within the OCP, the City has adopted goals to reduce greenhouse gas emissions by 20% below 2007 levels by 2020. Transportation-related emissions have been identified as the largest contributor to greenhouse gas emissions within the city, and as a result, ambitious mode share targets have been established to reduce emissions from the transportation sector. These targets call for a significant increase in walking, cycling, and transit, and will require a fundamental shift in how people move about the city to meet daily needs.

The graphs below illustrate the current percentage of work trips made by 'sustainable' modes, the corresponding 2020 target from the OCP, and the mode share achieved to date in other British Columbia jurisdictions with a similar labour force (ordered from lowest to highest). The data is based on 2011 journey-to-work figures from Statistics Canada, and may not be representative of other trip purposes.

- On the cycling front, Courtenay is doing well compared to other communities. However, a substantial increase in cycling is needed to achieve the City's 2020 cycling mode share target of 10%.
- Courtenay is also doing well on the walking front, with a slightly higher than average pedestrian modal share. In order to reach the 2020 target for walking, a doubling of the current (2011) modal share is required.
- On the transit front, there is considerable room for improvement. However, several other communities have achieved the 5% transit mode share target adopted by the City, implying that this target is attainable if the appropriate measures are put in place.

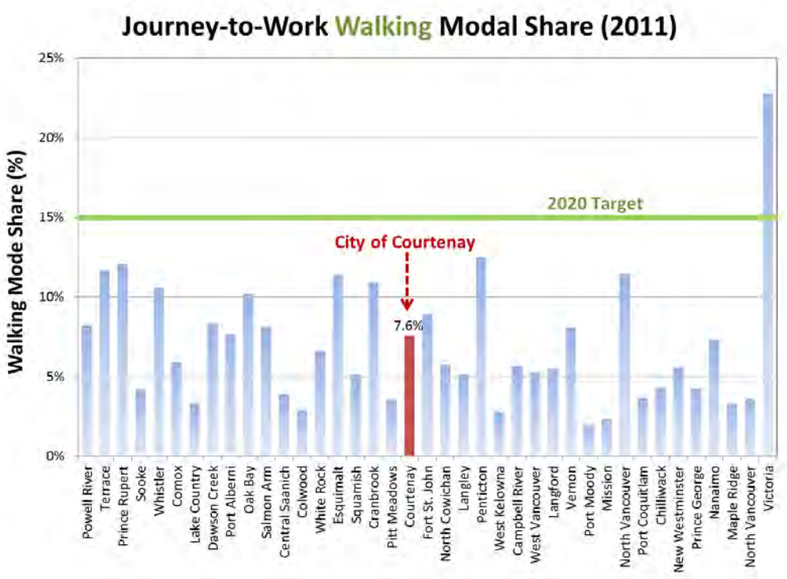
City of Courtenay Official Community Plan – Commitment to Climate Action

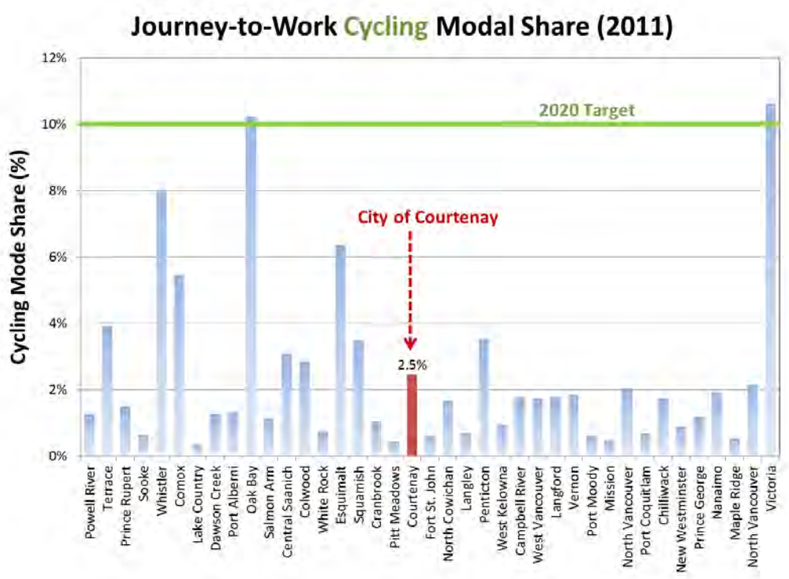
Goal: Reduce the City's annual community-wide greenhouse gas emissions 20% below 2007 levels by 2020.

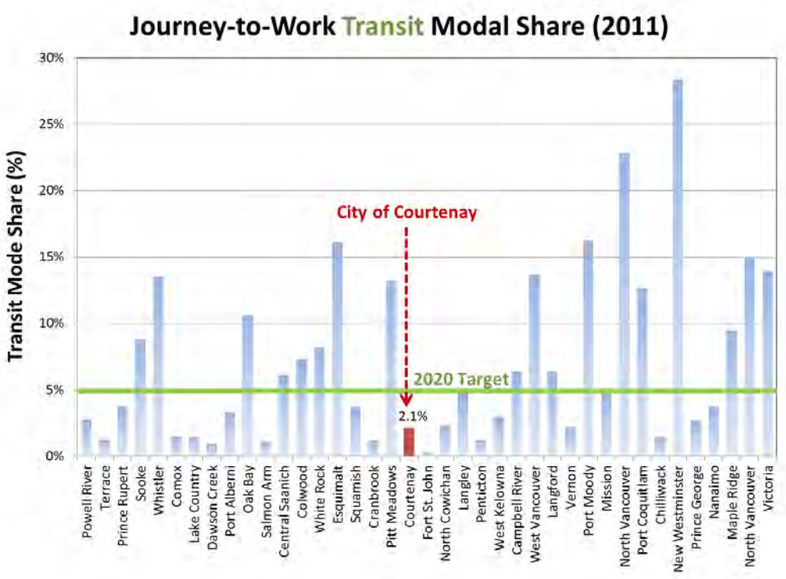
Strategy for Transportation: Adopt a "mobility management" approach that prioritizes active modes of transportation over motorized modes.

Key Policies

Encourage & support initiatives that reduce passenger vehicle travel
Create a Pedestrian and Cycling Plan, and promote walking /cycling as important transportation modes
Reduce the ratio of parking for new developments
Work to improve transit service
Increase capital spending on walking & cycling infrastructure
Implement land use policies that minimize trip distances and encourage the use of alternative travel modes







4 Community Perspectives

Extensive public consultation was carried out to gain insight on transportation perspectives within the community. Based on the results of this exercise, City of Courtenay residents envision a transportation system that is efficient, connected, multi-modal, accessible, useable, and safe.

Community perspectives on the transportation and land use systems were collected and analyzed, and inform the vision, principles, policy recommendations, and priority actions contained in the Transportation Strategy.

Detailed analysis of public engagement is provided in the *What We Heard Summary Report*, included in Appendix I.

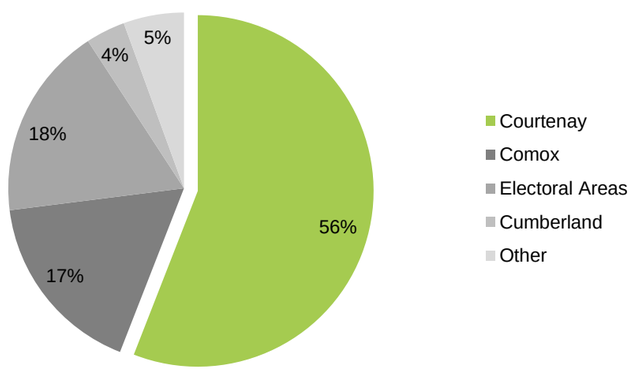
4.1 Resident Representation

Demographic data collected through the questionnaires provides insight into who is participating in the study. The data suggest that study participation represents a good balance of transportation system users, in terms of geographic representation, age distribution, and mode use. The quality and diversity of responses provide a comprehensive understanding of transportation values, issues and opportunities.

4.1.1 Geographic Representation

Given the interconnected nature of transportation systems, it is to be expected that interest in the study will extend beyond the City of Courtenay's municipal boundaries. As shown in Figure 5, 56% of survey respondents report residing in Courtenay. 17% report residing in Comox, and 18% report residing in Electoral Areas A, B, and C.

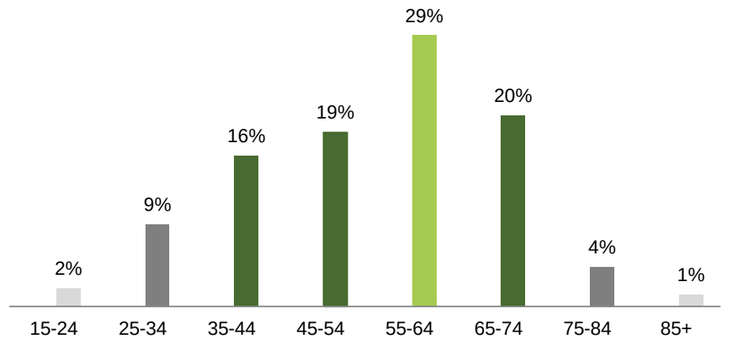
Figure 5. Area of Residence



4.1.2 Demographic Representation

Middle-aged and older adults were more likely to participate in the study, which led to a slight under-representation of adults under the age of 34, as shown in Figure 6.

Figure 6. Respondent Age Distribution



4.1.3 User Representation

The majority of respondents indicate that their primary mode of transportation is the private vehicle. Respondents report that walking and cycling are used as supplementary modes of transportation. Transit and other modes are used at considerably lower rates.

4.2 Core Themes

A coarse grain analysis of engagement input revealed a number of comments and concepts frequently repeated throughout Stage 1 engagement activities. A vision for the Transportation Strategy was distilled from these themes and is presented in Section 5.

The word cloud in Figure 7 helps conceptualize the frequency of comments received, with the larger words being heard most often.

Figure 7. Core Themes Word Cloud

A finer grained analysis defined the following core themes:

- **Efficiency.** Users want an efficient system where traffic flows smoothly, the road system is viable for all users and investment in the transportation network is environmentally and economically sustainable.

- **Connectivity.** It is important to users that all modes of travel feature a high degree of connectivity, allowing them to get to where they want to go.
  - For **pedestrians and cyclists**, connectivity means a linked network of sidewalks, pathways and bike lanes that provides access to destinations.
  - For **drivers**, connectivity means continuous traffic flow and improving access across the river and north of the city.
  - For **transit users**, connectivity means transit service that conveniently links people to destinations.

- **Choice.** Many respondents want the City to reduce car dependency and increase cycling and walking rates. Users would like multiple transportation options for commuting, recreation and to improve overall health.

- **Safety.** Safer streets for walking and cycling would encourage users to walk or cycle more often. Also, many drivers suggest that safer infrastructure would improve travel flow.

- **Infrastructure deficiencies.** A number of infrastructure deficiencies with the roadway network require attention, including:
  - Disconnected walking and cycling network.
  - Concerns about congestion and circulation, particularly at the river crossings.
  - Roadways in need of repair.

- **Supportive land use.** Respondents suggest that areas such as the downtown, the waterfront and residential communities should allow for high levels of pedestrian access and cycling connectivity.

4.3 What We Heard

Transportation system satisfaction rates and insightful comments provide a comprehensive picture of opportunities and issues to be addressed by the Transportation Strategy. The transportation system satisfaction rates are illustrated in Figure 8 along with a brief, illustrated overview of specific opportunities and issues identified through an analysis of respondent comments.

The information presented in Figure 8 is based on the results of the initial stage of public consultation, which focused on assessment of community values and development of a transportation vision. Following this initial consultation, a draft Transportation Strategy was developed. This Strategy was based on what we heard from stakeholders and the public, as well as existing policy documents and analysis of future transportation needs. Feedback from Stage 1 suggested a balanced approach to transportation, and the study team adopted a complete streets framework to develop and recommend policies and infrastructure projects.

Stage 2 of the public engagement process was undertaken to present the draft Transportation Strategy and solicit comments. Input from this stage indicated that the vision and policy framework recommended in the Strategy are consistent with desired improvements to walking and cycling conditions, and helped refine the prioritization of recommended actions and infrastructure projects.

Public input has been critical to the development of the Transportation Strategy. The study team thanks everyone who participated for their time and thoughtful responses.

COMMUNITY PERSPECTIVES

Public input is critical to the success of the Transportation Plan; here is what we heard.

What We Heard

+ **Maintain good levels of vehicle service**
+ **Improve my ability to bike, walk, and take transit**
+ **Fix congestion at river crossing**

814 completed surveys

75% satisfied with vehicle travel

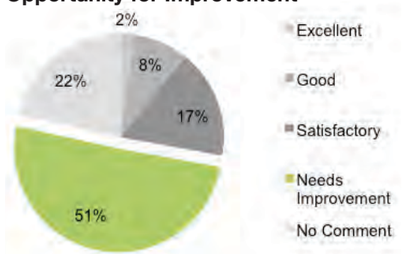
Most commonly heard comment: provide me with the ability to use multiple modes

Satisfaction Rates

PERSONAL VEHICLE TRAVEL
Highest Satisfaction Rate of Any Mode

BICYCLE TRAVEL
Lowest Satisfaction Rate of Any Mode

TRANSIT TRAVEL
Opportunity for Improvement



PEDESTRIAN TRAVEL
Satisfaction Could be Improved

Figure 8. Issues and Opportunities

sustainability, the process to achieve balanced environmental responsibility, economic efficiency, and social well-being embracing and supporting **transportation and land use systems** the relationship between

5 Vision Statement

"The City of Courtenay supports a transportation network that prioritizes connectivity and access to daily destinations and, through a balanced approach to transportation planning, provides all road users safe choices in their mode of transportation."

The vision for Courtenay's transportation system is informed by **six shared values** that emerged out of the citizen and stakeholder engagement. These values have guided the development of principles, goals, actions, and implementation priorities that form the basis of the Transportation Strategy. The following statements describe how Courtenay's transportation system will look in the future, based on the City's vision. The statements are organized around the six shared values, and are written from the perspective of someone living in the future, describing the features and characteristics of the multi-modal transportation network that has been achieved.

1. Sustainability, Liveability + Health

"I would like to see a system that emphasizes and supports greener modes of travel - pedestrian, cycling and public transport."

In the future, active and sustainable modes of transportation support a more balanced, **environmentally responsible** transportation system. **Cycling infrastructure is high quality**, well-connected, and designed for all levels of riders; **walking is convenient** due to the availability of paths, wide sidewalks, and amenities; and **transit service** is enhanced to create a more useable and accessible system. Travel demand management supports the use of alternatives such as teleworking and carpooling, while discouraging the use of the personal automobile. **Accessibility for persons with disabilities** is a priority, with improvements such as a fully accessible transit system and curb cuts at intersections.

2. Safety + Efficiency

All elements of the City's transportation system are designed to the highest standard, and can be **safely used by residents of all ages and abilities**. As the most vulnerable road users, pedestrians and cyclists are afforded special consideration through the provision of appropriate infrastructure and supportive policies and programs.

"I would like to be able to ride a bicycle and walk in a very safe manner."

"Ensure main arterial roads are not congested and flow freely."

Traffic flows smoothly and efficiently with minimal congestion. Such efficiency is achieved through a balanced approach to traffic management that includes optimization of existing infrastructure through improvements to signal timing and intersection design; the adoption of innovative traffic control treatments such as roundabouts; and investment in additional road capacity where warranted.

3. Connectivity

The City of Courtenay's transportation system provides a **high degree of connectivity for all modes**, linking destinations across the city. Investment in bike lanes and multi-use paths has created a well-connected pedestrian and cycling network for both recreational and commuting purposes.

"User friendly main traffic corridors around core areas i.e. complete connection of Piercy in north."

Modes are integrated, making it easy to transfer from one mode to another while travelling throughout the city. Travel between jurisdictions is also facilitated by providing a seamless transportation system throughout the Comox Valley – the result of **enhanced consultation and collaboration** amongst area stakeholders.

"I would like to see more bike lanes connecting crucial locations in the community: Downtown- NIC, the mall and main complexes, Comox, Cumberland, etc."

4. Economic Prosperity

The City of Courtenay's transportation network **promotes economic prosperity** by providing a high degree of mobility, supporting goods movement, and attracting businesses and investment. Access to the Inner Island Highway is enhanced, and appropriate measures are in place to support a **vibrant downtown**.

"Please create spaces where people can shop and socialize."

5. Affordability

The transportation system is **affordable and financially sustainable**. A range of mobility options is provided to suit all budgets, ensuring equitable access to transportation regardless of income. At the municipal level, infrastructure budgets are sensitive to the many competing priorities facing the City – transportation needs are met, without compromising the ability to fund other essential programs and services. Relationships are developed with local businesses and organizations to leverage the expertise, resources, and enthusiasm of these groups, and alternative funding sources are explored, including partnerships with higher levels of government. Project delivery is efficient, with the objective of achieving the greatest value over the project life cycle. Investment in alternative modes of transportation is pursued to help avoid or defer the cost of future road widening or expansion.

"...that doesn't cost the individual or the collective the lions share of municipal budgets."

6. Land Use

The City of Courtenay encourages development patterns that foster a **compact urban form**, creating more livable communities that support a variety of travel modes.

6 Nodes

Nodes are a planning concept that delineate where residential and commercial growth will occur. Nodes are characterized by a defined sense of place with high levels of community connectivity within and between nodes.

Nodes are an organizing principle for the Courtenay Transportation Strategy and are based on three key concepts that reflect the strategy's vision and shared values.

Sense of Place

Nodes define a clear sense place, delineating focal points and activity areas within the community to create a rich and vibrant public realm.

Community Connectivity

Nodes are easy to access and move through on foot, by bicycle and by car.

Growth Areas

Nodes integrate a mix of uses in the urban fabric that can accommodate residential and commercial growth at densities suited to the community's character.

The Nodes vision is presented in Figure 9.

6.1 Land Use System

Nodes that are compact contain land uses that are connected and promote neighbourhoods that are livable, reflect a sense of place, and support a range of mobility choices. The land use system organizes the built environment and defines the development patterns and road network that ultimately shape how a city looks and feels. A land use system that directs new growth into nodes creates opportunities for connected, accessible, and affordable development patterns.

Consultation and planning activities highlight the importance of improved connectivity to help residents better access daily needs in ways that are convenient, efficient, and sustainable. Further, the City of Courtenay Official Community Plan (OCP) provides overall direction to "select the correct location for density" for the development of a sustainable land use system in which "new growth enhances the community and supports existing and new services" (OCP 2011). A growth node framework that promotes sustainable, connected land use is presented in Table 3.

Table 3. Growth Node Framework

NODE TYPE	PURPOSE
Residential	Accommodates new residential growth and supports existing community services, integrates a mix of neighbourhood-level uses and is proximate to commercial nodes. Residential nodes promote accessible and connected development patterns and take advantage of opportunities for densification.
Commercial + Community Services	Major commercial and community services destinations are integrated with the urban fabric and represent significant opportunities for achieving increased density.
Downtown	The downtown is vibrant, pedestrian-focused, and linked to the Greenway Network. Mixed-use, higher-density development promotes compact urban form within the core of the city. It is an ideal and accessible location for new cultural, office, and institutional uses.

6.2 Growth Node Concepts

The growth node framework identifies different node types that will accommodate residential, commercial, and community growth. Each node type is conceptualized on the following pages, including general planning recommendations for the following considerations:

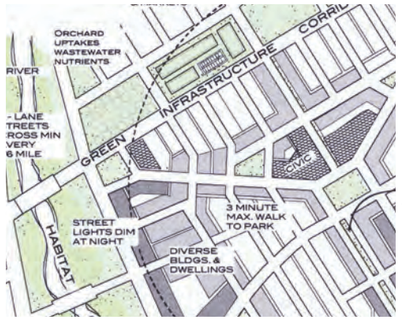
- **Urban Form** | the land use patterns and building types that shape scale, density, use and activity
- **Connectivity** | the density of network connections and the directness of links that help a person move through the built environment
- **Local Character** | the place-based context of an area that reflects its built, social and natural environments
- **Public Realm** | the spaces defined by the relationships between road form and function and land use, building scale and design

Figure 9 to Figure 12 illustrate the various growth node types, while Appendix D presents a series of tools for implementing the planning concepts. Policy direction and priority actions required to adopt and use these tools are discussed in Section 10.

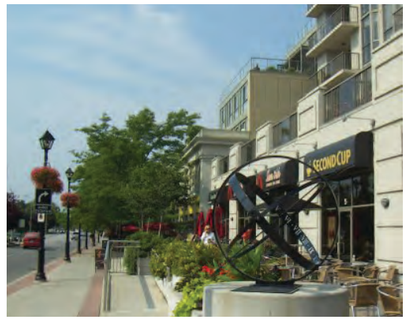
NODES

"Nodes are mixed-use areas that accommodate residential and commercial growth. Nodes are characterized by a defined sense of place with high levels of community connectivity."

SENSE OF PLACE
Nodes define a clear sense place, delineating focal points and activity areas within the community to create a rich and vibrant public realm.



COMMUNITY CONNECTIVITY
Nodes are easy to access and move through on foot, by bicycle and by car.



GROWTH AREAS
Nodes integrate a mix of uses in the urban fabric that can accommodate residential and commercial growth at densities suited to the community's character.

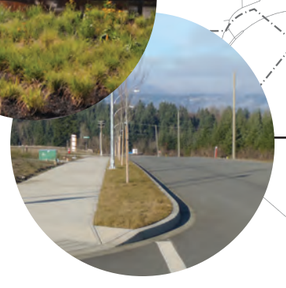
Downtown is the focal point of community activity.

Connected streets include short, direct links.

Cliffe Ave extends the downtown experience along an intensified commercial corridor.

A landscaped gateway defines the southern entrance to the City.

Commercial services support new residential development.



Ryan/Lerwick commercial /community services node anchors new mixed-use development.

A mix of uses and building types encourage the intensification of residential and commercial land use in this node.

Connectivity between residential neighbourhoods and the Ryan Road/ Island Highway commercial node is improved by providing convenient pedestrian and cycling facilities.

Figure 9. Nodes Vision

RESIDENTIAL NODES

Provide housing and mobility choices that promote a mix of housing types, active lifestyles and complimentary land uses. Residential nodes support community connectivity and a dynamic, livable public realm at the neighbourhood scale.

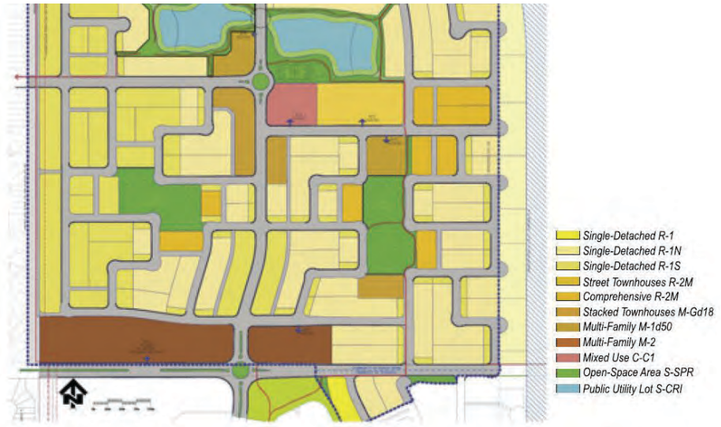
+ Urbsworks, Inc.

Through-block path enhances connectivity.

Urban Form	- Orient residential neighbourhoods around focal points for community activity, such as parks, corner stores, and community centres. - A walkable, cohesive unit that: • Flexibly accommodates varied housing formats to increase residential densities. • Integrates uses that provide daily needs while maintaining community character.
Connectivity	- Encourage walking and cycling by providing short, direct links to neighbourhood-level destinations (e.g. parks and small-scale goods and service clusters). - Decrease travel distance for pedestrians and cyclists with numerous links into and out of residential areas.
Local Character	- Employ context-sensitive design strategies. to ensure that increased use, density and activity reflects local neighbourhood characteristics. - Encourage the adaptive reuse of existing buildings.
Public Realm	Define a clear sense of place rooted in neighbourhood safety and community vitality: - Streetscaping and frontyard setbacks create a sense of dwelling and belonging. - Design roadway infrastructure to privilege pedestrian and bicycle comfort and mobility. - Buildings face outwards, placing “eyes on the street”.

+ Ross Chapin Architects

Arrangement of sidewalks, tree planting and residential setbacks define the public realm.



+ Urbsworks, Inc.

Connected street patterns and a variety of housing types, uses and activities create a walkable neighbourhood in this residential site plan in Portland, OR.

+ O2 Planning + Design

A neighbourhood-level service (market café) that is well-integrated in a residential neighbourhood through adaptive re-use of an existing building.

+ Ross Chapin Architects

Shared public green space is a focal point in a residential development, Vancouver, BC.

Figure 10. Residential Node Concept

COMMERCIAL + COMMUNITY SERVICES NODES

Provide community- and regional-scale services that are easily accessible by multiple modes. Service nodes feature context-sensitive, compact building types that are integrated with the urban fabric.

Urban Form	- Anchor service nodes around destinations that increase the intensity of uses and activities (e.g. higher density housing, grocery stores, civic buildings, commercial retail). - Provide a range of building types that flexibly accommodate employment, commercial and some residential uses. - Consider air quality impacts on susceptible populations when siting buildings near busy intersections (> 15,000 vehicles/day).
Connectivity	- On-site links encourage pedestrian circulation. - Off-site links increase access to the site, including multiple entry points for pedestrians and cyclists and defined destinations serviced by transit.
Local Character	- Encourage the concentration of specialized service areas in locations with defined user profiles/needs (e.g. health services primarily located at the hospital node). - Apply design guidelines to ensure that development is in keeping with size, scale and densities appropriate for the broader neighbourhood context.
Public Realm	Define a clear sense of place that animates social activity and interaction: - A mix of uses and pedestrian activity creates an animated public realm. - Balance multi-modal access to the node with pedestrian-focused circulation within the node. - Streetscaping and setbacks create engaging activity zones. - Site buildings on the front of the street and parking in back to create a more active street that is welcoming to pedestrians, cyclists and transit users.

Wide sidewalks + amenities create a pedestrian zone in front of low-rise redevelopment (concept)

+ O2 Planning + Design

Mix of residential, commercial and institutional uses orient an arterial road, balanced by connected open space, Zagreb, CRO

+ World Architects

Short links and multiple access points promote high levels of on- and off-site pedestrian, cycling and vehicular connectivity in the commercial site plan for Uptown Centre in Victoria, BC

+ Bunt & Associates

Figure 11. Commercial + Community Services Node Concept
City of Courtenay 25 Year Vision for Multi-Modal Transportation | Final Report - April, 2014

DOWNTOWN NODE

A vibrant destination for civic elements, business and shopping needs. The downtown is highly walkable and encourages infill and mixed use development that continues its compact urban form.

Urban Form

- Anchor the downtown with major cultural and social destinations (heritage and civic buildings, boutiques, restaurants) complemented by residential and recreation uses.
- Vary the intensity and scale of uses and buildings to draw a mix of users at different times of day.

Connectivity

- Encourage walking and transit use, and provide safe cycling infrastructure within the downtown.
- Link the downtown to the Greenway Network.
- Define and manage clear vehicular travel patterns to maintain the pedestrian focus.

Local Character

- Enrich the urban fabric and heritage character through infill and redevelopment of underused blocks and lots, such as the Palace Theatre site.
- Follow minimum and maximum density targets to guide intensification and promote a compact urban form.

Public Realm

Define a clear sense of place that reflects the city's unique heritage, values and characteristics:

- A mix of uses and pedestrian activity animates the public realm.
- High-quality design creates comfort and vitality (e.g. wooden signs, riverfront improvements, library design in Courtenay).
- Streetscaping and setbacks delineate outdoor rooms and emphasize the interactivity between private and public realms.
- Public space programming takes full advantage of road closure opportunities (e.g. market days).

Market Day in Courtenay, BC

+ City of Courtenay

Wide sidewalks encourage walking, Ottawa, ON

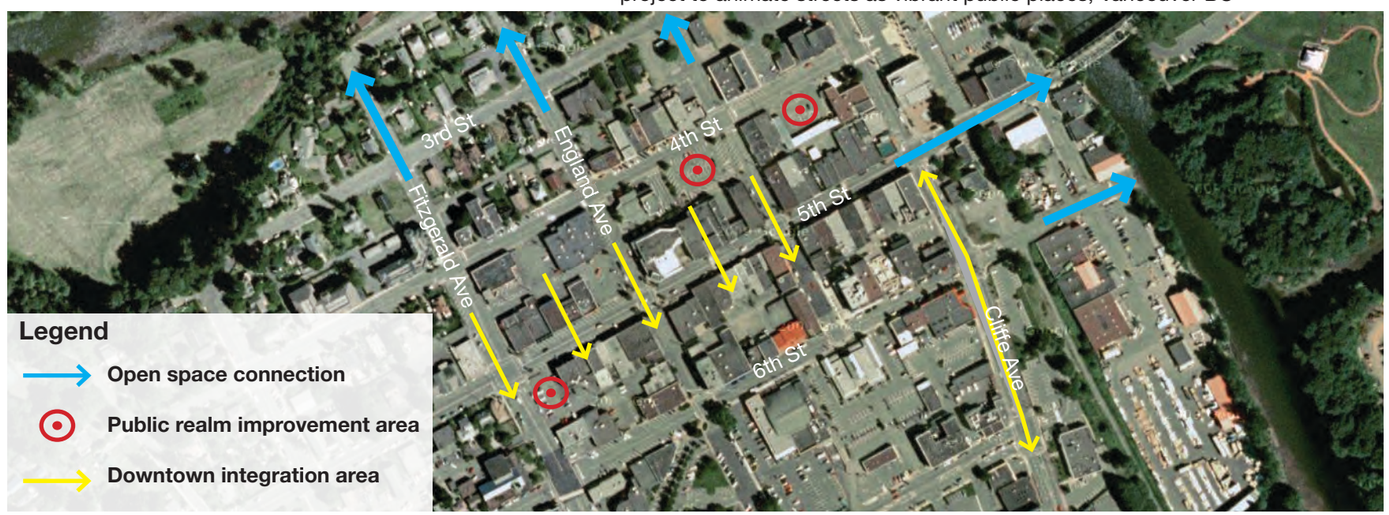
+ Ontario Growth Secretariat

Mixed use main street increases density while respecting local character, Grand Rapids, MI

+ Living Urbanism

Parklet installation stimulates pedestrian activity as part of Viva Vancouver project to animate streets as vibrant public places, Vancouver BC

+ Paul Krueger



Connected grid pattern, short blocks + proximity to open space offer significant public realm opportunities in Downtown Courtenay.

+ Google Maps

Figure 12. Downtown Node Concept

7 Greenways

Greenways are on- and off-road connectors such as multi-use paths and trails that provide ecological infrastructure, enhanced connectivity, and additional travel and recreation options for walking and cycling.

Greenways are an organizing principle for the Courtenay Transportation Strategy and are based on three key concepts that reflect the Strategy's vision and shared values.

