

City of Kelowna

Regular Council Meeting

AGENDA



Monday, November 16, 2020

1:30 pm

Council Chamber

City Hall, 1435 Water Street

Pages

1. Call to Order

I would like to acknowledge that we are gathered today on the traditional, ancestral, unceded territory of the syilx/Okanagan people.

This Meeting is open to the public and all representations to Council form part of the public record. A live audio-video feed is being broadcast and recorded on kelowna.ca and a delayed broadcast is shown on Shaw Cable.

In accordance with Order of the Provincial Health Officer on Gatherings and Events, the City is required to collect the first and last name and telephone number or email address of everyone attending a Council meeting. Thank you for your co-operation.

2. Confirmation of Minutes

3 - 6

PM Meeting - November 9, 2020

3. Development Application Reports & Related Bylaws

3.1. Rodondo Pl 1295 - Z20-0028 (BL12120) - Janis Wiens

7 - 26

To consider an application to rezone the subject property from the RR1- Rural Residential 1 zone to the RU1- Large Lot Housing zone and P3- Parks and Open Space zone to facilitate a 2-lot subdivision.

3.2. Rodondo Pl 1295 - BL12120 (Z20-0028) - Janis Wiens

27 - 28

To give Bylaw No. 12120 first reading in order to rezone the subject property from the RR1 - Rural Residential 1 zone to the RU1 - Large Lot Housing zone and P3 - Parks and Open Space zone.

3.3. Elliot Ave 535 - Z20-0033 (BL12121) - Robert T. Groholski and Michalina J. Groholski

29 - 50

To consider an application to rezone the subject property from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone to facilitate the development of a fourplex dwelling.

3.4.	Elliot Ave 535 - BL12121 (Z20-0033) - Robert T. Groholski and Michalina J. Groholski	51 - 51
	To give Bylaw No. 12121 first reading in order to rezone the subject property from the RU6 - Two Dwelling Housing zone to the RM1 - Four Dwelling Housing zone.	
3.5.	Laurier Ave 934 - Z18-0103 Extension - 1079687 BC Ltd	52 - 53
	To extend the deadline for adoption of Rezoning Bylaw No. 11799 for 6 months to May 7, 2021.	
4.	Non-Development Reports & Related Bylaws	
4.1.	Final Regional Transportation Plan, Regional Bicycling and Trails Master Plan and Regional Disruptive Mobility Strategy	54 - 499
	To update Council on regional transportation initiatives and present related final plans.	
4.2.	Kelowna Area Based Water Management Plan Update	500 - 539
	To update Council on the Kelowna Integrated Water Supply Plan and to comment on progress to date in area-based water resource management.	
4.3.	Bernard Avenue - Road Closure Review	540 - 579
	To update Council on “lessons learned” associated with the temporary vehicular closure of Bernard Avenue and to make recommendations pertaining to the on-going seasonal closure of vehicular traffic on Bernard Avenue in 2021 and beyond.	
4.4.	Road Closure 2105 - 2255 Glenmore Road North	580 - 586
	To seek Council approval for the closure of road adjacent to 2105 – 2255 Glenmore Road North, for consolidation with the adjacent lands.	
4.5.	BL12098 - Road Closure and Removal of Highway Dedication Bylaw	587 - 588
	To give Bylaw No. 12098 first, second and third reading.	
5.	Bylaws for Adoption (Non-Development Related)	
5.1.	BL12093 - Road Closure - portion of Abbott Street	589 - 590
	Mayor to invite anyone in the public gallery who deems themselves affected by the proposed road closure to come forward.	
	To adopt Bylaw No. 12093 in order to close a portion of Abbott Street.	
6.	Mayor and Councillor Items	
7.	Termination	



City of Kelowna Regular Council Meeting Minutes

Date: Monday, November 9, 2020
 Location: Council Chamber
 City Hall, 1435 Water Street

Members Present Mayor Colin Basran, Councillors Maxine DeHart, Ryan Donn, Gail Given, Brad Sieben, Mohini Singh, Luke Stack and Loyal Wooldridge

Members participating remotely Councillor Charlie Hodge

Staff Present City Manager, Doug Gilchrist; City Clerk, Stephen Fleming; Divisional Director, Planning & Development Services, Ryan Smith*; Community Planning & Development Manager, Dean Strachan*; Cultural Services Manager, Christine McWillis*; Divisional Director, Infrastructure, Alan Newcombe*; Infrastructure Delivery Dept Manager, Brian Beach*; Fire Chief, Travis Whiting*

Staff participating remotely Legislative Coordinator (Confidential), Arlene McClelland

(*Denotes partial attendance)

1. Call to Order

Mayor Basran called the meeting to order at 1:32 p.m.

Mayor Basran advised that the meeting is open to the public and all representations to Council form part of the public record. A live audio-video feed is being broadcast and recorded on kelowna.ca and a delayed broadcast is shown on Shaw Cable.

2. Confirmation of Minutes

Moved By Councillor Wooldridge/Seconded By Councillor Donn

R0715/20/11/09 THAT the Minutes of the Regular Meetings of November 2, 2020 be confirmed as circulated.

Carried

3. Development Application Reports & Related Bylaws

3.1 McCurdy Rd 335 - Z20-0053 (BL12117) - Mohan Lal Madurai

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

Moved By Councillor Singh/Seconded By Councillor DeHart

Ro716/20/11/09 THAT Rezoning Application No. Z20-0053 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 2 Section 26 Township 26 Osoyoos Division Yale District Plan 18917, located at 335 McCurdy Road, Kelowna, BC from the RU1 – Large Lot Housing zone to the RU6 – Two Dwelling Housing zone, be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Development Planning Department dated October 26, 2020.

Carried

3.2 McCurdy Rd 335 - BL12117 (Z20-0053) - Mohan Lal Madurai

Moved By Councillor Singh/Seconded By Councillor Given

Ro717/20/11/09 THAT Bylaw No. 12117 be read a first time.

Carried

3.3 Kuipers Cres 796 - DP20-0140 - Emil Anderson Construction Co. Ltd, Inc.No.Co172775

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

Moved By Councillor Given/Seconded By Councillor Donn

Ro718/20/11/09 THAT Council authorizes the issuance of Development Permit No. DP20-0140 for Lot 1 District Lot 1688S Similkameen Division Yale District Plan EPP71339, located at 796 Kuipers Crescent, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A,"
2. The exterior design and finish of the building to be constructed on the land, be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";
4. The applicant be required to post with the City a Landscape Performance Security deposit in the form of a "Letter of Credit" in the amount of 125% of the estimated value of the landscaping, as determined by a Registered Landscape Architect;

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permits to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

Carried

3.4 Valley Rd 244 252 260 268 - OCP18-0008 Z18-0042 - Extension - Vanmar Developments 2 Ltd

Staff:

- Responded to questions from Council with the reasons for the extension.

Moved By Councillor Given/Seconded By Councillor Donn

R0719/20/11/09 THAT in accordance with Development Application Procedures Bylaw No. 10540, the deadline for the adoption of Official Community Plan Bylaw No. 11641 and Rezoning Amendment Bylaw No. 11642, be extended from August 14, 2020 to August 14, 2021;

AND THAT Council directs Staff not to accept any further extension requests.

Carried

4. Non-Development Reports & Related Bylaws

4.1 2021-2022 Heritage Grants Program Agreement

Staff:

- Displayed a PowerPoint Presentation outlining the terms of the Grant Administration Agreement and responded to questions from Council.

Moved By Councillor Hodge/Seconded By Councillor Wooldridge

R0720/20/11/09 THAT Council authorizes the City to enter into a Grant Administration Agreement for the Heritage Grants Program with the Central Okanagan Heritage Society in the form attached to the Report from the Cultural Services Department dated November 9, 2020;

AND THAT Council authorizes the Mayor and City Clerk to execute all documents associated with this Agreement.

Carried

4.2 Fall 2020 Infrastructure Delivery Accomplishments

Staff:

- Displayed a PowerPoint Presentation summarizing the departmental 2020 accomplishments and responded to questions from Council.

Moved By Councillor Stack/Seconded By Councillor DeHart

R0721/20/11/09 THAT Council receives for information, the report from Infrastructure Delivery dated November 9, 2020, with respect to the status of 2020 Capital and Operating projects being managed by the Infrastructure Delivery Department.

Carried

4.3 Contract to Administer the Regional Emergency Program

Staff:

- Provided comments summarizing the agreement.

Moved By Councillor Singh/Seconded By Councillor Stack

R0722/20/11/09 THAT Council receives, for information, the report from the Fire Chief dated November 2, 2020, with respect to the Regional Emergency Program contract;

AND THAT the Mayor and City Clerk be authorized to execute the contract on behalf of the City of Kelowna.

Carried

5. Bylaws for Adoption (Non-Development Related)

5.1 BL12111 - SEKID Bylaws Repeal Bylaw

Moved By Councillor Singh/Seconded By Councillor Given

R0723/20/11/09 THAT Bylaw No. 12111 be adopted.

Carried

5.2 BL12110 - Amendment No. 12 to Water Regulation Bylaw No. 10480

Moved By Councillor Donn/Seconded By Councillor Singh

R0724/20/11/09 THAT Bylaw No. 12110 be adopted.

Carried

6. Mayor and Councillor Items

Councillor Hodge:

- Made comments on the recent passing of Howie Meeker.

Councillor Singh:

- Kudos to the Rotary Club for so quickly repairing the damage to the Crosses for Remembrance in City Park.

Councillor Given:

- Made comments on the meaning of Remembrance Day.

Councillor Wooldridge:

- Shout out to Dustyn Baulkham, Rebellious Unicorns Production Company who received the National 2020 Young LGBT+ Award from the Canadian LGBT+ Chamber of Commerce.

7. Termination

This meeting was declared terminated at 2:37 p.m.

Mayor Basran

/acm

City Clerk

REPORT TO COUNCIL



Date: November 16, 2020

To: Council

From: City Manager

Department: Development Planning

Application: Z20-0028

Owner: Janis Wiens

Address: 1295 Rodondo Pl

Applicant: Alfred Wiens

Subject: Rezoning Application

Existing OCP Designation: S2RES – Single/ Two Unit Residential
PARK – Major Park / Open Space (public)

Existing Zone: RR1 – Rural Residential 1

Proposed Zone: RU1 – Large Lot Housing
P3 – Parks and Open Space

1.0 Recommendation

THAT Rezoning Application No. Z20-0028 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 2, Section 6, Township 23, Osoyoos Division Yale District Plan 29771, located at 1295 Rodondo Place, Kelowna, BC from the RR1- Rural Residential 1 zone to the RU1- Large Lot Housing zone and P3- Parks and Open Space zone as shown on Map "A" attached to the Report from the Development Planning Department dated November 16, 2020, be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Development Planning Department dated November 16, 2020;

AND FURTHER THAT the final adoption of the Rezoning Bylaw be considered subsequent to the issuance of the Preliminary Layout Review Letter by the Approving Officer.

2.0 Purpose

To consider an application to rezone the subject property from the RR1- Rural Residential 1 zone to the RU1- Large Lot Housing zone and P3- Parks and Open Space zone to facilitate a 2-lot subdivision.

3.0 Development Planning

Development Planning staff support the proposed rezoning application. The proposed rezoning will allow for a future two lot subdivision. The existing residence will be isolated on proposed lot B and a new single-family dwelling can be accommodated on proposed lot A. The proposal is well aligned with the Future Land Use Designation of S2Res- Single/Two Dwelling Housing and is located within the City's Permanent Growth Boundary (PGB). The proposed lots are 861 m² and 1,380 m² which meets the minimum lot size, width and length for the RU1 zone.

There is a small section of the SE Corner of the property that has the Official Community Plan Future Land Use Designation of PARK – Major Park / Open Space (Public). The City is asking for this section to be dedicated to the City, as the existing trail is within the riparian area of Blair Pond and the trail needs to be safely setback from the water's edge and widened to allow for better pedestrian/cycling access. This trail is identified on Official Community Plan Map 5.9 - Linear Park Trails. Objective 5.14 – Policy .2 permits the City to ask for up to 10-metre width for linear trails at Rezoning or Subdivision. If approved, the new lots being adjacent to Blair Pond Park will be required to install a 1.2m height, black vinyl chain link fence 150mm inside private property line. Both lots are permitted to include a one-person gate, no larger than 1-metre width to access the park.

4.0 Proposal

4.1 Project Description

The proposed rezoning from RR1 – Rural Residential 1 to RU1 – Large Lot Housing is to facilitate a 2-lot subdivision. The existing dwelling will remain and will be able to meet all required setbacks of the new lot. Both of the two lots will meet the minimum dimensions of the RU1 zone, and no variances are required.

4.2 Site Context

The subject property is located in the Glenmore-Clifton OCP Sector and is within the Permanent Growth Boundary. The surrounding area is primarily zoned RR1 – Rural Residential 1 and RU1 – Large Lot Housing. The surrounding Future Land Use is primarily S2RES – Single/Two Unit Residential and PARK.

Specifically, adjacent land uses are as follows:

Orientation	Zoning	Land Use
North	RU1- Large Lot Housing	Single-dwelling Housing
East	P3- Parks and Open Space	Public Parks
South	P3- Parks and Open Space	Public Parks
West	RR1- Rural Residential Zone	Single-dwelling Housing

Subject Property Map:



5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Chapter 5: Development Process

Objective 5.2 Develop sustainably.

Policy .5 Integrated Land Use. Integrate land use approaches wherever possible to improve opportunities for biodiversity, ecosystem, connectivity, recreation, agriculture and local food production, while reducing conflicts.

Objective 5.14 Provide parks for a diversity of people and a variety of uses

Policy .2 Dedication of Linear Parks. At subdivision and rezoning for all development types secure a minimum 10-metre wide linear corridor for public access as included in Table 5.1 Linear Park – Public Access and/or shown on Map 5.9 – Linear Corridors / Paths. The 10-metre wide corridor may be in addition to, and outside, any riparian management area requirements imposed through the Environmental Development Permit (see Chapter 12) requirements of the OCP. On the private property side of the public access corridor, the City may, as necessary, consider stipulating additional “no disturb” zones. Lot line adjustments or other subdivision applications not resulting in the creation of new lots suitable for the construction of buildings permitted under the applicable zoning will be considered exempt from this policy. Linear trail corridors can have the following tenure which will be determined by staff at time of subdivision or rezoning:

- Titled property in the name of the city as park, protected area, or
- Road reserve right of way; or
- Statutory right of way.

Objective 5.22 Ensure context sensitive housing development

Policy .6 Sensitive Infill. Encourage new development or redevelopment in existing residential areas to be sensitive to or reflect the neighbourhood with respect to building design, height and siting.

6.o Application Chronology

Date of Application Received: March 9, 2020

Date Public Consultation Completed: August 26, 2020

Report prepared by: Tyler Caswell, Planner I

Reviewed by: Jocelyn Black, Urban Planning Manager

Approved for Inclusion: Terry Barton, Development Planning Department Manager

Attachments:

Schedule A: Development Engineering Memo

Attachment A: Map "A"

Attachment B: Site Plan

CITY OF KELOWNA

MEMORANDUM

Date: April 24, 2020
File No.: Z20-0028 R1
To: Community Planning (JB)
From: Development Engineering Manager (JK)
Subject: 1295 Rodondo PI

SCHEDULE _____ A	
This forms part of application # Z20-0028	
Planner Initials	TC
City of Kelowna DEVELOPMENT PLANNING	
RR1 to RU1	

Development Engineering has the following comments and requirements associated with this application. The utility upgrading requirements outlined in this report will be a requirement of this development.

1. Domestic Water and Fire Protection

- a. The property is located within the City of Kelowna service area. The existing 19mm PVC water service will be utilised to service one of the lots.
- b. Provide an adequately sized domestic water and fire protection system complete with individual lot connections. The water system must be capable of supplying domestic and fire flow demands of the project in accordance with the Subdivision, Development & Servicing Bylaw. Provide water calculations for this subdivision to confirm this. Ensure every building site is located at an elevation that ensures water pressure is within the bylaw pressure limits.
Arrange for individual lot connections before submission of the subdivision plan.

2. Sanitary Sewer

- a. The existing 100mm diameter service will be utilised to service one of the proposed lots.
- b. New second Sanitary Service to come from 200mm PVC main in Blair Pond Park in Easement to Property line.
- c. A new sanitary service should be provided at the applicants cost prior to subdivision approval.

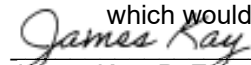
3. Development Permit and Site Related Issues

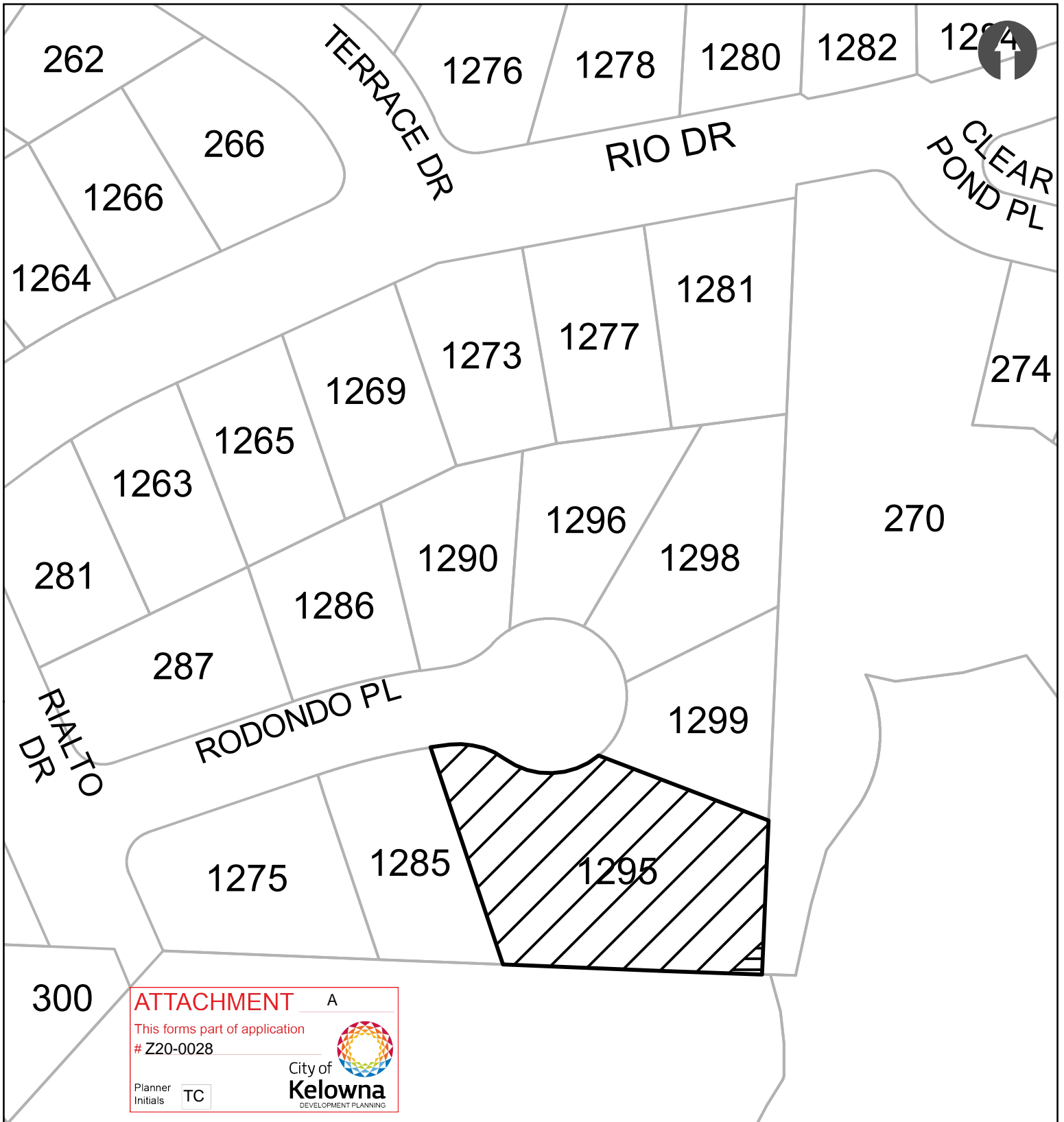
Direct the roof drains onto splash pads.

Frontages will be required to be complete, new Conc. Letdown 6.0m Max and landscaped Boulevard.

4. Electric Power and Telecommunication Services

It is the applicant's responsibility to make a servicing application with the respective electric power, telephone and cable transmission companies to arrange for service upgrades to these services which would be at the applicant's cost.


James Kay, P. Eng.
Development Engineering Manager
RO




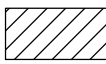
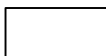
ATTACHMENT A

This forms part of application
Z20-0028

Planner Initials **TC**

City of Kelowna
DEVELOPMENT PLANNING

MAP "A" Proposed Zoning File Z20-0028

-  RR1 - Rural Residential 1 to P3 - Parks and Open Space
-  RR1 - Rural Residential 1 to RU1 - Large Lot Housing
-  Subject Property

0 15 30 Metres

PROPOSED SUBDIVISION OF LOT 2, SEC 6, TP 23, ODYD, PLAN 29771.

PID: 004-189-264

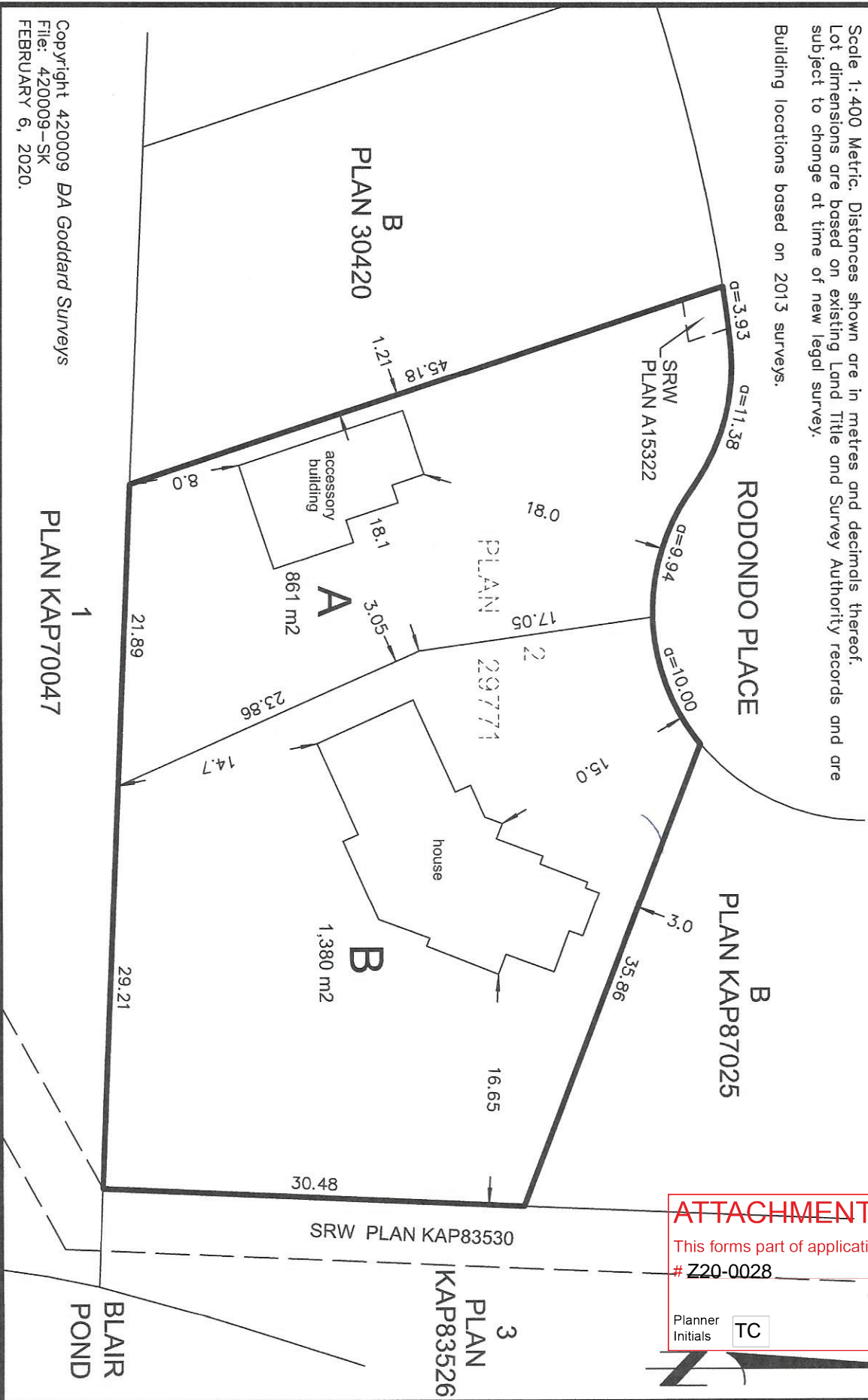
CIVIC ADDRESS: 1295 RODONDO PLACE, KELOWNA.

CLIENT: ALF WIENS

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Scale 1:400 Metric. Distances shown are in metres and decimals thereof. Lot dimensions are based on existing Land Title and Survey Authority records and are subject to change at time of new legal survey.

Building locations based on 2013 surveys.



ATTACHMENT

B

This forms part of application

Z20-0028

Planner
Initials

TC

City of
Kelowna
DEVELOPMENT PLANNING





Z20-0028 1295 Rodondo Pl

Rezoning Application



Proposal

- ▶ To rezone the subject property from RR1 – Rural Residential 1 to RU1 – Large Lot Housing and P3 – Parks and Open Space to facilitate a 2-lot subdivision.

Development Process

Mar 9th, 2020

Development Application Submitted

Staff Review & Circulation

Aug 26th, 2020

Public Notification Received

Nov 16th, 2020

Initial Consideration

Public Hearing
Second & Third Readings

Final Reading

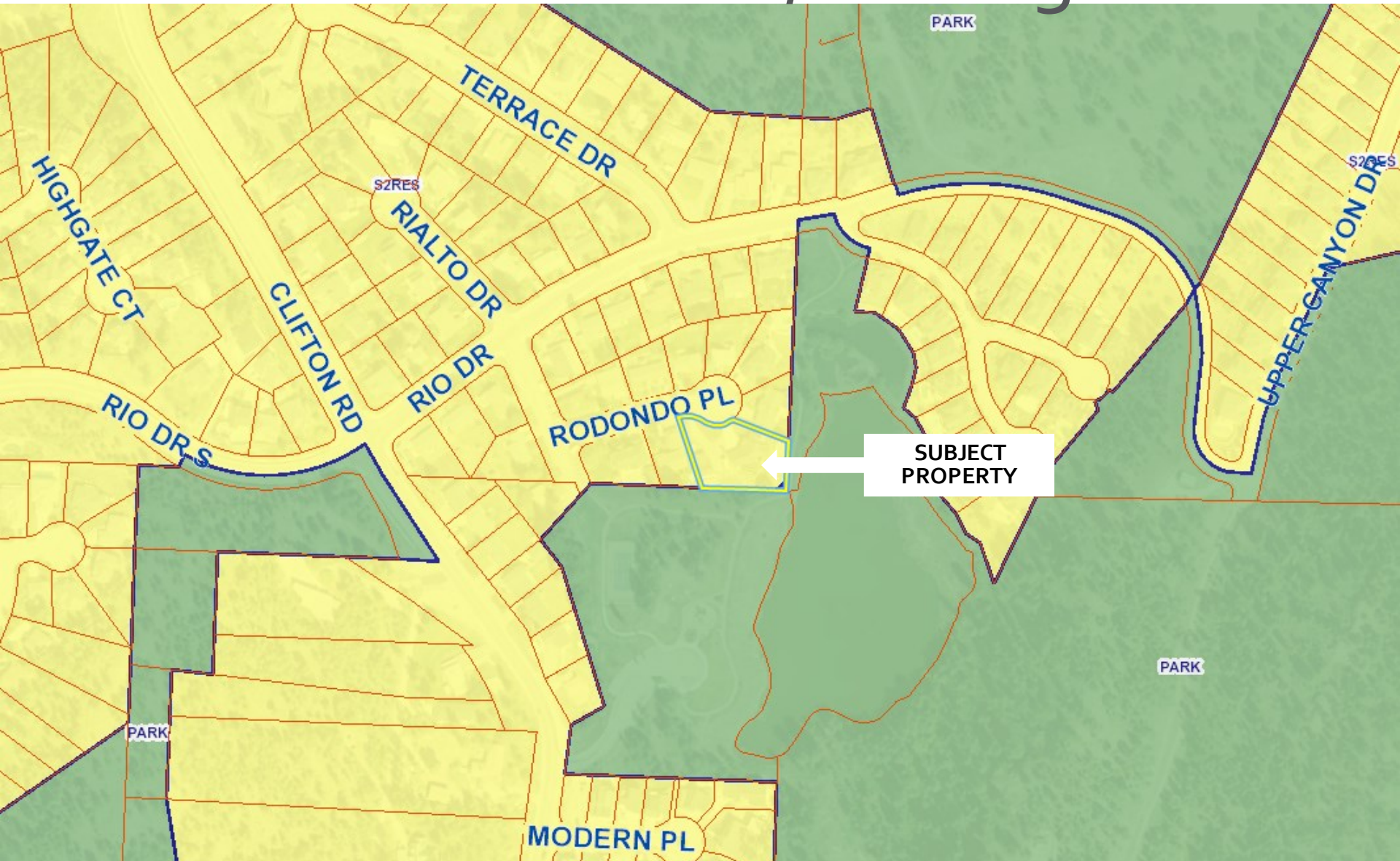
Building Permit

Council
Approvals

Context Map



OCP Future Land Use / Zoning



Subject Property Map



Project/technical details

- ▶ Proposed rezoning will facilitate a 2-lot subdivision.
- ▶ The existing dwelling will remain and meet all setbacks, but the accessory structure will be removed.
- ▶ Both lots meet the depth, width and size of the RU1 zone.

