Connecting Our Region

Our first region-wide transportation plan

Final Report

Regional Transportation Plan

Sustainable Transportation Partnership of the Central Okanagan (STPCO)

HDR

November 2020

RDCO Regional District of Central Okanagan

City of Kelowna

Lake Country

Peachland

West Kelowna

Westbank First Nation

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Contents

Connecting Our Region

The Regional Transportation Plan (RTP) identifies transportation projects and priorities that will help build and maintain a healthy, thriving and connected future for the Central Okanagan.

It will help improve the movement of people and goods and create a region where more people can choose sustainable and affordable transportation options.

The Regional Transportation Plan was developed in partnership with the City of Kelowna, City of West Kelowna, District of Lake Country, District of Peachland, Westbank First Nation and the Regional District of Central Okanagan (RDCO) and in collaboration with the Ministry of Transportation and Infrastructure (MoTI) and BC Transit.

The Regional Transportation Plan provides guidance on transportation projects, policies and programs that benefit the region. It is not intended to replace local or provincial planning, but to support and enhance planning by other levels of government. Further study, including project-level planning and design, will be required at the provincial and local level prior to implementation.

The interconnected projects, programs and policy recommendations will work together to:

- connect people and places across the region,
- prepare for future population growth and technology innovations,
- help people of all ages and abilities get around,
- reduce future greenhouse gas emissions, and
- help economic recovery post COVID-19.

Working collaboratively across the region

The Regional Transportation Plan was developed following more than two-and-a-half years of technical studies, consultation with residents from Peachland to Lake Country, and unprecedented region-wide partnership and collaboration.

The plan reflects the interests and values heard from people all across the region and sets the direction for Central Okanagan governments to work together to:

1. move people and goods more efficiently,
2. achieve fast and reliable transit,
3. create a safe and convenient regional bicycling, and trails network, and
4. incorporate new mobility options.

The Regional Transportation Plan and its supporting plans, the Regional Bicycling and Trails Master Plan[1] and the Regional Disruptive Mobility Strategy[2] include recommendations designed to address each of these key directions. The Regional Transportation System Maps in Appendix A show how the recommendations will lead to a more connected Central Okanagan region.

[1] Regional Bicycling and Trails Master Plan: https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final
[2] Regional Disruptive Mobility Strategy: https://smartTRIPS.ca/regional-disruptive-mobility-strategy-final

Key features of the Regional Transportation Plan

One of the key features of the plan is to create a fast and reliable transit spine along the Highway 97 corridor. This would make transit faster and more reliable, increase the people-moving capacity of the corridor and make more efficient use of the existing road network. It would also get transit out of mixed traffic and begin protecting space for potential future conversion to higher capacity transit, which may be possible in the future as the population grows and technology brings costs down. Harvey Avenue in Kelowna is the corridor with the best potential for reaching the population and employment densities needed to support bus rapid transit, light rail transit, or another form of higher capacity transit by the 2040 planning horizon.

The Regional Transportation Plan recommends further study of the following recommended projects along Highway 97 in Kelowna:

- adding dedicated transit lanes in the median along Harvey Avenue from the bridge and then north to UBC Okanagan along a future northern extension of Hollywood Road.
- adding an eastbound transit lane on the bridge during the morning rush hour to allow transit to bypass traffic and stay on schedule.
- widening the shoulder along Highway 97 on the Westside, from Westlake Road to the bridge to allow transit to bypass traffic and move onto the bridge faster and more reliably.

The goal of these recommended projects would be to achieve a fast and reliable transit corridor while minimizing the effect on existing vehicle capacity. It is anticipated that these and other projects on the provincial highway system will be looked at further as part of the next phase of the Ministry of Transportation and Infrastructure's Central Okanagan Planning Study.

The plan also recommends adding 81 new kilometres of regional bicycling and trail facilities. Examples include building the Westside Trail from the bridge to Peachland, creating a new active transportation corridor parallel to Highway 97 on the Westside, completing the gap in the Okanagan Rail Trail from the airport to Lake Country, and connecting the Okanagan Rail Trail to the Mission Creek Greenway via a new active transportation corridor along Dilworth Drive, among others.

The Regional Transportation Plan Vision:

"A transportation system that connects people to regional destinations within the Central Okanagan and beyond, supporting and enhancing the region's economy, social networks, and natural ecosystem."

Other key features of the plan include multimodal and safety improvements to Glenmore Road, transportation improvements around UBC Okanagan and the Kelowna International Airport (the Okanagan Gateway area), new mobility hubs in Peachland and Lake Country, and a recommendation to conduct a Regional Goods Movement Study to guide the sustainable movement of goods as our region grows.

In addition, the plan includes recommendations for policies, programs and services that will complement the infrastructure recommendations and help achieve the plan vision and goals through supportive land use policies, enhanced transit service, demand-responsive transit, and the incorporation of shared and new mobility options.

Moving forward

The Regional Transportation Plan is aligned with the strategic direction of Provincial plans, including CleanBC and the BC Economic Framework. Moving forward, Central Okanagan governments can use the plan as a framework of priorities over the next 20 years so that they can plan and seek funding together, as a unified region.

01 Introduction

Introduction

The Central Okanagan is an amazing place to call home and there are many reasons the area attracts thousands of visitors every year.

It is known for its stunning natural landscapes and unique destinations. The Central Okanagan has a growing and diversifying economy and transportation across the region provides a vital connection to jobs, markets, health care, education, recreation, shopping, emergency services and family and friends.

The region will continue to grow and diversify for the foreseeable future. Over the next 20 years, the population in the Central Okanagan is projected to increase to around 277,000 people.

Based on that growth, the need for access and mobility will continue to increase. The issues affecting all our communities – economic competitiveness, climate change, goods movement, emergency response, public health and quality of life – are directly impacted by the transportation choices we make as a region. This is why Central Okanagan communities are taking a collaborative approach to preparing for our future multimodal transportation needs through the Regional Transportation Plan (RTP).

1.1 Emerging Trends

Several emerging trends are changing how people travel, both today and in the future. The Regional Transportation Plan has been developed with these emerging trends in mind.

1.1.1 COVID-19 Pandemic

The COVID-19 pandemic has evolved rapidly and changed the way people travel, with rapid increases in work from home, decreases in transit ridership, and the use of streets for more active transportation experienced in the short-term. While the situation is uncertain and changing daily, the RTP is a long-range plan designed to establish the vision for regional transportation over the next 20 years. While the impacts and economic recovery from COVID-19 may delay growth in the next few years, the long-term transportation vision established by the RTP is still anticipated to be relevant in 2040. In addition, it is hoped that the RTP can provide a roadmap for investment in the Central Okanagan that will be an important part of economic recovery over the next few years.

1.1.2 Climate Change

Transportation is typically responsible for the largest share of metropolitan greenhouse gas emissions, and this is true in the Central Okanagan region where over 65% of greenhouse gas (GHG) emissions come from the transportation sector[3] . Through the RTP public engagement process, the project team heard that climate change is an important topic to residents. The STPCO partners recognize the urgency of the global climate crisis. The recommendations in the RTP will help to better connect our region, while reducing automobile dependence and improving the quality, convenience and reliability of more sustainable and affordable transportation modes, such as bicycling, walking, transit and small electric vehicles. This will be critical to help protect the Central Okanagan's environment and high quality of life for future generations to come.

1.1.3 Transportation, Technology, and our Changing Future

For the first time in nearly a century, transformative innovations are coming to the transportation sector. New technologies that are making transportation more connected, automated, shared and electric are reshaping how people get around and making owning a car less of a requirement. The RTP has been developed with these rapid changes in mind, and includes recommendations designed to take advantage of new mobility options, such as ride-hailing and bikeshare that can help extend the reach of transit and make getting around without a car easier. In addition, the RTP includes a Regional Disruptive Mobility Strategy[4] that provides a toolkit of policy options for Central Okanagan governments to help prepare for transportation technology change.

1.2 Study Area

Located on the traditional territories of the Syilx people on the shores of Okanagan Lake, the Central Okanagan is the largest urban centre between Vancouver and Calgary. The Central Okanagan is made up of distinct but closely related communities, many of which form the Sustainable Transportation Partnership of the Central Okanagan (STPCO). The organization is a partnership between the City of Kelowna, City of West Kelowna, District of Lake Country, District of Peachland, Westbank First Nation (WFN), and the Regional District of Central Okanagan (RDCO).

The study area is illustrated in **Figure 1**.

Figure 1. Central Okanagan Region

[3] https://www.regionaldistrict.com/media/20493/Climate_Change_Issue_Paper.pdf
[4] The Regional Disruptive Mobility Strategy is available online at: https://smartTRIPS.ca/regional-disruptive-mobility-strategy-final

1.3 Purpose of RTP

Planning and funding a unified regional transportation system can improve how people travel and access destinations in the Central Okanagan. A unified vision and direction for the regional transportation system can balance each community's unique identity and needs, while supporting efficient mobility between and within communities. The RTP will help shape the future of the Central Okanagan by identifying both short-term and long-term transportation investments to improve transportation over the next 20 years.

1.4 The Process for the Central Okanagan's First Regional Transportation Plan

The RTP has been developed in six main stages, as illustrated in **Figure 2**. In 2014, a pre-planning report was completed for the RTP that helped provide a framework for thinking about regional transportation in the Central Okanagan[5]. Development of the RTP was kicked off in 2018. This report represents the final stage of the project, and is a comprehensive summary of the work that has been completed to date.

1.4.1 STPCO's Role in Transportation Planning

The STPCO is a formal partnership that coordinates the regional delivery of sustainable transportation programs and projects in support of common regional policy, plans and interests (economic, social and environmental). The STPCO also provides a formal forum for discussion among elected officials, senior and technical staff, as well as stakeholders and the general public.

As a partnership, membership in the STPCO is voluntary and so the RTP does not have formal, regulatory authority. However, the STPCO members have committed to work together in the best interests of the region through the development and delivery of the RTP. Historically, the STPCO's focus has been on the delivery of travel demand management programs like Bike to Work Week and Bike Rodeos. The role has since evolved to include planning and coordination for all modes.

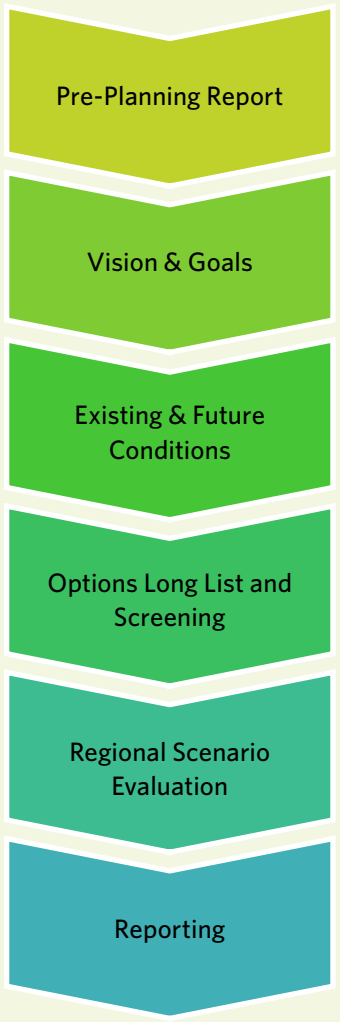
1.4.2 What is Regional?

The RTP provides guidance on transportation projects, policies and programs that benefit the region. It is not intended to replace local or provincial planning, but enhances planning by other levels of government. There is no firm definition of regional and no hard line between planning that is regional versus local or provincial. The regional component of planning should be easily integrated and consistent with all levels of planning.

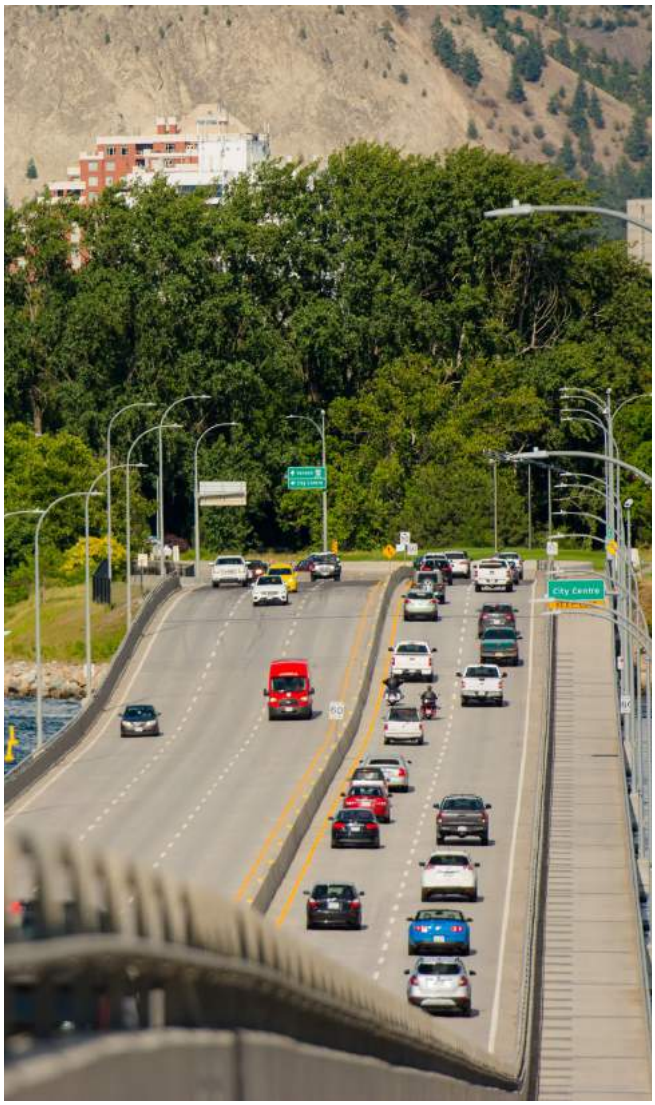
The STPCO does not own any of the transportation infrastructure, and therefore effective operation of the regional transportation system will continue to rely on the individual partners and province and the shared regional benefits of working cooperatively.

In general, what is regional has been defined as transportation system elements that connect people

Figure 2. RTP Process



[5] Regional Strategic Transportation Plan – Phase 1 Pre-Planning Report, 2014

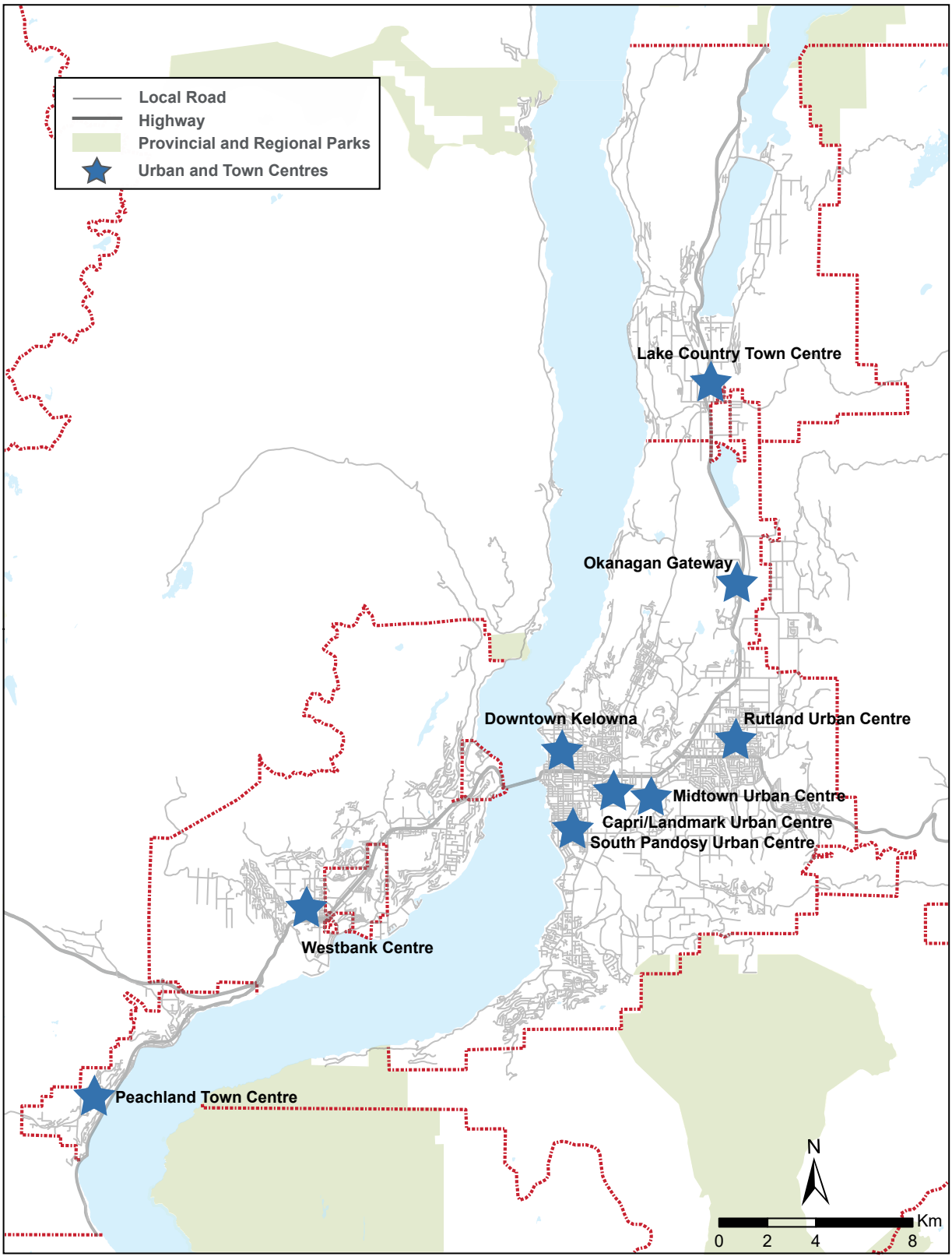


and goods to important regional destinations. Provincial highway planning is not included as regional, except where the highway provides an opportunity to support regional transportation in a way that has not normally been considered, such as high capacity transit. Connecting regional urban and town centres are of primary importance in the RTP. These centres include:

- Lake Country Town Centre (Winfield)
- The Okanagan Gateway area (University of British Columbia – Okanagan and Kelowna International Airport area)
- Rutland Urban Centre
- Midtown Urban Centre (Orchard Park area)
- Capri/Landmark Urban Centre
- South Pandosy Urban Centre
- Downtown Kelowna
- Westbank Centre
- Peachland Town Centre

There are several other regional destinations that have been considered, but these urban and town centres, shown in **Figure 3**, represent the highest demand areas in the region. The regional transportation system also connects the region to adjacent areas, such as the North and South Okanagan regions, via the provincial highway system.

Figure 3: Urban and Town Centres



02 The Vision for Regional Transportation

The Vision for Regional Transportation

The vision and goals for the RTP were developed through extensive consultation and engagement with the public, and through direct input from the STPCO partner's staff and visioning workshops held with elected officials.

Public engagement activities included an online survey and in-person, pop-up open house events across the region.

This work resulted in development of the following shared vision and goals for the regional transportation system in the Central Okanagan.

2.1 RTP Vision

"A transportation system that connects people to regional destinations within the Central Okanagan and beyond, supporting and enhancing the region's economy, social networks, and natural ecosystem."

2.2 RTP Goals

SAFE – transports people and goods safely

EFFICIENT – minimizes energy, emissions and travel times

SUSTAINABLE – creates a net positive social, environmental, and economic benefit to the region and future generations

AFFORDABLE – provides value to all users while minimizing costs to users and taxpayers

ECONOMIC GROWTH – supports regional economic growth

EQUITABLE – addresses the transportation needs of all areas, ages and incomes

ACCESSIBILITY – applies the principles of universal access

QUALITY OF LIFE – minimizes noise, visual and community effects while supporting community cohesion

ENVIRONMENTALLY RESPONSIBLE – minimizes negative effects on the natural ecosystem

MULTI-MODAL – increases the variety of travel choices available

ADAPTABLE – can change in response to evolving technology and societal trends

Together, the RTP vision and goals were used to guide the development of the RTP, including evaluation of the options and scenarios that were considered as part of the planning process.

2.3 RTP Alignment with Provincial Plans

The RTP has been developed to align with the strategic direction of Provincial plans, including CleanBC and the BC Economic Framework.

While the Central Okanagan region lacks a formal regional governance structure for setting and enforcing region-specific targets, the plan has been designed to support achievement of key provincial objectives related to climate, active transportation and the economy through regional collaboration. Additionally, section 6.2 discusses key performance metrics that will be critical for tracking progress in the region, such as vehicle kilometers traveled, mode share, and traffic counts, among others.

2.3.1 Clean BC

CleanBC outlines a series of actions to help reach the 2030 provincial target of a 25.4 Mt reduction in greenhouse gas (GHG) emissions. The CleanBC plan estimates that 6 Mt of GHGs will be reduced primarily though facilitating the transition to zero emission vehicles (ZEV) and speeding up the switch to cleaner fuels. The plan also identifies improving community planning, active transportation and transit as important parts of achieving the 2030 GHG target. To that aim, the province developed the Clean BC active transportation strategy "Move. Commute. Connect." which aims to double the trips taken by active transportation in the province by 2030.

The RTP, and its supporting plans, the Regional Bicycling and Trails Master Plan and the Regional Disruptive Mobility Strategy are aligned with the strategic direction of CleanBC and Move. Commute. Connect. and will help the region trend in the desired direction in support of provincial GHG and active transportation targets.

Specifically, the RTP recognizes the urgency of the global climate crisis and includes recommendations that will help create a region where more people can choose low-carbon, sustainable transportation options, such as walking, biking and transit. Additionally, the Regional Bicycling and Trails Master Plan aims to make bicycling and walking a safe and convenient year-round option for more people. Examples of recommendations in the plans include:

- creating a fast and reliable transit spine by investing in dedicated space for transit along key corridors
- adding another 81 km of regional bicycling and trail facilities,
- connecting regional destinations (such as the hospital, airport, college and university) with more frequent transit, and active transportation facilities, and
- designing active transportation infrastructure for people of all ages and abilities, consistent with the new BC Active Transportation Design Guide.

2.3.2 BC Economic Framework

The BC Economic Framework outlines a systematic approach to growing the economy and increasing the standard of living in BC, while maintaining alignment with CleanBC's environmental goals. The economic framework makes a clear link between prosperity and the need to decarbonize the economy, but also addresses broader issues of equity and affordability. It highlights the challenges of strained urban infrastructure and longer commutes that produce higher greenhouse gas (GHG) emissions.

The RTP is aligned with the BC Economic Framework and puts many of its recommendations into action, such as planning for transportation across jurisdictional boundaries, and focusing on managing congestion along key trade corridors, but doing so in a way that helps reduce GHG rather than inviting more traffic. Additionally, the RTP recommends the completion of a Regional Goods Movement Study (see Section 5.1.2) to look more in depth at sustainable goods movement in the Central Okanagan as the region grows.

03 Existing and Future Conditions

Existing and Future Conditions

The need to travel, and quality of travel is influenced and informed by a myriad of factors, varying from personal demographics and the locations of different services and uses, to the infrastructure that makes travel possible. This section summarizes the current state of transportation in the Central Okanagan and how transportation is expected to change, given future population growth.

3.1 Regional Demographics

This discussion includes existing demographic trends, housing tenure, housing affordability, education, employment, major industries in the Central Okanagan, and a forecast of future population growth.

3.1.1 Population

Current Population

The Central Okanagan has the third largest census metropolitan population (CMA) in British Columbia behind Vancouver and Victoria, and is the 22nd largest metropolitan area in Canada.

It has experienced steady growth over the last 20 years, reaching a total population of almost 193,000 in 2016. Between 2011 and 2016, the region's population grew 8.4%, greater than the national and provincial growth during the same period (5.0% and 5.6% respectively). Between 2011 and 2016, the Central Okanagan had the sixth largest increase in population of all census metropolitan areas in Canada behind Calgary, Edmonton, Saskatoon, Regina and Lethbridge.

The Central Okanagan's population growth rate is expected to exceed that of the Province for the foreseeable future. From 2016 to 2040, the total population in the region is forecasted to increase by 84,300 (43.7%) or at an average annual growth rate of 1.5%; a slightly higher rate than in the previous ten years. Over the same period, the provincial population is forecasted to increase 25.1%, or at an average annual rate of 1.1%.

Kelowna makes up 65% of the region's population, with West Kelowna accounting for 17%, and Lake Country for 7%. Between 2011 and 2016, 67% of the population growth occurred in Kelowna and the remaining 30% was split between West Kelowna, WFN, and Lake Country. **Table 1** provides a breakdown of the recent population by community in the Central Okanagan, as of 2016.

Table 1. 2016 Census Population by Community

Community	2016 Population	% of 2016 Total
Kelowna	127,380	66%
West Kelowna	32,660	17%
Lake Country	12,920	7%
Peachland	5,430	3%
Westbank First Nation	9,030	5%
RDCO	3,640	2%
OKIB	1,660	1%
Total	**192,710**	**100%**

Note: Values are rounded

[6] Statistics Canada, 2016 Census 8.5%

Future Population

Demand for transportation is influenced by land use and the activities associated with those uses. This forecast is based on assumptions used to develop the Regional Travel Model.

The RTP considers a future regional population of 277,000, which is expected to be reached between 2040 and 2041 based on recent BCStats projections. This represents a total population growth of 44%, and the addition of over 84,000 people between 2016 and 2040. For forecasting purposes, the shares of future growth developed as part of the Central Okanagan Planning Study and used in the Regional Travel Model were applied.

The estimated breakdown of future population by community is shown in **Table 2.** Generally, each community will continue to make up a similar share of the population. The values presented reflect those included in the Regional Travel Model.

Table 2. Future Population

Community	2016 Population	Share of Future Growth	Growth (2016-2040)	2040-2041
Kelowna	127,380	61%	51,720	179,100
West Kelowna	32,660	20%	16,750	49,400
Lake Country	12,920	7%	5,880	18,800
Peachland	5,430	1%	870	6,300
Westbank First Nation	9,030	6%	4,770	13,800
RDCO	3,640	5%	4,170	7,800
OKIB	1,660	< 1%	140	1,800
Total	**192,710**	**100%**	**84,290**	**277,000**

Note: Values are rounded

3.1.2 Demographic Trends

Demographic trends in the Central Okanagan include an aging population, but also an increase in the number of young professionals and young families. Housing trends indicate lack of affordability, especially for single-person households and single parents[7].

Increasing Number of Seniors and Young Families

Between 2011 and 2016 the share of seniors (individuals aged 65 and older) exceeded the share of children for the first time in Canadian history. In the Central Okanagan, seniors make up 21% of the population (or just over one in five people) compared to 20% provincially and 19% nationally. The higher proportion of seniors in the Central Okanagan population is also evident in the region's median age, at 43.0, compared to 41.2 provincially and 40.6 nationally. Population growth is expected across all age groups, however the average age in the region is expected to increase. The share of population 65 years of age or older in the Central Okanagan is anticipated to increase to 23.8% by 2034[8].

A profile of seniors transportation habits was completed by Statistics Canada in 2012[9]. The report found that relatively few seniors use public transit, accessible transit, or taxis before the age of 85. The main form of travel for seniors is private vehicle, as either the driver or as a passenger. While many seniors drive carefully, statistics show that people aged 70 and older have a higher accident rate than any other age group except for young male drivers[10]. Additionally, seniors are more likely than younger people to be killed when they are involved in a collision[11]. In the context of an aging population, the balance between seniors autonomy and road safety is a concern. Recognizing that one in five people in the Central

[7] Regional District of Central Okanagan, Regional Housing Needs Assessment, November 2019
[8] British Columbia Ministry of Transportation and Infrastructure, Central Okanagan Planning Study – Current Conditions Report, 2015
[9] Turcotte, Martin for Statistics Canada. Profile of Seniors Transportation Habits, 2012.
[10] Li, Guohua, Elisa R. Braver and Li-Hui Chen. 2003. "Fragility versus excessive crash involvement as determinants of high death rates per vehicle-mile of travel among older drivers." Accident Analysis and Prevention. Vol. 35, no. 2.
[11] According to the most recent statistics on traffic collisions in Canada, people aged 65 and over accounted for about 17% of collision fatalities in 2009, even though they make up about 14% of the population and travel fewer kilometres per year on average. See also Ramage-Morin, Pamela L. 2008. "Motor vehicle accident deaths, 1979 to 2004." Health Reports. Vol. 19, no. 3. Statistics Canada Catalogue no. 82-003.

Okanagan is a senior, accommodating some of these trips with other modes of transportation provides a significant opportunity to reduce collisions.

Between 2011 and 2016 the Central Okanagan experienced above average growth in the number of people in the 30 to 34 year-old age category, with an increase of 21.8%, compared to increases of 13.7% provincially and 8% nationally. The number of children in the 0 to 14 age category also increased in the region between 2011 and 2016 (by 4.7% which is slightly higher than the national increase of 4% and more than double the provincial increase of 2.1%). In many urban areas, 20% of morning peak hour traffic is connected to school travel[12], and trends over the past 20 years show that children are increasingly traveling to school by car and fewer are walking or bicycling[13].

Breaking down travel patterns by demographics such as age and income can reveal insights into the travel behaviours of different groups. Young adults belong to the generations of Millennials and Generation Zs (born between 1980 to 1994, and 1995 to 2015, respectively). Both age groups have come of age during globalization and the widespread adoption of personal computing. Compared to the other age groups, Millennials are facing lower employment levels, smaller incomes, and more debt, while nearly 56% of Generation Z agree that a car is no more than a means of transportation[14]. These trends suggest these groups may not be as tied to their vehicles as previous generations, and are likely to have greater expectations for availability of non-auto modes of transportation such as active transportation and transit.

Home Ownership

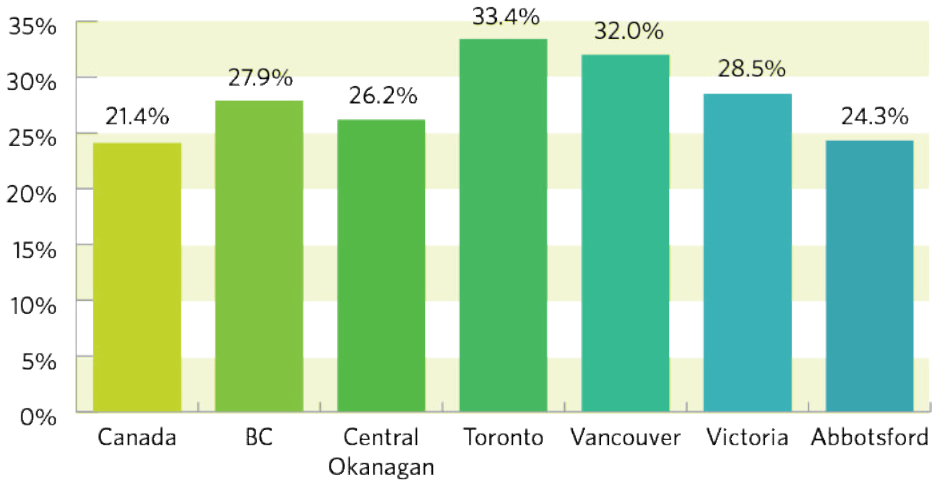
Home ownership rates in the Central Okanagan, at 73.3%, are higher than the provincial and national averages of 68%, and the regional home ownership rate is the third highest of all CMAs in Canada.

Housing Affordability

Housing affordability is a measure of whether a household spends 30% or more of its average gross monthly income on shelter costs. As shown in **Figure 4**, 24.1% of all Canadian households spend a third or more of their income on housing. In BC, 27.9% of households spend a third or more of their income on housing, and in the Central Okanagan that value is 26.2%.

Of those that rent, 45.6% spend 30% or more of their total income on housing costs, compared to 18.8% of homeowners. Recognizing that most lower- and moderate-income households spend more on housing and transportation than considered affordable, reducing the transportation cost burden is an opportunity for the Central Okanagan.

Figure 4. Households Spending 30% of Income or More on Shelter



[12] Transportation Tomorrow. Travel Survey Summaries for the Greater Toronto and Hamilton Area, 2011.
[13] R. Buliung, Journeys to School and Work using TTS Data, 2014.
[14] Allison+Partners, The Birth of Mobility Culture, 2019.

The 2019 Regional Housing Needs Assessment (RHNA)[15] looked at the availability and affordability of housing in the Central Okanagan region. The main priority groups with identified needs were:

- Persons Experiencing Homelessness
- Persons Experiencing Mental Health Issues & Substance Use Challenges
- Lower Income Households
- Seniors
- Youth & Young Adults
- Moderate Income Households

Housing and Transportation

In addition to housing, the costs for transportation can also be a major burden on households. Transportation is often the second highest cost after housing, and the RHNA study estimated that households that can forego a vehicle by using other modes of transportation could free up over $7,000 each year, enabling them to afford a mortgage that is an additional $129,000.

This indicates the importance of growing the region in a way that makes owning a car an option and not mandatory.

3.1.3 Employment

Current Employment

The top three industry sectors of employment in the region are:

- Healthcare and Social Assistance (13.5%)
- Retail Trade (13.1%)
- Construction (10%)

Between 2011 and 2016, the three industry sectors in the region that saw the largest increase in labour force were:

- Accommodation and Food Services (from 7.3% to 9.2%);
- Transportation and Warehousing (from 3.6% to 4.1%); and
- Mining, Quarrying, and Oil and Gas Extraction (from 0.8% to 1.3%).