Ecological Infrastructure

Greenways contribute ecological infrastructure by enhancing biodiversity, reducing ecological fragmentation, structuring new development patterns and promoting low-impact development features.

Recreation Amenities

Greenways connect parks and open spaces to provide greater recreation options and improve access to community amenities.

Transportation Options

Greenways link and supplement existing road and transit networks, enhancing mobility choice.

The Greenways vision is presented in Figure 13.

7.1 Greenway Network

A robust greenway network includes a path and trail system complemented by linear features and destinations to offer a range of transportation options and recreation amenities for a variety of users and abilities. Courtenay's Official Community Plan (OCP) identifies a Greenway Strategy that "serves recreation, transportation and conservation functions by providing for connections between main destinations, parks and residential areas" and defines a long range plan for implementation (OCP 2011).

Through consultation and planning, the Courtenay Transportation Strategy identified an opportunity to expand the range of pathway and trail types within the Greenway Strategy. A greenway network classification system composed of five types of paths and trails has been developed to implement the Greenways vision. The classification system is presented in Table 4.

Table 4. Greenway Network Classification System

TYPE	PURPOSE
Regional Greenway Path	Off-road, multi-use pathway system that connects to major destinations, including downtown, major commercial and community service nodes. The existing Courtenay Riverway is the backbone of the pathway system that will loop the municipality and connect major destinations.
Greenway Nature Trail	Natural or constructed recreation trails that are generally located in nature parks.
Greenway Street Link	On-road connectors that use design elements such as streetscaping to create cyclist and pedestrian-friendly spaces that fill connectivity gaps within developed, established areas.
Linear Features + Riverway Destinations	Provide opportunities to create ecological and cultural activity areas within the greenway network.

7.2 Design Concepts

The greenway network includes a range of path and trail types. Precedent images and four design features define the basic concept, structure and function of each greenway facility, as follows:

- **Facility Dimensions** | the optimal width and type of facility
- **Connectivity** | the scale and general extent of linkages provided by the facility
- **Design Principles** | the elements that make the facility accessible, continuous and safe for all users and abilities
- **Green Infrastructure** | the ecological attributes and contributions of the facility

The greenway network design concepts are presented below in Figure 14 to Figure 17. The policy direction and priority actions that will implement the greenway network are included in Section 10.

GREENWAYS

"Greenways are off- and on-road connectors such as multi-use paths and trails that provide ecological infrastructure, enhanced connectivity, and additional travel and recreation options for walking and cycling."

ECOLOGICAL INFRASTRUCTURE
Greenways serve many functions including enhancing biodiversity, reducing ecological fragmentation, acting as an organizing principle for new development and informing siting of low-impact development features.

RECREATION AMENITIES
Greenways connect parks and open spaces to provide greater recreation options and improve access to community amenities.

TRANSPORTATION OPTIONS
Greenways link and supplement existing road and transit networks, enhancing mobility choice.

Complete Riverway Path

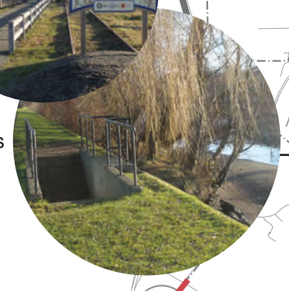
Link greenway and cycling networks across the Courtenay River

Improve riverway access through new east-west links

Link parks and open spaces with the riverway

Expand the linear park along the rail line

Create new riverway destinations



Preserve and protect ecological functions

Improve cyclist and pedestrian connections to NIC area

Develop a continuous pathway network that expands and connects to Courtenay Riverway System

Connect cyclists and pedestrians across estuary agricultural lands to downtown and major service nodes

Figure 13. Greenways Visions

REGIONAL GREENWAY PATH

Connects to major destinations as a continuous, multi-use facility that anchors the greenway network.

Dimensions

3.0 m off-road multi-use path

Connectivity

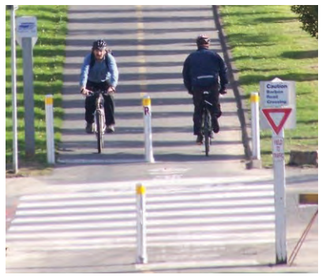
A network of paths that link major destinations:
- Downtown
- Major service nodes
- Courtenay Riverway System
- Neighbourhood pathways and street links connect residents to the greenway path

Design Principles

Accessible, continuous + safe design:
- Typically hard-surfaced for multiple users + abilities
- Safe and practical road crossings
- Barrier-free network
- Clear signage
- Required as a condition of development

Green Infrastructure

- Preserve, protect + retain native vegetation and create natural habitat corridors
- Natural buffers protect environmentally sensitive estuarial, foreshore + riparian habitat areas
- Preserve landscape as a natural community asset



+ John Lutton

Safe road crossings on the Galloping Goose Regional Trail, Victoria, BC

+ City of Courtenay

The Riverway Walkway in Courtenay, BC is a popular multi-use trail. Projects such as this provide the framework for expanding and improving the greenway network, and building on previous successes.

+ City of Courtenay

The “Rails with Trails” initiative is an important element of the regional greenway network, and is an example of how partnerships can be used to implement greenway paths in Courtenay, BC

+ NCC

Lane markings on a two-way regional path safely balance recreational and commuter cyclist uses in Ottawa, ON

Figure 14. Regional Greenway Path

GREENWAY NATURE TRAIL

Provides nature-based recreation opportunities in parks and open spaces.

Dimensions

2.0 m – 2.5 m walking or hiking path

Connectivity

- A system of trails within a nature park or environmentally sensitive area such as estuarial, foreshore + riparian habitat areas
- Accessible destination along regional greenway paths
- Walkways and bikeways provide neighbourhood-level links

Design Principles

Accessible, continuous + safe design:

- Constructed trail, typically of gravel or wood chips
- Signage identifies trail route, length + difficulty
- Prevent erosion + soil compaction
- Nature areas to be preserved inform new development + land use patterns

Green Infrastructure

- Ensure that the trail does not negatively impact habitat + environmental features
- Opportunity to access + experience nature
- Enhanced + accessible neighbourhood recreation amenity

+ City of Courtenay

Neighbourhood access to a nature trail, Courtenay, BC

+ City of Courtenay

A popular nature trail in Millard Nature Park, Courtenay BC.

Bike racks provide transportation options to access nature trails

+ Tourism BC

Asphalt nature trail is accessible to a range of users and abilities, Goldstream Provincial Park, BC

+ Bill Irvine

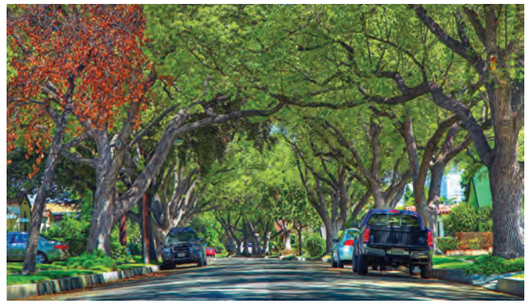
Gravel hiking trail with with split rail fence delineates sensitive Garry oak ecosystem, Mill Hill Regional Park

Figure 15. Greenway Nature Trail

GREENWAY STREET LINK

Fills gaps within the greenway network through on-road design elements such as streetscaping.

Dimensions	 1.5 m – 1.8 m on-road bike lane + 1.8 m sidewalk
Connectivity	New pedestrian and cyclist-friendly spaces that fill gaps in greenway network connectivity in established communities such as: - Old Orchard/Downtown - NIC area - Arden Road area, south toward the river - Tunner Drive/estuary agricultural lands to the east and west
Design Principles	Accessible, continuous + safe design: - Cycling zone with bike lane - Amenity zone within boulevard for green infrastructure - Pedestrian zone with opportunity for street parks, activities or programming - Calmed traffic - Aesthetic elements (public art, green infrastructure amenities) punctuate the streetscape
Green Infrastructure	- Opportunity for low impact development features such as bioswales or rain gardens - Enhanced vegetation features such as additional street trees - Improved air quality, local climate moderation, habitat provision, and sequestration + storage of carbon dioxides



Mature urban forest canopy provides environmental benefits + scales down roadways in residential areas

The Valley View Greenway provides neighbourhood-level links to Hurford Hill Nature Park, Courtenay, BC

Traffic calmed street link provides cycling and pedestrian connectivity + green infrastructure with streetscaping in Vancouver, BC

Complete street concept provides link to regional path system in Saanich BC

+ Spacing

+ 02 Planning + Design

Figure 16. Greenway Street Link

RIVERWAY DESTINATION

Ecological and cultural activity areas within the greenway network.

Dimensions

Site-specific

Connectivity

Destinations that integrate greenway or Courtenay Riverway experience into the urban fabric:

- E + N Linear Park (extension of Rails with Trails Rotary Walkway)
- Riverway, near Millard Creek Park
- Air Park
- Downtown/Simms Millennium Park
- Area near Puntledge Park
- Area near Comox Valley Exhibition Grounds

Design Principles

Accessible, continuous + safe design:

- High-quality public realm design, programming, activities + amenities
- Oriented toward Downtown, Riverway + estuary
- Integrate the City with the Riverway through connected and accessible pathways and programmed spaces

Green Infrastructure

- Opportunity for low impact development features such as bioswales or rain gardens
- Preserve landscape as a natural community asset

The Courtenay Airpark is a popular Riverway destination. Such existing destinations are an opportunity for creating a series of linked destinations through the greenway network

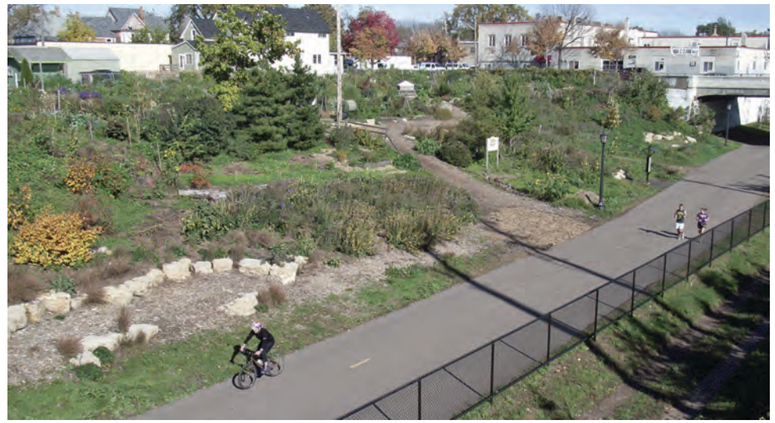
+ City of Courtenay

Existing waterfront access point along the Courtenay River

+ City of Courtenay

Public dock and kayak launch provides direct access to the waterfront and harbour taxi service from the Galloping Goose Trail in Victoria, BC

+ O2 Planning + Design



Landscaping and pathways create an accessible public space along a former rail bed that has been converted into a regional trail system.

+ Rails to Trails.org

Benches, information signs, and a small landscaped plaza create a destination along a riverfront pathway in Edmunston, NB.

+ dcmud

Figure 17. Linear Features + Riverway Destinations

8 Corridors

Corridors are the streets and infrastructure elements that make up the transportation network. In addition to providing mobility, corridors are part of the public realm and support a variety of users and experiences.

Corridors are an organizing principle for the Courtenay Transportation Strategy and are based on four key concepts that reflect the Strategy's vision and shared values.

Complete Streets Approach

Corridors respond to community needs and prioritize people in the transportation system by using a holistic approach to planning and design.

Connected Network

Corridors safely and efficiently link destinations. Road cross-sections are designed to support surrounding land uses and help create vibrant public realms.

Hierarchy of Form + Function

Corridors are connected in a networked hierarchy based on a classification system of road form and function.

Sustainable Infrastructure + Facilities

Corridors include roadway elements and alignments that integrate all types of infrastructure requirements through careful planning and sustainable design decisions.

The Corridors vision is presented in Figure 18. Additional information on the corridor improvements shown in this figure can be found in Section 9.2.

8.1 Transportation Network

Transportation networks that are efficient, safe and sustainable provide mode choice and mobility options that connect people to where they want to go. Roads, sidewalks, bike lanes, boulevards and bridges are the transportation infrastructure that enables people to move around the city. How this infrastructure is designed and implemented affects not only how the roads look and feel, but also the ways in which people use the roads.

A key message from public engagement is that people truly value the ability to move around the City of Courtenay and want to do so in ways that support a vibrant public realm, efficient use of infrastructure, and sustainable, active and healthy lifestyles. A road network classification system that reflects these aspirations is presented in Table 5.

Table 5. Road Network Classification System

ROAD CLASSIFICATION	PURPOSE
Arterial/Mobility Corridor	Provides primary connections to different areas of the city and is the spine of the transportation network.
Community Collector	Provides connections to commercial and community service nodes and functions as the veins of the transportation network.
Residential Collector	Serves as the primary routes within residential nodes, and connects to smaller scale neighbourhood services and higher density residential uses.
Rural Collector	Provides access to residential homes and services outside the urban boundary, as well as select areas wishing to retain a rural streetscape to fit the form and character of the neighbourhood.
Activity Street	Provides access to smaller scale retail shops and services in the downtown and select areas within residential and commercial and community service nodes.
Business/Industrial Street	Services larger office and industrial buildings.
Residential Street	Provides access to residential homes within residential nodes. Residential streets provide high levels of safety, privacy, and connectivity for local residents.

The policy direction and priority actions that will implement the corridor vision are included in Section 10.

CORRIDORS

"Corridors are the streets and infrastructure elements that make up the transportation network. In addition to providing mobility, corridors are part of the public realm."

COMPLETE STREETS
Corridors respond to community needs and prioritize people in the transportation system by using a holistic approach to planning and design.

CONNECTED NETWORK
Corridors link destinations. Road cross-sections are designed to support surrounding land uses and help create vibrant public realms.

HIERARCHY OF FORM + FUNCTION
Corridors are connected in a networked hierarchy based on a classification system of road form and function.

SUSTAINABILITY
Corridors include roadway elements and alignments that integrate all types of infrastructure requirements through careful planning and sustainable design decisions.

Potential need for future improvements dependent on growth north of Courtenay.

A new connection between Veterans Memorial Parkway and Anderton Road services new residential development.

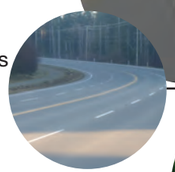
Downtown is a pedestrian-priority area. Pedestrian and cycling connectivity between Downtown and Ryan Road is improved.

Anderton Road upgrade improves access to ferry crossing & new residential development.

A third river crossing improves connectivity across the river and relieves pressure on the 5th St bridge.

Additional travel lanes and dedicated bike lanes ensure smooth traffic flow and improve cycling connectivity on Ryan Road and Lerwick Road.

Complete streets treatments on Cliffe Ave and Fitzgerald Ave support active modes

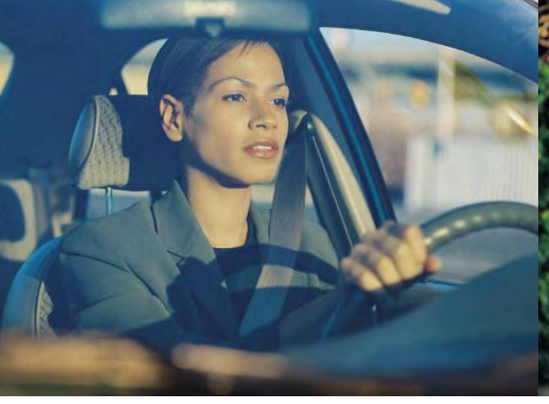


Additional travel lanes allow traffic to flow smoothly on Comox Road.

A new connection provides vehicle access to the South Courtenay development area.

A new connection between Comox Road and Back Road relieves traffic pressure on Ryan Road.

Figure 18. Corridor Vision





9 “Big Moves”

The Transportation Strategy will build on high levels of satisfaction with personal vehicle travel by achieving a balanced approach to improve pedestrian and cycling environments.

The Transportation Strategy envisions three “Big Moves” that support the City’s vision of a connected, sustainable transportation system that balances the needs of all road users. These include:

- Complete Streets
- Capacity Improvements
- Active Public Realms

9.1 Complete Streets

A complete streets approach represents a paradigm shift in transportation planning as it uses transportation infrastructure to create places for people. Complete streets are designed for cyclists, pedestrians, transit and vehicles in an integrated mobility corridor that is responsive to environmental features and the surrounding public realm.

+ Smart Growth America

“A Complete Street is designed for all ages, abilities, and modes of travel. On Complete Streets, safe and comfortable access for pedestrians, bicycles, transit users and the mobility-impaired is not an afterthought, but an integral planning feature.”

Complete Streets for Canada

Accordingly, one of the key recommendations in the Transportation Strategy is to adopt a complete streets policy for Courtenay. Such a policy will confirm the City’s commitment to designing roads for all users in an efficient, safe, and accessible way. It will help to balance the needs of all road users and will also achieve broader municipal and regional policy objectives:

- Traffic will continue to flow smoothly
- Improves pedestrian / cyclist safety and mode choice
- Helps implement sustainability goals around transportation in the Regional Growth Strategy and Official Community Plan and achieve greenhouse gas reduction targets

Given the significant benefits associated with complete streets, the Transportation Strategy recommends that complete streets be promoted in Courtenay by adopting cross-sections for different road classifications which reflect complete streets principles. Adoption of the proposed cross-sections would encourage the implementation of complete streets on all Community Collector and Arterial roads, providing a cost-effective way to gradually transition Courtenay’s road network to a truly multi-modal system. Complete streets also permeate through the other “big moves”.

Designing complete streets requires re-thinking the various elements that are included in the road cross-section. A cross-section determines how a road looks (road form) based on a specific arrangement of core elements. How these elements are combined together significantly impact how a road works (road function). A complete streets approach makes it possible to explicitly define how roadway elements achieve mobility objectives while also realizing social, environmental and economic goals.

To illustrate what complete streets could look like in Courtenay, Willemar Avenue was taken as an example. In the “before and after” image of the street [see next page], most of the space is currently given over to the car, which is generally considered to be inefficient as it takes useable space away from other users. By distributing space more efficiently within the right-of-way, the road is more balanced and becomes available to more users. The travel and parking functions are maintained – and designated cycling and pedestrian spaces are gained.

Complete streets improvements on Willemar Avenue result in a more balanced use of public space, where all road users are accommodated. The mobility and parking functions of the road are maintained, but by allocating space more efficiently, conditions for cyclists and pedestrians are improved.

9.1.1 Making the Case for Complete Streets

There are many reasons for investing in complete streets.

Complete streets are **equitable**, and ensure that all residents are able to move safely and efficiently around the city regardless of age, income, or level of mobility. Complete streets also provide important health, environmental, and economic benefits. The following discussion highlights the importance of investing in complete streets, focusing on active transportation in particular. Additional statistics compiled by Healthy Living Niagara can be found in Appendix H.

Active modes of transportation attract residents.

- Research by the Urban land Institute found that homeowners paid an additional $20,000 for homes in new pedestrian-friendly communities compared to similar homes in surrounding neighbourhoods[1]
- A study in the U.S. of 28 metropolitan areas found that the average family in a sprawling area pays roughly $1300 more in transportation costs annually, and the most expensive places for transportation provide the fewest transportation options.[2]
- Another U.S. study found that walkability was positively correlated with housing values in 13 of the 15 cities examined. Each additional point in Walk Score for the community was linked to a $700 to $3000 increase in home value, controlling for other factors.[3]

Active modes of transportation are good for business.

- Cycle tourism has significant untapped potential in many communities. In 2000, cyclotourists in Quebec spent $54.6 million travelling on the Route Verte – a 4,000 km network of bikeways which criss-cross the province.[4] In Vermont, cycle tourism earns twice the annual income of its most famous export product, maple syrup.[4]
- Employees who are physically active offer significant benefits to employers – increased productivity, reduced absenteeism and lower turnover, resulting in an estimated value of about $513 per worker per year.[5]
- Pedestrians and cyclists destined to Bloor Street in Toronto spend more money per month and visit more often than those who arrive by car.[6]
- Based on a study of 11 U.S. cities, bicycling infrastructure creates a total of 11.4 jobs per $1 million spent and pedestrian-only projects create about 10 jobs/$M, while road-only projects generate only 7.8 jobs/$M.[7]

Active modes of transportation can help revitalize the downtown.

- In Douglas, GA (pop. 12,000), transportation funds were invested into improving pedestrian accommodation and experience in the downtown through the addition of crosswalks, brick work, benches, lighting, landscaping and a gazebo. As a result of these investments, tax revenues increased and vacancy rates dropped from 10 percent to 3 percent.[8]
- Investments in streetscaping and pedestrian improvements in Lodi, California have helped to attract new business, decrease the vacancy rate from 18% to 6%, and increase downtown sales tax revenue by 30%.[9]
- In Fort Worth, Texas, business for restaurants along Magnolia Street increased by nearly 200% with the installation of bike parking and conversion of two traffic lanes into bike lanes.[10]

Active modes of transportation are cost-efficient.

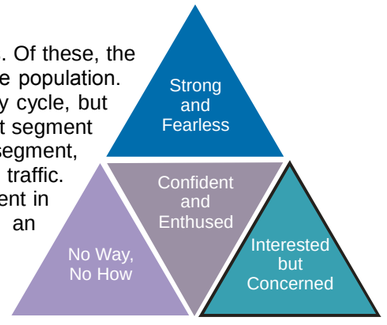
- Grey County, ON (pop. 92,568) approved a paved shoulder policy after an internal study found that over a 15-year period, paved shoulders are cheaper to provide and maintain than gravel.[11] Thus, improved safety benefits for cyclists were provided at negligible cost.

Active modes of transportation improve health.

- Obesity is a growing concern. Every additional hour spent in a car per day is associated with a 6% increase in the likelihood of obesity, while each additional kilometer walked per day is associated with a 4.8% reduction in the likelihood of obesity.[12]
- Meeting physical activity levels is shown to be easier when using "lifestyle" physical activities (such as walking, cycling and using stairs) than when relying on activities that require a gym or recreation centre.[13]
- People who commute at least 30 minutes daily by walking or cycling have a 35% lower risk of developing diabetes.[14]
- Emissions from motor vehicles contribute to poor air quality, which in turn impacts health, leading to lost productivity, health care costs, pain & suffering, and even loss of life. The economic cost of air pollution in British Columbia is expected to exceed $100 million annually by 2015.[15] Among children, asthma is reported to be the leading cause of school absenteeism.[16] By reducing the number of vehicles on the road, air pollution can be minimized, improving health.

To support active modes, investment is needed in pedestrian and cycling infrastructure.

The Portland Bureau of Transportation distinguishes between 4 types of cyclists. Of these, the "interested but concerned" segment is estimated to represent about 60% of the population. These individuals represent a "target market" for cycling – they do not currently cycle, but are willing and interested in cycling if safe facilities are provided. It is this market segment that offers the greatest potential to increase cycling activity. Within this market segment, people show a strong preference for cycling facilities that are separated from traffic. Such results suggest that efforts to increase cycling activity will require investment in cycling infrastructure. The move towards complete streets thus presents an opportunity to encourage cycling activity, as well as walking and transit.



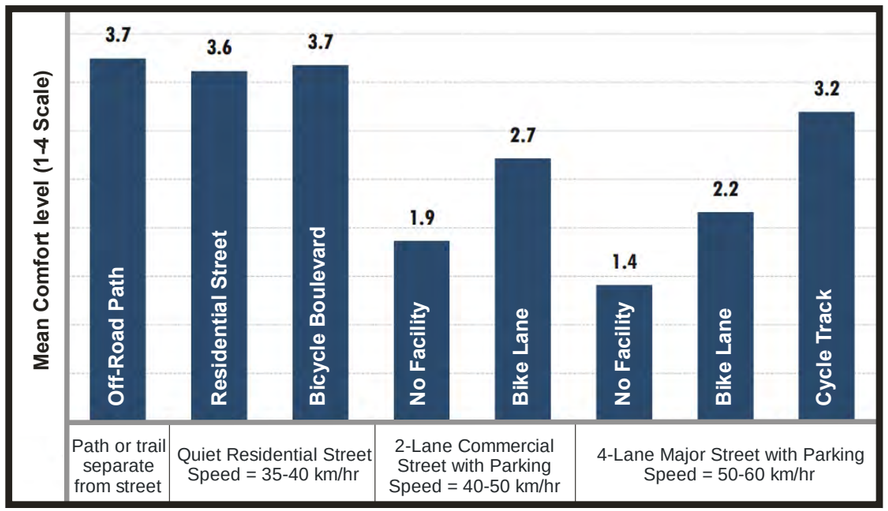


Figure 19. Cycling Facility Preferences

References

1. Cited in: Local Government Commission Center for Livable Communities. *The Economic Benefits of Walkable Communities*. Available online: http://www.lgc.org/freepub/docs/community_design/focus/walk_to_money.pdf
2. Surface Transportation Policy Project & Center for Neighborhood Technology. 2000. *Driven to $pend: The Impact of Sprawl on Household Transportation Expenses*. Available online: http://www.transact.org/PDFs/DriventoSpend.pdf
3. Joe Cortright, Impresa, Inc. 2009. *Walking the Walk: How Walkability Raises Home Value in U.S. Cities*. Prepared for CEOs for Cities. Available online: http://katana.hsrc.unc.edu/cms/downloads/WalkingTheWalk_CEOsforCities.pdf
4. Cited in: Bike ON Tours & IBI Group. 2011. *Cycle Tourism Assessment and Strategy Study*. Prepared for Regional Tourism Organization 8 (including Northumberland County, County of Peterborough, City of Peterborough, and City of Kawartha Lakes). Available online: http://rto8.com/wp-content/uploads/2011/11/RTO8-Cycle-Tourism-Assessment-and-Strategy-Study.pdf
5. World Health Organization. 2003. *Health and Development Through Physical Activity and Sport*. Available online: http://whqlibdoc.who.int/hq/2003/WHO_NMH_NPH_PAH_03.2.pdf
6. The Clean Air Partnership. 2009. *Bike Lanes, On-Street Parking and Business: A Study of Bloor Street in Toronto's Annex Neighbourhood*. Available online: http://www.cleanairpartnership.org/pdf/bike-lanes-parking.pdf
7. Garrett-Peltier, Heidi. 2011. *Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts*. Political Economy Research Institute, University of Massachusetts. Available online: http://www.peri.umass.edu/fileadmin/pdf/published_study/PERI_ABikes_June2011.pdf
8. National Transportation Enhancements Clearinghouse. *Communities Benefit! The Social and Economic Benefits of Transportation Enhancements*. Available online: http://www.enhancements.org/misc/benefits.pdf
9. Local Government Commission Center for Livable Communities. *The Economic Benefits of Walkable Communities*. Available online: http://www.lgc.org/freepub/docs/community_design/focus/walk_to_money.pdf
10. Blue, Elly. 2011. "Bikenomics: The Economic Case for On-Street Bike Parking*". Grist Magazine*. Available online: http://grist.org/biking/2011-04-11-the-economic-case-for-on-street-bike-parking/
11. Grey County. 2009. *Paved Shoulder Policy*. TAPSR-018-09. Available online: http://www.greycounty.ca/files/pagecontent/policy-raods-01-09-paved-shoul.pdf
12. Frank, L., M. Andresen, and T. Schmid. 2004. "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars". *American Journal of Preventive Medicine*, 27(2): 87–96.
13. Toronto Public Health. 2012. *Road to Health: Improving Walking and Cycling in Toronto*. Available online: http://www.toronto.ca/health/hphe/pdf/roadtohealth.pdf
14. Hu, G., Qiao, Q., Silventoinen, K., Eriksson, J.G., Jousilahti, P., Lindström, J., Valle, T.T., Nissinen, A., and J. Tuomilehto. 2003. "Occupational, commuting, and leisure-time physical activity in relation to risk for Type 2 diabetes in middle-aged Finnish Men and Women." *Diabetologia*. 46(3): 322-329.
15. Canadian Medical Association. 2008. No Breathing Room: National Illness Costs of Air Pollution. Available online: http://www.cma.ca/multimedia/CMA/Content_Images/Inside_cma/Office_Public_Health/ICAP/CMA_ICAP_sum_e.pdf
16. Kohen, D.E. 2010. "Asthma and School Functioning". *Statistics Canada Catalogue No. 82-003-XPE - Health Reports*. 21(4): 1-11. Available online: http:// www.statcan.gc.ca/pub/82-003-x/2010004/article/11363-eng.pdf

9.1.2 Development of Road Cross-Sections

The road network classification system defines a hierarchy of streets according to specific transportation functions that are integrated with the overall land use system. A road classification system for Courtenay was presented in Section 8.1. To illustrate the proposed road classifications and provide guidance for future road works, conceptual cross-sections were developed. These cross-sections are based on a complete streets approach to transportation planning that considers:

- **User Function** | the volume and user profile of people using the road (by mode)
- **Mobility Features** | the attributes and role of key road elements
- **Public Realm** | the relationship between the road and surrounding land uses

Table 6 summarizes the various elements that make up a road, and the role of each element in accommodating travel needs within a complete streets context.

Table 6. Road Elements

ROAD ELEMENT	COMPLETE STREETS FUNCTION
Travel Lane	Accommodates mobility for cars, trucks, and buses. Width and alignment manages traffic speeds.
Median/Turning Lane	Channelizes traffic to improve flow. Also controls access, enhancing safety on busy corridors. Planted median increases urban forest values and reduces runoff.
Cycle Lane	Improves safety and connectivity. Encourages greater cycling uses. Manages travel speeds by narrowing the roadway.
Parking	Efficiently services commercial and residential parking needs. Manages travel speeds by narrowing the roadway.
Boulevard	Increases urban forest values. Opportunity to support the management of stormwater. Hosts user facilities and amenities. Softens roadway and reminds drivers of being in a neighbourhood environment. Improves the public realm.
Sidewalk	Accessible curbs, wider sidewalks, and safe crossings improve pedestrian mobility for all users and abilities.
Setback	Mediates the relationship between the road and surrounding land uses and building types.

The proposed cross-sections developed for Courtenay include a range of road elements which work together to accommodate safe and efficient travel by all modes according to the road function. These representative cross-sections are presented in Appendix A. Ultimately, the cross-section for a given project will be determined by the road classification. The road classification will depend on several factors, including pedestrian and cycling needs; traffic speed and volume; requirements for transit and heavy vehicles, adjacent land use, and the intended function of the road. **In all cases, the cross-section should be determined with due regard for complete streets principles, and designed in accordance with recognized engineering standards and guidelines.**

Another key feature of complete streets is the use of “green infrastructure” to minimize environmental impacts. Appendix E illustrates how green infrastructure can be incorporated into the road cross-section. In general, opportunities to employ green infrastructure should be assessed on a project-by-project basis. The appropriate application of green infrastructure is largely dependent on site conditions, and it is therefore recommended that opportunities for green infrastructure be explored while preparing Local Area Plans.