Park dedication

- ▶ The City is requiring a small corner of the lot to be dedicated to the park.
- ▶ Blair Pond Park trail needs to be setback from the riparian area of the pond.
- ▶ This dedication will be a condition of the Rezoning.

Park dedication



Site Plan

PROPOSED SUBDIVISION OF LOT 2, SEC 6, TP 23, ODYD, PLAN 29771.

PID: 004-189-264

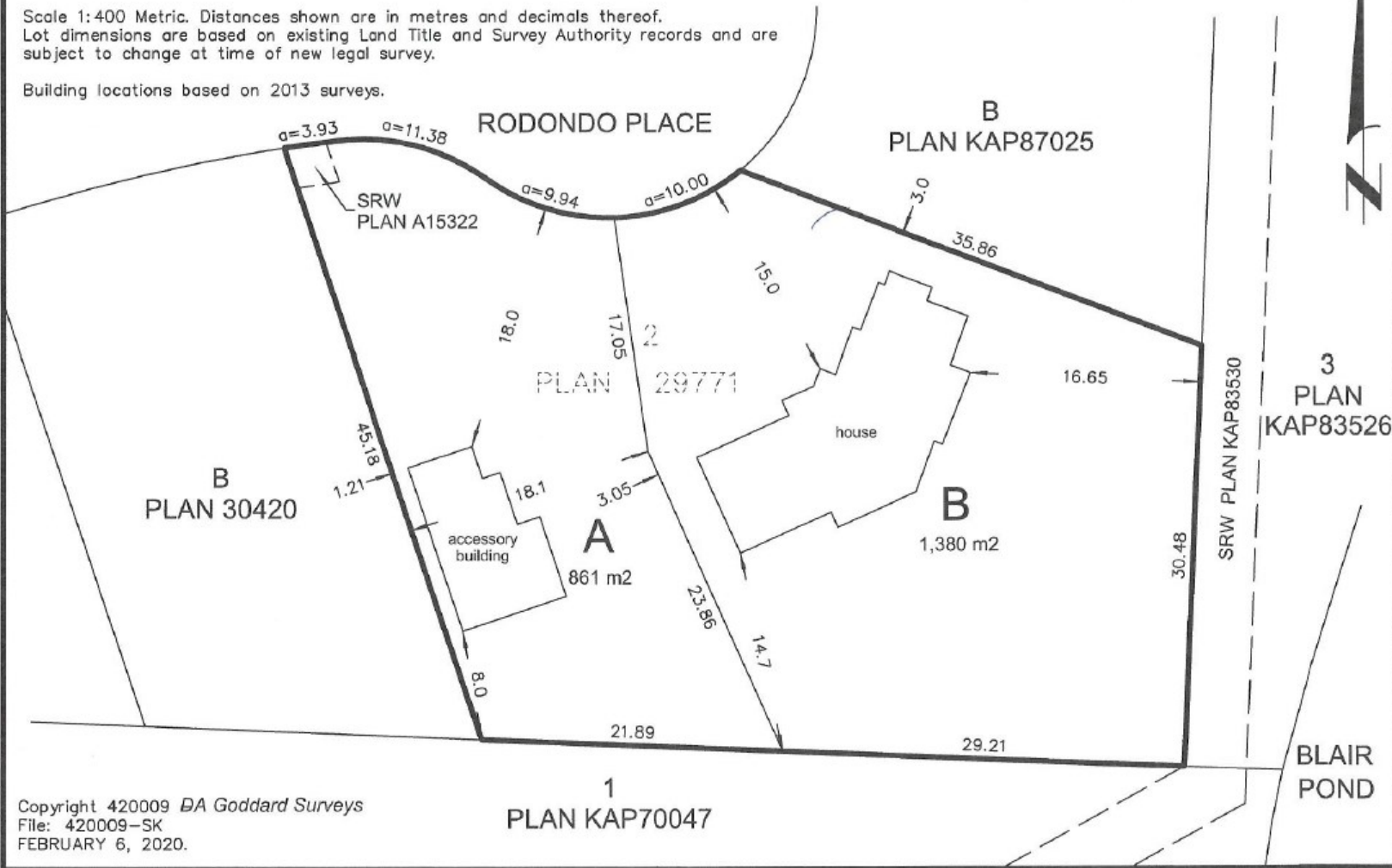
CIVIC ADDRESS: 1295 RODONDO PLACE, KELOWNA.

CLIENT: ALF WIENS

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Scale 1:400 Metric. Distances shown are in metres and decimals thereof.
Lot dimensions are based on existing Land Title and Survey Authority records and are subject to change at time of new legal survey.

Building locations based on 2013 surveys.



Development Policy

- ▶ Meets the intent of Official Community Plan Urban Infill Policies:
 - ▶ Within Permanent Growth Boundary
 - ▶ Sensitive Infill
 - ▶ Dedication of Linear Parks.
- ▶ Consistent with Zoning Bylaw – no variances

Staff Recommendation

- ▶ Staff recommend **support** of the proposed rezoning to facilitate a 2-lot subdivision
- ▶ Meets the intent of the Official Community Plan
 - ▶ Urban Infill Policies
- ▶ Applicant has agreed to dedicate small portion of property to the City as part of the trail widening.
- ▶ Recommend the Bylaw be forwarded to Public Hearing



Conclusion of Staff Remarks

CITY OF KELOWNA

BYLAW NO. 12120 Z20-0028 - 1295 Rodondo Place

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 8000".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 8000 be amended by changing the zoning classification of Lot 2 Section 6 Township 23 ODYD Plan 29771 located at Rodondo Place, Kelowna, BC from the RR1 – Rural Residential 1 zone to the RU1 – Large Lot Housing zone and P3 – Parks and Open Space zone as per Map "A" attached to and forming part of this bylaw.
2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first time by the Municipal Council this

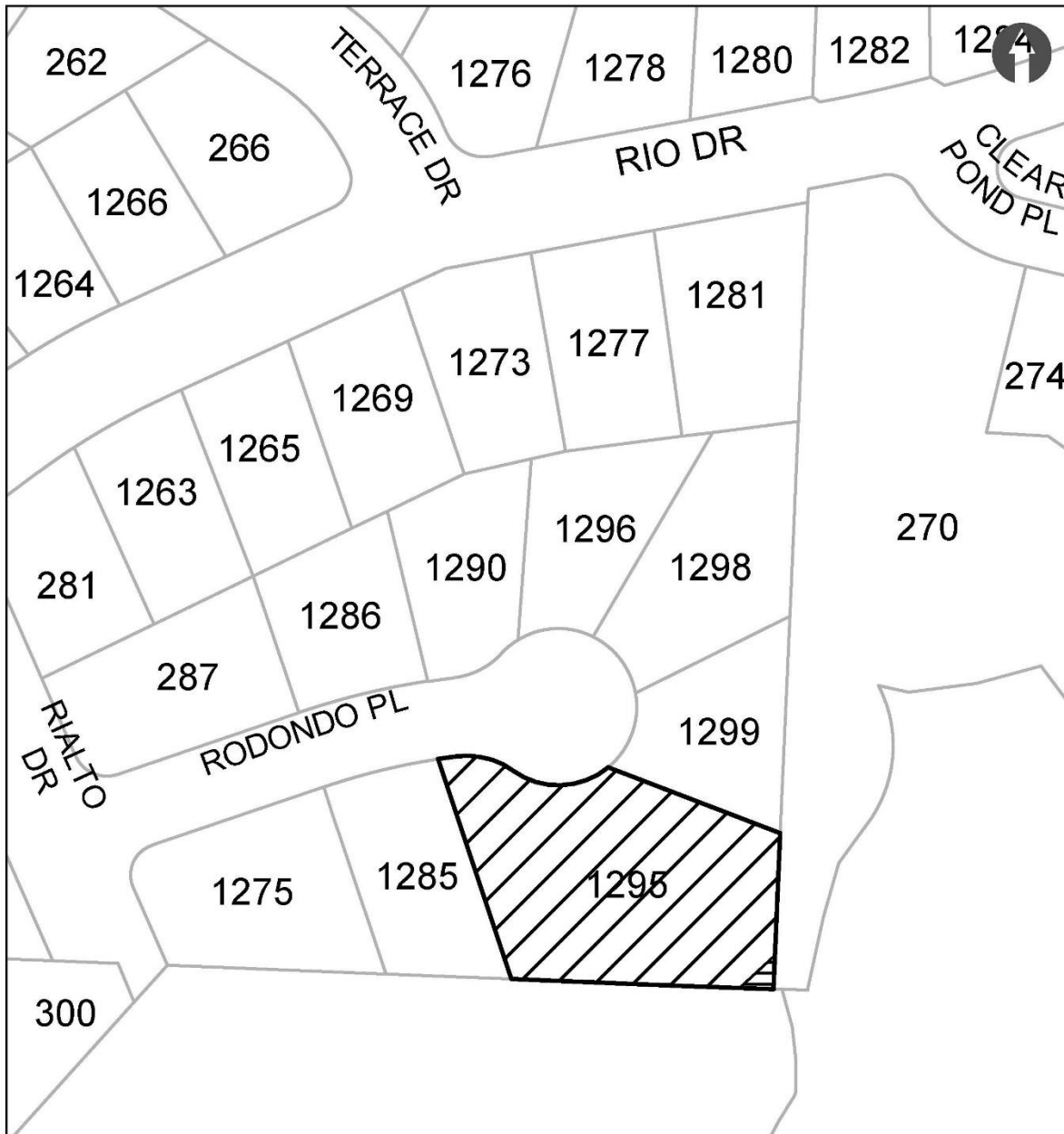
Considered at a Public Hearing on the

Read a second and third time by the Municipal Council this




Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk



MAP "A" Proposed Zoning
File Z20-0028

-  RR1 - Rural Residential 1 to P3 - Parks and Open Space
-  RR1 - Rural Residential 1 to RU1 - Large Lot Housing
-  Subject Property

0 15 30 Metres



Rev. Friday, October 30, 2020

REPORT TO COUNCIL



Date: November 16, 2020

To: Council

From: City Manager

Department: Development Planning

Application: Z20-0033

Owner: Robert T. Groholski and
Michalina J. Groholski

Address: 535 Elliot Avenue

Applicant: New Town Architecture &
Engineering

Subject: Rezoning Application

Existing OCP Designation: MRL – Multi Unit Residential (Low Density)

Existing Zone: RU6 – Two Dwelling Housing

Proposed Zone: RM1 – Four Dwelling Housing

1.0 Recommendation

THAT Rezoning Application No. Z20-0033 to amend the City of Kelowna Zoning Bylaw No. 8000 by changing the zoning classification of Lot 2, Block 19, District Lot 14, Osoyoos Division Yale District, Plan 830, located at 535 Elliot Avenue, Kelowna, BC from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone, be considered by Council;

AND THAT the Rezoning Bylaw be forwarded to a Public Hearing for further consideration;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Schedule "A" attached to the Report from the Development Planning Department dated May 6, 2020;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the approval of the Ministry of Transportation and Infrastructure;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered in conjunction with Council's consideration of a Development Permit and a Development Variance Permit for the subject property.

2.0 Purpose

To consider an application to rezone the subject property from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone to facilitate the development of a fourplex dwelling.

3.0 Development Planning

Development Planning Staff are supportive of the proposed rezoning of the subject property from RU6 – Two Dwelling Housing zone to RM1 – Four Dwelling Housing zone to facilitate the development of a fourplex dwelling, as it is consistent with the Official Community Plan (OCP) future land use designation. Located within the Permanent Growth Boundary, the property is immediately south of the Downtown Urban Center and is in close proximity to nearby amenities including shops and restaurants, the public transit, parks and recreational opportunities within the area.

Should Council support the rezoning, a Development Permit and a Development Variance Permit would be brought before Council for consideration.

To fulfill Council Policy No. 367, the applicant submitted a Neighbour Consultation Summary Form to Staff on June 10, 2020, outlining that the neighbours within 50 m of the subject property were notified.

4.0 Proposal

4.1 Background and Project Description

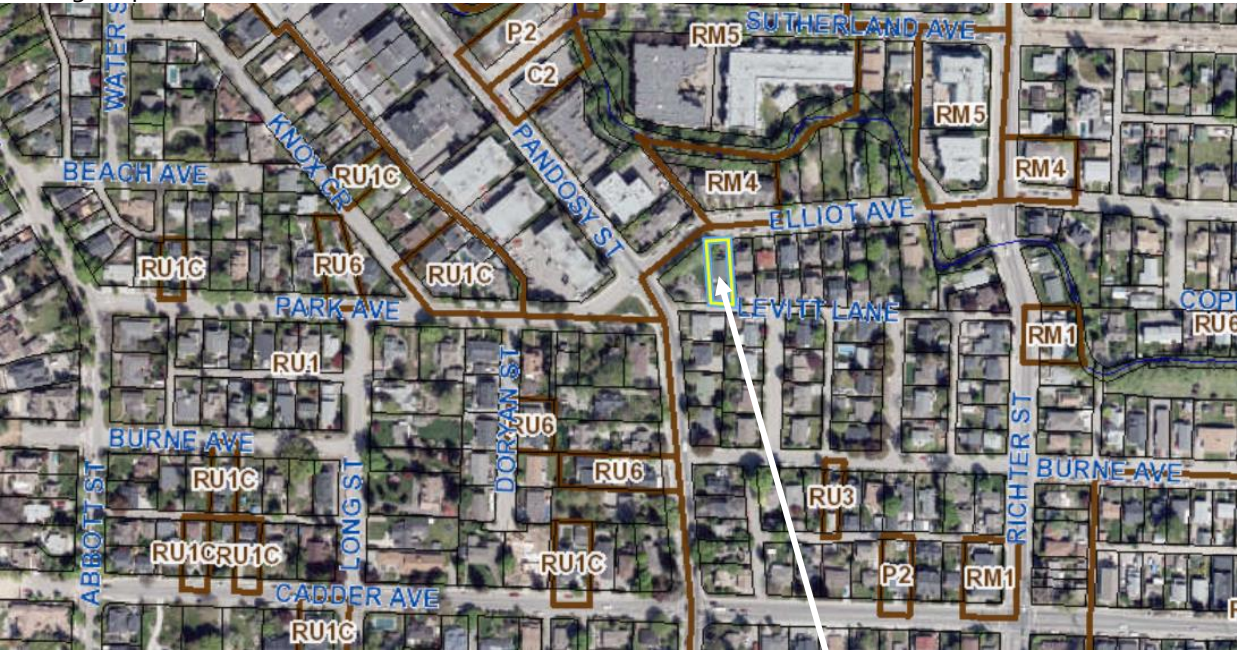
The applicant is proposing to rezone the subject property to RM1 – Four Dwelling Housing zone in order to facilitate the development of a fourplex on the parcel. The property currently has a single-family dwelling and a carriage house. The existing buildings will be demolished prior to the construction of the new development on the property. The applicant has provided a site plan (Attachment A) for the proposed new development.

4.2 Site Context

The subject property is located near the corner of Elliot Avenue and Pandosy Street within the Central City Sector. The property fronts Elliot Avenue to the north and backs onto to Levitt Lane to the south. The surrounding residential area is characterized by a mix of single family and secondary dwelling units developed as second dwellings and carriage houses to the south and east, and by townhouses and medium density apartment buildings to the north and west. The property is close to the Okanagan Lake and Abbott Street Multiuse Corridor to the west, to the City Park and Rowcliffe Park to the north and is within walking to the City Centre.

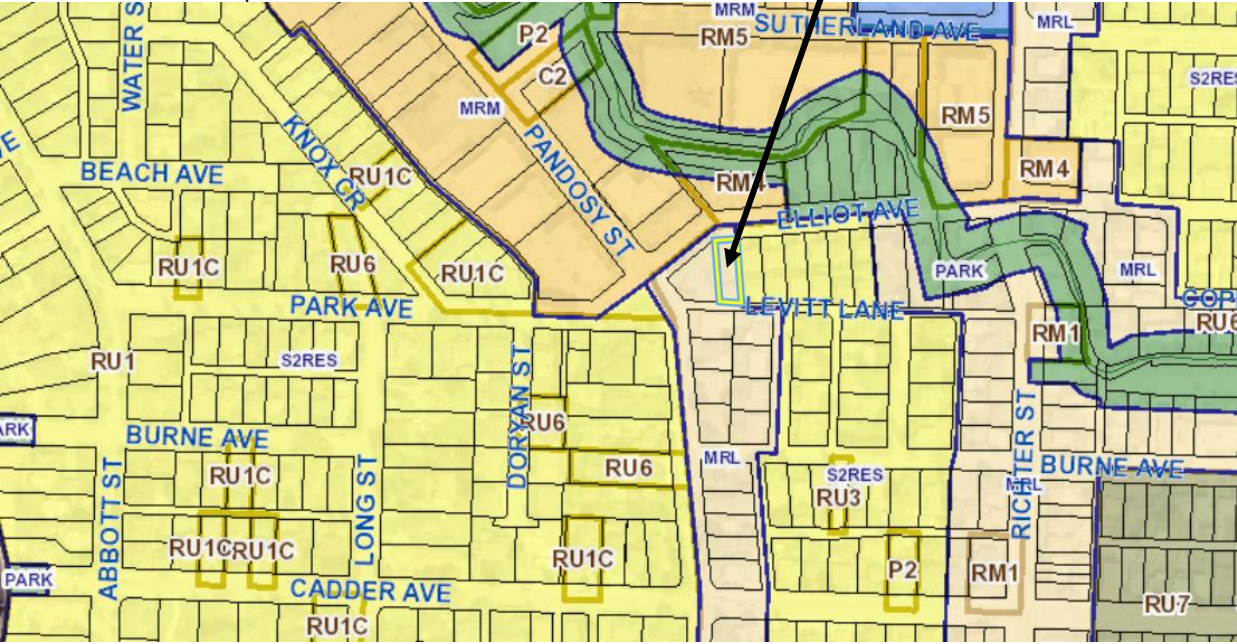
Subject Property Map: 535 Elliot Avenue

Zoning Map:



Subject Property

Future Land Use Map:



5.0 Current Development Policies

5.1 Kelowna Official Community Plan (OCP)

Chapter 5: Development Process

Objective 5.3 Focus development to designated growth areas

Policy .1 Permanent Growth Boundary. Establish a Permanent Growth Boundary as identified on Map 4.1 and Map 5.2. The City of Kelowna will support development of properties outside the PGB for more intensive use only to the extent permitted as per the OCP Future Land Use designations in place as of initial adoption of OCP Bylaw 10500, except for Agri-Business designated sites or as per Council's specific amendment of this policy. The PGB may be reviewed as part of the next major OCP update.

Policy .2 Compact Urban Form. Develop a compact urban form that maximizes the use of existing infrastructure and contributes to energy efficient settlement patterns. This will be done by increasing densities (approximately 75 - 100 people and/or jobs located within a 400 metre walking distance of transit stops is required to support the level of transit service) through development, conversion, and re-development within Urban Centres (see Map 5.3) in particular and existing areas as per the provisions of the Generalized Future Land Use Map 4.1.

Objective 5.22 Ensure context sensitive housing development

Policy .6 Sensitive Infill. Encourage new development or redevelopment in existing residential areas to be sensitive to or reflect the character of the neighbourhood with respect to building design, height and siting.

Policy .7 Healthy Communities. Through current zoning regulations and development processes, foster healthy, inclusive communities and a diverse mix of housing forms, consistent with the appearance of the surrounding neighbourhood.

6.0 Technical Comments

6.1 Development Engineering Department

Refer to attached Schedule A, Development Engineering Department Memorandum, dated May 6, 2020.

7.0 Application Chronology

Date of Application Received: April 16, 2020
 Date Public Consultation Completed: June 10, 2020
 Date of Revised Drawings Received: October 15, 2020

Report prepared by: Barbara B. Crawford, Planner II
Reviewed by: Jocelyn Black, Urban Planning Manager
Approved for Inclusion: Terry Barton, Development Planning Department Manager

Attachments:

Schedule A: Development Engineering Memo

Attachment A: Site Plan

CITY OF KELOWNA

MEMORANDUM

SCHEDULE		A
This forms part of application # Z20-0033		
Planner Initials	BC	 City of Kelowna DEVELOPMENT PLANNING

Date: May 6, 2020

File No.: Z20-0033

To: Community Planning (BC)

From: Development Engineering Manager (JK)

Subject: 535 Elliot Ave.

RU6 to RM1

The Development Engineering Department has the following comments and requirements associated with this application to rezone the subject property from RU6 to RM1. The road and utility upgrading requirements outlined in this report will be a requirement of this development. The Development Engineering Technician for this project is Aaron Sangster.

1. General

- a) The following requirements are valid for one (1) years from the reference date of this memo, or until the PLR and/or application has been closed, whichever occurs first. The City of Kelowna reserves the rights to update/change some or all items in this memo once these time limits have been reached.

2. Domestic Water and Fire Protection

- a) The subject property is currently serviced with a 19mm water service. One metered water service will be required for the development. The disconnection of the existing small diameter water services and the tie-in of a larger service is the developer's responsibility.

3. Sanitary Sewer

- a) This property is currently serviced with a 100-mm sanitary service. The developer's consulting mechanical engineer will determine the development requirements of this proposed development and establish the service needs. Only one service will be permitted for this development.

4. Storm Drainage

- a) The developer must engage a consulting civil engineer to provide a storm water management plan for the site, which meets the requirements of the Subdivision, Development and Servicing Bylaw No. 7900. The storm water management plan must also include provision of lot grading plan, minimum basement elevation (MBE), if applicable, and provision of a storm drainage service for the development and / or recommendations for onsite drainage containment and disposal systems. Only one service will be permitted for this development. The applicant, at his cost, will arrange the installation of one overflow service if required.

SCHEDULE		A
This forms part of application # Z20-0033		
Planner Initials	BC	 City of Kelowna DEVELOPMENT PLANNING

5. Electric Power and Telecommunication Services

- a) All proposed service connections are to be installed underground. It is the developer's responsibility to make a servicing application with the respective electric power, telephone and cable transmission companies to arrange for these services, which would be at the applicant's cost.

6. Road Improvements

- a) Elliot Ave. must be upgraded to a local standard along the full frontage of this proposed development, curb and gutter, sidewalk, irrigated landscaped boulevard, pavement removal and replacement, and re-location or adjustment of utility appurtenances if required to accommodate the upgrading construction. The road cross section to be used is a SS-R5.
- b) Levitt Lane fronting this development has already been upgraded, and no further upgrades are required at this time.

7. Erosion Servicing Control Plan

- a) Provide a detailed ESC Plan for this development as per the Subdivision, Development and Servicing Bylaw #7900.
- b) The developer must engage a consulting civil engineer to provide an ESC plan for this site which meets the requirements of the City Subdivision Development and Servicing Bylaw 7900.
- c) Civil consultant is responsible for all inspection and maintenance.
- d) A Security Deposit for ESC Works equal to 3.0% of the Consulting Engineer's opinion of probable costs of civil earthworks and infrastructure will be added to the Servicing Agreement.

8. Road Dedication and Subdivision Requirements

- a) Grant Statutory Rights of Way if required for utility services.
- b) If any road dedication or closure affects lands encumbered by a Utility right-of-way (such as Hydro, Telus, Gas, etc.) please obtain the approval of the utility. Any works required by the utility as a consequence of the road dedication or closure must be incorporated in the construction drawings submitted to the City's Development Manager.

9. Design and Construction

- a) Design, construction supervision and inspection of all off-site civil works and site servicing must be performed by a Consulting Civil Engineer and all such work is subject to the approval of the City Engineer. Drawings must conform to City standards and requirements.
- b) Engineering drawing submissions are to be in accordance with the City's "Engineering Drawing Submission Requirements" Policy. Please note the number of sets and drawings required for submissions.
- c) Quality Control and Assurance Plans must be provided in accordance with the Subdivision, Development & Servicing Bylaw No. 7900 (refer to Part 5 and Schedule 3).

SCHEDULE		A
This forms part of application # Z20-0033		
Planner Initials	BC	 City of Kelowna <small>DEVELOPMENT PLANNING</small>

- d) A “Consulting Engineering Confirmation Letter” (City document ‘C’) must be completed prior to submission of any designs.
- e) Before any construction related to the requirements of this subdivision application commences, design drawings prepared by a professional engineer must be submitted to the City’s Works & Utilities Department. The design drawings must first be “Issued for Construction” by the City Engineer. On examination of design drawings, it may be determined that rights-of-way are required for current or future needs.

10. Servicing Agreement for Works and Services

- (a) A Servicing Agreement is required for all works and services on City lands in accordance with the Subdivision, Development & Servicing Bylaw No. 7900. The applicant’s Engineer, prior to preparation of Servicing Agreements, must provide adequate drawings and estimates for the required works. The Servicing Agreement must be in the form as described in Schedule 2 of the bylaw.
- (b) Part 3, “Security for Works and Services”, of the Bylaw, describes the Bonding and Insurance requirements of the Owner. The liability limit is not to be less than \$5,000,000 and the City is to be named on the insurance policy as an additional insured.

11. Geotechnical Report

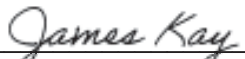
Provide a geotechnical report prepared by a Professional Engineer competent in the field of hydro-geotechnical engineering to address the items below: NOTE: The City is relying on the Geotechnical Engineer’s report to prevent any damage to property and/or injury to persons from occurring as a result of problems with soil slippage or soil instability related to this proposed subdivision. The Geotechnical reports must be submitted to the Development Services Department (Subdivision Approving officer) for distribution to the Development Engineering Branch and Inspection Services Division prior to submission of Engineering drawings or application for subdivision approval.

- (i) Area ground water characteristics, including any springs and overland surface drainage courses traversing the property. Identify any monitoring required.
- (ii) Site suitability for development.
- (iii) Site soil characteristics (i.e. fill areas, sulphate content, unsuitable soils such as organic material, etc.).
- (iv) Any special requirements for construction of roads, utilities and building structures.
- (v) Recommendations for items that should be included in a Restrictive Covenant.
- (vi) Recommendations for roof drains, perimeter drains and septic tank effluent on the site.
- (vii) Any items required in other sections of this document.

SCHEDULE		A
This forms part of application # Z20-0033		
Planner Initials	BC	 City of Kelowna DEVELOPMENT PLANNING

12. Charges and Fees

- a) Development Cost Charges (DCC's) are payable.
- b) Fees per the "Development Application Fees Bylaw" include:
 - i) Survey Monument, Replacement Fee: \$1,200.00 (GST exempt) – only if disturbed.
 - ii) Engineering and Inspection Fee: 3.5% of construction value (plus GST).



James Kay, P.Eng.
Development Engineering Manager

AS



Revision	No	Date	Description
	1	20/12/2019	ISSUED FOR DP
	2	17/03/2020	RE-ISSUED FOR DP
	3	18/03/2020	RE-ISSUED FOR DP
	4	25/06/2020	RE-ISSUED FOR DP
	5	10/08/2020	RE-ISSUED FOR DP

project title	ELLIOTT 4-PLEX
project address	535 Elliott Street Kelowna, BC
project no.	4108

drawn by	SITE PLAN & ZONING ANALYSIS		
designed	K.F.	scale	1"=100'
shown	R.B.P.V.		
checked	R.V.		

A2.00



Z20-0033

535 Elliot Avenue

Rezoning Application



Proposal

- ▶ To consider an application to rezone the subject property from RU6 – Two Dwelling Housing zone to RM1 – Four Dwelling Housing zone to facilitate the development of a fourplex dwelling.