Tourism and information technology are changing the economic profile of the region. Tourism involves many industry sectors that derive business from serving visitors. The importance of tourism is also demonstrated through passenger traffic at the Kelowna International Airport, which is the 10th busiest airport in Canada. Tourism is not a distinct industry, and instead, includes a number of sectors related to retail trade, real estate, transportation, arts, entertainment / recreation, and accommodation / food services. There were 633 technology companies in the Okanagan Valley in 2017. In 2017, the information technology industry contributed $1.67 billion to the local economy, up from $1.3 billion in 2015. This trend is affecting young adults the most, with 44% of employees in the technology industry in the Okanagan between 25 and 34 years of age.

Future Employment

Employment in the Central Okanagan is expected to increase by almost 46,000 jobs by the time the regional population reaches 277,000.

Table 3. Current and Future Employment by Community

Source: Regional Transportation Model

Community	Current Employment	% of Total Employment	Future Employment *(277,000 Population)*	Increase
Lake Country	4,400	5%	6,400	+2,000
RDCO	800	1%	1,100	+300
Kelowna	67,700	78%	103,500	+35,800
West Kelowna	7,800	9%	12,100	+4,300
WFN	4,300	5%	6,700	+2,400
Peachland	1,500	2%	2,300	+800
Total	**86,300**	**100%**	**132,050**	**+45,600**

Note: Values are rounded

[15] Regional District of Central Okanagan, Regional Housing Needs Assessment, November 2019

3.2 Regional Travel Patterns

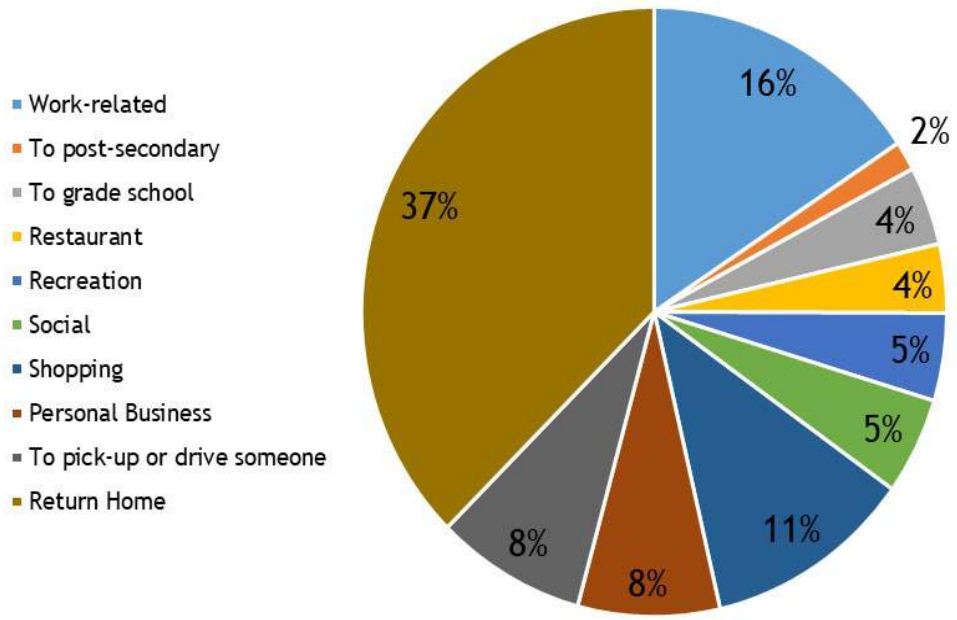
The 2018 Okanagan Travel Survey (for all trips within the region) and the 2016 Census (for all work-related travel in the region) provide insight into regional travel trends, issues, and opportunities.

3.2.1 Why We Travel

The 2018 Okanagan Travel Survey provides a wide range of travel information in the region, including why people travel, what modes they use, and where they are travelling to and from. Key findings from the survey are as follows:

- Central Okanagan residents made a total of 567,000 trips on a typical Fall weekday in 2018, a 10% increase compared to 2007.
- 20% of all trips cross municipal boundaries, although this proportion is lower in Kelowna.
- Kelowna is the main trip destination in the region. 429,000 trips are destined to Kelowna, and of those, 89% originated in Kelowna.
- While auto travel remains the dominant mode of transportation, the share of auto (driver and passenger) trips decreased by 2% between 2007 and 2018, to 86%.
- The share of transit trips increased to 3% region-wide, a doubling between 2007 and 2018.
- The share of active transportation trips increased to 9% in 2018, from 7% in 2007.
- The majority of trips are to work, grade school, post-secondary, and back home. The remaining 45% of trips are mostly discretionary (non-work or school trips that have more flexibility in start and end times). The proportion of trips by purpose are shown in **Figure 5**.

Figure 5. Typical Weekday Trip Purpose



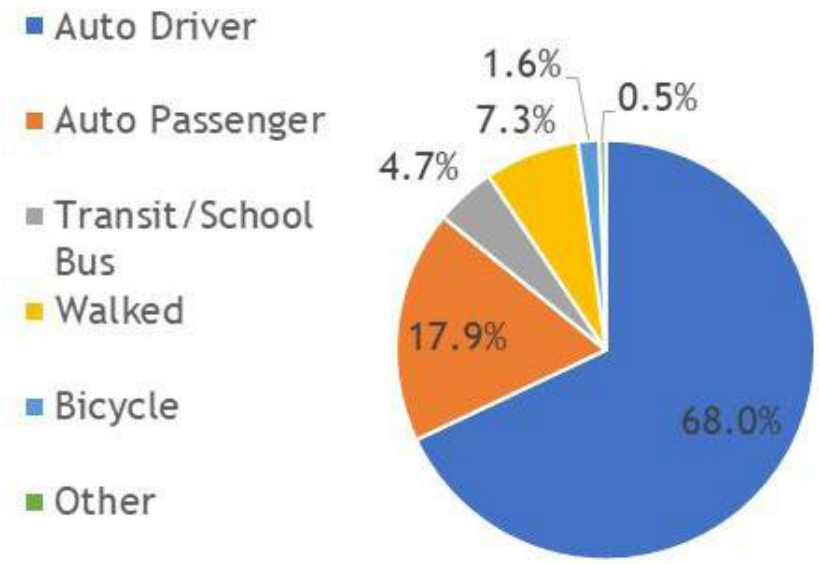
Source: 2018 Okanagan Travel Survey

3.2.2 How We Get Around

All Trips

Figure 6 shows the mode shares for all trips in the region. Most trips in the Central Okanagan are made by car, either as a driver or passenger (85.9%), with walking and bicycling making up 7.3% and 1.6% respectively, and transit being 2.9% of all trips.

Figure 6: Trip Mode Share



Source: 2018 Okanagan Travel Survey

The percentage of trips made by car (whether driving alone or as a passenger) are highest in Peachland (93%) and Lake Country (90%) and lowest in Kelowna at (84%). The transit mode share is highest in Kelowna (3.4%), and lowest in Lake Country (1.0%). The percentage of trips made by school bus is highest in Lake Country at 3.1%, compared to only 1.6% in Kelowna. Kelowna has the highest active transportation mode share, with 11% of all trips made on foot or by bike compared to 2.8% in Peachland. The breakdown of travel by mode can be found in **Table 4**.

Table 4. Mode Split for All Trip Purposes

Municipality	% Auto Driver	% Auto Passenger	% Transit	% School Bus	% Walk	% Bike	% Other
Peachland	75.5	17.9	1.0	2.5	2.5	0.3	0.3
West Kelowna	72.9	16.8	1.9	1.9	5.8	0.6	0.1
Kelowna	65.8	18.0	3.4	1.6	8.4	2.2	0.5
Lake Country	73.1	16.4	2.5	3.1	4.0	0.3	0.4

Source: 2018 Okanagan Travel Survey

Work Trips

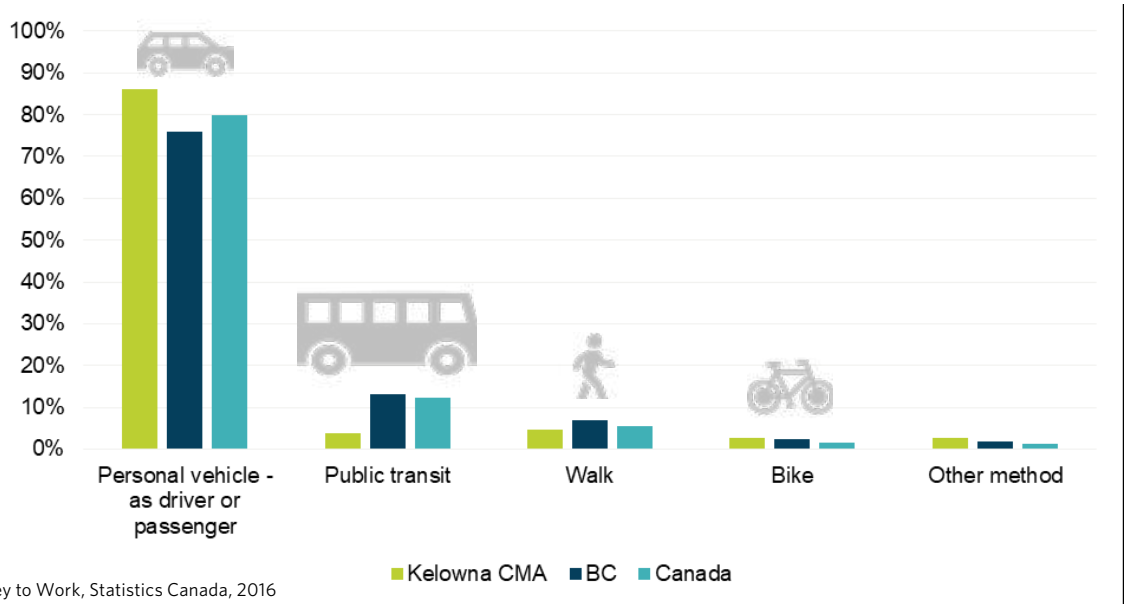
In 2016, based on the National Household Survey Journey to Work data, the majority of work trips (86%) were made by car, which is 10% higher than the provincial share and 6% higher than the national share. Commuting mode shares are illustrated in **Figure 7**.

In 2011, the proportion of work trips made by car was marginally higher, at 87.2%. For municipalities, Kelowna has slightly lower proportion of auto work trips at 84%. Personal vehicles were used for 90% or more of work trips in all other municipalities.

Public transit accounted for 4% of work trips, a 1% increase from 2011. In BC, 13% of all work trips were made by transit; nationally, the proportion was 12%. In Kelowna, Peachland, West Kelowna, and WFN, transit accounted for 4% of all work trips. In Lake Country, 2% of all work trips were made by transit.

In 2016, the number of work trips made on foot or by bike in the Central Okanagan accounted for 5% and 3%, respectively. These proportions are unchanged from 2011. In Kelowna, the number of work trips made by active modes was the highest of all municipalities at 12%.

Figure 7. Regional Main Mode of Travel to Work in 2016



Source: Journey to Work, Statistics Canada, 2016

Based on a comparison against similar sized CMAs, the Central Okanagan has a higher bike to work mode split than other CMAs, and a similar walk to work mode split. Personal vehicle use (either as a driver or passenger) is lower in Kelowna than in Abbotsford-Mission, Barrie, Sherbrooke or St. John's. Public transit across all CMAs in this comparison sits between 3% and 4%.

Table 5. Comparison of Mode of Commuting in Similar Sized Census Metropolitan Areas

Census Metropolitan Area	Kelowna CMA	Abbotsford-Mission	Barrie	Sherbrooke	St. John's
CMA Population (2016)	194,882	180,518	197,059	212,105	205,995
Personal vehicle	86%	93%	91%	89%	90%
Public transit	4%	3%	4%	4%	3%
Walk	5%	3%	4%	6%	5%
Bike	3%	1%	0%	1%	0%
Other method	3%	1%	1%	1%	2%

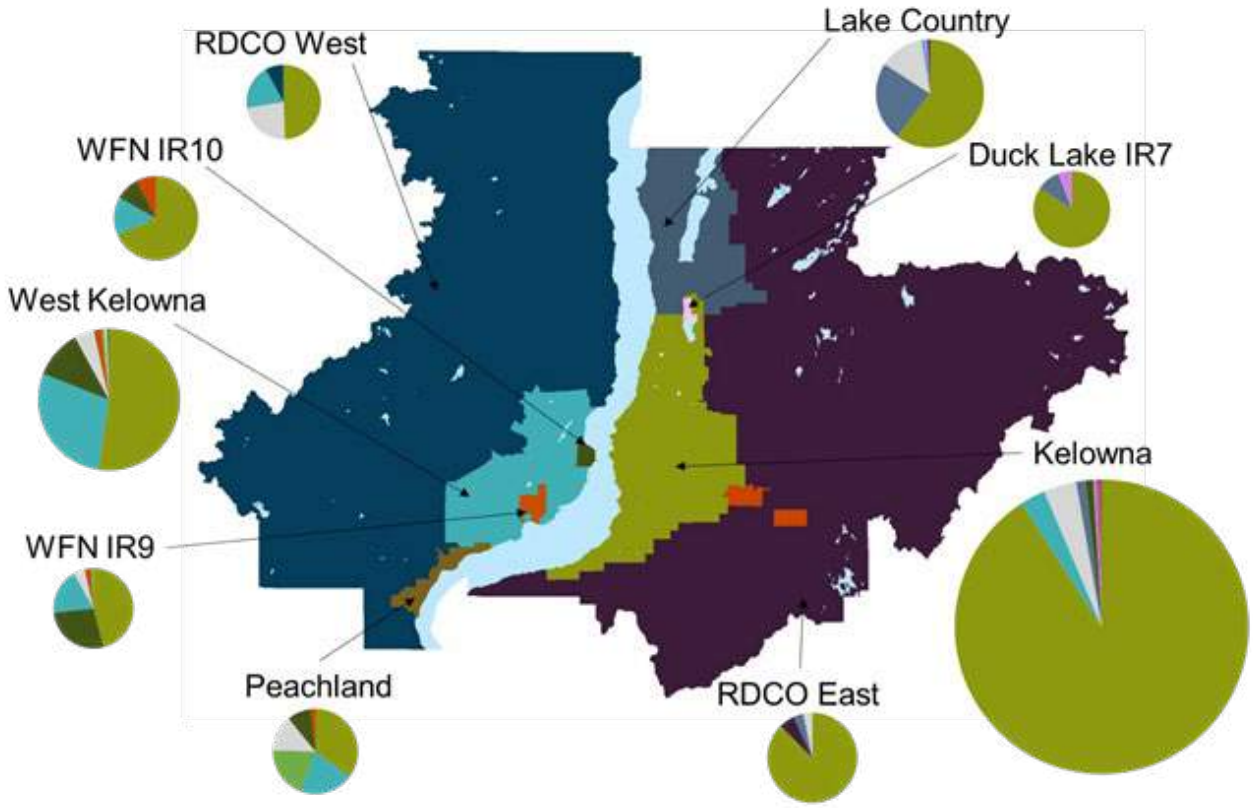
Source: Journey to Work, Statistics Canada, 2016

3.2.3 Where We Travel

The 2016 National Household Survey indicates that the majority of work trips (63%) in the region are destined to Kelowna, followed by 16% to West Kelowna and 6% to Lake Country. For all communities, with the exception of Peachland and WFN IR 9, the majority of work trips are to Kelowna.

In addition, in Peachland, West Kelowna, WFN IR 9, RDCO West, RDCO East, Kelowna, and Lake Country, there are a notable proportion of trips outside of the region, whether to municipalities in neighbouring regions (Vernon, Summerland and Penticton), or centres that may be accessed by air travel (i.e. Fort McMurray, Greater Vancouver, Edmonton or Calgary). Commute destinations are illustrated in **Figure 8**, with the colour of the municipality corresponding to trips.

Figure 8. Commuting Destinations from Each Jurisdiction in the Central Okanagan in 2016



Note: Commute destinations are coordinated with the colour of the municipality corresponding to trips (eg. the destinations for commuting trips from West Kelowna to West Kelowna are shown in teal, to Kelowna in green, etc.)

3.2.4 Commute Distances

In 2016, the majority of private vehicle trips were less than 20 km. Most transit trips were 10 km or less, and most active transportation trips were five km or less. Out of all trips, 56% were less than five km. Kelowna and WFN IR 10 have the shortest commute distances, and most trips are 10 km or less. In Lake Country, Peachland, and RDCO West, most trips are between 10 km and 35 km.

3.2.5 Self-Containment

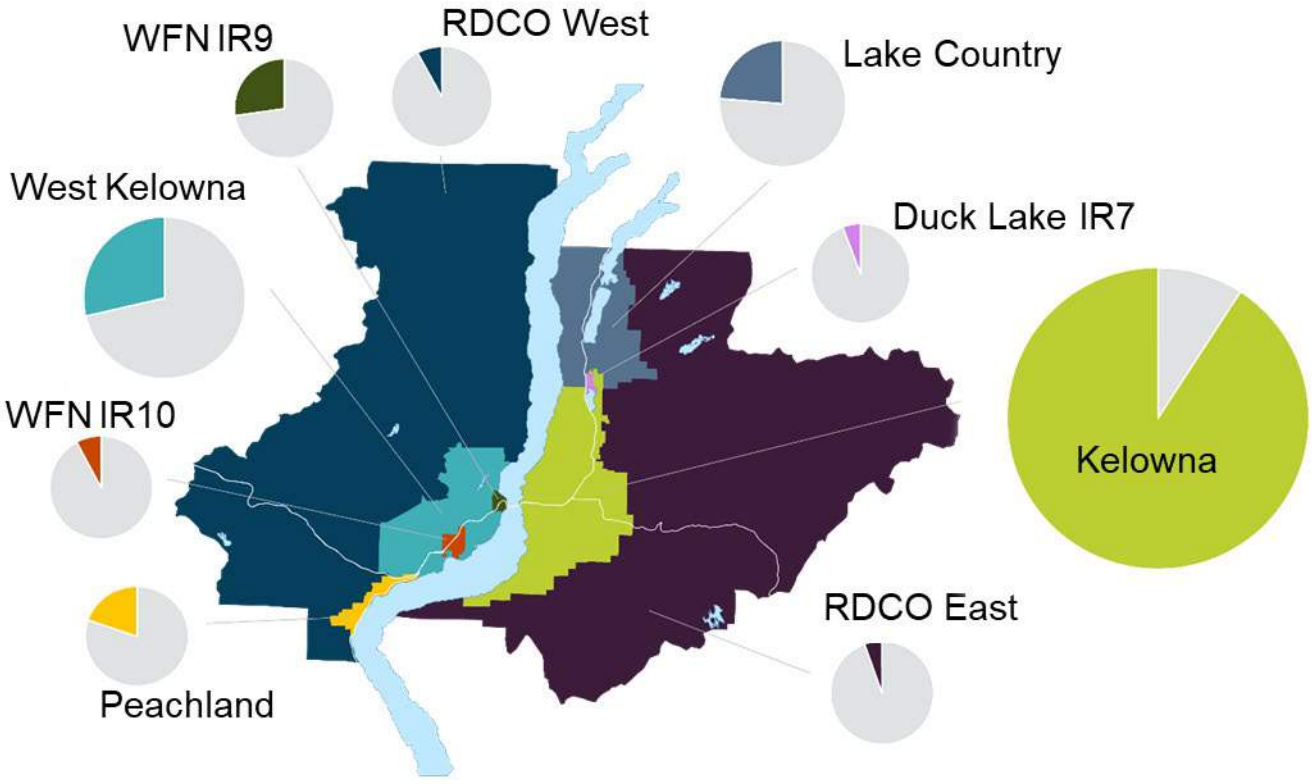
When comparing the percentage of work trips that have an origin and destination in the same community (as reported in the 2016 National Household Survey) to the percentage of internal total trips (trips for any purpose) reported in the 2018 Okanagan Travel Survey, there is a higher number of trips for any purpose in Peachland, West Kelowna and Lake Country. There is a roughly equal proportion of work trips in Kelowna to internal trips, which may be attributed to the concentration of employment centres within Kelowna. A comparison of all trips versus work only trips is provided in **Figure 9**.

Figure 9. Comparison of Self-Contained Trips (Work Trips vs. Trips for All Purposes)

Source: Journey to Work, Statistics Canada, 2016 and 2018 Okanagan Travel Survey

The 2016 Census found that the vast majority of work trips in Kelowna stay in Kelowna (92%). Around 30% of work trips that start in West Kelowna, WFN IR 9, and Lake Country stay in those municipalities. Around 20% of work trips that originate in Peachland stay in Peachland. Less than 8% of work trips in WFN IR 10, RDCO West, or RDCO East are internal. The proportion of internal trips are illustrated in **Figure 10**.

Figure 10. Self-contained Commute Trips by Jurisdiction in 2016



Note: Colours in the pie charts match the colours indicated on the map. Grey pie slices represent trips with destnations outside the originating community and that are not internal to the community

3.3 Travel Conditions

The ease of movement and travel conditions within the region differ based on the mode of transportation being used, and where the travel occurs. This section discusses what it is like to travel using each mode of transportation, and identifies key existing and potential future issues.

3.3.1 Passenger Vehicles and Trucks

A study was recently conducted to understand existing travel patterns and congestion in the region (Appendix B)[16]. The study used a crowd-sourced data set from a one-year period to determine and assess the most congested routes in the region. It found that routes between the Westside and downtown Kelowna are the most congested.

As the region grows, travel demand will continue to grow, and vehicle kilometres travelled (VKT) are expected to increase accordingly. The Regional Travel Model was used to estimate travel metrics and forecast future travel patterns, based on the land use plans and assumptions of the STPCO partners.

Table 6 compares the existing and future peak hours (the busiest periods during the day), which are typically represented by the morning and afternoon rush hours. The future projections estimate what travel would be like in 2040 baseline scenario if current travel behaviour continues (residents continue to drive as much as today) and no major investments are made in the regional transportation system). Under this baseline scenario, it is estimated that total VKT would increase between 35% and 47%, and total vehicle hours travelled (VHT) would increase at a higher rate. This indicates that the average trip would take longer and average travel speeds would decrease without improvements to the regional transportation network and policies and programs to shift travel behaviours, such as those proposed in the RTP and its supporting plans.

Table 6: Existing and Future Baseline Network-wide Transportation Metrics[17]

Metric	Existing Peak Hour		Future Peak Hour		% Change	
	AM	PM	AM	PM	AM	PM
Total Vehicle Kilometres Travelled (VKT)	353,700	419,600	476,500	614,900	+35%	+47%
Total Vehicle Hours	7,300	8,900	11,100	15,400	+52%	+74%
Average Travel Speed (km/h)	48.5	47.3	43.0	39.9	-11%	-16%
Average Trip Length (km)	8.9	9.9	9.0	9.4	+1%	-5%

Note: Values are rounded

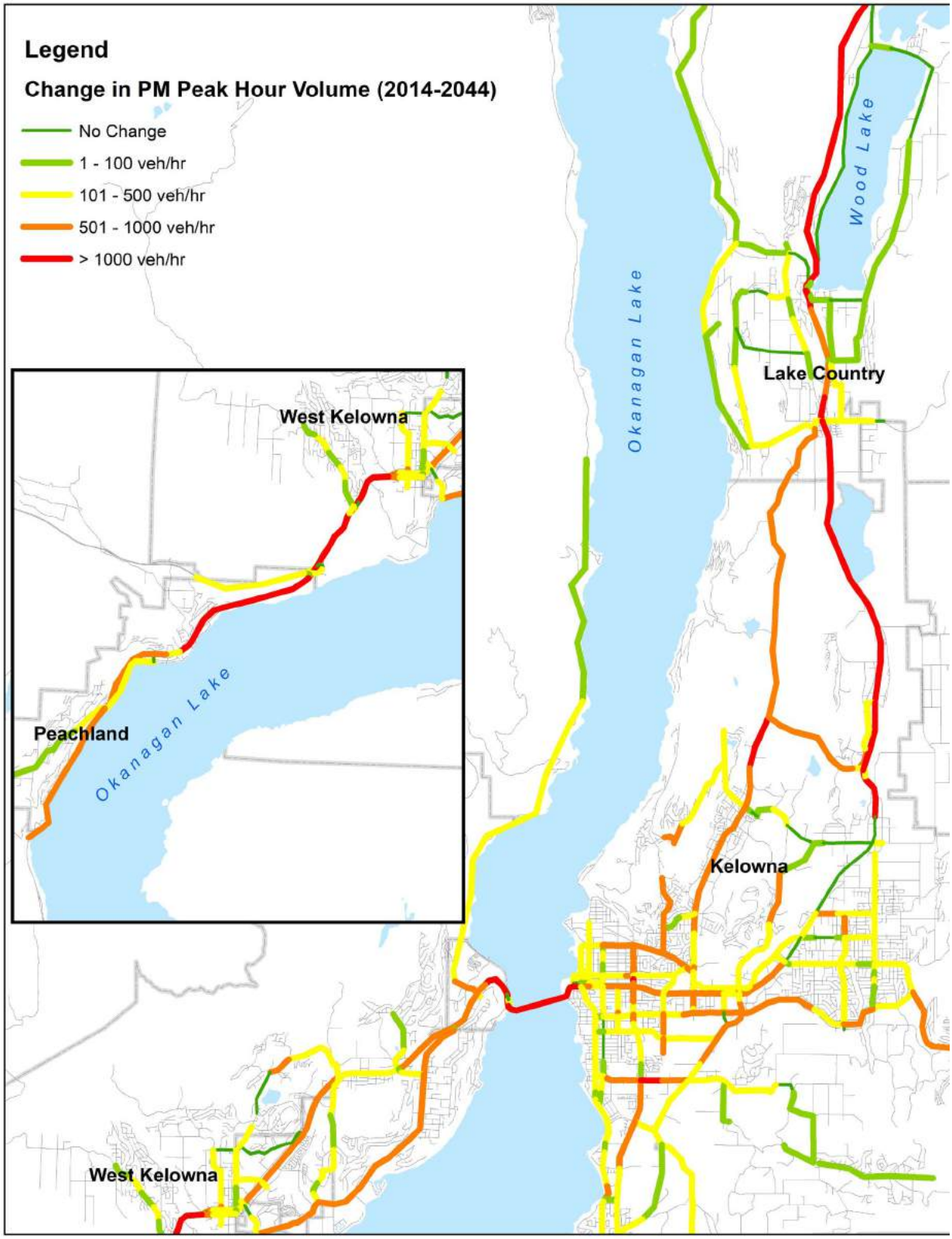
Highway 97

As the main transportation route in the region that passes through all of the STPCO partner jurisdictions (except the rural areas of the RDCO), Highway 97 is a critical corridor for all regional travel. Highway 97 plays an important role for passenger vehicles and trucks entering and leaving the Central Okanagan, for getting goods to market, and is a critical element of the transportation systems for trips within the region.

Traffic volumes are the highest within Kelowna and West Kelowna, and decrease along the highway to the north and south. Alternate parallel routes to the highway are available in Kelowna, including Clement Avenue, Enterprise Way, and Springfield Road, but there are fewer alternate routes available in West Kelowna, WFN, Lake Country and Peachland, making Highway 97 a critical connection for these communities. The highway currently experiences congestion throughout the day, with congestion peaking during the morning and afternoon rush hours. Under the baseline scenario, traffic volumes on the corridor are estimated to increase by up to 2,000 vehicles per hour (veh/hr) on some sections, with volumes on the bridge increasing by more than 2,500 veh/hr. The estimated growth in traffic demand is shown in **Figure 11**.

[11] STPCO Regional Transportation Plan, Congestion in the Central Okanagan, June 2019
[12] Regional Travel Model

Figure 11: PM Peak Hour Traffic Volume Demand Difference from 2015 to 2040 (vehicles/hour)



3.3.2 Transit

BC Transit provides transit service in the Central Okanagan primarily though the Kelowna Regional Transit System, with connections to the Vernon Regional Transit System and the South Okanagan-Similkameen Regional Transit System.

The Kelowna Regional Transit System serves the communities of Peachland, West Kelowna, WFN, Kelowna, and Lake Country. The current transit network is made up of 29 routes, which are illustrated in **Figure 12**. Of these routes, Route 97 forms the backbone of the transit service, running primarily along the Highway 97 corridor, connecting Westbank Centre to UBC Okanagan Route 97 is classified as a RapidBus service, with weekday frequencies ranging from 7 to 15 minutes in Kelowna, and between 15 and 30 minutes in West Kelowna.

Two regional routes, Route 1 – Lakeshore/Downtown, connecting Downtown Kelowna to South Pandosy, and Route 23 – Lake Country, connecting UBC Okanagan to Lake Country, are classified as frequent routes with weekday headways ranging between 15 and 30 minutes during peak periods.

Two local routes, Route 22 – Peachland and Route 90 – UBC Okanagan Connector (to Vernon), are also part of the Kelowna Regional Transit System. Route 90 runs hourly on weekdays and connects Downtown Vernon through Lake Country (via Highway 97) to UBC Okanagan Route 22 connects Peachland to Westbank Centre, and runs roughly every 50 minutes on weekdays.

The South Okanagan-Similkameen Transit System operates a service (Route 70) between Penticton and Kelowna, with a stop in West Kelowna and a stop soon to be added in Peachland.

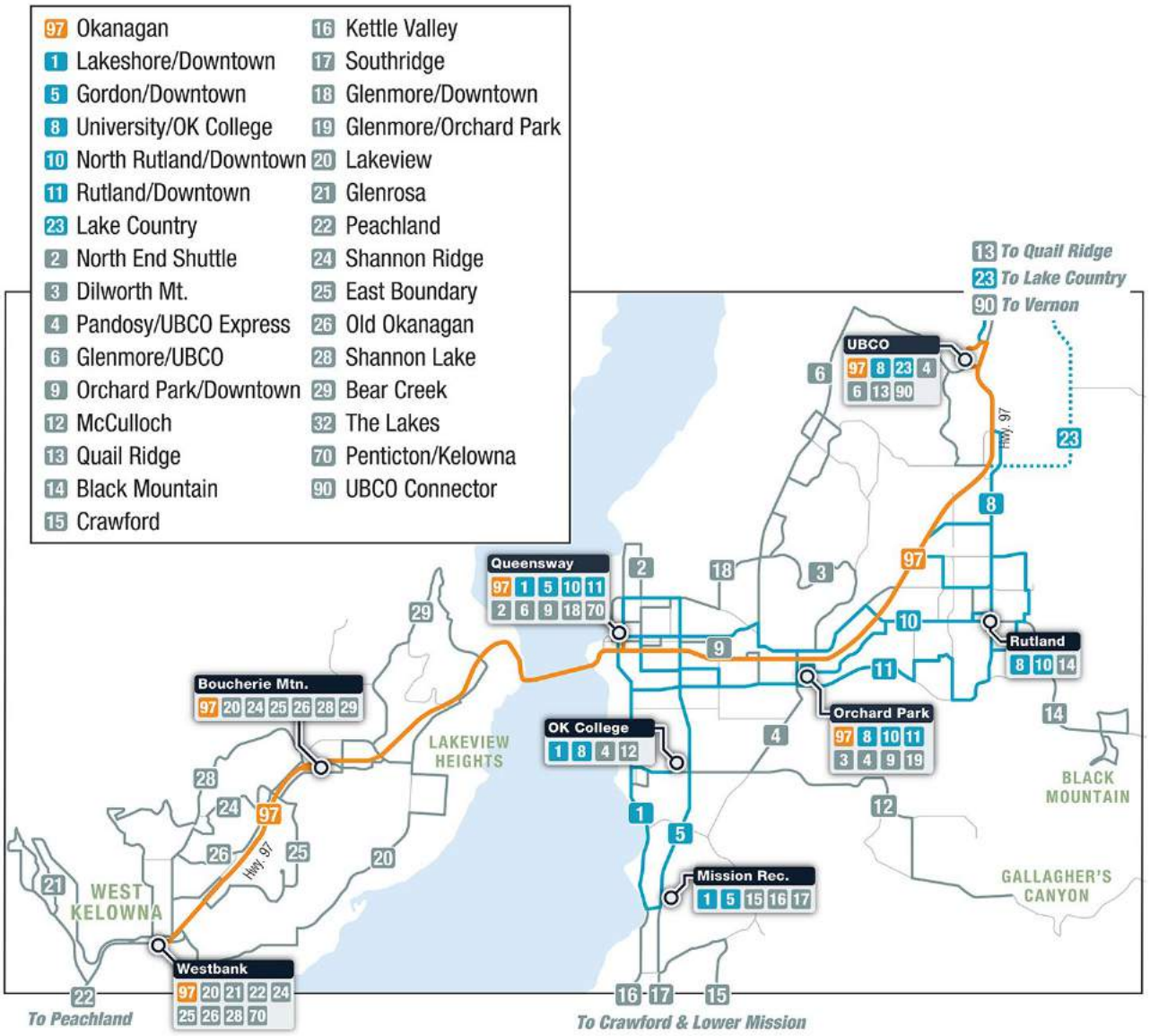
To assess the current performance of the entire transit system relative to other transit systems in Canada, the system was compared with a number of other similar sized metropolitan areas with universities, including Kingston, Moncton and Guelph. This comparison is shown in **Table 7**.

Compared to its peers, Kelowna is about average, with the comparison data showing that there is room for improvement.