9.1.3 Priority Complete Streets Projects

For the most part, it is anticipated that complete streets in Courtenay (and associated walking and cycling improvements) will be implemented as part of other road works, and not initiated as special projects. There are three exceptions:

- The Implementation Toolbox in Section 10 speaks to the need to address gaps in the sidewalk network, and recommends an annual budget for sidewalk projects.
- The Implementation Toolbox also gives high importance to implementing a network of on-road cycling facilities. While every opportunity should be made to take advantage of road construction and reconstruction activities, implementation of the cycling network should also proceed independently where funding allows, particularly in high-priority areas of the network where safety concerns have been identified. Indeed, it is anticipated that the City’s designated bike routes can be used as a starting point for identifying high priority corridors where complete streets are needed, allowing the City to gradually build a complete streets network over time.
- Finally, there may be situations where there is a desire to “revitalize” a particular corridor – to attract more street-level activity and create a more pleasant public realm. Such complete street retrofits would ideally feature high quality aesthetic design and incorporate streetscape enhancements to animate the corridor, complementing land use initiatives to promote intensification and a mix of development types.

Some of the key corridors and intersections which would benefit from a complete street “make-over” are outlined in Table 7. The list in Table 7 is not intended to be comprehensive or exhaustive. Streets included in this table were selected not on the basis of traditional vehicular capacity needs, but because existing land uses and/or future redevelopment opportunities offer the potential to generate significant multi-modal activity, particularly if improvements are made to the walking, cycling, and transit environments. With greater street-level activity to animate the area, adjacent businesses will also benefit, with the potential to spur further land use changes which complement and reinforce the complete streets initiatives. Thus, in prioritizing projects, consideration should be given to the expected level of multi-modal travel demand which would benefit from the improvements, the redevelopment potential along the corridor, and opportunities to take advantage of other planned infrastructure works.

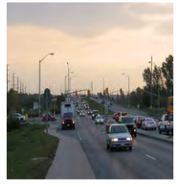
Table 7. Priority Complete Streets Projects

No.	Project
1	**Cliffe Avenue** plays a key mobility role in Courtenay's road network, and also serves as one of the main gateways to the city. It is therefore important to maintain this mobility function, yet also create an attractive, welcoming entrance to the community. Since Cliffe Avenue is under the jurisdiction of the B.C. Ministry of Transportation and Infrastructure (MOTI), collaboration will be needed between the City and the Province to implement changes to the corridor. It is anticipated that measures would generally focus on improvements to the pedestrian environment (such as improved crossings), and opportunities to promote intensification. The latter would accommodate commercial growth, lead to a mix of uses, and stimulate pedestrian activity by encouraging more street-oriented development. There is also opportunity to reinforce the connection between the downtown and the Anfield/Driftwood complex and create a more transit-oriented corridor with clear destinations. Dedicated cycling lanes would help to improve the cycling environment; however, should cycling lanes prove difficult to implement, cycling traffic could be redirected to Fitzgerald Avenue, but only if there are numerous links that make it possible to access the commercial services on Cliffe.
2	In the **Ryan Road/Lerwick Road** area, the emphasis should be on fostering a safe and welcoming environment for all travel modes and creating an intensified mix of uses that invites people to visit. To improve cycling connectivity and access, dedicated cycling lanes are recommended on both Lerwick Road and Ryan Road.
3	The **Ryan Road/Island Highway commercial node** would benefit from improved connectivity to the surrounding communities using treatments such as through-block connectors and other measures, as determined through a connectivity audit. As this area is almost fully developed, the City would need to go through a detailed planning exercise and identify pieces of land required to address connectivity issues.
4	It is recommended that dedicated bike lanes be provided on **Fitzgerald Avenue**, along with improvements to the pedestrian environment, such as widened sidewalks. Other corridors that would benefit from improved pedestrian and cycling facilities include **Willemar Avenue** and **Lerwick Road**.
5	To create a more vibrant, people-friendly downtown, a pedestrian precinct is proposed for **5th Street**, as further described in Section 9.2.2. While cars would still be allowed along the corridor, greater priority would be given to pedestrians, building on existing measures to create a more attractive downtown environment that promotes street-level activity.

Appendix C provides additional information on infrastructure improvements for achieving complete streets. In particular, **a toolbox of measures is presented for addressing the needs of pedestrians and cyclists, and calming traffic in residential neighbourhoods**.

9.2 Capacity Improvements

The second “big move” toward a balanced transportation system is capacity improvements. To accommodate future population and employment growth, modifications to the road network are often needed. Such modifications ensure that sufficient road network capacity is available to meet mobility needs. Options for increasing road capacity include building new roads, widening roads, or upgrading existing roads to carry more cars, bikes, pedestrians and buses. To this end, if complete streets is a way of thinking, capacity improvements is a way of doing.



Build new roads/bridges

Extend existing roads

Add travel lanes

Upgrade roadway classifiation

Provide access control

Add turning lanes

Improve road/intersection geometry & traffic control

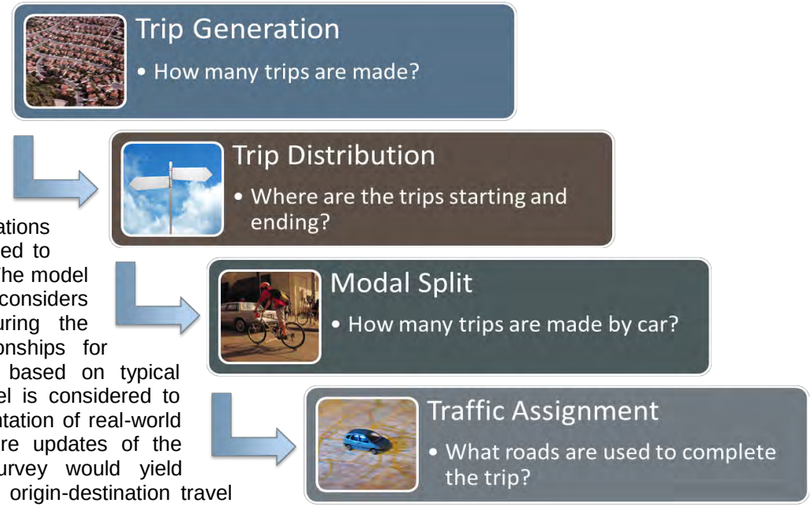
To plan for the future, models are needed to predict the volume of traffic on the road network as the city develops over time.

To assess future road network requirements, there is a need to predict future travel demand. Such projections are often developed using models which are capable of forecasting travel activity as a function of land use. Typically, these models address four key elements of travel:

- How many trips are made in a given residential or employment area?
- Where do the trips begin and end? What mode of travel is used for the trip?
- What route is used to make the trip?

In general, the model inputs consist of land use data for each residential / business area within the city; and network data that describe the physical characteristics of the road links that connect these areas. The model outputs include an estimate of the traffic volume on each major road in the city and the average time for a vehicle to travel each road section.

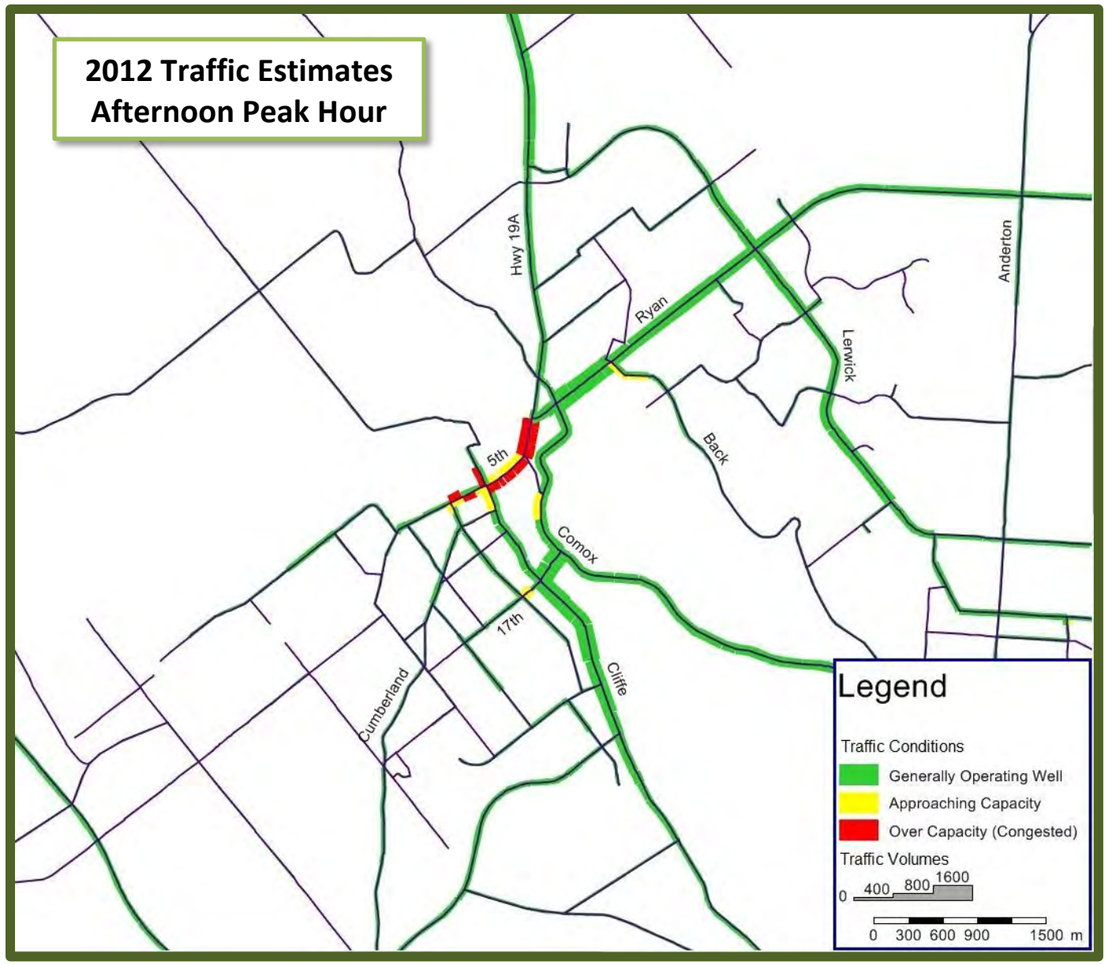
The City of Courtenay’s transportation model has been implemented in VISUM, a popular platform for transportation modelling and analysis. The model was originally developed in 1995 and was updated in 2005. For the current modelling exercise, a number of modifications and enhancements were applied to improve the model accuracy. The model has a base year of 2012, and considers passenger vehicle travel during the afternoon rush hour. Relationships for predicting travel activity are based on typical experience. Overall, the model is considered to provide a reasonable representation of real-world conditions. However, for future updates of the model, a regional travel survey would yield considerable insight into local origin-destination travel patterns.



Once the accuracy of the model was deemed to be acceptable, it was used to estimate future traffic volumes on the road network based on the land use projections. Such estimates of future travel activity provide the basis for assessing future network deficiencies (congestion bottlenecks), where the travel demand is expected to exceed the road capacity. Additional details on the model development and calibration can be found in Appendix B.

It should be noted that the transportation model only considers failures at a “link level”, and is not intended to capture localized failures at individual intersections. Such failures are typically addressed by modifying the intersection design or signal timing, without the need for extensive network modifications. In contrast, the transportation model considers traffic flow at a corridor or network level, and helps to identify where improvements may be needed over an extended area (such as road widening or the construction of new roads).

Figure 20 presents a summary of the 2012 and 2037 travel activity as estimated by the VISUM model, assuming no road network improvements are implemented.



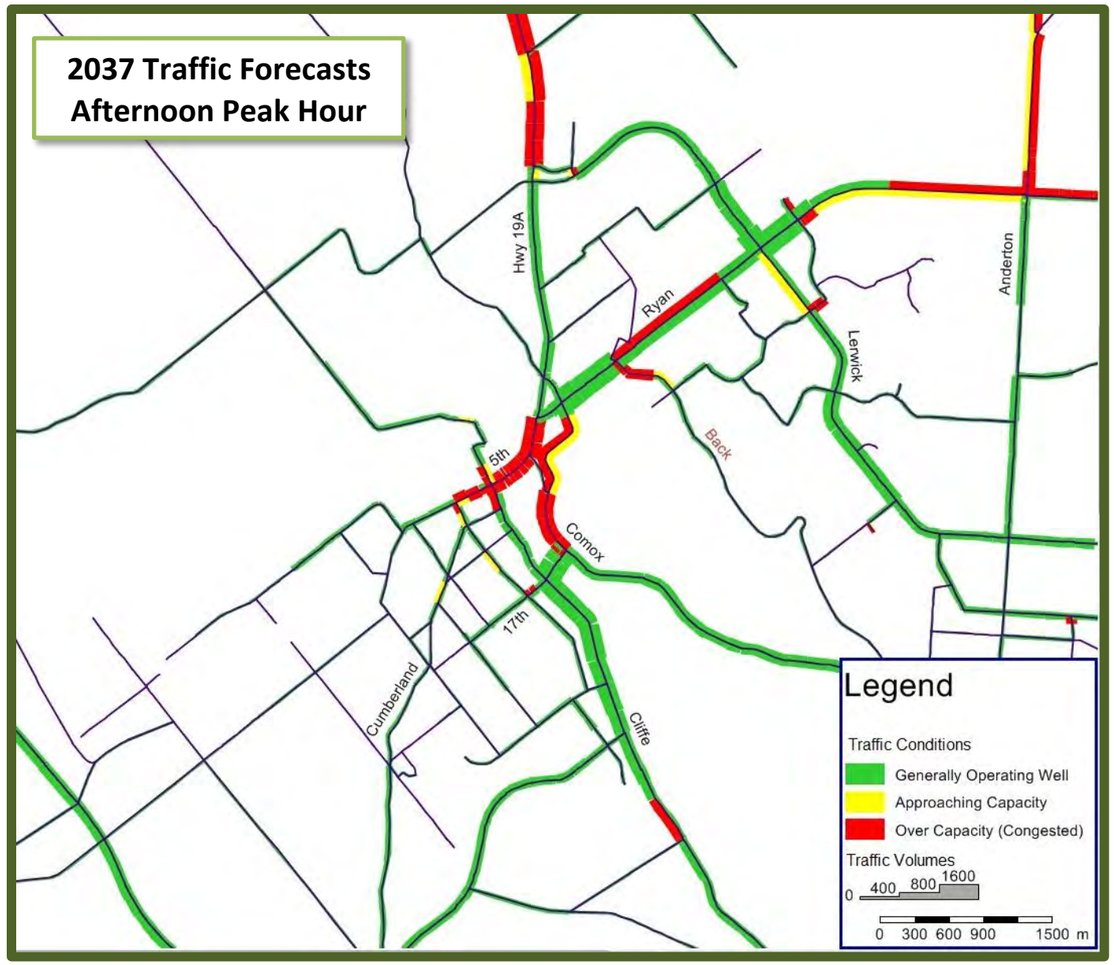


Figure 20. Summary of 2012 and 2037 Travel Activity Estimated by the VISUM Model

The results in Figure 20 suggest that there is limited traffic congestion in Courtenay at present, and that traffic generally moves well, with the exception of the 5th Street Bridge. Such findings are consistent with residents' perceptions of the transportation system: during the public consultation exercise for the Transportation Strategy, 75% of respondents rated personal vehicle travel within the city as satisfactory or better.

In 2037, a slightly different picture emerges. Traffic volumes have increased, resulting in traffic congestion on several key corridors, including Ryan Road and Comox Road. Other roads are approaching capacity, with levels of traffic demand that are exceeding accepted standards. To address these issues, several road network scenarios were developed and tested in the transportation model. The evaluation of scenarios was carried out using a multi-criteria evaluation framework that included the following objectives:

- Accommodate the movement of people and goods effectively and efficiently
- Minimize cost
- Support downtown vitality
- Minimize environmental impacts
- Encourage cycling activity by creating a safe, well-connected network of cycling facilities
- Enhance community connectivity
- Foster economic development

For each objective, a 'measure of effectiveness' was defined for measuring how well a particular road network scenario achieves the desired outcome. To develop an overall scenario score, the evaluation results for each

measure were converted to a score between 0 and 1 and weighted together. A table illustrating the evaluation framework can be found in Appendix B, along with a description of the various road network scenarios and the corresponding evaluation results.

From the results of the evaluation process, a preferred road network scenario was identified. Figure 21 presents the recommended network, while additional detail on specific projects can be found in the following sections. Within Figure 21, projects outside the City's jurisdiction have been highlighted. These projects are needed to meet travel needs, but would require approval (and funding) from others.

The proposed road network projects were presented to the community during the second round of public consultation. In general, there appears to be agreement amongst both stakeholder groups and the public that the proposed road network improvements address vehicular travel needs within the city. However, there is concern that the plan includes too many "road projects" at the expense of other modes, and that the entire transportation budget will be given over to major infrastructure investment to improve vehicle travel, leaving no money for pedestrian and cycling improvements. Moving forward, it will be important to allocate funding appropriately to ensure the balanced transportation system envisioned in this plan is achieved – a balance which can only be attained by improving conditions for all modes of travel, including walking, cycling, and transit. In this regard, it is important to note that many of the proposed capacity projects are located on roads that require improvements to support multi-modal travel. The implementation of these capacity projects thus provides an opportunity to improve conditions for other travel modes.

It is also important to note that **the proposed road network improvements are dependent on future development** – if development proceeds more slowly than anticipated, the need for road improvements will be deferred. Likewise, the proposed projects are conservatively based on the assumption that the proportion of trips made by walking, cycling, and transit will remain similar over time. In reality, a shift towards more sustainable travel modes is anticipated in accordance with the City's mode share objectives. Such a shift will relieve pressure on existing roads, and may potentially alleviate the need for road improvements in certain areas of the city.

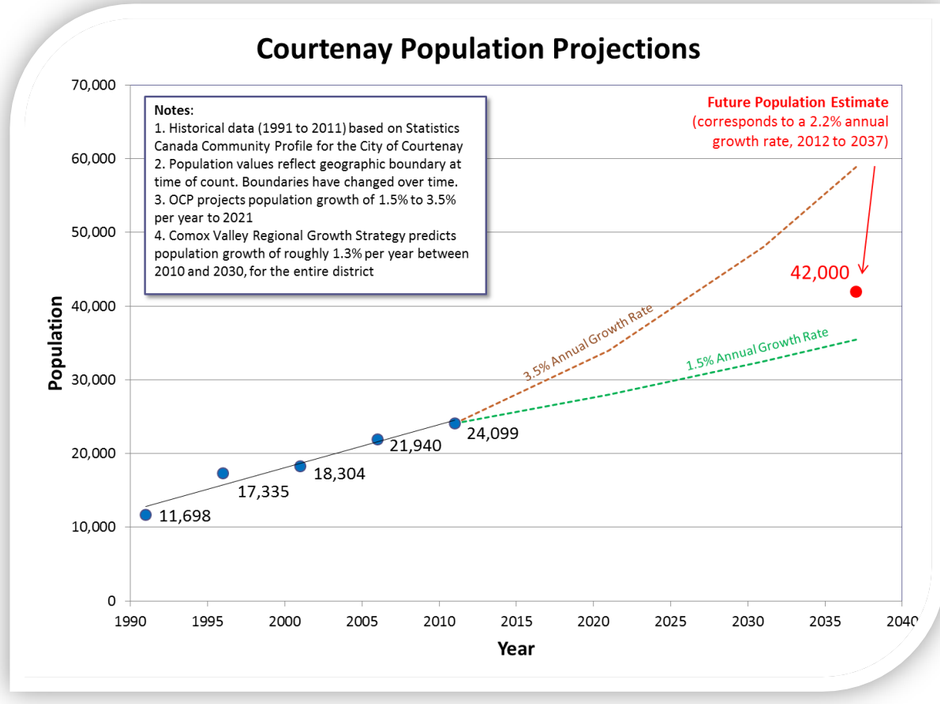
The impact of achieving the City's mode share targets was examined as part of the Transportation Strategy (refer to Appendix B), but was not used for developing road network recommendations or implementation priorities. Such an approach allows for flexibility – plans are in place to accommodate vehicular travel if demand materializes; however, such plans may be modified or scaled back over time if efforts to encourage walking, cycling, and transit prove effective. For this reason, the City is encouraged to vigorously pursue opportunities to reduce demand for vehicular travel, and to update the Transportation Strategy on a regular basis to reflect changes in development and travel behaviour which may occur over the planning horizon.

Why Does Traffic Increase in Courtenay?

Traffic is predicted to increase over time due to growth in population and employment. Based on current projections, the population in Courtenay is expected to grow by approximately 70% over the next 25 years, putting additional pressure on existing roads and bridges. From a review of development opportunities within the City, it is expected that by 2037, there will be roughly:

- 7,900 new dwelling units
- 1.5 million sq. ft. of new commercial space

This level of development corresponds to a population growth rate of approximately 2.2% per annum, which is roughly within the middle of the growth range presented in the OCP.



CAPACITY IMPROVEMENTS

Recommended projects ensure the road network continues to operate with a high level of service as the community grows.

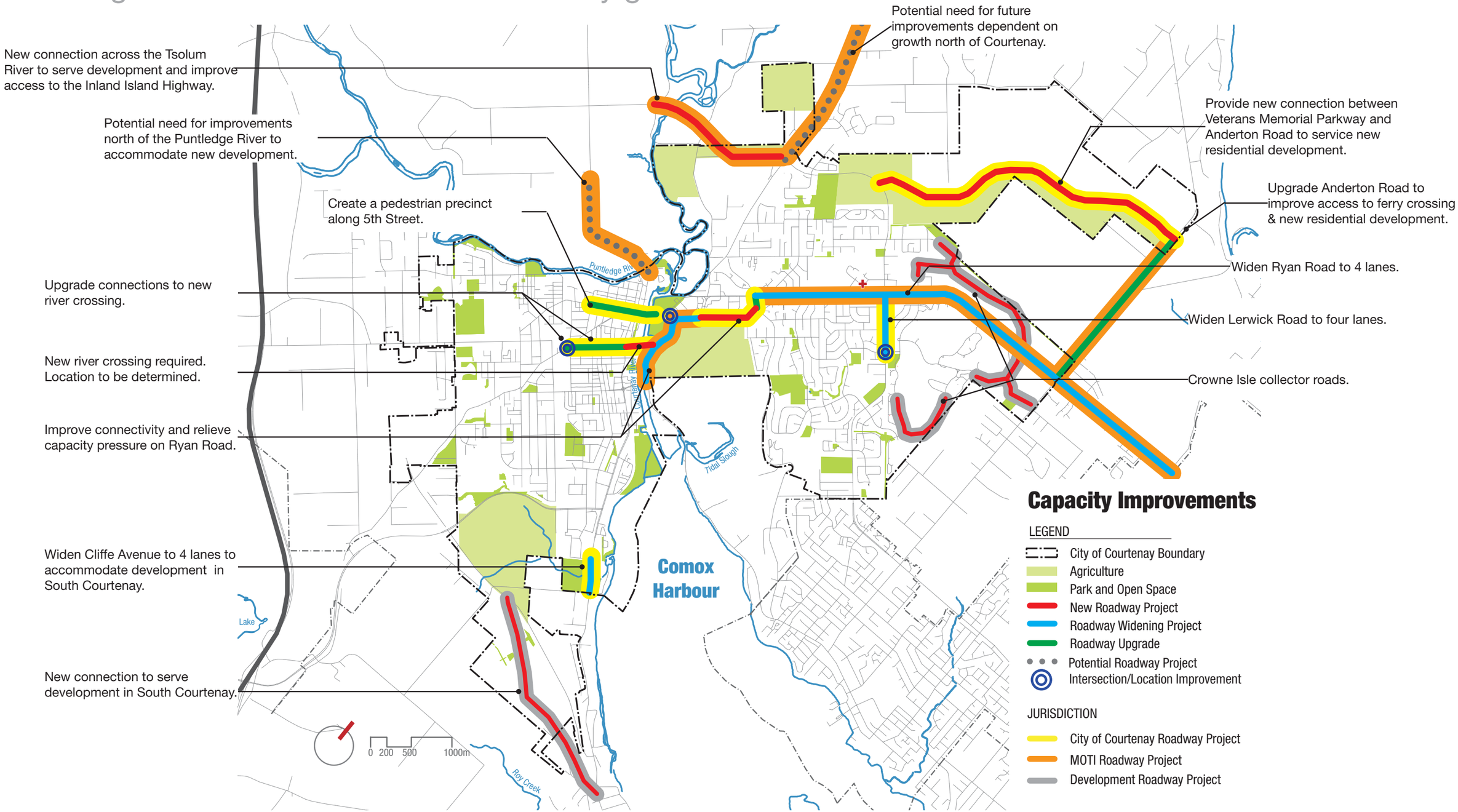


Figure 21. Recommended Road Network Improvements

9.2.1 Third River Crossing

The need for a third river crossing over the Courtenay River was confirmed based on the traffic projections. Accordingly, four potential crossing locations were examined:

- 8th Street
- 11th Street
- 19th Street
- 29th Street

The 2008 *Courtenay River – Third Bridge Crossing Conceptual Options Study* concluded that 11th Street was the most favourable site for a third crossing of the Courtenay River. Compared to crossings at 19th Street and 8th Street, a crossing at 11th Street has the least property impact, lowest construction cost, and most favourable geotechnical conditions.

Results of the current modelling exercise confirm that 11th Street continues to be a leading candidate for a new crossing location:

- Of the four crossing locations, 11th Street does the best job at reducing the amount of travel under congested conditions. It also does reasonably well at reducing network-wide travel time. 11th Street is situated midway between the two existing crossings, and may thus help to alleviate pressure on these crossings.
- The crossing at 8th Street also performs well from a mobility perspective, reflecting the predominant travel patterns within the city. A crossing at 8th Street is estimated to be slightly more expensive than a crossing at 11th Street (based on the cost projections developed in the 2008 report), and has a slightly poorer spacing in relation to the existing crossings.
- The crossing at 19th Street generally performs the worst from a mobility perspective, and is also slightly more expensive than the crossings at 11th Street and 8th Street (based on the 2008 report).
- While 29th Street is most effective at reducing overall travel time, the cost associated with this option is more than double that of the other options, and the environmental impacts to the Courtenay estuary are expected to be significant.

While 11th Street is considered to be the leading option for a new river crossing , it is important to emphasize that the evaluation was conducted at a fairly high level, and did not consider all of the factors which may impact the preferred crossing location (such as geotechnical conditions). As a result, **the location of the new crossing should be confirmed as the City moves forward with the design process**. In particular, a crossing at 8th Street was also found to perform well, and may be a viable option.

In building a new river crossing, it is important to examine the connections to the crossing to ensure they are appropriately designed for the anticipated traffic volume. In particular, if a crossing at 11th Street is selected, than 11th Street should be upgraded from its current status as a local road. In addition, options should be explored for improving the intersection of Cumberland Road and 11th Street; given the road geometry in this area, the option of providing a roundabout may have particular merit.

According to the modelling results, a two-lane bridge will likely be adequate over the 2037 horizon. However, this does not account for potential auxiliary lane requirements at the intersections on either side of the bridge, which may extend back onto the bridge itself. Moreover, while one thru lane may be sufficient in each direction, traffic volumes are predicted to be approaching the threshold where two thru lanes per direction would be required (particularly if the traffic diversion from 5th Street is greater than predicted by the model). **A traffic operations study is required to confirm lane requirements, as well as the configuration of upstream and downstream intersections**.

Previous studies have examined the potential merit of operating the new and existing bridges as one-way couplets, and also converting sections of adjacent roads to one-way operation. A traffic operations study would be needed to confirm the merit of such options from a traffic flow perspective. However, many cities have begun to move away from one-way roads in an effort to revitalize their streets and eliminate circuitous travel. As a result, any decision to implement one-way operations should carefully consider the social, economic, and environmental implications to ensure the project supports the City's vision as outlined in this Transportation Strategy.

In terms of implementation timing, the construction of a new river crossing has been identified as a high priority project (refer to Section 9.2.6). A recent study suggests that the existing 5th Street Bridge has roughly 50 years of service life remaining with appropriate maintenance. The provision of a new crossing will not only increase the capacity over the Courtenay River, but can also be used to accommodate traffic during maintenance work on the existing bridges, reducing traffic impacts.

9.2.2 Recommended Road Network Improvements

In addition to a third river crossing, a number of other projects have been identified to accommodate travel needs over the 2037 horizon. A summary of recommended improvements to the City of Courtenay road network is provided in Table 8 below.

Table 8. Recommended City of Courtenay Projects

Project	Comments
Third River Crossing	• Will address capacity deficiencies over the Courtenay River, provide a new crossing opportunity for pedestrians and cyclists, and add redundancy to the road network in the event of an emergency or lane closure on one of the existing bridges • Refer to Section 9.2.1 for additional details
New 2-lane arterial road connection between Comox Road and Back Road	• Will help to relieve pressure on Ryan Road • Serves as an alternate access to Comox Road (and the new river crossing), creating redundancy in the system • Previous discussions have focused on a connection to Tunner Drive. However, a connection to 6th Street East would be preferable from a traffic operations perspective to increase the separation from the traffic light on Ryan Road, reduce traffic on Back Road north of 6th Street, and provide a more direct connection into the community to the east. A connection to 10th Street East would be even more favourable in terms of road spacing, but may not be feasible due to land use constraints • In conjunction with this project, it is also recommended that Back Road be upgraded to an arterial between Ryan Road and the new connection
Create a pedestrian precinct along 5th Street	• With a new river crossing to take pressure off of 5th Street, there is opportunity to create a pedestrian precinct along the corridor to support a more vibrant, people-friendly downtown • While cars would still be allowed on 5th Street, temporary road closures could be used for street festivals and other special events • Although the transportation model shows traffic congestion on 5th Street (and the 5th Street Bridge) under the recommended plan, this is considered acceptable given that there are alternative routes available for drivers (once the third river crossing is in place). In fact, limited congestion on 5th Street may even be desirable to encourage slower travel speeds and support a more pedestrian-oriented environment

Project	Comments
Widen Lerwick Road to four lanes between Ryan Road & Malahat Drive	• This project will help to improve access to the residential area south of Ryan Road • With the widening of Lerwick Road and continued development of the Crown Isle area, there may also be a need for improvements to the Malahat Drive / Lerwick Road intersection to improve access. The need for such improvements should be confirmed during the design process & cost estimates prepared • From a lane continuity perspective, there would also be value in widening the 3-lane section of Lerwick Road between Malahat Drive and Idiens Way/Valleyview Drive, to connect with the 4-lane sections to the north and south. However, the model results suggest that such widening will not be required within the 2037 horizon based on road capacity needs
Widen Cliffe Avenue from 2 to 4 lanes between Fraser Road and Anfield Road	• Needed to accommodate development in South Courtenay
New 2-lane arterial road between Veterans Memorial Parkway and Anderton Road	• Needed to service the anticipated residential development north of Ryan Road (Raven Ridge) • Will also benefit existing residents by improving the spacing of east-west arterial roads in this area of the city, providing additional network redundancy, and enhancing access to the airport / ferry terminal • 2 lanes likely to be sufficient over the 2037 horizon • As this project is largely being driven by new development, it is anticipated that the project will be funded through development, and implemented in accordance with development timing needs

To improve the flow of traffic through the City of Courtenay, it is further recommended that the City work with the B.C. Ministry of Transportation and Infrastructure (MOTI) to pursue improvements to roadways under the Ministry's jurisdiction. A summary of recommended projects is provided in Table 9.