RU6  RM1

Development Process



April 16, 2020

Development Application Submitted



Staff Review & Circulation



June 10, 2020

Public Notification Received



 **November 16, 2020**

Initial Consideration



Public Hearing
Second & Third Readings



Final Reading
DP & DVP Applications

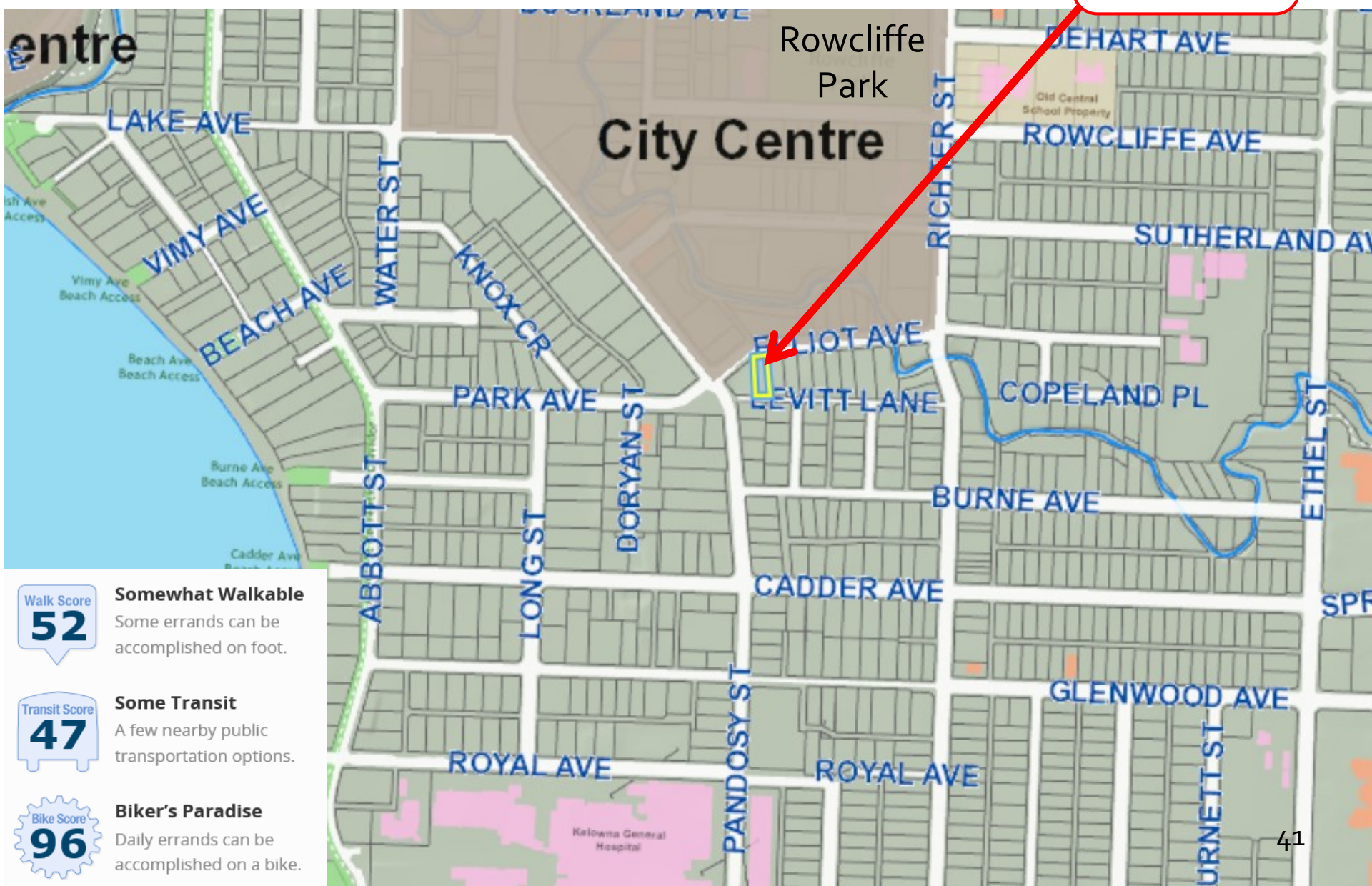


Building Permit

} Council Approvals

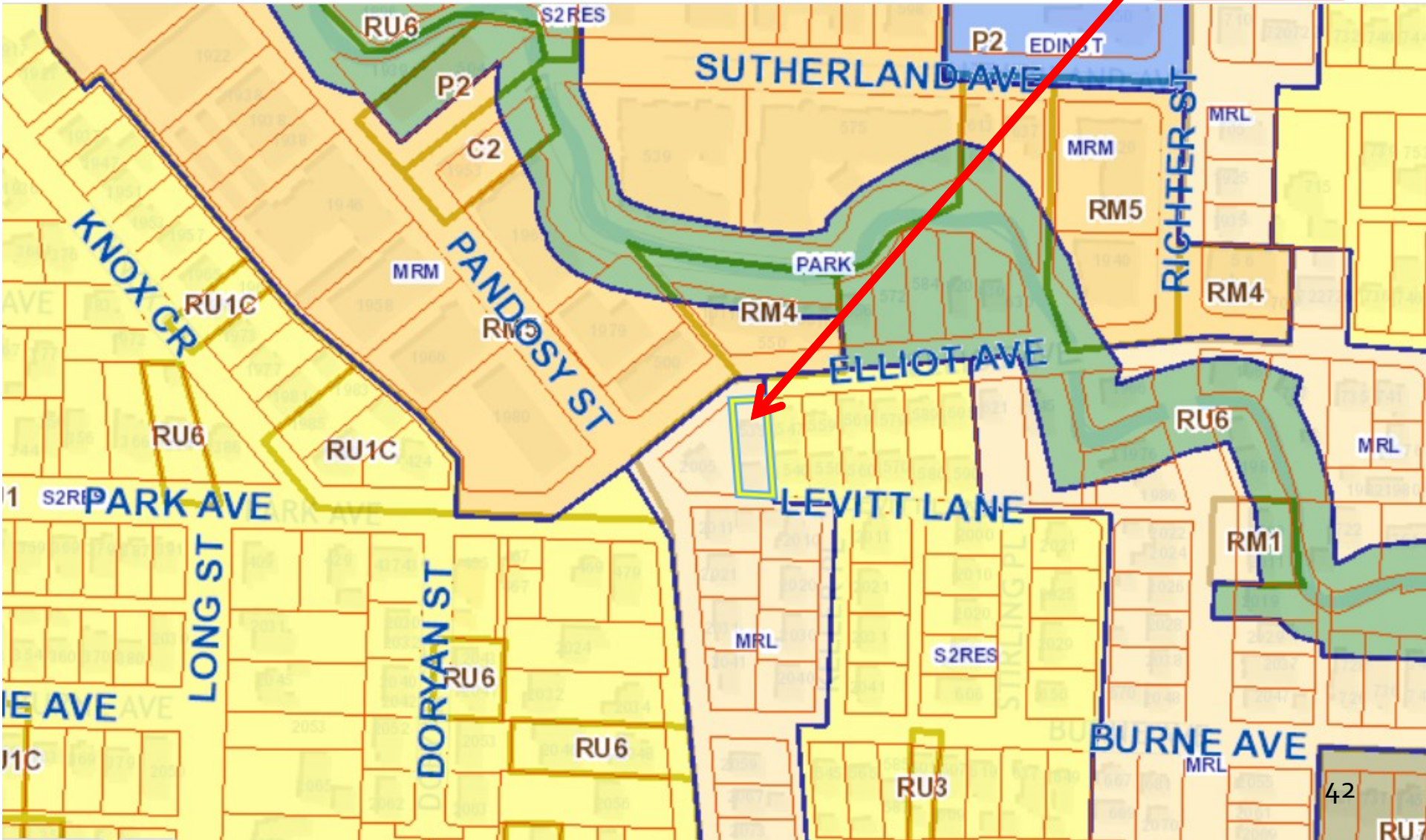
Context Map

Subject
Property



Zoning and OCP Future Land Use

Subject
Property



Subject Property Map



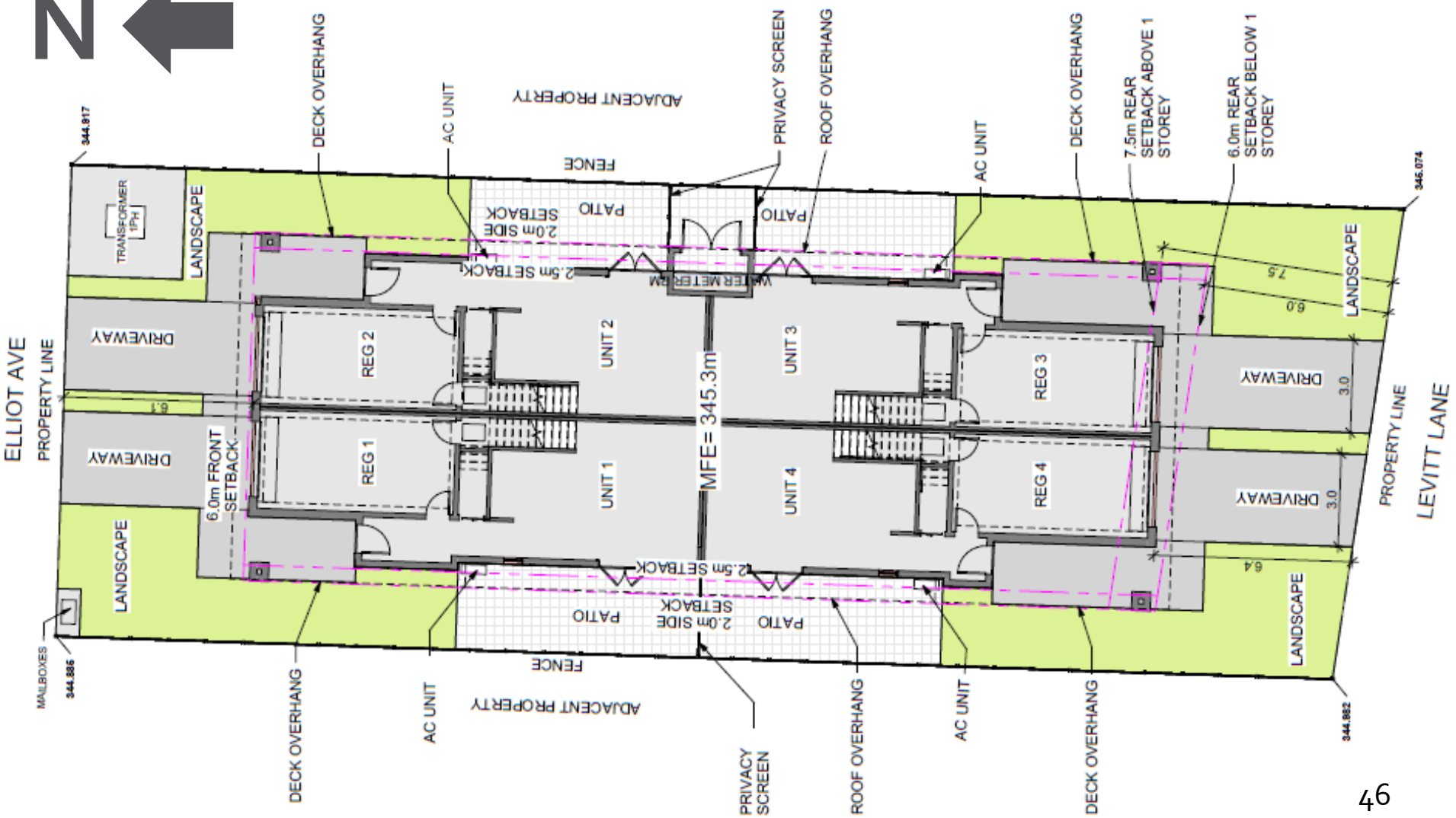
Subject Property Photo – Elliot Ave



Subject Property Photo – Levitt Lane



Conceptual Site Plan



Development Policy

- ▶ Meets the intent of Official Community Plan Urban Infill Policies:
 - ▶ Within Permanent Growth Boundary
 - ▶ Compact Urban Form
 - ▶ Sensitive Infill
 - ▶ Healthy Communities

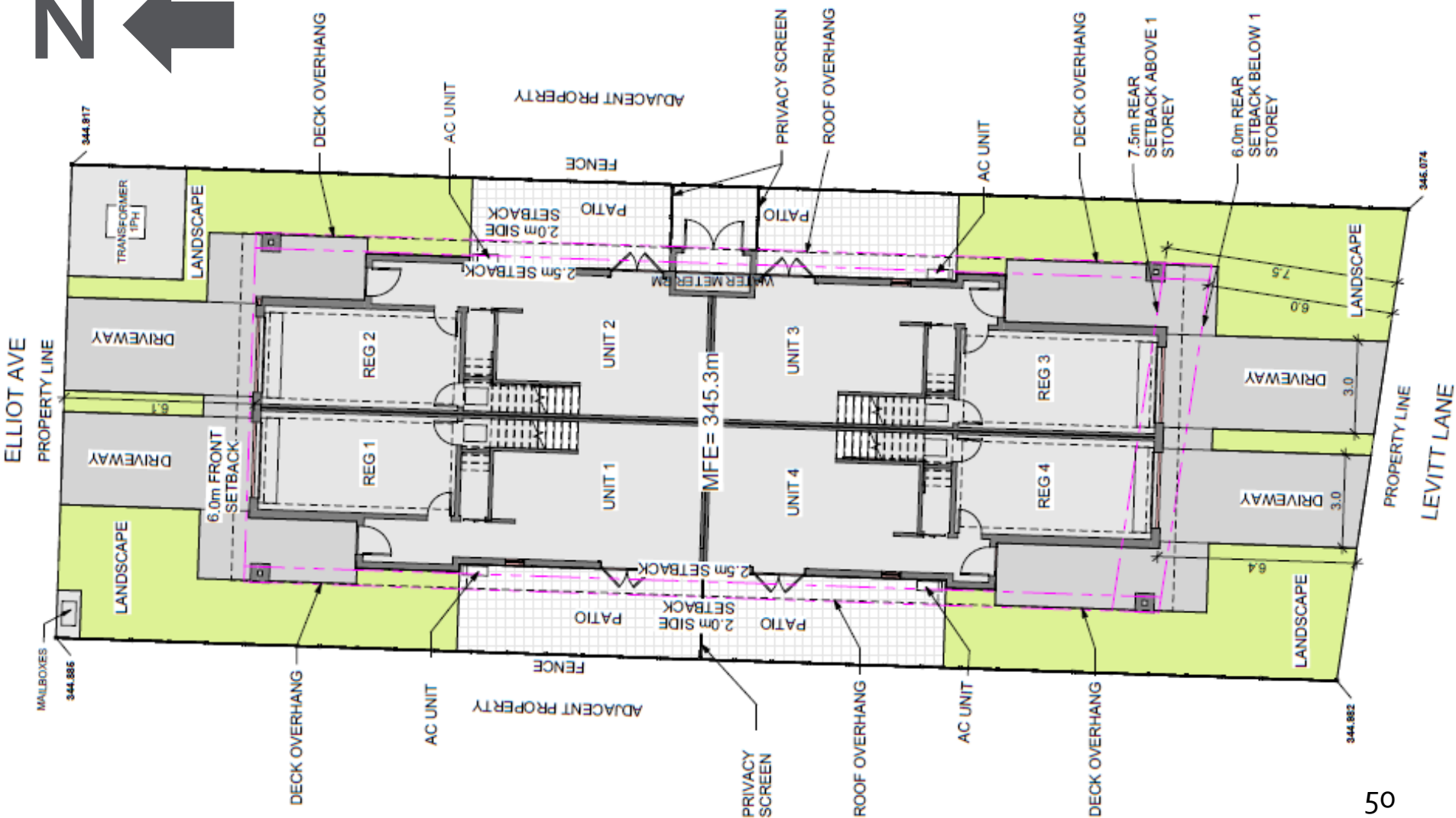
Staff Recommendation

- ▶ Staff recommend **support** for the proposed rezoning to facilitate the development of a fourplex dwelling.
- ▶ Meets the intent of the Official Community Plan
 - ▶ Urban Infill Policies
 - ▶ Appropriate location for adding residential density
- ▶ Recommend the Bylaw be forwarded to Public Hearing



Conclusion of Staff Remarks

Conceptual Site Plan



CITY OF KELOWNA

BYLAW NO. 12121

Z20-0033 - 525 Elliot Avenue

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 8000".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 8000 be amended by changing the zoning classification of Lot 2 Block 19 District Lot 14 ODYD Plan 830 located at Elliot Avenue, Kelowna, BC from the RU6 – Two Dwelling Housing zone to the RM1 – Four Dwelling Housing zone.
2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first time by the Municipal Council this

Considered at a Public Hearing on the

Read a second and third time by the Municipal Council this

Approved under the Transportation Act this

(Approving Officer – Ministry of Transportation)

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Report to Council



Date: November 16, 2020
To: Council
From: City Manager
Subject: 934 Laurier Avenue, Z18-0103, Extension Report
Department: Development Planning

Recommendation:

THAT in accordance with Development Application Procedures Bylaw No. 10540, the deadline for the adoption of Rezoning Amending Bylaw No. 11799, for Lot 4 District Lot 138, ODYD, Plan 2819 located at 934 Laurier Avenue, Kelowna, BC, be extended for 6 months from November 7, 2020 to May 7, 2021;

AND THAT Council directs Staff to not accept any further extension requests.

Purpose:

To extend the deadline for adoption of Rezoning Bylaw No. 11799 for 6 months to May 7, 2021.

Community Planning:

Rezoning Bylaw No. 11799 received second and third readings at a Regular meeting of Council held on May 7, 2019. Final adoption of the zone amendment bylaw is subject to the applicant meeting the requirements for the Development Engineering Department. The applicant has made progress on the rezoning application and advises they are moving forward to complete these requirements. Staff are recommending that Council supports extending the deadline for adoption for the Rezoning Bylaw No. 11799 to May 7, 2021.

Approved for inclusion: Terry Barton, Development Planning Department Manager

Report to Council



Date: November 16, 2020

To: Council

From: City Manager

Subject: Final Regional Transportation Plan, Regional Bicycling and Trails Master Plan and Regional Disruptive Mobility Strategy

Department: Integrated Transportation & STPCO

Recommendation:

THAT Council receives, for information, the report dated November 16, 2020 with respect to an update on STPCO activities and the Regional Transportation Plan.

And THAT Council endorses the final versions of the Regional Transportation Plan (RTP) and its supporting plans: The Regional Bicycling and Trails Master Plan (RBTMP) and the Regional Disruptive Mobility Strategy (RDMS).

Purpose:

To update Council on regional transportation initiatives and present related final plans.

Background:

The Sustainable Transportation Partnership of the Central Okanagan (STPCO) is a formal partnership of the City of Kelowna, City of West Kelowna, Districts of Lake Country and Peachland, Westbank First Nation and the Regional District of Central Okanagan. The STPCO coordinates the regional delivery of sustainable transportation programs and projects in support of common regional interests, including development of the Regional Transportation Plan. The STPCO also provides a formal forum for discussion amongst elected officials, senior and technical staff, stakeholders and the general public.

The STPCO Work Plan is divided into the three areas: Strategic Partnerships with Senior Government, Transit Program and Delivery, and Regional Transportation Planning. This report provides an update on activities in the Regional Transportation Planning work area, including presentation of the results of the 2018 Okanagan Travel Survey, the results of the summer 2020 draft Regional Transportation Plan engagement, and final versions of the Regional Transportation Plan and its supporting plans: the Regional Bicycling and Trails Master Plan and the Regional Disruptive Mobility Strategy.

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. Development of the plan was supported by a grant from the Strategic Priorities Fund under the Administrative Agreement on the Federal Gas Tax Fund (GTF) in British Columbia.

Discussion:

2018 Okanagan Travel Survey: The Okanagan Travel Survey is one of the largest public surveys undertaken in the Central Okanagan and provides the most comprehensive picture of how people travel around the region to date. Nearly 9,000 people from the Central Okanagan participated in the 2018 Okanagan Travel Survey and logged over 25,000 trips¹. The survey builds on both the 2007 and 2013 Okanagan Travel Surveys.

One of the most significant findings in the 2018 Okanagan Travel Survey is that residents are making fewer trips per capita (by all modes). While the population has grown by 20 per cent since 2007, the number of trips made on a typical weekday only grew by 10 per cent, resulting in fewer trips per person. Several factors may be contributing to this trend, including an aging population, changing nature of work, and a rise in e-commerce. Although residents are making fewer trips, these trips have become longer. As a result, the total vehicle kilometres travelled (VKT) in the region has increased by 13 per cent. VKT is an important measure for greenhouse gas (GHG) emissions.

Another key finding is that, while driving remains the way most people get around, there has been a 2% shift region-wide towards sustainable modes since 2007. Between 2013 and 2018, mode share remained relatively stable (within the margin for error), which means that efforts to encourage mode shift are roughly keeping up with population growth.

More information on the 2018 Okanagan Travel Survey is available as Attachment 2 and posted on the smartTRIPS website. STPCO staff are preparing a webinar for December 9th for interested participants who wish to better understand the results and how to use the data.

Final Regional Plans: After more than two and a half years of technical studies, consultation, and unprecedented region-wide partnership and collaboration, the Regional Transportation Plan and its supporting plans, the Regional Bicycling and Trails Master Plan and Regional Disruptive Mobility Strategy are ready for presentation to the STPCO Councils for endorsement.

Together, the plans identify transportation projects and priorities that will help build and maintain a healthy, thriving and connected future for the Central Okanagan region over the next twenty years. They set the direction for Central Okanagan governments to work together to prepare for future population growth, help people of all ages and abilities get around, reduce the growth of traffic congestion and greenhouse gases, and help the region's economic recovery post COVID-19.

The interconnected recommendations for projects, programs and policies in the plans will help connect people and places across the region, improve the movement of people and goods, achieve fast and reliable transit, and help create a region where more people can choose sustainable and affordable transportation options. Moving forward, the plans will help Central Okanagan governments collaborate on the delivery of regionally significant projects, coordinate with their local transportation plans, and seek funding for transportation investments that benefit the entire Central Okanagan region.

¹ The 2018 Okanagan Travel Survey also included Vernon. The results in this report have been tallied to report results for the Central Okanagan region. A complete summary of findings is provided in Attachment 2.

Draft Regional Transportation Plan Engagement Summary: The draft Regional Transportation Plan (RTP) and its supporting plans: the draft Regional Bicycling and Trails Master Plan (RBTMP) and the draft Regional Disruptive Mobility Strategy (RDMS) were presented to each of the STPCO partner councils and the RDCO Board in June and July of 2020 (including to the Kelowna City Council on June 15th, 2020). Following the presentation of the draft plans, the project team launched a public engagement period in August 2020 to invite input from Central Okanagan residents on the draft plans.

Due to COVID-19, engagement activities were hosted in a digital format to align with advice from the Provincial Medical Health Officer. A virtual open house and online questionnaire was available from August 4 – 23, 2020, and two live video panel discussions were hosted on August 19th and 20th. In total, 322 people shared their thoughts and opinions by responding to the questionnaire and 18 people participated in the live video panel discussions. In addition, individual stakeholder groups reached out to the project team directly to provide comments on specific topic areas.

Over 1,200 open-ended comments were provided in response to the virtual open house and online questionnaire. The project team read each comment and developed a list of themes based on their content. Each time a theme was mentioned it was tallied. The top themes that were mentioned most often are shown below, with font sizes roughly corresponding to the number of times each theme was mentioned:

Figure 1: Top Themes from Open-Ended Comments on the Draft Regional Transportation Plan



A complete and more detailed summary of engagement activities and results, including verbatim comments, is available in Attachment 3 and on the smartTRIPS website.

The feedback received was used to help prepare final versions of the Regional Transportation Plan and its supporting plans for endorsement. An overview of the key refinements that have been made to each plan are described below:

- **Regional Transportation Plan:** Key refinements that were made to the Regional Transportation Plan include:
 - Addition of a Preamble: The introduction was expanded to clarify the purpose and intended outcomes of the Regional Transportation Plan. The plan recommendations were summarized, including how the transit recommendations in the plan are intended to work together to create a fast and reliable “transit spine” that connects the region and increases the people-moving capacity of the highway corridor.
 - Alignment with Provincial Plans: A new section was added in response to comments requesting measurable targets and asking how the RTP aligns with provincial plans related to climate and active transportation. The provincial CleanBC plan sets a target of a 25.4 Mt reduction in greenhouse gas (GHG) emissions by 2030. While the Central Okanagan region lacks a formal regional governance structure for setting and enforcing region-specific targets, the RTP and its supporting plans have been developed to align with the strategic direction of CleanBC and the BC Economic Framework. The plans are designed to help the region trend in the desired direction of provincial GHG and active transportation targets.
 - Incorporation of 2018 Okanagan Travel Survey Results: The Existing and Future Conditions chapter was updated to include the results of the 2018 Okanagan Travel Survey. The survey findings were reviewed and the RTP direction and recommendations were still found to be highly relevant. In particular, given that people are making longer driving trips resulting in an increase in regional VKT, the recommendation to create faster and more reliable transit that better connects our region remains vitally important to help provide a convenient alternative to driving for longer regional trips.
 - Updates to the Future of the STPCO: This section was updated to reflect the most recent direction from the STPCO Local Government Advisory (LGA) Board regarding oversight and implementation of the RTP after it is endorsed.
 - Addition of Performance Monitoring Approach: In response to comments and in alignment with recent LGA Board direction, a new section called Monitoring the RTP Success was added to the plan. The section suggests key metrics and data sources that will be necessary to track plan progress over time.

Additionally, the document was reviewed for final edits, overall flow and final formatting. It should also be noted that the recommendations in the Regional Transportation Plan are being incorporated into the on-going development of the Kelowna Transportation Master Plan, to ensure coordination across the two plans.

The final version of the Regional Transportation Plan is attached to this report and available on the smartTRIPS website. The recommended projects, programs and policies can be found in Chapter 5 of the plan.

- **Regional Bicycling and Trails Master Plan (RBTMP):** The Regional Bicycling and Trails Master Plan (RBTMP) updates the 2012 Regional Active Transportation Master Plan. The regional bicycling and trails network presented in the RBTMP are designed to provide safe and convenient active transportation connections to regionally significant destinations across the Central Okanagan. The proposed regional bicycling and trails network spans 193 km, including 82 km that exist today, 81 km that are not yet constructed, and 30 km that need to be upgraded.

Key refinements that were made to the draft Regional Bicycling and Trails Master Plan to prepare it for endorsement include:

- Alignment with Provincial Plans: Similar to the RTP, a new section was added in response to comments asking how the RBTMP aligns with provincial plans related to climate and active transportation. The provincial active transportation strategy “Move. Commute. Connect.” aims to double the trips taken by active transportation in the province by 2030. While the Central Okanagan region lacks a formal regional governance structure for setting and enforcing region-specific targets, the RBTMP will help the region trend in the desired direction of the provincial active transportation goals.
- Incorporation of 2018 Okanagan Travel Survey Results: The RBTMP chapter on the Current Status of Active Transportation was updated to include the results of the 2018 Okanagan Travel Survey. In addition, the survey findings were reviewed and the RBTMP direction and recommendations were still found to be highly relevant. In particular, given that bike and walk mode share held relatively steady between 2013 and 2018, the recommendations to create a safe and convenient regional biking and trail network that better connects our region remains vitally important to help encourage more biking and walking trips.
- Strengthening alignment with the BC Active Transportation Design Guide: In response to comments, the text and language regarding the relationship of the RBTMP to the recently published BC Active Transportation Design Guide was clarified. In particular, some language and terms were made more consistent and the intent to refer primarily to the BC Active Transportation Design Guide, in conjunction with the TAC Geometric Design Guide for the design of regional active transportation facilities was clarified.

Additionally, some refinements to the network were made based on partner input and comments from provincial and local bicycling groups, and a final edit and formatting was completed.

The final version of the Regional Bicycling and Trails Master Plan is attached to this report and available on the smartTRIPS website.

- **Regional Disruptive Mobility Strategy (RDMS)**: “Disruptive mobility” refers to changes in transportation technologies that will fundamentally change how people get around in the future. These changes are making transportation more connected, automated, shared, and electric. These changes have the potential to benefit the region, though negative impacts that work against current policy directions are possible as well.

In response to comments, it was determined that more clarity was needed in regards to the scope and intent of the Strategy to address some common misunderstandings. Rather than a strategy for promoting new technologies, per se, the RDMS is intended to help Central Okanagan governments *prepare* for inevitable technology change, harness its benefits, and minimize potential drawbacks, in alignment with our shared regional transportation vision and goals.

To help provide clarity, a new subtitle was developed so the full title of the document now reads “*The Regional Disruptive Mobility Strategy: Helping Central Okanagan Governments Prepare for Transportation Technology Change.*” In addition, a tag-line was developed “*Technology will disrupt how we move around the region. Are you ready?*” These changes, among other small edits in response to comments are intended to help people understand that the Regional Disruptive Mobility Strategy is a resource guide for Central Okanagan governments to pick and choose the

tactics and actions that work best for their community to prepare for changes to transportation on the horizon.

As part of the development of the Kelowna Transportation Master Plan, tactics and actions ideally suited for Kelowna will be identified and incorporated into the plan.

The final version of the Regional Disruptive Mobility Strategy is attached to this report and available on the smartTRIPS website.

Next Steps:

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. In particular, it is anticipated that recommendations that involve the highway and that require further study will be analyzed further as part of the next phase of the Ministry of Transportation and Infrastructure's Central Okanagan Planning Study.

Final versions of the Regional Transportation Plan and its supporting plans are being presented to each of the STPCO partner councils and the RDCO Board for endorsement in November and December 2020.

To follow up on the progress of implementing the Regional Transportation Plan, the STPCO LGA Board has recommended the creation of a regional technical committee administered by the Regional District of Central Okanagan (RDCO) and initially facilitated by City of Kelowna staff. Additionally, the LGA Board has recommended that the RDCO administration place the topic of regional transportation on the agenda at two RDCO Board meetings each year to promote discussion and cooperation on regional transportation issues.