Table 7: Transit Service Comparison

2016 Statistics	Peer Group	Kelowna	Kingston	Moncton	Guelph
Population	>150,000	140,900	120,500	116,900	131,800
Service Hours	-	195,500	250,500	104,600	236,300
Revenue Passengers	-	4,928,700	5,193,900	2,307,700	6,109,000
Transit Mode Share	-	3.9%	6.8%	3.4%	6.4%
Service Hours per Capita	1.2	1.3	2.1	0.9	1.8
Passengers per Capita	26	35	43	20	46
Passengers per Hour	22	25	21	22	26
Revenue Cost Ratio	34%	34%	35%	38%	43%

Figure 12. Kelowna Transit Network



Source: BC Transit (2020)

Another indicator used to evaluate the performance of a transit system is walkshed coverage, i.e., how close the regional population is to the regional transit network. Walksheds are typically defined as the land area within a defined walking range of a location, in this case, a bus stop. For transit, walksheds of 400 metres and 800 metres were measured from bus stops along the regional transit network. Most people are willing to walk 400 metres (about five-minutes) to access bus services, with 800 metres (about ten-minutes) usually being the upper limit.

Table 8 shows the current walkshed population and employment coverage of the regional transit system, and the future coverage. The current and future population and jobs served by frequent or rapid transit at bus stops along regionally-significant transit routes was calculated.

Currently, there are approximately 34,000 people living within 800 metres of these stops, which equates to 17% of the total Central Okanagan population. By the 277,000 population horizon, this number is expected to more than double, and increase to approximately 27% of the total population. Current plans show a concentration of new growth, particularly high intensity growth, along major transit corridors.

There are also around 42,300 jobs within 800 metres of transit, which equates to almost 50% of all current jobs in the Central Okanagan. In the future, that number is expected to increase to 76,400, which would equate to 57% of all future jobs. These metrics are a positive sign for the future of the regional transit network, as the more people and jobs that are within walking distance of transit, the more people are likely to use transit.

Table 8: Current and Future Forecasted Population and Jobs around Bus Stops

Distance from Stop Centroid	Current Population (2014)	Future Population Horizon (277K population)	Current Employment (2014)	Future Employment (277K population)
400m Walkshed	8,900	20,400	12,300	24,900
400m to 800m Walkshed	25,100	45,200	30,000	51,500
Total	34,000	65,600	42,300	76,400

Future Transit Plans

BC Transit's 2011 Transit Future Plan identifies a mode shift goal of 7% over the next 25 years. To achieve this goal, the 25-year transit network identified in the plan includes the following service elements:

- Rapid Transit Network: continuing the RapidBus service along Highway 97, connecting West Kelowna and WFN to Kelowna to UBC Okanagan
- Frequent Transit Network (FTN): expanding the FTN from six routes today to 14 routes.
- Local Transit Network and Targeted Services: includes all other transit services such as regional routes, express routes, local routes, and handyDART services.

The recent Transit Future Action Plan (the action plan for the region) calls for investment in routes in the core that generate the largest benefits in terms of ridership growth, supplementing service on higher performing local routes while considering opportunities for service expansion to new coverage areas.

3.3.3 Walking and Bicycling

Active transportation (walking, bicycling, and all other modes of self-propelled travel) fulfills a multitude of functions that benefit both individuals and the performance of the transportation system overall. Active transportation is affordable, healthy, environmentally friendly, and a viable alternative for many types of trips. The space requirements and costs for active transportation infrastructure are small compared to other modes of transportation, and supporting active transportation is a key component of long-term strategies to manage traffic congestion and reduce automobile dependence. Active transportation also supports transit trips and other types of trips as well, since nearly every person starts and ends their trip as a pedestrian.

With a majority (56%) of all trips in the region being less than five km in length, there is the potential to increase the share of trips completed by active transportation. To achieve this, a high-quality network of sidewalks, pathways and street crossings will be required within local jurisdictions, as well as improvements to the regional

active transportation network connecting them (the focus of this plan).

The following provides a brief summary of active transportation in the region. Regional active transportation issues and recommendations are discussed in more detail in the Regional Bicycling and Trails Master Plan (RBTMP)[18].

Facility Availability

The bicycle network is made up of on- and off-street facilities. On-street facilities are located within the roadway on the existing street network. Off-street facilities are usually off the road network and involve greater separation between non-motorized and motorized travel. In the region, off-street facilities mainly include aggregate trails and multi-use pathways that can also be used by pedestrians. On-street facilities include paved shoulders, bike lanes, and shared traffic streets.

The regional active transportation network through West Kelowna, WFN and Peachland is primarily on-street along major roads, including Highway 97 and roads that run parallel to Highway 97. For most of the major corridors, active transportation facilities are paved shoulders of various widths. There are some segments of paved multi-use pathways along Gellatly Road in West Kelowna and Beach Avenue in Peachland.

The regional active transportation network through Kelowna is a mix of on- and off-street facilities. Within Kelowna, the regional active transportation network includes the Okanagan Rail Trail, which provides connections from downtown Kelowna to the Kelowna International Airport (with connections to UBC Okanagan) and plans to eventually connect to the portions of the Okanagan Rail Trail in Lake Country. Additional active transportation corridors (ATCs) that connect to regional destinations within Kelowna include the Abbott Street ATC (which helps provide connections to Kelowna General Hospital) as well as the Ethel ATC, Houghton ATC, Cawston ATC and the Mission Creek Greenway (which help provide connections to Kelowna's urban centres).

Walkscore Assessment

Walk Score[19] is one way of understanding and comparing the walkability of specific locations. Points are awarded based on the distance to amenities and pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density. There are five rankings based on the walk score for a location, described in **Table 9**.

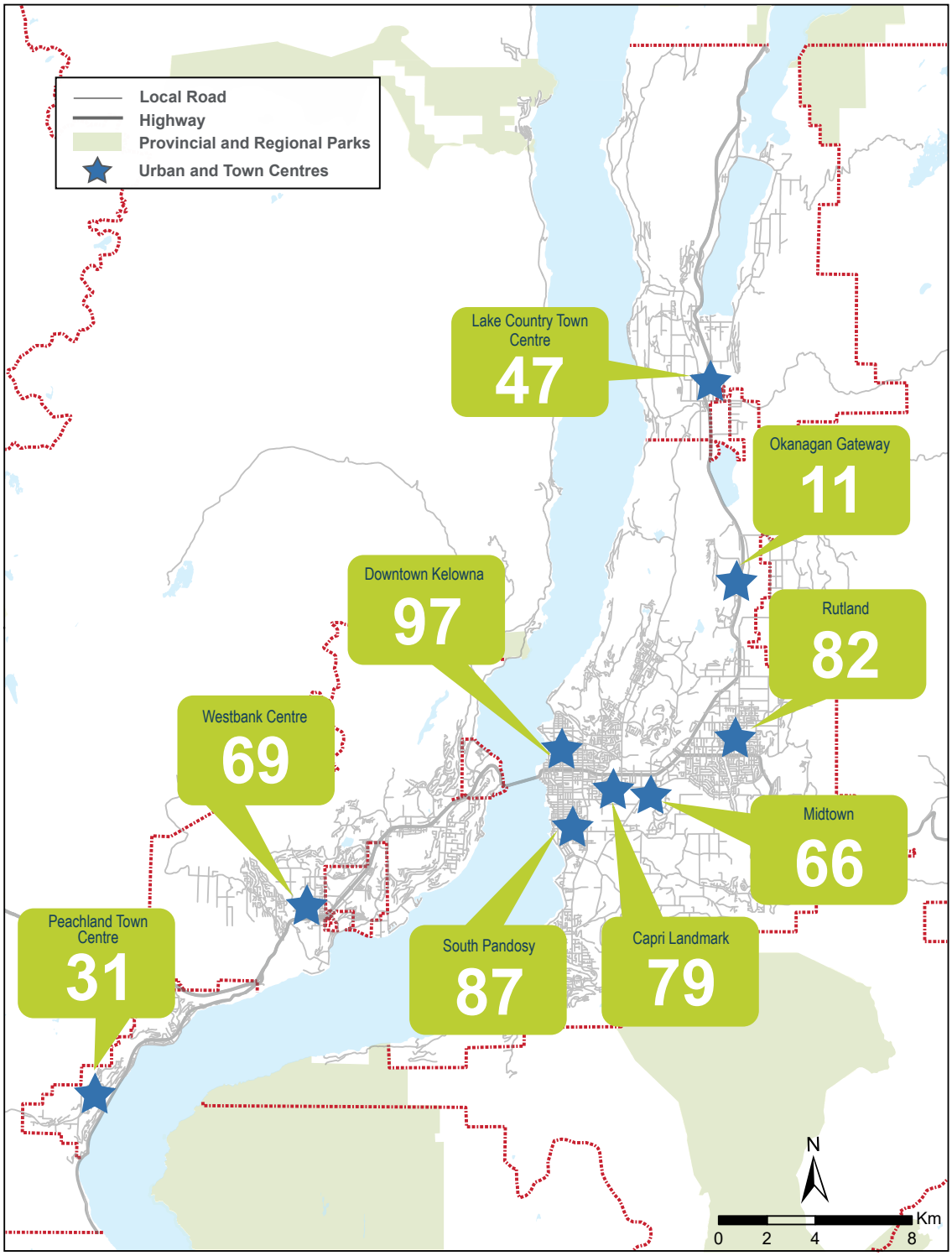
Table 9: Walkscore Rating System

Walk Score	Description
90-100	**Extremely Walkable**: daily errands do not require a car
70-89	**Very Walkable**: most errands can be accomplished on foot
50-69	**Somewhat Walkable**: some errands can be accomplished on foot
25-49	**Car-Dependent**: most errands require a car
0-24	**Very Car-Dependent**: almost all errands require a car

The centroids of the urban and town centres were assessed with Walk Score. Peachland Town Centre, Okanagan Gateway, and Lake Country Town Centre all had scores less than 50, indicating a car-dependent environment. Westbank Centre and Midtown / Orchard were deemed as somewhat walkable. South Pandosy, Capri-Landmark, and Rutland Town Centre were classified as very walkable, while Downtown Kelowna was measured as highly walkable. The Walk Scores are shown in **Figure 13.**

[18] Regional Bicycling and Trails Master Plan: https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final
[19] The Walk Score tool can be found at *https://www.walkscore.com* and methodology information is described at *https://www.walkscore.com/how-it-works/*

Figure 13. Urban and Town Centres Walk Scores



3.3.4 Emergency Vehicles

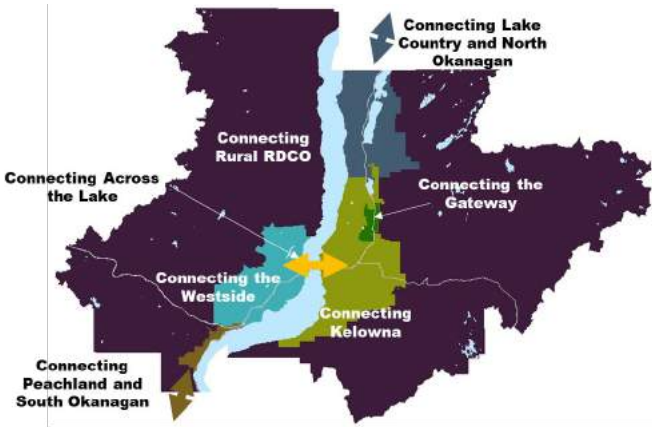
Emergency routes provide access to regional emergency services, such as Kelowna General Hospital (KGH) and the Westbank First Nation Health and Wellness Centre (WFN HWC). The key routes serving KGH are Highway 97 and Pandosy Street, while access to the WFN HWC is via Highway 97 and Elk Road.

04 The Regional Transportation Network

The Regional Transportation Network

4.1 The Region

The transportation context throughout the region varies due to factors such as land use, population and employment densities, topography, the available transportation network, and the location of the area relative to the rest of the region. For ease of analysis and planning, the region has been divided into six areas. This section describes the regional travel needs and priorities for each area.



4.1.1 Connecting Lake Country and the North Okanagan

Lake Country is the northern most municipality in the region, extending from Kalamalka Lake to just north of Ellison Lake, on the east side of Okanagan Lake. Highway 97 is the primary north-south transportation corridor in the area. North-south travel is the dominant regional travel pattern, with trips going to, from and through Lake Country to major destinations in Kelowna and Vernon.

Glenmore Road is the other significant regional north-south corridor and is an alternate route to Highway 97. Congestion on Highway 97, and a lack of regional active transportation facilities and transit connections are some of the key issues in this area.

The BC Ministry of Transportation and Infrastructure (BC MoTI) is currently conducting the Highway 97 Lake Country Planning Study[20], which is investigating future transportation needs along Highway 97 through Lake Country, including options for the Glenmore / Beaver Lake Road intersection.

4.1.2 Connecting the Gateway

The Okanagan Gateway is an important regional hub that includes the Kelowna International Airport, the University of British Columbia – Okanagan (UBC Okanagan), the growing businesses and industrial areas adjacent to the airport, and the Quail Ridge and University South residential areas. The primary travel pattern in the areas is north-south, with UBC Okanagan and Kelowna International Airport serving as important regional destinations. Highway 97 and Glenmore Road are the primary regional north-south corridors, connected by the recently completed John Hindle Drive. Key issues in the area include rapidly increasing transit demand, congestion at intersections on Highway 97 and reliance on private automobiles due to the location.

The Gateway area is the subject of a separate study, the Okanagan Gateway Transportation Study, which is a partnership between the City of Kelowna, UBC Okanagan,

[20] Highway 97 Lake Country Planning Study: https://www2.gov.bc.ca/gov/content/transportation/transportation-reports-and-reference/reports-studies/okanagan/highway-97-lake-country-planning-study-glenmore-beaver-lake-road

BC MoTI, and the Kelowna International Airport. The RTP incorporates the recommendations of the Okanagan Gateway Transportation Study, which looked at this regionally significant, growing, and complex area in more depth.

4.1.3 Connecting Kelowna

Kelowna is the functional centre of the Central Okanagan and is home to many regional destinations. A high proportion of the region's trips start or end in Kelowna, and it has many multimodal, regional transportation facilities.

On the east side of Kelowna, the primary north-south transportation corridors include Highway 97 and Glenmore Road, while the primary east-west connections include Enterprise Way, Highway 33, Highway 97, and Springfield Road.

On the west side of Kelowna, the primary east-west transportation corridors include Clement Avenue, Highway 97, Springfield Road, and KLO Road. The primary north-south corridors include Pandosy Street / Lakeshore Road, Richter Street, and Gordon Drive. Right-of-way and urban development constraints along these corridors limit opportunities to increase road capacity. As such, active transportation and transit will be important for accommodating increasing travel demand.

Downtown Kelowna and the area south of Highway 97 include several important regional destinations including several urban centres, Kelowna General Hospital (KGH) and Okanagan College. Demand for access to downtown from the east and north will continue to create congestion on north-south routes, while growth south of Highway 97 will lead to significantly increased travel demand on north-south routes than has historically been observed.

On the east side of Kelowna there is a narrowing of available east-west transportation corridors, particularly between Highway 33 and Spall Road. Within this area there is also a concentration of activities, employment and services, and a high proportion of trips in the region pass through it. Future traffic forecasts show that travel demand in the area will grow considerably over the next 20 to 25 years on both Highway 97 and Enterprise Way.

Efficienctly using available right-of-way will be key to accommodating growth and increased travel demand in this area, while mitigating the effects of increased vehicle traffic and congestion.

4.1.4 Connecting Across the Lake

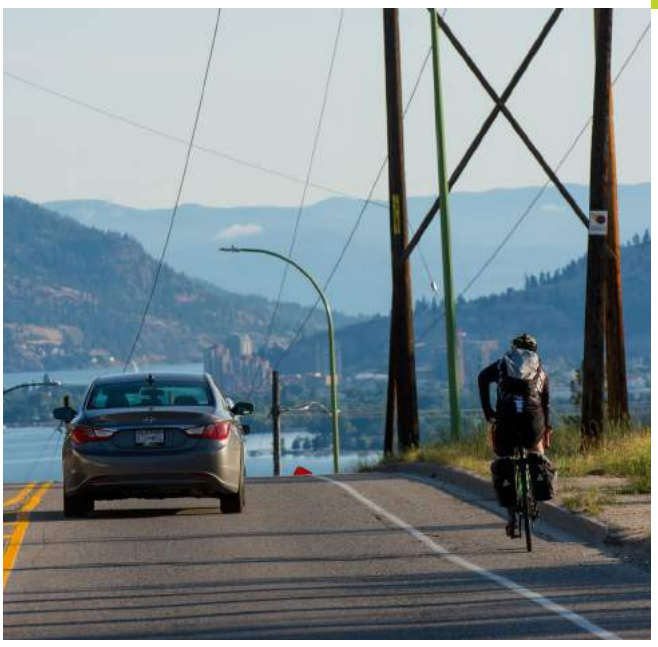
The WR Bennett Bridge is the only link between the east and west parts of the region across Okanagan Lake. The first phase of BC MoTI's Central Okanagan Planning Study (COPS) showed that there is sufficient capacity for traffic demand on the bridge until at least 2040, although it was found that the bridge approaches will reach capacity before then. COPS explored options for a second bridge across the lake but did not reach a conclusion or recommendation regarding a second crossing. A second crossing will be further explored in the next phase of COPS.

The RTP considers options for a variety of modes to support and improve travel across the lake, but a second crossing is not within the RTP scope for the 20 to 25-year horizon.

4.1.5 Connecting the Westside

The Westside includes the communities west of Okanagan Lake, including West Kelowna and WFN. The area has steep geography, low density development, and many curvilinear street networks.

Transportation within West Kelowna and WFN rely heavily on Highway 97 as it is the most direct east-west route and connects to the only crossing of the lake. As such, there is a need for the highway corridor to support multiple modes. The alternate corridor of Shannon Lake Road / Old Okanagan Highway / Stevens Road is a complementary parallel route that is a feasible



alternative to the highway for many local trips. Multimodal options along this corridor will also be important as the area grows. Westside Road is an important connection for rural areas and is an alternative route to Highway 97, along the west side of the lake. Topography in the area limits opportunities to connect the network.

Key areas include Westbank Centre, and the West Kelowna Business Park. The Westbank Centre and adjacent commercial areas on IR 9 represent the highest areas of activity on the west side of the lake. In addition to being important regional destinations, these two areas provide employment and many of the day-to-day services for WFN and West Kelowna residents. Improving connections to these areas will help to support further growth in employment and services, and could reduce the need for crossing the lake.

4.1.6 Connecting Peachland and the South Okanagan

Peachland is located in the southern portion of the Central Okanagan region, on the west side of the lake and south of West Kelowna. There is a strong travel demand to the north (to the rest of the Central Okanagan) and to the south (to destinations outside the region such as Summerland and Penticton). There is also a desire for improved transit connections between Peachland and the rest of the Central Okanagan. Due to low population and employment densities, this would require the consolidation of trips in the area to make service to the Central Okanagan more feasible.

BC MoTI is currently studying options for Highway 97 in Peachland, including reviews of improvements to the existing highway or an alternate route around the community, as part of the Peachland Transportation Study[21].

4.1.7 Connecting Rural Areas of the Central Okanagan

Rural areas have different needs than those in urban areas. Trips tend to be longer and reliant on privately-owned automobiles. Highway 33 is the primary transportation corridor in the east, connecting the Central Okanagan East Electoral Area, including the community of Joe Rich. The Central Okanagan West Electoral Area relies on Westside Road for connections to the rest of the region, and to the north. Long trip distances and a lack of multimodal transportation options are the key issues affecting regional travel in the Central Okanagan's rural areas. Agricultural access is also an issue in rural areas, reflecting the importance of agriculture in the region.

4.2 Regional Transportation Modes: Background and Considerations

This section discusses the key modes of transportation and technologies that are currently being used to move around the region, those that could be expanded, and those that may have future applicability beyond the future horizon of the RTP.

4.2.1 High Frequency and Rapid Transit

Light Rail Transit

Residents of the region have expressed interest in higher capacity transit service; particularly rail-based transit such as Light Rail Transit (LRT) or SkyTrain technologies. These types of transit operate on protected rights-of-way, and typically provide frequent service throughout much of the day[22] . While they have the potential to attract and accommodate more riders than bus rapid transit (BRT), capital and operating costs are typically significantly higher than that of comparable bus systems, and require higher levels of population and job density to generate the ridership levels needed to reach a feasible per passenger cost.

Density

Minimum population and employment levels are generally recommended for prospective LRT corridors. The USA Federal Transit Administration (FTA) recommends minimum densities for LRT based on location types along the route (urban core, key centers, and along the corridor overall), as shown in **Table 10**.

The City of Kelowna has produced a similar metric, shown in **Figure 14**, illustrating the minimum people and job densities for different types of transit, compared with major corridors in Kelowna. It shows the minimum population and job density ranges where each type of transit becomes feasible.

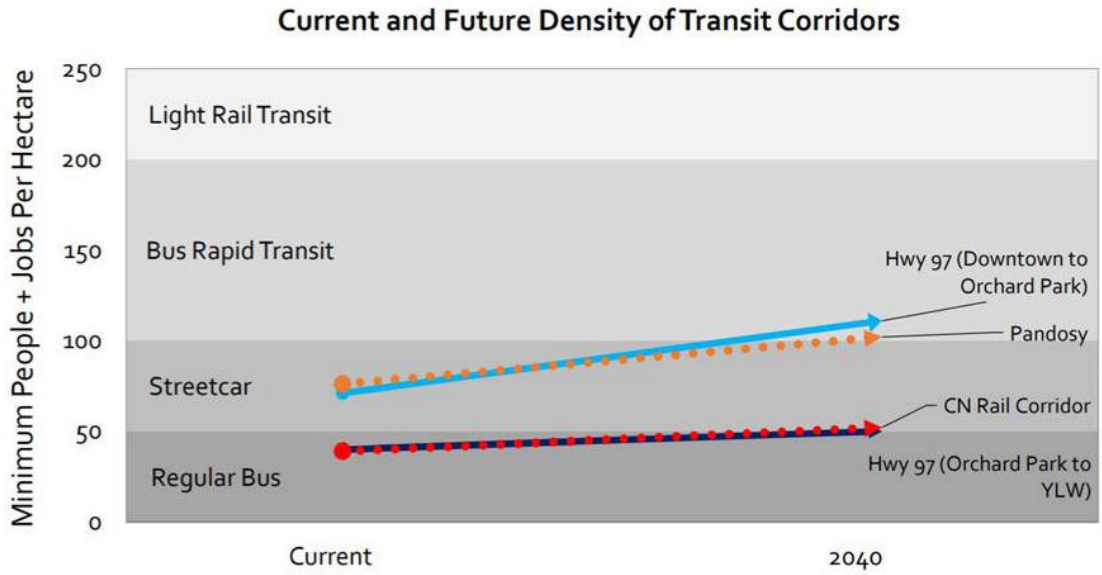
> Higher capacity transit is public transit that often has an exclusive right-of-way and has vehicles that make fewer stops, travel at higher speeds, provide more frequent service and carry more people than typical local bus service.

[21] Highway 97 – Peachland Transportation Study: https://www2.gov.bc.ca/gov/content/transportation/transportation-reports-and-reference/reports-studies/okanagan/peachland-study
[22] FTA, *https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA_Report_No._0056.pdf*

Table 10: FTA Minimum Suggested Densities for Light Rail Transit – Dwelling Units + Jobs

Area Type		Core	Centres	Corridor
Suggested Minimum Densities*	Residential (dwelling units per hectare)	85+	60-85	30-60
	Employment (jobs per hectare)	1,235	250-370	75-100
Combined – Residential DU + Jobs per hectare		1,320	310-455	105-160

Figure 14: People + Jobs Thresholds based on Transit Type



Source: Facts in Focus: How Transit Can Keep Kelowna Moving, City of Kelowna (2018)

Considering that more than one person typically lives in each housing unit, the City of Kelowna's metric is generally consistent with the FTA recommendations for corridors shown in Table 10. Thresholds of 100 to 200 people-plus-jobs per hectare are also supported by other Canadian jurisdictions[23].

Existing densities in the Central Okanagan are lower than the 100 to 200 recommended minimum people-plus-jobs threshold. The future land use used for the 2040 horizon in the regional transportation model shows residential and job densities increasing in central Kelowna, with select locations exceeding 100 people-plus-jobs per hectare. This level of growth will bring these areas in central Kelowna to the lower end of the recommended density range for supporting high capacity transit. However, this level of density does not extend to areas outside of central Kelowna, such as to the Westside or east of Orchard Park.

This suggests that by 2040, some of central Kelowna could begin to support a BRT or LRT level of transit. However, there is no corridor with a level of urban activity that would be sufficient to support LRT, as most systems are typically 10 km in length or longer to generate enough ridership to offset the cost.

Cost

The cost to build LRT and SkyTrain lines vary considerably depending on the local context, specifically the availability of land and geotechnical conditions. A comparison of recently completed and planned LRT lines in Canada are presented in **Table 11**, showing total cost and cost per kilometre.

[23] A minimum of 100-150 people / jobs per hectare to support higher capacity transit service (streetcars, busways, light rail transit, commuter rail), City of Calgary, 2007 | 100-160 residents and jobs per hectare for dedicated Rapid Transit (LRT / BRT), Ministry of Transportation Ontario.

Table 11: LRT Costs

City	Line	Length (km)	Total Cost ($ billion)	Cost / Kilometre ($ Million / km)
Built				
Calgary	Blue Line – West Extension	8.2	1.4	170
Vancouver	Canada Line	19.2	2.0	104
Ottawa	Confederation Line – Stage 1	12.5	2.1	168
Waterloo	ION Kitchener - Waterloo	19.0	0.87	46
Planned				
Surrey*	Newtown – Guildford LRT	10.5	1.65	157
Edmonton	Valley Line	13.0	1.8	138

*Note: The Surrey Newtown-Guildford LRT has been suspended and is now being considered as Sky Train

Total costs range from $0.87 to $1.8 billion, with costs per kilometre ranging from $46 to $168 million. The existing 30-kilometre Highway 97 RapidBus system cost $46 million ($1.5 million per kilometre)[24], whereas other similar lines can cost around $3 million per kilometre, depending on the level of separation from traffic[25].

This shows that LRT lines in Canada can be 10 to 100 times more expensive per kilometre than a RapidBus style of system.

Population

The populations of the cities (and their metropolitan regions) shown in **Table 11** are greater than 500,000, with all but Waterloo Region being greater than one million people. Higher populations enable these cities to offset the high capital and operating costs of the projects, by providing a higher pool of potential riders and taxpayers.

The Central Okanagan has a population of approximately 200,000, and the future horizon population is 277,000 by approximately 2040. This comparatively low population does not preclude an LRT system, but considerably more aggressive land use and overall planning practices, including much higher density corridors, would be necessary to justify future higher capacity transit infrastructure.

Future Provisions

The current regional density, regional population, and cost premium over RapidBus or BRT makes the implementation of mass transit (LRT / SkyTrain) in the Central Okanagan challenging in the near term. However, this does not preclude the feasibility of LRT or other higher capacity transit technologies in the future as the region grows. Prudent planning to identify and reserve a potential future corridor(s), and to develop future ridership (i.e. residential and employment density) along these corridors will increase the likelihood that higher capacity transit will be feasible in the future. Within the Central Okanagan, the former rail corridor in Kelowna has been suggested in the past as a possible LRT route. However, due to topography and established land use patterns along the corridor, it is unlikely that the necessary residential and employment densities to support ridership can be established. Conversely, the urban form along the Highway 97 corridor through Kelowna has the potential to eventually reach densities that can support LRT, particularly newer LRT technologies that can be converted from bus rapid transit or dedicated transit lanes.

[24] Rapid Bus Doubles Network in Central Okanagan, Kelowna Daily Courier, 2014
[25] Calgary Transit, Max Yellow, Purple, Teal and Orange BRT routes, average cost of $2.7 million per kilometre

Bus Rapid Transit and RapidBus

Although there is only a very small area of the region that will be within the land use densities to support LRT within the RTP horizon, there is a much larger area along Highway 97 in Kelowna that will have appropriate land use to support Bus Rapid Transit (BRT), or an enhanced version of RapidBus.

Currently, the backbone of the Central Okanagan transit system is Route 97, a RapidBus route currently running between Westbank Centre and Within Kelowna, frequencies range from 7 to 15 minutes, and in West Kelowna, between 15 and 30 minutes.

RapidBus

RapidBus services and infrastructure can provide higher travel speeds and limited-stop bus service compared to more local style bus service. It is typically supported by transit signal priority (TSP) and High Occupancy Vehicle (HOV) lanes, reducing the impact of traffic congestion on transit speed and reliability. Common amenities include stations with shelters, level-boarding platforms and digital screens with real-time schedule information.

Bus Rapid Transit

Bus Rapid Transit (BRT) offers a higher level of transit priority than RapidBus, with transit vehicles operating in dedicated lanes and corridors. BRT provides the highest level of bus-based transit reliability, speed, and comfort. BRT systems like the transitways in Ottawa or Winnipeg generally cannot achieve the same capacity as light rail, but have greater flexibility since buses can leave the BRT corridor and provide direct connections off the corridor. BRT infrastructure can be combined with transit priority measures along a route to allow for staged implementation. Where BRT is supported by dedicated corridors, it may be possible to later convert BRT to other types of transit, such as light rail (LRT).

Autonomous Rapid Transit

Although still an emerging technology, Autonomous Rapid Transit (ART) shows significant promise as a way to provide the benefits of light rail, but without the need to install rails. Autonomous technologies would allow for buses to operate in platoons, much like trains, but with the flexibility of adjusting the size of the platoon to respond to demand or allow the platoon to split apart to serve different destinations[26]. There are several potential forms of ART, from rubber tire trains operating on virtual tracks (sensors in the pavement, paint) to self-guided demand-responsive pods collecting people with common destinations. ART solutions can easily be adapted and implemented in dedicated transit lanes as technology evolves.

A recent study in San Francisco along a stretch of Geary Boulevard looked at converting two lanes of the six-lane arterial into dedicated bus transit lanes. As an alternate to buses, a fleet of 4-person vehicles was considered that would gather at least three passengers before proceeding direct to destinations. In addition to this skip-stop operation, the cars would platoon and trigger green lights at intersections. The analysis found that such a system would cut delay time in half and reduce travel time by 35% compared to BRT or the cars traveling alongside in non-dedicated lanes.[27]

A "railless train", developed in China is operational in Zhuzhou city, in central China's Hunan province. It opened in May 2018. It has been tested in cold, harsh climates and was recently tested in very hot climates. The electric-powered vehicle uses sensors and lane departure warning systems to help the vehicle follow a virtual track painted in the pavement.[28]

[20] "Is Autnomous Bus Rapid Transit the Next Evolution of BRT?" Mass Transit Magazine, December 2016. *https://www.masstransitmag.com/bus/article/12270117/is-autonomous-bus-rapid-transit-the-next-evolution-of-brtstshore%20ferry.pdf*

[21] "Autonomous vehicles: Hype and potential" Peter Calthorpe, Jerry Walters. CNU Public Square. September 2016. *https://www.cnu.org/publicsquare/2016/09/06/autonomous-vehicles-hype-and-potential*

[22] "China's self-driving trackless 'rail bus' starts first overseas run", chinadaily.com, July 2019. *https://www.chinadaily.com.cn/a/201907/16/WS5d2d4057a3105895c2e7dab7.html*

Lake Ferries

Reviving a ferry route has remained a popular idea since the Kelowna – Westbank ferry service was discontinued in 1958. This coincided with the opening of the Okanagan Lake Bridge, which was replaced by the current WR Bennett Bridge in 2008. The previous ferry service was primarily offered to transport private cars and their occupants across the lake, but these services were no longer necessary with a bridge.

It has been suggested that a new passenger ferry route could open up development and tourism opportunities for West Kelowna, WFN and possibly Peachland, and could reduce travel demand on the bridge. Potential forms of water transportation suitable for the region could include passenger ferries or water taxi services.

Urban passenger ferries are typically large in scale, with person capacities of over 100 people, similar to the Seabus between Vancouver and North Vancouver, or the Halifax – Dartmouth Ferry in Nova Scotia. Water taxi style services are another popular type of urban water transportation. They are typically small vessels, with a person capacity of around 20 people, and are often owned and operated by private third-party entities. Similar services in Canada include the Granville Island and False Creek Ferry services in Vancouver.

Halifax Transit Ferry, Nova Scotia

False Creek Ferries, Vancouver

Comparable Connections

In Canada, the ferries in Halifax operate within a comparable context to that of the Central Okanagan. The Halifax – Dartmouth service operates in competition with a bridge (as it would in the Central Okanagan), but it serves two well established downtown cores with a significant density of jobs and population within walking distance of the ferry terminals, reducing the need for many passengers to use connecting bus services. West Kelowna and WFN do not offer similar dense, walkable areas on the west side of the lake.

In terms of land use, the Woodside ferry service in Halifax may be a more appropriate comparison. It operates between the lower density area of Woodside and downtown Halifax. Demand is highly linked to the provision of Park & Ride spaces in Woodside, and the ferry only operates on weekdays to capture commuter trips. However, the key distinguishing feature in comparison to the Okanagan context is that the Woodside Ferry effectively bridges a gap in the roadway network, connecting across the harbour in place of a bridge that was planned but never built. Because of this, the ferry is significantly quicker than the alternative drive during peak periods. This "advantage" leads to relatively high ferry demand, and this situation is not replicated in the Central Okanagan since the bridge is available.

Cost

In the right location and with high enough ridership, ferry services can be cost effective, and operational costs can range between $400 and $800 per service hour (Halifax-Dartmouth and Vancouver-North Vancouver). The capital investment required to build passenger ferry services are significant. A recent pre-feasibility service estimate for a passenger ferry service in Greater Victoria estimated a cost of $41 million for three terminals and over $10 million per ferry[29].

Due to the limited existing population density around the potential ferry terminal site on the Westside, and the adjacent competing bridge, a traditional ferry service is not likely to attract sufficient demand to offset the high capital and operating costs.