Table 9. Recommended MOTI Projects

Project	Comments
Upgrade bridge across the Tsolum River & realign Vanier Drive/Piercy Road connection	• This project is not recommended over the 2037 horizon from a road capacity perspective. Based on 2012 traffic counts, there are fewer than 250 vehicles per hour currently using the crossing in both directions combined. By 2037, it is estimated that this figure will grow to roughly 475 vehicles per hour, which can be accommodated under two-way one-lane operation • However, the project would improve access to the Inland Island Highway and is considered to have economic benefits to the Comox Valley • The project would also serve new development north of the Puntledge River. Depending on where this new development is located, improvements in this area of network could potentially relieve pressure on the Puntledge and Courtenay River crossings, as well as routes into and through the downtown (i.e. by providing an attractive alternate route to access destinations in east Courtenay and Comox)
Widen Comox Road to 4 lanes between south of Ryan Road & 17th Street	• Will relieve congestion on Comox Road and improve access to the new river crossing • Based on the model results, the section of Comox Road north of the new river crossing will be approaching capacity by 2037, even with widening to four lanes. Given the potential for such localized operational issues, it will be important to carefully design the intersections along this corridor to minimize delay. Depending on the type of traffic control, auxiliary turning lanes and/or access restrictions may be appropriate
Widen Ryan Road to 4 lanes between Back Road & Military Row	• Ryan Road serves as the primary east-west corridor east of the Courtenay River, and will require widening to 4 lanes to accommodate future travel demand • The option of terminating the 4-lane section at Crown Isle Drive was explored, but would result in unacceptable traffic operations along the section of Ryan Road to the east (i.e. between Crown Isle Drive and Military Row)
Upgrade Anderton Road to an arterial	• Will improve access to the ferry terminal and new residential development north of Ryan Road (Raven Ridge)

9.2.3 Development Projects

Projects included in Local Area Plans (LAP's) and other development proposals are intended to provide access to new communities. Such projects are typically lower order facilities (local roads and collectors) and only serve residents of the community, not through trips. For modelling purposes, the projects are generally included in the "base" scenario since there is every expectation that they will be built (otherwise, residents of the development have no way to access the rest of the city). However, the projects are typically not considered when developing implementation priorities or capital cost estimates, since they are funded through development.

As a general rule, multiple access points should be provided to new communities to distribute traffic more evenly, reduce pressure points, and create a more porous road network. For the 2037 horizon, two "development" projects were modelled, as shown in Table 10. It should be noted that several arterial road projects will also be needed to serve new developments in Courtenay. However, as these projects typically benefit the wider community as well, all arterial road projects have been shown in Table 8, including projects that are largely development driven, such as the new two-lane arterial road between Veterans Memorial Parkway and Anderton Road.

Table 10. Development Projects

Project	Comments
Crown Isle Collector Road System	• The Crown Isle collector road system is intended to provide access to new development north and south of Ryan Road in the east end of the city. Although this project was not included in the 2037 base scenario, it is considered to be essential for servicing the Crown Isle area • As this area of the city develops, the proposed collector road system will provide new connections to Ryan Road, Anderton Road, and Idiens Way, and as such will reduce strain on Malahat Drive

Project	Comments
Comox Logging Road / Livingston Road connection	• This connection is shown in the Local Area Plan for South Courtenay, and is primarily intended to provide access to new development. As such, it was included in the 2037 base scenario as a required project • Depending on the pace of growth in this area, at some point, it may also be necessary to upgrade Fraser Road between Cliffe Avenue and Comox Logging Road, and Comox Logging Road between the Comox Valley Parkway and Fraser Road. The need for such improvements was examined as part of the modelling exercise, but based on currently anticipated development levels, traffic volumes within the 2037 horizon are not expected to be sufficiently high to warrant action. However, these projects should be considered longer-term initiatives as this area of the city continues to develop

9.2.4 Additional Network Needs

The modelling exercise for Courtenay also identified locations where road improvements may be needed in the future, subject to certain conditions. These projects are noted in Table 11. As potential projects, implementation priorities and capital cost estimates were not prepared. However, it is recommended that conditions along these corridors be monitored, and updated travel forecasts be prepared as new data becomes available.

Table 11. Potential Projects

Project	Comments
Improve access between the downtown and the area north of the Puntledge River	• There is a potential need for improvements to accommodate development north of the Puntledge River, including: upgrades to Anderton Avenue and Condensory Road, and improvements to the Puntledge River crossing • The need for improved access may be alleviated if a new bridge is provided across the Tsolum River and the Vanier Drive / Piercy Road connection is realigned. Such initiatives would encourage people living north of the Puntledge River to by-pass the downtown if travelling to east Courtenay or Comox. However, the potential for such diversion is dependent on the location of development; if residents must backtrack to take advantage of such facilities, they are more likely to use the Puntledge River crossing, putting more pressure on the road network in this area
Improvements to Highway 19A North of Veterans Memorial Parkway	• The model results suggest that there may be a need to upgrade / widen Highway 19A north of Veterans Memorial Parkway within the 2037 horizon • However, these results are sensitive to the land use projections used in the analysis, and should be confirmed as new land use forecasts become available for the areas north of the City of Courtenay

9.2.5 Projects Considered but Not Recommended

In the process of developing the recommended road network improvements, a number of projects were considered that were not carried forward into the recommended plan. Some of these projects were intended to support the various river-crossing options, and are no longer needed with the selection of 11th Street as the leading option (such as the extension of McDonald Road to support the proposed crossing at 29th Street). Others were stand-alone projects which were not found to be warranted based on the traffic projections. A summary of the key stand-alone projects that were considered but not recommended can be found in Table 12.

Table 12. Projects Considered but Not Recommended

Project	Comments
Arden Road Connection	• Based on the traffic projections, there is little benefit to connecting the two sections of Arden Road to create a continuous corridor between Embleton Crescent and Lake Trail Road. Such a connection could be considered from an accessibility perspective (i.e. to address emergency service requirements), but is not needed on the basis of road capacity given anticipated development patterns
Upgrade Comox Logging Road between the Comox Valley Parkway and Fraser Road	• As noted in Table 10, development in South Courtenay will put increasing pressure on Comox Logging Road. Accordingly, the need to upgrade this facility was examined as part of the modelling exercise. Although traffic volumes within the 2037 horizon are not expected to exceed the road capacity, this project should be considered a longer-term initiative as South Courtenay continues to develop

9.2.6 Implementation Priorities and Costing

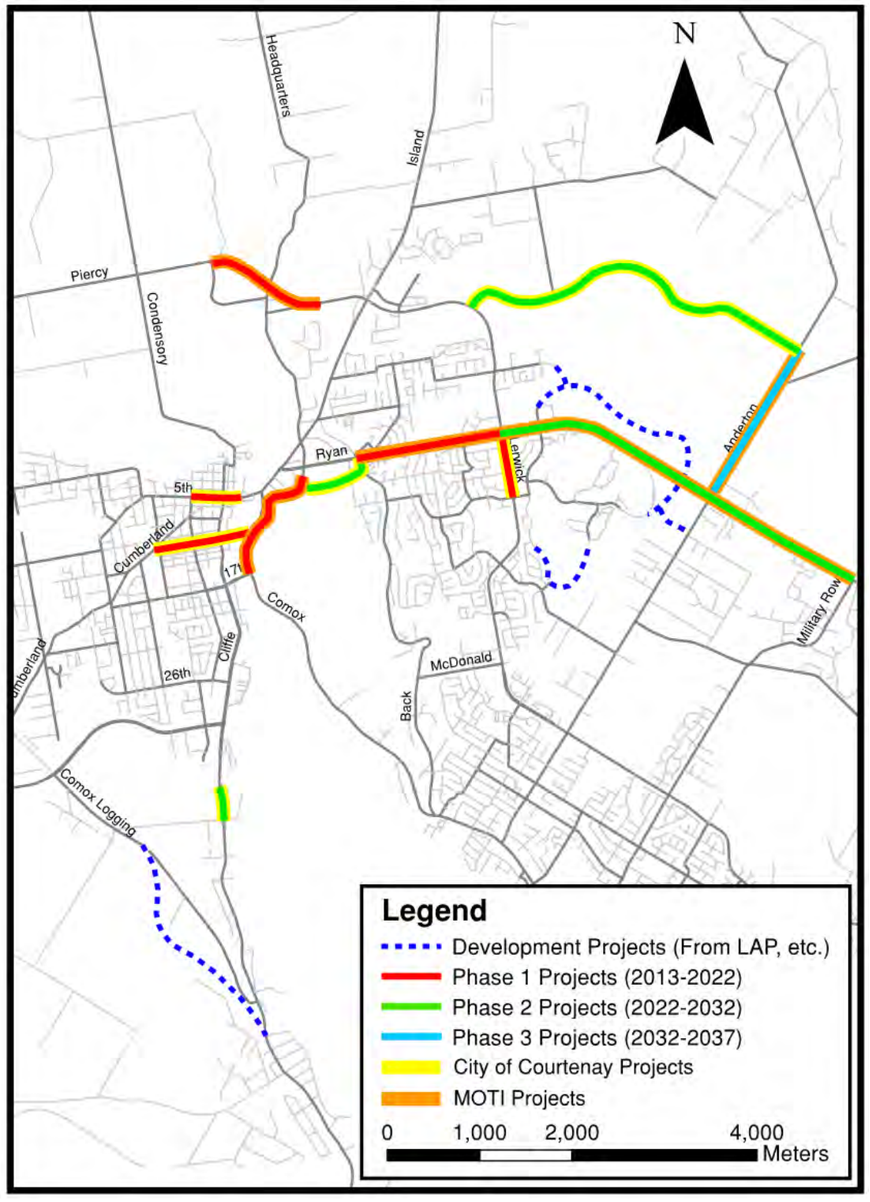
Implementation priorities for the recommended road network primarily reflect the earliest year of need – in other words, how soon will a particular project be needed to address the anticipated capacity deficiencies? Such an assessment was carried out using the transportation model to examine road network performance in several intermediate horizon years, assuming population and employment growth in each area of the city occur uniformly over time. In reality, the actual timing of projects will depend on funding availability and Council approval. Projects may also be deferred or moved forward depending on how development unfolds and the associated change in traffic volumes.

Figure 22 illustrates the proposed implementation plan for the recommended road network, along with order of magnitude cost estimates. In preparing the cost estimates, it was assumed that all projects would be implemented as complete streets, with sidewalks and cycling facilities included in the road cross-section.

As shown in Figure 22, the provision of an improved connection between Veterans Memorial Parkway and Piercy Road is considered a high priority project. Based on findings from the traffic modelling exercise, a new connection is not necessarily needed over the 2037 horizon from a road capacity perspective, but will provide several key benefits, including improved access to the Inland Island Highway, Mount Washington Alpine Resort, and new Comox Valley Hospital. There are also benefits related to safety, emergency response, network spacing, and economic development, as detailed in Appendix G. For these reasons, the City is encouraged to work with its municipal and provincial partners to move this project forward.

In implementing the recommended projects shown in Figure 22, additional planning and design work will be needed to confirm the project requirements, identify the preferred cross-section, examine environmental impacts, prepare design drawings, and refine the estimated cost.

Proposed Implementation Strategy



Order of Magnitude Cost Estimates[1] – City of Courtenay Projects

Project	Cost Estimate	Priority
11th Street River Crossing[2]	$18.5 M	High
Upgrade 11th Street to a residential collector between Cliffe Avenue & Cumberland Road	$0.3 M	High
Tunner Drive Connection between Comox Road and Back Road Upgrade Back Road to a 2-lane minor arterial between Tunner Drive and Ryan Road	$2.5 M	Medium
Create a pedestrian precinct on 5th Street from the bridge to Fitzgerald Avenue	$0.3 M	High
Widen Lerwick Road to 4 lanes between Ryan Road & Malahat Drive[3]	$2.7 M	High
Widen Cliffe Avenue from 2 to 4 lanes between Fraser Road and Anfield Road	$3.1 M	Medium
New 2-lane arterial road between Veterans Memorial Parkway and Anderton Road north of Ryan Road	$15.8 M	Medium
TOTAL	**$43.2 M**	
Per Annum (Based on 25 Years)	**1.7 M**	

Order of Magnitude Cost Estimates[1] – MOTI Projects

Project	Cost Estimate	Priority
New bridge across the Tsolum River & realignment of the Vanier Drive / Piercy Road connection	$11.5 M	High
Widen Hwy 19a to 4 lanes between new Tunner Drive Connection & 17th Street	$7.2 M	High
Widen Ryan Road to 4 lanes between Back Road & Military Row	$28.3 M	High: Back to Lerwick Medium: Lerwick to Military Row
Upgrade Anderton Road to a major arterial north of Ryan Road	$3.6 M	Low
TOTAL	**$50.6 M**	
Per Annum (Based on 25 Years)	**2.0 M**	

Note:

[1] All costs in 2012 dollars. Cost estimates exclude utility and property acquisition costs, as well as costs for tree planting & streetscape amenities.

[2] Assumes only 2 lanes on new river crossing. If 4 lanes provided, cost will increase accordingly.

[3] There is also merit in widening Lerwick Road between Malahat Drive and Idiens Way to provide lane continuity with the 4-lane sections to the north and south. This was not costed since it is not required for capacity reasons.

Figure 22. Implementation Priorities & Order of Magnitude Cost Estimates

9.2.7 Capacity Improvements within a Complete Streets Framework

The recommended road network improvements described above are intended to address anticipated road capacity deficiencies. Nonetheless, by applying complete streets principles in the design and implementation of each project, there is also opportunity to address walking and cycling needs, particularly along existing corridors where pedestrian and cycling facilities may be lacking.

Each road network improvement is to be designed, constructed, and maintained in accordance with complete streets principles. While the need for a particular project may be driven by road capacity considerations, the benefits should be felt by all road users.

As one example, results of the road network analysis call for the widening of Lerwick Road between south of Ryan Road and Malahat Drive to address anticipated congestion. The following “before and after” image of Lerwick Road near Mark Isfeld Secondary School shows how capacity improvements can be implemented in a way that balances the needs of all users. Before improvements, the quality of service provided along the corridor suffers for a number of reasons:

- Poor lane continuity affects vehicle travel. There are currently three travel lanes through this section; however sections of Lerwick Road to the north and south each have four, causing undesirable lane change activity at the transition point where one of the lanes is dropped.
- There are no bike lanes, decreasing travel choice.
- The pathway is not very accessible, forcing residents to cross the road to use sidewalk facilities with a smooth travel surface.
- More car traffic is generated because of the poor walking and cycling environments.

With new infrastructure, a balanced roadway is achieved. An additional travel lane is provided, but is balanced by tree plantings and sidewalks that remind cars to slow down. In addition, the exhibit illustrates the potential opportunity to consider a multi-use path for the corridor, which would help to create a safe and attractive environment for walking and cycling. These changes would improve conditions for all road users by enhancing connectivity and ensuring an equitable allocation of roadway space while also addressing road capacity needs.

The capacity improvements recommended in the Transportation Strategy will make sure that as the City grows, the roadway network grows with it. And it will provide for growth in such a way that drivers, cyclists, pedestrians, and transit users are being accommodated in a balanced fashion.

The provision of an additional travel lane on Lerwick Road improves conditions for motorists while a new off-road path creates a safer environment for walking and cycling.

9.3 Active Public Realms

The final piece for the success of a balanced plan is the creation of active public realms. This third “big move” is the recognition that active, vibrant and interesting places create cities – and destinations within those cities – that people want to be in. Streets have a big role to play in the creation of active public realms as they often consist of the largest percentage of public space owned by a municipality, and are therefore significant and valuable assets.

One area of the city where active public realms are particularly important is the downtown. While improvements are encouraged throughout the downtown, the Transportation Strategy focuses on 5th Street as a high priority. With construction of a third river crossing, the volume of traffic on 5th Street is expected to decline, which, combined with streetscape improvements, has the potential to create a more welcoming public space for both residents and visitors.

The “before and after” images of 5th Street help illustrate how the public realm is affected by the physical relationships between vehicles and people. By widening the sidewalk and creating “activity zones”, a pedestrian-friendly environment is created that let people know they belong in the space. This has health, social, economic and environmental benefits:

- **Social:** Active streets create a sense of community and give people a reason to be out of their homes, meeting neighbours and socializing. Streets contribute to a sense of neighbourhood identity, an important element to creating a livable city that people want to be a part of.

- **Economic:** Active streets within commercial areas are positive economic drivers – they attract people to come walk around, sit and shop. Streets can also offer economic efficiencies by becoming places for green infrastructure, such as stormwater management.

- **Environment:** Streets can also help realize environmental benefits such as air filtration and habitat provision by increasing the urban tree canopy. They are also places to efficiently locate green infrastructure; they provide stormwater treatment through filtration, lessening demands on existing underground infrastructure.

- **Health:** Interesting, vibrant and accessible destinations encourage people to walk and cycle more, resulting in healthy lifestyle choices.

Streets are therefore significant environmental, economic and social assets. Realizing these assets requires strategic investments in transportation infrastructure such as wider sidewalks, bicycle parking, paving treatments, benches and street furniture to create ‘activity zones’, and bioswale and planting features. These investments are not required on every street, but are required to create areas, or nodes, that are fun, active places to be, and that will contribute to economic resiliency and social vibrancy.

Wider sidewalks and attractive streetscapes create a welcoming pedestrian environment on 5th Street. Vehicular access and on-street parking define the public space, but no longer dominate it.

10 Implementing the Strategy: A Toolbox for Action

The City of Courtenay Transportation Strategy presents a vision for transportation and land use that supports healthy lifestyles and sustainable, connected communities. To realize this vision, an Implementation Toolbox was developed which describes various opportunities, strategies, and supporting measures for achieving key Node, Greenway, and Corridor objectives. The toolbox is presented on the following pages, and is intended to help the City in identifying priority actions for moving forward.

Nodes

Objective 1 Growth nodes accommodate new residential, commercial and community services development.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
1.1 Direct growth toward residential, commercial/community services and downtown nodes.	a. Prepare an urban structure concept to confirm the optimal location for new residential and commercial/community service nodes in accordance with the following principles: – Nodes are intensely place-based and reflect local character, including built form, land use, user profile and neighbourhood context – Nodes are located in areas appropriate for more intense density, use and activity – The downtown will be the major focal point of community activity – New nodes strengthen existing land use anchors – Nodes accommodate a mix of uses
	b. Update the OCP to include the growth node framework and develop supporting policies to ensure consistency with the proposed land use vision
	c. Prepare Local Area Plans for growth nodes to guide development, giving consideration transportation, the public realm, land use and built form
1.2 The downtown node is the community focal point.	a. Implement OCP goals and policies identified in the Downtown Plan. Continue to encourage a diversity of uses and building types, increase office and residential uses in the area, preserve heritage and architectural resources, and promote the downtown as a social and cultural hub
	b. Encourage pedestrian-prioritized activities, as follows: – Careful streetscape design that clearly delineates pedestrian zones, including wide sidewalks, interesting surface treatments and paving materials, incorporation of green infrastructure, engaging and unique street furniture (lighting, benches, planters, bike racks) – Activity programming that closes the street to vehicle travel such as traffic-free days, night markets, community celebrations
	c. Prepare a Local Area Plan to provide direction for the following: – Increased density of institutional/office and residential uses – Pedestrian-prioritized areas and activities – Potential infill locations – Parking strategy – Context-sensitive design that respects a cohesive aesthetic

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
1.3 Residential nodes accommodate anticipated residential growth.	a. Respect the conceptual growth boundary identified in the OCP when planning for new residential nodes
	b. Prepare Local Area Plans for candidate node sites: – Raven Ridge (north of Ryan Road, between Lerwick Road and Anderton Road) – Area south of Lake Trail Road and east of Marsden Road – Area south of Fraser Road
	c. Develop process and zoning tools to encourage small-scale development and residential intensification within the urban boundary
1.4 Commercial/community services nodes are locations of more intense density, mixed use and activity.	a. Orient nodes around intersecting corridors that can be easily accessed by walking, cycling and transit. Potential candidate corridors include: – Cliffe Avenue, as a linear node extending from Downtown to the Anfield/Driftwood node – Ryan Road and Lerwick Road – Ryan Road and Hwy 19a – Hwy 19a and the Veterans Memorial Parkway
	b. Identify place-based functions for nodes to attract increased use and activity based on a particular type of retail (home supplies), neighbourhood need (park, grocery store), or specialized service (e.g. hospital, elder care)
	c. Encourage increased density and mixed use through: – Sensitive infill that expands the mix of uses while protecting positive qualities of built up areas – Redevelopment or adaptive reuse of an existing site – Intensification of land uses in new development
	d. Establish minimum density thresholds

Nodes

Objective 2

Development patterns provide mobility choice for travel within and between nodes

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
2.1 Encourage the development of connected street patterns.	a. Identify a range of potential street pattern types for residential neighbourhoods and commercial/ community service nodes
	b. Allow for more direct pedestrian and cyclist travel between destinations by increasing route options and decreasing travel distance by choosing street patterns with the following characteristics: – Many short links – Numerous intersections with other pedestrian or cycling routes – Minimal dead ends
	c. Conduct walkability and bikeability audits to identify existing areas with connectivity gaps. Preliminary research and public engagement suggest the following areas: – Residential access from Tunner Drive to the commercial node at Ryan Road/South Island Highway – Residential access across Ryan Road to the North Island College Area – Safe routes to neighbourhood schools
	d. Address connectivity gaps through improvements such as through-block connectors or connections at the end of cul-de-sacs
2.2 Require all subdivision and development to adhere to block and lot standards.	a. Define standards for block and lot size, area, perimeter and configuration in accordance with the following principles: – Block perimeters balance pedestrian and bicycle comfort, emergency response times, transit accessibility, service vehicle access and automobile movement – Block perimeters maximize real estate value by creating the greatest number of high-value perimeter lots – Block and lot sizes create modular units that can be flexibly assembled or subdivided to meet short- and long-term needs and respond to changing market demand – Block and lot configuration is consistent with connected street pattern types – Block areas and perimeters support a range of building types to encourage mixed use and varied housing formats – Block and lot configuration respects topography and natural features
	b. Design residential blocks that are small enough to maximize development opportunity, street network connections and street frontages
	c. Design larger blocks that can accommodate larger scale commercial or institutional uses. Provide pedestrian and cycling links to increase connectivity within these blocks
	d. Evaluate existing large blocks to determine potential suitability for redevelopment and/or creation of pedestrian and cycling links to improve connectivity

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
2.3 Promote a mix of uses and building types in residential, commercial/community services and downtown nodes.	a. Encourage residential areas to provide small-scale goods and services clusters to generate activity and a mix of uses that provide daily needs
	b. Develop design guidelines to direct infill that is context-sensitive and respects local character
	c. Configure and distribute land uses in new development such that daily needs can be accessed within a 5- to 10-minute walk or bike ride, as follows: – Residential nodes are configured as walkable neighbourhoods that include some small-scale neighbourhood-level commercial services – Commercial/community services nodes and the downtown node support residential nodes and may include some higher-density housing formats
	d. Evaluate existing residential developments to identify areas that cannot meet daily needs within a 5- to 10-minute walk or bike ride by using mobility catchment mapping tools
	e. Ensure zoning supports the distribution of a mix of uses within each node

Greenways

Objective 1

Integrate the design of the greenway network at all scales of planning and development.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
1.1 Require all subdivision and development to be planned and developed in accordance with greenway network design guidelines as a condition of approval.	a. Prepare Local Area Plans for all new development areas to determine the appropriate location of greenway network sites
	b. Develop greenway network design guidelines to inform the preparation of Local Area Plans in accordance with the following principles: – Identify and preserve areas of ecological importance at the outset of any new planning or development project – Connect preserved areas to other natural areas and the greenway regional path through buffer strips or conservation corridors – Require through-block connections (bikeways and walkways) to ensure connectivity to major and minor destinations within and outside the development
	c. Dedicate buffer strips within properties prior to any land rezoning or covenant registration under Section 219 of the Land Title Act to provide for pedestrian trails and landscaped areas, in addition to the 5% parkland dedication requirement
	d. Create greenway network approvals checklist to assist with Approving Officer review of all subdivision applications
1.2 Link new developments along the riverfront to the Courtenay Riverway System.	a. Provide bikeway and walkway links to the Riverway prior to any land rezoning or covenant registration under Section 219 of the Land Title Act

Objective 2

Improve cycling and pedestrian access and opportunities within the City of Courtenay.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
2.1 Protect, enhance, expand and promote the greenway network to provide sustainable, connected transportation options, improved recreation amenities and integrated ecological infrastructure.	a. Update the Greenways Map to reflect the new greenway network classification system
	b. Develop design and maintenance standards for all greenway network facilities based on the design concepts presented in this report
	c. Develop a signage strategy to identify clear and consistent approaches to: – Wayfinding (e.g. mile markers and map boards showing key destinations) – Conveying information about appropriate user activities and behaviours – Interpretive messaging about natural and historical features of interest
	d. Work with regional partners, neighbouring municipalities, supporting agencies and interested community groups to promote and develop the greenway network and to ensure coordination
	e. Identify land acquisition procedures for acquiring and dedicating land for the greenway network
	f. Review potential impacts on the greenway network before selling or leasing any City owned lands
2.2 Expand the Courtenay Riverway System.	a. Review and update Courtenay Riverway policies in the OCP to reflect the design concepts presented in this report
	b. Identify candidate locations and develop site concepts for riverway destinations that support increased recreational and tourism uses
2.3 Implement streetscaping improvements to build network connectivity through greenway street links.	a. Identify candidate locations and a priority implementation list for greenway street links in areas identified as requiring improved pedestrian and cycling connections in the Greenways vision map
	b. Create a list of funding mechanisms to assist with streetscaping improvements

Corridors

Objective 1

Transform streets into appealing public spaces that accommodate a variety of uses and modes, while still meeting mobility and access needs.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
1.1 Design road corridors in accordance with “Complete Streets” principles	a. Develop a complete streets policy for Courtenay: – Pedestrian, cyclist, transit, and motorist needs to be routinely accommodated in all road reconstruction and new construction projects – Operations and maintenance activities to consider the needs of all users – Exceptions should be clearly stated and approved by Management
	b. Update the Official Community Plan to include complete streets concepts
	c. Adopt the road classification system presented in **Section 8** of this report and apply the system to the city’s existing road network
	d. Adopt the conceptual road cross-sections presented in **Section 9.1.2** of this report as a general guideline for new and existing corridors, recognizing the need for flexibility and creativity in responding to site-specific conditions and right-of-way constraints
	e. Consider opportunities to incorporate “green infrastructure” in all road projects
1.2 Improve integration between land use and transportation infrastructure (also refer to policies for Nodes)	a. Retrofit existing corridors / intersections to create more attractive, people-friendly streets. Priority locations include: – Cliffe Avenue – Ryan Road / Lerwick Road intersection area – Ryan Road / Island Highway intersection area

Objective 2

Minimize impacts to water quality and quantity by integrating low impact development (LID) stormwater management techniques in roadway design and maintenance.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
2.1 Green infrastructure is integrated, where possible, along new roadways.	a. Develop low impact development (LID) stormwater management guidelines that direct the application of comprehensive and cost-effective techniques such as bioswales, rain gardens, and permeable pavements for new road construction
	b. Consider planting shrubs and understory vegetation in place of grass in boulevards, where appropriate

Objective 3

Minimize climate change impacts by expanding the urban forest.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
3.1 Retain and plant trees along boulevards within the road right-of-way.	a. Utilize context-sensitive design practices to retain mature trees, where possible
	b. Plant native, climate-adaptive tree species and understory vegetation

Objective 4

Create a safe and attractive network for walking and cycling with a high degree of connectivity to community destinations.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
4.1 Develop an integrated, well-connected pedestrian network	a. Develop & implement a Sidewalk Strategic Plan – Conduct an inventory of current sidewalk facilities and identify gaps in the sidewalk network – Develop a prioritization process for ranking sidewalk improvements and apply the process to identify priority needs – Develop a sidewalk capital improvement program with an annual budget for sidewalk construction
	b. Work with the Comox Valley Accessibility Committee to identify, prioritize, and implement accessibility improvements for pedestrians
	c. Require sidewalks to be provided on all new roads and road reconstruction projects, when practical, in accordance with the complete streets policy to be developed and in keeping with the recommended road cross-sections presented in this report
	d. Develop a Pedestrian Plan for Courtenay – Identify roads and districts where pedestrians have high priority and develop recommendations to improve the pedestrian environment in such locations – Develop guidelines and standards for the design and construction of pedestrian friendly streets and neighbourhoods, to be included in all Development Permit Areas and subdivision and servicing regulations
4.2 Develop an integrated, well-connected cycling network	a. Continue to be an active participant in the Comox Valley Cycling Task Force, and support the Task Force in its efforts to implement the Comox Valley Cycling Plan
	b. Develop a Cycling Plan for Courtenay – Identify a connected local network of dedicated bike lanes throughout the city that link seamlessly with other jurisdictions – Develop guidelines and standards for the design and construction of cycling facilities, to be included in all Development Permit Areas and subdivision and servicing regulations – Confirm the most appropriate location for a new pedestrian/cyclist connection across the Courtenay River to improve east-west connectivity
4.3 Continue to allow traffic calming in residential areas and school zones to minimize cut-through traffic and reduce vehicle speeds	a. Develop Traffic Calming Guidelines for Courtenay which set out: – The conditions that must be met in a given community for considering traffic calming measures – The toolbox of traffic calming measures that are considered appropriate for Courtenay – The process for ranking traffic calming projects across the city (for prioritizing funding & implementation)
4.4 Adopt measures to improve pedestrian and cyclist safety	a. Identify and address safety issues on existing walking and cycling facilities, particularly at road crossings
	b. Promote pedestrian supportive design at intersections (e.g. smaller radii, curb cuts, bulb-outs, etc.)
	c. Encourage the police department to carry out targeted traffic enforcement to educate cyclists and motorists on safe behaviour (i.e. cycling and share-the-road campaigns)
	d. Support traffic safety education and outreach initiatives – Provide educational material on the City's website and link to ICBC educational tools
4.5 Continuously strive to improve existing policies and programs	a. Collect data to monitor effectiveness and identify opportunities for improvement – Public perceptions and attitudes – Capital and maintenance expenditures – Network characteristics (i.e. km of on-road cycling lanes per capita, etc.)
4.6 Adopt maintenance strategies that recognize the needs of all road users	a. Provide a convenient way for the public to report cycling and pedestrian maintenance issues
	b. Ensure work zones can be safely navigated by cyclists and pedestrians
	c. Work with neighbouring jurisdictions to ensure coordination of maintenance and snow clearing activities