Internal Circulation:

Communications
Financial Planning
Infrastructure Engineering
Parks & Buildings
Policy and Planning

Considerations not applicable to this report:

Legal/Statutory Authority:
Legal/Statutory Procedural Requirements:
Existing Policy:
Financial/Budgetary Considerations:
External Agency/Public Comments:
Communications Comments:

Submitted by:
M. VanZerr, Strategic Transportation Planning Manager

Reviewed and Approved by:

R. Villarreal, Department Manager, Integrated Transportation & STPCO Administrator

Approved for inclusion:



Alan Newcombe, Divisional Director, Infrastructure

Attachment 1 – Final Regional Transportation Plan Presentation

Attachment 2 – 2018 Okanagan Travel Survey Report

<https://smartTRIPS.ca/2018-okanagan-travel-survey-final-report>.

Attachment 3 – Draft RTP Engagement Summary:

<https://smartTRIPS.ca/rtp-engagement-summary-summer-2020>

Attachment 4 – Regional Transportation Plan

<https://smartTRIPS.ca/regional-transportation-plan-final>

Attachment 5 – Regional Bicycling and Trails Master Plan

<https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final>

Attachment 6 – Regional Disruptive Mobility Strategy

<https://smartTRIPS.ca/regional-disruptive-mobility-strategy-final>

cc: Deputy City Manager
Divisional Director, Corporate Strategic Services
Divisional Director, Financial Services
Divisional Director, Infrastructure
Divisional Director, Partnership & Investments
Divisional Director, Planning & Development Services



Connecting Our Region

Our first region-wide transportation plan



Final Regional Transportation Plan

Kelowna

November 16th 2020

Agenda

- 1. STPCO Updates**
- 2. 2018 Okanagan Travel Survey**
- 3. Draft RTP Engagement Summary**
- 4. Endorsement of Final Plans:**
 - Regional Transportation Plan**
 - Regional Bicycling and Trails Master Plan**
 - Regional Disruptive Mobility Strategy**

Regional Governance Update

STPCO

**Sustainable Transportation
Partnership of the Central Okanagan**

STPCO

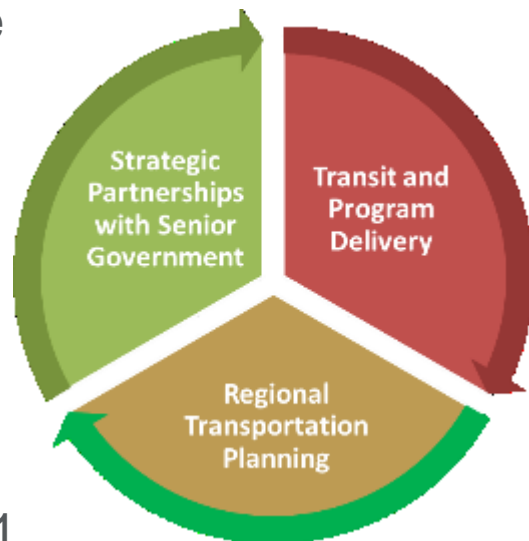
Interjurisdictional service agreement

Local Government Service Agreement, under the auspices of the Local Government Act

“STPCO was formally established in 2012. At that time, the partnership agreement contemplated the joint funding and delivery of services related to transportation demand management, regional transportation planning and regional transportation surveys and studies.”

STPCO functions will be transitioned starting 2021

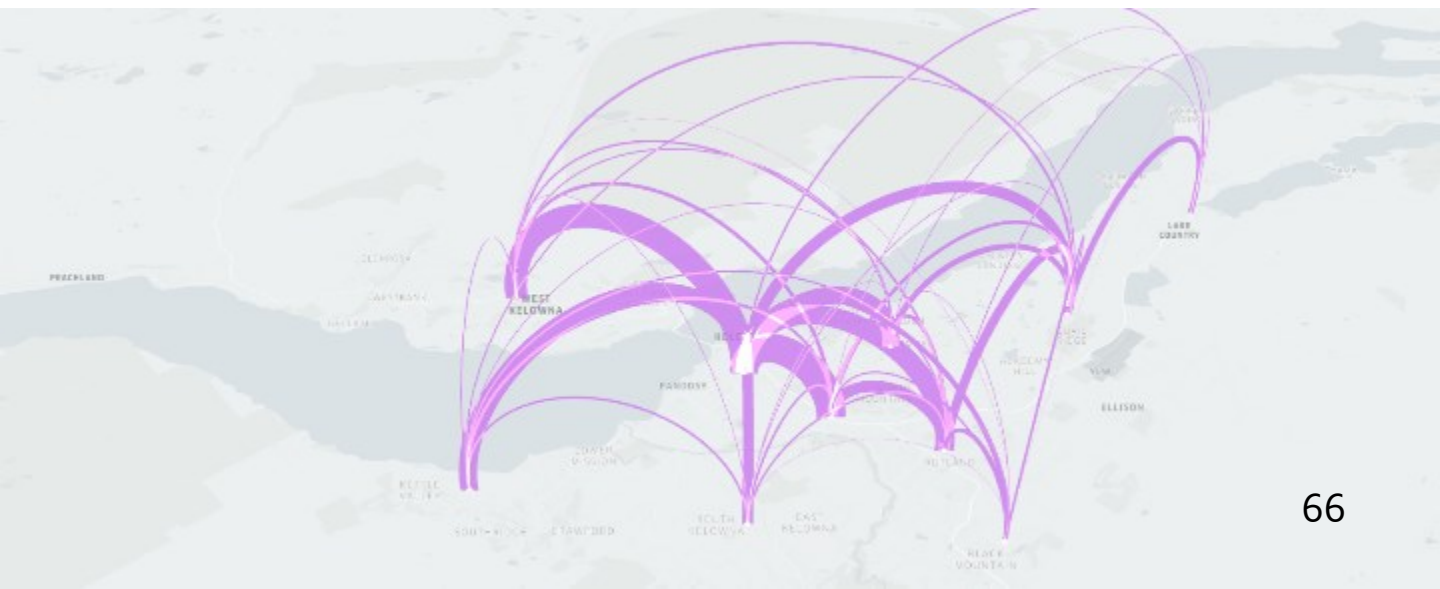
2018-2020 Work Plan



2018 Okanagan Travel Survey

2018 Okanagan Travel Survey

- The most comprehensive picture of how people travel around the region to date:
 - 9,000 participants / 25,000 trips
- The survey builds on both the 2007 and 2013 Okanagan Travel Surveys.



2018 Okanagan Travel Survey

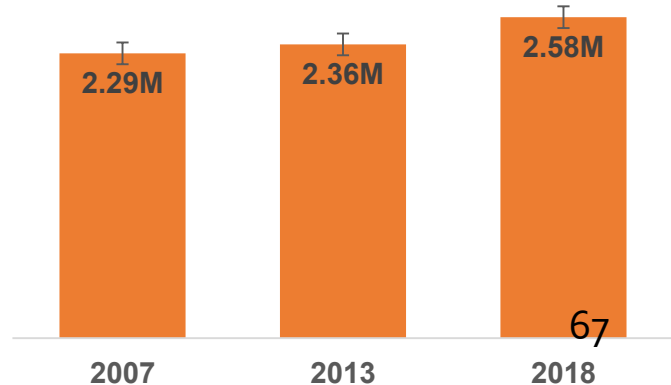
Key findings:

- Residents are making fewer trips per capita (by all modes)
- However, trips are longer distances

Since 2007:

- **20%** increase in population
- **5%** increase in driving trips
- **13%** increase in VKT since 2007

Estimated Daily Vehicle Km Travelled

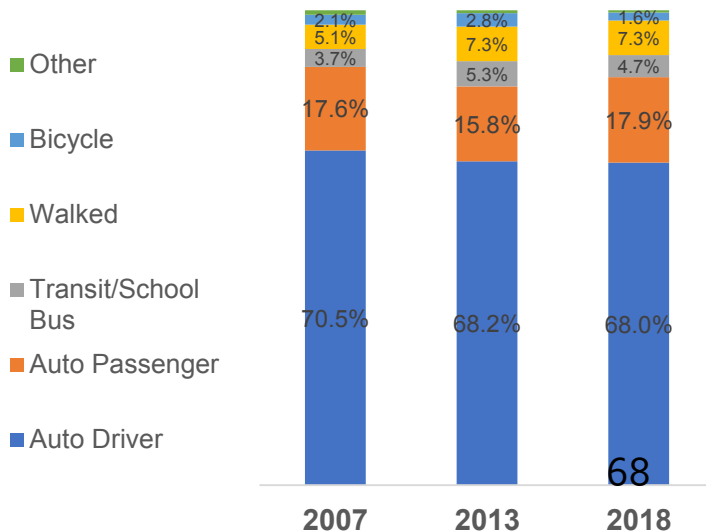


2018 Okanagan Travel Survey

- Since 2007, 2% shift region-wide towards sustainable modes
- Since 2013, mode shares are relatively stable
 - within the margin for error
 - indicates sustainable mode shift is keeping pace with population growth
- 47% of trips are less than 5 km long

2018 Okanagan Travel Survey
Report: <https://smartTRIPS.ca/2018-okanagan-travel-survey-final-report>

Webinar on Dec 9th



Final Regional Plans

Connecting our Region

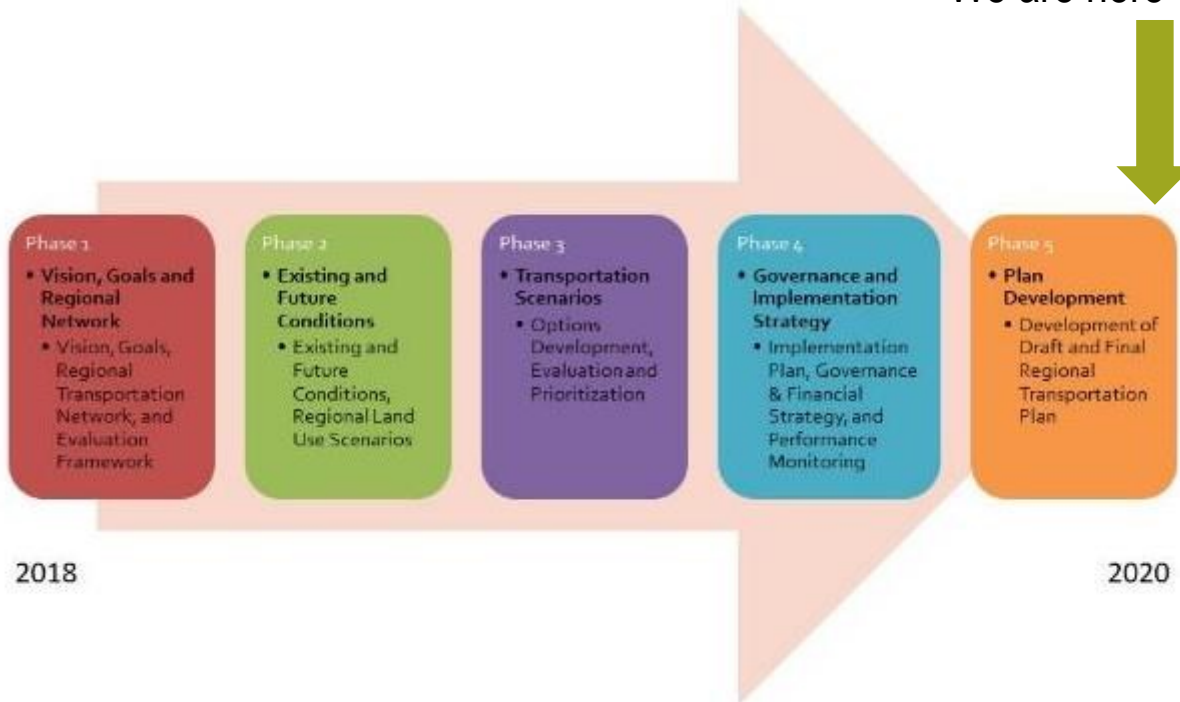
2.5 years of technical studies, consultation, and unprecedented region-wide partnership and collaboration

- Regional Transportation Plan
- Regional Bicycling and Trails Master Plan
- Regional Disruptive Mobility Strategy

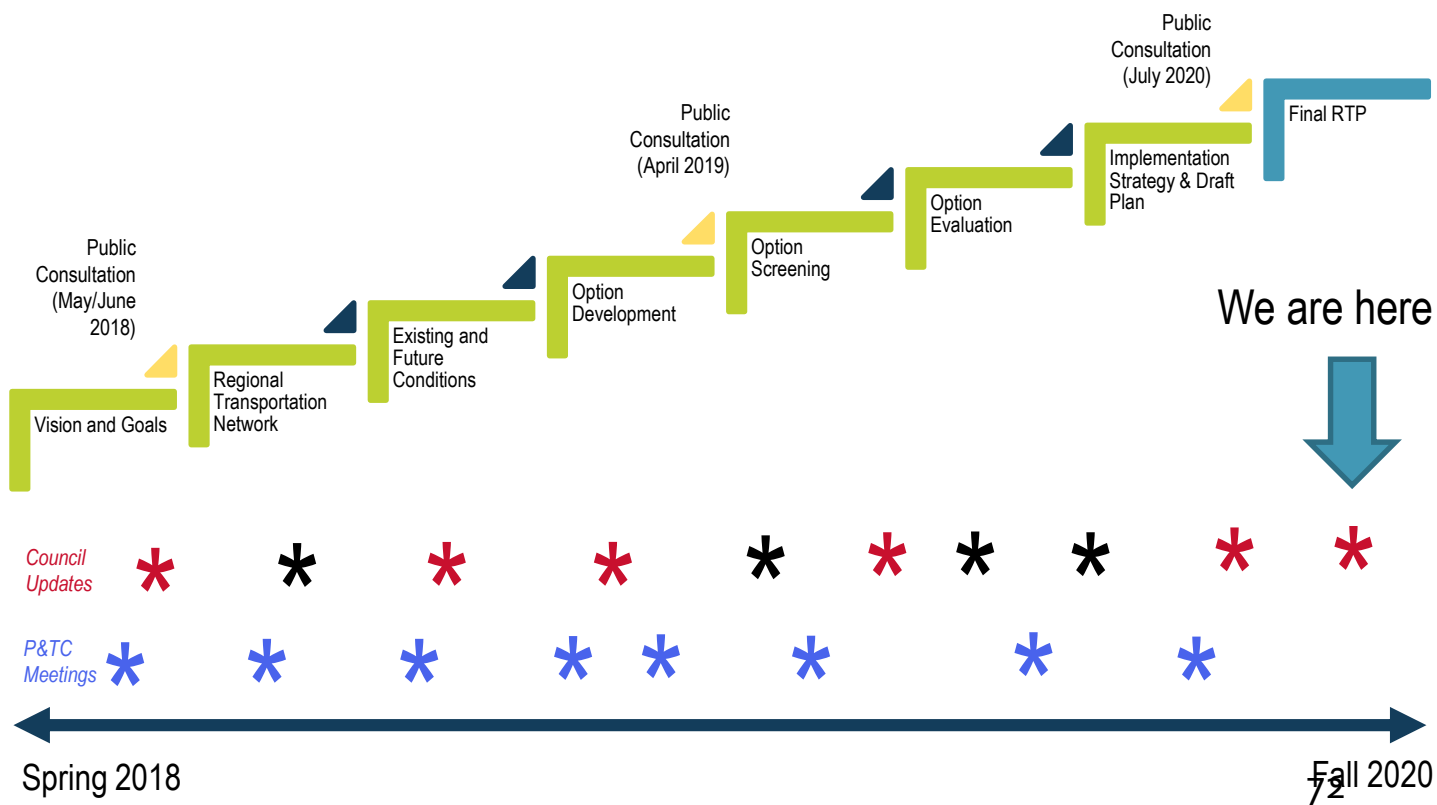


Regional Transportation Plan - Schedule

We are here



Regional Transportation Plan - Schedule



Connecting our Region

Together, the plans identify transportation projects and priorities that will help build and maintain a healthy, thriving and connected future for the Central Okanagan region over the next twenty years.



Connecting our Region

The plans set the direction for Central Okanagan governments to work together to:

- prepare for future population growth,
- help people of all ages and abilities get around,
- reduce the growth of traffic congestion and greenhouse gases, and
- help the region's economic recovery post COVID-19.



Connecting our Region

The interconnected recommendations for projects, programs and policies in the plans will help:

- connect people and places across the region
- improve the movement of people and goods
- achieve fast and reliable transit
- create a region where more people can choose sustainable and affordable transportation options.



Connecting Our Region

Moving forward, the plans help Central Okanagan governments:

- Establish a framework of priorities over the next 20 years for transportation investments that benefit the entire Central Okanagan region.
- Plan and seek funding collaboratively, as a unified region



Draft RTP Engagement Summary

RTP Engagement Summary

- **Draft Plans Presented to STPCO Partners in June / July:**
 - Draft Regional Transportation Plan,
 - Draft Regional Bicycling and Trails Master Plan
 - Draft Regional Disruptive Mobility Strategy
- **Public Engagement in August 2020**
 - Virtual Open House and Online Questionnaire
 - Live Video Panel Discussions



340

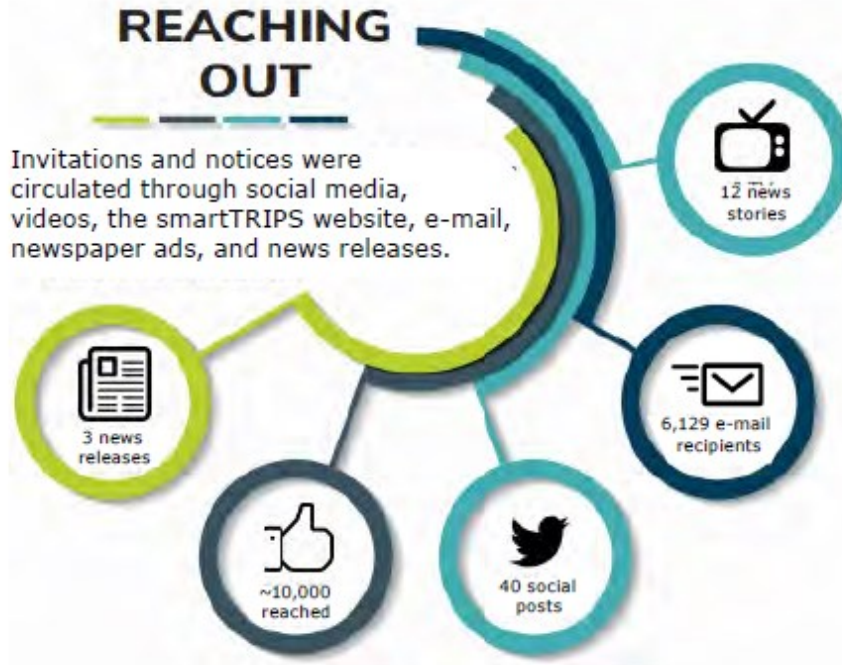
engaged
participants



1,200

comments
received

RTP Engagement Summary



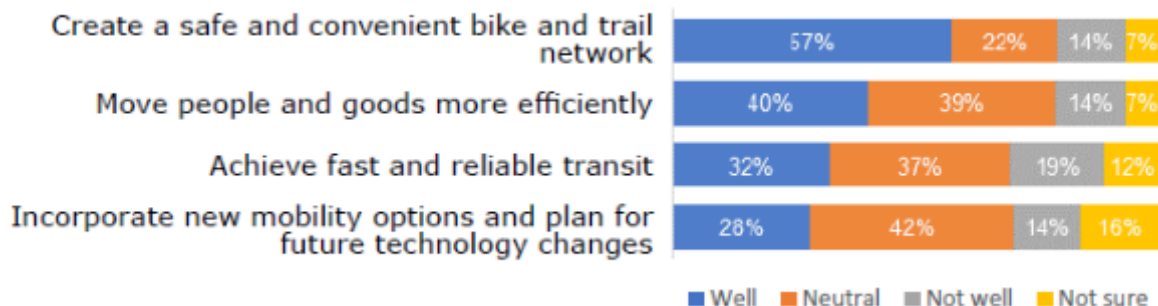
RTP Engagement Summary



What we heard

Alignment with outcomes

Question: "Overall, how well do you think the Regional Transportation Plan achieves the following outcomes?"



What we heard

Open-ended comment themes:



Final Regional Transportation Plan

Updates Following Public and Stakeholder Engagement

Provincial Plans and Targets

- Sets a framework to trend toward meeting Provincial targets associated with climate change and active transportation
- Provincial targets include:
 - Reduction of 6 Mt of vehicle greenhouse gas emissions by 2030
 - Double the trips taken with active transportation by 2030



Economic Plan
2019-2020



Addition of Preamble & Summary of Recommendations

Added clarity regarding how recommendations work together to create a fast & reliable transit “spine”:

- Use of shoulders by transit on the Westside
- Eastbound transit lane on the WR Bennett Bridge in the morning
- Dedicated transit lanes on Harvey Avenue
- Hollywood Road transit priority corridor to UBCO



Incorporation of 2018 Okanagan Travel Survey Results

- Updated Existing and Future Conditions Chapter with new data
- Survey findings reviewed: RTP recommendations still highly relevant
- Faster and more reliable transit needed to provide convenient alternative to driving for longer regional trips



Future of STPCO

- Section updated to reflect the most recent direction from the STPCO Local Government Advisory (LGA) Board regarding oversight and implementation of the RTP after it is endorsed.
- Desire for a new, more effective and simpler governance structure to oversee implementation of the RTP:
 - Dissolution of STPCO and some functions transferred to RDCO on January 1, 2021
 - To implement the RTP: creation of a regional technical committee administered by the RDCO and initially facilitated by City of Kelowna staff,
 - Resolve cost sharing over next two years
 - Regional transportation issues at two RDCO Board meetings each year



Monitoring the RTP Success

- New monitoring program section added
- Example metrics
 - Network VKT and GHG
 - Average trip length
 - Mode split by trip purpose
- Requires reliable data sources:
 - Okanagan Travel Survey
 - Regional Travel Model
 - Journey to Work (Statistics Canada)
 - Annual data collection
- Regional Transportation
Plan: <https://smartTRIPS.ca/regional-transportation-plan-final>
(Recommended projects, programs and policies are in Chapter 5)



Final Regional Bicycling and Trails Master Plan

Updates Following Public and Stakeholder Engagement

Regional Bicycling and Trails Master Plan

- Updates the 2012 Regional Active Transportation Plan
- Connects regional destinations / aligns with RTP
- Regional Bicycle and Trails Network: 193 km (82 existing, 81 new, 30 km to be upgraded)



Provincial Plans and Targets

- Sets a framework to trend toward meeting Provincial targets associated with climate change and active transportation
- Provincial targets include:
 - Reduction of 6 Mt of vehicle greenhouse gas emissions by 2030
 - Double the trips taken with active transportation by 2030



Economic Plan
2019-2020



Incorporation of 2018 Okanagan Travel Survey Results

- Updated the Chapter on the Current Status of Active Transportation in the RBTMP
- Survey findings reviewed: RBTMP recommendations still highly relevant
- Creating a safe and convenient regional bicycling and trails network that better connects our region remains vitally important to help encourage more biking and walking trips.



Clarified alignment with BC Active Transportation Design Guide

Neighbourhood Bikeways



Protected Bicycle Lanes (one-way)



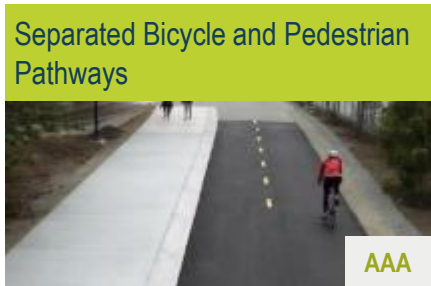
Protected Bicycle Lanes (two-way)



Multi-Use Pathway



Separated Bicycle and Pedestrian Pathways



Painted Bicycle Lanes



Bicycle Accessible Shoulders



“AAA” indicates All Ages and Abilities facility 93

Regional Bicycling and Trails Master Plan

Other Key Updates:

- Refinements to the network based on partner input and comments from provincial and local bicycling groups
- Final edit and formatting

Regional Bicycling and Trails Master Plan: <https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final>



Final Regional Disruptive Mobility Strategy

Updates Following Public and Stakeholder Engagement

What is Disruptive Mobility?

“Disruptive mobility” refers to changes in transportation technologies that will fundamentally change how people get around in the future:

- Connected
- Automated
- Shared
- Electric



Regional Disruptive Mobility Strategy

- New subtitle & tagline to provide clarity
- Toolkit for Central Okanagan governments to *prepare* for change that is coming
- Harness benefits while minimizing impacts in support of shared regional vision and goals for transportation
- Regional Disruptive Mobility Strategy:
<https://smartTRIPS.ca/regional-disruptive-mobility-strategy-final>



Next Steps

Next Steps

- Regional recommendations support and enhance local and provincial planning
- Final plans presented for endorsement to Councils through Nov / Dec (dates subject to change):
 - Nov 16th, City of Kelowna
 - Nov 17th, City of West Kelowna
 - Nov 23rd, Regional District of Central Okanagan
 - Nov 30th, Westbank First Nation
 - Dec 1st, District of Lake Country
 - Dec 8th, District of Peachland
- RTP implementation to be overseen by a technical committee administered by the RDCO

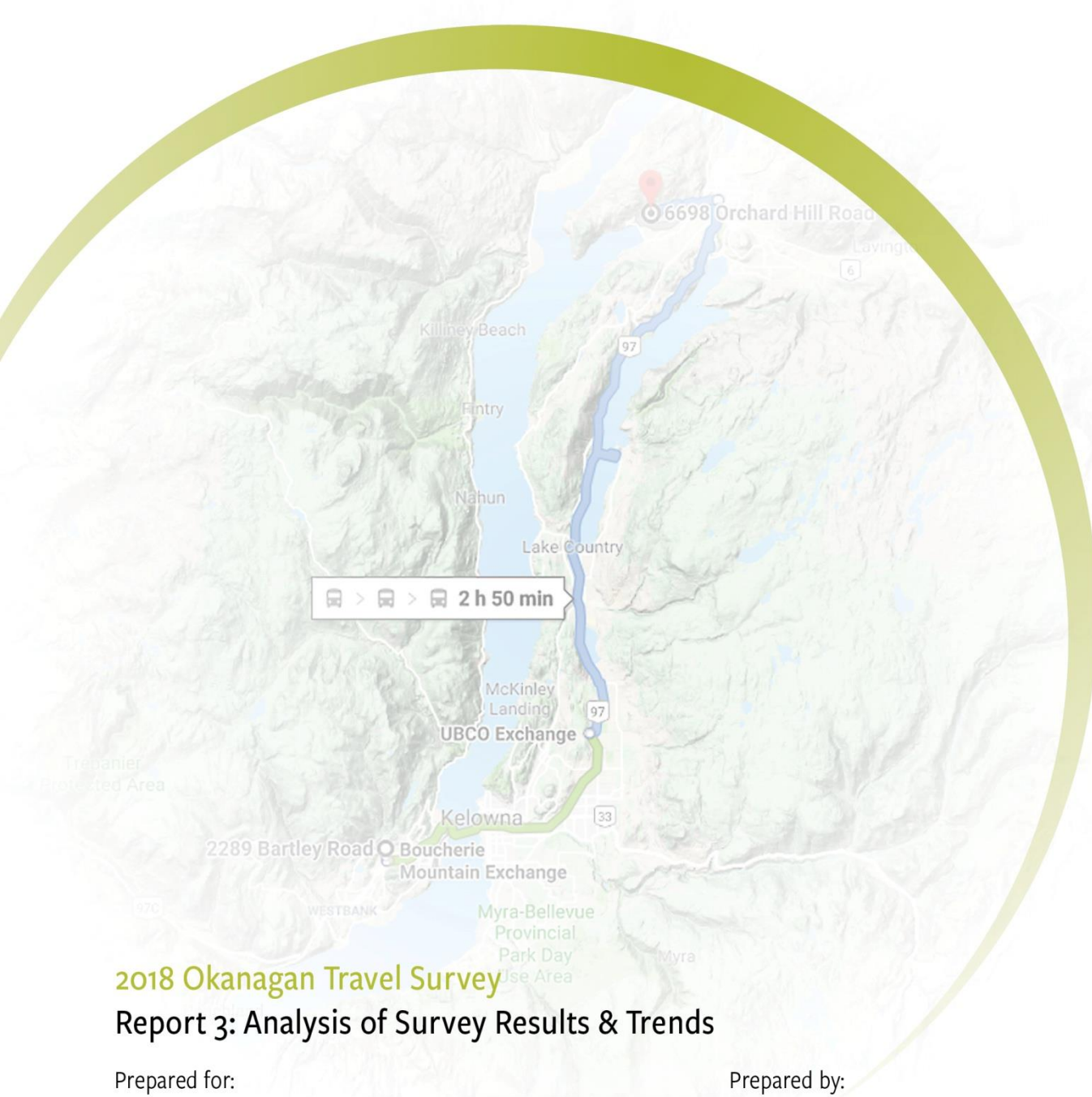




2018 Okanagan Travel Survey

Report 3: Analysis of Survey Results & Trends

February 2020



2018 Okanagan Travel Survey

Report 3: Analysis of Survey Results & Trends

Prepared for:
 City of Kelowna
 City of Vernon
 City of West Kelowna
 Westbank First Nation
 District of Lake Country
 District of Peachland
 Regional District of Central Okanagan
 BC Ministry of Transportation and Infrastructure

Prepared by:
 R.A. Malatest & Associates Ltd.
 858 Pandora Ave. Victoria, BC V8W 1P4
 Phone: (250) 384-2770

February 2020



Ministry of
Transportation
and Infrastructure



Survey Highlights

2018 Okanagan Travel Survey

The 2018 Okanagan Travel Survey was conducted between late October and mid December of 2018. It is the third such survey, with previous surveys having been conducted in 2007 and 2013. The survey was completed with 4,886 households, representing a 4.8% sample of households in Vernon, Kelowna and the rest of the Central Okanagan. The survey gathered information on household and demographic characteristics relevant to understanding travel patterns. The survey also captured detailed trip information for residents aged 5+ years that provides a snapshot of the 24-hour travel patterns of residents of the study area over the course of a typical fall weekday.