Alternatively, there may be an opportunity for a smaller water taxi service, especially in the short to medium term instead, if such a system were coordinated with the development of the area around a future terminal on the Westside. This service could serve commuters and tourists, while establishing demand on the route and catalyzing development around the Westside terminal, potentially enabling a larger scale ferry in the future. While a future ferry service is not included in the RTP at this time, this does not preclude ferry service outside the 20-year time horizon of the plan. A public-private partnership may be an appropriate approach to this type of service.

[19] *https://admin.glaciermedia.ca/fileserver/file/1364625/filename/0318-westshore%20ferry.pdf*

4.2.2 Active Transportation

The following section highlights the core elements of the regional active transportation network. Regional active transportation facilities are discussed in more detail in the Regional Bicycling and Trails Master Plan (RBTMP)[30].

Okanagan Rail Trail

The Okanagan Rail Trail is the spine of the regional active transportation network, extending from downtown Kelowna to the top of Kalamalka Lake near the south end of Vernon (with the exception of a gap between the Kelowna International Airport and Lake Country). The trail accommodates all modes of active transportation, and connects many regionally significant destinations including downtown Kelowna, UBC Okanagan, Kelowna International Airport, and Lake Country. In addition to the gap, there are also missing connections between the Okanagan Rail Trail and other regionally significant active transportation facilities, including the Pelmewash Parkway, and the Mission Creek Greenway. Completing these missing connections would improve connectivity and safety for active transportation in the region.

Westside Trail

Concepts for the Westside Trail have previously identified a continuous trail between the WR Bennett Bridge and Peachland. While the full corridor is yet to be completed, portions of the Westside Trail have been developed through regional collaboration between West Kelowna, WFN, and RDCO (e.g. the Gellatly Bay Recreational Corridor). The Westside Trail would also be a key component of the Trail of the Okanagans[31], which is envisioned by the Trail of the Okanagans Society to ultimately connect from Vernon, across the bridge, and all the way south to the Canada / US border. The Westside Trail was highly-supported as a future project during public engagement processes for the RTP. It is discussed in more detail in section 5.3.2 and in the Regional Bicycling and Trails Master Plan (RBTMP)[32].

Other Connections

There are a number of other pathways and bicycle facilities that are regionally significant, as they provide connections to regional destinations and the regional network. These include facilities along Sutherland Avenue, Abbott Street, and Glenmore Road in Kelowna, and along and parallel to Highway 97 on the Westside. Improvements and connections to these facilities and other major destinations and routes have been considered, such as a connection.

4.2.3 Efficient Vehicle Movement

Goods Movement

The regional goods movement network accommodates the transport of goods and trucks within the region. Goods movement means more than trucks, and includes all business-related travel and other services, such as parcel delivery.

Highway 97 is the primary goods movement route in the region. In 2018, large vehicles (longer than 12.5 metres), represented 2.5% of all vehicles on the WR Bennett Bridge[33]. Throughout the entire region, less than half of all heavy vehicle trips (44%) have an origin and destination outside the Central Okanagan. Most have destinations within the region, about one-quarter of heavy vehicle trips originate outside the Central Okanagan and just under one-third start and end within the region[34]. A Regional Goods Movement Study is recommended (see Section 5.1.2) to look more in depth at the long-term, efficient and sustainable movement of goods as the Central Okanagan region grows.

Emergency Vehicles

Emergency vehicles, such as ambulance, police and fire vehicles rely on the ability to move quickly through the regional transportation network in the case of an emergency. Traffic congestion and a lack of redundancy in the transportation network are significant considerations for accommodating emergency vehicles. Emergency vehicles rely on reliable routes and travel times, and just as importantly, alternative routes to avoid congestion or incidents.

HOV

Curbside HOV lanes have been in place on Highway 97 in Kelowna since 2009 and are intended to provide priority travel to transit and vehicles with two or more occupants. The lanes are in effect from 7 am to 7 pm between Water Street and Highway 33.

[30]Regional Bicycling and Trails Master Plan: https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final
[31]Trail of the Okanagans: https://www.trailoftheokanagans.com/
[32]Regional Bicycling and Trails Master Plan: https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final
[33] BC Ministry of Transportation and Infrastructure traffic count. Permanent Count Station P-25-1
[34] Central Okanagan Planning Study, 2017

Private Vehicles

Single occupant vehicles (SOV) are the dominant form of transportation in the region, and without investments in other modes of transportation, auto trips and traffic congestion will increase with population growth.

Increases to traffic volumes are projected to be most significant along Highway 97 between Peachland and Westbank Centre, between Westside Road and Pandosy Street, and in the Kelowna industrial areas around Old Vernon Road through to Lake Country. As the highway becomes more congested, traffic increases will disperse to parallel routes such as Glenmore Road, Clement Avenue, and Springfield Road.

05 Recommended Policies, Programs and Recommended Projects

Recommended Policies, Programs and Projects

This section describes recommended programs, policies and recommended projects that are designed to work together to help achieve the RTP Vision and Goals.

5.1 Programs and Services

Infrastructure is only one part of the transportation system. Complementary programs and services are important to maximize the value of physical infrastructure. This section provides recommendations for the following key topic areas:

- Land Use
- Goods Movement
- Transit Service and Multimodal Integration
- Pricing
- Shared Mobility

A summary of recommendations is provided for each topic area, and many of these recommendations are again reflected in the policy guidance.

5.1.1 Land Use

Regions and transportation systems operate most efficiently when people live close to where they work and play, and when they have choices when it comes to transportation. Increasing population and employment densities can help make biking, walking and transit more viable. Increasing the number of people who work and live along major transit corridors and in urban centres can also make transit service more economical, enabling better transit service to be provided along these corridors and throughout the region. In addition to focusing development in these areas, walkability within and between them and transit stops is also important.

In Lake Country and Peachland, there is an opportunity to create nodes of higher density development around potential mobility hub locations. These higher density nodes will increase the number of potential transit passengers within walking distance of a transit hub, which in turn can increase the potential to operate more frequent transit service to these locations.

Land use intensification is not limited to residential density. Locating employment and services close to

transit corridors also supports transit use. Additionally, balancing of employment and residential land use within a community will allow some people to live closer to work, and reduce overall trip lengths, for all modes.

Land Use Recommendations:

- Focus future regional growth and development along major transit corridors, and within urban and town centres.
- Concentrate select retail, commercial, office, and other land uses around proposed mobility hubs in Peachland and Lake Country (see 5.3 Recommended Projects).
- Reflect the principles of allowing people to live closer to work and reducing overall trip lengths in the RDCO Regional Growth Strategy, Official Community Plans and other relevant land use planning documents.

5.1.2 Goods Movement

As the Central Okanagan region grows it will be important to guide the sustainable and efficient movement of goods in support of the regional economy. There are several industries that rely on access to the provincial highway network and airport to deliver goods to markets. In addition, goods movement must be responsive to changing urban environments and economic forces that are changing the way we do business. Examples include shifts to e-commerce, increased competition for loading/delivery curb space, and the right-sizing of delivery vehicles in urban areas. To support the regional economy it will be important to consider goods movement within the context of our dynamic and growing region.

Goods Movement Recommendation:

- The STPCO partners should work with BC MoTI, business organizations and industry stakeholders to develop a Regional Goods Movement Study. The study should look more in depth at sustainable and efficient goods movement within the Central Okanagan as the region grows.

5.1.3 Transit Service and Multi-Modal Integration

As the region grows, it will be important to expand and enhance transit service to regional destinations. In addition, it will be important to provide high quality, multimodal connections to transit stops to help people get to and from their final destination (helping to solve what is known as the "last mile" problem in transit planning). This multimodal integration will help to increase the reach of transit, making it a more viable option for more people.

Frequent and RapidBus Services

The expansion of frequent and RapidBus transit service will be important as the region grows, in particular to regional destinations such as the Kelowna International Airport and UBC Okanagan. It will also be important to increase transit service frequencies along Highway 97 on the Westside as the area grows and to extend frequent and/or RapidBus transit service to Lake Country and Peachland when sufficient densities make this economically feasible. This will help to better connect the region with fast and reliable transit that is a realistic and convenient alternative to driving.

Local Transit Routes

Transit infrastructure projects will only be successful with a level of transit service that leads to an increase in mode share for transit. The infrastructure projects will help to provide reliability travel time benefits, but frequency of service and direct connections between major origins and destinations are essential to make transit an attractive choice.

Rapid and frequent transit routes in particular will be most successful when supported by local routes that are coordinated with the rapid and frequent service, providing convenient and direct connections between key stops/stations and local destinations.

Mobility Hub

A mobility hub is a central location where a variety of transportation services meet. They can include amenities such as car share, bike share, ride-hailing stands, short and long term bicycling parking, park and ride stalls, and electric vehicle charging stations, among others, to help people get to / from their final destination. They help consolidate trips to a single location and can make the provision of transit service to low density areas more feasible. Mobility hubs would be appropriate in lower density communities such as Lake Country and Peachland.

Park and Ride

Park and ride lots are parking lots with transit connections. Typically located near the edge of a region, they intercept vehicle trips destined for the city centre, and allow passengers to leave their vehicle and transfer to transit for the remainder of their journey.

Park and ride lots should be included at the proposed mobility hubs in Lake Country and Peachland, but are also recommended in Rutland and along Highway 97 on the Westside. Specific locations will need to be investigated. It may also be appropriate to include other mobility hub amenities at these park and ride lots, depending upon location and nearby land uses.

Implementation of park and ride, along with other project recommendations in this plan, including transit shoulder operation on Highway 97 on the Westside and the transit contraflow lane on the bridge, would work together to increase transit reliability and shorten transit travel times.

Demand Responsive Transit

Demand responsive transit presents an opportunity to provide transit in areas where conventional fixed-routes are not economically feasible. Demand responsive transit serves travelers on a case-by-case basis.

It is not a new type of service and was historically known by names like Dial-a-Ride. New technologies, particularly booking apps and optimization software, are beginning to allow the full potential of this concept to be realized.

Demand responsive services have become increasingly popular in Ontario and Alberta, where partnerships with private companies are common. There are a variety of operating models, which should be monitored. An example of an on-demand transit service is in Cochrane, AB, which launched in the fall of 2019. The Town of Cochrane contracted with Southland Transportation to deliver a new local, on-demand transit service. There are over 150 stops throughout the town, but stops are only serviced when a request is made through the app or by telephone.

Cochrane, Alberta's "Cochrane On-Demand Local Transit" or C.O.L.T. launched in the fall of 2019, providing a demand-responsive service throughout the town.

Demand-responsive services are likely to have the best applicability in Peachland and Lake Country, where topography makes fixed-route service more challenging. Ideally, BC Transit would be involved with any implementation as transferability to the regional system is an important consideration, but there may be a need to explore private partnerships for access to apps and software.

There may also be applicability to rural areas where the population cannot support traditional fixed-route transit services.

Transit Service and Multimodal Integration Recommendations:

- Consider extending RapidBus or another frequent transit service to the Kelowna International Airport (at half hour or hourly headways), as described in the Okanagan Gateway Transportation Study. Airport transit service should also consider shift changes at major industrial employers such as KF Aerospace, which may require extending transit service hours in this area.
- To address future transit demand at UBC Okanagan, consider increasing the frequency of transit service along Glenmore Road between downtown and UBC Okanagan, and possibly along routes that connect UBC Okanagan and Rutland. Additionally, provide transit service in conjunction with development of the future Hollywood Rd North connection to UBC Okanagan, which is envisioned as a future transit corridor.
- Support the recommended transit priority infrastructure projects with frequent enough transit service to grow ridership and connect local transit service to Rapid Bus stations, and other rapid or frequent transit stops to facilitate connections.
- As ridership grows on the Westside, consider increased frequency for Route 97 as part of future transit service planning.
- Design mobility hubs and park and ride facilities to leverage transit service along Highway 97 (which will have the added benefit of reducing vehicle trips on the most congested corridors during peak travel periods).
- Investigate demand-responsive transit service for Peachland, Lake Country, the Westside and rural RDCO communities, in addition to other areas where fixed-route services are not feasible.

- Extend RapidBus transit service to Peachland and Lake Country once population and employment densities are high enough to make the service economically feasible. This could be achieved by terminating the existing routes 22 (Peachland) and 23 (Lake Country) at the new mobility hubs in each community and replacing the local connections with on-demand transit service to increase transit connectivity for Peachland and Lake Country residents to regional destinations.

5.1.4 Pricing

New approaches to pricing of transportation services are designed to reflect the inherent costs of each service, or set to encourage certain type of travel behaviours. Two potential pricing approaches that may be appropriate in the Central Okanagan include parking and mobility pricing.

Parking Pricing

Central and downtown Kelowna experience some of the highest congestion in the region; strategically pricing parking has the potential to relieve congestion in these areas.

To encourage people to travel to these areas with transit, parking prices should be set to make transit competitive with vehicle travel. As a minimum, parking prices can be set so that a month's worth of parking costs are more than a monthly transit pass (currently $70/per month). The highest concentration of full-day parking and the highest monthly prices are in downtown Kelowna, where monthly parking is approximately $80/month. With the exception of the airport, these are the highest monthly parking costs in the region, but yet are only slightly higher than a monthly transit pass. In order to promote modal shift to transit, monthly parking costs need to be substantially higher than transit. Shifting commuters, who occupy parking spaces all day, to other modes has the added advantage of freeing up parking spaces for shoppers and other visitors to downtown.

Major destinations and campuses in the region, such as UBC Okanagan or Okanagan College, should also be encouraged to price parking higher than transit. Revenues raised by parking fees can be used to improve active transportation, provide park and ride facilities in other areas to encourage transit use, or be re-invested into the community in the form of community revitalization programs to get buy-in from local residents and businesses.

Mobility Pricing

Mobility pricing is a method of collecting fees for using transportation services, and it can be used to recover the cost of providing the service. While it is often associated with bridge tolls, improvements in technology and an increasing need for a replacement of gas tax revenues make mobility pricing a fair and efficient candidate to generate transportation revenues while discouraging costly trips. Mobility pricing recognizes the full cost of a trip, considering factors such as the amount a driver contributes to congestion. Mobility pricing can come in many forms, for example dynamic, time-of-day road pricing (sometimes known as congestion pricing) or pay as you drive insurance (with premiums tied directly to the number of kilometers driven). While no recommendations on mobility pricing are included in the RTP, the concept should be considered as a potential future opportunity.

Pricing Recommendations:

- Review parking pricing in high-demand locations or where there are strategic benefits to limiting parking so that the price reflects the value of the space provided for parking.
- Continue to monitor trends related to mobility pricing, particularly as vehicle electrification evolves, as an alternative to considering a regional fuel.

5.1.5 Shared Mobility

Shared mobility is the concept of sharing transportation vehicles or services. It enables people to use transportation services and vehicles when they need to, without being burdened by the costs and inconveniences of private ownership. Micromobility, car sharing, and ridehailing services are some of the most common forms of shared mobility.

This section includes some high-level recommendations related to shared mobility. A more in-depth discussion and review of shared mobility and other new emerging transportation modes is provided in the Regional Disruptive Mobility Strategy[35].

Micromobility

Micromobilty includes many different types of personal, space-efficient transportation modes, such as bikeshare and scooter sharing. The City of Kelowna has recently welcomed a number of different providers for these services.

Additional areas where mircomobility may be successful include Peachland and UBC Okanagan. Micromobility could be used by residents and tourists in Peachland particularly for travel between the town centre and beach areas and a future mobility hub. They may also be highly viable at UBC Okanagan, as many students live nearby and may be receptive to the new technology.

Car Share

Car sharing is a model of car rental where people can rent cars for a short period of time, often by the minute. Much like bikeshare, car sharing is part of a greater trend of shared mobility. Modo is the main carshare provider in Kelowna, and it provides a two-way roundtrip service where users must pick up and return the car in the same location. Other services include one-way car sharing, where members can begin and end their trip at different locations. By allowing convenient access to a car when needed, car sharing services can make it easier for people to forgo vehicle ownership, and can bolster other modes of transportation, such as transit.

Ridehailing Services

Ridehailing has recently been approved in British Columbia, and therefore is new to the Central Okanagan. Ridehailing uses an app-based platform to provide on-demand transportation. It connects passengers with local drivers who use their own personal vehicles to provide door-to-door service. Depending on demand and pricing, ridehailing services can often be cheaper than taxi fares. Major ridehailing companies include Uber and Lyft. Neither company has committed to operating in Kelowna, although two local companies, Lucky-To-Go and Kabu, started operation in summer 2020.

While ridehailing services are not a fundamental component of the RTP, they will likely become relevant within the region's mobility fabric. It is recommended that these services be re-evaluated on a regular basis as they become more available in the region.

Shared Mobility Recommendations:

- Investigate new potential micromobility opportunities at key transit hubs, particularly at UBC Okanagan and in Peachland, and during summer months.
- Continue to support car sharing by providing priority car sharing parking spaces in urban and town centres or near transit exchanges.
- Continue to monitor and re-evaluate the potential effects of ridehailing services on a regular basis as they become available in the region.

5.2 Regional Transportation Policy Guidance

The section provides policy recommendations for developing and maintaining the regional transportation system. Recognizing that the RTP is not a statutory document and that there is no enforcing agency, policies are provided as guidance. In many cases, policy guidance provides suggestions for policies that can be included within local transportation master plans and local statutory planning documents. Policies are organized around each of the nine RTP goals.

Network maps referenced in this section are provided in **Appendix A**.

5.2.1 Goal: Safe

The regional transportation system will transport people and goods safely.

In 2018, there were almost 5,000 ICBC claims made in the Central Okanagan and over 40% involved an injury or fatality. Improving transportation safety and eliminating traffic-related fatalities is a critical public health, quality of life and economic issue.

[35]The Regional Disruptive Mobility Strategy is available online at: https://smartTRIPS.ca/regional-disruptive-mobility-strategy-final

Objectives

Improve safe travel by all modes - Safety must be inherent in all future transportation system development. In particular, vulnerable users of the transportation system, such as people walking and biking, require safe and direct routes. Roadway design and education for all road users are important aspects in reducing vehicle crashes.

Policy Recommendations

- The STPCO partner transportation master plans will prioritize local improvements at the highest crash locations within the jurisdiction, with a particular emphasis on locations with a high number of fatal and injury crashes.
- Prioritize safety considerations for all modes of travel, supported by education programs.
- Make vehicle speed reduction a key consideration in planning, design, and construction of transportation infrastructure.
- Incorporate the principles of Crime Prevention Through Environmental Design (CPTED).
- Require safety assessments in all transportation impact assessments, consistent within each of the STPCO partner jurisdictions.
- Provide pedestrian crossings that are protected with pedestrian signals or grade-separation at a minimum spacing of 800 metres on regional network streets (Map 3), where there are pedestrian destinations on either side of the highway. In developed urbanized areas, 400 metre spacing is desirable.
- Develop the core regional active transportation network as identified on Map 1 so that it can ultimately evolve to being a safe and comfortable network for all ages and abilities.

5.2.2 Goal: Efficient

The regional transportation system will minimize energy, emissions and travel times.

As traffic congestion grows, travel times will increase, and cars stuck in traffic waste gas and emit harmful air pollutants and greenhouse gas (GHG) emissions. Creating an efficient regional transportation system will help to decrease the rate at which congestion intensifies, seeking balanced and healthy levels of congestion for a thriving economy.

Objectives

Increase proportion of population within reasonable travel times of urban centres - A reliable network means people and goods will have predictability when they travel by any mode. A regional transportation system that is focused on shorter travel times and distances among regional destinations will have a positive effect on greenhouse gas emissions and can facilitate concentration of mixed uses in urban centres.

Provide redundancy within the network - Redundancy allows for route choice. In emergency situations, it allows for multiple egress routes and allows for alternate routes when incidents occur. Network redundancy can also help to reduce dependence on the highway and major arterials.

Policy Recommendations

- Prioritize capacity for longer regional and provincially significant trips by all modes on the future regional transportation system.
- Prioritize redundancy and reduce reliance on individual corridors in regional transportation network expansion.
- Develop the regional transportation network in a manner that improves safety, security and resiliency while minimizing life cycle cost and impact on the environment.
- Limit expansion of new roadways and highways to four lanes plus auxiliary lanes between intersections/interchanges. Apply transit, travel demand management (TDM) and active transportation measures to address excess travel demand. For residual demand, consider developing new transportation connections that create increased redundancy and connectivity in the network before expansion beyond four lanes.
- Implement transit priority during congested conditions such as, but not limited to, dedicated lanes, transit signal priority, queue jump lanes and other measures, on regional transit corridors as shown on Map 2.

- Consider intelligent transportation systems (ITS) to improve traffic incident detection and response, and to provide advanced traveler information for all modes.

5.2.3 Goal: Sustainable

The regional transportation system will create a net positive social, environmental, and economic benefit to the region and future generations.

The regional transportation system provides social and economic connections for people and goods. A highly connected system creates opportunities offered by increased mobility. The advantages of increased mobility should balance environmental, social and economic considerations.

Objectives

Support Official Community Plans (OCPs) and Regional Growth Strategy - Transportation is an important enabling component of the regional growth strategy and Official Community Plans, and helps to shape overall growth patterns in the region.

Reduce dependence on highways and major arterials - Strengthening local street connectivity and dispersing traffic creates choice, redundancy in the network, maximizes the efficient use of infrastructure, and helps to facilitate direct routes between origins and destinations.

Improve coordination and cooperation among those responsible for the regional transportation system - There are several owners and stakeholders in the regional transportation system. Without a common vision and collaboration among agencies, successful development of a future system will be difficult.

Policy Recommendations

- Include strategies to reduce vehicle kilometres traveled in the STPCO partners' transportation master plans.
- Establish employer-based travel demand management programs for the STPCO partners' organizations, and encourage similar programs for major employers within their jurisdictions.
- Include provisions for highly connected and dense local networks within the STPCO partners transportation master plans, particularly around urban and town centres.
- Consider including minimum requirements for bicycle parking and end-of-trip bicycling facilities within he STPCO partners' appropriate plans and regulations.
- Encourage concentration of residential, commercial and other land uses in urban centres in Official Community Plans, the Regional Growth Strategy and other local land use plans
- Work with BC Transit to accelerate implementation of zero-emission transit vehicles in the region.
- Work with the Province and service providers to establish an electric vehicle charging network in the region.
- Set daily parking rates within the urban and town centres and at major regional destinations under the jurisdiction of the STPCO partners at more than two-way transit fares.
- Within urban and town centres, manage vehicle parking to minimize the amount of land dedicated to parking.
- Within urban and town centres, prioritize walking as the highest priority mode of transportation.
- Consider complete street and green street designs that prioritize safe and convenient pedestrian and bicycle access on all new or expanded urban and suburban streets within the regional transportation system.
- Explore trip reduction through travel demand management, active transportation and transit solutions before roadway expansion is applied as the solution to increased travel demand to reduce the effect of roadway expansion on environmental and historical resources.

5.2.4 Goal: Affordable

The regional transportation system will provide value to all users while minimizing costs to users and taxpayers.

Mobility and transportation choices have value to the regional economy and well-being of residents. Investment in transportation infrastructure, programs and services should be focused on cost-effective options that maximize benefits to the region, recognizing that not all benefits are monetary. Maximizing benefits must be balanced with the ability to fund initial investment and ongoing operation and maintenance.

Objectives

Develop new revenue sources to support regional growth - Notwithstanding the ongoing need to explore new funding options, realistic funding sources from local government, regional partners, senior government and potentially other partners will identified to support the life cycle costs. New revenue sources will continue to be explored.

Policy Recommendations

- Work with the Province to identify new revenue sources for regional transportation projects, programs and services.
- Coordinate rezoning and associated collection of development cost charges among the STPCO partners along corridors benefiting regional transportation to reflect the transportation improvement needs along the corridor.
- Establish partnerships among various levels of government and benefiting municipalities to secure funding of regional transportation projects and programs.
- All STPCO partners will agree to be supportive of funding and grant applications for regional transportation projects, programs and services identified in the RTP, regardless of which partner(s) is making the funding or grant application.

5.2.5 Goal: Economic Growth

The regional transportation system supports regional economic growth.

Access to markets and ease of commuting are factors that can affect regional economic growth. There are several industries that rely on access to the highway network and airport to deliver goods to markets.

Objectives

Efficient movement of goods to and from commercial and industrial hubs - Goods can be moved efficiently between commercial / industrial hubs and the provincial highway network and Kelowna International Airport.

Active transportation facilities are an attraction - The region has many positive attributes and tourism is an important economic generator. Active transportation corridors can enhance access to amenities and be an attraction for tourists and residents.

Policy Recommendations

- Create and maintain efficient and reliable access to Kelowna International Airport from the provincial highway system to support the airport's role in regional economic growth.
- Support economic development organizations within the region to continue to promote the region as a premier bicycle tourism destination, focused on the Westside Trail and Okanagan Rail Trail, as well as the Kettle Valley Rail Trail.
- Prioritize future transit infrastructure investments

and service to areas with high concentrations of employment.

- Provide strong active transportation connections within and to/from major employment locations and urban and town centres in the STPCO partners' transportation master plans.

5.2.6 Goal: Equitable and Accessible

The regional transportation system will address the transportation needs of all ages, abilities and incomes.

Mobility and access to employment opportunities, services and amenities for everyone are critical to the well-being of the region. The transportation system should remove barriers to travel due to income, age, ability or other marginalized populations. The ability to efficiently move about the region for jobs and services should not be limited to those who can afford or are able to drive a personal automobile.

Objectives

The transportation system should be inclusive and welcoming for all citizens - Regional destinations, and particularly urban and town centres, include a high proportion of the jobs in the region and most services required by the regional population. Access to key regional services and employment should be available to all.

Policy Recommendations

- Align planning for affordable housing with access to affordable transportation.
- Design active transportation infrastructure to be inclusive of all ages and abilities whenever possible, and in alignment with the BC Active Transportation Design Guide.
- Access to all existing and new bus stops, RapidBus stations and transit exchanges will be barrier-free and hard surfaced, meeting minimum design dimensions to support lift and ramp-assisted boarding and other universally accessible design features.
- Focus transit service planning on access to transit service in areas with low to moderate income.
- Work with BC Transit to increase awareness of existing transit pass programs including U-Pass, Pro-Pass, Class Rides Free program, Companion Pass and BC Bus Pass.
- Directly address equity in the STPCO partners' transportation master plans[36].

5.2.7 Goal: Quality of Life

The regional transportation system will minimize noise, visual and community effects while supporting community cohesion.

The transportation system should help bring people together, not divide them. Central Okanagan residents and visitors can expect mobility to be a benefit, while feeling safe and comfortable as they get around. Convenient travel options support active living and encourage increased physical activity.

Objectives

Promote walkable urban and town centres with dense, contained land use - Urban and town centres are the "heart" of Central Okanagan communities with land uses and activities that rely on foot traffic. They are more attractive and inviting when conflicts between people and cars are reduced.

Minimize the barrier effects of transportation facilities - Extreme congestion and network pinch points create barriers within the network, increasing emissions and travel times for all modes. Limited crossing points and lack of network permeability increase trip lengths and travel times for all modes.

Improved aesthetic quality on corridors - High quality aesthetics improve the impression of the region for people using transportation corridors and creates a more inviting pedestrian environment.

Policy Recommendations

- Regional transportation corridors should be well-connected to the adjacent land use, and as much as practical, land uses should front-face onto streets.
- For residential land uses in close proximity to transportation corridors, balance access to transportation amenities while minimizing exposure to noise and air pollutants.

[36] For further information on equity, review Supporting Equity in Planning and Policy Guide *https://planh.ca/sites/default/files/equity_action_guide.pdf*

5.2.8 Goal: Environmentally Responsible

The regional transportation system will minimize negative effects on the natural ecosystem.

The Central Okanagan is well-known for its natural beauty and natural environment. Expansion of the regional transportation system should not be at the expense of the attributes that make the region great.

Objectives

Biological, aquatic and historical resources are protected - The Central Okanagan's biological, water, historic and cultural resources are protected and preserved from the negative impacts of transportation.

Policy Recommendations

- Consider environmentally sensitive areas, such as wetlands and critical habitat for threatened or endangered species, and where possible, avoid impacts to these areas when expanding the regional transportation system.
- Apply consistent standards for protecting environmental and historical resources when designing and implementing transportation infrastructure.

5.2.9 Goal: Multi-modal

The regional transportation system will increase the variety of travel choices available.

The regional transportation system will include networks for multiple modes and will be accessible and efficient, connecting regional destinations.

Objectives

Create dense urban networks that create choices - Dense networks tend to include shorter blocks, facilitating pedestrian movements and dispersing traffic.

Realistic transportation choices - Choice is only available when alternatives are reasonably convenient and time-competitive with the private automobile. Continued reliance on private automobiles as the primary mode of travel will continue to contribute to growing congestion in the region.

Increase access to high frequency transit - Access to high frequency transit, such as frequent and rapid transit network routes is supported through high quality walking environments and convenient local transit connections.

Provide a connected active transportation system - Safety, comfort and directness are important factors in the choice to use active transportation. Disconnected networks with even small gaps can significantly impact the attractiveness of active transportation.

Travel across modes is fully integrated - Not every mode can serve every trip. The ability to move between modes to make the most effective use of the system will improve traveler experiences.

Policy Recommendations

- Focus regional transit service design on frequency of service and directness between regional destinations.
- Work with BC Transit to include frequent and rapid transit network routes on regional transit corridors so that transit travel times between regional destinations are competitive with times by private automobile.
- Work with BC Transit and potentially private partners to implement on-demand transit services connected to a series of mobility hubs directly accessing regional transit corridors.

5.2.10 Goal: Adaptable

The regional transportation system can change in response to evolving technology and societal trends.

The Central Okanagan's transportation network will support long-term efficiency and durability. Transportation investments will allow for infrastructure to be easily modified to take advantage of evolving transportation trends. Adaptations will continue to provide attractive opportunities for multimodal travel.

Objectives

Support access to real-time travel information - As technology evolves, there is increased expectations for real-time information to support travel decisions, for all modes.

Disaster response is enabled by a resilient transportation system - Reduce the vulnerability of regional transportation infrastructure to natural disasters, climate change and hazardous incidents.

Policy Recommendations

- Investigate technological solutions that increase network capacity before investing in significant roadway capacity expansion.
- Annually monitor emerging transportation trends and identify opportunities for application regionally and locally.
- Work with BC Transit to provide comprehensive, integrated, universally accessible and real-time transit travel information.
- Transportation system development should not preclude long-term implementation of higher-order or new types of transit such as light rail or autonomous rapid transit.

5.3 Recommended Projects

This section provides recommendations for projects to help develop the future regional multimodal transportation network. The recommendations are the result of a robust project identification and evaluation process, described in section 5.3.1. As a regional, system-level plan, all of the recommended projects require further planning and design before they will be ready for construction. Some of the project recommendations are new ideas, while others are based on previous or on-going planning work.

5.3.1 Project Identification Process

A wide range of regional infrastructure projects supporting all modes was generated, screened, evaluated and reviewed through a series of public and stakeholder engagement opportunities, workshops with the STPCO staff and presentations to the STPCO Councils.

An initial list of projects was developed from:

- historical reports and plans, including local transportation master plans;
- public and stakeholder input; and the
- existing and future conditions technical analysis.

This initial list of recommended projects ranged from specific projects at advanced stages of planning and design, to aspirational ideas. This initial list of almost 200 project ideas was consolidated by combining similar projects (i.e., those that were variations of the same project) and removing those that cannot be reasonably achieved within the plan horizon (e.g., flying cars were removed as the technology is not yet sufficiently developed). In many cases, the uncertainties and opportunities related to future technologies are addressed in the Regional Disruptive Mobility Strategy[37]. Projects that are actively being reviewed through other planning processes were also removed. The concurrent planning processes included:

- Okanagan Gateway Transportation Study
- Lake Country Highway 97 Transportation Study
- Peachland Transportation Study, Phase 2
- Westlake and Boucherie Road Interchange Designs

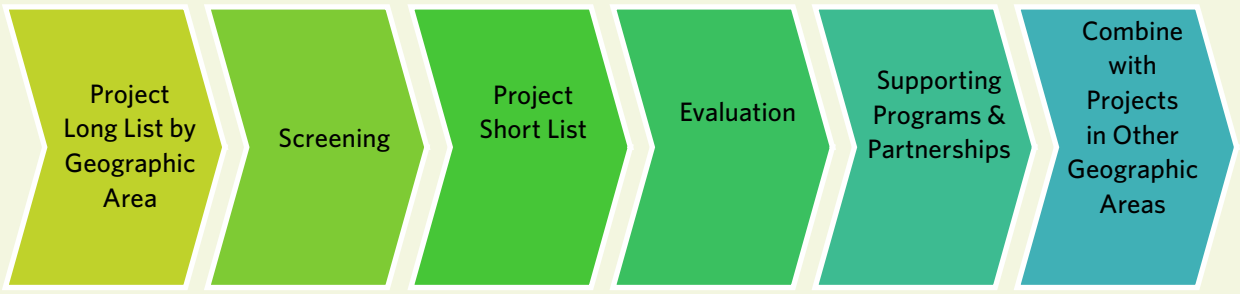
While the projects included in these studies were not evaluated in the RTP, they are referenced where appropriate. Additionally, projects included in the first phase of BC MoTI's Central Okanagan Planning Study (COPS) were not included in the list of projects to be considered in the RTP. However, the RTP will provide input into the next phase of COPS and many of the recommended projects identified in the RTP will be further reviewed and developed as part of this upcoming process.

The resulting list of about 30 projects was organized into six geographic areas. A screening and evaluation process was applied to the list, as illustrated in Figure 15, to generate a final regional multimodal network.