Corridors

Objective 5

Encourage and support initiatives that reduce the number of passenger vehicles trips within the city.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
5.1 Encourage Travel Demand Management (TDM) initiatives *TDM is aimed at changing travel behaviour in order to improve the efficiency of the transportation system and reduce environmental impacts. It includes strategies that encourage auto drivers to:* – *Shift travel modes (to more sustainable options such as* walking*, cycling, car-pooling, or transit);* – *Reduce the number and length of trips (by changing the trip destination, consolidating trips, or substituting telework for physical travel); or* – *Opt for less congested routes and times.*	a. Conduct a parking study for downtown Courtenay and assess the feasibility / implications of implementing paid parking in the downtown b. Work with the School District in its efforts to develop Safe Routes to School and support B.C.'s HASTe (Hub for Active School Travel) initiative which encourages active transportation among school children c. Revise Traffic Impact Study requirements to include the development of a TDM plan for all major developments d. Review parking requirements for new developments and revise downward where appropriate e. Evaluate potential changes to the Off-Street Parking Reserve Fund to allow future funds to be used for TDM initiatives as well as vehicular parking f. Work with community event organizers to encourage the use of alternative modes to concerts, festivals, and other events by providing preferential treatment, such as preferential carpool parking and bike valet services g. Lead by example by adopting TDM measures at City facilities and offices: – Provide preferential carpool parking – Upgrade pedestrian and cyclist amenities (end-of-trip facilities, sidewalks, benches, etc.) – Support flexible working hours by City staff where feasible h. Support employers in encouraging TDM within the workplace: – Develop a TDM toolkit for employers – Promote local carpool programs such as IslandRideShare – Work with large employers (such as the Military Base) to implement TDM programs i. Promote TDM to the community through advertising and marketing programs, and support initiatives such as 'Bike to Work Week' j. Encourage the Comox Valley Transit System to join Google's Transit Partner Program to facilitate multi-modal trip planning within the Comox Valley

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
5.2 Provide amenities to support alternative modes	a. Introduce changes to the Zoning By-law to include bicycle parking / end of trip facilities as a requirement of development b. Conduct an audit of existing pedestrian facilities to ensure adequate lighting, benches, and other amenities. Develop a long-term strategy for improving amenities and accessibility c. Conduct an audit of bicycle parking at public facilities (shopping malls, libraries, recreation centres, etc.) and upgrade where necessary d. Provide a pedestrian-supportive environment near transit stops and stations, including benches and shelters e. Provide long-term bicycle parking at major transit hubs f. Promote the "bikes on buses" service offered by the Comox Valley Transit System

Corridors

Objective 6 Maintain a high level of service for vehicular movement.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
6.1 Address localized safety and congestion issues through a combination of traffic control and infrastructure improvements	a. Provide a convenient way for the public to report traffic and safety issues b. Implement a Traffic Systems Management Program to optimize traffic flow on the existing road network – Undertake traffic operations assessments at problem locations – Review collision records on a regular basis to identify potential safety issues – Require traffic impact studies to be prepared for all major developments
6.2 Apply innovative traffic control strategies to improve traffic flow	a. Routinely consider the use of roundabouts in all road and intersection projects b. Examine the appropriateness of applying advanced technologies for traffic management and control (i.e. traffic cameras for incident management and real-time traveler information, advanced traffic signal systems, transit / emergency vehicle priority systems, etc.)
6.3 Implement road capacity improvements to accommodate future population and employment growth	a. Commence functional planning and design studies for the recommended road network improvements outlined in this report, with timing dependent on observed growth rates and development activity b. Ensure that transportation requirements are considered in all Local Area Plans, including the designation of a collector road system that provides multiple access points into the community on a well-connected network of streets c. Monitor traffic conditions on the road network, and update the Transportation Strategy every 5 to 10 years as development activity warrants (in concert with updates to the Official Community Plan)
6.4 Promote integrated planning within the Comox Valley by developing partnerships with the Town of Comox, Village of Cumberland, Comox Valley Regional District and BC Ministry of Transportation	a. Continue to participate in joint task forces and planning initiatives b. Develop a new Regional Travel Demand Model for the Comox Valley. The existing model was originally developed in the 1990's. To improve the model accuracy, there is a need to carry out a household travel survey to confirm trip generation rates and origin-destination travel patterns, modify the traffic zone system to reflect development patterns and boundary changes, improve the modelling of external trips, and update the land use data for Electoral Areas "A", "B", and "C"

Objective 7 Improve the quality of transit service in the Comox Valley.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
7.1 Collaborate with BC Transit and the Comox Valley Regional District to improve transit service	a. Participate in the development of the Comox Valley Transit Future Plan currently underway b. Pursue options for a new transit exchange downtown which meets bus routing requirements (currently under review), yet also provides a welcoming waiting area for pedestrians, with landscaping / artwork, shelters, benches, information panels, wide sidewalks, bicycle parking, and lighting. Ideally, the transit exchange is integrated into the downtown fabric and looks at shared use opportunities with retail and commercial business. The exchange contributes to a positive place-making experience for patrons and non-patrons alike
7.2 Implement transit-supportive measures within the city	a. Provide transit route & schedule information at bus stops b. Establish transit amenity standards for shelters, accessibility features, and lighting. Upgrade existing bus stops and apply the standards in all new developments c. Consider the application of transit priority treatments at signalized intersections to improve transit service in key areas

Objective 8 Provide a resilient and flexible transportation system that can respond to emergency situations.

OPPORTUNITY / STRATEGY	SUPPORTING MEASURES
8.1 Develop a plan for meeting transportation needs during various emergency scenarios	a. Work with the B.C. Ministry of Transportation to designate emergency detour routes in the event of a closure on Highway 19 or Highway 19A b. Continue to work with the Comox Valley Emergency Program on evacuation routes as part of the City's Emergency Management Plan
8.2 Build redundancy into the transportation system	a. Implement the recommended road network improvements outlined in Section 9.2 of this report to address anticipated congestion bottlenecks and provide alternative transportation routes.

A copy of the City's current Emergency Transportation Routes is provided in Appendix F.

11 Priorities Moving Forward

Based on the ideas put forward in the Implementation Toolbox, specific actions and deliverables were identified for priority implementation in the short, medium, and long-term. A summary of these priority actions is presented in the following tables.

Category 1.0 Land Use Planning Principles

ITEM	DELIVERABLES	PRIORITY	DEPT. LEAD
1.1 Develop Local Area Plans and integrate elements of the Transportation Strategy into LAP's	– Identify and prioritize required LAP – Establish a budget for the implementation of 1 LAP every other year – Implement clear language in the OCP for expectations regarding LAP renewal to ensure that policies remain current	Med-High (1-5 years)	Planning
1.2 Adopt land use planning principles that support the implementation of objectives in this plan in the OCP update	– Establish language around the following planning principles to implement into OCP • Directed growth • Access by proximity • Connected mobility choices • Ecological foundation • Network hierarchy – Implement during next OCP amendment	Med-High (1-5 years)	Planning

Category 2.0 Transportation Network Development

ITEM	DELIVERABLES	PRIORITY	DEPT. LEAD
2.1 Update the City Road Network Map	– Update the road network map to reflect new road classifications – Review and update truck routes – Review and update cycling routes – Adopt as amendment to OCP	High (1-3 years)	Engineering
2.2 Make improvements to the City's cycling network	– Establish an annual budgetary commitment to improve the City's cycling infrastructure – Complete an evaluation of the City's cycling network and infrastructure through a report identifying the state of multi-modal transportation in the Comox Valley – Review and update the City's Cycling Network – Develop a prioritized list of cycling infrastructure upgrades required	Med-High (1-5 years)	Engineering
2.3 Update subdivision servicing bylaw	– Develop language to implement the following products of the Transportation Strategy • Road cross-sections • End of trip facilities • Block size and lot size standards	High (1-3 years)	Engineering
2.4 Make improvements to the City's pedestrian/ mobility network	– Establish an annual budgetary commitment to improve the City's pedestrian/ mobility network – Complete an evaluation of the City's pedestrian/ mobility network and infrastructure through a report identifying the state of multi-modal transportation in the Comox Valley – Review and update the City's pedestrian/ mobility network – Develop a prioritized list of pedestrian/ mobility infrastructure upgrades required	Med-High (1-5 years)	Engineering

Category 3.0 Network Improvements

ITEM	DELIVERABLES	PRIORITY	DEPT. LEAD
3.1 Update the Parks and Greenways plan	– Establish a steering committee to develop the needs, requires, and/or scope of the parks and greenways plan – Establish a budget to complete the plan	High (3-5 years)	Planning
3.2 Establish traffic calming guidelines	– Identify locations where traffic calming is to be accepted – Establish approved traffic calming specifications and standards – Develop evaluation criteria for prioritization of traffic calming requests	Long Term	Engineering
3.3 Evaluation framework	– Develop an evaluation framework for evaluating and ranking transportation related capital projects	High (1-3 years)	Engineering
3.4 Road network analysis	– Establish a program to carry out performance reviews of individual intersections – Allocate annual funding for ongoing review and analysis of intersections	High	Engineering

Category 4.0 Education and Promotions

ITEM	DELIVERABLES	PRIORITY	DEPT. LEAD
4.1 Educate City of Courtenay businesses in Transportation Demand Management	– Develop a TDM toolkit that is representative of local businesses – Deliver a clear, consistent, and targeted message with Regional approval – Ongoing promotions of the program	Long Term	Planning
4.2 Corporate policy	– Develop a program to guide the City in leading by example	Long Term	Transportation Strategy Steering Committee

Category 5.0 Monitoring and Evaluation

ITEM	DELIVERABLES	PRIORITY	DEPT. LEAD
5.1 Transportation Steering Committee	– Establish a Steering Committee to oversee the implementation of the Strategy and monitor the successes – Senior management to appoint members – Steering Committee to report back to Council regularly on the successes and progress of the Strategy – Steering Committee to establish lines of communication with public interest groups to explore opportunities for collaboration	High	Engineering
5.2 Data Collection and Traffic Counts	– Develop a program to carry out continuing data collection and traffic counts – Produce a report every 5 years updating the assumptions of traffic volumes and modal split – Create a GIS layer to store traffic data	High (1-5 years)	Engineering

Appendix A: Road Cross-Sections

ARTERIAL/MOBILITY CORRIDOR

The primary connectors to different areas of the city and the spine of the transportation network.

+City of Courtenay

Generous setback from road provides comfort and safety for pedestrians using the sidewalk on Lerwick Road in Courtenay, BC

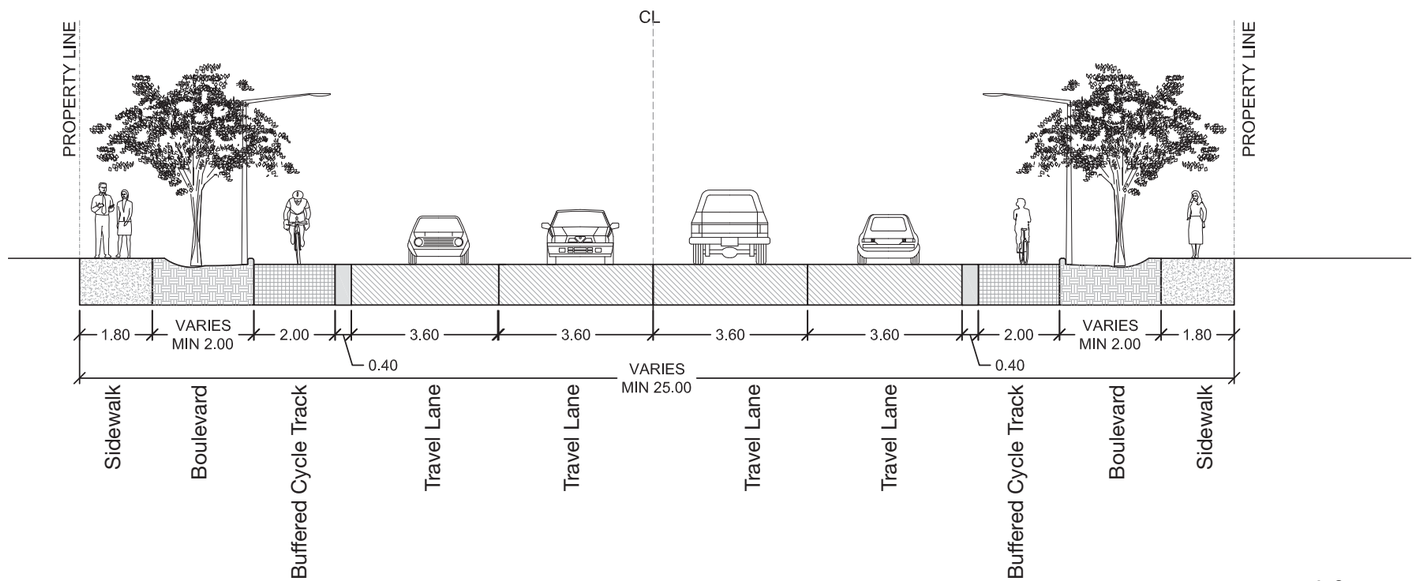
+ City of Courtenay

Separated multi-use path along Veteran's Memorial Parkway.

+ BiPediality

A buffered cycle track increases separation between vehicles and cyclists.

User Volumes	Heavy regional travel movements and significant traffic volumes between residential and service nodes.
Mobility	Operational measures + physical design support a high level of vehicular mobility. Features may include: - Signal timing - Dedicated turning lanes - Controlled access to the road allows traffic to flow freely A cycle track increases separation between cyclists and vehicles, increasing the sense of safety and comfort for all road users.
Public Realm	The road frontage varies as roads pass through different land uses to connect different areas of the city.
Candidate Streets	- Ryan Road - Veteran's Memorial Parkway - Comox Valley Parkway



COMMUNITY COLLECTOR

Provides access to larger community destinations such as schools, major parks and civic buildings.

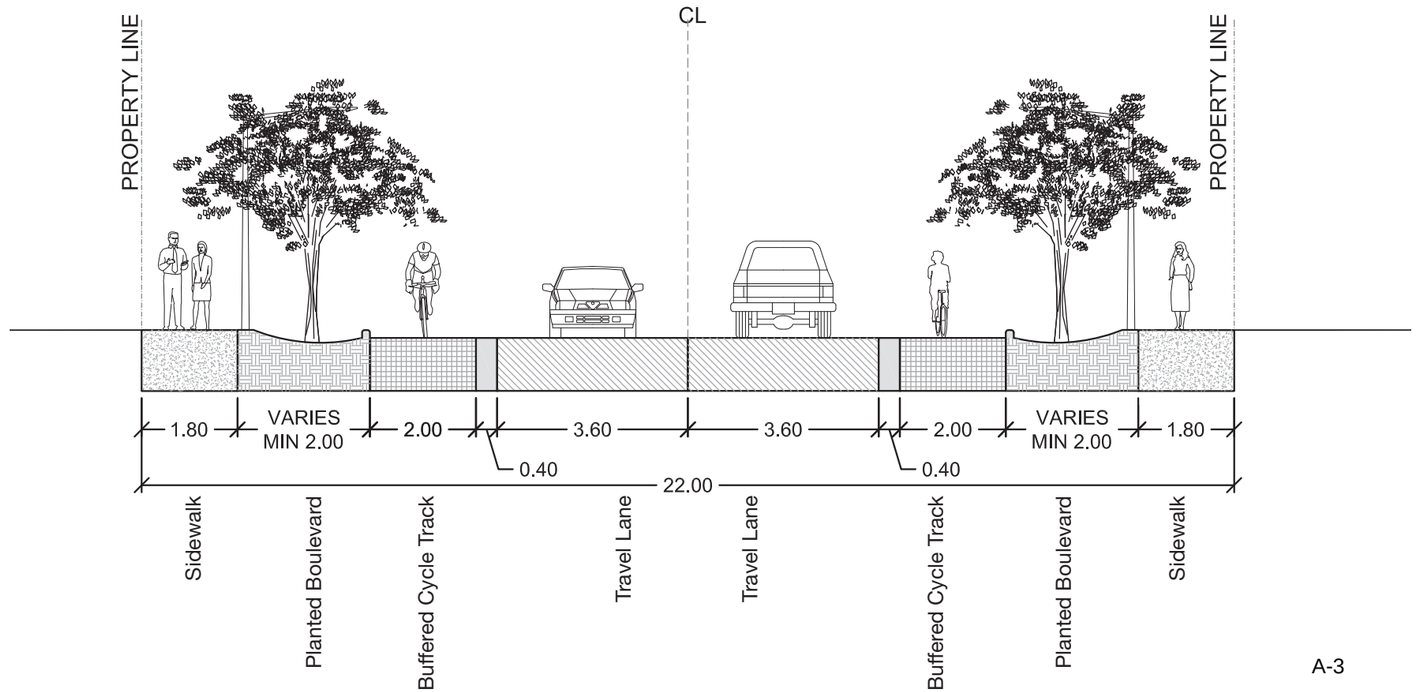
Two travel lanes, dedicated cycle lanes, a transit shelter, wide sidewalks and planted medians provide comfortable environments for multiple transportation modes.

+ O2 Planning + Design

A collector road with a dedicated cycle lane and sidewalk provides access to nearby amenities.

+ City of Courtenay

User Volumes	Relatively high volumes of vehicle, transit and cycling travel.
Mobility Features	Operational measures + physical design support a high level of vehicular + cycling mobility: - Signal timing - Dedicated turning lanes. - Parking is generally discouraged to enable free-flow of traffic and reduce vehicle-cyclist conflict. - A cycle track increases separation between cyclists and vehicles, increasing the sense of safety and comfort for all road users.
Public Realm	- Road frontage features a mix of uses, densities + building types. - Sidewalks widen near activity areas to generate pedestrian interest street-level amenities.
Candidate Streets	- Cliffe Avenue (north of 17th St) - Comox Road - Cumberland Road



RESIDENTIAL COLLECTOR

The residential node connectors that service neighbourhood destinations and higher density residential uses.

+ Google

Residential collector street characterized by generous setbacks, varied building types and densities.

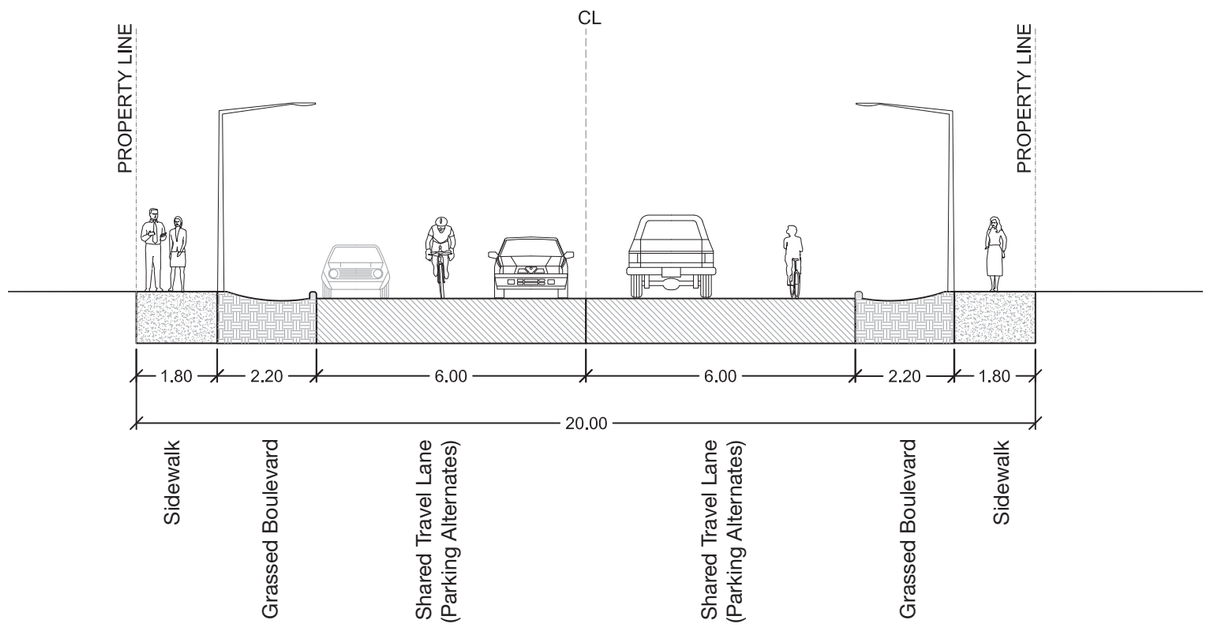
+ Creative Commons

Curb extensions and planted swale provide safe pedestrian crossing.

User Volumes	Well used locally by vehicles, cyclists and pedestrians to access daily needs.
Mobility Features	Physical design elements balance traffic speed and flow for all modes: - Curb extensions at priority crossings - Sharrow markings for cyclist safety - Parking alternates on either side of street to safely accommodate cyclists Additional design elements such as planted boulevards, cycle lanes, and parking bays may be considered as part of Local Area Plans.
Public Realm	- Road frontage features a mix of higher-density residential uses and neighbourhood-level commercial services/community destinations.
Candidate Roads	- Crown Isle Boulevard - Malahat Drive - McLauchlin Drive - Valley View Drive

+ Ciclavia

Sharrow markings demarcate a shared road environment on a residential collector.



RURAL COLLECTOR

The links to residential homes and services outside the urban boundary.

+ City of Courtenay

Rural residential roadside environment in Courtenay, BC

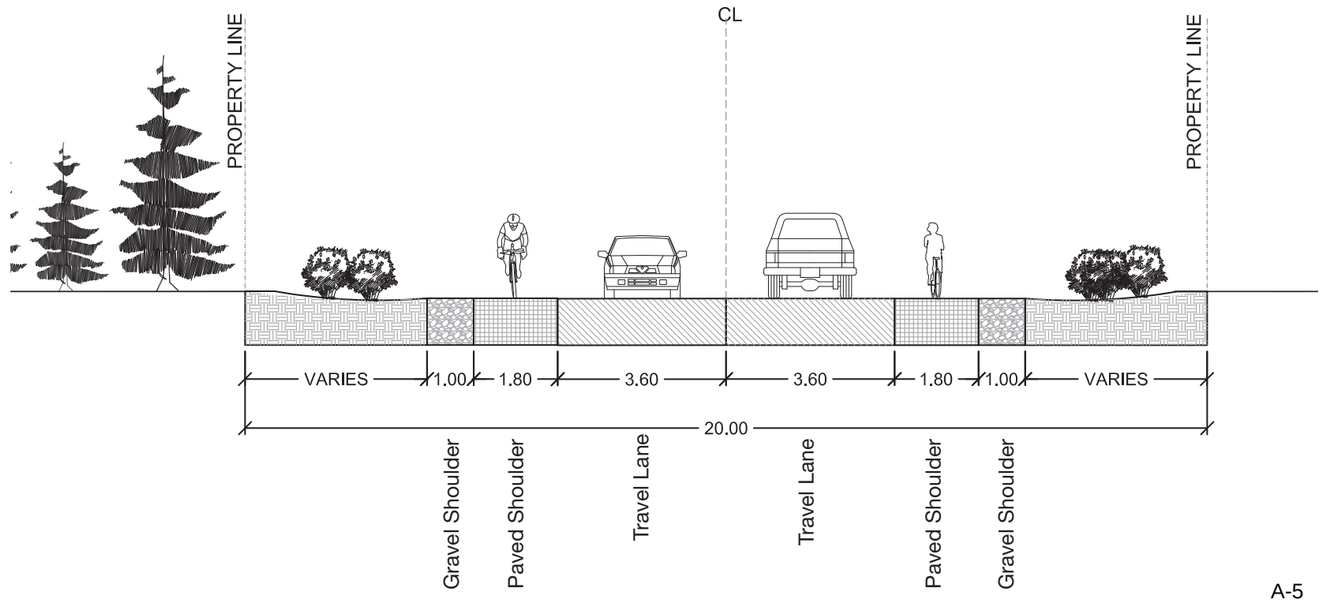
+ John Lutton

Paved shoulder safely accommodates cyclists.

+ Creative Commons

Rural collector road featuring narrow paved shoulder and adjacent cycling path option.

User Volumes	Well used locally by vehicles, transit, cyclists and some farm vehicles.
Mobility Features	- Free flowing traffic. - Uncontrolled access (driveways, side roads) increases friction factor. - Paved shoulders accommodate cyclists and pedestrians. - Parking is generally not permitted. - Transit is accommodated.
Public Realm	- The road frontage is primarily rural landscape with some scenic features that afford tourism values. - Buildings are set far from the road.
Candidate Streets	- Comox Logging Road - Arden Road - Lake Trail Road



ACTIVITY STREET

The animated links that provide access to smaller scale retail shops and services in the downtown and select areas within residential and commercial and community service nodes.

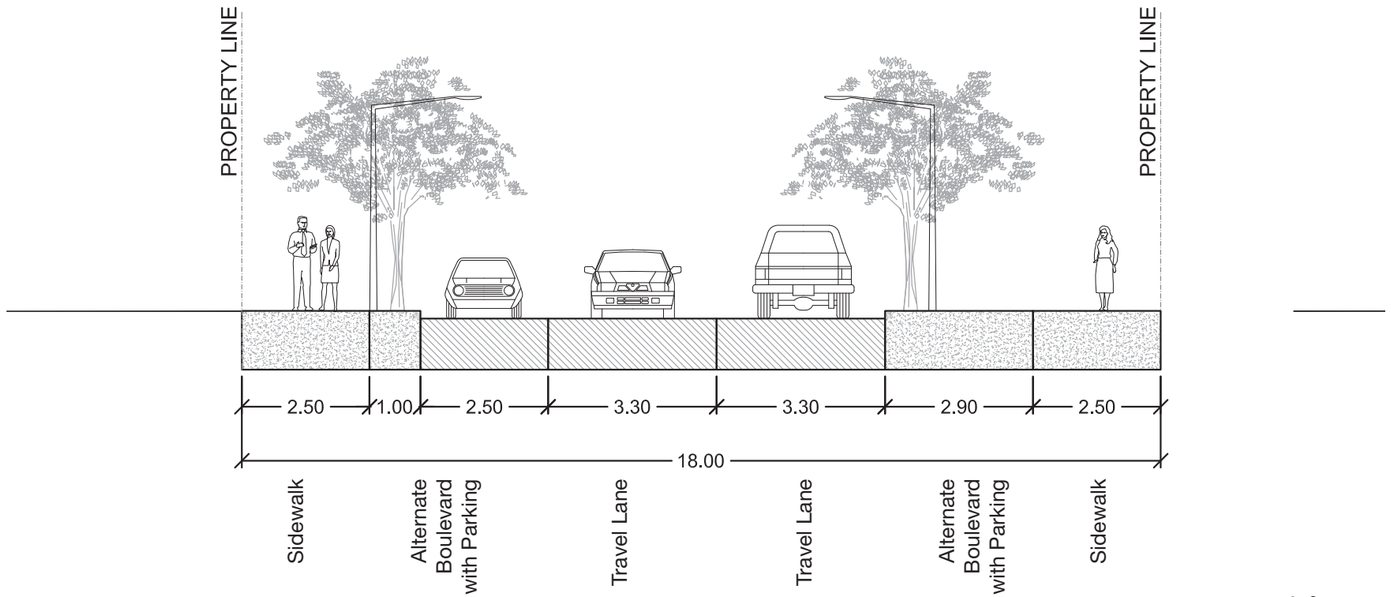
+O2 Planning + Design

Concept for 5th Street, featuring wider sidewalks, parallel parking, and “spillover” space for local businesses.

User Volumes	High volumes of walking traffic and vibrant, animated streets slow vehicle travel flow.
Mobility Features	Operational measures support a high level of pedestrian mobility - Pedestrian priority signals - Enhanced crosswalks & intersection bulb-outs - Dedicated parking bays are designed to integrate with pedestrian and cycling infrastructure.
Public Realm	- Road frontage features a mix of uses and densities. - Design elements attract high levels of pedestrian activity. - Amenities such as benches and bicycle racks enhance the walking and cycling environment
Candidate Streets	- 5th Street - 4th Street - Cliffe Avenue (north of 5th Street)

+ City of Courtenay

Build on the strengths of existing Downtown streetscapes



BUSINESS/INDUSTRIAL STREET

The links that service larger office and industrial buildings.

+ John Lutton

Sharrow indicates shared road environment on a street that provides numerous access points.

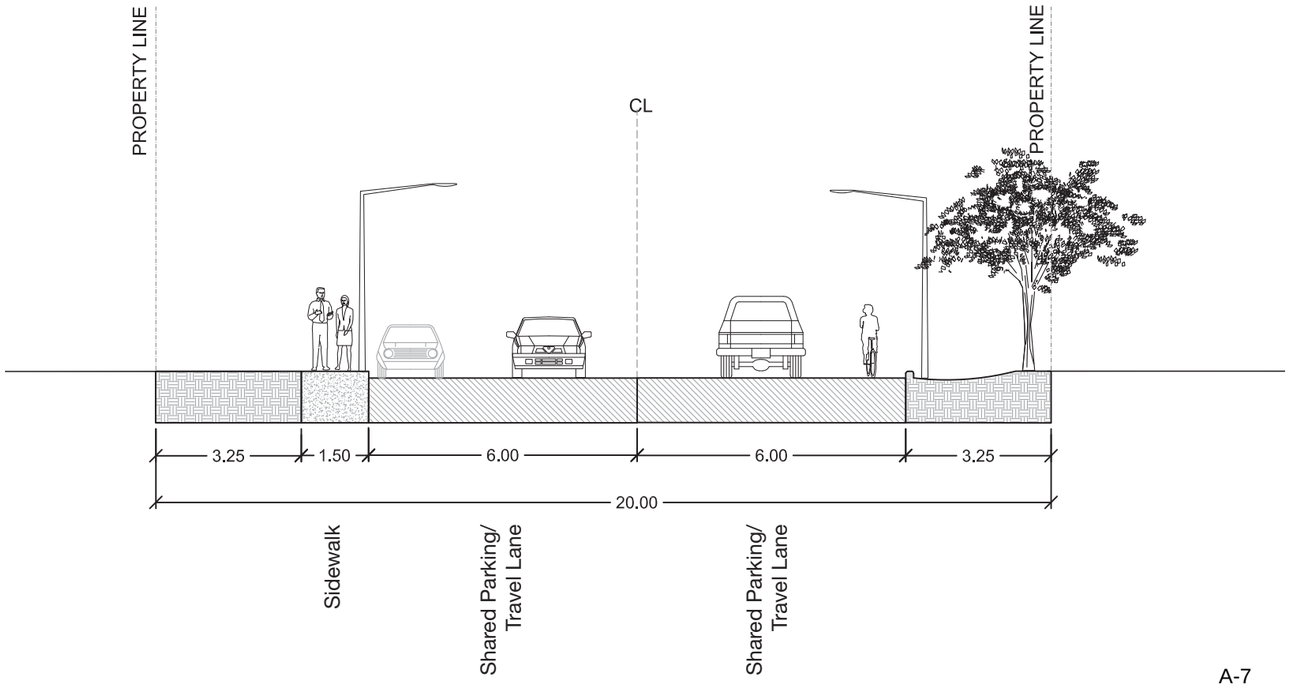
+ David Gleason

Consider pervious paving, raingardens, and other low impact development stormwater management techniques in design guidelines for commercial sites.