Major Trends since the 2007 Baseline Survey

It has been eleven years since the baseline 2007 Okanagan Travel Survey. In this time, the following trends can be observed:

- a 24% increase in households,
- a 19% increase in population (with average household size decreasing from 2.40 to 2.31 persons),
- a 16% increase in vehicles,
- a 17% increase in bicycles,
- a 14% increase in the employed labour force,
- a 40% increase in retirees,
- only an 8% increase in trips made by household members aged 5+ years, but with
- an 18% increase in the estimated cumulative straight-line distance of all trips, and
- a 13% increase in the estimated cumulative straight-line distance of vehicle driver trips.

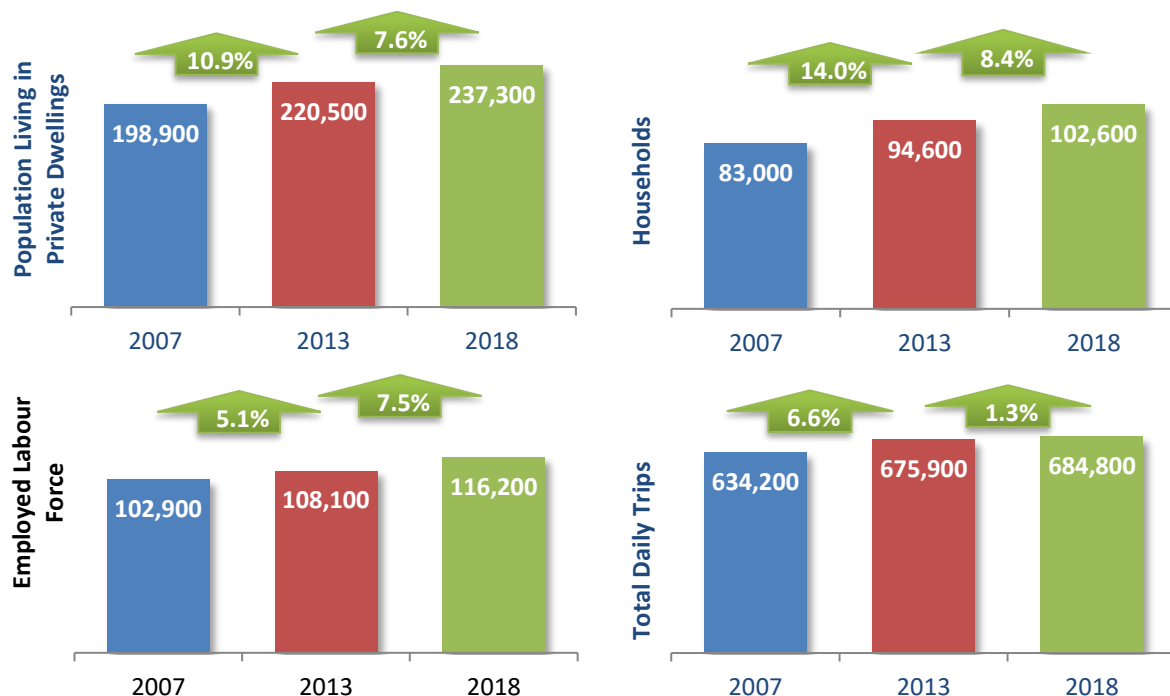
It may be noted that the 8% growth in trips is not even across the survey area. Kelowna witnessed a 10% increase in total trips across eleven years, compared to a 1% decrease in Vernon, and a 10% increase in the rest of the Central Okanagan. The greater increases in the total distances (18%) and vehicle distances (13%) travelled suggests that while there may be fewer reported trips per person, with those trips being longer, the pressure on the region's transportation systems is still significant.

The survey results suggest a diminishment in trip rates in recent years, from 3.37 daily trips per person on average in 2007 to 3.02 in 2018. This trend may be the result of a number of factors including the aging population, slow growth in the size of the workforce, and/or changing travel habits that may be related to societal shifts in work arrangements, leisure, entertainment, and/or shopping patterns. A closer look at trip rates by age group revealed that population aged 35 to 49 has the highest trip rates (3.73-3.79 daily trips), likely related to both work and family responsibilities. A gender-based analysis also revealed that women have higher trip rates than men (3.16 vs. 2.87 daily trips) and a slightly different profile of trip volumes throughout the day.

The charts that follow illustrate the trends in population, households, workers, and trips by survey cycle. In comparison to the growth in population illustrated, the average population increase in Canada was 5.9% from 2006 to 2011 and 5.0% from 2011 to 2016.



Population and Households, 2007-2018



Vernon, Kelowna, and the Rest of the Central Okanagan

The analysis of the 2018 Okanagan Travel Survey looks at three sub-areas: Kelowna, with 55% of the population, the rest of the Central Okanagan (28%), and Vernon (17%). The household, demographic, and employment characteristics of these areas differ, which, along with their geographies, have an impact on the travel patterns. The table below summarizes some key characteristics which may provide some perspectives on the differences between these areas.

	Vernon	Kelowna	Other Central Okanagan
Households	18,500	56,500	27,600
Population	40,200	129,800	67,200
Household Size	33% 1-person 40% 2-person 27% 3+persons	29% 1-person 39% 2-person 32% 3+ persons	21% 1-person 45% 2-person 34% 3+ persons
Dwelling Types	50% house 24% apartment or condo 26% other	46% house 30% apartment or condo 24% other	66% house 9% apartment or condo 25% other
Household Income	21% under \$30,000 36% over \$80,000	14% under \$30,000 41% over \$80,000	10% under \$30,000 42% over \$80,000
Average Age	45.1 (up from 43.8 in 2007) 26% 65+	42.3 (up from 41.9 in 2007) 20% 65+	44.2 (up from 42.4 in 2007) 23% 65+
School & Work	18% students 44% workers 29% retirees	21% students 51% employed 23% retirees	19% students 47% employed 26% retirees

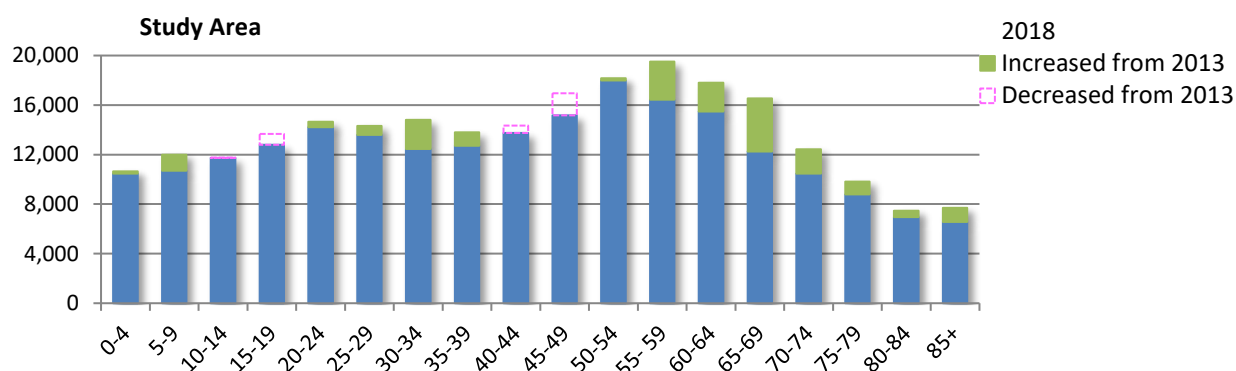
Note: some students are also workers



Aging Population

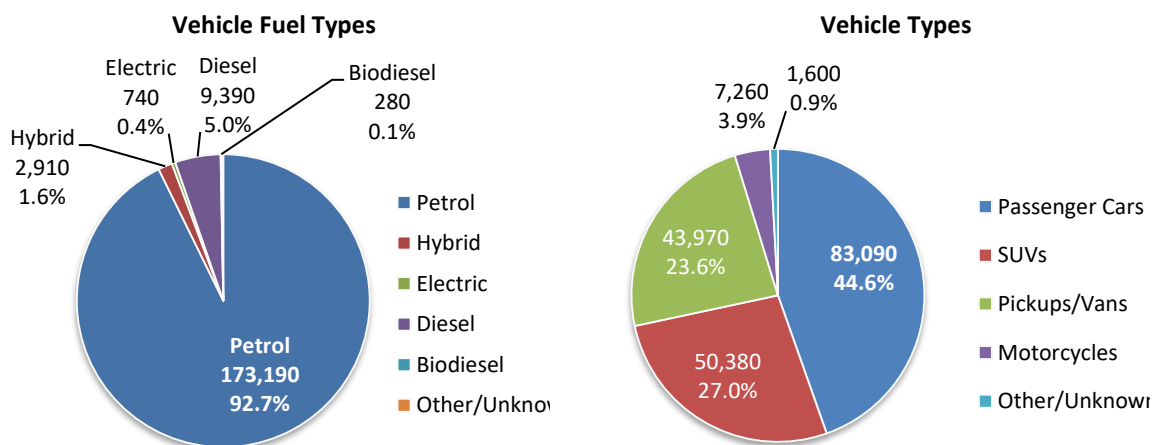
The chart below illustrates the age profile of the study area. As illustrated, there is a larger population 'hump' in age groups between 50 years and 70 years. Much of the 7.6% population growth between 2013 and 2018 has been associated with increases in the number of people in older age groups (whether via the aging of the population or migration of older people to the Okanagan for retirement). Of note is the net loss in the number of people 15-19 years of age and only slight growth in those 20-24 years, as well as the net losses in those between 40 and 49 years. As transportation mode choices and travel purposes vary as people age, the changing age profile has implications for travel patterns.

Population Distribution by Age, with Change from 2013-2018



Transportation Options

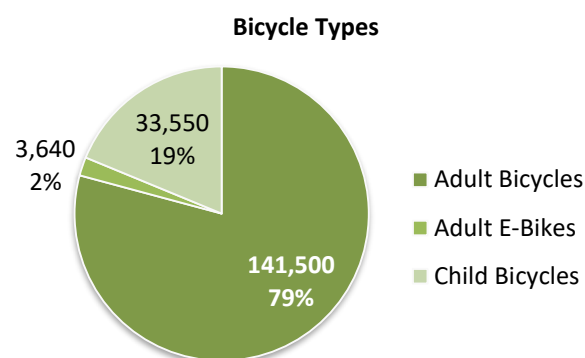
Vehicles. Residents of the study area own or have access to 186,800 household vehicles. Overall, 97% of households have at least one vehicle. This proportion is lower amongst those living in apartments or condominiums, at 89%. About 7% of all vehicles use alternative fuels, with 1.6% being hybrids and 0.4% electric. This is the first survey year the question about alternative fuel types has been asked, and will serve as a good baseline against which to measure changes in the household vehicle fleet over time.





Drivers. There are 186,500 licensed drivers in the study area. The percentage of the population aged 16+ years with a driver's licence has increased over the last eleven years, from 81% in 2007 to 85% in 2018. This follows an earlier decline in the licensed drivers in the early 2000's documented in other studies (suggesting that more young people may have delayed getting their licence, but do so eventually).

Bicycles. Residents of the study area own 178,800 working bicycles, of which 19% are children's bicycles (compared to 15% of the population being under 15 years of age). The rate of bicycle ownership over the past 11 years has stayed relatively flat at 0.75 bicycles per person. The survey results suggest that each day (in the late fall period of the survey, from late October to mid December), about 5% of people 5+ years of age, or approximately 11,000 people, make one or more cycling trips. Of note, the survey results also indicate that while the female population accounts for 54% of all trips by all modes, they make only 32% of bicycle trips.

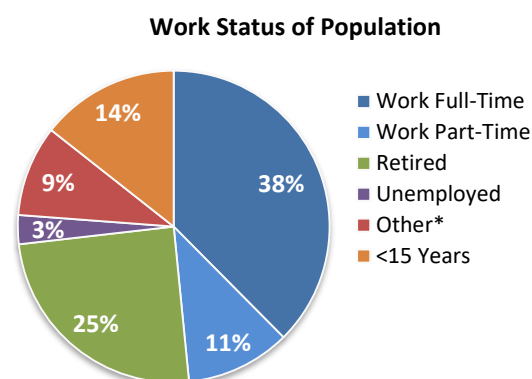


Mobility Challenges. Overall, 2.7% of the population (about 15,300 people) use mobility aids to get around, with another 3.5% reporting limitations to their mobility but not using an aid. For those 65-74 years of age the proportion using mobility aids is 10.9%, and for those 75 years or older, it is 24.9%. In the eleven years since the 2007 baseline survey, the percentage of the population using mobility aids has increased somewhat, from 2.2% to 2.7%, particularly in the Vernon area (currently at 3.6% of total population). As the 50-69 year hump in population ages forward, and as the Okanagan attracts more retirees, accommodation of mobility limitations may become more important as well.

Employment and Student Status

Across the study area, there are 89,100 full time and 25,800 part-time workers, for a total of 114,900 workers, representing approximately half of the total population. There are also 58,700 retirees, a 40% increase in the eleven years since 2007, representing 25% of the total population.

In total there are also 28,200 K-12 students and 16,300 post-secondary students. In the past five years, Kelowna has seen a 9% increase in K-12 students, whereas Vernon and the Other Central Okanagan sub-area have seen drops of 8% and almost 5% respectively.

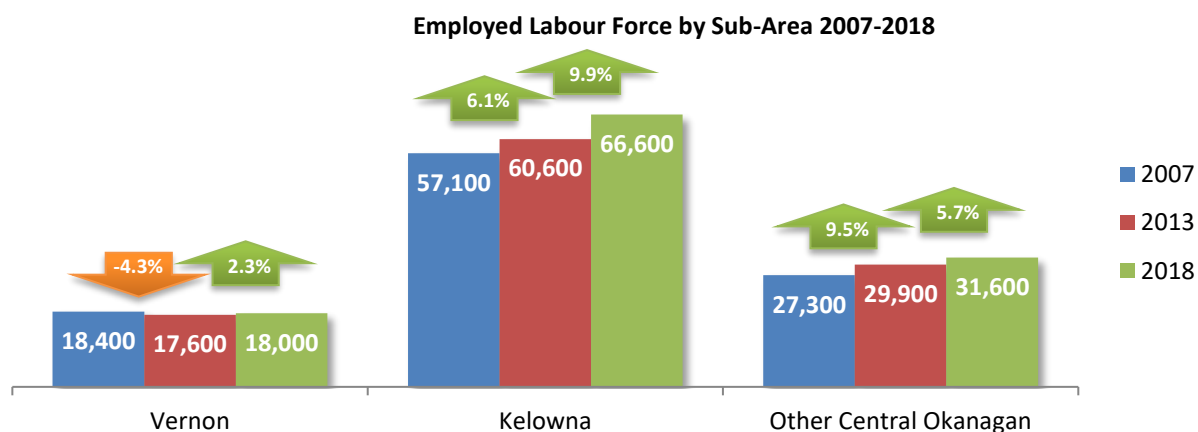


In the same five-year period since 2013, enrolment at the three public post-secondary campuses has risen 29% (although it may be noted that the survey does not represent the portion of those students who live on campus or outside the study area). Post-secondary students are important



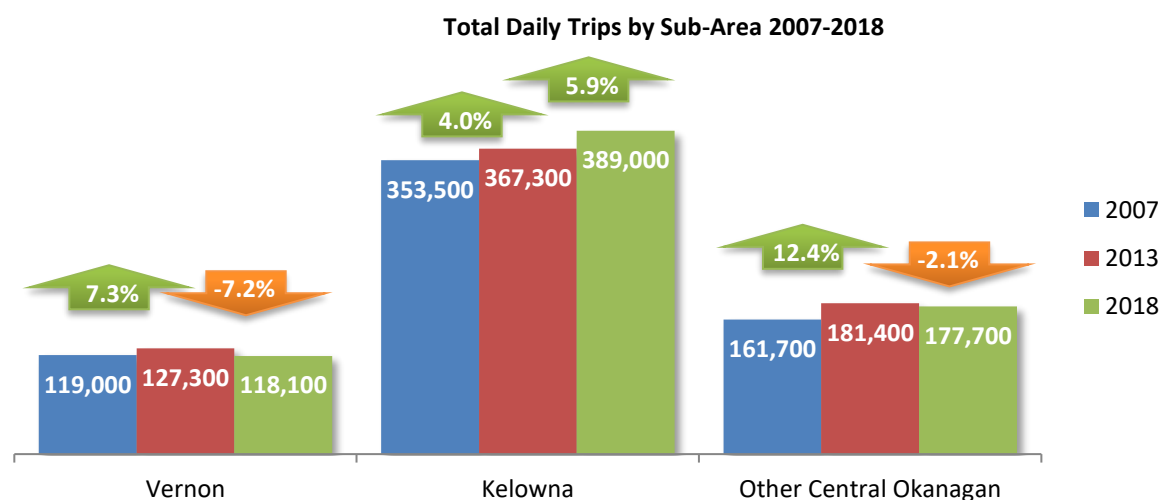
transit users. Approximately 31% of trips to post-secondary school are via transit, and the transit mode share is highest amongst 20-24 year olds, at 13% of all trips made.

The employed labour force has grown most in Kelowna, particularly in the last five years, whereas growth has been more modest in the rest of the Central Okanagan, and relatively flat in Vernon. This has implications for the share of trips which are work commutes.



Trip Volumes

Each weekday, residents of the study area make approximately 684,800 trips, an increase of 8% over eleven years compared to a 19% increase in population. The change in the number of trips since the baseline survey has varied by survey cycle and varies by community. The variations by sub-area are consistent with the different trends in the communities in terms of aging population, changes in the labour force, and the proportion of households with children. Shifts in work arrangements, leisure, entertainment, and/or shopping patterns may also influence this trend.

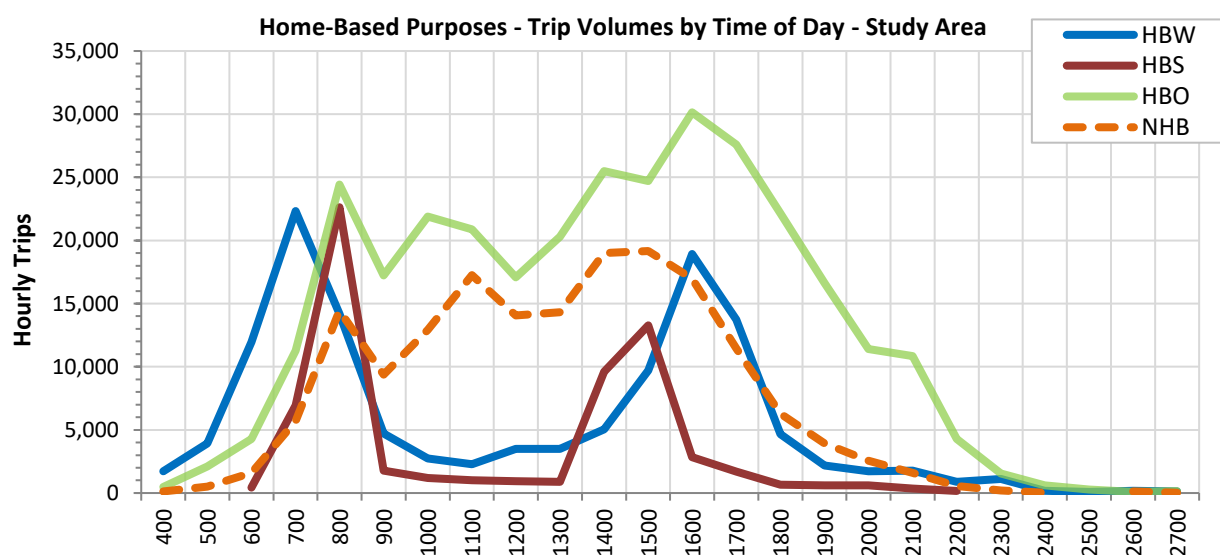
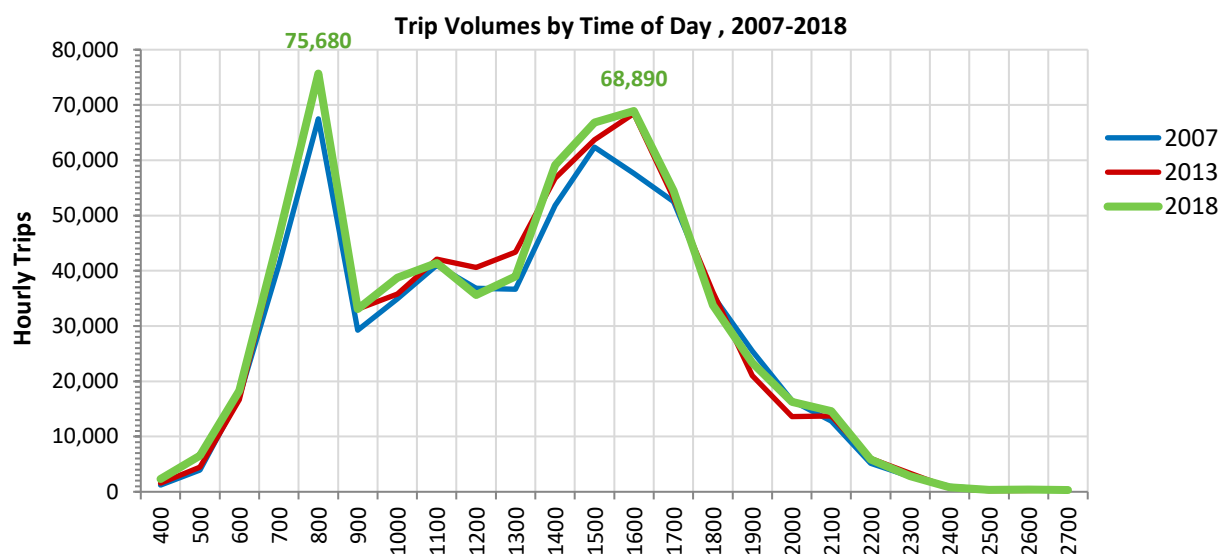




Trip Volumes by Time of Day

Looking at the volume of trips by time of day reveals that the peak hour is at 8 AM, a pattern which has been consistent, with a modest increase, since 2007. The PM Peak period has experienced some spreading since 2007, and covers a four-hour period from 2 PM to 6 PM. The afternoon peak spreading is consistent with the higher growth in older people than in workers.

Breaking down the trip volumes by overall purpose reveals that home-based work (HBW) and school (HBS) commutes dominate the AM Peak (where a 'home-based' trip is either from home or a return home). The work trip peak is at 7 AM and the school trip peak at 8 AM, with a number of home-based other (HBO) passenger drop-off trips in this period as well. Home-based other (HBO) trips dominate the rest of the day, peaking at 4 PM, the same time as the afternoon HBW peak.



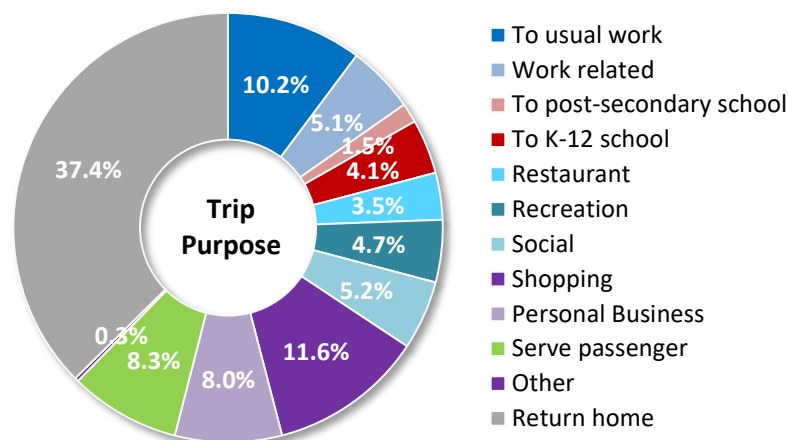
The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

HBW = home-based work/work-related. HBS = home-based school (K-12 or PSE). HBO = home-based other. NHB = non-home-based.



Destination Activity

Approximately one in ten trips is to work, while another one in twenty is to a work-related activity, for about 15% overall. K-12 and post-secondary school commutes together make up a little under 6% of all trips. Another 8% are 'serve-passenger' trips, a good portion of which may be pick-up and drop-off trips for children's school commutes and recreational/social activities.



Non-commute purposes are substantial:

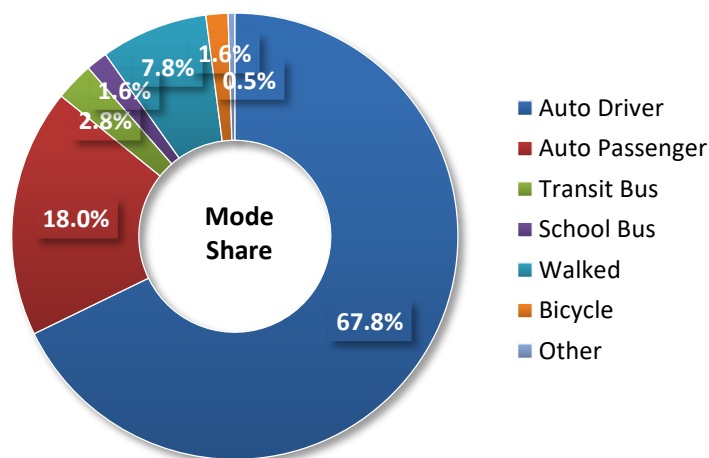
trips for shopping make up almost 12%, personal business comprises another 8%, and leisure purposes (recreational, social and restaurant trips) combined make up another 18% of all trips. Of the total daily trips, 37% of trips are returning home from commutes or other of the activities noted.

By sub-area, Vernon residents have proportionately fewer work, work-related, school, and restaurant trips and more social, shopping, and personal business trips, which is consistent with the older demographics of this community. Kelowna, on the other hand has proportionately more work and school related trips. The Other Central Okanagan area has the greatest percentage of work-related trips, which may reflect the overall profile of jobs held by these residents (with more workers reporting not having a fixed workplace address).

Transportation Modes

Mode Share. Automobile trips dominate: 67.8% of all trips are made as auto drivers, and 18.0% as auto passengers. Transit mode share is modest, accounting for 2.8% of all trips, while cycling and walking account for 1.6% and 7.8%, respectively.

The Other Central Okanagan sub-area has the highest driving mode share (72.5%), Vernon had the highest walk share (9.9%), and Kelowna has the highest transit (3.4%) and cycling shares (2.2%).



Looking across the eleven years since the 2007 baseline reveals the following trends in mode shares:

- a 2.6%-pt decrease in auto driver mode share,
- a 1.4%-pt increase in transit mode share (doubling this mode share),
- a 2.3%-pt increase in walking trips,
- a 0.7%-pt decrease in school bus trips, and



- a 0.3%-pt decrease in bicycle trips since 2007. As the 2018 survey was conducted at a different time (late fall) than the 2007 survey (mid spring) and the 2013 survey (early fall), this result is difficult to assess. Closer review of the data suggests that with colder weather some travellers may choose to walk instead of cycle (particularly children 5-19 years of age). Also encouraging is the fact that bicycle ownership per capita has remained relatively steady.

Sustainable Mode Share. Combined, sustainable modes (transit, school bus, walking, and cycling) comprise a 13.7% mode share, which is a 2.7%-pt increase from 11.0% in 2007.

Active Mode Share. Looking at just active modes (walking and cycling) reveals that, combined, the active modes comprise a 9.4% mode share (up 2.0%-pts from 7.3% in 2007).

Impact of Survey Timing on Mode Share. While the past 11 years shows a net positive growth in both sustainable and active mode shares, the survey data suggest that most of the growth was between 2007 and 2013, with a slight decline in the last five years to 2018. However, it should be noted that the 2013 survey was conducted in the early fall (September 23 to November 30) while the 2018 survey period was a month later (October 24 to December 21), with the weather likely affecting mode shares. Methodological differences and sampling errors associated with surveying a random sample of the population may also affect the fluctuations from survey cycle to survey cycle.