The screening step considered four questions:

- Will the project address a problem?
- Are the project benefits consistent with the RTP goals?
- Is the project regionally-significant?
- Is the project likely to be competitive with other options?

Figure 15: Potential Project Screening and Evaluation Process



[37] The Regional Disruptive Mobility Strategy is available online at: https://smartTRIPS.ca/regional-disruptive-mobility-strategy-final

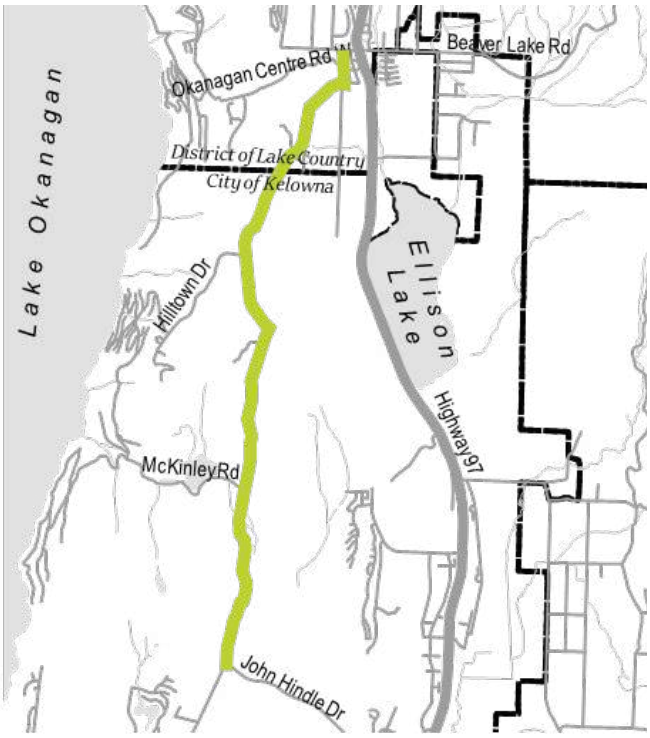
Many of the projects that were screened out were considered to be valuable, but more appropriate for inclusion in provincial or local transportation planning plans.

The remaining short list of projects was evaluated against the RTP vision and goals using a triple-bottom line process to further refine the recommended project list. While the evaluation provided some comparative information, an important consideration was how the recommended projects worked together to generate the most benefit. The resulting list of complementary projects was aligned with supporting services and programs to comprise the RTP recommendations.

5.3.2 Recommended Project Descriptions

The RTP project recommendations are described on the following project sheet pages. Although most of the projects require more detailed planning and design, an indicator of the high-level project cost estimate is provided as follows:

Symbol	Project Cost
$	< $5 M
$$	$5M to $20M
$$$	$20M - $50M
$$$$	> $50M



Recently constructed intersection of Glenmore Road and Hilltown Drive (Source: HDR)

Buffered shoulder in Lyndonville VT (Source: Small Town and Rural Multimodal Networks, FHWA)

Glenmore Road Safety Upgrades

Description:

This project would improve Glenmore Road between John Hindle Drive and Beaver Lake Road with safety upgrades such as intersection improvements, curve straightening and consistent shoulders. This 8.6 km corridor would remain a rural roadway, but existing property accesses may be consolidated and/or improved where possible.

Why Needed?:

Glenmore Road is the only continuous alternative to Highway 97 between Kelowna and Lake Country and is projected to experience an increase in travel demand as the region grows. The functionality and safety of the road is currently limited by sharp corners, frequent accesses, narrow shoulders and a lack of active transportation facilities.

While the Okanagan Rail Trail is intended to serve as the primary regional active transportation corridor connecting Lake Country and Kelowna, Glenmore Road is also a popular route for people biking. Wider and consistent shoulders, with the potential for buffered shoulders (where feasible) would improve safety for all travelers and provide a better environment for the confident bicyclists that use this route.

Key Benefits:

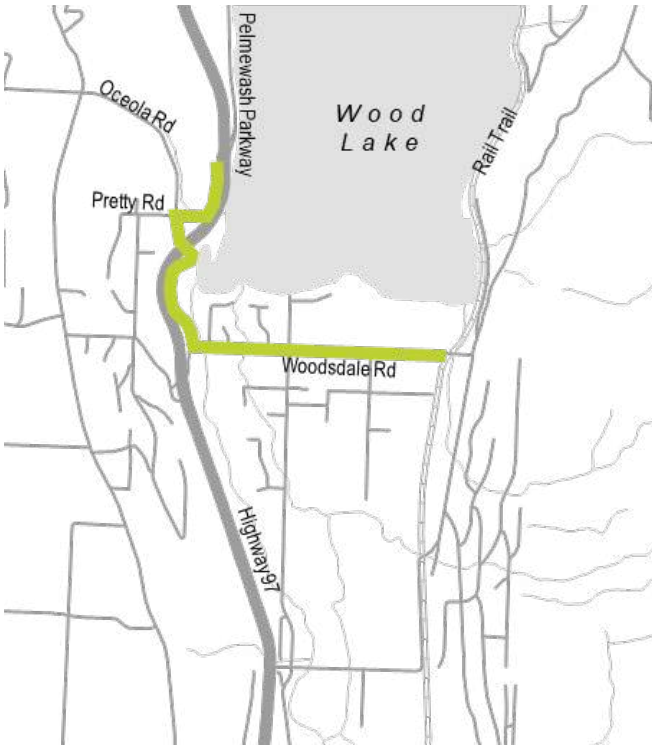
The project will help to improve safety for people driving and biking, which will be important for this corridor as traffic volumes continue to grow between Lake Country and Kelowna.

Supporting Programs:

- N/A

Partners: District of Lake Country, City of Kelowna

Project Cost Range: $$



Raised cycle track (Source: Small Town and Rural Multi-modal Networks, FHWA)

Multi-use pathway in Victoria BC (Source: Visitor in Victoria)

Pelmewash Parkway to Okanagan Rail Trail Active Transportation Connection

Description:

This project would include a new multi-use pathway that connects the south end of the Pelmewash Parkway to the Okanagan Rail Trail. An initial routing could be a multi-use pathway on Pretty Road, Oceola Road, and Woodsdale Road, about 2.3 km long. It could be built within existing right-of-way replacing the shoulders and sidewalk / pathway on the north side of Woodsdale Road or with protected bike lanes. In the longer term, a route that remains on the east side of Highway 97, from Pelmewash Parkway to Woodsdale Road should be investigated to avoid crossing Highway 97.

More project information is provided in the Regional Bicycling and Trails Master Plan.

Why Needed?:

The Pelmewash Parkway and Okanagan Rail Trail are important regional north-south active transportation routes. There is currently no direct connection between them.

Key Benefits:

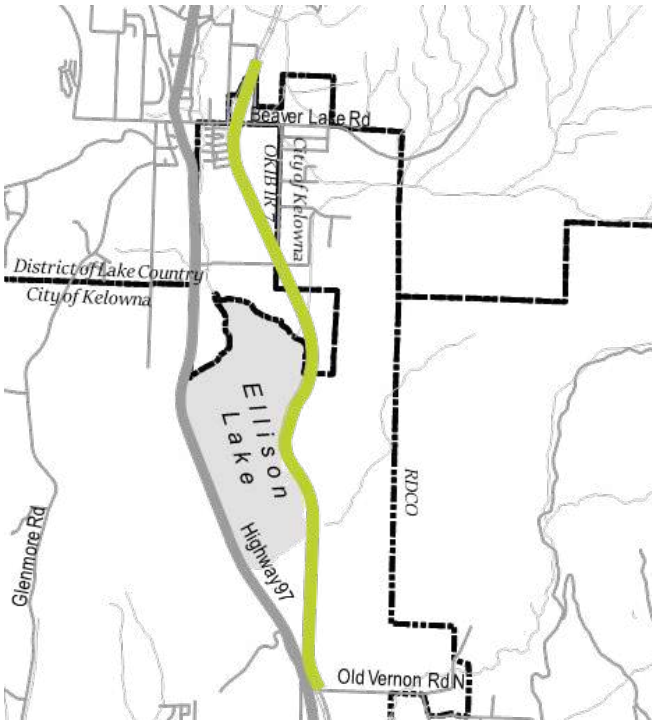
This project will provide an important connection between two regional active transportation corridors, increasing regional connectivity for people biking and walking.

Supporting Programs:

- Bicycle tourism promotion

Partners: District of Lake Country, BC MoTI

Project Cost Range: $



Okanagan Rail Trail. (Source: City of Kelowna)

Complete Okanagan Rail Trail

Description:

This project would complete the 6.5 km gap in the Okanagan Rail Trail that currently exists between Old Vernon Road and McCarthy Road (north of Beaver Lake Road) through the Okanagan Indian Band (OKIB) IR 7 area. The project would be constructed to a similar standard as the sections to the north, with consideration to update to a paved facility in the future.

OKIB is a partner in the project. Transfer of corridor ownership from CN Rail to the Government of Canada is being facilitated through the federal Addition to Reserve (ATR) process. More project information is provided in the Regional Bicycling and Trails Master Plan.

Why Needed?:

The Okanagan Rail Trail is the primary active transportation route in the region. However, the existing gap means that there is currently no high quality active transportation connection between Kelowna and Lake Country. This limits the feasibility of active transportation trips to and within the north portion of the region. Completing this segment would connect the existing north and south portions of the trail. When complete, the Okanagan Rail Trail will be a total of 48.5 km long and connect Kelowna to the Vernon area.

Key Benefits:

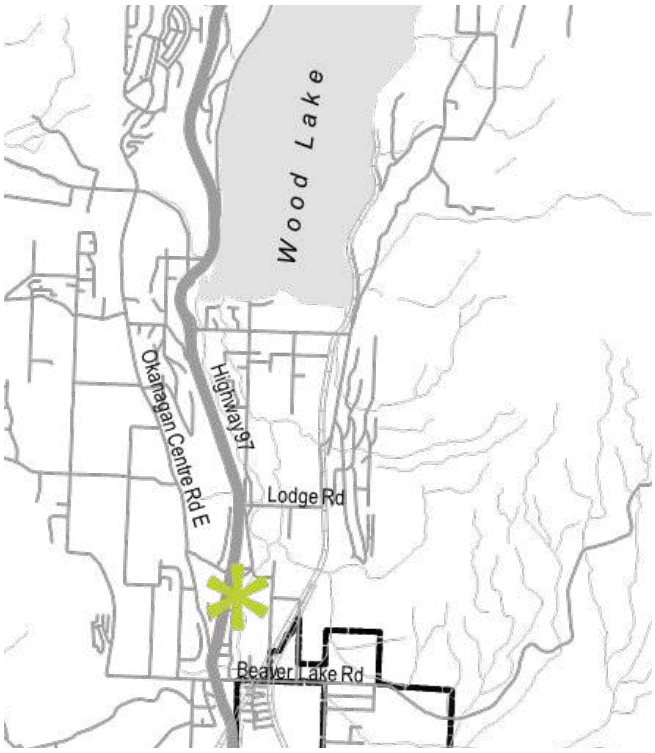
This project will complete a gap in an important regional active transportation corridor, increasing regional connectivity for people biking and walking.

Supporting Programs:

- Cycle tourism promotion

Partners: Okanagan Rail Trail Partners

Project Cost Range: $



BC Transit Sooke Park and Ride (Source: Google Maps)

Small-scale mobility hub in Bremen, Germany (Source: Shared-use Mobility Centre)

Winfield Mobility Hub / Park and Ride

Description:

This project would develop a mobility hub in the Winfield area of Lake Country. The mobility hub would need to be developed around a transit exchange, and could include transportation services and amenities such as park and ride, bicycle parking, electric vehicle charging, carshare, bikeshare, scooter share, and/or ride-hail/taxi stand options, among others.

In addition, a well-connected active transportation network in the immediate vicinity of the mobility hub would be important to facilitate walking and bicycling connections to transit.

Why Needed?:

Currently, dispersed land uses make it challenging for Lake Country residents to access transit. Providing travel options that help connect Lake Country residents to/from transit would help extend the reach of transit and make it a viable option for more people.

The project is recommended in conjunction with increases in population and employment densities in the Winfield area. This would support the development of Winfield as a town centre and help make more frequent and direct transit service connections to Lake Country more feasible over time.

Key Benefits:

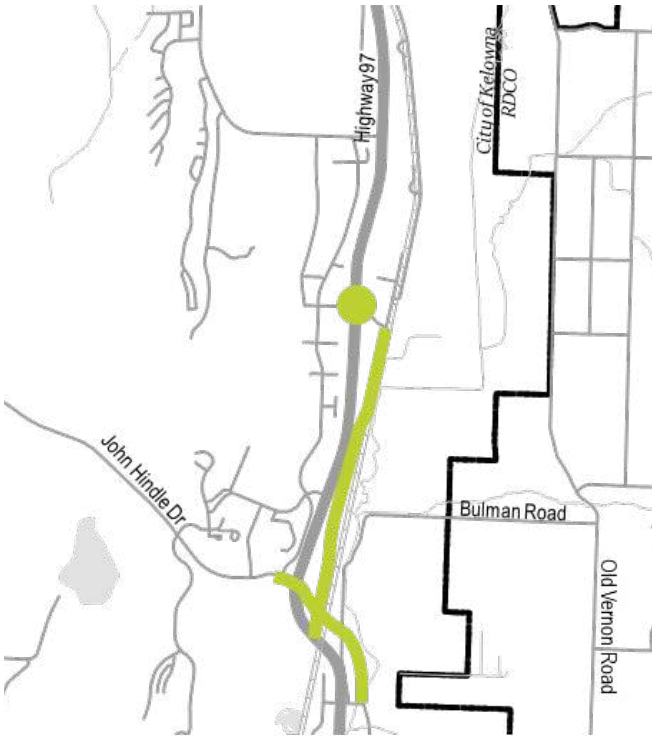
The project would improve access to/from transit for Lake Country residents and help support more frequent and direct transit service over time.

Supporting Programs:

- Demand-responsive transit
- Extension of higher frequency transit service or RapidBus
- Land use intensification

Partners: District of Lake Country, BC Transit, BC MoTI

Project Cost Range: $



Highway 1 / Kokanee Way Interchange, Kamloops. Example of an interchange with the highway over the local road. (Source: Google Maps)

UBC Okanagan Transit Exchange. The OGTS identified a tripling of UBC Okanagan transit demand in the next 20 years (Source: HDR)

Okanagan Gateway

Description:

The Okanagan Gateway area includes the Kelowna International Airport, UBC Okanagan, and adjacent industrial and residential areas. The area is the subject of a separate study, the Okanagan Gateway Transportation Study (OGTS), which was a partnership between the City of Kelowna, UBC Okanagan, BC MoTI, and the Airport.

The RTP incorporates the recommendations of the OGTS, which included taking a staged approach to expanding transit service, active transportation infrastructure and the road network to better serve the important regional destinations in this growing area. More information is provided in the OGTS.

Why Needed?:

The OGTS identified a need for significant transit service expansion to UBC Okanagan and outlined the mode share required to support more frequent transit service to the Airport. The infrastructure improvements were developed by first identifying the potential demand reduction and modal shift strategies, then addressing residual vehicle demand with infrastructure. The major infrastructure components are phased strategically for cost-efficient implementation.

Key Benefits:

The OGTS recommendations will improve access by all modes to two of the most significant regional destinations in the Central Okanagan.

Supporting Programs:

- Extension of higher frequency transit service or RapidBus to the Airport
- Expanded UBC Okanagan transit service

Partners: BC MoTI, UBC Okanagan, City of Kelowna, YLW, BC Transit

Project Cost Range: $$$$

Protected Bike Lane, Edmonton (Source: HDR)

Dilworth Active Transportation Connection

Description:

This project would provide an all ages and abilities active transportation connection between the Okanagan Rail Trail and the Mission Creek Greenway along Dilworth Drive. Alternatively, Cooper Road was studied as a potential alignment and found to provide similar benefits.

Coordination with MoTI regarding the crossing of Highway 97 will be an important part of the project planning and design process. More project information is provided in the Regional Bicycling and Trails Master Plan.

Why Needed?:

Currently it is very challenging to travel by bicycle between the Okanagan Rail Trail and Mission Creek Greenway, and access to destinations in the Midtown Urban Centre are also difficult by bike.

Key Benefits:

This project will help to connect two major active transportation corridors in the region, filling a gap in the regional active transportation network. The project will also provide needed active transportation connections to the Midtown Urban Centre.

Supporting Programs:

- N/A

Partners: BC MoTI, City of Kelowna

Project Cost Range: $$

Queue Jump: Riverbend Gate at 18 Ave SE, Calgary (Source: HDR)

Multi-use Pathway on Glenmore Road at Cross Road (Source: Google Maps)

Glenmore Road Multi-modal Arterial

Description:

This project would create a consistent multimodal corridor along Glenmore Road from John Hindle Drive to Clement Avenue. It would include transit priority measures at signalized intersections, where appropriate, in conjunction with more frequent transit service and transit stop improvements, such as enhanced shelters and boarding platforms. The project would also create a continuous high quality active transportation route from John Hindle Drive to central Kelowna, including a 1.8 km separated facility to connect the existing gap between John Hindle Drive and Scenic Road and active transportation improvements between Dallas and Clement. Glenmore Road would also be widened from two lanes to four lanes for the 2.5 km between Union Road and John Hindle Drive.

Why Needed?:

Glenmore Road provides important regional connections between Lake Country and Kelowna and to UBC Okanagan and the Airport. Forecasts show that Glenmore Road will experience increased travel demand as the region grows.

Key Benefits:

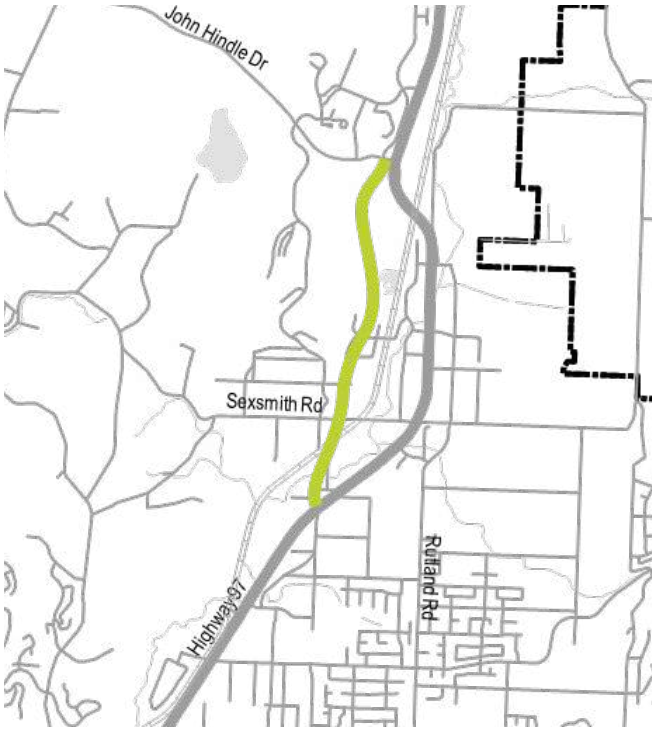
This project will help Glenmore Rd accommodate growing travel demand via multiple modes, moving more people safely and efficiently through the corridor and providing people with more convenient transportation options.

Supporting Programs:

- Expanded frequent transit service on Glenmore Road

Partners: City of Kelowna, BC Transit

Project Cost Range: $$$



Queue Jump Lane – 114 Ave. SE, Calgary (Source: HDR)

Hollywood Road North Transit Corridor – Highway 97 to UBC Okanagan

Description:

This project would extend Hollywood Road North to connect Highway 97 with John Hindle Drive, and serve as a transit priority corridor to UBC Okanagan. The project would likely consist of a two-lane roadway with active transportation facilities, new transit service and transit priority measures at key intersections, where appropriate.

Why Needed?:

Transit demand at UBC Okanagan is anticipated to almost triple over the next 20 years. Hollywood Road North presents an opportunity for a new transit route to help service the additional demand.

Key Benefits:

The Hollywood Road North extension project would provide a direct connection to UBC Okanagan and the future transit operation and maintenance facility, and could support new transit ridership if the future industrial land use is developed in a way to focus transit-supportive businesses close to the corridor.

Coordination with BC Transit will be needed to determine the appropriate transit service on this future corridor, considering growing transit demand at UBC Okanagan and any service changes planned for parallel and adjacent routes.

Supporting Programs:

- Expanded frequent transit (UBC Okanagan – Rutland)
- Transit-supportive industrial development

Partners: City of Kelowna, BC MoTI, BC Transit, UBC Okanagan

Project Cost Range: $$

New Four Lane Cross Section on Clement Avenue. (Source: Google Maps)

Clement Avenue Capacity Optimization

Description:

This project would create a uniform cross section from Ellis to Gordon, widening the remaining two-lane sections to four lanes. As the corridor redevelops, some portions of the project are being developed via frontage improvements, though other portions will still need to be delivered.

The project would also include strategic capacity improvements and optimization to maximize the capacity of the corridor for traffic and transit, and would delay or reduce the need to further widen Clement Avenue in the future. Intersections with Clifton Road, Gordon Drive, Ethel Street and Richter Street would be optimized and coordinated to improve east-west traffic flow, and potentially incorporate transit priority measures as well.

Why Needed?:

Clement Avenue provides an alternate route to Highway 97 for travel to / from downtown Kelowna. In particular, it provides more direct access to the rapidly developing north end of downtown.

Key Benefits:

Traffic signal optimization will maximize the capacity of this route without needing to expand beyond four lanes or widen other streets.

Supporting Programs:

- N/A

Partners: City of Kelowna

Project Cost Range: $

Bus Priority/ Queue Jump Lane, Christchurch New Zealand (Source: Google Maps)

Pandosy / Richter Transit Enhancement

Description:

This project would optimize transit service between downtown Kelowna, the Kelowna General Hospital area, and the Pandosy Urban Centre using both Pandosy and Richter Streets. Transit service restructuring would occur in combination with transit frequency enhancements, and transit priority measures, such as queue jumps and transit signal priority, where appropriate. Additional study is recommended to determine the long-term potential for local and express style transit service, as well as higher capacity transit along these corridors.

Why Needed?:

The number of trips traveling between Downtown and the Pandosy and Capri-Landmark urban centres is anticipated to nearly double between now and 2040. If all the future trips are made by driving, congestion will intensify, making access to the multiple regional destinations in this area (i.e. the Kelowna General Hospital, Okanagan College, Downtown, and the Pandosy Urban Centre) more challenging.

Key Benefits:

This project would make transit faster and more reliable between these key regional destinations and help shift a greater portion of future trips to transit, reducing congestion, GHG and providing people with more travel choices.

Supporting Programs:

- Expanded frequent transit service along Pandosy and Richter

Partners: City of Kelowna, BC Transit

Project Cost Range: $$

Burtch Road at Byrns Road (Source: Google Maps)

Burtch Road Extension

Description:

This project would provide a continuous north-south corridor from Glenmore Road to KLO Road, by extending Burtch Road south to KLO Road and reconfiguring the junction of Spall Road, Glenmore Road and Bernard Avenue.

Burtch Road and Bernard Avenue would need to be realigned in the area around the Apple Bowl, in conjunction with future redevelopment of the Apple Bowl site and proposed new school. The new corridor would be a combination of two lanes (in the south) and four lanes (north of Springfield Road). Some planning for the southern extension to KLO Road has been completed, but not designed.

Why Needed?:

Currently, Clement Avenue and Glenmore Road directly connect to Spall, which terminates at Springfield Road. The current configuration creates a discontinuous network for north-south travel and congested conditions along Spall Road. Spall Road would be challenging to extend south due to the presence of agricultural land.

Key Benefits:

This project would provide a continuous north-south corridor that would improve connections to regional destinations to the south (e.g. Okanagan College) while minimizing encroachment into agricultural lands. The project would enhance network connectivity and efficiency, and help relieve congestion on Spall Road.

Supporting Programs:

- N/A

Partners: City of Kelowna, BC MoTI, Developers

Project Cost Range: $$

17 Avenue SE Median Transit Lanes, Calgary (Source: HDR)

No. 3 Road Median Transit Lanes, Richmond (replaced by SkyTrain) (Source: HDR)

Highway 97 Dedicated Median Transit Lanes, Bridge to Hollywood Road

Description:

This project would add dedicated transit lanes in the median along Highway 97and enhanced transit service to create a fast and reliable transit corridor from the bridge to UBC Okanagan.

The goal of the project would be to achieve a fast and reliable transit corridor without reducing existing vehicle capacity. Further study is required to determine the best way to achieve this goal. It is anticipated the project will be part of the next phase of the Ministry of Transportation and Infrastructure's Central Okanagan Planning Study.

Why Needed?:

Adding dedicated transit lanes along Highway 97 would:

- Increase the people-moving capacity of the corridor
- Make more efficient use of the existing road network
- Make transit faster and more reliable by allowing transit to bypass traffic and stay on schedule

Adding dedicated transit lanes to Harvey Avenue would also protect space for potential future conversion to light rail or other type of higher capacity transit. This may be possible in the future as the population grows and technology brings costs down.

Key Benefits:

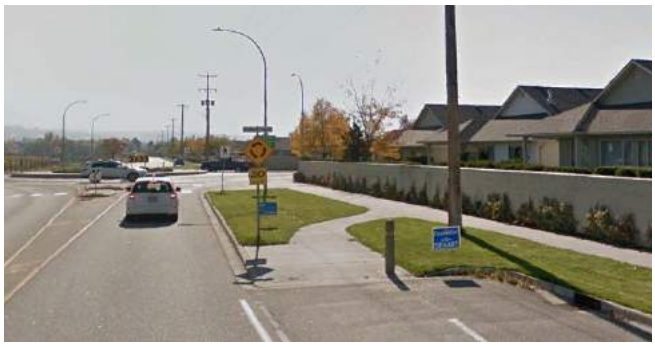
The project would increase the people-moving capacity of the Highway 97 corridor between the bridge and UBC Okanagan.

Supporting Programs:

- Realignment of local transit network
- Enhanced frequent transit service
- Coordination with Clement Avenue Extension

Partners: City of Kelowna, BC MoTI, BC Transit

Project Cost Range: $$$



Similar design standard - Burtch Road at Byrns Road (Source: Google Maps)

Clement Avenue Extension – Clement Avenue to McCurdy Road

Description:

This project would extend Clement Avenue from Spall Road to Highway 33, with a connection at Dilworth Drive. This project is recommended for consideration in conjunction with the dedicated transit lanes project along Highway 97. The project includes a two-lane, at-grade roadway initially developed to Highway 33 with the potential to extend the road to McCurdy Road in the future (long-term vision). The Okanagan Rail Trail would be preserved, though some realignment may be necessary.

Further study, in partnership with the Ministry of Transportation and Infrastructure is recommended prior to implementation.

Why Needed?:

Extending Clement Avenue from Spall Road to Highway 33 would help reduce the growth of traffic congestion on Harvey Avenue and help improve the movement of people and goods.

Key Benefits:

This project would help provide east-west roadway capacity parallel to Highway 97 if needed as a result of the installation of dedicated transit lanes on Highway 97.

Supporting Programs:

- Coordination with Highway 97 Dedicated Transit Lanes project

Partners: City of Kelowna, BC MoTI

Project Cost Range: $$$

Evergreen Point Floating Bridge Approach, SR 520, (Source: Washington State DOT)

Eastbound Transit Lane on the Bridge (Morning Only)

Description:

This project would provide an eastbound transit lane on the WR Bennett Bridge during the morning rush hour. The goal of this project would be to make transit across the bridge faster and more reliable, without reducing the existing vehicle capacity on the bridge. Further study is required to determine the best way to achieve this goal. It is anticipated the project will be part of the next phase of the Ministry of Transportation and Infrastructure's Central Okanagan Planning Study.

Why Needed?:

Studies have shown there is sufficient capacity on the bridge until at least 2040, although the approaches may reach capacity before then. Routes that cross the bridge currently experience congested conditions, in particular, during the morning rush.

Key Benefits:

Creating an eastbound transit lane in the mornings on the bridge would be an innovative way to increase the people-moving capacity of the bridge. It would:

- Make transit faster and more reliable during the busy morning rush
- Allow transit to bypass traffic and stay on schedule
- Make more efficient use of the existing infrastructure

Supporting Programs:

- Coordination with the Hwy 97 Dedicated Median Transit Lanes project
- Expanded RapidBus Service

Partners: City of Kelowna, WFN, BC MoTI, BC Transit

Project Cost Range: $$

Crowchild Trail Shoulder Transit Lanes, Calgary (Source: HDR)

Shoulder Transit Lane (Source: Washington State DOT)

Westside Highway 97 Shoulder Transit / Park and Ride

Description:

This project would widen the shoulder along Highway 97 from Westlake Road to the bridge to allow transit to bypass traffic and move onto the bridge faster and more reliably. In addition, this project recommends park and ride lots adjacent to transit stops along the highway corridor (specific locations to be determined). The park and rides would facilitate access to transit from areas that are too far to walk or bike.

Why Needed?:

Traffic delays are frequently experienced on Hwy 97 eastbound toward the bridge. Currently transit runs in mixed traffic, reducing its competitiveness with auto travel. To manage the growth of traffic congestion over the long-term it will be important to increase the people-moving capacity of the corridor and provide options that can help reduce auto dependence.

Further study, including coordination with potential interchanges at Westlake Road and Boucherie Road, is required. It is anticipated that this project will be included as part of the next phase of the Ministry of Transportation and Infrastructure's Central Okanagan Planning Study.

Key Benefits:

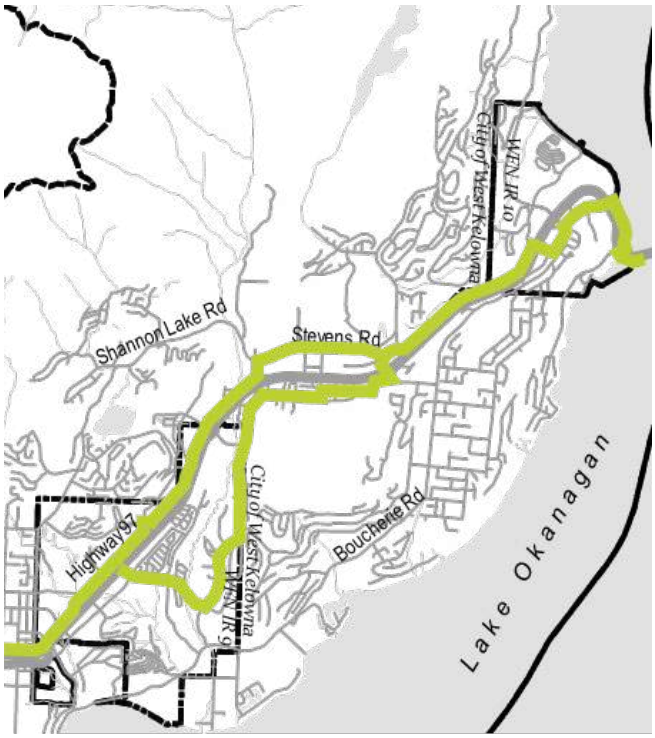
Using the shoulder for transit would increase the people-moving capacity of the Highway 97 corridor, make more efficient use of the existing road network and make transit faster and more reliable. Park and ride lots would enable more people to safely and reliably access transit.

Supporting Programs:

- Expanded RapidBus Service and local transit service reconfigurations

Partners: WFN, City of West Kelowna, BC MoTI, BC Transit

Project Cost Range: $$$



Multi-use Pathway adjacent to Highway 97, Lake Country (Source: Google Maps)

Active Transportation Route Parallel to Highway 97

Description:

This project would develop an active transportation route parallel to Highway 97 between the WR Bennett Bridge and Westbank Centre. The project would take advantage of existing bicycling routes and local streets on both sides of the highway. Some new pathways or other facilities would need to be constructed to connect gaps. Some of these gaps could be addressed in conjunction with other projects, such as the Westlake and/or Boucherie interchange projects. The route would be a mix of separated on- and off-street facilities, with the ultimate goal of creating a continuous corridor that is separated from traffic. More project information is provided in the Regional Bicycling and Trails Master Plan.

Why Needed?:

The Highway 97 corridor is the most direct continuous route between the bridge and Westbank Centre. However, narrow shoulders and high-speed traffic make Highway 97 an inhospitable environment for bicyclists, even those who are experienced and confident. As such, it is currently challenging for people biking to connect to many destinations on the Westside.

Key Benefits:

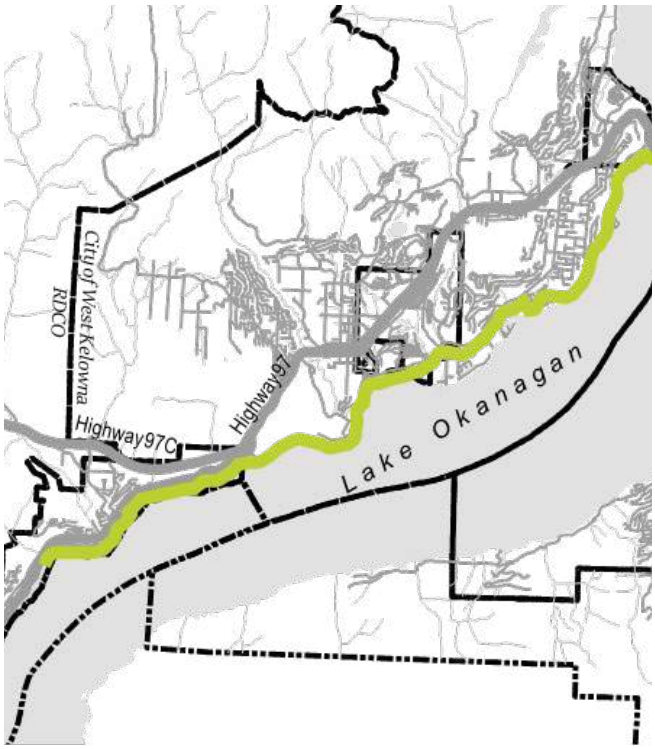
This project would provide a regional active transportation corridor on the Westside, connecting people walking and biking to destinations within West Kelowna, WFN and to the bridge. The facility could also enable better pedestrian and bicycle connections to RapidBus stations along Highway 97.