+ City of Courtenay

Sidewalks and controlled access define business street patterns. Landscape treatments buffer parking areas.

User Volumes	Commercial traffic and service vehicles primarily circulate within commercial nodes.
Mobility Features	- Shared travel lanes accommodate all modes, and are most appropriate for this street type given user volumes. - Landscaping to screen buildings and parking is provided according to design guidelines. - Ensure adequate space to accommodate truck turning.
Public Realm	- Road frontage features a mix of commercial uses and services that are typically accessed by individual driveways and parking lots. - Wide expanses of parking fronting the roadway should be avoided or mediated by landscaping (or hardscaping) treatments.
Candidate Streets	- Puntledge Road - Mansfield Drive - Kilpatrick Avenue



RESIDENTIAL STREET

The links to residential homes within residential nodes that provide high levels of safety, privacy and connectivity for local residents.

+ Google

On-street parking is provided in a residential neighbourhood.

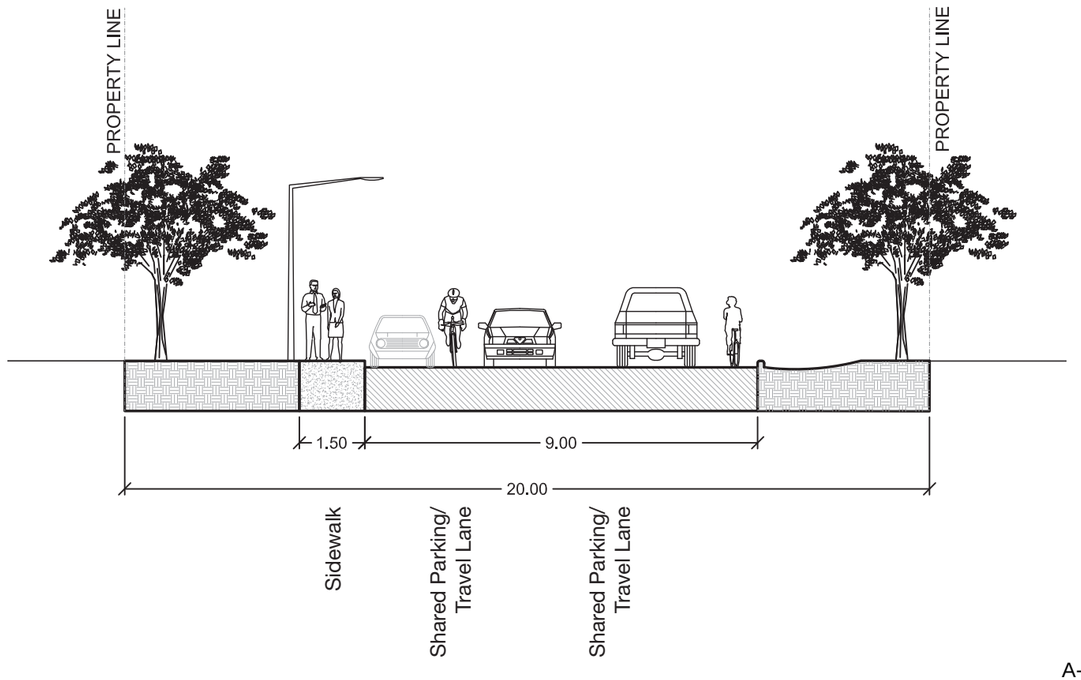
+ City of Courtenay

Housing setbacks from road allows for landscaping to transition from the public to private realm.

+ Google

A sidewalk is provided on one side of the street to accommodate pedestrians.

User Volumes	High volumes of pedestrian and cycling travel and slower vehicle travel flow.
Mobility Features	Physical design measures support calmed traffic and road patterns provide pedestrian and cycling connectivity. - Shared vehicle-cycling lane slows traffic. - Parking on both sides of street requires vehicles to yield to on-coming traffic, increasing the friction factor, narrowing the roadway and slowing traffic.
Public Realm	- Road frontage features primarily residential land uses. - Buildings are set apart from the road. - Boulevards and private landscaping mediate transition from public to private realm.
Candidate Streets	- Majestic Drive - 6th Street East - Tull Avenue - Mallard Drive



Appendix B: Road Network Modelling and Evaluation

Road Network Modelling and Evaluation

As part of the City of Courtenay 25 Year Vision for Multi-Modal Transportation, a VISUM travel demand model was developed to forecast traffic patterns within the City over the next 25 years to support the planning and phasing of future infrastructure projects. The model corresponds to the afternoon peak hour, when traffic demand tends to be greatest. This summary briefly introduces the VISUM traffic modelling process including data sources, methodology, and assumptions.

Model Source

The current VISUM model was developed based on an earlier transportation model for the Comox area originally created in TModel in 1995 and subsequently updated in 2005. The current model retains the traffic zone system and land use categories from the earlier 2005 model; however, the road network was re-created in VISUM using Statistics Canada GIS data due to errors in the model conversion process. The current VISUM model also incorporates information from the 2011 transportation model developed by the Town of Comox.

Traffic Counts

Traffic count data was collected at 30 strategically selected locations throughout the city by a third party traffic count service provider in November 2012. This information was used to refine the base year travel demand matrix and confirm the model calibration. From a review of the data, the hour between 3:30 p.m. and 4:30 p.m. was identified as having the highest traffic volumes during the Monday to Friday work week, and was therefore selected for modelling purposes.

Network Development

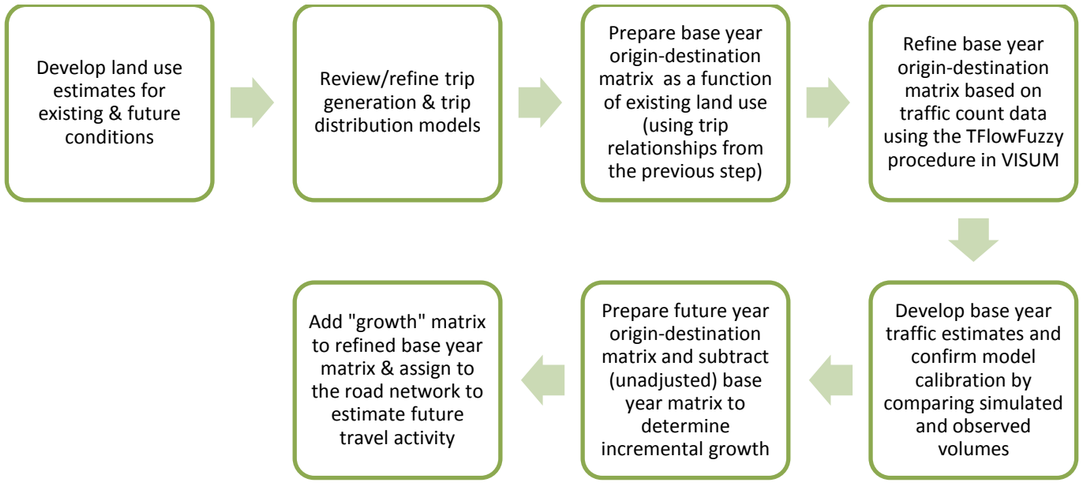
As noted above, the road network data used in the model was developed using GIS layers from Statistics Canada. This information was imported into ArcGIS and supplemented with information on the road classification, speed limit, number of lanes, and cross-section characteristics (divided/undivided), as determined from various sources (including City of Courtenay mapping and Google Streetview). Lane capacity assumptions were also developed and coded into the model, with the lane capacity ranging from 800 vph for major arterials to 250 vph for local roads.

Land Use Estimates

Land use estimates for the City of Courtenay were developed for the 2012 base year and a horizon year of 2037 in consultation with City Staff. Land use data for 2012 was derived from the previous 2005 model, and updated to account for development between 2005 and 2012. Land use projections for 2037 were developed based on anticipated development activity over the next 25 years as estimated by City Staff. Further refinement was carried out for certain retail parcels based on the zoning of the parcel and corresponding development potential. Land use estimates for the Town of Comox were obtained from the Town's 2011 transportation model. For areas lying outside the City of Courtenay and Town of Comox, land use estimates were determined by extrapolating from the previous 2005 model (with some limited adjustments applied to reflect current population levels from the most recent census).

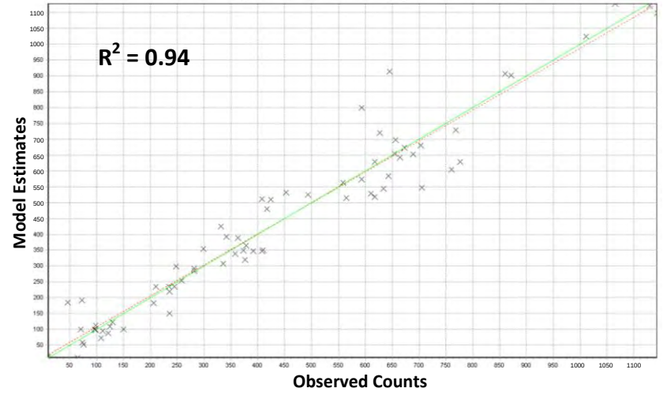
Overview of the Modelling Process

The traditional approach for modelling transportation activity relies on origin-destination survey results which provide information on how, when, and where people travel. Since no origin-destination survey was available for the Comox Valley, a modified modelling approach was adopted. A summary of the approach is presented below.



Model Calibration Results

Model calibration is undertaken to assess the reliability of the model for forecasting future travel activity. Calibration is carried out by comparing the model estimates for base year conditions against observed counts. One of the ways used to assess the model calibration is to plot the observed traffic volume on each road where traffic count data is available against the traffic volume estimated by the VISUM model. Ideally, the two volumes would be the same, resulting in a diagonal line. The co-efficient of determination (R^2 value) is a statistical measure of the model "Goodness of Fit", with R^2 equal to 1 indicating a perfect correlation between the estimated and observed volumes. For the Courtenay model, an R^2 value of 0.94 was obtained, which is considered to be acceptable.[1]



Modelling of Future Travel Activity

Once the model calibration was deemed to be acceptable, the VISUM model was used to estimate future traffic volumes on the road network in 2037. By comparing the estimated volumes to the available road capacity, potential road network deficiencies could be identified. To address the anticipated capacity concerns, road network improvement scenarios were developed and modelled in VISUM to assess their effectiveness in improving road network performance. The criteria used to evaluate each scenario are provided on the next page, followed by a summary of the various road network scenarios, and the corresponding evaluation results.

[1] Note that the reported calibration results correspond to the 'refined' base year matrix developed using TFlowFuzzy. To minimize estimation error, the model relationships were only used to generate the change in travel between 2012 and 2037, with this change added to the 'refined' base year matrix to estimate the total future demand.

Road Network Evaluation Framework

	Objective	Measure of Effectiveness (MOE)	Rationale	Weight
1	Accommodate vehicle movement effectively and efficiently	Amount of travel on arterial and collector roads experiencing Level of Service "E" or "F" during the afternoon peak hour in 2037. Level of Service (LOS) is a concept used to describe traffic conditions on the road network. LOS ranges from “A” to “F” with “A” representing free-flow conditions and “F” representing failure (i.e. heavy congestion).	Minimizes the share of vehicular travel on higher order facilities (i.e. arterials and collectors) that is experiencing an unacceptable level of service. Since congestion tends to lead to higher fuel consumption and vehicle emissions, this measure also provides an indication of the localized environmental benefits of the project.	10% (LOS F) 5% (LOS E)
		Total travel time by passenger vehicles on the road network during the afternoon peak hour in 2037.	Considers unnecessary delays related to congestion, which affects worker productivity and time available for family/leisure pursuits (which in turn impacts residents’ quality of life).	15%
2	Minimize cost	Construction cost ($)	Recognizes the importance of fiscal responsibility in the expenditure of public funds and the various competing priorities facing the City.	20%
3	Support downtown vitality	Volume of traffic using 5th Street (immediately west of Cliffe Avenue) during the afternoon peak hour in 2037 as estimated by the traffic model.	A reduction in traffic travelling through the downtown (to destinations elsewhere in the city) will help to create a more vibrant, pedestrian-friendly commercial district.	2.5%
		Potential to promote pedestrian activity in the downtown as measured based on a qualitative score between 0 and 10. Points awarded for projects that include pedestrian treatments and other measures to create a more welcoming downtown environment.	Recognizes the importance of providing measures that enhance the attractiveness of the downtown and encourage street-level activity.	2.5%
4	Minimize environmental impacts	Potential for negative environmental impacts, as measured based on the following point rating system: – Low impact: 0 to -2.5 – Moderate impact: -2.5 to -5 – High impact: -5 to -10 – Very high impact: -10 to -20	Ensures that impacts on the environment are given due consideration. Potential for negative impact is measured in terms of proximity to wetlands, water courses, agricultural land, parks, and other natural features.	10%
5	Promote multi-modal transportation by creating a safe, well-connected network of pedestrian and cycling facilities	Qualitative measure with a score between 0 and 10. Points awarded for transportation projects that address gaps in the walking/cycling network and improve access to key destinations.	Ensures that projects to increase road capacity address the needs of pedestrians and cyclists. Also supports sustainability and climate change objectives.	20%
6	Enhance community connectivity	Qualitative measure with a score between 0 and 10. Points awarded for transportation projects that improve access across a major barrier, address gaps in road spacing, or provide redundancy in the transportation system.	Recognizes the benefits of improving the connectivity of the road network, particularly for emergency services and transit.	10%
7	Foster economic development	Support for business activity & tourism, as measured based on the following point rating system: – Project improves access to the downtown and/or encourages downtown activity: +5 – Project improves access to the Inland Island Highway to/from the North: +15 – Project improves access to the Inland Island Highway to/from the South: +5 – Projects improves access to the ferry/airport: +5	Ensures that the needs/interests of local businesses are considered.	5%

Road Network Scenarios

No.	Project Description	Scenario[1]							
		A	B	C	D	E	F	G	H
2	Tunner Drive Connection between Comox Road and Back Road Upgrade Back Road to a 2 Lane Minor Arterial between Tunner Drive and Ryan Road	✓	✓	✓	✓		✓	✓	
3	Widen Comox Road to 4 lanes between new Tunner Drive Connection & 17th Street	✓	✓	✓	✓	✓	✓	✓	✓
4	Create pedestrian precinct on 5th Street from the bridge to Fitzgerald Avenue						✓	✓	✓
5	Widen Lerwick Road to 4 Lanes between Ryan Road and Malahat Drive[2]	✓	✓	✓	✓	✓	✓	✓	✓
6a	Widen Ryan Road to 4 lanes between Back Road & Military Row	✓	✓	✓	✓		✓	✓	✓
6b	Widen Ryan Road to 4 lanes between Back Road & Crown Isle					✓			
7	New bridge across Tsolum River & realignment of Vanier Drive / Piercy Road connection	✓	✓	✓	✓	✓		✓	✓
8	New 2 lane Arterial between Veterans Memorial Parkway and Anderton Road north of Ryan Road to provide access to the new Raven Ridge development	✓	✓	✓	✓	✓	✓	✓	✓
9	Upgrade Anderton Road to Major Arterial north of Ryan Road	✓	✓	✓	✓	✓	✓	✓	✓
10	Widen Cliffe Avenue from 2 to 4 lanes between Fraser Road and Anfield Road	✓	✓	✓	✓	✓	✓	✓	✓
11	Comox Logging Road Upgrade between Comox Valley Parkway and Fraser Road				✓				
12	Arden Road Connection between 1st Street and Lake Trail Road				✓				
13	8th Street River Crossing – 4 lanes, Minor Arterial	✓							
14a	11th Street River Crossing – 4 lanes, Major Arterial Upgrade 11th Street to residential collector between Cliffe Avenue & Cumberland Road			✓	✓	✓			
14b	11th Street River Crossing – 2 lanes, Major Arterial Upgrade 11th Street to residential collector between Cliffe Avenue & Cumberland Road						✓	✓	
15	19th Street River Crossing – 4 lanes, Major Arterial		✓						
16	29th Street River Crossing – 2 lanes, Major Arterial								✓
17	Extension of McDonald Road from Back Road to Comox Road								✓

Note:
[1] All scenarios include the Crowne Isle collector system and Comox Logging Road / Livingston Road connection to accommodate future development
[2] There is also merit in widening Lerwick Drive between Malahat Drive and Idiens Way to provide lane continuity with the 4-lane sections north & south. This was not modeled in VISUM since it is not required for capacity reasons

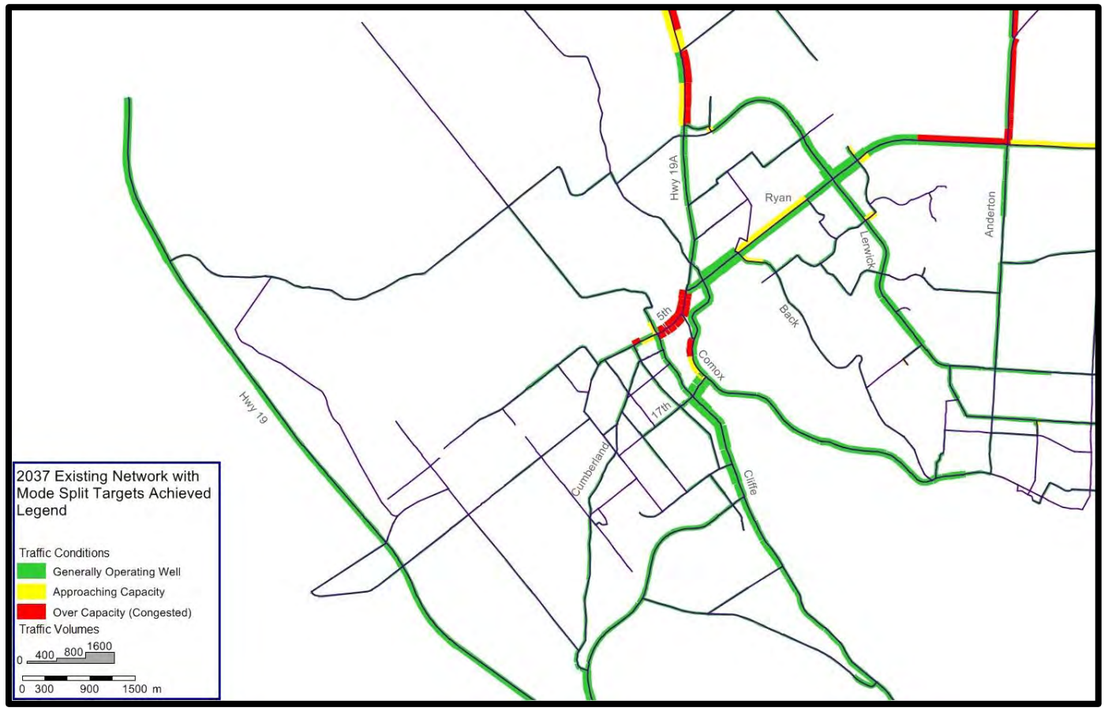
Evaluation Results

Objectives		Weight	Scenarios							
			A	B	C	D	E	F	G	H
Objective 1a	*LOS "F"*	**10**	6.9	6.8	9.2	6.9	0.0	10.0	9.9	8.5
	LOS "E"	**5**	5.0	2.4	1.4	4.7	0.0	1.1	1.1	2.3
Objective 1b	*Travel Time*	**15**	13.2	9.5	12.2	13.1	0.0	8.6	9.2	15.0
Objective 2	*Cost*	**20**	11.0	10.5	11.7	10.6	18.8	20.0	14.5	0.0
Objective 3	*Downtown*	**5**	1.6	0.0	1.5	1.4	1.4	5.0	5.0	3.6
Objective 4	*Environmental*	**10**	7.0	7.0	8.1	5.4	10.0	8.9	8.1	0.0
Objective 5	*Multi-modal*	**20**	12.0	10.7	12.0	17.3	0.0	16.0	18.7	20.0
Objective 6	*Connectivity*	**10**	2.9	2.9	4.3	10.0	0.7	0.0	4.3	7.9
Objective 7	*Economic*	**5**	3.3	2.5	3.3	3.3	0.0	0.0	5.0	4.2
Total Score		**100**	**63.0**	**52.2**	**63.8**	**72.7**	**30.8**	**69.7**	**75.7**	**61.5**

Preferred Scenario

Model Results for 2037 – Assuming 2020 Mode Share Targets for Walking, Cycling, and Transit are Achieved

No Road Network Improvements (except as shown in Local Area Plans)



Required Road Network Improvements by 2037 – Assuming 2020 Mode Share Targets for Walking, Cycling, and Transit are Achieved

No.	Project
3	Widen Comox Road to 4 lanes between the existing 4-lane section south of Ryan Road & 17th Street
4	Create pedestrian precinct on 5th Street from the bridge to Fitzgerald Avenue
6b	Widen Ryan Road to 4 lanes between Back Road & Crown Isle
8	New 2 lane Arterial between Veterans Memorial Parkway and Anderton Road north of Ryan Road
9	Upgrade Anderton Road to Major Arterial north of Ryan Road

Additional projects to consider:

- *New bridge across the Tsolum River & realignment of Vanier Drive / Piercy Road connection* – Not needed from a capacity perspective, but would improve access to the Inland Island Highway.
- *New bridge across the Courtenay River (i.e. at 11th Street)* – Assuming the City's mode split targets are achieved, it is anticipated that traffic over the Courtenay River will not increase significantly over the 2037 horizon. However, the total demand over the river will be approaching the capacity of the two existing bridges, particularly if a pedestrian precinct is created on 5th Street which reduces the capacity in this area. In addition, when the two bridges are considered separately, failures are expected on the 5th Street Bridge due to the prevailing travel patterns.

Appendix C: Complete Streets Toolbox

C.1 Pedestrian Treatments

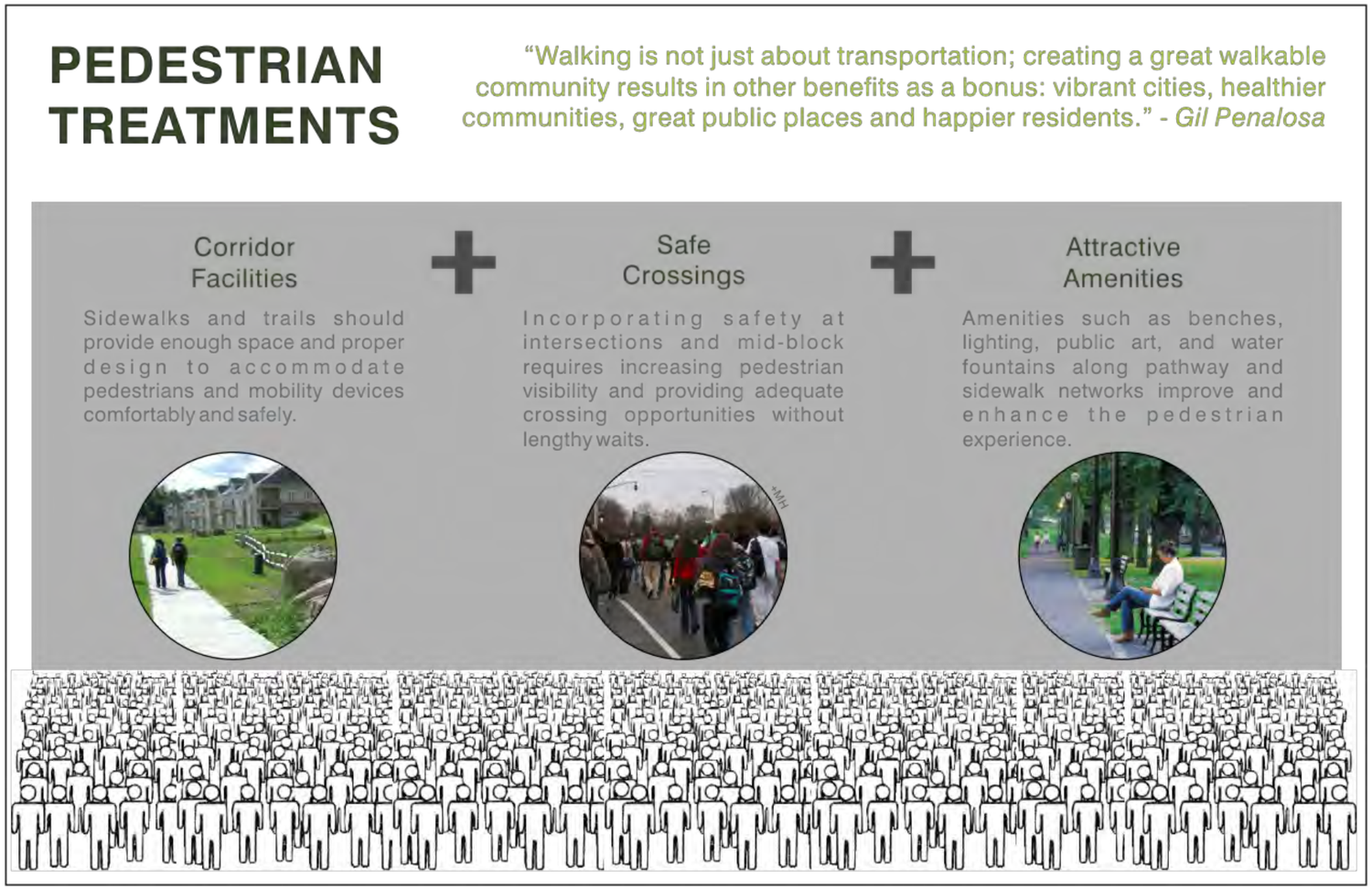
Walking is one of the most important modes of transportation; everyone, whether travelling by car, transit, or bicycle, is a pedestrian at some point during their trip. Walking provides significant health, community and economic benefits. A city filled with pedestrians is a vibrant place. While pedestrians are perhaps the most resilient of all transportation users, carving cow-paths where sidewalks are lacking, climbing barriers and fences, and crossing at midblock locations, providing pedestrian infrastructure helps to improve the safety and attractiveness of walking. Pedestrian facilities create an equitable transportation system which allows residents of all ages, demographics, incomes and physical abilities to access services. As Courtenay's population ages, the provision of accessible, high-quality walking facilities will become even more important.

"The presence of a sidewalk or pathway on both sides of the street corresponds to approximately an 88% reduction in 'walking along road' pedestrian crashes."
FHWA Proven Safety Countermeasures

Along corridors, sidewalks are an integral element of pedestrian infrastructure, increasing safety and providing pedestrians with a sense of belonging. **Sidewalks are therefore recommended on both sides of all major urban roads in Courtenay, including arterial/mobility corridors, community collectors, residential collectors, and activity streets.** Sidewalks are also recommended on one side of business/industrial streets and residential streets.

Sidewalks must be well-maintained, continuous, smooth and incorporate accessibility features (refer to Figure C.1) in order to be effective. Once the essential elements have been incorporated along corridors, features should be considered to enhance the pedestrian experience. Boulevards buffer pedestrians from traffic, increasing pedestrian comfort and reducing noise. Amenities such as benches, landscaping, shady trees and kiosks should be incorporated without impeding pedestrian travel. The 'clear width' of the sidewalk must maintain an appropriate width to accommodate wheelchair travel.

Despite the importance of sidewalks, the majority of pedestrian collisions occur at intersections & crossings - areas of multiple potential conflicts for pedestrians. As vulnerable road users, ensuring pedestrian safety at crossings is of paramount importance. A sampling of potential improvements at crossings is described below.



ACCESSIBILITY CONSIDERATIONS

"By catering for the mobility impaired at all stages of the transport planning process, local governments ensure social justice, greater community, lowered care costs and greater chance of rehabilitation." - *Thinking Transport*

Accessibility needs should be addressed in a systematic manner throughout the City of Courtenay in concert with improvements to the pedestrian network. Potential treatments should consider wheelchair users, visually and hearing impaired pedestrians and other users requiring special accommodations.

Examples of treatments to be considered include:

- **Curb ramps/curb cuts** at intersections to facilitate travel between the sidewalk and the crosswalk
- **Detectable warning surfaces** at crosswalks to warn of adjacent traffic lanes
- Entry **ramps** to provide access for wheelchair users
- Use of **high-contrast** paint to identify elevation changes, curbs, stairs, etc.
- **Sufficient clear distances** on sidewalks to accommodate those with mobility aids, walkers, or guide dogs
- **Median refuges** with curb cuts
- Signals at pedestrian crosswalks which incorporate **audible and flashing signals** and **tactile or vibro-tactile pushbutton** features
- Consideration for **extended walking phases** to provide additional crossing time
- **Accommodation at transit stops** including firm, flat surfaces, seats inside bus shelters, and clearance for mobility devices at loading areas

Figure C.1 Accessibility Treatments

Intersection Treatments for Pedestrians

There are a number of treatments that can be considered to improve pedestrian safety at intersections and crossings. Some of the most common measures include the following:

+MH

Raised Crosswalk

Raised crosswalks improve pedestrian visibility. They also provide a vertical deflection, forcing drivers to slow down when approaching. The importance of reducing vehicle speeds is well-documented. A pedestrian has only a 5% chance of being killed when hit by a car travelling at 30km/hr; for cars travelling at 50 km/hr, this percentage increases to 80%.

+PBIC – Dan Burden

Raised Medians (with pedestrian refuges)

Medians are one of the U.S. Federal Highway Administration's proven safety countermeasures for pedestrian safety. Medians essentially create two distinct crossings of one-way traffic, simplifying the crossing task for pedestrians, particularly along busy roads.

+PBIC – Carl Sundstrom

Curb Extensions (Bulb-outs)

Bulb-outs slow traffic by creating horizontal deflection. Bulb-outs also reduce pedestrian crossing distances and help make pedestrians more visible to motorists. Given these benefits, bulb-outs are often implemented as part of traffic calming schemes.

+MH

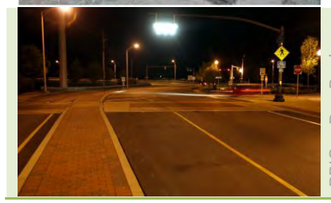
Sidewalk Extensions

Rather than stopping the sidewalk at driveways and accesses, sidewalk extensions involve continuing the sidewalk across the access, preferably at its original height. This creates an effect similar to a raised crosswalk, forcing drivers to slow as they enter/exit the property. Such treatments give priority to pedestrians and can help to reduce conflicts. Sidewalk extensions can also be considered for local streets.

+FHWA

Minimum Corner Radii

In urban settings (such as Courtenay's downtown), the use of minimum corner radii helps to improve pedestrian safety by slowing turning vehicles, reducing crossing distances and increasing pedestrian visibility.