Transit Trips. Residents of the study area make approximately 19,100 transit trips each day, with 23,800 boardings (23% of transit trips entail at least one transfer). This is more than double the 7,500 trips and 8,100 boardings observed in the 2007 baseline survey. In 2018, approximately one-tenth of trips involved driving (Park and Ride, 4%) or being driven (Kiss and Ride, 6%) to or from one of the transit stops, while 1% involved cycling.

Vehicle Occupancy. Average vehicle occupancy is 1.35 people (including the driver), with almost three-quarters (73%) of all vehicle trips being in single-occupant vehicles (SOVs). The vehicle occupancy rate and single-occupancy proportion is almost universal across the three survey sub-areas, and similar to that in previous survey cycles.

Sustainable Mode Choice. The great majority (70%) of residents who depart on a trip from home via a sustainable mode (transit bus, walking, cycling) make the choice to do so rather than drive. The people who make the other 30% of sustainable-mode journeys leaving home did not have access to a household vehicle or have no vehicles. These journeys may therefore be considered dependent on the sustainable mode. This dependence varies by mode: 62% who use transit are reliant on this mode, compared to 20% of those who walked, and 26% of those who travelled via bicycle. The high reliance amongst transit users underscores both the importance of this mode to serve the needs of the population and the challenge of making transit an appealing choice to those with vehicles.

If travelled by a non-auto mode of travel, was a vehicle available for your travel (but you chose not to drive)?	Survey Average	Transit	Walked	Bicycle
Yes, vehicle available	70%	38%	80%	74%
No, not available	30%	62%	20%	26%

Based on trips leaving home via a non-automobile mode made by persons 16+ years of age.



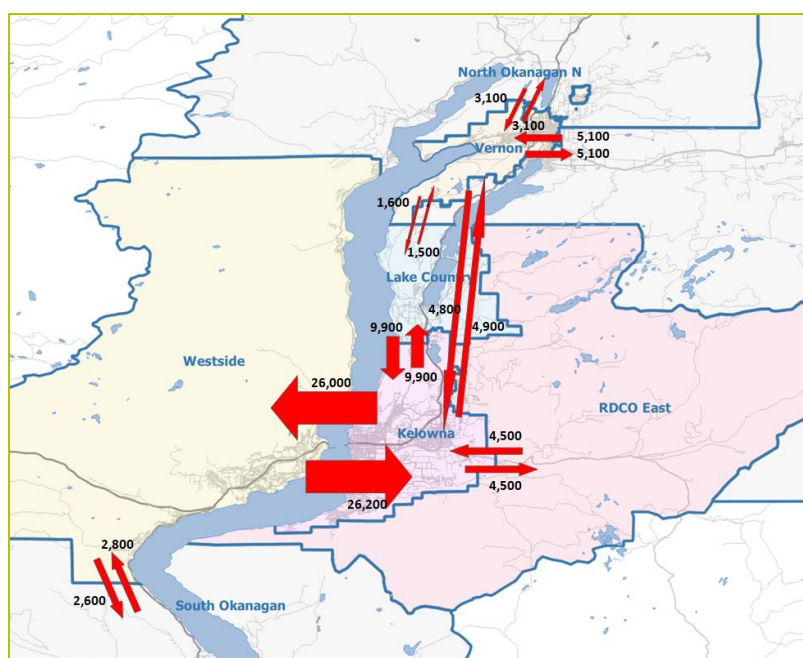
Vehicle Kilometres Travelled

The 2018 survey estimated the actual vehicle kilometers travelled (VKT) for auto driver trips based on the most likely route taken at the time of day of the trip as suggested by Google Maps. The average length of auto driver trips is estimated to be 10.4 km.

- Each household vehicle in the study area averages 25.8 km per day. This average is lowest in Kelowna (21.6 km) and highest in Other Central Okanagan (31.2 km) and Vernon (29.2 km).
- In total, residents of the study area drive about 4.81 million km each weekday for personal trips.
- Across an entire year, this amounts to 1.24 billion km of road travel generated by personal vehicles on weekdays (excludes commercial driving trips and weekend trips).

Inter-Regional Traffic Flows

The map illustrates the 24-hour inter-regional flows within and outside the study area. There is considerable exchange between communities across the study area, but with the bulk between the Westside and Kelowna, with over 26,000 personal trips in each direction with trip ends within these communities. The pattern in the AM Peak period reveals that much of this flow is from the Westside residents to Kelowna destinations, with over 9,500 trips crossing the bridge in this direction during the AM Peak (6 AM to 9 AM), and much of this occurring during the 8 AM peak hour.



The City of Kelowna is a net attractor of trips as the largest hub of jobs, shops and services, particularly in the City Centre/Pandosy and Central Kelowna districts. Examination of work locations reveals that Kelowna accounts for 57% of workers living in the area but accounts for fully 64% of the places of work of study area residents. Within the city, the City Centre/Pandosy and Central districts combined accounting for 19% of workers but 39% of all places of work in the study area.

Internalization of Trips. The survey analysis also looked at ‘trip internalization, or the extent to which residents of each district or municipality make trips contained within their home district – a measure of the accessibility of work, school, shopping and other opportunities to the traveller’s place of residence. Across the entire study area, 27% of residents’ trips are made within the same district their home is located in. Residents of the Vernon City Core / Alexis Park / Harwood / North Vernon fulfill 66% their trip purposes within the set of neighbourhoods that comprise this district. Next highest are Central Kelowna and Kelowna City Centre / Pandosy, at 39% and 42% respectively. Lake Country also has a high degree of internalization at 37%.



Conclusions

Overall, the survey results show a growing region with significant population growth (exceeding the Canadian average) and a significant increase in housing units. The characteristics of households and population are undergoing some changes, with a decrease in household size, an aging population (with possible migration to the region as a retirement destination), and a workforce that is growing at a slower rate than the rest of the population. While vehicle ownership is high (with 97% of households having at least one vehicle), greener fuel types are beginning to emerge (with 2% of household vehicles reported as hybrids or electric vehicles). Bicycle ownership is also high, with 0.75 bicycles per person, even if only about 5% of the population uses their bicycle on a given weekday.

Trips rates have decreased somewhat, the reasons for which may be related to both the aging population and shifts in travel behaviours. As a result the total number of household trips has not grown as fast as population. However, one of the shifts in travel behaviour appears to be an increase in the distance of the trips taken. This has resulted in increases to the cumulative distance travelled on the transportation network, with, across 11 years, a seemingly modest 4% increase in auto driver trips actually resulting in a 13% increase in cumulative daily trip distance across all auto driver trips. Auto driver trips dominate, at a 67.8% mode share, with three-quarters of these trips made as single-occupant vehicles. Auto driver mode shares do, however, appear to be declining slightly (from 68.1% in 2013 and 70.4% in 2007). Encouragingly, the number of transit trips has doubled in the past eleven years, to a 2.8% mode share. Younger adults and post-secondary students appear to make up a significant portion of transit users, with the greatest increases in transit mode share observed amongst those 15-19 years of age.

The overall increases since 2007 in sustainable mode share, and within this, active mode share can be looked upon positively (especially considering that the active mode shares reported were likely dampened by colder weather in the period of the 2018 survey cycle). This finding is tempered somewhat by the fact that survey results suggest that much of this increase was in the earlier period from 2007 to 2013, and there may even have been a slight decline in sustainable modes in the later period from 2013 to 2018. The shorter-term survey cycle to survey cycle trends are difficult to assess as comparisons may be affected by survey timing, random sampling error, and/or methodological differences (with a comparison against historical transit ridership data suggesting that the 2013 results possibly over-state transit mode share). The aging of the population may also be a factor in the changes from 2013 to 2018, with the greater population increase being amongst older age groups having greater automobile ownership and the highest auto mode shares. Nevertheless, the net changes since 2007 are positive ones.

The information presented in this highlights section is explored in greater depth in the body of this report, including more of the survey results broken out for the Vernon, Kelowna, and Other Central Okanagan sub-areas.



Contents

Survey Highlights	III
Acknowledgements.....	18
1 Project Overview	19
1.1 Project Background	19
1.2 2018 Okanagan Travel Survey.....	19
1.3 Report Organization.....	20
2 Survey Conduct	21
2.1 Overview	21
2.2 Survey Geography	22
2.3 Survey Design.....	26
2.4 Survey Conduct	27
2.5 Data Processing.....	28
2.6 Data Expansion and Weighting	28
2.7 Validation of the Weighted Survey Data	30
2.8 Treatment of the 2007 and 2013 Survey Data for Longitudinal Comparisons	32
2.9 Statistical Reliability	33
2.9.1 Data Reliability	33
2.9.2 Estimates of Sampling Error.....	35
2.9.3 Caveats.....	38
3 Households, Vehicles and Demographics.....	39
3.1 Population and Households, 2007 to 2018.....	40
3.1.1 Population and Households by District.....	45
3.2 Household Characteristics	46
3.2.1 Dwelling Type.....	46
3.2.2 Household Size.....	47
3.2.3 Household Income	48
3.3 Household Vehicles.....	49
3.3.1 Household Vehicles, 2007 to 2018	49
3.3.2 Vehicle Types	51
3.3.3 Relationship between Household Characteristics and Vehicle Availability	52
3.4 Household Bicycles	55
3.4.1 Household Bicycles, 2007 to 2018	55
3.4.2 Levels of Bicycle Ownership by District.....	57
3.4.3 Bicycle Types	58
3.5 Age Distribution	59
3.5.1 Average Age by District.....	61
3.6 Licensed Drivers	62



3.7	Mobility Challenges.....	63
3.7.1	Mobility Challenges by District	65
3.8	K-12 and Post-Secondary School Enrolments	66
3.9	Employed Labour Force	68
3.9.1	Total Workers, 2007-2018	68
3.9.2	Detailed Occupation Status.....	69
3.9.3	Type of Occupation	70
3.9.4	Place of Work	71
3.9.5	Place of Work by District.....	71
3.10	Retirement	73
4	Travel Patterns and Trends	74
4.1	About the Trip-Level Survey Results	74
4.2	Total Trips and Trip Rates	75
4.2.1	Trips and Trip Rates by District	79
4.3	Trip Rates by Selected Characteristics	80
4.3.1	Trip Rates by Household Characteristics.....	80
4.3.2	Trip Rates by Demographic Characteristics	81
4.4	Trips by Start Hour	86
4.4.1	Profile of Trips by Start Hour	86
4.4.2	Trips by Start Hour by Gender and Employment Status	89
4.5	Primary Mode	92
4.5.1	Mode Shares by Sub-Area.....	93
4.5.2	Mode Shares, 2007-2018	94
4.5.3	Interpreting Differences in Transit Mode Shares.....	96
4.5.4	Interpreting Differences in Bicycle Mode Shares.....	97
4.5.5	Sustainable and Active Mode Shares.....	98
4.5.6	Mode Shares by District of Residence	99
4.5.7	Mode Shares by Age Group	100
4.5.8	Trip Mode by Start Hour	103
4.6	Trip Purpose	104
4.6.1	Trip Purposes, 2007-2018	105
4.6.2	Trend in Daily Number of People with Work Commutes	106
4.6.3	Trip Purpose by Start Hour.....	107
4.6.4	Mode Shares by Trip Purpose	108
4.6.1	Home-Based Trip Purposes.....	109
4.7	Vehicle Occupancy	112
4.8	Transit Boardings and Transit Access Modes.....	113
4.9	Vehicle Availability for Trips Made via Sustainable Modes	115
4.10	Trip Distances.....	116
4.10.1	Average Trip Distance	116
4.10.2	Trends in Trip Distance, 2007-2018	117



4.11	Vehicle Kilometres Travelled (VKT)	118
4.12	Inter-Regional Travel.....	120
4.13	Internalization of Travel.....	124
4.14	Origin-Destination Matrices.....	126
5	Residents' Views of Transportation Issues in their Community	135
6	Reference Tables by District.....	140

Appendices under Separate Covers:

Technical Appendix 1: Reference Tables by Survey Geography

Technical Appendix 2: Respondent Verbatim Comments

List of Figures

Figure 1. Survey Process Overview	21
Figure 2. Study Area.....	22
Figure 3. Travel Area	23
Figure 4. Sub-Municipal Districts	25
Figure 5. Population and Households 2007-2018 – Study Area	42
Figure 6. Population and Households 2007-2018 – Kelowna	42
Figure 7. Population and Households 2007-2018 – Other Central Okanagan.....	43
Figure 8. Population and Households, 2007-2018 – Vernon	43
Figure 9. Population Distribution, 2018	44
Figure 10. Households by Dwelling Type, 2018	46
Figure 11. Households by Size, 2018.....	47
Figure 12. Household Income (% of Households), 2018	48
Figure 13. Total Household Vehicles, 2007-2018	49
Figure 14. Trends in Vehicle Ownership, 2007-2018	50
Figure 15. Vehicle Type, 2018	51
Figure 16. Vehicle Fuel Type, 2018	51
Figure 17. Relationship of Household Size to Vehicle Access – Study Area, 2018.....	52
Figure 18. Relationship of Dwelling Type to Vehicle Access – Study Area, 2018	53
Figure 19. Household Bicycles, 2007-2018	55
Figure 20. Trends in Bicycle Ownership, 2007-2018.....	56
Figure 21. Bicycles per Person by District, 2018	57
Figure 22. Types of Bicycle, 2018.....	58
Figure 23. 2018 Population by Age, with Gains or Losses since 2013 (Based on Census Statistics)	60
Figure 24. Average Age by District, 2018.....	61
Figure 25. Possession of a Driver's Licence, 2007-2018	62
Figure 26. Percent of Population Using a Mobility Aid, 2007-2018.....	63



Figure 27. Increase in Mobility Challenges with Age – Study Area, 2007-2018	63
Figure 28. Mobility Challenges by District, 2018	65
Figure 29. Employed Labour Force, 2007-2018	68
Figure 30. Occupational Status (% of Population), 2018	69
Figure 31. Total Retirees, 2007-2018	73
Figure 32. Retirees as % of Population, 2007-2018	73
Figure 33. Total Trips and Trip Rates – Study Area, 2007-2018	75
Figure 34. Total Trips and Trip Rates – by Sub-Area of Residence, 2007-2018	78
Figure 35. Total Daily Trips by District of Residence, with Net Change from 2007 to 2018	79
Figure 36. Person Trip Rates by District of Residence, 2018	79
Figure 37. Trip Rate by Age – Study Area, 2018	82
Figure 38. Trip Rate by Age and Gender – Study Area, 2018	83
Figure 39. Trip Rate by Age – Study Area, 2007-2018	84
Figure 40. Trip by Start Hour – Study Area, 2007-2018	86
Figure 41. Trips by Start Hour – by Sub-Area of Residence, 2007-2018	88
Figure 42. Trips by Start Hour by Gender, Study Area	90
Figure 43. Daily Mode Shares – Study Area, 2018	92
Figure 44. Mode Shares by Sub-Area, 2018	93
Figure 45. Mode Shares – Study Area, 2007-2018	94
Figure 46. Comparison of Survey Transit Estimates to BC Transit Ridership Figures, 2007-2018	96
Figure 47. Mode Shares by District, 2018	99
Figure 48. Mode Share Changes by Age, 2007-2018	102
Figure 49. Trips by Mode by Start Hour – Study Area, 2018	103
Figure 50. Trips Purposes – Study Area, 2018	104
Figure 51. Trips by Grouped Purposes by Start Hour – Study Area, 2018	107
Figure 52. Home-Based Trip Purposes by Time of Day – Study Area, 2018	110
Figure 53. Breakdown of Home-Based Other (HBO) Purposes by Time of Day – Study Area, 2018	111
Figure 54. Vehicle Occupancy – Study Area, 2007-2018	112
Figure 55. 24-Hour Inter-Regional Flows	122
Figure 56. AM Peak Inter-Regional Flows	123
Figure 57. Internalization of Trips by Home District	124

List of Tables

Table 1: Travel Area Geographies	24
Table 2. Survey Completions and Sampling Errors – for Household Level Statistics	36
Table 3. Survey Samples, Sampling Errors – for Person-Level Statistics & Trips Made by those Persons..	37
Table 4. Households and Population 2007-2018 – Study Area	40
Table 5. 2018 Households and Population by District	45
Table 6. Vehicles per Household by Household Size	53
Table 7. Population by Age Group, 2018, with Change in Proportions since 2013 (Based on Census Stats)	59
Table 8. Mobility Challenges and Mobility Aids, 2018	64



Table 9. Students by Type by Sub-Area of Residence 2018.....	66
Table 10. K-12 Students by Place of Residence, 2013-2018	67
Table 11. Post-Secondary School Enrolments, 2013-2018	67
Table 12. Occupation Status, 2018	69
Table 13. Occupational Type (Employed Persons), 2018.....	70
Table 14. Workplace Type, 2018.....	71
Table 15. Distribution of Workers' Places of Residence and Places of Work by District.....	72
Table 16. Average Daily Trips per Household and per Person by Geography of Residence, 2007-2013 ...	76
Table 17. Total Daily Trips and Trip Rates by Household Characteristics, 2018	80
Table 18. Total Daily Trips and Trip Rates for Selected Demographic Characteristics, 2018	81
Table 19. Total Daily Trips and Trip Rates by Age (5-Year Age Range), 2018	84
Table 20. Estimated Total Daily Trips by Primary Mode of Travel.....	92
Table 21. Total Trips by Mode, Mode Shares – Study Area, 2007-2018.....	94
Table 22. Total Trips by Mode, Mode Shares – by Sub-Area, 2007-2018.....	95
Table 23. Survey Time Periods and Temperature Norms, 2007-2018.....	97
Table 24. Sustainable and Active Mode Shares – by Sub-Area, 2007-2018	98
Table 25. Mode Shares by Age Group – Study Area, 2018	101
Table 26. Estimated Daily Volume of Trips by Mode by Age Group – Study Area, 2018	101
Table 27. Trips Purposes (Trips and % of Trips) by Sub-Area, 2018.....	104
Table 28. Trips Purposes (Trips and % of Trips), 2007-2018.....	105
Table 29. Workers with at Least One Work Trip, 2007-2018	106
Table 30. Reasons for not Travelling to Work, 2007-2018	106
Table 31. Mode Shares by Trip Purpose – Study Area, 2018.....	108
Table 32. Estimated Daily Volume of Trips by Mode by Trip Purpose – Study Area, 2018	108
Table 33. Home-Based Trip Purposes, 2018	109
Table 34. Home-Based Trip Purposes – Study Area, 2007-2018	109
Table 35. Number of Bus Routes Taken, Transit Access Modes, 2018.....	113
Table 36. Bus Routes Taken (Expanded # of Boardings from Survey Responses), 2018	114
Table 37. Vehicle Availability for Trips by Sustainable Mode, by Sub-Area, 2013-2018	115
Table 38. Vehicle Availability for Trips by Sustainable Mode, 2013-2018.....	115
Table 39. Average Trip Distance (km) by Trip Purpose and Mode, 2018	116
Table 40. Trend in Average Trip Distance by Mode, 2007-2018.....	117
Table 41. Estimated Cumulative Distance of All Daily Trips by Mode, 2007-2018.....	117
Table 42. VKT-Related Statistics, 2018.....	118
Table 43. Inter-Regional Flows, 2018.....	120
Table 44. Other Central Okanagan – Flows between Westside, Lake Country and RDCO East, 2018	121
Table 45. Internalization of Trips by Home District for HBW, HBS and HBO purposes, 2018	125
Table 46. Origin - Destination Matrix by District (24-Hour Trips).....	127
Table 47. Origin - Destination Matrix by District (AM Peak).....	129
Table 48. Origin - Destination Matrix by District (PM Peak).....	131
Table 49. Origin - Destination Matrix by District (Off-Peak).....	133



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We gratefully acknowledge the direction and guidance of Cameron Noonan, Transportation Planner, City of Kelowna and Angela Broadbent, Active Transportation Coordinator, City of Vernon, as well as the marketing and public communications support provided by Alix Matthews-Mahe, Communications Advisor, City of Kelowna.

This project would not be possible without the contributions of over 4,800 participating households that responded to this survey, via phone interview or online, and told us about their daily travel. We thank you for your participation in the region's third household travel survey; you have contributed to transportation planning data that will be useful for years to come.



1 Project Overview

1.1 Project Background

The 2018 Okanagan Travel Survey (OTS) is an initiative of the City of Kelowna, City of Vernon, Regional District of Central Okanagan, West Kelowna, Lake Country, Peachland and Westbank First Nation, as well as the BC Ministry of Transportation and Infrastructure. The survey was undertaken with the support of the smartTRIPS program, an initiative of the Sustainable Transportation Partnership of the Central Okanagan (STPCO).

The OTS uses a household travel survey methodology and is carried out every five years in the Central Okanagan and City of Vernon area. The household travel survey model collects information about daily travel for each member of the household's (5 years of age or older) travel on the previous day. The previous data collection cycles of the Okanagan Travel Survey took place in 2007 and 2013. The survey data collected helps provide local municipalities and regional planners with information critical for making data-based decisions on improvements to transportation infrastructure and services as well as transportation planning and investment decisions.



The Regional District of Central Okanagan, West Kelowna, Lake Country, Peachland and Westbank First Nation, as well as the BC Ministry of Transportation and Infrastructure are responsible for collecting, analysing and distributing data that helps inform decision-makers with regard to transportation systems, planning and infrastructure. Transportation research and origin-destination studies can help to track growth trends in communities. An important input to forecasting models is a profile of residents' travel behaviour, and how this changes over time. Origin-destination (O-D) surveys are commonly used by municipalities and urban areas around the world to develop these types of transportation profiles.

Similar to the goals of the 2007 and 2013 Okanagan Travel Surveys, the 2018 OTS data collected forms a database of resident travel behaviours that can be used as a basis for policy development and transportation planning across the Central Okanagan and The City of Vernon. The 2018 OTS also supports the broader goals of monitoring regional travel patterns in the area, and the development of a regional transportation demand model for the region.

1.2 2018 Okanagan Travel Survey

The 2018 OTS was conducted between late October and mid December of 2018. The survey was a 24-hour recall household travel survey that captured household characteristics, the demographics of all household members, and the details of travel undertaken by household members 5+ years of age on the most recent previous weekday. Respondents could complete the survey online or over the telephone. An address-based sample of households was randomly selected and invited to participate by letter, with some households with matched phone numbers also contacted by phone to target selected areas with low online response rates.



The 2018 survey captured information on 4,886 households, 10,801 people, and 30,299 trips, after data validation and rejection of surveys with data issues. When weighted to compensate for non-response bias and expanded to the population, the survey data represent approximately 237,300 residents of 102,600 households in the study area, for a sampling rate of 4.8% of households or 4.6% of the population living in private residences¹. The trip data captured by the survey provide a snapshot of 24-hour travel patterns of residents of the study area over the course of a typical fall weekday.

Overall, the household-level survey results are subject to a margin of sampling error of $\pm 1.7\%$ at a 95% confidence level, taking into account the effects of data weighting.² The margin of sampling error for results for the three sub-area geographies analyses is $\pm 2.3\%$ for the City of Kelowna, $\pm 3.3\%$ for the rest of the Central Okanagan, and $\pm 4.1\%$ for the City of Vernon.

1.3 Report Organization

This report is one of three that document the survey methodology, dataset, and results. The three reports are:

- *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*
- *Report 2: 2018 Okanagan Travel Survey – Survey Database*
- *Report 3: 2018 Okanagan Travel Survey – Analysis of Survey Results and Trends*

This report describes the analysis and results of the survey, including comparison to the 2007 and 2013 surveys. For further information regarding the survey methodology, survey administration, or the database, refer to Reports 1 and 2, respectively.

This remainder of this report is organized into the following sections:

Section 2: Survey Conduct

Section 3: Households, Vehicles, and Demographics

Section 4: Travel Patterns and Trends

Section 5: Residents' Views of Transportation Issues in their Community

Two appendices accompany this report, providing survey results by individual district and respondents' opinions as to what they believe are the most important transportation issues facing their communities:

Technical Appendix 1: Reference Tables by Survey Geography

Technical Appendix 2: Respondent Verbatim Comments

¹ Excludes approximately 2.4% of the population living in collective residences (senior's care homes, university residences, group homes, prisons, barracks, etc.) or who are homeless.

² 19 times out of 20, for a given survey question, the survey response percentage should be somewhere within the margin of error of the survey results. The margin of error has been corrected to take into account the increase in error associated with data weighting to correct for over-/under-sampling and/or non-response bias.



2 Survey Conduct

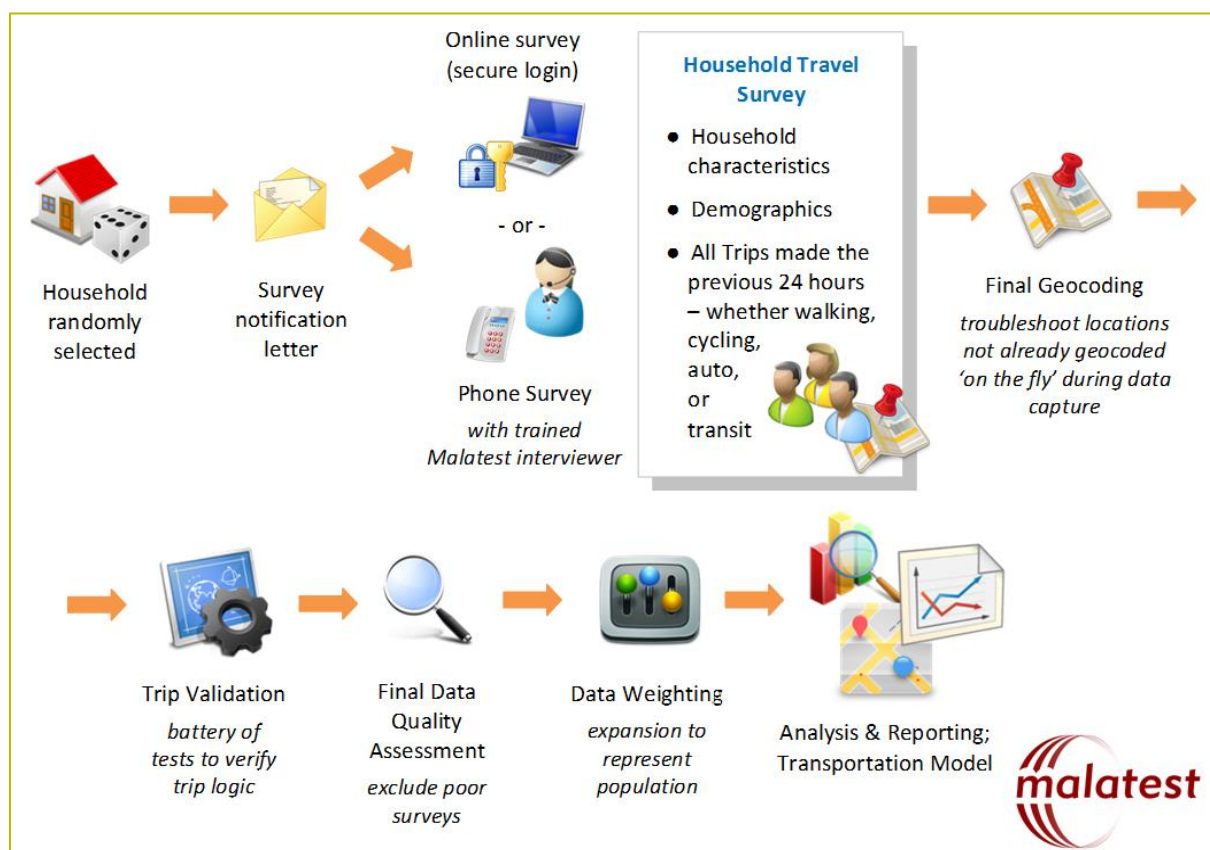
2.1 Overview

The OTS was designed to obtain information on mode shares and travel patterns in the study area. The survey captured information on key household characteristics (number of household members, number of vehicles, dwelling type, income); household residents' demographics, socio-economic characteristics, and places of work and school; and trips taken over the course of 24 hours (from 4:00 a.m. to 3:59 a.m. the next day).

The methodology for this study included the completion of surveys both by telephone and online via a 24-hour recall survey. Respondents were given the option of participating via telephone interview or via an online survey form. Triptelligence™, Malatest's CATI/CAWI (Computer Assisted Telephone/Web Interview) system accommodated both of these survey modes on a single integrated platform.

The diagram below illustrates the general process for the household travel survey. The survey process is summarized in the sections that follow and discussed in further detail in *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*.

Figure 1. Survey Process Overview





2.2 Survey Geography

The 2018 study area consists of the six communities in the Central Okanagan (City of Kelowna, Regional District of Central Okanagan, West Kelowna, Lake Country, Peachland and Westbank First Nation), the City of Vernon, and the Okanagan Indian Band lands within these bounds (Duck Lake Indian Reserve No. 7, bordering Lake Country and Kelowna, and Priest's Valley Indian Reserve No. 6 bordering Vernon). The daily travel patterns and socioeconomic characteristics of residents of households in the study area were captured through the survey. The Study Area is shown in [Figure 2](#).

For analysis, most survey results are summarized for three sub-regions: **Vernon**, **Kelowna**, and **Other Central Okanagan** (comprising all other communities in the Central Okanagan, excluding Kelowna).