Supporting Programs:

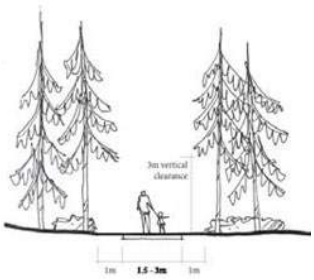
- N/A

Partners: WFN, City of West Kelowna, BC MoTI, BC Transit

Project Cost Range: $$



Okanagan Rail Trail, (Source: Global News)



Goats Peak Park multi-use trail concept (Source: RDCO)

Westside Trail

Description:

This project includes a multi-use pathway on the west side of Okanagan Lake, extending from the WR Bennett Bridge to Peachland. While portions of the trail exist along the route, the majority remains to be completed.

The project would follow existing corridors where possible, but it would require some land acquisition to provide direct connections in some locations. Where there is not enough right-of-way and where traffic volumes are low, a greenway or shared street may be considered. For some constrained sections, the Highway 97 right-of-way may need to be considered. The project would need to be developed in phases. More details on this project are available in the Regional Bicycling and Trails Master Plan (RBTMP).

Why Needed?:

There is currently no continuous active transportation facility that connects regional destinations on the Westside. The project would also be a key component of the Trail of the Okanagans, which is envisioned to ultimately connect from Vernon, across the bridge, and all the way south to the Canada / US border.

Key Benefits:

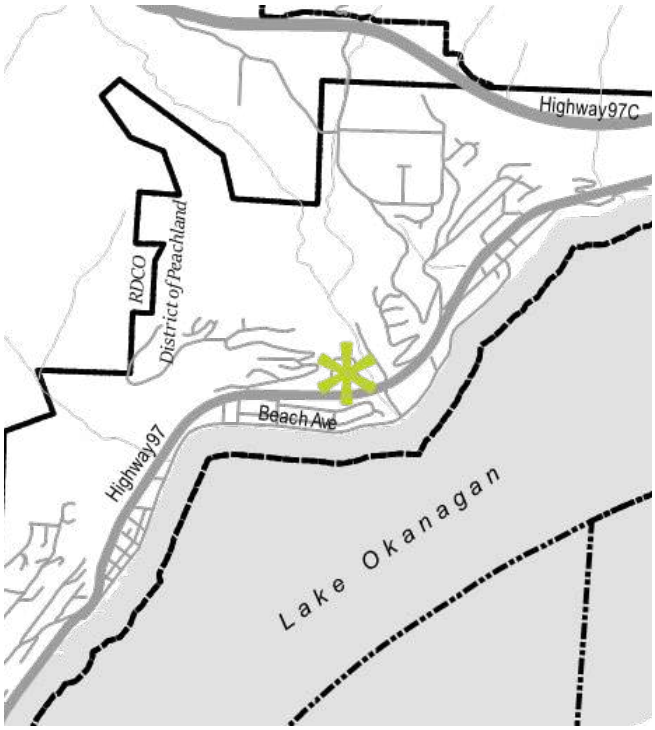
This project would provide a regional active transportation corridor on the Westside, connecting people walking and biking along the lakefront from Peachland to the WR Bennett Bridge. This route would likely serve as both a commuting and a recreational amenity, attracting new riders, bicycle tourism, and supporting regional economic growth.

Supporting Programs:

- N/A

Partners: WFN, City of West Kelowna, RDCO, District of Peachland, BC MoTI

Project Cost Range: $$



BC Transit Sooke Park and Ride (Source: Google Maps)

Peachland Mobility Hub

Description:

This project would develop a mobility hub in Peachland located with convenient access to Highway 97, and potentially near the Peachland Shopping Centre (IGA). The mobility hub would need to be developed around a transit exchange, and could include transportation services and amenities such as park and ride, bicycle parking, electric vehicle charging, carshare, bikeshare, scooter share, and/or ride-hail/taxi stand options, among others.

Why Needed?:

Currently, dispersed land uses make it challenging for Peachland residents to access transit. Providing travel options that help connect Peachland residents to/from transit would help extend the reach of transit and make it a viable option for more people.

Key Benefits:

The project would improve access to/from transit for Peachland residents.

The project is recommended in conjunction with increases in population and employment densities in the area. This would help make frequent and direct transit service connections between Peachland and the rest of the Central Okanagan region more feasible over time.

Supporting Programs:

- On-demand transit service
- Land use intensification

Partners: District of Peachland, BC Transit, BC MoTI

Project Cost Range: $

Westside Road (Source: Google Maps)

Highway 33 (Source: Google Maps)

Westside Road and Highway 33 Upgrades

Description:

This project recommends the continuation of maintenance, rehabilitation and safety upgrades along Westside Road and Highway 33 to support rural connections within the region. Recent improvements on Westside Road have helped to address the importance of this route as an alternative to Highway 97 and to the population that lives along Westside Road.

Although the deficiencies are not as prominent on Highway 33, it is also an important route for residents and as a connection to the Kootenays.

Why Needed?:

Upgrading and regular maintenance are critical to maintain the safety and reliability of these routes.

Key Benefits:

These corridors are the primary routes connecting the rural areas of the region, and are significant goods movement routes.

Supporting Programs:

- Demand-responsive transit service
- Park and ride lots at Rutland Town Centre and Westside Road

Partners: RDCO, BC MoTI, BC Transit

Project Cost Range: N/A

5.3.3 Alignment with RTP Goals

All of the recommended projects and supporting services together form a regional transportation system that will address the vision and goals of the RTP. **Table 12** provides a summary of the goals that each of the recommended projects addresses. Lack of a check mark does not indicate misalignment with a goal, but rather signifies the goal is not directly addressed by the recommended project.

Table 12: Summary of Recommended Projects and RTP Goals

Recommended Project	Safe	Efficient	Sustainable	Affordable	Economic Growth	Equitable and Accessible	Quality of Life	Environmentally Responsible	Multi-modal	Adaptable
Glenmore Road Safety Upgrades	✓	✓							✓	
Pelmewash Parkway to Okanagan Rail Trail Active Transportation Connection	✓		✓	✓		✓	✓	✓	✓	
Complete Okanagan Rail Trail	✓		✓	✓	✓	✓	✓	✓	✓	
Winfield Mobility Hub / Park and Ride			✓	✓	✓	✓	✓	✓	✓	✓
Okanagan Gateway	✓	✓			✓		✓		✓	✓
Dilworth Active Transportation Connection	✓		✓	✓		✓	✓	✓	✓	
Glenmore Road Multi-modal Arterial	✓	✓	✓		✓		✓		✓	
Hollywood Road North Transit Corridor – Highway 97 to UBC Okanagan	✓	✓	✓		✓	✓			✓	
Clement Avenue Capacity Optimization		✓			✓					
Pandosy / Richter Transit Enhancement			✓			✓	✓	✓	✓	✓
Burtch Road Extension		✓			✓					
Highway 97 Dedicated Median Transit Lanes, Bridge to Hollywood Road		✓	✓		✓	✓	✓	✓	✓	✓
Clement Avenue Extension – Clement Avenue to McCurdy Road (COMC Corridor)		✓			✓					
Eastbound Transit Lanes on the Bridge (Morning Only)		✓	✓	✓	✓	✓	✓	✓	✓	✓
Westside Highway 97 Shoulder Transit / Park and Ride		✓	✓			✓	✓	✓	✓	✓
Active Transportation Route Parallel to Highway 97	✓		✓	✓		✓	✓	✓	✓	
Westside Trail	✓		✓		✓	✓	✓		✓	
Peachland Mobility Hub			✓	✓	✓	✓	✓	✓	✓	✓
Westside Road and Highway 33 Upgrades	✓	✓			✓		✓			
TOTAL NETWORK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

06 Moving Forward Together to Achieve Our Regional Transportation Vision

Moving Forward Together to Achieve Our Regional Transportation Vision

The RTP establishes a framework for priorities over the next 20 years so that Central Okanagan governments can plan and seek funding as a unified region. This section describes next steps for implementation of the RTP, including the future of the STPCO and partnerships that will be required to deliver on the RTP recommendations.

6.1 Future of STPCO

The STPCO partners have been meeting several times per year since the STPCO's formation in 2012. Based on recent discussions, there is agreement that periodic meetings to discuss regional transportation issues have merit; however, the STPCO's mandate and governance structure remains in question.

In 2017, a review of the development and history of the STPCO was conducted. The review documented feedback from the Board and CAO Committee, and proposed initiatives that may help the STPCO evolve to offer greater long-term positive impacts to sustainable regional transportation.

Through the RTP development process, the STPCO partners have had several discussions regarding the next steps for the STPCO, how best to implement the RTP, the principles of good governance and the importance of an organization's mandate, membership and structure. The partners have agreed that a new, more effective and simpler governance structure would be beneficial to oversee implementation of the RTP.

The current preference among the partners is to dissolve the STPCO and align with and transfer the current functions to the RDCO. A number of challenges with this approach must be resolved over the next two years as the regional service is formalized. These include questions related to staff capacity, mandate, scope, membership, voting structure and cost sharing. However, as a starting point, the STPCO LGA Board has recommended that the STPCO be dissolved and directed staff to transfer some of the regional functions formerly carried out under the STPCO to the RDCO effective January 1st, 2021. The functions that will continue to be delivered after the dissolution of the STPCO include support for the School District #23 Traffic Safety Officer position, regional bicycling promotion, and support for

the smartTRIPS website and brand. These functions are recommended to be administered by the RDCO on an initial two-year contract basis to the City of Kelowna for ease of continuity.

To implement the RTP and monitor progress, the STPCO LGA Board has recommended the creation of a regional technical committee administered by the RDCO and initially facilitated by City of Kelowna staff, while a formal regional service is created. Additionally, the Board recommended that the RDCO administration place regional transportation on the agenda at two Regional Board meetings each year to promote discussion and cooperation on regional transportation issues.

6.2 Monitoring the RTP Success

Monitoring the success of the RTP will require data collection, analysis, and a lead agency to be accountable for reporting out on progress. Instead of embedding a monitoring plan within the RTP that will have uncertainty among all of these requirements, it is recommended that development and implementation of an RTP monitoring plan be among the first tasks of the emerging RDCO functions and technical committee responsible for overseeing the implementation of the RTP. This will allow a plan to be developed within the budget and resource capabilities of the new committee and functions.

In addition to tracking the status of the proposed projects, programs and policies in the Regional Transportation Plan, key performance metrics for the region should be tracked on an annual basis, which will require the collection of regional data.

The availability of high-quality regional data will require that both the Regional Travel Model and the Regional Okanagan Travel Survey be kept up to date. It is recommended that funding five-year updates to both be a priority to help inform performance monitoring of the RTP. This will allow for monitoring of key performance metrics, such as:

- Vehicle kilometres travelled (VKT) per capita (which can be used to estimate fuel consumption and GHG emissions)
- Average trip length
- Mode split by trip purpose

With the results of the 2007, 2013 and 2018 Regional Okanagan Travel Surveys the region is building historical trends. The 2018 results can serve as the baseline for many of the monitoring metrics and can be used to update the Regional Travel Model, if funding can be secured. The Census Journey to Work data is also a valuable source of performance monitoring data. Although it is limited to commuting trends, it can provide valuable information on those trends, possibly as an interim source of information to the Regional Okanagan Travel Survey. The key Journey to Work metrics would include:

- Average commuting distance
- Mode split
- Self-containment (proportion of work trip destinations in the same municipality as the place of residence)

On an annual basis, there is also count data available by mode that can be compared year over year, including:

- Traffic counts on key links (BC MoTI count stations and local traffic count information)
- Pathway counts on key active transportation corridors such as the Okanagan Rail Trail and on the WR Bennett Bridge
- Transit passenger counts

6.3 Implementation and Partnerships

Without a single organization to implement the RTP, long-term success will depend on partnerships to deliver the recommendations. This section provides guidance on implementation priorities and potential partnerships.

6.3.1 Coordinated Local and Regional Planning

To implement the RTP, the first priority will be to update local land use and transportation plans to align with the RTP and provide consistency across the region. The highest priority should be local transportation master plans, but should also include official community plans, the Regional Growth Strategy and other land use planning documents to reflect the concentration of population and employment densities in urban and town centres and along regional transit corridors.

The RTP is intended to facilitate collaboration among the STPCO partners and support coordinated communication with senior government to aid in securing project funding.

Alignment of local plans with the RTP will demonstrate a commitment to coordination and facilitate RTP implementation. It will also help to balance regional needs with the aspirations of local governments and provide the private sector with consistency.

6.3.2 BC Transit

Many of the RTP recommendations would require close coordination with BC Transit. This section highlights the recommendations that would require close partnerships with BC Transit for successful implementation.

Demand Responsive Transit Service

This is a pragmatic option for the delivery of local transit service in areas where fixed route, scheduled service is not practical, such as low density rural and outlying parts of the region, and may be an alternative to some existing conventional services. Ideally, the on-demand service would be operated by, or in partnership with BC Transit allowing for integration with regional transit service. There may be a need for a partnership with a private provider to gain access to an app and other supporting technologies.

Future Extensions of Frequent and RapidBus Services

The STPCO partners should continue to work with BC Transit to expand frequent and RapidBus transit service as the region grows, where appropriate. Specific recommendations are described in section 5.1.3. Partnering with BC Transit to develop transit service plans that are coordinated with and support areas of growing population and employment densities will be important for success.

In addition, several of the RTP project recommendations will require coordination and partnership with BC Transit. These include:

- Highway 97 Dedicated Median Transit Lanes
- Eastbound Transit Lane on the Bridge (Mornings Only)
- Westside Highway 97 Shoulder Transit / Park and RideHollywood North Extension Transit Corridor
- Winfield and Peachland Mobility Hubs
- Pandosy / Richter Transit Enhancement

Project sheets with additional information on each project can be found in section 5.3.2

6.3.3 BC Ministry of Transportation and Infrastructure

Reflecting the importance of the highway system to travel in the Central Okanagan, many of the RTP project recommendations will require further study, planning and design by BC MoTI in the context of the Ministry's needs for a provincial highway. The RTP provides important guidance around regional priorities that will serve as input to future BC MoTI planning processes, including the next phase of the Central Okanagan Planning Study (COPS). Several of the recommended RTP projects are significantly related to Highway 97, including:

- Highway 97 Dedicated Median Transit Lanes
- Clement Avenue Extension to McCurdy Road
- Eastbound Transit Lane on the Bridge (Mornings Only)
- Westside Highway 97 Shoulder Transit / Park and Ride

Recommended projects that will either cross a provincial highway or have components located within highway right-of-way will also require coordination and partnership with MoTI, such as:

- Pelmewash Parkway to Okanagan Rail Trail Active Transportation Connection
- Dilworth Active Transportation Connection
- Westside Trail

Other projects, programs and studies that will require coordination between the STPCO partners and BC MoTI include:

- **Hollywood Road North Connection to Highway 97** - The Hollywood Road North extension project may require some changes to the current signalized intersection of Highway 97 and Lloyd / Findlay Road. The City of Kelowna and BC MoTI will need to coordinate to agree on the form of intersection, which could occur as part of the next phase of the Central Okanagan Planning Study and/or as the project moves into design.
- **Burtch Road and Highway 97** - The intersection of Burtch Road and Highway 97 may need to be modified as part of the Burtch Road extension project, which will increase the importance of Burtch Road as a north-south connection across the highway. Further analysis and coordination between the City of Kelowna and BC MoTI is needed, which could occur as part of the next phase of the Central Okanagan Planning Study and/or as the project moves into design.
- **Regional Active Transportation Route Adjacent to Highway 97** - This project involves creating a continuous active transportation route along Highway 97. It is assumed this route will be established taking advantage of the local street network in the shorter term, and will initially be a route for more confident bicyclists, with upgrading to an all-ages-and-abilities (AAA) in the longer term. Combined with expansion of bike lanes and signage, a continuous route from Westbank Centre to the bridge is possible to accommodate more experienced bicyclists that avoids the need to use the highway. There may be recommended to create a short link on either side of the highway in conjunction with development of the Boucherie and Westlake interchanges, and/or the shoulder transit lanes.
- **Westside Road and Highway 33** - Westside Road and Highway 33 are the primary regional links for the RDCO West and East Electoral Areas respectively. Coordination between BC MoTI and the RDCO already exists. This coordination should continue and implementation of safety improvements, particularly on Westside Road should continue to improve the reliability of these routes.
- **Regional Goods Movement Strategy** - A Regional Goods Movement Study is recommended to inform BC MoTI highway planning priorities, as well as local strategies to support getting goods to market. The Study should be implemented in partnership with BC MoTI and with input from industry stakeholders (see section 5.1.2).
- **Okanagan Gateway** - Many of the recommendations in the Okanagan Gateway Transportation Study either directly involve or will benefit Highway 97. Partnerships between the study partners, including the City of Kelowna, YLW, UBC Okanagan, and MoTI will be needed to successfully implement the study recommendations.
- **Highway 97 Lake Country Planning Study (Glenmore / Beaver Lake Road)** - This study is currently being conducted by BC MoTI and is considering transportation solutions in the Highway 97 corridor from Duck Lake to Lodge Rd, with specific emphasis on the intersection of Highway 97 and Beaver Lake Road. The RTP is designed to coordinate with this study and assumes the transportation issues in this corridor will be addressed by the MoTI study recommendations. As such, the RTP focuses primarily on improved transit access and service to the Winfield Town Centre. It is anticipated that partnerships and coordination will be needed between the jurisdictions in the study area and MoTI to deliver on the study recommendations.
- **Peachland Transportation Study** – This study is currently being conducted by MoTI and looks at improvements to the highway corridor in and through Peachland. The RTP is designed to coordinate with this study and assumes the transportation issues in this corridor will be addressed by the study recommendations. As such, the RTP focuses primarily on improved transit and active transportation connections to Peachland. It is anticipated that continued coordination between BC MoTI and the District of Peachland will be necessary to implement the Study recommendations related to the highway.
- **Central Okanagan Planning Study (Phase 1)** – There were several areas reviewed in the first phase of COPS, such as the highway configuration through Westbank Centre. These project concepts were not addressed in the RTP, but are expected to require further coordination with BC MoTI in the next phase of COPS.

6.3.4 Okanagan Rail Trail Partners

Okanagan Rail Trail Completion

Completing the gap in the Okanagan Rail Trail between Kelowna International Airport and Lake Country will require continued collaboration among the Okanagan Rail Trail partners. Once completed, there will be a continuous trail between downtown Kelowna and the Vernon area.

6.3.5 City of Kelowna and District of Lake Country

Glenmore Road Upgrades

Upgrades to Glenmore Road between John Hindle Drive and Highway 97 in Lake Country will likely occur gradually and opportunistically. As this connection benefits both communities, there should be coordination on issues such as design standards, timing and sequencing of projects and potentially joint funding applications to senior government.

6.4 Implementation Summary

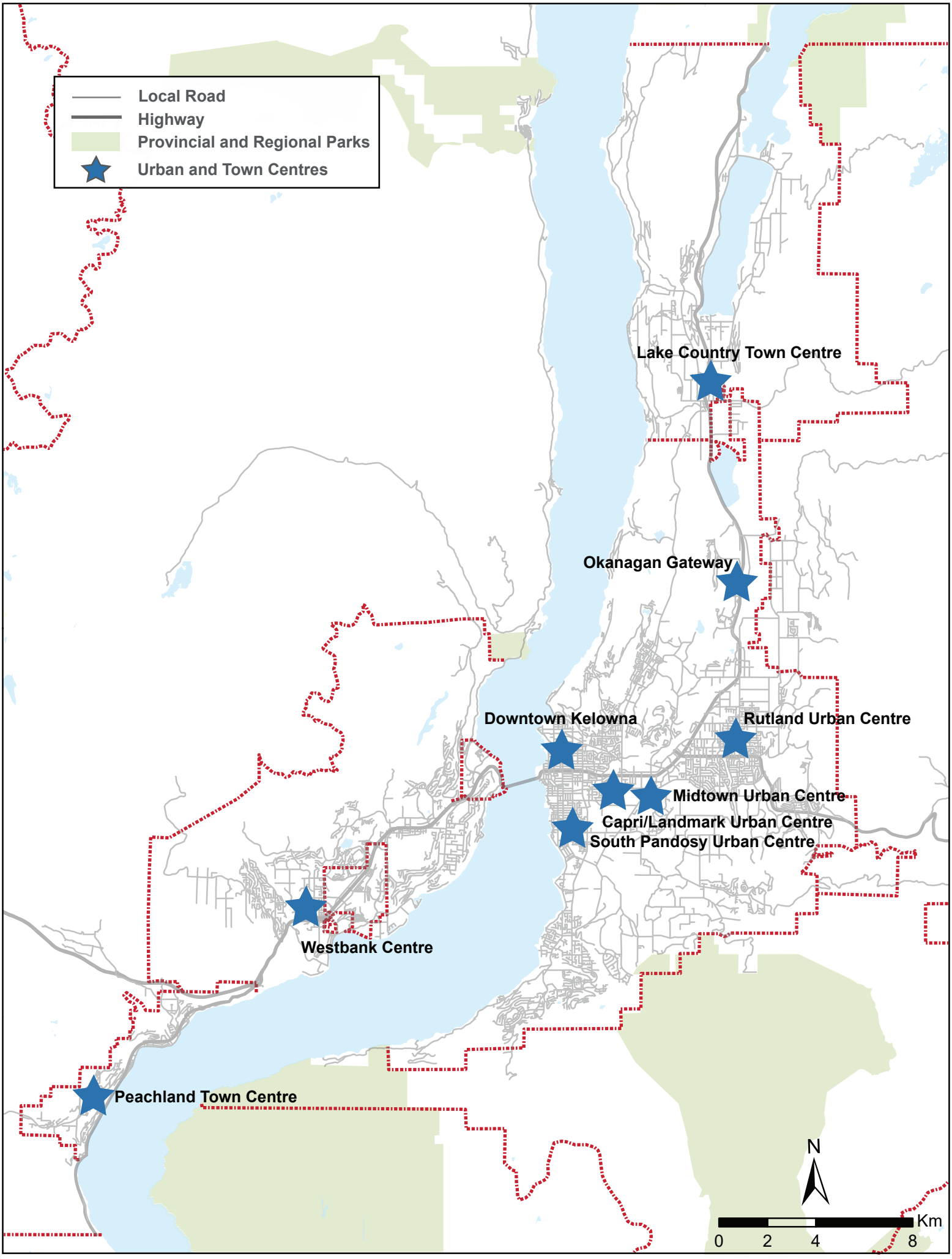
A summary of the current and previous planning for each of the RTP recommendations is provided in **Table 13**. While each one is at varying levels of development, all are considered strategic in nature and require further project / program development to confirm preferred concepts or design.

Table 13: Implementation Status

Project / Service	Potential Partners	Status	Key Next Steps
Glenmore Road Safety Upgrades	District of Lake Country, City of Kelowna	Minimal / localized previous planning	• Confirm alignment within Lake Country, including consideration of effects related to current BC MoTI Lake Country Planning Study • Establish of long-term, consistent design standards
Pelmewash Parkway to Okanagan Rail Trail Active Transportation Connection	District of Lake Country, BC MoTI	Preliminary planning has been completed	• Confirm Oceola Road / Highway 97 crossing configuration • Preliminary and detailed design
Complete Okanagan Rail Trail	Okanagan Rail Trail Partners	Design completed	• Complete transfer of ownership from CN Rail to Government of Canada • Final design and construction
Winfield Mobility Hub / Park and Ride	District of Lake Country, BC Transit, BC MoTI	No prior planning	• Identify hub location • Transit service planning coordination
Okanagan Gateway	BC MoTI, City of Kelowna, Kelowna International Airport, UBC Okanagan, BC Transit	Localized previous planning	• Finalize Okanagan Gateway Transportation Study
Dilworth Active Transportation Connection	City of Kelowna, BC MoTI	Alternatives analysis completed	• Detailed planning, preliminary and detailed design
Glenmore Road Multi-modal Arterial	City of Kelowna, BC Transit	Minimal / localized previous planning	• Incorporation into Kelowna TMP • Planning and design for various project components
Hollywood Road North Transit Corridor – Highway 97 to UBC Okanagan	City of Kelowna, BC Transit, BC MoTI, UBC Okanagan	Previous land use and roadway alignment planning	• Confirm Highway 97 intersection configuration through next phase of COPS • Incorporation into Kelowna TMP
Clement Avenue Capacity Optimization	City of Kelowna	Varying levels of planning and investigation	• Preliminary and final design • Detailed traffic operation review and signal design
Pandosy / Richter Transit Enhancement	City of Kelowna, BC Transit	Minimal previous planning	• Incorporation into Kelowna TMP • Conduct Pandosy / Richter Transit Corridor Study
Burtch Road Extension	City of Kelowna, BC MoTI, Developers	Some planning for south extension only	• Detailed planning of Burtch Road / Highway 97 intersection in next phase of COPS • Coordination with Apple Bowl, school site and other redevelopment
Highway 97 Dedicated Median Transit Lanes	City of Kelowna, BC MoTI, BC Transit	No previous planning	• Further investigation in next phase of COPS
Clement Avenue Extension to McCurdy Road	City of Kelowna, BC MoTI	Previous alignments identified but no planning for the specific recommended project	• Coordinate planning with Highway 97 Dedicated Median Transit Lanes in next phase of COPS
Eastbound Transit Lane on the Bridge (Mornings Only)	City of Kelowna, WFN, BC MoTI, BC Transit	No previous planning	• Further investigation in next phase of COPS
Westside Highway 97 Park and Ride / Shoulder Transit	WFN, City of West Kelowna, BC MoTI, BC Transit	No previous planning	• Further investigation in next phase of COPS • Identification of park and ride locations, with associated local transit service modifications
Active Transportation Route Parallel to Highway 97	WFN, City of West Kelowna. BC MoTI, BC Transit	No previous planning	• Detailed planning and design to identify specific routing and phasing
Westside Trail	WFN, RDCO, City of West Kelowna, District of Peachland, BC MoTI	Previous concept identification; requires detailed planning / design	• Detailed route planning to refine cost estimates • Funding plan and coordination with volunteer trail groups
Peachland Mobility Hub	District of Peachland, BC Transit, BC MoTI	No previous planning	• Identify hub location • Transit service planning coordination
Westside Road / Highway 33 Ongoing Upgrading	BC MoTI, RDCO, BC Transit	BC MoTI maintenance and rehabilitation planning	• Continue safety, maintenance and rehabilitation improvements • Establish park and ride lot locations as Rutland Town Centre and Westside Road to intercept commuters from RDCO electoral areas
Local Plan Updates	All STPCO Partners	Varies by partner	• Align with RTP as plans are updated
Demand Responsive Transit Service	BC Transit, STPCO Partners	No previous planning	• Undertake a feasibility and partnering study
Transit Service Planning	BC Transit, STPCO Partners	Align with next Transit Futures update	• Develop a ridership monitoring plan on key regional routes

The material in this report reflects HDR's professional judgment considering the scope, schedule and other limitations stated in the document and in the contract between HDR and the client. The opinions in the document are based on conditions and information existing at the time the document was published and do not consider any subsequent changes. In preparing the document, HDR did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that HDR shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party resulting from decisions made or actions taken based on this document.

Appendix A: Regional Transportation System Maps


Local Road
Highway
Provincial and Regional Parks
Urban and Town Centres
Lake Country Town Centre
Okanagan Gateway
Downtown Kelowna
Rutland Urban Centre
Midtown Urban Centre
Capri/Landmark Urban Centre
South Pandosy Urban Centre
Westbank Centre
Peachland Town Centre
N
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2
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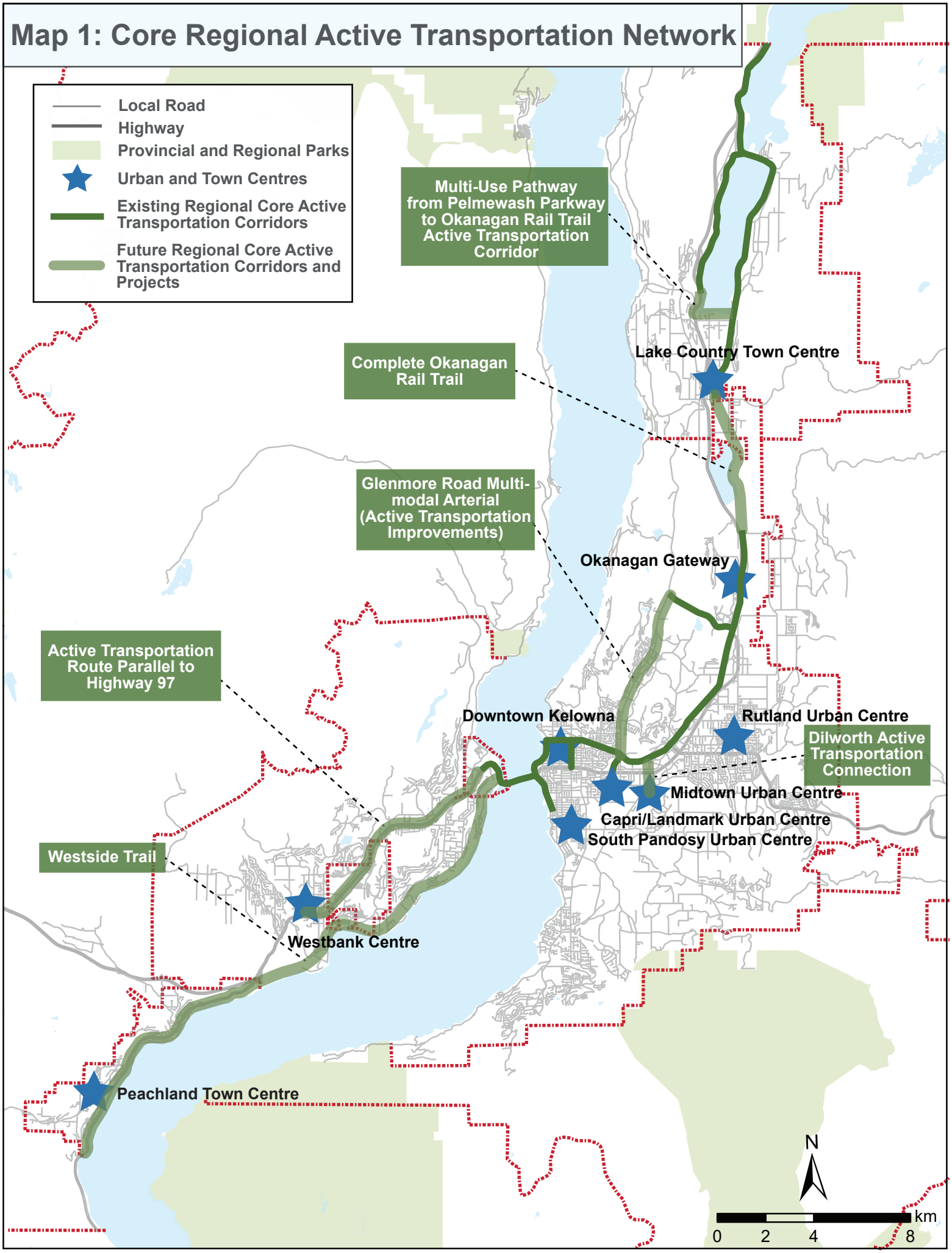
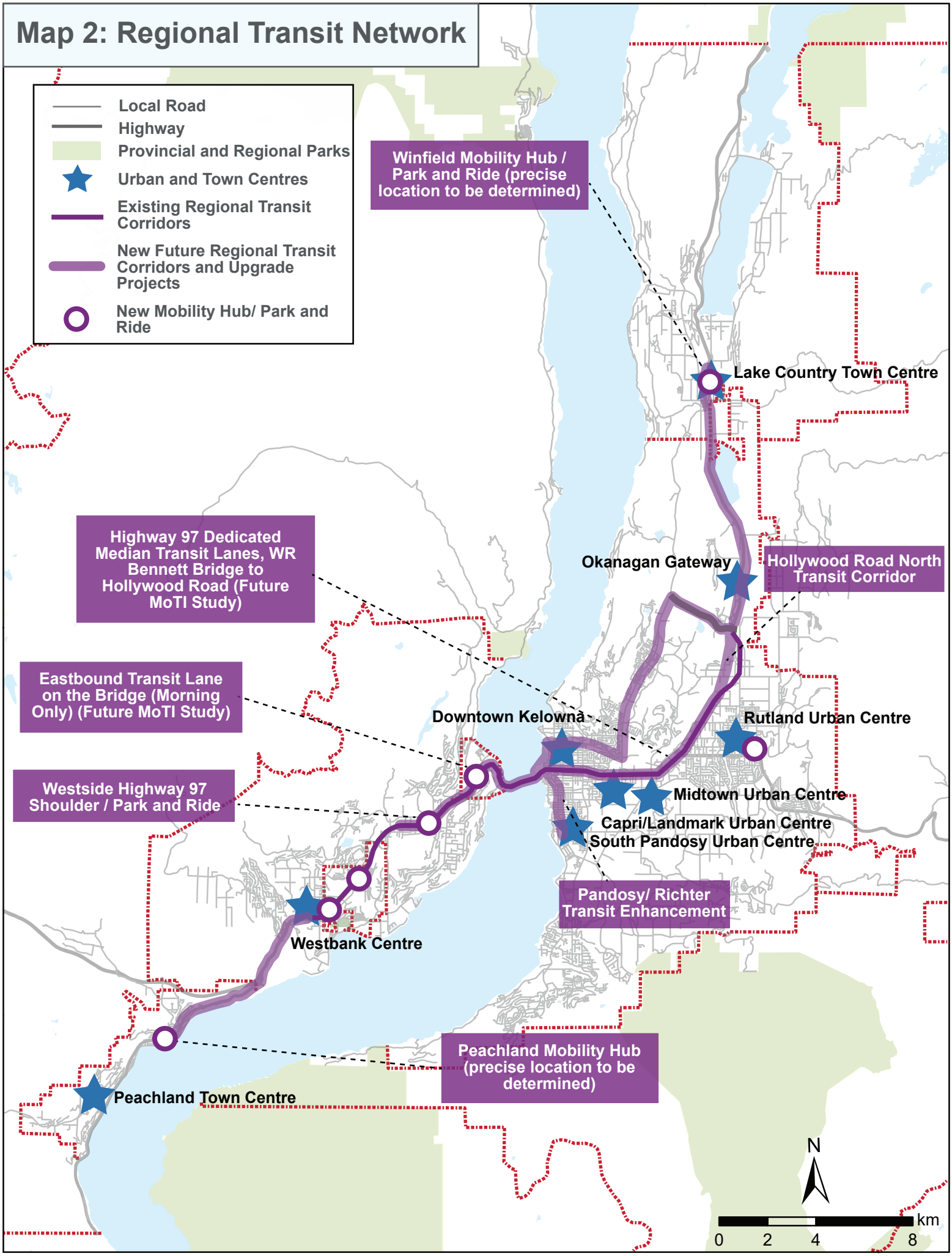
Km