+PBIC – Dan Burden

Lighting

Lighting ensures that pedestrians and infrastructure are clearly visible to drivers at night. In addition, lighting often promotes a feeling of personal security in quieter, more isolated areas.

+MH

High-visibility Crosswalk

High visibility crosswalks increase the impact of pedestrian crosswalks either through use of coloured/textured pavements or pavement markings (ladder or zebra crosswalk markings). High visibility marking are often combined with *raised crosswalk* treatments.

+MH

Warning Signs

Signage can be used to alert drivers to the presence of pedestrians. However, as with any signage, warning signs must be used judiciously in order to be effective.

+PBIC – Dan Burden

Pedestrian Signals

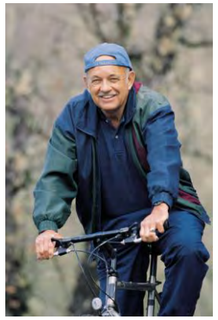
Pedestrian signals can be provided midblock in order to serve major crossing desire lines.

+ PBIC – Dan Burden

C.2 Cycling Treatments

Cycling is one of the most sustainable modes of transportation, providing numerous health benefits to residents, promoting economic activity, and providing transportation choices regardless of circumstance. Moreover, cycling is fun – cyclists enjoy their commute more than any other mode and take less sick days at work. In a city the size of Courtenay, there is significant potential for many vehicle trips under 5km to be replaced by cycling trips. Ultimately, the willingness of residents to shift to cycling is dependent on a number of factors. Some of the key factors are summarized below:

- **Social Norms & Attitudes towards Cycling** – In the past, 'car-culture' attitudes have painted cycling as a less-desirable, inconvenient and undesirable mode choice. However, the cycling renaissance has been gaining momentum, with more and more age groups adopting cycling as a preferred mode choice. Results of the consultation exercise suggest that the majority of residents in Courtenay would like to cycle more, demonstrating that there is a group of 'interested, but concerned' potential cyclists who need encouragement in the form of programs, facilities, and policies.
- **Climate** – The climate in Courtenay is generally conducive to cycling. With relatively mild winters, there is potential to build a market for year-round cyclists. While precipitation may be a deterrent for some cyclists, in general, the impacts of precipitation are minimal compared to cities with heavy snow or extremely cold temperatures.
- **Topography** – A hilly topography may act as a deterrent to cycling, particularly for less fit individuals. Since Courtenay is a relatively flat city, topography is likely not a key factor in the decision whether to cycle, except perhaps in isolated cases. The advent of e-bikes and motor-assisted bicycles more recently has also helped to minimize the impact of topography on mode choice.
- **Transit Integration** – For trips beyond 5 km, some cyclists may wish to combine cycling with transit. Ideally, this requires the accommodation of bicycles on buses, or at minimum, the provision of bicycle parking at transit stops. Since the Comox Valley Transit System provides bike racks on the front of buses, promotion of this service may help to encourage longer trips by cycling and transit.



- **Safety & Availability of Infrastructure** – Many potential cyclists are deterred simply by a lack of high-quality facilities. Building safe and comfortable facilities that accommodate all types of cyclists, regardless of age, fitness, or comfort in traffic, will be an important component of the Complete Streets movement in Courtenay. In providing cycling facilities, network connectivity and access to major destinations are of critical importance. In particular, there is a need for improved crossings of the Courtenay River, improved access to the North Island College area, and improved connections to facilities in other jurisdictions.
- **End-of-Trip Facilities** – The importance of end-of-trip facilities cannot be overstated. In many cases, willing cyclists are deterred because there are no showers or changing facilities at a workplace. Without good quality bike parking, biking to community destinations for shopping or leisure trips is not an option. Bicycle lockers at transit facilities can also be an integral component of longer trip-making activity.

Many of the above factors may be influenced through policy. Section 10 sets out strategies and related action items for encouraging cycling activity.

One of the cornerstones of cycling policy is the provision of appropriate infrastructure to improve the cycling environment. The cross-sections in Appendix A demonstrate how cycling can be accommodated on various types of roads in the city. This section provides more detailed information on potential cycling treatments, including options for intersections and transition points.

Table C.1 and Figure C.2 describe the various types of on-road cycling facilities that are proposed for Courtenay and the types of corridors on which these facilities are most appropriate. While the cross-sections shown in Appendix A illustrate a "typical" cycling treatment for each road classification, in general, a range of facility types may be considered depending on the characteristics of the corridor.

Table C.1 On-Road Cycling Facility Types

FACILITY TYPE	DESCRIPTION
Shared Lane	Cyclists and vehicles share the road Cycling route may be designated by signage or pavement markings Generally appropriate on roads with lower traffic volumes / speeds
Bicycle Boulevard	Low-volume / low-speed streets that have been optimized for bicycle travel Typically include treatments such as traffic calming, signage, pavement markings, and intersection crossing treatments. May also include measures to reduce thru traffic
Bicycle Lane	A dedicated lane for cyclists, typically located adjacent to the curb, or if parking is present, between the parking lane and the traffic lanes Often provided on roads with higher speeds / volumes to separate cyclists from moving traffic
Cycle Track	Segregated on-street bicycle lane, separated from traffic by a physical barrier or elevated slightly above the adjacent traffic lanes May require special consideration for cyclists at intersections
In-Boulevard Multi-Use Trail	Shared-use trail which lies within the road right-of-way but is separated from the roadway by a grass boulevard, buffering cyclists from traffic Not appropriate on roads with a higher number of intersections / driveways due to conflicts at crossing points

CYCLING FACILITIES

"Cycling facilities must be safe and attractive for all users - including those who are intimidated by heavy traffic volumes and are less willing to cycle in mixed traffic "

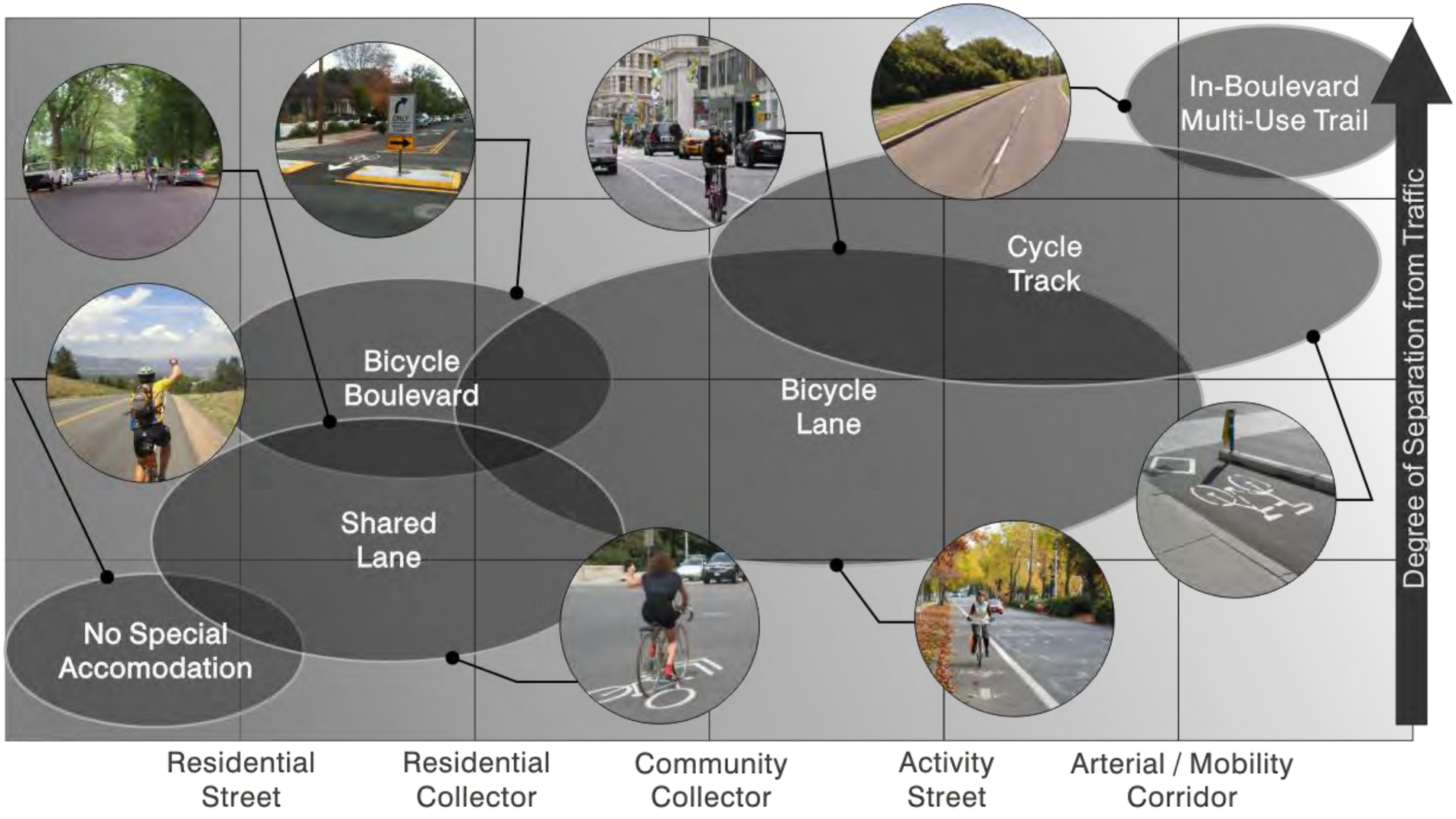


Figure C.2 On-Road Cycling Facility Types

Intersection Treatments for Cyclists

Intersections and transition points are often overlooked in the planning of a cycling network. Corridors with extensive cycling facilities but poorly planned intersection treatments can discourage even the most resilient of cyclists. As a result, it is critical that treatments at intersection be selected to improve actual and perceived safety, promote visibility and give priority to cyclists as vulnerable road users.

Some tools which can be used to improve safety at crossings and intersections include:

+ Mississauga Cycling

Elephant's Feet/Crossrides

Crossrides are crossings which are delineated separately from pedestrian crosswalks with 'elephant's feet' markings at intersections to allow bicycles to legally cross without dismounting. The markings also help to increase the visibility of cyclists and increase driver awareness.

+CBC

Bike Boxes

Bike boxes provide waiting areas for cyclists in advance of vehicles to provide priority to cyclists at intersections. These are currently being used in Toronto & Vancouver among other cities

+ Ottawa Citizen

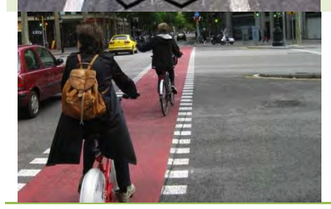
Launch Pads

Similarly to bike boxes, launch pads facilitate left turns for cyclists by providing waiting areas for cyclists, allowing less confident cyclists to make a two-stage left turn in a similar manner to a pedestrian. As a cyclist approaches an intersection (say, in the N-S direction) wanting to turn left, they continue through the intersection and pull into the launch pad, waiting for the green light of the E-W direction, when they can then make a through movement ahead of vehicles.

+ sa.gov.au

Bicycle Sensing Traffic Signals

Bicycles sensors can be combined with cyclist signals to provide leading cycle signals, facilitating left turning or through bicycle traffic.



+ PBIC - Julia Diana

Coloured Pavement Treatments

Continuing bicycle lanes in bright pavement colours through intersections helps to call attention to cyclist movements.

+ Breakfast on Bikes

Separated Bicycle Through Lane

This measure involves providing a separate lane for cyclists travelling through the intersection to the left of the right turn lane for vehicles, minimizing the chance for conflict between the two movements

+ sa.gov.au

Cyclist Push Buttons

Conveniently placed to allow cyclists to call signals without dismounting, cyclist push buttons increase the ease of street crossings.

+ VDOT

Zig-zag pavement treatments

Help to call attention to upcoming mid-block crossings, reducing driver speed (piloted in Virginia, originally in use in the UK)

+ PBIC - Eric Robitaille

Sharrows

Sharrows are pavement markings showing the ideal space for a cyclist to situate themselves in a lane, acting as a visual reminder to drivers that cyclists may be present and are entitled to space on the road. They can be used specifically in the case of intersections to call attention to cyclist movements and aid cyclists in aligning with cycling facilities on the far side of the intersection.

An overview of intersection and trail crossing treatments is provided in Figures C.3 and C.4, respectively.

CYCLING TREATMENTS AT INTERSECTIONS

"The majority (64%) of bicycle injuries in Canada occur at intersections; looking at urban areas only, the share is even higher (72%). These findings suggest that special attention needs to be paid to intersections."
-Transport Canada

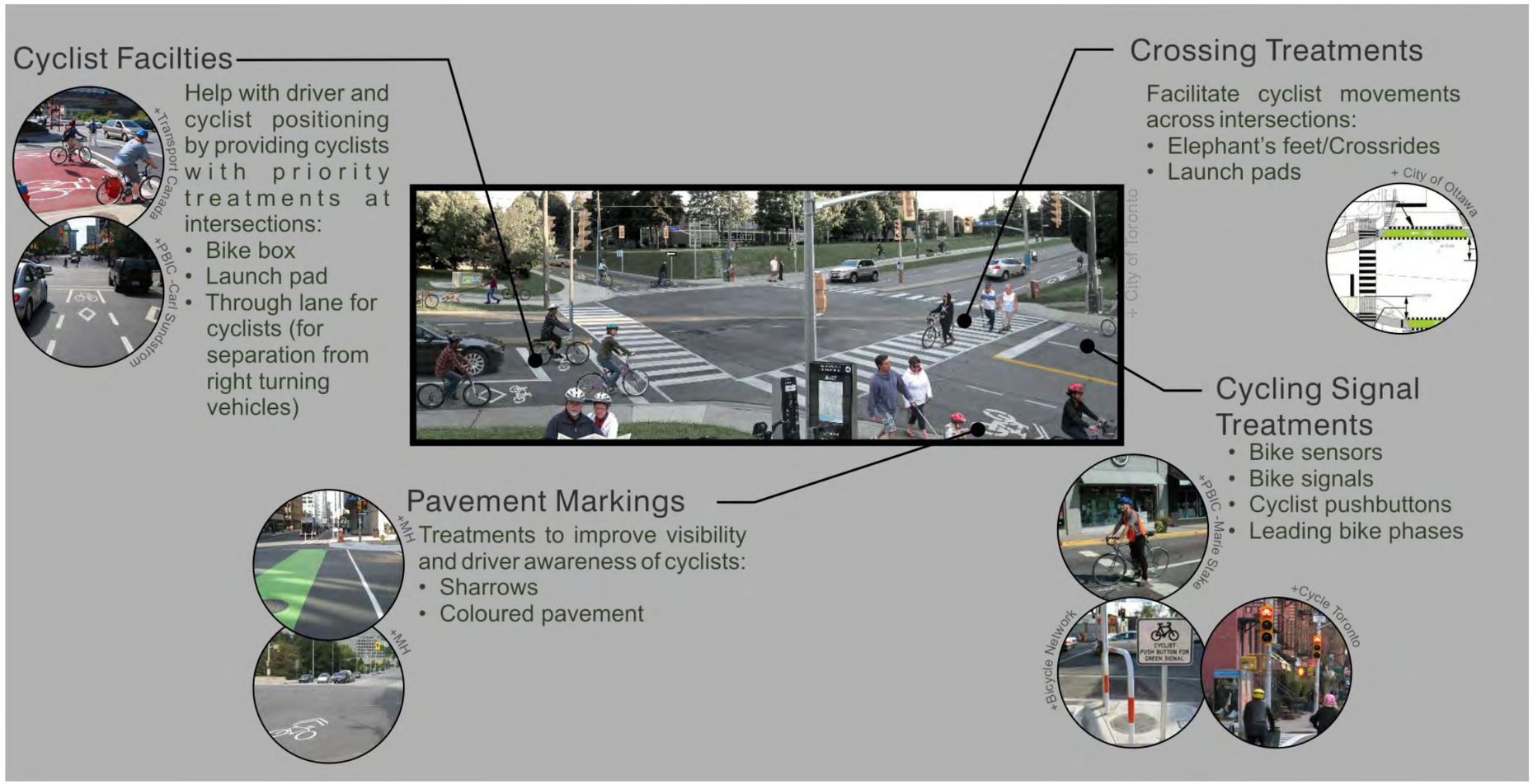


Figure C.3 Overview of Intersection Crossing Treatments

TRAIL CROSSINGS & TRANSITIONS

"At a trail crossing users may change directions, encounter other user groups, experience a narrower or wider trail width, or encounter automobile traffic." -*FHWA*

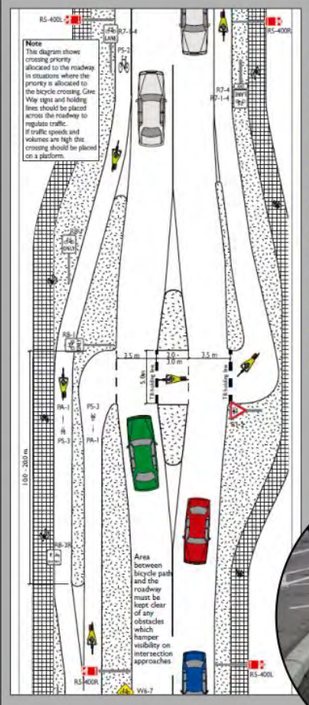
"Intersections between shared use paths and roadways are the greatest challenge. Great care has to be taken in managing the operation of trail/roadway intersections to ensure safety, convenience and comfort are balanced." - PBIC

Intersection
- Signalization (with bike sensors, bike signals, and/or cyclist push-buttons)
- Enhanced Pavement Markings

Mid-block
- Pedestrian / Cyclist Signals (actuated by a push-button)
- Signage
- Enhanced Pavement Markings
- Median Refuge Area for Pedestrians

Road Crossings

When transitioning from off-road to on-road facilities, the design must be context-sensitive and address best practices. Driver and cyclist expectations should be considered.



Transition from two-way off-road facility to bike lanes - Extracted from New South Wales Bicycle Guidelines

Off-Road / On-Road Transitions

Figure C.4 Overview of Trail Crossing Treatments

C.3 Traffic Calming

In addition to investing in pedestrian and cyclist infrastructure, it is also important to create an environment conducive to walking and cycling by ensuring that motor vehicles are used in a manner consistent with the intended purpose of the street. This does not mean imposing restrictions on roads used primarily for mobility purposes, but it does mean creating neighbourhood streets that are welcoming and safe for all modes of travel. In residential areas in particular, people are often concerned with "cut-through" traffic and speeding on roads that are shared among a variety of users. One of the ways to address such concerns is through the use of traffic calming.

"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users" – Canadian Guide to Neighbourhood Traffic Calming

The application of traffic calming in residential neighbourhoods follows three general principles:

- Street design allows drivers to drive at, but no more than the desired speed;
- Street design allows local access, while discouraging through traffic, and;
- Traffic calming works best when roads are properly designed in the first place.

Traffic calming is most effective when implemented across a network of residential streets. This helps to eliminate the off-loading of traffic from one street to the next. However, there may also be cases where only one or two streets are impacted and localized traffic calming may be appropriate (e.g. cut-through traffic close to an intersection may be eliminated by turning movement restrictions during the peak hour). In all cases, the need for traffic calming should only be considered after attempts have been made to optimize traffic conditions on the arterial roads serving the community to minimize the incentive for non-local traffic to cut through on residential streets.

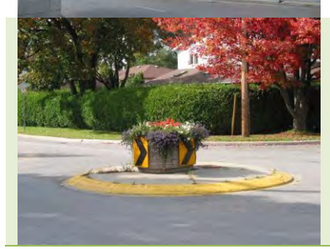
It has been said that the process of implementing traffic calming is as important as the physical changes themselves. As a result, a traffic calming policy and process should be developed which emphasizes community participation.

Examples of traffic calming measures that may be appropriate for Courtenay are illustrated below.

+Hamilton Spectator

Gateways

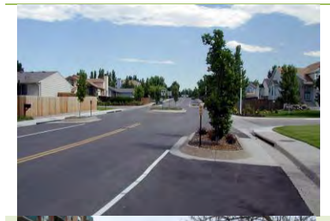
Gateway features serve to both enhance and traffic calm neighbourhood and community entry points. Since they often provide horizontal deflection, they usually narrow the travelled way, slowing drivers. They also can serve as a reminder to drivers that they are entering an area where mobility is no longer the primary function of the street i.e. a residential collector, downtown entry point, large institutional destination, etc.



+MH

Traffic Circles

Traffic circles are typically implemented within a residential community in place of stop-controlled intersections. In addition to reducing vehicle speeds and conflicts, traffic circles can also improve the appearance of the community by incorporating plants or sculptural elements into the design. However, some research has identified an increase in cyclists injuries at traffic circles compared to other types of intersection treatments, so their use should be carefully reviewed prior to implementation.



+PBIC – Dan Burden

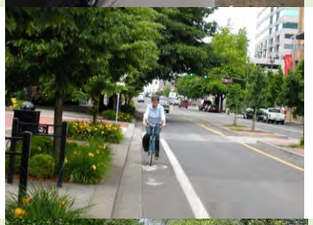
Chicanes

Chicanes are offset (alternating) curb extensions which create horizontal deflections into the roadway. Chicanes slow drivers, and discourage cut-through traffic. They can be installed in such a way that only one direction of traffic can pass at a time, similar to the effect of on-street parking on a narrow local street.

+MH

On-Street Parking

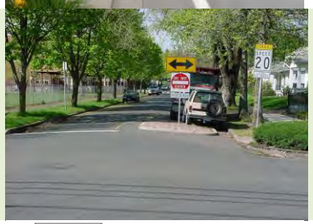
On-street parking creates a narrowing of the travel lane and creates friction as drivers exit/enter and park cars. This forces drivers to slow down, and may increase driver alertness.



+PBIC - Jennifer Campos

Bicycle Lanes

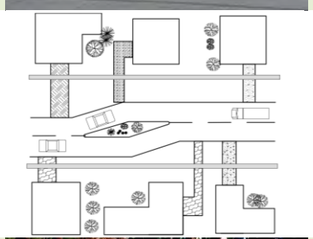
In addition to their functional use, bicycle lanes tend to slow traffic by narrowing the width of the travelled lane. Similarly to on-street parking, drivers are encouraged to drive with greater care when cyclists are present.



+PBIC – Dan Burden

Street Closures

Street closures, diversion or obstructions can help to restrict movements by motor vehicles, reducing cut-through traffic in residential neighbourhoods. Streets closures are often implemented for the creation of bicycle boulevards, and improve the street environment for both cyclists and pedestrians.



+City of Sparks

Lateral Shifts

Lateral shifts with islands can be used on higher order roadways (arterials, collectors) to slow traffic and prevent speeding. They create horizontal deflections which are great enough to decrease speeds without affecting the use of the corridor for mobility.

+PBIC – Dan Burden

Speed Humps

Speed humps provide vertical deflection, forcing drivers to slow as they approach. To increase effectiveness, multiple speed humps may be implemented along a particular stretch of road.

Appendix D: Land Use Toolkit

LAND USE TOOL KIT

Land use tools are the process and design ‘building blocks’ that shape how a city looks (**built environment**) and feels (**urban form**).

STREET PATTERNS

Description

The configuration of roads that define how a person moves through the built environment.

Application

Identify a range of street patterns that incorporate:
- Public space
- Green infrastructure
- Quality pedestrian and cycling links.

+ City of Courtenay

Disconnected street patterns constrain movement and limit mobility choice.

+ M. Southwarth

Different street pattern types limit or facilitate access.

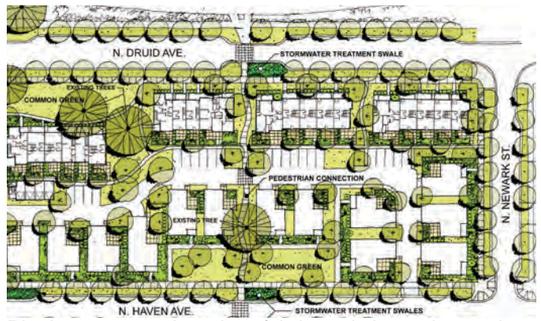
BLOCK + LOT STANDARDS

Description

The physical containers for development. Standards ensure that development:
- Promotes connectivity
- Integrates infrastructure
- Respects local context
- Establishes building blocks for animated public realms

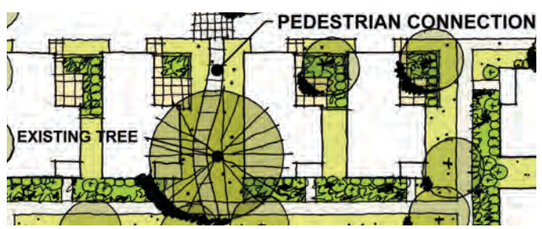
Application

Define standards for block and lot:
- Size
- Area
- Perimeter
- Configuration



+ Urbsworks, Inc.

Blocks structure the urban fabric and shape the road network.



+ Urbsworks, Inc.

Lots make area within blocks available for development.

MOBILITY CATCHMENT

Description

The distance people can travel on foot, by bicycle or by car within five, ten and fifteen minutes to access services and daily needs.

Application

Configure land uses according to mobility catchments of a five to ten minute walk or bike ride.

+ Congress for the New Urbanism

Most people are comfortable travelling five minutes to access daily needs and services.

+ Duany Plater-Zybek & Company

A mobility catchment tool helps structure site plan layout in a proposed community.

MIXED USE DEVELOPMENT

Description

A mix of uses provides residents the opportunity to live, work, and access daily needs within their community.

Application

Identify an appropriate mix of uses for different node types to establish community focal points and create place identity.

+ Saddleton Plan

A site plan layout identifies a range of appropriate building types within a common area.

Appendix E: Green Infrastructure

GREEN INFRASTRUCTURE

Green infrastructure is the application or retention of natural processes to the design of the built environment. Green infrastructure elements can be integrated into roadway design to provide environmental and social benefits, as well as cost savings.

Stormwater Management

Description

Low Impact Development (LID) is a stormwater management strategy that mimics natural hydrologic patterns.

Benefits

- Improved watershed health
- Minimizes requirements on stormwater management system
- Filters water and improves groundwater recharge
- Integrates natural systems into urban environments
- Improved landscape aesthetic

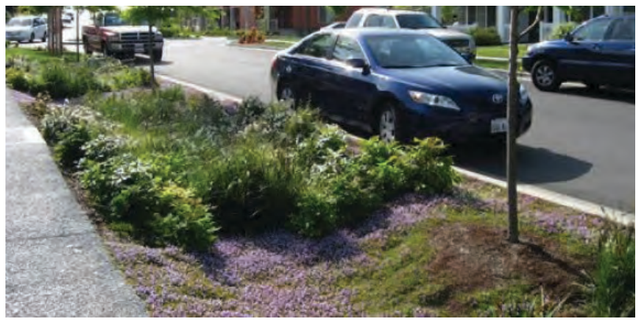
Application

LID methods are grouped into infiltration, capture and reuse.

Treatments include:
- Rain gardens
- Bioswales
- Permeable pavements
- Green roofs
- Rainwater harvesting

Rain gardens use plants and permeable soils to store, filter, infiltrate and evapotranspirate stormwater runoff.

+ Minnesota



A vegetated swale conveys, treats and infiltrates runoff from adjacent sidewalks and road surfaces.

+ Seattle

A bioretention planter captures runoff from a sidewalk or street and allows it to feed vegetation and infiltrate into the soils below.

+Portland

Urban Forest

Description

The collection of city trees located on public and private lands, including street trees planted within the road right-of-way.

Benefits

- Improved air quality
- Prevention of soil erosion
- Local climate moderation
- Habitat provision
- Sequestration and storage of carbon dioxides
- Soften and scale down roadways
- Add character and sense of place

Application

Urban forestry practices are divided into tree retention, maintenance and new planting.

Best practices include:
- Retain large mature trees.
- Integrate tree planting in roadway projects.
- Maintenance program is successful when tree species are appropriate for facility type.

Climate-adaptive native understorey vegetation

+ Gye + Associates

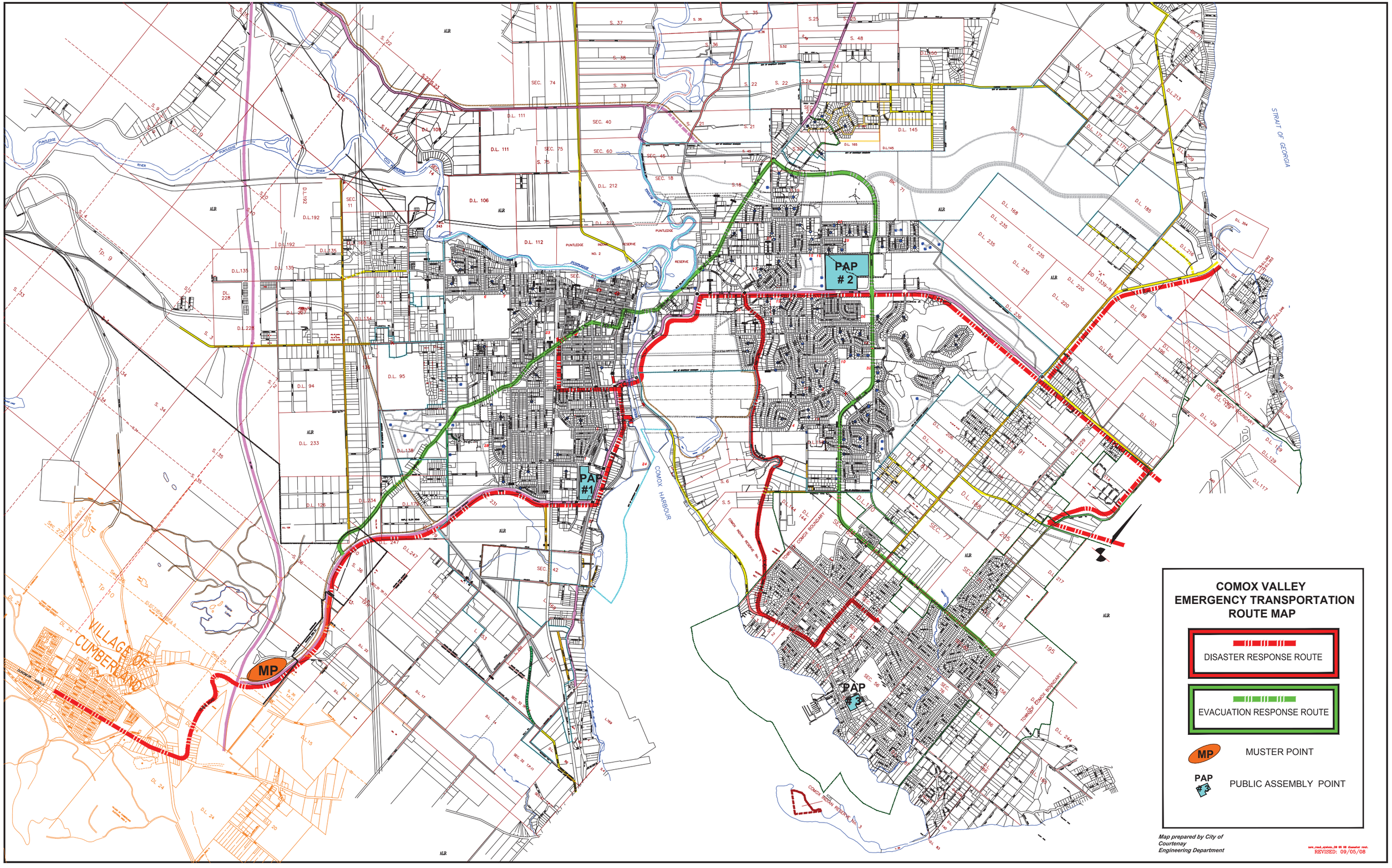
Context-sensitive design preserves mature trees and integrates them with pedestrian and cycling infrastructure

+ Gye + Associates

Large-growing tree species provide climate buffering, stormwater management and neighbourhood realm improvements

+ Gye + Associates

Appendix F: Emergency Transportation Routes


PAP # 2
PAP #1
PAP #3
MP
VILLAGE OF CUMBERLAND
COMOX HARBOUR
STRAIT OF GEORGIA
PUNTLEDGE RIVER
COMOX INDIAN RESERVE NO. 3
COMOX VALLEY EMERGENCY TRANSPORTATION ROUTE MAP
DISASTER RESPONSE ROUTE
EVACUATION RESPONSE ROUTE
MUSTER POINT
PUBLIC ASSEMBLY POINT
Map prepared by City of Courtenay Engineering Department
REVISED: 09/05/08

Appendix G: North Connection to the Inland Island Highway

MEMORANDUM

TO:	Lesley Hatch, P.Eng.	ACTION BY:	
FROM:	Jennifer Armstrong, P.Eng.	FOR INFO OF:	
PLEASE RESPOND BY:		PROJECT No.:	5124118.00
RE:	North Connection to the Inland Island Highway	DATE:	April 22, 2014

M:\PROJ\5124118\03 DOCUMENTS\DRAFT REPORT\FINAL\APPENDICES\APPENDIX G PUBLIC CONSULTATION SUMMARY\NORTHCONNECTOR_FINAL_SEPT13_2013.DOCX

Background

The need for a more direct connection between Veteran's Memorial Parkway and the Inland Island Highway has been discussed for many years.