For the purposes of defining trips external to the study area, a wider geographical 'Travel Area' was developed ([Figure 3](#), following page), so that relatively local trips to, from, and within nearby communities are accounted for, and only trips well beyond the study area bounds are considered true 'external trips'.

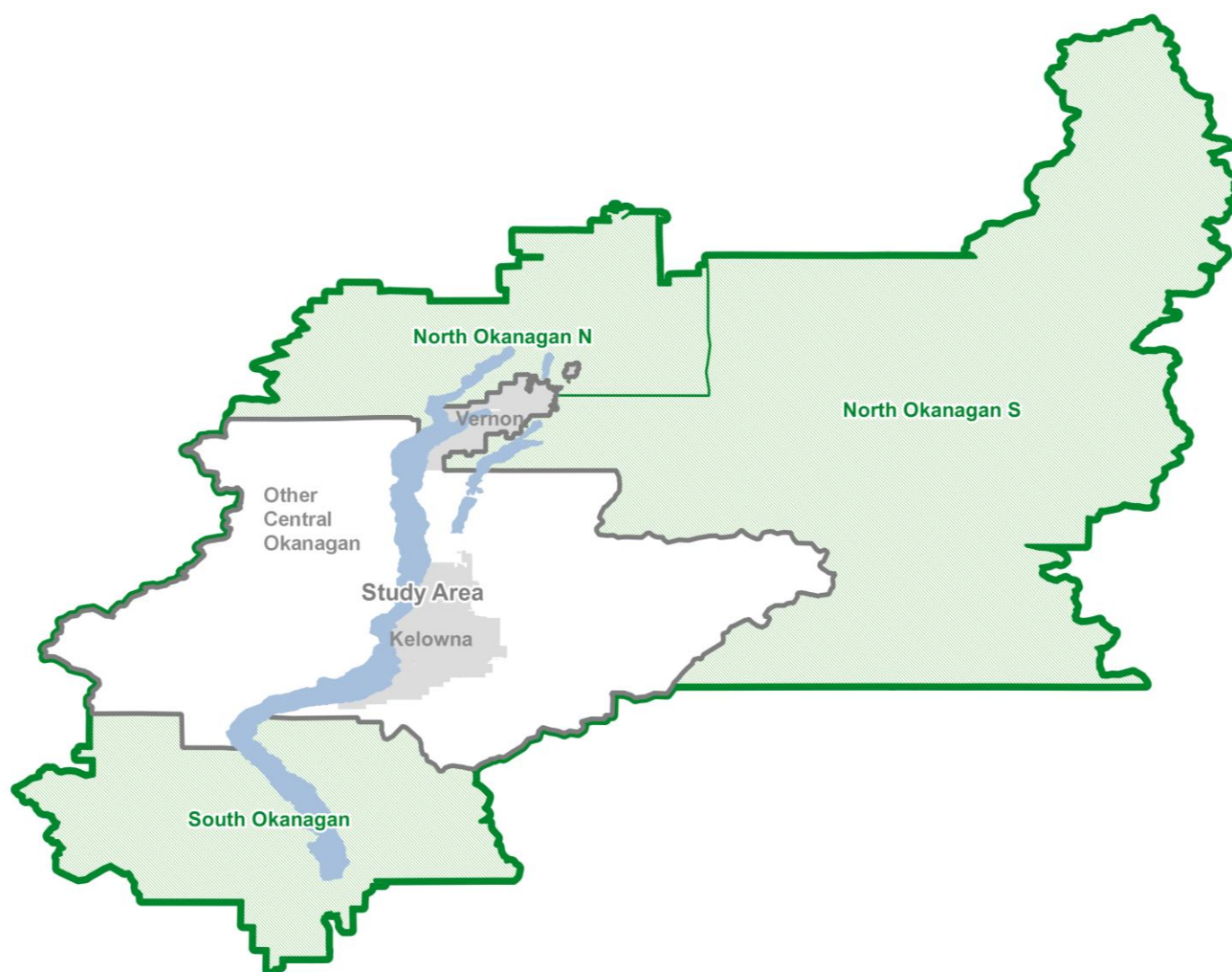
Figure 2. Study Area





The Travel Area includes a wider boundary around the study area to encompass parts of the North and South regions of the Okanagan. The Okanagan South travel area includes Summerland and nearby areas in the Okanagan-Similakeen Regional District. To the North, the Travel Area includes two areas outside the study area: North Okanagan South (including Coldstream, Lumby and other areas more likely to approach Vernon from the South or East) and North Okanagan North (including Armstrong, Enderby, and other nearby areas more likely to approach Vernon from the North).³ The map below shows the external areas and also the three sub-areas in the study area that are the focus of much of the analysis.

Figure 3. Travel Area



³ It may be noted that a similar approach was taken in the 2013 cycle of the Okanagan Travel Survey, where trips within the local study area as well as beyond to North Okanagan, South Okanagan and some surrounding external areas adjacent to the Okanagan Valley were included in the capture and reporting of trips, although the boundaries differed somewhat.



The travel area is organized into various levels of geography (**Table 1**). ‘Municipal sectors’ aggregate First Nations communities with municipal boundaries they are located within or adjacent to. In total, 19 sub-municipal ‘districts’ within these sectors were used for data weighting as well as for selected analyses that illustrate the pattern of results within municipalities and sub-areas. The districts within Kelowna, West Kelowna, and Vernon are mapped in **Figure 4** (following page). It may be noted that the 2013 cycle of the Okanagan Travel Survey did not undertake analysis by the same sub-municipal districts.

Most analysis is undertaken for three ‘sub-areas’ which are easily identifiable from the municipal sectors below: **Vernon** (‘Vernon+’ municipal sector), **Kelowna** (‘Kelowna+’ sector), and **Other Central Okanagan** (aggregating all other sectors within the Central Okanagan).

Table 1: Travel Area Geographies

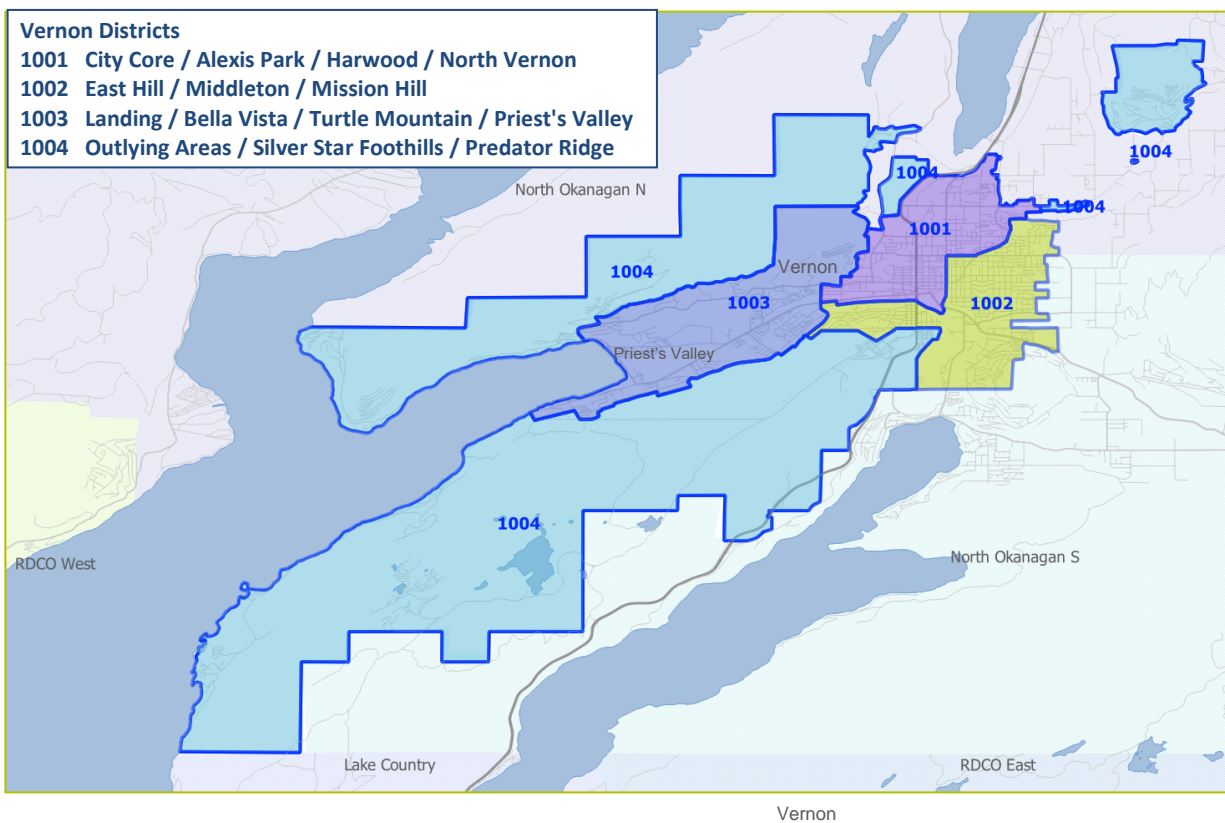
Travel Area	Census Division	Municipal Sector	Census Subdivision	District
Study Area	Vernon (part of RD of North Okanagan)	Vernon+	City of Vernon	1001 City Core / Alexis Park / Harwood / North Vernon
				1002 East Hill / Middleton / Mission Hill
				1004 Outlying Areas
				1003 Landing / Bella Vista / Turtle Mountain / Priest’s Valley 6
			Priest’s Valley 6	
	Central Okanagan	Lake Country	Lake Country	2000 Lake Country
		Kelowna+	City of Kelowna	3001 City Centre / Pandosy
				3002 Central Kelowna
				3003 Glenmore
				3004 Rutland
				3005 Mission
				3006 Black Mountain / Southeast
				3007 Kelowna North
			Duck Lake 7	3008 Duck Lake 7
		Westside	City of West Kelowna	4001 Glenrosa / Westbank
				4002 Rose Valley / Lakeview
			Tsinstikeptum 9	5001 Westbank First Nation (WFN)
			Tsinstikeptum 10	
			Peachland	6000 Peachland
			Central Okanagan J	7000 Central Okanagan J
		RDCO East	Central Okanagan	8000 Central Okanagan
North Okanagan	(portion of RD of North Okanagan)		Coldstream, Lumby, North Okanagan B (portion), C (portion), D, and E	10001 North Okanagan – South
			Spalumcheen DM, Armstrong, Enderby, Okanagan B (portion) and C (portion), Enderby 3, Harris 3, Okanagan (Part) 1	10002 North Okanagan – North
South Okanagan	(portion of Okanagan Similkameen RD)		Summerland, Okanagan-Similkameen E, Okanagan-Similkameen F.	11000 Okanagan South
External				99999 External

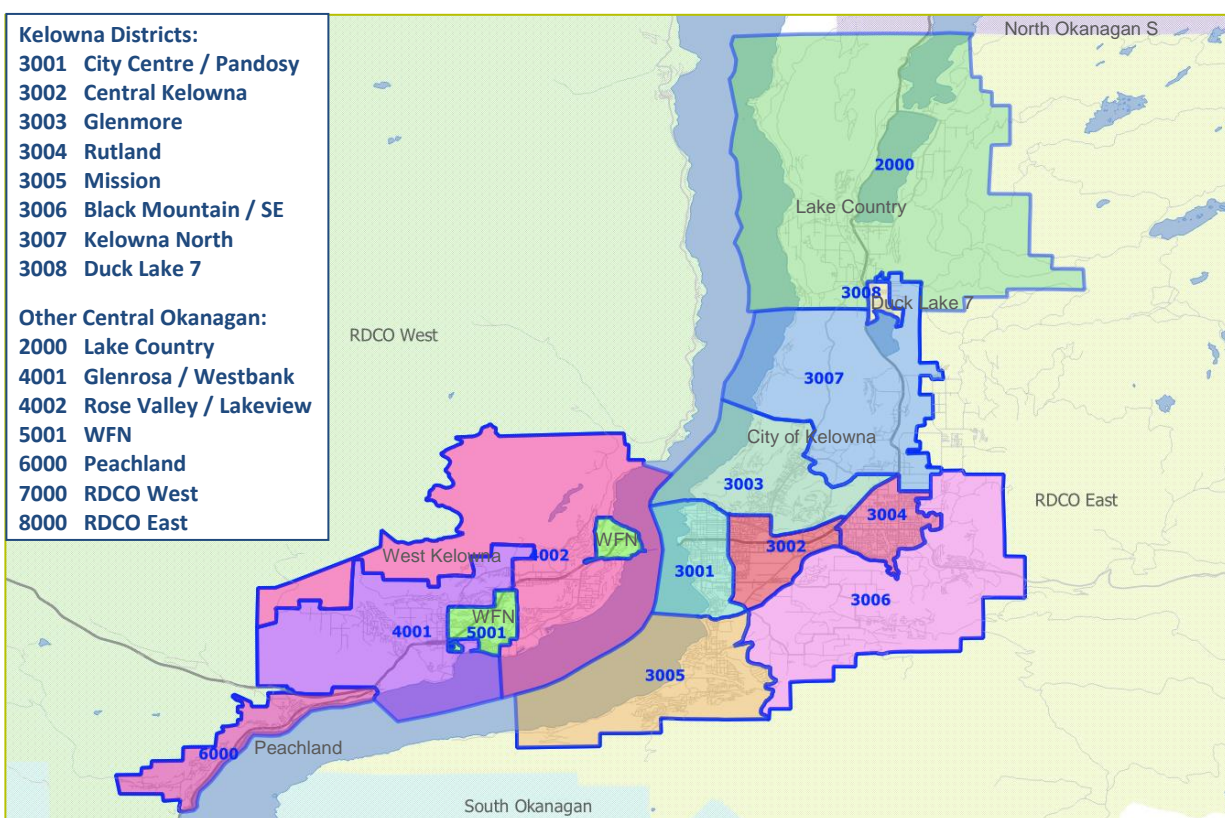
RD = Regional District RDCO = Regional District of Central Okanagan

+ = sector is defined by the municipal boundaries plus First Nations communities within/adjacent to the municipal boundaries.



Figure 4. Sub-Municipal Districts





2.3 Survey Design

The survey was a household-based survey that collected demographic information on all household members and trip information for household members 5 years of age and older. The survey employed a 24-hour recall method that asked survey respondents to report on their trips on the previous weekday, from 4:00 a.m. on the previous day to 3:59 a.m. the next day. The survey could be completed online or over the phone. The survey was conducted using Malatest's Triptelligence™ system, an integrated CATI/CAWI (computer assisted telephone/web interview) system incorporating Google Maps and data handling features developed specifically for origin-destination surveys.

Outlined below are the types of information collected by the survey:

HOUSEHOLD LEVEL	PERSON LEVEL For each person in the household	TRIP LEVEL For each trip made by each household member 5+ years of age
Home location	Gender	Origin location
Dwelling type	Age	Destination location
Household size (# people)	Driver's licence	Trip departure time
Number of vehicles by vehicle type and fuel type	Mobility devices used, if any	Arrival time at destination
Number of bicycles (adult pedal	Student status (f/t, p/t)	Purpose (destination activity)
	School level	Mode(s) of travel (up to 5)



bikes, adult e-bikes, children's)	School location	Transit routes taken (if bus)
Household Income	Employment status (f/t, p/t)	Number of vehicle occupants (if driver or passenger)
	Workplace location	Vehicle availability for non-auto trips leaving home
	Type of job	
	Other occupational status (retired, unemployed, etc)	
	Whether took trips on travel day (if age 5+)	

The survey used the following definition of a trip: A trip is a journey from one place (origin) to another (destination) with a single purpose that may involve more than one mode of travel. Travel to work with a stop at a coffee shop is two separate trips: one with a purpose of restaurant/dining, another with a purpose of work. Travel to work which involved driving to a park & ride location then taking transit the rest of the way is considered a single trip with a primary mode of transit and a transit access mode of driving.

2.4 Survey Conduct

To obtain coverage of both all households in the study area, including cell-phone-only households, an address-based sampling approach was taken. Households were randomly selected from databases of mailable residential addresses, with a portion of these households having only address listings (address-only), while a portion had addresses that could be matched to listed phone numbers (address-and-phone). Households were sent survey invitation letters with secure access codes and instructions for completing the survey online or over the telephone. In geographies with lower response rates, addresses with listed landlines received follow-up telephone calls to complete the survey over the telephone or encourage online completion. Overall, across both sample types, the survey had a 9.3% response rate before rejection of invalid surveys.

The survey was field tested October 25-27, 2018 and full survey administration was undertaken between October 30 and December 8, 2018. While the majority of the data collection was completed by December 8, additional online surveys were still allowed between December 9 and 21 to allow interested residents to complete the survey and to allow for extra surveys in case others were rejected during data validation. The later survey completions were reviewed to determine whether the travel patterns could be considered typical, and some households were removed if they had particularly unusual patterns that might have been influenced by the holiday season or if they had school-aged children and the travel date was after schools closed regular classes. The overall response rate to the survey was 9.1% after rejection of invalid surveys.

A total of 4,993 surveys were completed, well exceeding the survey target of 4,601 surveys. A total of 107 surveys were rejected during data validation, for a final dataset of 4,886 validated households. This represents a sampling rate of 4.8% of the 102,594 households estimated to be in the study area in 2018.



These households provided information for 10,801 people, with 30,299 trip records reported for 10,418 persons 5+ years of age.

2.5 Data Processing

After data collection, the survey data were subjected to a battery of validation tests to ensure that the survey questions were completed as intended and to flag possible errors in the data or issues with trip logic. Each night, Malatest's Triptelligence™ data validation system automatically ran a battery of tests on survey completions from the previous day, and assigned flags for different issues with different levels of priority (critical issue, possible error, warning, etc.) for review by data validation staff. The data validation staff reviewed each flagged survey and either made logical corrections, re-geocoded locations, called back respondents to clarify information, or rejected the survey as unsalvageable. Surveys that passed all data validation tests were randomly selected for manual review to verify that such surveys appeared to be correct and that validation tests were working as expected. In the data validation, only 2.1% of surveys were rejected.

The data were also systematically reviewed and tested by data analysts to quality control the dataset and rule out the possibility of any systematic data issues. Any relevant recodes to the data were undertaken (such as combining captured information on work status, school status, or other status into a single occupation variable).

A small number of missing data points was imputed. In preparation for the data weighting, the few person records with unknown age or gender were imputed, and those reporting non-binary gender were randomly assigned to male or female for the purpose of weighting and analysis (with the original responses preserved in the final dataset).

After finalization of the dataset, all latitude/longitude coordinates for locations captured by the survey (home, work, school, trip origin, trip destination) were geocoded using GIS tools to relevant study geographies and to Universal Transverse Mercator (UTM) zone 11 x-y coordinates.

2.6 Data Expansion and Weighting

The data for the surveyed households were expanded to represent the population living in residential households in the study area and were weighted to more accurately represent the distributions of households by household characteristics and demographics. This is necessary to address non-response bias and uneven sampling rates in the final survey sample.

The study area geography was organized into expansion zones (also referred to as weighting districts). The expansion zones were developed based on Statistics Canada Census Subdivisions (CSDs) and, within Kelowna, Vernon, and West Kelowna, were further based on aggregated neighbourhoods mapped against Statistics Canada Dissemination Areas (DAs). It may be noted that the boundaries of the expansion zone share the same definitions as the 19 districts in the study area used for reporting (see [Table 1](#)), with the exception of a few instances where the boundaries of a component DA straddled the boundaries of the neighbourhoods that define the districts. Rather than attempting to split the DA-level Census data to two different expansion zones, the DAs were assigned to either one expansion zones or



another, thus a few expansion zones have slightly different boundaries from the reporting zones. As these overlaps were few, and affected only a small portion of all households in each expansion zone / reporting district, these slight discrepancies should not overly skew the weighted data or the demographic profiles when analysed by reporting district. Users of the data should be careful to select the field appropriate district geography for their purposes, which in most instances will be the reporting district.

An iterative proportional fitting (IPF) method was employed to balance household weights and person weights for the multiple weighting controls. In this method, incremental adjustments to the household weights are made in succession for each of the household controls, as well as a composite adjustment to each household weight to account for the disproportionate distribution by age/gender amongst the members of each household. Each successive adjustment to balance a given control may slightly or significantly unbalance the correction previously introduced for a different control. However, iteratively cycling through each control results in convergence to a solution where all household and population controls have expected distributions (to within reasonable tolerance; some deviations may be expected, particularly for weighting districts with smaller sample sizes). In this manner, all persons within each household carry the same weight as the household. Limits were set on extreme weights, although they were allowed to range from 0.25 to 4.0 times the base expansion weight for the household's district. The weights received final calibrations to ensure that the total number of households in each district matched the control totals.

The weighting controls were developed from 2016 Census data. The controls were selected for having significant influence on trip-making behaviour and for completeness of the information in the survey data. The weighting controls included, for each weighting district:

- **total households** (private dwellings occupied by usual residents),
- household counts by **dwelling type** (house, apartment, other ground oriented),
- household counts by **household size** (1-person, 2-person, 3-person, 4-person, 5+ person), and
- population counts by **age and gender** (12 age ranges, 2 genders).

Estimates for 2018 were projected forward from 2016 Census counts using 2011 Census to 2016 Census growth rates by CSD or Aggregated Dissemination Area (ADA) where appropriate. The population counts by age and gender were rescaled to represent population living in private residential dwellings (reducing the population count by the 2.4% of the population living in collective dwellings or without fixed address, who are not represented by the survey; and accounting for unequal distribution of this segment of the population by age group, i.e., people in older age groups are more likely to be living in collective dwellings). In some small weighting districts, age and/or gender categories may have been collapsed further due to small sample sizes or cells with no sample.

Three lower-priority secondary weighting adjustments were introduced at the beginning of the weighting process (one pass only):

- **incidence of travel in rejected surveys vs. in accepted surveys.** As only a small proportion of all



survey completions was rejected, this factor was small;⁴

- **distribution of households by Statistics Canada Dissemination Area (DA)** so that the initial weighted distributions would be better geographically balanced within each expansion zone; and
- **total public post-secondary enrolment** across the study area for UBC Okanagan, Okanagan College, Okanagan College Vernon Campus, excluding students living in residence (who were not surveyed).

It may be noted that these adjustments were only used to ‘seed’ the weights, in the hopes of steering the distributions to be more representative for these attributes. Afterwards, the adjustments for the primary weighting controls were allowed to determine final weights. The secondary controls were not used in subsequent iterations of the IPF weighting. The weighted survey data may not necessarily align as closely with the census counts by DA or the overall enrolment counts by post-secondary campus.

No attempt was made to adjust the weighting to balance the survey sample by day of week. It may be noted that travel on Thursdays and Fridays is somewhat over-represented, while travel on Mondays, Tuesdays, and Wednesdays is somewhat under-represented.

2.7 Validation of the Weighted Survey Data

The weighted survey data were validated against reference data, with the following observations about the representativeness of the weighted data:

- The weighted data were found to align very closely with the dwelling type aggregations⁵, household size, age and gender distributions from the Census (projected to 2018), as might be expected as these were the weighting controls.
- Weighted counts of total workers living in the study area and counts of workers who have a fixed place of work outside the home also matched Census counts projected to 2018.
- Amongst employed survey respondents, the distribution of the weighted data by occupational group (10 National Occupational Classification major groups) varied somewhat from the Census, with workers in Health Services occupations somewhat over-represented (122% of expected counts) and workers in the following occupations somewhat under-represented (79%-82% of expected counts): sales and service occupations; natural resource, agriculture and related occupations; and occupations in manufacturing and utilities. For other occupational groups, the weighted counts were between 88% and 99% of expected.
- Looking at weighted survey counts for post-secondary student enrolments revealed some under-representation of students, with weighted counts for UBC Okanagan representing 77% of the 9,973 enrollment in the 2018/19 academic year (which is not unsurprising as this survey of

⁴ As people who did not travel on their travel day had little chance of rejection of their surveys, while those who did travel have more data points thus more chances to be rejected during data validation, a slight adjustment factor was applied to accepted household surveys with travel to compensate for the higher rejection rate amongst travelling households.

⁵ While the dwelling type aggregations (single-detached, apartment or condominium, and other ground oriented) aligned well, it may be noted that within the other ground oriented aggregation, row/townhouses were somewhat over-represented and semi-detached houses were under-represented.



private residential addresses does not represent the over 1,600 students living in residence on campus); 91% of enrolments at Okanagan College's main campus in Kelowna; and 77% of enrolments at Okanagan College Vernon campus, which is to be expected as the Vernon campus likely attracts students from nearby communities in the North Okanagan that were not part of the sampled study area.

- Comparing Census data on reported 2015 pre-tax household income against the 2018 OTS valid survey responses suggests that the survey results may somewhat under-represent households at the lowest (below \$30,000 per year) and highest income ranges (\$125,000 or more), and slightly over-represent those in income brackets in-between. This comparison should be interpreted with caution, however, as incomes for working people will have increased from 2015 to 2018, and only 17% of survey respondents refused to provide a response to this question.
- Census data on workers' journeys to work were also compared to the survey results. It may be noted that these data are not strictly comparable: The Census journey-to-work data ask persons who workers what their usual mode of travel was in the last week before the May 10 Census, or if not employed that week, their longest-held job in the last 16 months⁶; In contrast, the Okanagan Travel Survey asked persons who were currently employed what their mode of travel was if they worked on a single day (the previous weekday in late October through mid-December), with some workers not commuting on the sampled day (e.g., due to not being scheduled to work, working from home, away on travel, or sick). Thus one might expect the survey counts to be lower than the Census counts, which they were, by about 24%. Comparing the mode shares (% distributions), the Census data and weighted survey results are relatively similar, with some differences (survey results for auto driver and bicycle commute mode shares are slightly higher than Census journey-to-work shares, and slightly lower for transit shares). Given the differences between the data definitions and time of year, it is difficult to say whether the differences suggest bias in the survey results.
- Transit ridership figures for the Kelowna Regional Transit System were compared against the weighted survey data. This comparison shows weighted survey counts virtually equal to ridership figures, both when compared to total trips and when compared to total estimated boardings (trips that involve transfers between bus routes have more than one boarding). It may be noted that official ridership figures may under-count total ridership.⁷ In this context, it may

⁶ Main mode of commuting "reported for population aged 15 years and over, in private households, who worked at some time since January 1, 2015. Persons who indicated that they either had no fixed workplace address, or specified a usual workplace address, were asked to identify the mode of transportation they usually used to commute from home to work. The variable usually relates to the individual's job held during the week of Sunday, May 1 to Saturday, May 7, 2016. However, if the person did not work during that week but had worked at some time since January 1, 2015, the information relates to the job held the longest during that period. ...Persons who used more than one mode of commuting were asked to identify the single mode they used for most of the travel distance. As a result, the question provides data on the main mode of commuting." (Statistics Canada. Dictionary, Census of Population 2016, Main mode of commuting, release data May 3, 2017; <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/pop177-eng.cfm>)

⁷ While monthly passes are scanned and cash fares are counted, post-secondary students with a U-Pass simply have to present their pass, and some drivers may not consistently manually register each student boarding.



be possible that despite the match between the weighted survey counts and official ridership, the survey may slightly under-represent actual transit trips. At the very least, survey data do not represent the local transit trips of students living in on-campus accommodation, as collective residences were not included in the survey sample.

- Ridership data for the Vernon Regional Transit System were not examined. As this transit system services Vernon, Coldstream, and the North Okanagan, any comparisons to the survey data for just Vernon residents would likely be difficult to interpret.

Overall, the weighted survey data appear to align very well with the reference data examined, which should provide confidence in the survey results. Notwithstanding the efforts to ensure that the survey data are representative of the population as a whole, it should be noted that it may not be possible to correct for all sources of non-response bias. The survey data may not provide a perfect match for all population characteristics (as evidenced by the modest differences in the comparisons against college and university enrolments, occupation type, and household income).

More detail on the validation of the weighted data can be found in *Report 1: 2018 Okanagan Travel Survey – Survey Design and Conduct*.

2.8 Treatment of the 2007 and 2013 Survey Data for Longitudinal Comparisons

An aspect of transportation research of great interest is to track trends over time, to understand changing transportation demand and to measure the impact of transportation initiatives and policies. Therefore the 2007 and 2013 travel survey data are invaluable for tracking how the key indicators such as mode share and trip rates change over time. In order to facilitate this analysis, aspects of the 2013 dataset were reworked to provide a better basis for comparison and the data were reweighted. The 2007 baseline survey included a number of municipalities in the North Okanagan other than Vernon. In 2013 and 2018 Vernon was the only North Okanagan municipality surveyed, so these records were dropped from the 2007 data set. The 2013 survey included surveys with 24 UBCO students living in residence on campus. The 2018 survey did not survey collective dwellings, so the on-campus records were dropped from the 2013 dataset to provide the same basis for comparison. Location data in both the 2007 and 2013 datasets were recoded to the geographic systems used in 2018 in order to facilitate longitudinal comparisons at the sub-regional level. As a result of these adjustments, statistics for the earlier survey cycles reported here may in some cases differ slightly from those reported at the time of those survey cycles.