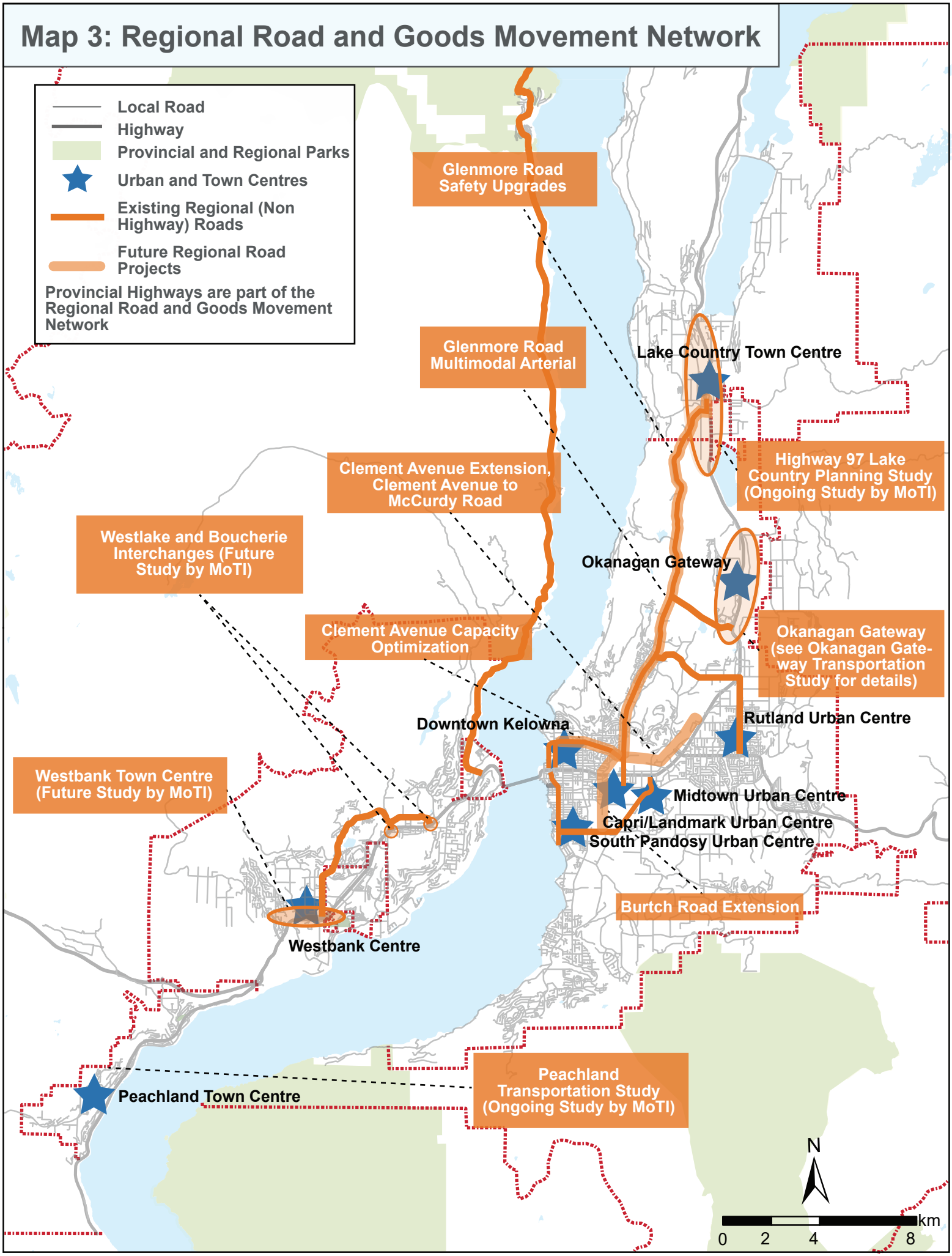
Map 1: Core Regional Active Transportation Network



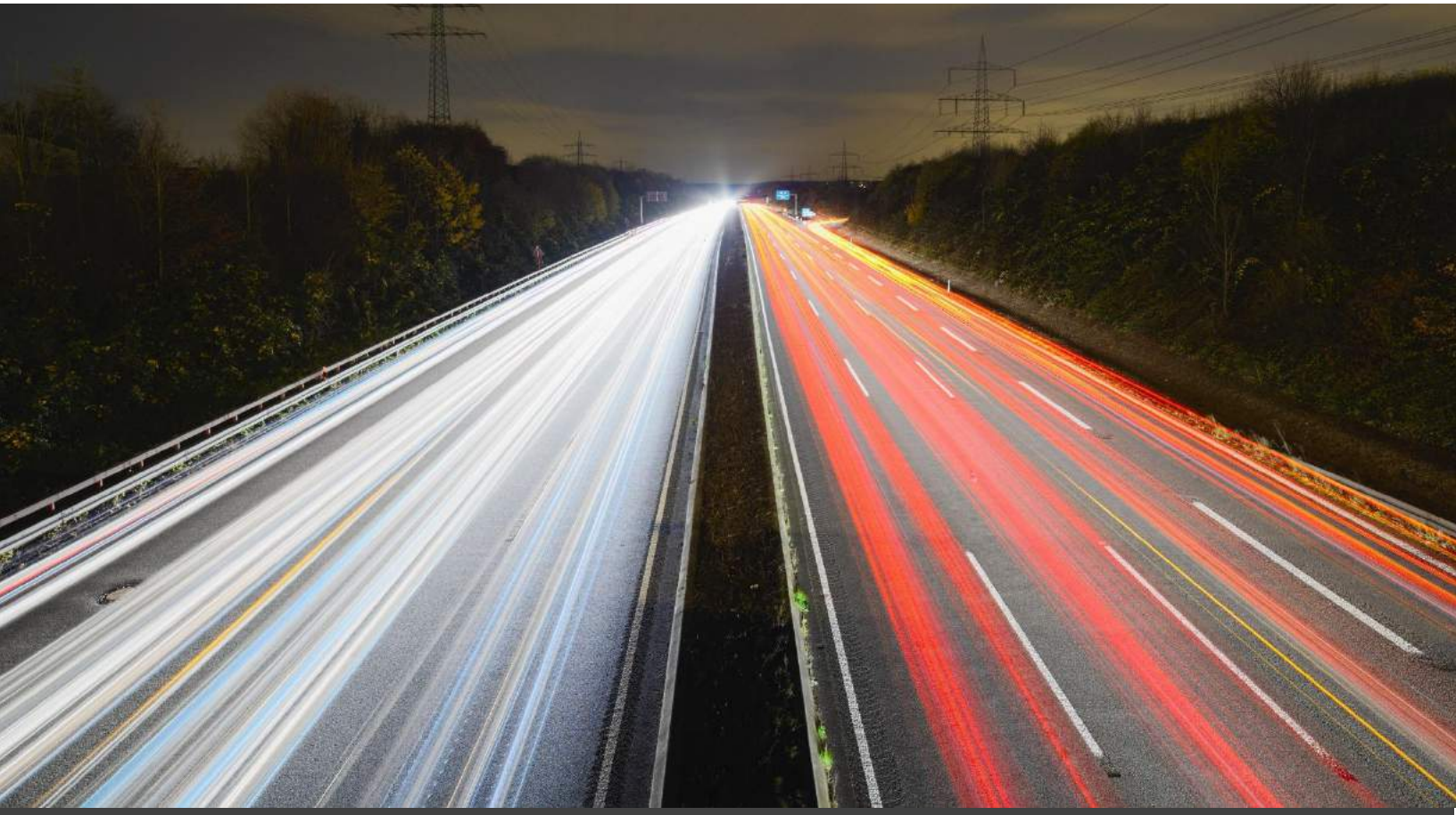
Map 2: Regional Transit Network



Map 3: Regional Road and Goods Movement Network



Appendix B: Congestion in the Central Okanagan



Congestion in the Central Okanagan

STPCO | Regional Transportation Plan

Acuere Consulting
sustainability quantified.

June 2019

Congestion in the Central Okanagan

Baseline Transportation Conditions in Preparation for the Regional Transportation Plan

Submitted to

Sustainable Transportation Partnership of the Central Okanagan (STPCO):

- City of Kelowna
- City of West Kelowna
- District of Lake Country
- District of Peachland
- Regional District of Central Okanagan
- Westbank First Nation

Prepared by

Acuere Consulting Inc.
301-4475 Wayburne Drive
Burnaby, B.C. V5G 4X4

June 2019

Executive Summary

Defining and Measuring Change through Congestion

Congestion is one of the most significant issues for urban regions. Although it is a common and daily experience for many people around the world, congestion is not easily measured or defined. Everyone experiences congestion *subjectively* on a daily basis in most urban settings. However, a more *objective* and deeper understanding from a range of viewpoints is required to manage our problems with congestion.

Physically, congestion is a competition for the same space at the same time to a degree that the *demand* for the use of the space exceeds the *supply* or *capacity* of that space. Congestion can be considered as a feedback to society of the overuse and reliance on the automobile—an early warning sign of potentially larger problems to come. Congestion is also a by-product of prosperity, which is a way of looking at the "congestion cup" as "half-full". It is a "necessary cost" arising from economic growth and the increase in wealth. For decades, studies have shown correlations between economic growth and increased traffic congestion in countries around the world. Conversely, when the economy slows down, so do urban activities. With less people employed or shopping, congestion levels also drop proportionally. On the one hand, we want to eliminate congestion altogether because it is a sign of inefficiency. On the other hand, congestion can be an indicator of prosperity and vitality.

Measuring the various dimension of congestion is a challenge, but through the use of new "big data" methods, the collection of congestion data is now possible at an unprecedented level. From this data, congestion can be defined from a number of metrics to allow for a thorough analysis of the performance of our transport system.

It is important to note the dual nature of congestion: delay and reliability. This duality presents a way to measure congestion that is more consistent to how people experience congestion compared to merely measuring traffic volumes. The various facets of congestion can be meaningfully measured by incorporating congestion delay and reliability along with traditional metrics such as travel time and speeds.

Utilizing a rich dataset of "crowd-sourced" data for a 1-year period, an assessment of congestion in the Central Okanagan was made to understand the performance of main roadways within the region. This entailed the assessment of congestion and travel times along 12 "representative" regional routes in both directions (Exhibit ES.1).

Exhibit ES.1 – Regional Routes

ID	Route Name	General Corridor	Origin	Destination
1i	Lake Country to Downtown Kelowna	along Glenmore & Clement	Glenmore Rd & Beaverlake Rd	Hwy 97 & Abbott
1o	Downtown Kelowna to Lake Country	along Glenmore & Clement	Hwy 97 & Abbott	Glenmore Rd & Beaverlake Rd
2i	Lake Country to Downtown Kelowna	along Hwy 97	Hwy 97 & Beaverlake Rd	Hwy 97 & Abbott
2o	Downtown Kelowna to Lake Country	along Hwy 97	Hwy 97 & Abbott	Hwy 97 & Beaverlake Rd
3i	Black Mountain to Downtown Kelowna	along Hwy 33 & Springfield	Hwy 33 & Goudie	Hwy 97 & Abbott
3o	Downtown Kelowna to Black Mountain	along Hwy 33 & Springfield	Hwy 97 & Abbott	Hwy 33 & Goudie
4i	Kettle Valley to Downtown Kelowna	along Pandosy & Lakeshore	Chute Lake Rd & Main St	Hwy 97 & Abbott
4o	Downtown Kelowna to Kettle Valley	along Pandosy & Lakeshore	Hwy 97 & Abbott	Chute Lake Rd & Main St
5i	Glenmore Heights to Capri Urban Centre	along Bernard & Glenmore	Kane & Drysdale	1835 Gordon
5o	Capri Urban Centre to Glenmore Heights	along Bernard & Glenmore	1835 Gordon	Kane & Drysdale
11i	Peachland to Downtown Kelowna	along Hwy 97	Hwy 97 & Hardy St	Hwy 97 & Abbott St
11o	Downtown Kelowna to Peachland	along Hwy 97	Hwy 97 & Abbott St	Hwy 97 & Hardy St
12i	West Kelowna residential to Downtown Kelowna	along Hwy 97 & Shannon Lake	2616 Shannon Lake Rd	Queensway & Pandosy
12o	Downtown Kelowna to West Kelowna residential	along Hwy 97 & Shannon Lake	Queensway & Pandosy	2616 Shannon Lake Rd
13i	Downtown Peachland to Kelowna General Hospital	along Hwy 97 and Pandosy	5830 Beach Avenue	2268 Pandosy St
13o	Kelowna General Hospital to Downtown Peachland	along Hwy 97 and Pandosy	2268 Pandosy St	5830 Beach Avenue
14i	IR 10 residential to UBCO	along Hwy 97 & Westside	1525 Echo Blvd	University Way & Innovation Drive
14o	UBCO to IR 10 residential	along Hwy 97 & Westside	University Way & Innovation Drive	1525 Echo Blvd
15i	Kelowna Airport to Pandosy	along Hwy 97, Benvoulin & KLO	5333 Airport Way	KLO & Pandosy
15o	Pandosy to Kelowna Airport	along Hwy 97, Benvoulin & KLO	KLO & Pandosy	5333 Airport Way
16i	Lake Country residential to Kelowna Capital News Centre	along Hwy 97, Benvoulin & Gordon	2650 Robinson Road	4105 Gordon Drive
16o	Kelowna Capital News Centre to Lake Country residential	along Hwy 97, Benvoulin & Gordon	4105 Gordon Drive	2650 Robinson Road
17i	Joe Rich residential to Kelowna Orchard Park	along Hwy 33 & Springfield	11749 Greystokes Rd	2271 Harvey Avenue
17o	Kelowna Orchard Park to Joe Rich residential	along Hwy 33 & Springfield	2271 Harvey Avenue	11749 Greystokes Rd

Data was collected across 4 seasons, 2 weekly periods, and 4 daily time periods:

Seasons:

- Winter (December, January, February)
- Spring (March, April, May)
- Summer (June, July, August)
- Fall (September, October, November)

Weekly Periods:

- Mid-Week (Tuesdays, Wednesdays, Thursdays)
- Saturdays (mid-day period only)

Time Periods:

- Early Morning (midnight to 7 AM)
- AM Peak (7 AM – 9 AM
- Mid-Day (9 AM – 3 PM)
- PM Peak (3 PM – 5 PM)

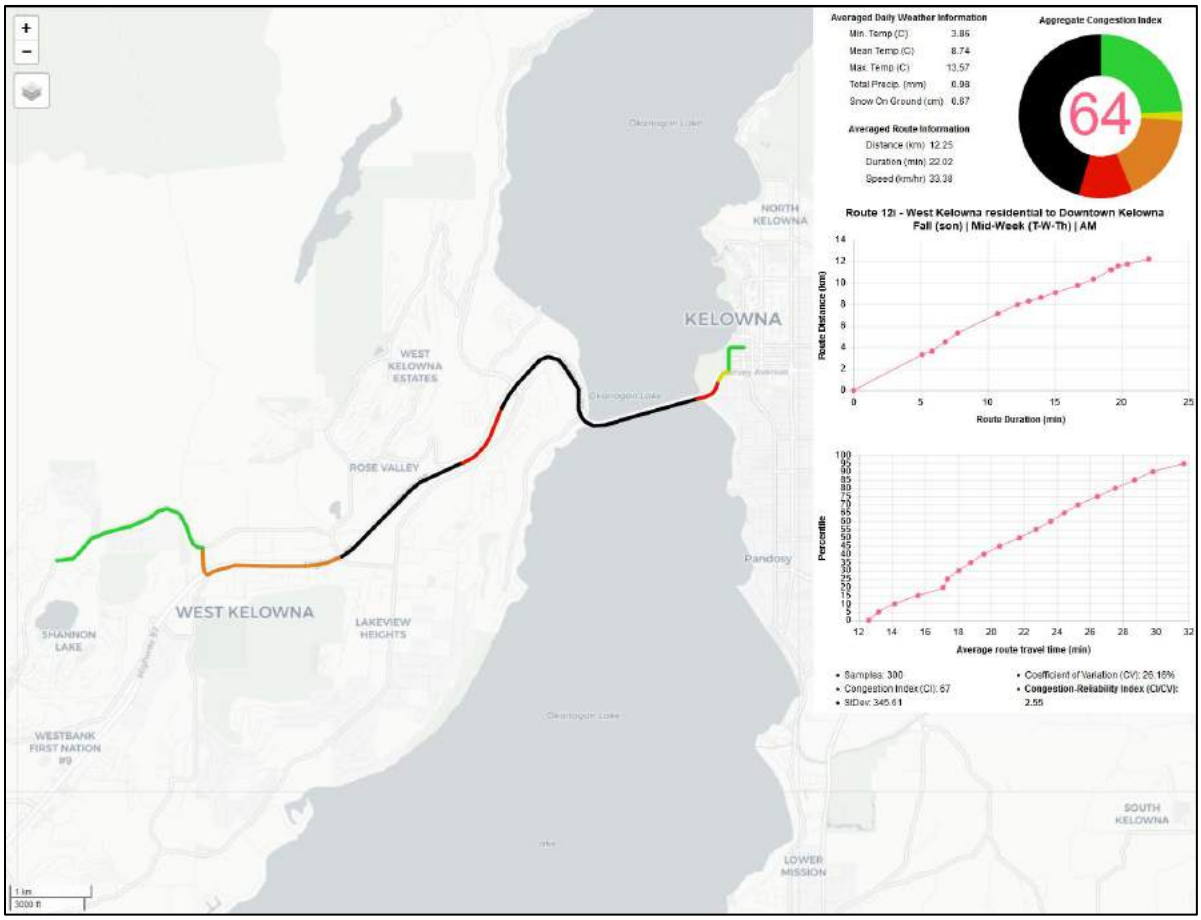
Top 10 Congested Route-Times

From Exhibits ES.2 and ES.3, it can be seen that the routes between West Kelowna residential areas (Shannon Lake Rd) to Downtown Kelowna (Queensway and Pandosy) present the worst congestion levels in the AM and PM peak periods, including mid-day Saturdays. Further analysis of these routes identified the sources of congestion were at the bridgehead, as well as from the re-construction of the Shannon Lake Road Bridge during the late summer and early fall months. Other routes between Peachland and Kelowna that cross the W.R. Bennett Bridge are ranked in the top 10 worst congested routes. With 7 of the top 10 congested routes-time instances crossing the bridge, this confirms the popular understanding that the crossing is one of the most congested locations in the Central Okanagan.

Exhibit ES.2: Route Performance Ranked by the Congestion Reliability Index (Top 10 and Bottom 10)

Rank	Route ID & Name	DOW	Period	Mean Speed	Mean CI	CV%	CV%90	CRI	CRI-90%
1	12i - West Kelowna residential to Downtown Kelowna	Tue-Thu	AM	36.45	0.69	33.0%	17.9%	2.70	4.12
2	4i - Kettle Valley to Downtown Kelowna	Tue-Thu	AM	33.21	0.83	15.4%	11.3%	5.41	7.83
3	11i - Peachland to Downtown Kelowna	Tue-Thu	AM	56.48	0.83	21.8%	11.3%	4.92	7.94
4	12o - Downtown Kelowna to West Kelowna residential	Tue-Thu	PM	43.72	0.78	15.7%	11.4%	5.54	8.05
5	14i - IR 10 residential to UBCO	Tue-Thu	AM	45.88	0.81	13.9%	10.5%	6.29	8.13
6	13i - Downtown Peachland to Kelowna General Hospital	Tue-Thu	AM	47.45	0.81	20.0%	10.3%	5.32	8.46
7	12i - West Kelowna residential to Downtown Kelowna	Sat	MD	49.74	0.85	10.9%	9.2%	11.16	14.05
8	15o - Pandosy to Kelowna Airport	Tue-Thu	PM	39.50	0.74	8.4%	5.4%	10.16	15.06
9	13o - Kelowna General Hospital to Downtown Peachland	Tue-Thu	PM	47.85	0.80	8.9%	5.4%	9.26	15.71
10	15o - Pandosy to Kelowna Airport	Tue-Thu	AM	47.44	0.84	7.8%	5.5%	12.32	16.42
	:								
87	17i - Joe Rich residential to Kelowna Orchard Park	Tue-Thu	MD	62.05	0.91	3.1%	2.3%	30.47	40.49
88	13i - Downtown Peachland to Kelowna General Hospital	Tue-Thu	PM	53.84	0.85	4.9%	2.3%	22.00	41.18
89	17i - Joe Rich residential to Kelowna Orchard Park	Tue-Thu	PM	60.04	0.90	3.0%	2.1%	30.74	43.62
90	11o - Downtown Kelowna to Peachland	Tue-Thu	MD	66.55	0.87	3.2%	2.1%	29.35	44.48
91	13i - Downtown Peachland to Kelowna General Hospital	Tue-Thu	MD	54.40	0.86	10.1%	1.9%	13.58	45.72
92	1i - Lake Country to Downtown Kelowna	Tue-Thu	PM	46.77	0.87	2.9%	1.9%	30.92	46.62
93	17o - Kelowna Orchard Park to Joe Rich residential	Tue-Thu	AM	64.80	0.93	2.7%	2.0%	34.76	47.88
94	17o - Kelowna Orchard Park to Joe Rich residential	Tue-Thu	MD	64.16	0.93	3.3%	1.8%	33.88	51.96
95	17o - Kelowna Orchard Park to Joe Rich residential	Tue-Thu	PM	63.20	0.93	3.5%	1.8%	32.82	52.65
96	17o - Kelowna Orchard Park to Joe Rich residential	Sat	MD	62.71	0.93	27.0%	1.7%	31.67	56.95

Exhibit ES.3: Route 12i West Kelowna residential to Downtown Kelowna | Fall | Mid-Week | AM



Change in Congestion: 2008-2017

A comparison to survey data from a 2008 travel time survey[1] in the Central Okanagan was also made to provide an estimation of changes in congestion between 2008 and 2017. Comparing the recently collected data to the regional travel survey conducted in 2008, it was found that travel times/congestion along surveyed routes:

- increased by 6.4% during the morning peak period,
- held steady during the mid-day peak (0.6% increase), and
- increased 4.7% in the afternoon peak period.

This is the first known measurement of the change in congestion over a long-term period for any region in B.C.

Conclusion: Applications for the Regional Transportation Plan

The use of "big data" provides the "eyes" to see details in traffic at an unprecedented level. Having access to this rich data set allows for information-based decision making that will provide a strong foundation for development of the Regional Transportation Plan. While this report provides a high-level summary of findings, the data can continue to support investigations such as:

- How many incidents of extreme congestion were detected last year, and of those how many are recurring vs. random (e.g. collisions)?
- How do changes in speeds correlate to collisions and overall safety?
- What is a "healthy" level of congestion for a given time and location?

Moving forward, the rich set of congestion data collected will be used to help inform the development of recommended projects, policies and programs for evaluation as part of the Regional Transportation Plan. Specific attention will focus on problem areas identified in this report.

[1] *2008 Central Okanagan Travel Time Survey*, October 28, 2008, Acuere Consulting for the City for Kelowna

Congestion in the Central Okanagan

1. Urban Congestion

1.1 Congestion and the Health of a Region

What is congestion, and why do we feel there is so much of it in our region? Why does it appear like clockwork every day on the bridge, yet sometimes appears out of nowhere in remote locations? Why can't we get rid of congestion?

Congestion is a common phenomenon that occurs on roads around the world. Anywhere there is a large gathering of people, congestion seems to follow. It is considered a negative aspect to living in urban environments, because it comes down to congestion causing delays to one's travel and seemingly stealing from us the thing that we value: our time. And as we lose both our personal and productive time, we increasingly feel stressed, use excessive fuel, emit more air pollution, and increase wear and tear of our vehicles from all the stop-and-go traffic. In fact, traffic congestion is usually one of the top three issues in most urban regions.

While everyone experiences congestion *subjectively* on a daily basis in most urban settings, a more *objective* and deeper understanding from a range of viewpoints is required to manage our problems with congestion. Physically, congestion is a competition for the same space at the same time to a degree that the *demand* for the use of the space exceeds the *supply* or *capacity* of that space. However, congestion can also be viewed as a positive aspect of society. Congestion is a feedback to society of the overuse and reliance on the automobile—an early warning sign of potentially larger problems to come. Congestion is also a by-product of prosperity, which is a way of looking at the "congestion cup" as "half-full". It is a "necessary cost" arising from economic growth and the increase in wealth. For decades, studies have shown correlations between economic growth and increased traffic congestion in countries around the world. Conversely, when the economy slows down, so do urban activities. With less people employed or shopping, congestion levels also drop proportionally.

On one hand, we want to eliminate congestion altogether because it is a sign of inefficiency. On the other hand, congestion can be an indicator of prosperity and vitality. The irony of humans is that we tend to flock to—and add more congestion to—places that are already congested. One needs to go no further than to their local street of restaurants and see a bar with lineups extending out the door, while the restaurant adjacent is empty. Which one would you rather go to? Ultimately, congestion is a sign of desirability, and it seems people are willing to put-up with the added delay because their demand for something exceeds the cost of waiting.

But ignoring the problem of excess congestion can cause problems as well. For example, people may move away due to long commutes, and businesses may relocate to other cities with less congestion in order to save on transport costs. The question then may be more appropriately: what is an *acceptable* level of congestion? Furthermore, the question could be refined as: what is a *healthy* level of congestion? Like a healthy person, who has a heart-rate appropriate for a given level of activity, a healthy level of congestion can change throughout the day. Exercising requires a higher heartrate and blood pressure, and so during the busy times of the day, we expect higher levels of congestion. During times of rest, our bodies reduce our heartrate and blood pressure, and similarly congestion levels should be lower.

It is the defining of *healthy levels of congestion*—levels that are not too excessive, but also not too low—which should be the aim of cities and regions to support their overall goals of sustainability, livability, and vitality. But to perform this balancing act, congestion first needs to be defined and measured continuously over time (i.e. monitoring) to allow for the profile of congestion to be determined throughout the course of each day, week, month, and year. Then, from this profile of evidence, a values-based approach can be applied to judge what levels of congestion are appropriate for a given time of day and season. This is the modern approach to setting congestion policies to ensure the unintended consequence of building too much road capacity is minimized, while investments in effective infrastructure is maximized.

Through monitoring, the dual issues of congestion can be managed: the frequent occurrence of excessive congestion on a particular roadway facility can be identified and action taken to remedy the situation, while excessive roadway building (which can induce more traffic), can be curbed at locations that do not really need the additional capacity but have the *subjective perception* of the need for expansion.

1.2 The Two Sides of the "Congestion Coin": Delay and Reliability

Like a coin, there are two faces or sides of congestion. Congestion is commonly referred to as excessive delay or the time to travel along a section of roadway. This definition considers the amount of travel time delay as the measure of congestion. While there are predictable changes in congestion levels that occur throughout the day (what traffic engineers term "recurring congestion") often at places such as approaches to bridges, or at major intersections, there are also random instances of congestion. Random, or "non-recurring", congestion is usually due to traffic incidents such as breakdowns or collisions. They can also occur from temporary road closures, natural disasters, major events, or construction.

Road users tend to react differently to these two types of congestion. Recurring congestion is experienced by people consistently on a daily basis. While no one enjoys the experience of recurring delays, it is predictable and expected, so people tend to grudgingly accept the phenomenon. However, when road users experience random instances of congestion, especially ones that cause high levels of delay, the lack of predictability means that the congestion has a greater chance of negatively impacting people's day and is generally not well-tolerated.

At the heart of the matter is the issue of **congestion *reliability***. Congestion that is predictable and reliable is acceptable to most people as this type of congestion can be planned for and anticipated. However, once congestion becomes unusually volatile, or less reliable, people are negatively impacted and frustration-levels increase.

Case in point: The 2003 Greater Vancouver Travel Time Survey[1] was the first region-wide travel time survey conducted in Canada utilizing GPS technology. The study documented levels of congestion throughout the Greater Vancouver region. A key finding was that congestion was not merely about delays, but also included the variations of delays experienced by people who commuted the same routes on a daily basis. Essentially, it was not only excessive delays, but atypical episodes of excessive delays, that were identified as a factor in the negative perception of congestion.

To conclude, congestion has a dual nature of both travel time ***delay* and *reliability***—the two sides of the "congestion coin." In order to meaningfully measure congestion, both "sides" of the congestion coin should be considered.

2. Congestion in the Central Okanagan

2.1 Modernizing the Measurement of Congestion

In June 2017, the STPCO initiated a project to measure and assess levels of congestion across major roads within the Central Okanagan. A region-wide congestion analysis network (CAN) was developed, consisting of 700 road segments representing highways, arterials, and collector roads. Utilizing a new "crowd-sourced" approach to obtaining travel time data along roadways, this congestion measurement system was employed to "harvest" travel time data along each segment at a frequency of 15 minutes continuously over a 1-year period. The data collected spanned from July 2017 to June 2018 and comprised of over 24 million records to allow for the measurement of congestion at unprecedented spatial and temporal levels.

Utilizing the rich dataset, an assessment of congestion in the Central Okanagan was made to understand the performance of main roadways within the region. This entailed the assessment of congestion and travel times along 12 "representative" regional routes in both directions (**Exhibit 1**) across 4 seasons, 2 weekly periods, and 4 daily time periods:

Seasons:

- Winter (December, January, February)
- Spring (March, April, May)
- Summer (June, July, August)
- Fall (September, October, November)

Weekly Periods:

- Mid-Week (Tuesdays, Wednesdays, Thursdays)
- Saturdays (mid-day period only)

Time Periods:

- Early Morning (midnight to 7 AM)
- AM Peak (7 AM – 9 AM
- Mid-Day (9 AM – 3 PM)
- PM Peak (3 PM – 5 PM)

While the congestion performance across these 24 individual routes provides the performance of representative trips, a more macro assessment of congestion was made across the entire RDCO congestion analysis network. This regional outlook

provides a more holistic assessment of congestion on major roads within the region, resulting in an "executive summary" of congestion over a 1-year period.