The City of Courtenay's Official Community Plan includes the project in its future road network, and also includes a policy statement which commits the City to "pursue the design and construction of the next stage of the North Courtenay Connector from Highway 19A to Piercy Road as a primary link between the Comox Valley Regional Airport and Mount Washington Resort."

More recently, the City of Courtenay developed a Transportation Plan which sets out a 25 year vision for multi-modal transportation. The Plan, currently being finalized, confirms the need for better access between the Inland Island Highway and north Courtenay. The current routing (via Vanier Drive, Headquarters Road, and Dove Creek Road) involves multiple turns, and is inconvenient for residents and confusing to visitors. The route also has limited capacity; with only a single lane bridge over the Tsolum River, the ability to accommodate future traffic growth is constrained. As a result, the Transportation Plan calls for the realignment of the Veteran's Memorial Parkway / Piercy Road connection, and a new bridge over the Tsolum River.

Why is a New Connection Needed?

Access - The main driver behind the need for a new connection is accessibility. A new road corridor linking Veteran's Memorial Parkway and Piercy Road would improve access to several key destinations, including:

- Comox Valley Airport
- Little River Ferry Terminal (connecting to Powell River)
- New Comox Valley Hospital
- Mount Washington Alpine Resort
- Town of Comox
- City of Campbell River

With regards to the latter, it is worth noting that roughly 6% of Courtenay residents work in Campbell River, based on 2006 census data. However, improved access will not only benefit residents of the Comox Valley, but will also support business activity and tourism. By providing an improved connection, there is opportunity to create a new gateway into the City for travelers arriving from the north.

During the consultation that was carried out for the Transportation Plan, connectivity emerged as a key objective. In particular, connectivity to the Inland Island Highway was noted as important, with the current northerly connection criticized as being indirect and confusing.

New Development – The new connection will also support development activity within and adjacent to the City, in particular, development north of the Puntledge River and development of the Raven Ridge (Block 71) lands. These two areas alone could see up to 3500 new residential units constructed in the next 25 years (1000 units in the area north of the Puntledge River, and 2500 units in Raven Ridge).

Road Spacing & Network Redundancy – Another key benefit of the project is an improvement in road spacing and network redundancy. Where arterial road spacing is substandard, there is greater pressure on lower order facilities, as well as intersections. Currently, there is no continuous east-west arterial road north of Ryan Road within the Comox Valley area. This project, combined with a new arterial connection between Veterans Memorial Parkway and Anderton Road (within the Block 71 lands; also recommended in the Transportation Plan), will create a new east-west corridor, increasing travel options for residents and creating redundancy in the transportation system in the event of problems on Ryan Road.

Emergency Response – A more direct connection between Piercy Road and Veteran's Memorial Parkway would improve the provision of emergency services (fire and ambulance), particularly at the Tsolum River Crossing where emergency vehicles must currently yield to any vehicle on the bridge under the existing single lane configuration. Improved access to the Inland Island Highway is also important for evacuation purposes and disaster response. In the event that Highway 19 must be closed due to a collision or other event, an improved connection to the highway from the north would also provide a convenient detour route for diverted traffic.

Road Capacity & Network Benefits – Based on findings from the Transportation Plan, a new connection between Piercy Road and Veteran's Memorial Parkway is not needed over the 2037 horizon from a road capacity perspective. Based on 2012 traffic counts, there are fewer than 250 vehicles per hour currently using the Tsolum River Crossing during the afternoon peak in both directions combined. By 2037, it is estimated that this figure will grow to roughly 475 vehicles per hour, which can be accommodated with the existing road configuration.

However, it is important to note that the traffic forecasts are based on data collected in November, and do not capture the peak tourist season. Moreover, construction of the project is anticipated to attract additional traffic to the corridor, with future traffic volumes increasing by roughly 30% (to nearly 625 vehicles per hour) once improvements are in place. An even greater increase may occur depending on how development actually unfolds. As noted above, a new connection between Piercy Road and Veteran's Memorial Parkway will serve development north of the Puntledge River. Depending on where this new development is located, improvements in this area of network could potentially relieve pressure on the Puntledge and Courtenay River crossings, as well as routes into and through the downtown (i.e. by providing an attractive alternate route to access destinations in east Courtenay and Comox).

Safety – Although collision statistics are not available for the area in question, the elimination of the "jog" at Headquarters Road can be expected to have a positive impact on safety.

Economic Benefits – A more direct connection between Veterans Memorial Parkway and Piercy Road in the north end of the City will help to promote new development and support existing businesses (and tourism) through improvements in access and connectivity. Of course, there are also economic benefits to be derived from construction of the road itself, supporting job creation in the Comox area.

Given the above considerations, a new connection between Veteran's Memorial Parkway and Piercy Road has considerable merit, and the City should continue to work with its municipal and provincial partners to move the project forward.

Appendix H: Making the Case for Complete Streets

Fact Sheets from Healthy Living Niagara
(http://healthylivingniagara.com)

ECONOMIC VALUE: Active Transportation and Local Businesses

Promoting active transportation will benefit Niagara businesses

What is Active Transportation?

Active transportation (AT) refers to people-powered transport such as walking, cycling, using a wheelchair, in-line skating or skateboarding[1].

People who walk or cycle spend more money than drivers at local businesses

- Pedestrian and cyclists on Bloor Street (Toronto) spend more than drivers at local businesses[2]
- A survey of downtown British shopping districts found that pedestrians spent $142 weekly on goods while those who drove only spent $97 per week[3]

People will walk or cycle to businesses more often if it is convenient

- In Copenhagen, 33% of people cycle because it is more convenient while only 9% cycle because of environmental concerns[4]

Providing AT infrastructure makes $ense for local businesses

- When new bike racks and bike lanes were added on Magnolia Street in Fort Worth, Texas business increased by nearly 200 percent[5]
- After bike lanes were built along Valencia Street in San Francisco, merchants believed that sales increased, more area residents shopped locally, and that the area was economically revitalized[6]
- Investments in streetscape and pedestrian improvements in Lodi, California (population 62, 133[7]) has helped to attract new businesses, decrease vacancy rate from 18% to 6% and increase downtown sales tax revenue by 30%[8]

Providing AT infrastructure is relatively inexpensive

- The cost of building a parking space for a bicycle is about 5% of the cost of building a parking space for a car[9]
- Almost 20 bicycles can be parked in the space needed for one car[10]

Promoting AT can attract new customers to Niagara Businesses

Kevin Echlin began promoting his restaurant, The Smokin' Buddha in Port Colborne, as bike-friendly after attending a workshop and becoming a part of the "Welcome Cyclists Network" 5 years ago. Cyclists now make-up 29-35% of his summer business and approximately 30% of winter business on Wednesday nights[11]. Information for businesses on becoming part of the Welcome Cyclists Network can be found at http://www.welcomecyclists.ca/join-the-network.

Bottom Line: Promoting active transportation modes makes good business sense; attracting customers who walk or cycle will increase revenue for Niagara businesses

1 Public Health Agency of Canada. (2010). What is Active Transportation? Retrieved from: http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/at-ta-eng.php

2 The Clean Air Partnership. (2009). Bike Lanes, On-Street Parking and Businesses: A Study of Bloor Street in Toronto's Annex Neighbourhood. Retrieved from: http://www.cleanairpartnership.org/pdf/bike-lanes-parking.pdf

3 Litman, T. D. (2009). Economic Value of Walkability . Victoria Transport Policy Institute. Retrieved from http://www.gtkp.com/assets/uploads/20091126-000855-1363-walkability.pdf (£ converted to Canadian dollars)

4 City of Copenhagen. (2011). Copenhagen City of Cyclists: Bicycle Account 2010. Retrieved from: http://www.cycling-embassy.dk/wp-content/uploads/2011/05/Bicycle-account-2010-Copenhagen.pdf

5 Blue, E. (2011). Bikenomics: The Economic Case for On-Street Bike Parking. Grist. Retrieved from http://grist.org/biking/2011-04-11-the-economic-case-for-on-street-bike-parking/

6 Drenne, E. (2003). Economic Effects of Traffic Calming on Urban Small Businesses. Department of Public Administration, San Francisco State University. Retrieved from: http://www.sfbike.org/download/bikeplan/bikelanes.pdf

7 United States Census Bureau. (2012). State and & country Quick Facts: Lodi, California. Retrieved from http://quickfacts.census.gov/qfd/states/06/0642202.html#

8 Local Government Commission Center for Livable Communities. (2000). The Economic Benefit of Walkable Communities. Retrieved from http://www.lgc.org/freepub/docs/community_design/focus/walk_to_money.pdf

9 Interface for Cycling Expertise and Habitat Platform Foundation. (2000). The Economic Significance of Cycling. Retrieved from http://www.ocs.polito.it/biblioteca/mobilita/EconomicSignificance.pdf

10 Hasan, T. (2012). Homepage. Velo-city: Bicycle Parking. Retrieved from http://velo-city.org/bike-parking/index.html

11 Echlin, K. Personal Communication, October 30, 2012.

HEALTHY LIVING NIAGARA
healthylivingniagara.com

Niagara Region
www.niagararegion.ca

ECONOMIC VALUE: Active Transportation and Tourism

Promoting active transportation in Niagara will increase tourism revenue.

What is Active Transportation?

Active transportation (AT) refers to people-powered transport such as walking, cycling, using a wheelchair, in-line skating or skateboarding[1].

Bicycle tourism is big business in Niagara

- Niagara bicycle tourists spent $164 million in 2002, representing 12% of total tourism expenditures[2] and fuelling almost 5000 jobs. Restaurant, retail and lodging establishments receive the biggest benefit[3]
- Most cyclist tourists in Niagara stay for at least one night[4] and spend more money than non-cycling tourists daily. In 2005, cycling tourists in Quebec spent 27% more daily[5] than other tourists.

Destinations which encourage active transportation attract visitors

- The Ontario Bruce trail has over 400,000 visitors annually[6], 70% of whom spend an average of four nights in accommodation and purchase consumable goods within 10 km of the trail[7]
- Bicycle tourists are generally professional white collar workers, with annual incomes of over $60,000[8]

Developing strategies to attract tourists who walk or cycle makes $ense

- The RouteVerte[9] is a 4,000 km network of bikeways which the Quebec government created to promote cycling tourism. In 2006, Routeverte cyclists[10] spent an estimated $134 million.
- When North Carolina invested public funds to construct multiuse pathways and paved shoulders for bicycles the state saw a 900% return on their investment. Tourists spent almost $60 million annually on restaurants, retail and lodging businesses[11].

Small AT investments will encourage tourists and residents and to cycle more

- One-quarter of cycling tourists and residents surveyed in Niagara reported that they would be encouraged to cycle more often if there was better signage and more bike lanes on roads[8]
- Developing infrastructure which supports active transportation is relatively inexpensive. In Canada, to construct a km of on-street bike lanes (i.e. restriping) costs an average of $20,000 to install whereas a km of road costs an average of $1.3 million[9].
- The cost of building a parking space for a bicycle is about 5% of the cost of building a parking space for a car[12]

Bottom Line: Now is the time to promote cycling and walking opportunities in Niagara to attract profitable tourism dollars.

1 Public Health Agency of Canada. (2010). What is Active Transportation? Retrieved from: http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/at-ta-eng.php

2 Niagara Region. (2003). Bikeways Master plan study: 4.0 Cycling in Niagara Region. Retrieved from http://www.regional.niagara.on.ca/government/initiatives/pdf/04-Chapter4-Cycling%20in%20Niagara%20Region.pdf

3 Campbell, R., & Wittgens, M. (2004, March). The Business Case for Active Transportation: The economic Benefits of Walking and Cycling. Retrieved from http://thirdwaveycling.com/pdfs/at_business_case.pdf

4 Bike Train and Welcome Cyclists Network. (2010). Economic Impact of Cycle Tourism Niagara Region and Greenbelt Areas. Retrieved from http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCAQFjAA&url=http%3A%2F%2Fwww.welcomecyclists.ca%2Fnetworkresources%2Fitem%2Fdownload%2F22&ei=Qn9OUMGpH5KCyAHTnYGIBQ&usg=AFQjCNG4LJ5k2wRwIk-EBRn-n6XxS0f5YWA

5 Vélo QuébecAssociation. (2006). Bicycling in Québec in 2005. Retrieved from http://www.veloquebec.info/documents/bicyclingquebec2005-en.pdf

6 Ontario Trails Council. (2012). Bruce Trail. Retrieved from: http://www.ontariotrails.on.ca/trails-a-z/bruce-trail/

7 Go for Green. The Economic Benefit of Trails. Retrieved from: http://atfiles.org/files/pdf/econgo4green.pdf

8 Bike ON Tours (2011).Characteristics of Bicycle Tourists. Retrieved from: http://www.bikeontours.on.ca/tourism.htm

9 La Route Verte. (2003). The Route verte concept .Retrieved from http://www.routeverte.com/rv/index_e.php?page=projet_e

10 La Route Verte. (2003). Economic spin-off. Retrieved from http://www.routeverte.com/rv/index_e.php?page=retombees_e

11 Lawrie, J. J., Norman T. P., Meletiou, M., & O'Brien, S. W. (2006). Bikeways to Prosperity Assessing the economic impact of Bicycle Facilities. TR News. Retrieved from http://onlinepubs.trb.org/onlinepubs/trnews/trnews242rpo.pdf

12 Interface for Cycling Expertise and Habitat Platform Foundation. (2000). The Economic Significance of Cycling. Retrieved from http://www.ocs.polito.it/biblioteca/mobilita/EconomicSignificance.pdf

HEALTHY LIVING NIAGARA
healthylivingniagara.com

Niagara Region
www.niagararegion.ca

ECONOMIC VALUE: Active Transportation and Your Health

Using active transportation more often can improve the health of Niagara residents and result in healthcare savings

What is Active Transportation?

Active transportation (AT) refers to people-powered transport such as walking, cycling, using a wheelchair, in-line skating or skateboarding[1].

Physical Inactivity, Active Transportation and Healthcare Savings

- Physical inactivity accounts for about $2.4 billion of direct health care costs[2]. This inactivity contributes to serious health problems such as heart disease, colon cancer, and type II diabetes[3].
- People who commute at least 30 minutes daily by cycling or walking show a 35% reduction in the risk of diabetes[4]
- If Canadians increased their physical activity levels by just 10%, direct healthcare costs could be reduced by almost $150 million yearly[5]. Switching to active transportation from driving increases physical activity levels.

Safety, Active Transportation and Healthcare Savings

- The direct health care costs of motor vehicle-caused injuries are $375 million yearly[6]. Using active transportation can reduce the number of motor vehicle collisions and injury costs.

The Environment, Active Transportation and Healthcare Savings

- Cars produce pollutants that can cause asthma, heart disease and bronchitis resulting in hospitalizations and death[7]. Motor transportation contributes to 40% of annual greenhouse gas emissions in Niagara[8].
- Driving less would decrease the estimated $1 billion of provincial smog-related air pollution costs[9]. Small changes can have big effects. A study in London, England estimated that for each adult who switched from using a car to a bicycle for a commuting journey of 2.6 miles each way, 80 days per year, there would be a reduction in the cost of traffic emissions by $109 yearly per person[10].

Bottom Line: Using AT more often can result in reduced health care costs.

1 Public Health Agency of Canada. (2010). What is Active Transportation? Retrieved from: http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/at-ta-eng.php

2 Janssen, I. (2012). Health care costs of physical inactivity in Canadian adults. Applied Physiology, Nutrition and Metabolism, 37, 803-806.

3 Region of Waterloo Public Resources. (2011). The Handbook for Healthy Workplaces: Physical Activity. Retrieved from: http://www.projecthealth.ca/files/upload/ISION_-_PHYSICAL_ACTIVITY_-_JUIY_15__2011_1_.pdf

4 Hu, G., Qiao, Q., Silventoinen, K., Eriksson, J. G., Jousilahti, P., Lindström, J., Valle, T. T., Nissinen, A., &Tuomilehto, J. (2003). Occupational, commuting, and leisure-time physical activity in relation to risk for Type 2 diabetes in middle-aged Finnish men and women. Diabetologia, 46(3), 322-329.

5 Katzmarzyk, P. T., Gledhill, N., & Shephard, R. J. (2000). The economic burden of physical inactivity in Canada. Canadian Medical Association Journal, 163, 1435-1440.

6 Health Canada. (1998). The economic burden of unintentional injury in Canada. Retrieved from: http://www.smartrisk.ca/downloads/burden/Canada1998/EBI-Can-Summary.pdf

7 Gilbert, R., & O'Brien, C. (2005). Child-and youth-friendly land-use and transport planning guidelines. The Centre for Sustainable Transportation. Retrieved from http://cst.uwinnipeg.ca/documents/Guidelines_ON.pdf

8 Niagara Region. (2011). Complete Streets for Niagara. Retrieved from: http://www.niagararegion.ca/government/planning/pdf/NRCompleteStreetsPaper2012.pdf

9 Ontario Medical Association (2005). Illness Costs of Air Pollution (ICAP) – Regional Data for 2005.Retrieved from https://www.oma.org/Resources/Documents/d2005IllnessCostsOfAirPollution.pdf

10 Joint Report: London Councils and London cycling Campaign. (2010). Delivering the benefits of cycling in Outer London. Retrieved from: http://www.tfl.gov.uk/assets/downloads/businessandpartners/benefits-of-cycling-report.pdf

HEALTHY LIVING NIAGARA
healthylivingniagara.com

Niagara Region
www.niagararegion.ca

ECONOMIC VALUE: Active Transportation and Air Quality

Using active transportation more often can improve the health of Niagara residents and result in healthcare savings

What is Active Transportation?

Active transportation (AT) refers to people-powered transport such as walking, cycling, using a wheelchair, in-line skating or skateboarding[1].

Physical Inactivity, Active Transportation and Healthcare Savings

- Physical inactivity accounted for approximately $2.4 billion of direct health care costs[2] in 2009. Physical inactivity contributes to serious health problems such as heart disease, colon cancer, and type II diabetes[3].
- Those who commute at least 30 minutes daily by cycling or walking show a 35% reduction in the risk of diabetes[4]
- Switching to active transportation from motorized transport increases physical activity levels. If Canadians increased their physical activity levels by just 10%, direct healthcare costs could be reduced by almost $150 million yearly[5].

Safety, Active Transportation and Healthcare Savings

- The direct health care costs of motor vehicle-caused injuries are $375 million yearly[6]. Using forms of active transportation can reduce the number of motor vehicle collisions and the associated costs of bodily injury.

The Environment, Active Transportation and Healthcare Savings

- Cars produce pollutants that can cause asthma, heart disease and bronchitis resulting in hospitalizations and death[7]. Motor transportation contributes to 40% of annual greenhouse gas emissions in Niagara[8].
- Driving less would decrease the estimated $1 billion of provincial smog-related air pollution costs[9]. Small changes can have big effects. A study in London, England estimated that for each adult who switched from using a car to a bicycle for a commuting journey of 2.6 miles each way, 80 days per year, there would be a reduction in the cost of traffic emissions by $109 yearly per person[10].

Bottom Line: Using AT more often can result in reduced health care costs.

1 Public Health Agency of Canada. (2010). What is Active Transportation? Retrieved from: http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/at-ta-eng.php

2 Janssen, I. (2012). Health care costs of physical inactivity in Canadian adults. Applied Physiology, Nutrition and Metabolism, 37, 803-806.

3 Region of Waterloo Public Resources. (2011). The Handbook for Healthy Workplaces: Physical Activity. Retrieved from: http://www.projecthealth.ca/files/upload/ISION_-_PHYSICAL_ACTIVITY_-_JUIY_15__2011_1_.pdf

4 Hu, G., Qiao, Q., Silventoinen, K., Eriksson, J. G., Jousilahti, P., Lindström, J., Valle, T. T., Nissinen, A., &Tuomilehto, J. (2003). Occupational, commuting, and leisure-time physical activity in relation to risk for Type 2 diabetes in middle-aged Finnish men and women. Diabetologia, 46(3), 322-329.

5 Katzmarzyk, P. T., Gledhill, N., & Shephard, R. J. (2000). The economic burden of physical inactivity in Canada. Canadian Medical Association Journal, 163, 1435-1440.

6 Health Canada. (1998). The economic burden of unintentional injury in Canada. Retrieved from: http://www.smartrisk.ca/downloads/burden/Canada1998/EBI-Can-Summary.pdf

7 Gilbert, R., & O'Brien, C. (2005). Child-and youth-friendly land-use and transport planning guidelines. The Centre for Sustainable Transportation. Retrieved from http://cst.uwinnipeg.ca/documents/Guidelines_ON.pdf

8 Niagara Region. (2011). Complete Streets for Niagara. Retrieved from: http://www.niagararegion.ca/government/planning/pdf/NRCompleteStreetsPaper2012.pdf

9 Ontario Medical Association (2005). Illness Costs of Air Pollution (ICAP) – Regional Data for 2005. Retrieved from https://www.oma.org/Resources/Documents/d2005IllnessCostsOfAirPollution.pdf [Figure calculated by summing direct and indirect healthcare smog-related costs from each region]

10 Joint Report: London Councils and London cycling Campaign. (2010). Delivering the benefits of cycling in Outer London. Retrieved from: http://www.tfl.gov.uk/assets/downloads/businessandpartners/benefits-of-cycling-report.pdf

HEALTHY LIVING NIAGARA
healthylivingniagara.com

Niagara Region
www.niagararegion.ca

ECONOMIC VALUE: Active Transportation to School

Using active school travel will improve the health of Niagara's children while saving schools and parents money.

What is Active Transportation?

Active transportation (AT) refers to people-powered transport such as walking, cycling, using a wheelchair, in-line skating or skateboarding[1].

What is Active School Travel?

Active school travel is the self-propelled transport children use to get to and from school such as walking, cycling, using a wheelchair, in-line skating or skateboarding[2].

DID YOU KNOW?

In Niagara 31% of youth aged 12-17 are overweight or obese[3]

- Physical inactivity is a major contributor to high obesity rates among youth and children[4]
- Just 7% of Canada's children and youth meet Canadian daily physical activity guidelines (60 min/day)[5].

Active school travel may promote a more active lifestyle in children

- Boys who walk to school are more active outside of school hours than those who are driven[6]
- Children and adolescents who bike to school have greater fitness[7] than those who do not.

Active school travel can also improve student academic performance

- Girls who walk or bike to school have shown higher test scores than those who do not, regardless of how much physical activity they engage in outside of school[8]

Fewer students use active school travel than their parents

- Since 1985 the proportion of Canadian children walking to school has fallen by 50% to 1 in 3[9]
- Approximately 41% of Canadian students are driven to school, while only 13% of their parents were[10]

There are significant costs related to increased school vehicle traffic and congestion

- When children are driven to school, special lanes for safely dropping off children plus extra parking spots often need to be created. When Parkview Education Centre (Nova Scotia) retrofitted a parking lot to deal with increased traffic congestion the cost was estimated at $250,000[11].
- Many principals spend up to an hour per day managing school parking lot issues. Across all elementary schools in Ontario, this can translate to 721,980[12] hours used per year. With less school traffic activities to manage principals could devote more time to education.

HEALTHY LIVING NIAGARA
healthylivingniagara.com

Niagara Region
www.niagararegion.ca

ECONOMIC VALUE: Active Transportation to School

Promoting active school travel makes $ense for schools

- Active & Safe Routes to School (ASRTS)[13] is a national movement that is dedicated to children's health, mobility and happiness. Many active school travel programs operate with little financial cost and use student and parent volunteers with support from local professionals such as planners, engineers and health promoters[12].
- When faced with a shortage of parking spots, the principal of St. Nicholas Catholic Elementary (Waterloo) did not seek additional parking. Instead, she closed the school parking lot to parents while introducing ASRTS programming. Staff time spent on managing school traffic was reduced from 80 minutes per day to none. This could mean a cost savings of $9,600 per year for her school[12].

Promoting active school travel makes $ense for parents

- Driving a child for a short distance (2.2 km) to and from school can cost an average of $237/year in fuel costs alone[14]

Children are receptive to using active school travel

- Nearly 75% of Ontario elementary children prefer to walk or bike to school, with just over 60% actually doing so[15]

Adults are receptive to using active school travel

- 74% of Ontarians support urgent action to encourage Ontario's children to increase bike use through active and safe route to school initiatives[16]

Educators are receptive to using active school travel

"As an elementary school principal, the initial benefits of the School Travel Plan are obvious. By encouraging children to walk to school, we provide needed daily physical activity, improved health and nutrition, and take a major step towards reducing the pollution and traffic congestion that none of our schools were ever intended to accommodate...Through the simple act of taking the time to encourage your child to walk to school, you are helping to build the safe, caring and confident community that every school is trying to achieve - one step at a time. Who would have thought it was that easy?[17]"

— **Gary King,**
Principal, General Vanier Public School, Fort Erie.

Bottom Line: Using AT more often can result in reduced health care costs.

1 Public Health Agency of Canada. (2010). What is Active Transportation? Retrieved from: http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/at-ta-eng.php

2 Green Communities Canada. (n.d.). Active and Safe Routes to School: Active School Travel. Retrieved from: http://www.saferoutestoschool.ca/active-school-travel

3 Niagara Region. (2012). Chronic Diseases and Healthy Behaviour with Statistics. Retrieved from http://www.niagararegion.ca/news/publications/health-story-chronic-diseases-and-healthy-behaviour.aspx

4 Janssen, I., & LeBlanc, A. G. (2010). Systematic review of health benefits of physical activity and fitness in school-aged children and youth. International Journal of Behavioural Nutrition and Physical Activity, 7(40)

5 Active Healthy Kids Canada. (2012). Is Active Play Extinct? 2012 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth. Retrieved from: http://dvqdas9jty7g6.cloudfront.net/reportcards2012/AHKC%202012%20-%20Report%20Card%20Long%20Form%20-%20FINAL.pdf

6 Cooper, A. R., Page, A. S., Foster L. J., & Qahwaii, D. (2003). Commuting to school: are children who walk more physically active? American Journal of Preventative Medicine, 25 (4), 273-276.

7 Cooper, A. R., Wedderkopp, N., Jaqo, R., Kristensen, P. L., Moller, N. C., Froberg, K., Page, A. S., & Andersen, L. B. (2008). Longitudinal associations of cycling to school with adolescent fitness. Preventative Medicine, 47(3), 324-328.

8 Martínez-Gómez, D., Ruiz, J. R., Gómez-Martínez, S., Chillón, P., Rey-López, J. P., Díaz, L. E., Castillo, R., Veiga, O. L., & Marcos, A. (2011). Active Commuting to School and Cognitive Performance in Adolescents. Archives of Pediatrics & Adolescent Medicine, 165(4).

9 Green Communities Canada. (n.d.). Active and Safe Routes to School. Retrieved from: http://www.saferoutestoschool.ca/

10 Canada Walks: Green Communities Canada. (2012). Children's Mobility, Health and Happiness A Canadian School Travel Planning Model: 2012 National Results - Executive Survey. Retrieved from: http://www.saferoutestoschool.ca/downloads/Executive%20Summary-CLASP%20Results-May%202012.pdf

11 Colwell, S. (2009). Park View gets its Parking lot. SouthShorenow.ca Retrieved from: http://southshorenow.ca/archives/2009/042109/news/index023.php

12 Green Communities Canada. (2010). Saving Time and Money with Active School Travel. Retrieved from: http://www.saferoutestoschool.ca/oldsite/downloads/Saving_Money_and_Time_with_AT-Final-Sept_2010.pdf

13 Green Communities Canada. (n.d.). Active & Safe Routes to School: Programs. Retrieved from: http://www.saferoutestoschool.ca/oldsite/downloads/Saving_Money_and_Time_with_AT-Final-Sept_2010.pdf

14 Based on distance of 2.2 km/10 trips per week/single child/mid-sized car as calculated November 14, 2012 via Haste hub for active school travel: iSchool Travel Calculator. Retrieved from: http://hastebc.org/tools/ischooltravel-calculator

15 O'Brien, C. (2001). Ontario Walkability Study Trip to School: Children's Experiences and Aspirations. York Centre for Applied Sustainability. Retrieved from: http://www.saferoutestoschool.ca/oldsite/downloads/guide/Walkability_Study_Report.pdf

16 Share the Road. (2010). When Ontario Bikes, Ontario Benefits. Retrieved from: http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCUQFjAA&url=http%3A%2F%2Fwww.sharetheroad.ca%2Fstr_green_paper_2010_03_02-pdf-r155217&ei=Z4emUNfqIoaVygHKroAg&usg=AFQjCNHkANGdyX-bgazBeWr6HAgUf4z1sQ&sig2=02-8kv98PaF5dR_-jTL91w

17 King, Gary, personal communication, November 5th, 2012, Fort Erie, Ontario.