Exhibit 2.1 – Regional Routes

ID	Route Name	General Corridor	Origin	Destination
1i	Lake Country to Downtown Kelowna	along Glenmore & Clement	Glenmore Rd & Beaverlake Rd	Hwy 97 & Abbott
1o	Downtown Kelowna to Lake Country	along Glenmore & Clement	Hwy 97 & Abbott	Glenmore Rd & Beaverlake Rd
2i	Lake Country to Downtown Kelowna	along Hwy 97	Hwy 97 & Beaverlake Rd	Hwy 97 & Abbott
2o	Downtown Kelowna to Lake Country	along Hwy 97	Hwy 97 & Abbott	Hwy 97 & Beaverlake Rd
3i	Black Mountain to Downtown Kelowna	along Hwy 33 & Springfield	Hwy 33 & Goudie	Hwy 97 & Abbott
3o	Downtown Kelowna to Black Mountain	along Hwy 33 & Springfield	Hwy 97 & Abbott	Hwy 33 & Goudie
4i	Kettle Valley to Downtown Kelowna	along Pandosy & Lakeshore	Chute Lake Rd & Main St	Hwy 97 & Abbott
4o	Downtown Kelowna to Kettle Valley	along Pandosy & Lakeshore	Hwy 97 & Abbott	Chute Lake Rd & Main St
5i	Glenmore Heights to Capri Urban Centre	along Bernard & Glenmore	Kane & Drysdale	1835 Gordon
5o	Capri Urban Centre to Glenmore Heights	along Bernard & Glenmore	1835 Gordon	Kane & Drysdale
11i	Peachland to Downtown Kelowna	along Hwy 97	Hwy 97 & Hardy St	Hwy 97 & Abbott St
11o	Downtown Kelowna to Peachland	along Hwy 97	Hwy 97 & Abbott St	Hwy 97 & Hardy St
12i	West Kelowna residential to Downtown Kelowna	along Hwy 97 & Shannon Lake	2616 Shannon Lake Rd	Queensway & Pandosy
12o	Downtown Kelowna to West Kelowna residential	along Hwy 97 & Shannon Lake	Queensway & Pandosy	2616 Shannon Lake Rd
13i	Downtown Peachland to Kelowna General Hospital	along Hwy 97 and Pandosy	5830 Beach Avenue	2268 Pandosy St
13o	Kelowna General Hospital to Downtown Peachland	along Hwy 97 and Pandosy	2268 Pandosy St	5830 Beach Avenue
14i	IR 10 residential to UBCO	along Hwy 97 & Westside	1525 Echo Blvd	University Way & Innovation Drive
14o	UBCO to IR 10 residential	along Hwy 97 & Westside	University Way & Innovation Drive	1525 Echo Blvd
15i	Kelowna Airport to Pandosy	along Hwy 97, Benvoulin & KLO	5333 Airport Way	KLO & Pandosy
15o	Pandosy to Kelowna Airport	along Hwy 97, Benvoulin & KLO	KLO & Pandosy	5333 Airport Way
16i	Lake Country residential to Kelowna Capital News Centre	along Hwy 97, Benvoulin & Gordon	2650 Robinson Road	4105 Gordon Drive
16o	Kelowna Capital News Centre to Lake Country residential	along Hwy 97, Benvoulin & Gordon	4105 Gordon Drive	2650 Robinson Road
17i	Joe Rich residential to Kelowna Orchard Park	along Hwy 33 & Springfield	11749 Greystokes Rd	2271 Harvey Avenue
17o	Kelowna Orchard Park to Joe Rich residential	along Hwy 33 & Springfield	2271 Harvey Avenue	11749 Greystokes Rd

A comparison to survey data from a 2008 travel time survey in the Central Okanagan (utilizing GPS technology) was also made to provide an estimation of changes in congestion between 2008 and 2017.

Congestion information can be presented using a number of surrogate metrics, such as **travel time** and **speed**. More direct metrics such as the **Congestion Index (CI)**, which is the ratio between the speed on roads for a particular time period compared to "free-flow" conditions (i.e. overnight), and the **Congestion-Reliability Index (CRI)**[2], which is the combination of the volatility of congestion levels with the Congestion Index. The variety of congestion metrics allows for the observation and analysis of congestion from different perspectives, allowing for a more well-informed base of evidence from which effective decisions can be made.

Overall, the ability to measure congestion at such a rich level for the first time in the region's history, allows for the monitoring of the performance of transportation services and infrastructure, as well as the performance of policies and plans. Eventually, the transition of modern cities to smart cities will be founded on a bedrock of "big data", of which transportation data will be an essential part.

[2] Specifically, the CRI is the CI divided or "normalized" by the coefficient of variation for a given roadway and time period.

2.2 Congestion Analysis Along Regional Routes

To understand the variations of congestion from a relatable perspective, typical routes that residents travel on a daily basis throughout the region were identified. A set of 12 representative routes were defined and congestion levels captured in both directions along these routes. Data was collected on a continuous basis and covered all months of the year, days of the week, and time periods of the day. This resulted in a very large database from which tens of thousands of analyses can be made at a regional or local level.

2.2.1 Examples of Low and High Congestion Routes

The following table (**Exhibit 2.2.1**) provides examples of typical congestion levels along these routes for various time periods and weekdays across a 1-year period (July 2017-June 2018). The list is ranked from "worst" (#1) to "best" (#96) in terms of the CRI-90%[3] index.

Exhibit 2.2.1: Route Performance Ranked by CRI (90%ile Sample): Top 10 and Bottom 10

Rank	Route ID & Name	DOW	Period	Mean Speed	Mean CI	CV%	CV%90	CRI	CRI-90%
1	12i - West Kelowna residential to Downtown Kelowna	Tue-Thu	AM	36.45	0.69	33.0%	17.9%	2.70	4.12
2	4i - Kettle Valley to Downtown Kelowna	Tue-Thu	AM	33.21	0.83	15.4%	11.3%	5.41	7.83
3	11i - Peachland to Downtown Kelowna	Tue-Thu	AM	56.48	0.83	21.8%	11.3%	4.92	7.94
4	12o - Downtown Kelowna to West Kelowna residential	Tue-Thu	PM	43.72	0.78	15.7%	11.4%	5.54	8.05
5	14i - IR 10 residential to UBCO	Tue-Thu	AM	45.88	0.81	13.9%	10.5%	6.29	8.13
6	13i - Downtown Peachland to Kelowna General Hospital	Tue-Thu	AM	47.45	0.81	20.0%	10.3%	5.32	8.46
7	12i - West Kelowna residential to Downtown Kelowna	Sat	MD	49.74	0.85	10.9%	9.2%	11.16	14.05
8	15o - Pandosy to Kelowna Airport	Tue-Thu	PM	39.50	0.74	8.4%	5.4%	10.16	15.06
9	13o - Kelowna General Hospital to Downtown Peachland	Tue-Thu	PM	47.85	0.80	8.9%	5.4%	9.26	15.71
10	15o - Pandosy to Kelowna Airport	Tue-Thu	AM	47.44	0.84	7.8%	5.5%	12.32	16.42
	:								
87	17i - Joe Rich residential to Kelowna Orchard Park	Tue-Thu	MD	62.05	0.91	3.1%	2.3%	30.47	40.49
88	13i - Downtown Peachland to Kelowna General Hospital	Tue-Thu	PM	53.84	0.85	4.9%	2.3%	22.00	41.18
89	17i - Joe Rich residential to Kelowna Orchard Park	Tue-Thu	PM	60.04	0.90	3.0%	2.1%	30.74	43.62
90	11o - Downtown Kelowna to Peachland	Tue-Thu	MD	66.55	0.87	3.2%	2.1%	29.35	44.48
91	13i - Downtown Peachland to Kelowna General Hospital	Tue-Thu	MD	54.40	0.86	10.1%	1.9%	13.58	45.72
92	1i - Lake Country to Downtown Kelowna	Tue-Thu	PM	46.77	0.87	2.9%	1.9%	30.92	46.62
93	17o - Kelowna Orchard Park to Joe Rich residential	Tue-Thu	AM	64.80	0.93	2.7%	2.0%	34.76	47.88
94	17o - Kelowna Orchard Park to Joe Rich residential	Tue-Thu	MD	64.16	0.93	3.3%	1.8%	33.88	51.96
95	17o - Kelowna Orchard Park to Joe Rich residential	Tue-Thu	PM	63.20	0.93	3.5%	1.8%	32.82	52.65
96	17o - Kelowna Orchard Park to Joe Rich residential	Sat	MD	62.71	0.93	27.0%	1.7%	31.67	56.95

Top 10 Congested Route-Times

From **Exhibit 2.2.1**, it can be seen that the routes **12(i) and 12(o)** between **West Kelowna residential areas (Shannon Lake Rd) to Downtown Kelowna (Queensway and Pandosy)** present the worst congestion levels in the AM and PM peak periods, including mid-day Saturdays. Further analysis of this route identified the sources of congestion were at the

[3] The 90%ile version of this index is used to ignore "outliers" which are extreme congestion events due to unusual/rare conditions such as road closures.

bridgehead, as well as from the re-construction of the Shannon Lake Road Bridge during the late summer and early fall months. Other routes between Peachland and Kelowna that cross the W.R. Bennett Bridge are ranked in the top 10 worst congested routes. With 7 of the top 10 congested route-time instances crossing the bridge, this confirms the popular understanding that the crossing is one of the most congested locations in the Central Okanagan.

While the bridge is the most congested infrastructure, there are other routes that travel within the City of Kelowna proper that made it into the top 10 list of congested routes. **Route 4(i), Kettle Valley to Downtown Kelowna**, is the 2nd most congested route during the AM peak periods on weekdays. Likewise, route **15(o), Pandosy to Kelowna Airport**, is also one of the most congested routes during the AM and PM peak periods.

Exhibits 2.2.2 and **2.2.3** illustrate the congestion along the two most congested routes during the AM peak period.

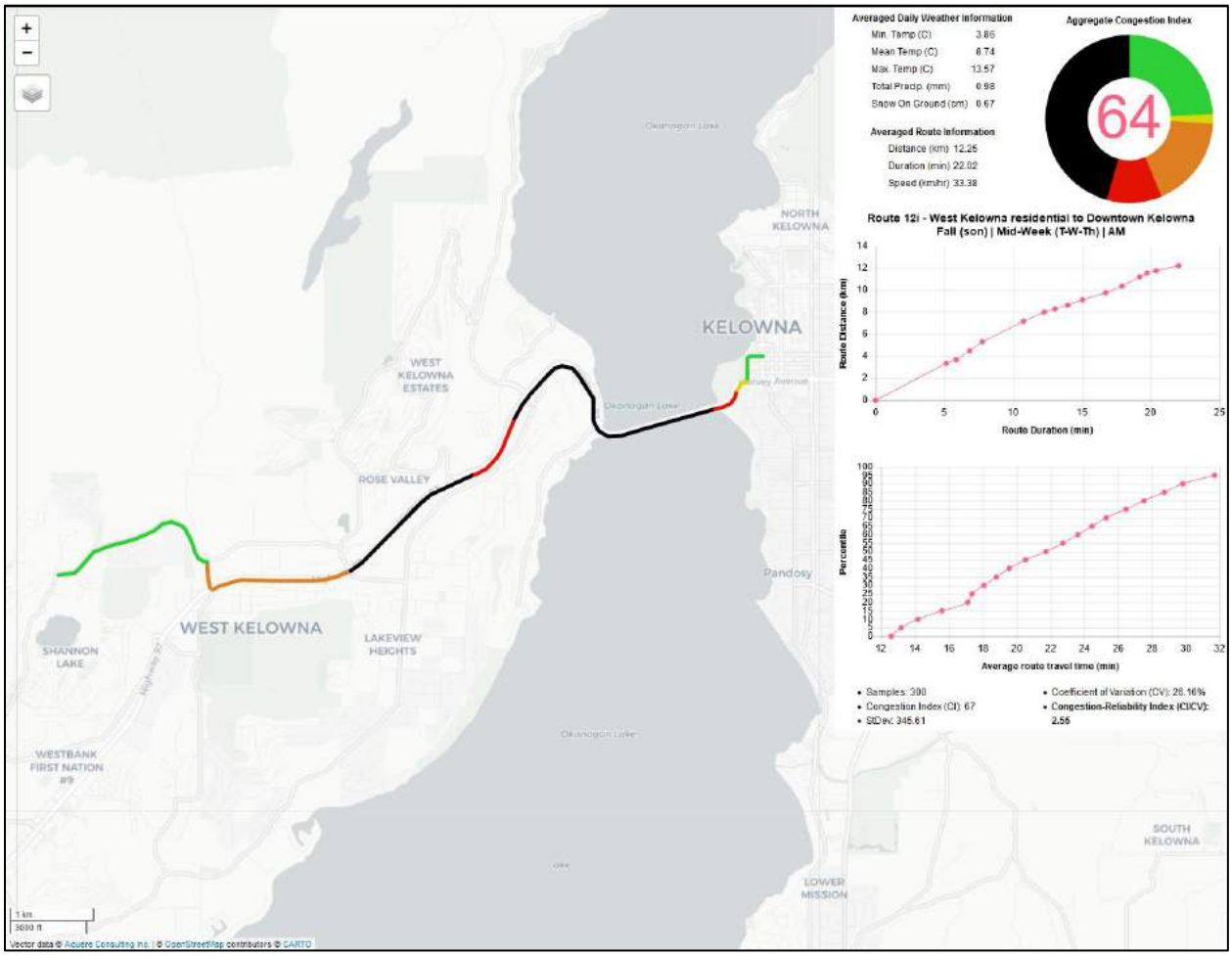
Top 10 Least Congested Route-Times

The routes where the least amount of congestion was observed were mostly on routes that connected to the outer communities of the region. **Route 17(o), Kelowna Orchard Park to Joe Rich residential**, was the least congested route for all time periods and weekdays. However, over a weekend in August 2017, wildfires in the area required road closures east-bound. Although this particular route is the least congested throughout the year, from the observation of all of the data collected, it was calculated as the 2nd most volatile[4] route because of the wildfires.

Overall, these results help to paint a picture of when and where in the region commutes are smooth, and where there are potential issues.

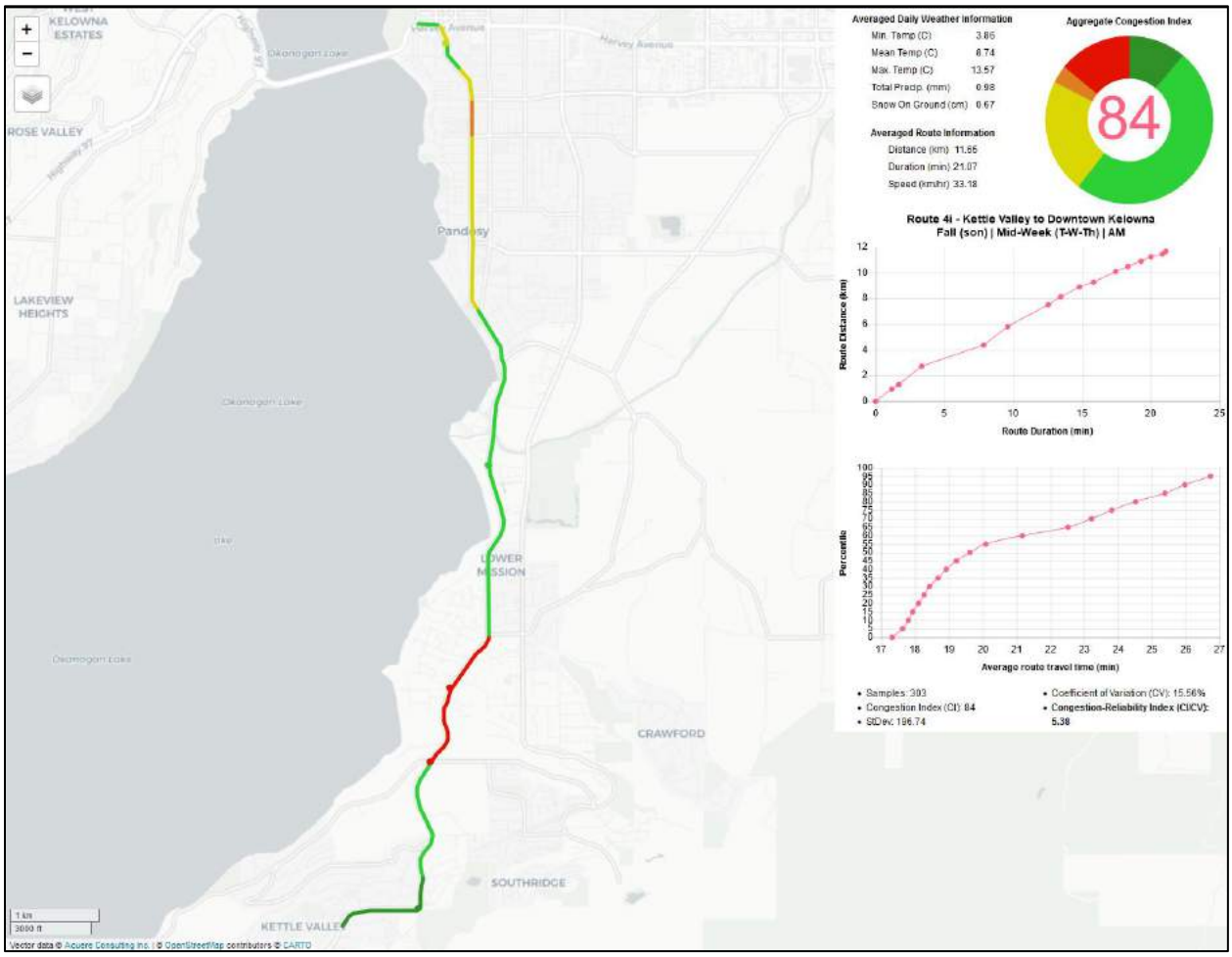
[4] Based on the calculated coefficient of variation utilizing 100% of the samples such that outliers are included to help identify periods of extreme congestion.

Exhibit 2.2.2: Route 12(i) West Kelowna residential to Downtown Kelowna | Fall | Mid-Week | AM



Observations: The highest delays occurred eastbound on Hwy 97 starting at Westlake Road, with the approach into and along the Bennet Bridge serving as the most congested. The primary congestion point appears to be the first traffic light in Kelowna.

Exhibit 2.2.3: Route 4(i) Kettle Valley to Downtown Kelowna | Fall | Mid-Week | AM



Observations: The highest delays occurred northbound on Lakeshore Rd. between Barnaby Rd. and DeHart Rd. Further investigations into the data suggest congestion occurs during morning school drop-off times, adjacent to Anne McClymont Elementary.

2.2.2 Daily Congestion Levels

Exhibit 2.2.4 summarizes the average speed and congestion metrics by time period for weekdays (Tuesdays to Thursdays) and Saturdays. The summary shows that regional travel times and congestion levels vary over the course of the day. The fastest travel times (when there is little or no traffic) are seen overnight (midnight to 6 AM). As residents and businesses start their day, traffic volumes grow and travel times lengthen, during the morning rush period, with average travel speeds decreasing by about 9% compared to overnight conditions, then remaining similar through the mid-day. Towards the end of the day, as students and workers return home or travel to other activities, travel speeds are the lowest; over 15% slower than overnight periods. On Saturdays, mid-day travel times are similar, but slightly faster than weekday morning.

Exhibit 2.2.4: Average Speed and Congestion Metrics by Time Period, RDCO 2017-2018

	Average Speed	Average CI	Average CV%90	Average CRI-90%	Comparison vs. Overnight Speeds
Weekdays					
Overnight	56.8	92.7	3.1	37.1	
AM Peak	51.8	86.9	5.6	22.9	-8.9%
Mid-Day	51.0	85.4	3.3	33.0	-10.2%
PM Peak	48.0	82.5	4.0	27.2	-15.5%
Saturdays					
Mid-Day	52.4	86.1	3.8	26.9	-7.8%

All Time Periods	**52.0**	**86.7**	**4.0**	**29.4**
Exclud. Overnight	**50.8**	**85.2**	**4.2**	**27.5**

Notes: higher speeds indicate less congestion delay
higher CI indicates less congestion delay
lower CV%90 indicates less congestion volatility
higher CRI-90% indicates less congestion delay and volatility

Overall, average speeds along the arterials and highways monitored are just over 50 km/hr throughout the day.

2.2.3 Seasonality of Congestion

It is understood that traffic conditions vary by season. To prove this point, average speed and congestion metrics were summarized by season. **Exhibit 2.2.5** shows the slowest/most congested season is Summer (June-Aug.), followed by Fall (Sept.-Nov.). Interestingly, the least congested season is during the Winter (Dec.-Feb.). This may be due to a few possible factors, such as less volumes of people commuting to work and school during the winter break, as well as people leaving town to warmer climates. Also, as these metrics represent the whole day (excluding overnight periods), during the winter months, there may be less activities (and therefore travel), throughout the day. Contrasting this to the Summer season, in which there is a significant additional tourist population that arrives in the Okanagan, congestion is the highest with this temporary increase in population.

Exhibit 2.2.5: Average Speed and Congestion Metrics by Season, RDCO 2017-2018

	Average Speed	Average CI	Average CV%90	Average CRI-90%	Comparison vs. Winter Speeds
Winter	51.9	86.2	3.2	31.8	
Spring	51.1	85.3	3.8	28.5	-1.6%
Summer	49.9	84.2	4.8	23.1	-3.8%
Fall	50.2	85.2	4.9	26.6	-3.2%
Grand Total	**50.8**	**85.2**	**4.2**	**27.5**	

Notes: data excludes overnight period
higher speeds indicate less congestion delay
higher CI indicates less congestion delay
lower CV%90 indicates less congestion volatility
higher CRI-90% indicates less congestion delay and volatility

2.3 Network-Wide Congestion Analysis

The congestion data collected across the region can be plotted to produce congestion maps for different times of the year. Using the CRI metric, network-wide average congestion values were shown to be somewhat similar in range across the year, with the lowest CRI values (i.e. most congested in terms of high delays and low reliability) observed in the Summer season during AM and PM peak periods:

- Winter AM Period Network CRI: 23
- Winter PM Period Network CRI: 22
- Spring AM Period Network CRI: 27
- Spring PM Period Network CRI: 27
- Summer AM Period Network CRI: 23
- Summer PM Period Network CRI: 21
- Fall AM Period Network CRI: 28
- Fall PM Period Network CRI: 27

  Note: higher values indicate a combination of less congestion and increased reliability.

While there are congestion differences across the network along specific roadway segments, overall, the congestion levels are similar in the Spring and Fall seasons with AM and PM period CRI values between 27 and 28. While the Spring and Fall seasons represent the least congested periods of the year (based on CRI), conversely, the most congest periods are during the Winter and Summer seasons, with AM CRI values of 23 and PM CRI values between 21-22.

As the CI values are similar across the year during peak periods, the differences in measuring congestion with the CRI metric suggests the Winter and Summer seasons are more volatile/less reliable from a congestion perspective.

Exhibits 2.2.6 to 2.2.7 provide network-wide congestion maps based on the CRI metric for the Summer season during the AM and PM peak periods (Tues/Wed/Thu).

Exhibit 2.2.6: Network CRI for Summer – AM Peak Period, Tues-Thurs

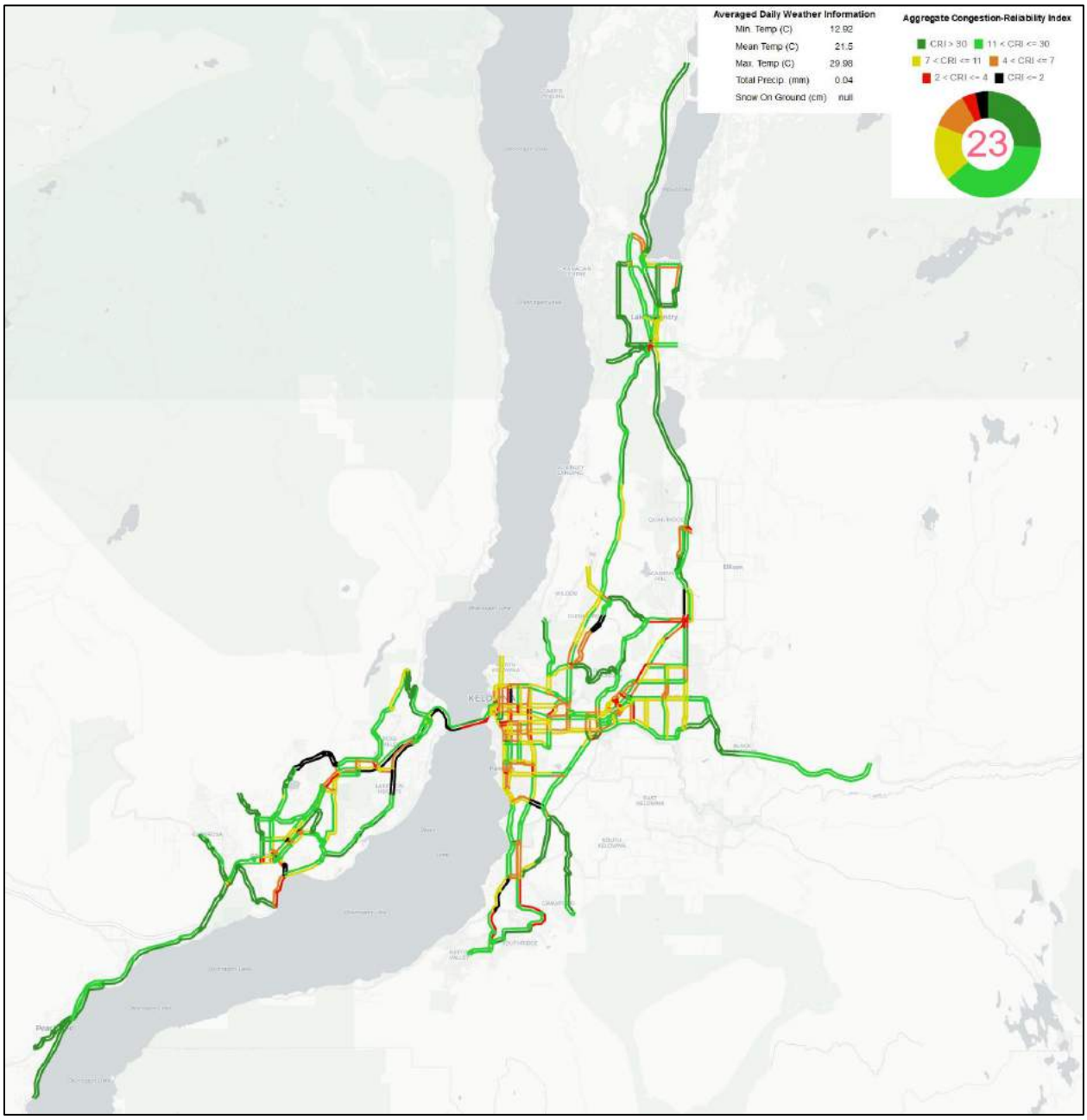
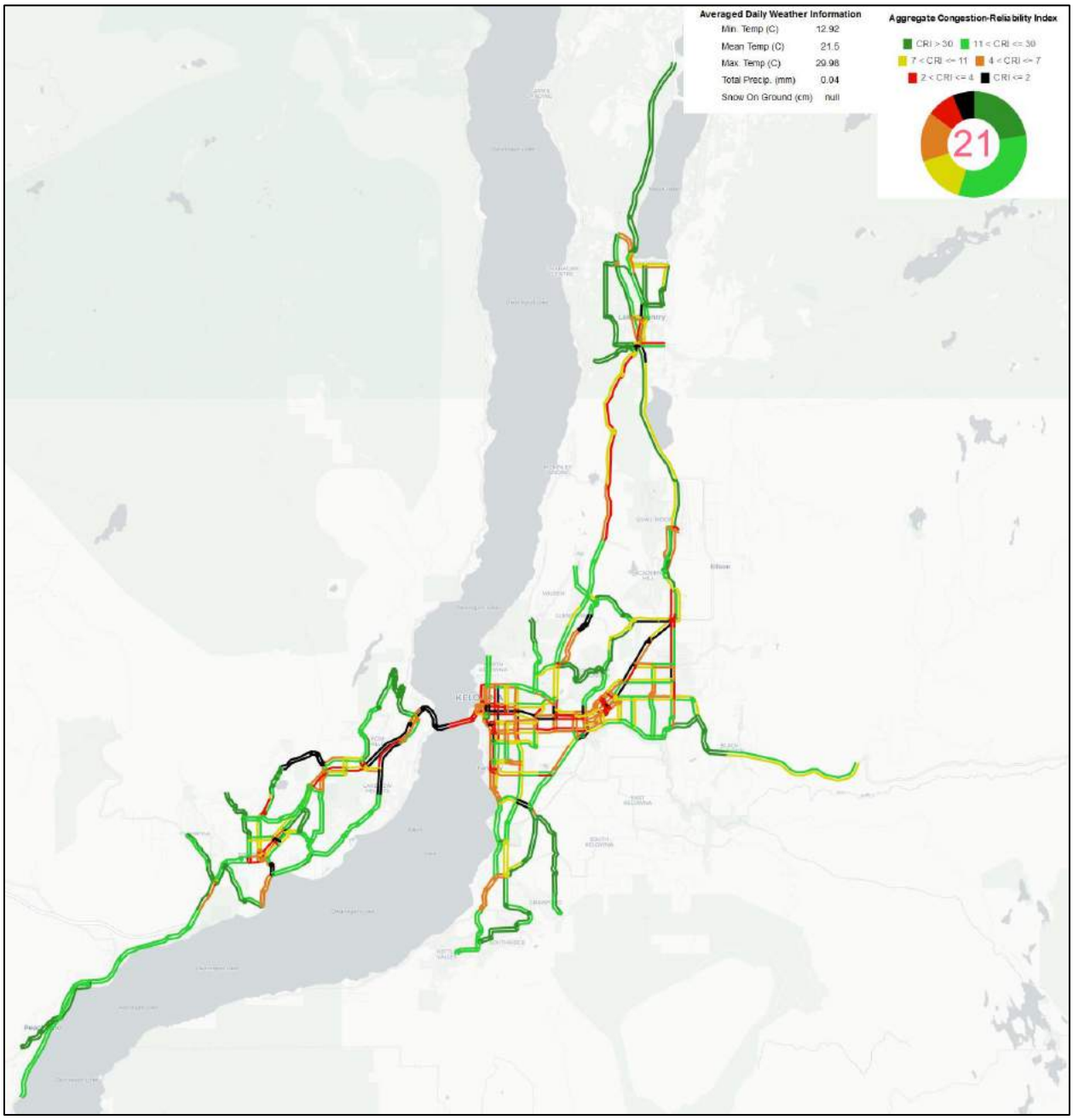


Exhibit 2.2.7: Network CRI for Summer – PM Peak Period, Tues-Thurs



2.4 Change in Congestion: 2008-2017

A useful and important application of congestion data collected over time is the ability to monitor changes to routes and roadway segments. With the benefit of the **2008 Central Okanagan Travel Time Survey**[5] conducted almost a decade ago, a comparison between 2008 and 2017 data allows for the analysis of changes to congestion levels along comparable routes.

Exhibit 3.1 provides the summary of this historic comparison. Overall the following conclusions can be deduced between the 9-year period for the routes surveyed:

- **AM Period**: travel times increased at an average rate of **6.4%** between 2008 and 2017 during the AM Peak period (7:30AM-9AM)
- **Mid-Day**: travel times held steady, if not slightly increased by **0.6%** between 2008 and 2017 during the mid-day period (12PM-2PM)
- **PM Period**: travel times increased at an average rate of **4.7%** between 2008 and 2017 during the PM Peak period (3PM-5PM)

Exhibit 2.4: 2008 vs. 2017 Travel Time Comparison by Route

Route*		Morning			Midday			Afternoon		
		2008	2018	Change	2008	2018	Change	2008	2018	Change
Lake Country (via Glenmore)	To DT	21.7	24.8	+3.1 (+14.5%)	23.7	26.2	+2.5 (+10.8%)	23.3	26.3	+3.0 (+12.5%)
	From DT	21.7	24.4	+2.7 (+12.8%)	23.2	26.3	+3.1 (+13.3%)	23.3	28.7	+5.4 (+23.3%)
Lake Country (via Highway 97)	To DT	22.1	21.3	-0.8 (-3.3%)	29.6	25.4	-4.2 (-14.3%)	29.0	25.2	-3.8 (-13.2%)
	From DT	21.0	21.7	+0.7 (+3.4%)	29.4	26.8	-2.6 (-8.9%)	27.9	27.4	-0.5 (-1.5%)
Kettle Valley	To DT	16.4	20.0	+3.6 (+21.4%)	20.0	21.6	+1.6 (+7.6%)	19.9	22.7	+2.8 (+13.9%)
	From DT	16.0	17.2	+1.2 (+7.2%)	18.2	18.9	+0.7 (+3.7%)	18.1	19.1	+1.0 (+5.4%)
Black Mountain	To DT	21.0	21.3	+0.3 (+1.5%)	26.7	23.6	-3.1 (-11.7%)	24.7	24.7	0.0 (+0%)
	From DT	22.3	20.5	- 1.8 (-8.2%)	26.0	26.0	0.0 (+0%)	25.2	26.5	+1.3 (+5.1%)
Peachland	To DT	24.8	27.2	+2.4 (+9.8%)	26.2	27.2	+1.0 (+3.6%)	27.8	28.0	+0.2 (+0.5%)
	From DT	22.4	24.3	+1.9 (+8.4%)	25.2	27.7	+2.5 (+10.3%)	27.1	29.5	+2.4 (+8.8%)

* "DT" refers to Downtown Kelowna

**2008 Survey average times recomputed by recapturing 2008 Survey GPS data

[5] *2008 Central Okanagan Travel Time Survey*, October 28, 2008, Acuere Consulting for the City for Kelowna

While most of the corridor/time periods saw increases in travel times, there were reductions in travel times on a few corridor/time periods which may have be due to upgrades along Hwy 97. If so, this would suggest the highway upgrades improved overall performance and congestion levels for routes utilizing Hwy 97.

Overall, the routes with the largest increase in travel times were:

- Lake Country to Downtown Kelowna (both directions): up to **23.3%** increase in travel times for the outbound/north direction in the PM commute.
- Kettle Valley to Downtown Kelowna (both directions): up to **21.4%** increase in travel times for the inbound/north direction in the AM commute.

Further investigations, including a comparison of the route travel times in context to the changes to the transportation system between these survey years, would provide further clarity and understanding of the results.

2.5 Conclusion: Applications for the Regional Transportation Plan

The use of "big data" provides the "eyes" to see details in traffic at an unprecedented level. Having access to this rich data set allows for information-based decision making that will provide a strong foundation for development of the Regional Transportation Plan. While this report provides a high-level summary of findings, the data can continue to support investigations such as:

- How many incidents of extreme congestion were detected last year, and of those how many are recurring vs. random (e.g. collisions)?
- How do changes in speeds correlate to collisions and overall safety?
- What is a "healthy" level of congestion for a given time and location?

Moving forward, the rich set of congestion data collected will be used to help inform the development of recommended projects, policies and programs for evaluation as part of the Regional Transportation Plan. Specific attention will focus on problem areas identified in this report.