It may be noted that there may be other methodological differences between the different survey cycles related to question wording, sampling, data processing, or other aspects of the research design that may affect the comparability of the datasets. The usefulness of the comparisons is strengthened by the fact that the survey was conducted in the same season of the year with a questionnaire with the same core data elements in each cycle, and by the adjustments to the previous data sets to provide a similar basis for comparison.

The weather during the time period of the survey may also affect the data in each survey, with the



surveys having been conducted mid April to mid May 2007, late September to early November 2013, and late October to mid December 2018, respectively. While commutes, school enrolments, and other activity patterns may be equivalent for the most part, of all the transportation indicators presented, the cycling and walking mode shares may be most influenced by weather, so caution should be exercised when making longitudinal comparisons.

2.9 Statistical Reliability

2.9.1 Data Reliability

The 2018 OTS was conducted with a sample of about 4.8% of households in the study area. As with any survey, the data collected can be subject to sources of error or bias that can affect the reliability of the survey results. Potential sources of error can include the following:

- *Undercoverage.* Coverage error is associated with the failure to include some populations in the same frame used for sample selection, which may occur with samples of convenience such as telephone directories. The 2018 sample frame was enriched by City of Kelowna address data amalgamated with the Canada Post database of mailable residential addresses; this hybrid sampling approach should provide excellent coverage of private dwellings in the study area, reducing the concern of under-coverage. However, both data sources may miss some housing types, such as basement/secondary suites, mobile home parks and other non-conventional dwelling types.
- *Non-response bias.* Non-response bias occurs when individuals who do not participate in a survey differ in relevant ways from individuals who do participate. For example, younger people are often less inclined to participate in surveys. This bias has also been addressed, in part, through the data expansion process, including the weighting by dwelling type, age, and gender. However, it should be noted that there can be other, hidden biases in the data that could not be corrected by the data weighting.
- *Measurement error.* This type of error is associated with the failure of survey instruments to capture correct information (e.g., through misunderstanding survey questions). To control for this, the questionnaire and associated materials were based on previously well-tested survey questions, thoroughly reviewed for content and meaning, and field-tested with a sample of respondents prior to the full survey administration. Telephone interviewers were trained on the objectives of the survey, definitions of key terms, the intent of survey questions, and how to address different trip circumstances described by respondents. During survey administration, interviews were regularly monitored by a supervisor to ensure consistent application of questions. The online survey also included a number of built-in tests to prompt respondents to confirm key data and clarify illogical responses.
- *Processing error.* Processing errors include data entry, coding, editing, and imputation errors. These potential sources of error were addressed through comprehensive training of survey staff and survey validation staff, continuous quality management practices, and data validation.



- *Sampling error.* Sampling error refers to the variability that occurs by chance because a sample was surveyed, rather than the complete population. As best as possible, sampling error was controlled in the sample design by over-sampling from districts with smaller populations, as a strictly proportional sample design would have resulted in very few completions for smaller districts.
- *Error due to extreme weights when analysing small samples.* Notwithstanding the limiting of very extreme weights in the data weighting, small sample sizes for some strata and non-response bias may contribute to the assignment of high weights for some cases relative to others within the same geographic district or population stratum. Users of the data should take note that the sample sizes for some districts are relatively modest, and the survey results for such districts should be interpreted with caution. Caution should also be exercised when analysing any small subgroups of the total population.



2.9.2 Estimates of Sampling Error

Sampling error can be estimated based on the size of the sample universe (number of households in the region) and the number of household survey completions. The estimated margin of error for the survey results at the household level is presented in [Table 2](#) for each district, as well as for the aggregations used in reporting. The estimated margin of error for the survey results at the person level is presented in [Table 3](#). The sampling errors have been corrected to account for the effects of the data weighting.

Overall, the margin of error for the household-level survey results is estimated at $\pm 1.7\%$ at a 95% confidence level (theoretically, for a given survey question, the true response proportion for the population would be somewhere within the margin of error of the survey results 19 times out of 20). For person- and trip-level survey results for the entire study area is estimated to be $\pm 1.1\%$.

Sampling errors increase when the study area is disaggregated into sub-areas and districts. The sampling design included higher sampling rates for smaller populations, in order to reduce the sampling errors when reporting on these districts individually. Nevertheless, survey results for geographies with smaller samples and higher sampling errors should be interpreted with caution.

Reporting of survey results related to trips originating in or destined to given sub-areas or sub-municipal districts will include trips made by residents of the given geography as well as other residents of the study area from outside the given geography. For example, while the survey sample for residents of Kelowna North is modest (104 households with 250 persons), the reporting on trips within the district is based on a considerably larger sample of surveyed residents (943 persons) who reported travelling to, from, or within this district (UBC Okanagan in this district is an significant attractor of trips). Therefore the sampling error associated with information on trips to, from or within the area would be much better than that for just the trips made by residents of the area. Sampling errors for trips destined to each geography are also listed in [Table 3](#). It may be noted that the sampling errors for person-level information can be considered to carry over to the trips those people make (i.e., the sampling error is associated with the entire trip chain). Therefore the calculation of sampling error was undertaken using the number of persons as the samples size rather than number of trips.⁸

It should be understood that sampling error is not the only possible source of error. While efforts have been made to weight the data to be more representative of the population, there may be non-response bias or other sources of error not accounted for in the data weighting and data processing.

⁸ It may also be noted that the person-level sampling errors are a crude estimate, in that the actual sample units were households, and individual persons were not independently sampled. The sampling errors have not been adjusted to take into account the clustered nature of the sampling of persons.


Table 2. Survey Completions and Sampling Errors – for Household Level Statistics

Geography of Residence	District	2018 Occupied Dwelling Units (N) ⁽¹⁾	Household Surveys Completed (n)	Sampling Rate ⁽²⁾	Theoretical Margin of Error ⁽³⁾
Study Area		102,600	4,886	4.8%	±1.7%
Central Okanagan		84,100	4,002	4.8%	±1.9%
Vernon		18,500	884	4.8%	±4.1%
Kelowna		56,500	2,617	4.6%	±2.3%
Other Central Okanagan		27,600	1,385	5.0%	±3.3%
City Core / Alexis Park / Harwood / North Vernon	1001	5,800	234	4.0%	±7.6%
East Hill / Middleton / Mission Hill	1002	6,400	292	4.6%	±7.4%
Landing / Bella Vista / Turtle Mountain / Priest's Valley	1003	4,200	209	5.0%	±8.5%
Outlying Areas *	1004	2,000	149	7.4%	±9.1%
Lake Country	2000	5,300	251	4.7%	±7.5%
City Centre / Pandosy	3001	13,400	613	4.6%	±4.6%
Central Kelowna	3002	8,900	365	4.1%	±6.1%
Glenmore	3003	8,200	381	4.6%	±5.8%
Rutland	3004	11,100	497	4.5%	±5.1%
Mission	3005	6,600	332	5.0%	±6.3%
Black Mountain / Southeast	3006	5,400	247	4.6%	±8.0%
Kelowna North *	3007	2,100	104	4.9%	±11.5%
Duck Lake 7 *	3008	800	78	9.7%	±13.5%
Glenrosa / Westbank	4001	7,300	318	4.4%	±6.5%
Rose Valley / Lakeview	4002	5,400	247	4.5%	±7.5%
West Kelowna Subtotal		12,700	565	4.4%	±4.9%
WFN	5001	4,700	201	4.3%	±8.0%
Peachland *	6000	2,500	141	5.6%	±11.2%
RDCO West *	7000	900	106	11.7%	±12.1%
RDCO East *	8000	1,500	121	7.9%	±11.7%

⁽¹⁾ Estimated dwelling units in 2018, projected forward from 2016 by using population growth trends from the 2011 Census to the 2016 Census by aggregated dissemination area.

⁽²⁾ Sampling rate: the percentage of households surveyed.

⁽³⁾ Sampling error: in random sampling, the actual results for the population may be expected to lie within the range of the survey result plus or minus the sampling error, at a 95% confidence level (i.e., 19 times out of 20). The sampling errors estimated above have been adjusted for possible design effects due to over-/under-sampling.

* Districts with smaller sample sizes / higher sampling errors. Results for these districts should be interpreted with caution.



Table 3. Survey Samples, Sampling Errors – for Person-Level Statistics & Trips Made by those Persons

Geography of Residence	District	Sampling Error For Trips Made by Residents of District				For Trips Destined to District			
		2018 Estimated Population (N) ⁽¹⁾	Persons Surveyed (n)	Sampling Rate ⁽²⁾	Theoretical Margin of Error ⁽³⁾	Trip Records for Persons Living in District	Trips Records for Trips Destined to District	Sample Size (n) (Persons with Trips Destined to District)	Theoretical Margin of Error ⁽³⁾
Study Area		237,300	10,801	4.6%	±1.1%	30,299	29,554	8,608	±1.3%
Central Okanagan		197,000	8,963	4.5%	±1.2%	25,135	24,810	7,362	±1.4%
Vernon		40,200	1,838	4.6%	±2.9%	5,164	4,744	1,594	±3.1%
Kelowna		129,900	5,831	4.5%	±1.5%	17,015	18,900	6,223	±1.5%
Other Central Okanagan		67,200	3,132	4.7%	±2.2%	8,120	5,910	2,830	±2.3%
City Core/ Alexis Park / Harwood/ North Vernon	1001	10,300	419	4.1%	±5.6%	1,097	2,460	1,163	±3.6%
East Hill / Middleton / Mission Hill	1002	15,200	646	4.3%	±4.9%	1,986	1,263	726	±4.6%
Landing/ Bella Vista/ Turtle Mountain/ Priest's Valley	1003	10,000	444	4.5%	±5.9%	1,103	629	420	±6.0%
Outlying Areas *	1004	4,800	329	6.9%	±6.3%	978	392	303	±6.9%
Lake Country	2000	13,200	603	4.6%	±4.7%	1,680	1,257	655	±4.5%
City Centre / Pandosy	3001	25,200	1,178	4.7%	±3.4%	3,626	4,842	2,824	±2.2%
Central Kelowna	3002	17,100	717	4.2%	±4.3%	2,143	5,716	3,259	±2.1%
Glenmore	3003	20,400	948	4.6%	±3.7%	2,980	1,920	1,164	±3.4%
Rutland	3004	27,100	1,153	4.3%	±3.4%	3,204	2,564	1,504	±3.0%
Mission	3005	18,900	827	4.4%	±3.9%	2,487	1,651	993	±3.6%
Black Mountain / Southeast	3006	14,500	615	4.2%	±5.0%	1,545	876	631	±4.9%
Kelowna North *	3007	5,000	250	5.0%	±7.3%	642	1,176	943	±3.8%
Duck Lake 7 *	3008	1,600	143	9.2%	±9.9%	388	155	122	±11.1%
Glenrosa / Westbank	4001	18,500	723	3.9%	±4.4%	1,768	1,386	873	±4.0%
Rose Valley / Lakeview	4002	14,300	617	4.3%	±4.8%	1,623	1,167	786	±4.2%
<i>West Kelowna Subtotal</i>		<i>32,800</i>	<i>1,340</i>	<i>4.1%</i>	<i>±3.2%</i>	<i>3,391</i>	<i>2,553</i>	<i>1,429</i>	<i>±3.1%</i>
WFN	5001	9,700	395	4.1%	±5.9%	984	1,134	749	±4.3%
Peachland *	6000	5,500	294	5.3%	±7.8%	749	434	268	±7.9%
RDCO West *	7000	2,000	213	10.9%	±8.6%	494	187	153	±10.0%
RDCO East *	8000	3,900	287	7.3%	±7.6%	822	345	260	±7.8%
External to Study Area		n/a	n/a	n/a	n/a	n/a	159	157	±9.6%

⁽¹⁾ Estimated population living in private dwellings 2018, projected forward from 2016 by using population growth trends from the 2011 Census to the 2016 Census by aggregated dissemination area.

⁽²⁾ Sampling rate: the percentage of households surveyed.

⁽³⁾ Sampling error: in random sampling, the actual results for the population may be expected to lie within the range of the survey result plus or minus the sampling error, at a 95% confidence level (i.e., 19 times out of 20). The sampling errors estimated above have been adjusted for possible design effects due to over-/under-sampling.

* Districts with smaller sample sizes / higher sampling errors. Results for these districts should be interpreted with caution.



2.9.3 Caveats

The margins of sampling error detailed above should not be interpreted as circumscribing all sources of error. While every effort has been made to control for possible error and correct for non-response bias, there may still remain some error or bias in the survey data beyond the sampling error.

Expanded counts from the survey data should be understood to be estimates not exact counts. The weighted survey data are based on a 4.6% sample of population expanded to represent the total population of persons living in private dwellings (excluding population living in collective dwellings).

While efforts were made to ensure the survey data for different cycles had a similar basis for comparison, differences in sampling methodology, survey design, data processing and/or the time period of the survey may affect the comparability of results. Although most survey questions remain essentially consistent, it should be noted that some questions have been changed and new questions added (hence are not comparable). The geographies covered may also have some differences. All of the above may affect the accuracy of the longitudinal comparisons. Nonetheless, the comparisons can be viewed as indicative.



3 Households, Vehicles and Demographics

This section profiles the households and population in the study area, including trends in the growth of households, population, vehicles, and bicycles from the baseline survey in 2007 to the second survey in 2013 to the 2018 survey. Household characteristics and population demographics are explored, along with tracking of selected trends in those demographics. This provides the context for the analysis of the travel patterns examined later in this report.

The importance of presenting the demographics of the survey area is twofold. First, it profiles the region's residents: these are the people who are making trips. Second, the demographics help explain the reasons for travelling and the travel choices people make. The explanations, in turn, enable a further understanding of the travel characteristics.

Most results are presented for three sub-areas: Vernon, Kelowna, and Other Central Okanagan (See [Section 2.2](#) for definitions of the study area geography). Certain results, such as exploration of relationship between dwelling type and vehicle ownership, are presented only for the study area as a whole, as the observations may apply equally to all of the communities, albeit with some local variation. As each of the sub-areas is not necessarily homogenous, selected results are also featured for the 19 sub-municipal districts to provide an idea of the differences between the communities that make up the study area.

Some trends are examined across 11 years and others for the six- and five-year increments between the 2007, 2013, and 2018 survey cycles. It should be noted that some fluctuations over time may be due to error associated with random sampling of a population, differences in survey design, and/or different biases in the samples for different survey cycles, however major trends should usually reveal themselves even if there is some imprecision in the comparisons.

The survey results are based on a 4.8% random sample of households expanded to represent the total private households and population of the study area. The expanded results should be understood to be estimates only. When presenting expanded survey counts, some larger figures are rounded to the closest 100, while other figures are rounded to the closest ten, so as not to give an undue impression of precision. It should be noted that the actual margin of error of the expanded results may often be much greater than the closest ten or closest 100.



3.1 Population and Households, 2007 to 2018

The entire survey area encompasses 237,300 residents living in 102,600 private dwellings in 2018. This figure excludes the 2.4% of the total population living in collective dwellings (care homes, group homes, student residences) or without fixed address, who were outside the survey scope. Based on the survey data, there has been a 19% increase in population and a 24% increase in households in the 11 years since the baseline survey in 2007, with the increases in the past five years being 7.6% and 8.4% respectively.

The Central Okanagan accounts for 84,100 households with 197,000 residents. Population growth in the Central Okanagan has been brisk, at 8.1% across the five years from the last survey in 2013 to the 2018 survey (about 1.6% per year). For analysis, the Central Okanagan is broken out into two sub-areas: two-thirds of the population live in the Kelowna sub-area, at 56,500 households and 129,900 residents ([Figure 6](#))⁹, while the other geographies are aggregated as the Other Central Okanagan sub-area, at 27,600 households and 67,200 residents ([Figure 7](#)).

Vernon, located in the Regional District of North Okanagan (RDNO), accounts for an additional 18,500 households and 40,200 residents¹⁰ ([Figure 8](#)), with a somewhat less dramatic population increase of 5.5% over the previous five years (about 1% per year). Other communities in the RDNO were not surveyed.

[Table 4](#) summarizes these figures for the major geographies in the study area. All areas have experienced a reduction in average household size since the 2007 baseline although this trend appears to have slowed somewhat.

Table 4. Households and Population 2007-2018 – Study Area

Survey Year	Study Area	Central Okanagan Subtotal	Vernon	Kelowna	Other Central Okanagan	Study Area	Central Okanagan Subtotal	Vernon	Kelowna	Other Central Okanagan
Households						% Change Since Previous Survey				
2007	83,000	66,930	16,070	45,970	20,960	n/a	n/a	n/a	n/a	n/a
2013	94,650	77,460	17,190	52,310	25,150	14.0%	15.7%	7.0%	13.8%	20.0%
2018	102,590	84,140	18,460	56,530	27,600	8.4%	8.6%	7.4%	8.1%	9.7%
Population Living in Private Dwellings						% Change Since Previous Survey				
2007	198,870	162,690	36,180	108,140	54,560	n/a	n/a	n/a	n/a	n/a
2013	220,470	182,350	38,110	120,340	62,010	10.9%	12.1%	5.3%	11.3%	13.7%
2018	237,250	197,030	40,220	129,860	67,180	7.6%	8.1%	5.5%	7.9%	8.3%
Avg. Household Size						% Change Since Previous Survey				
2007	2.40	2.43	2.25	2.35	2.60	n/a	n/a	n/a	n/a	n/a
2013	2.33	2.35	2.22	2.30	2.47	-2.8%	-3.2%	-1.5%	-2.2%	-5.3%
2018	2.31	2.34	2.18	2.30	2.43	-0.7%	-0.5%	-1.7%	-0.1%	-1.3%

⁹ For analysis, the 'Kelowna area' includes Duck Lake 7 (Okanagan Indian Band), est. 2018 population in private dwellings: 1,550.

¹⁰ For analysis, the 'Vernon area' includes Priest's Valley (Okanagan Indian Band), est. 2018 population in private dwellings: 550.





Figure 5. Population and Households 2007-2018 – Study Area

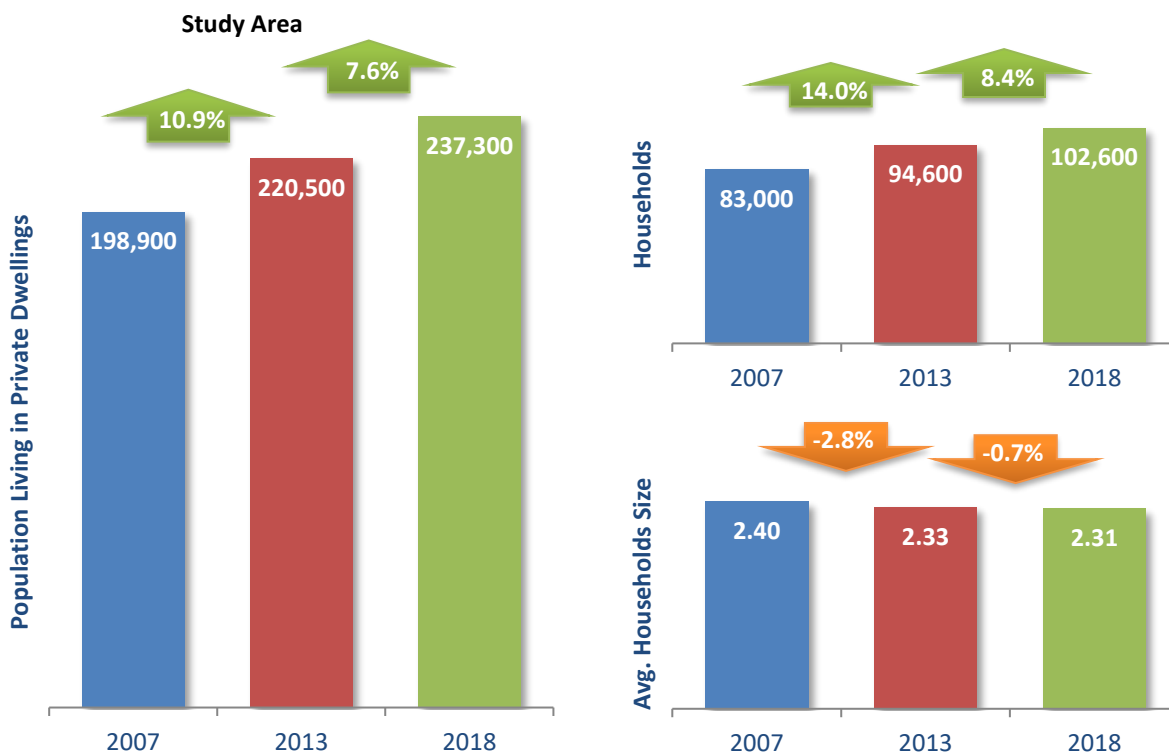


Figure 6. Population and Households 2007-2018 – Kelowna

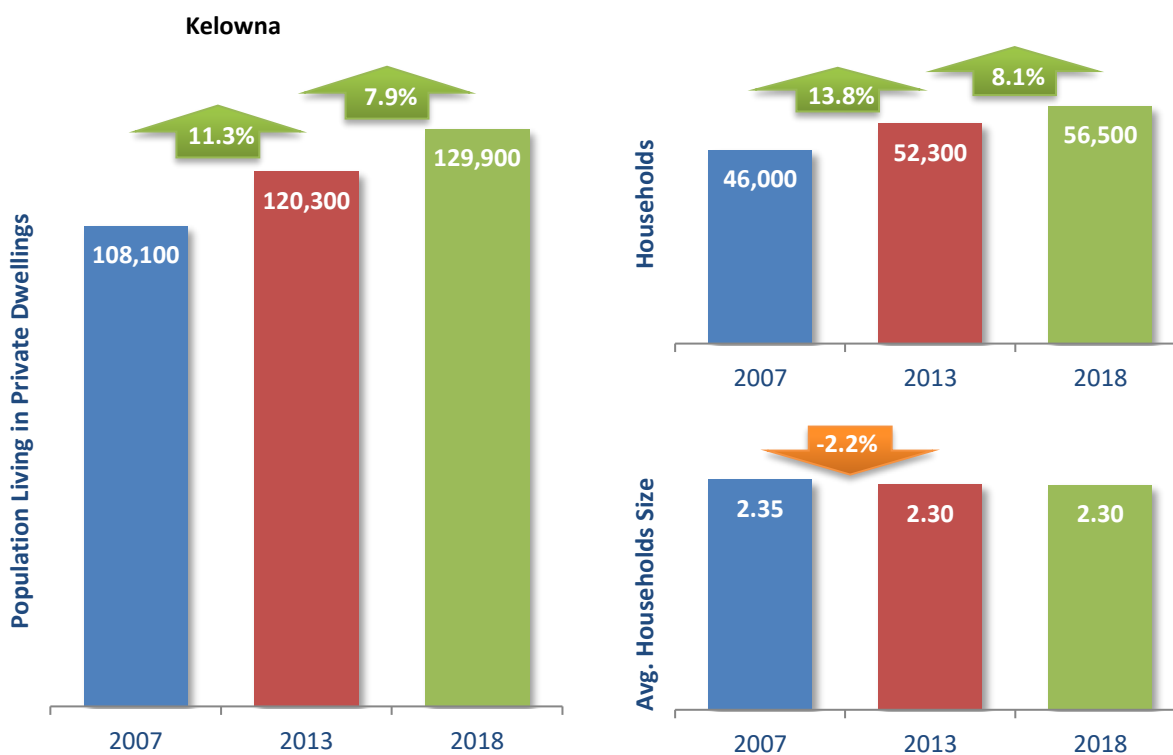




Figure 7. Population and Households 2007-2018 – Other Central Okanagan

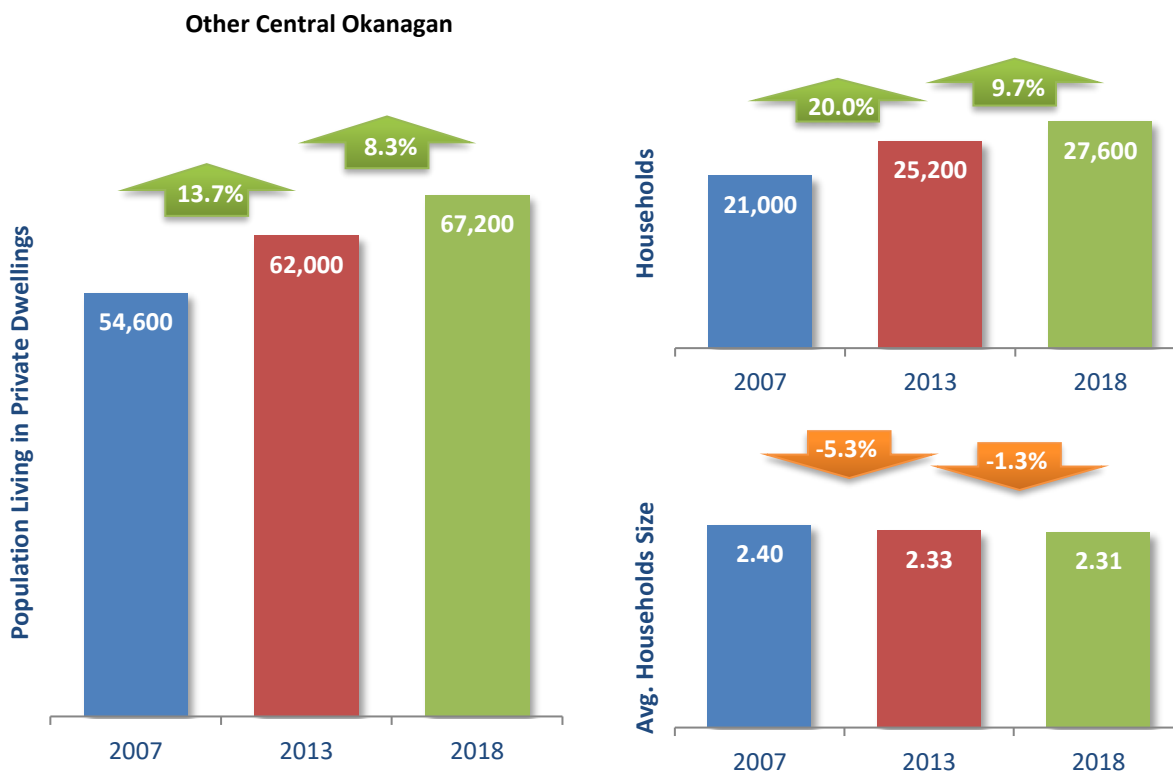


Figure 8. Population and Households, 2007-2018 – Vernon

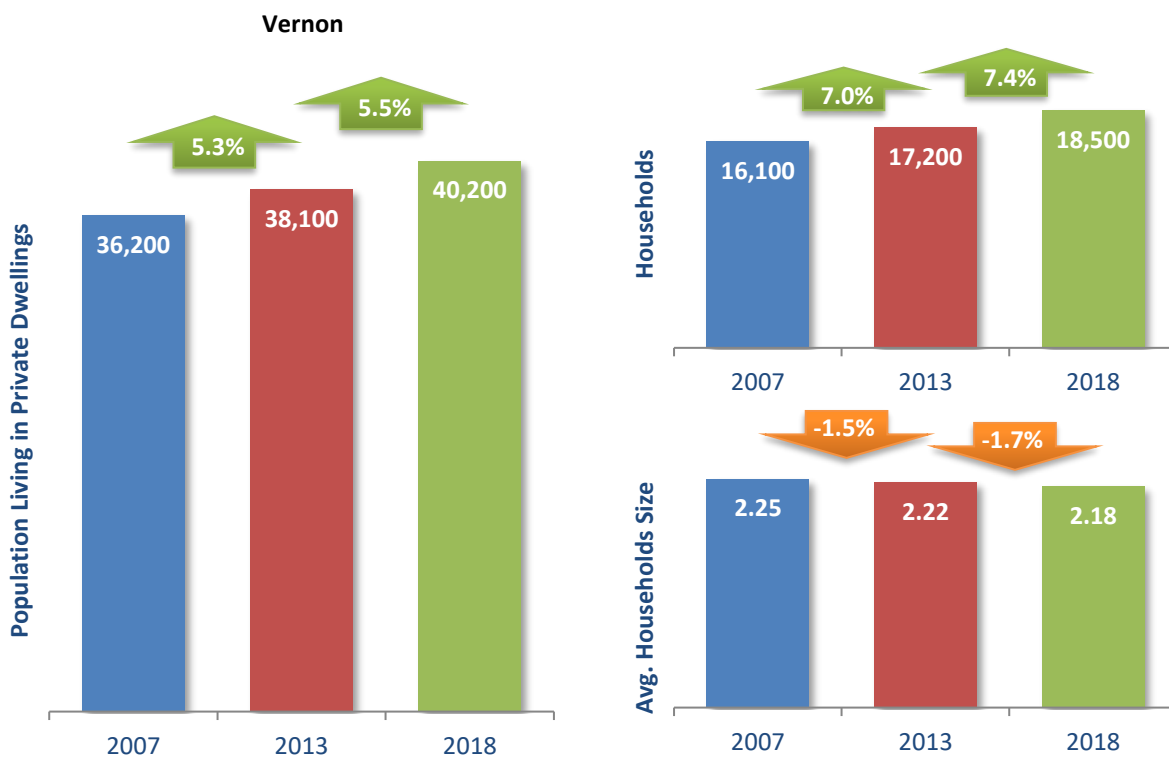
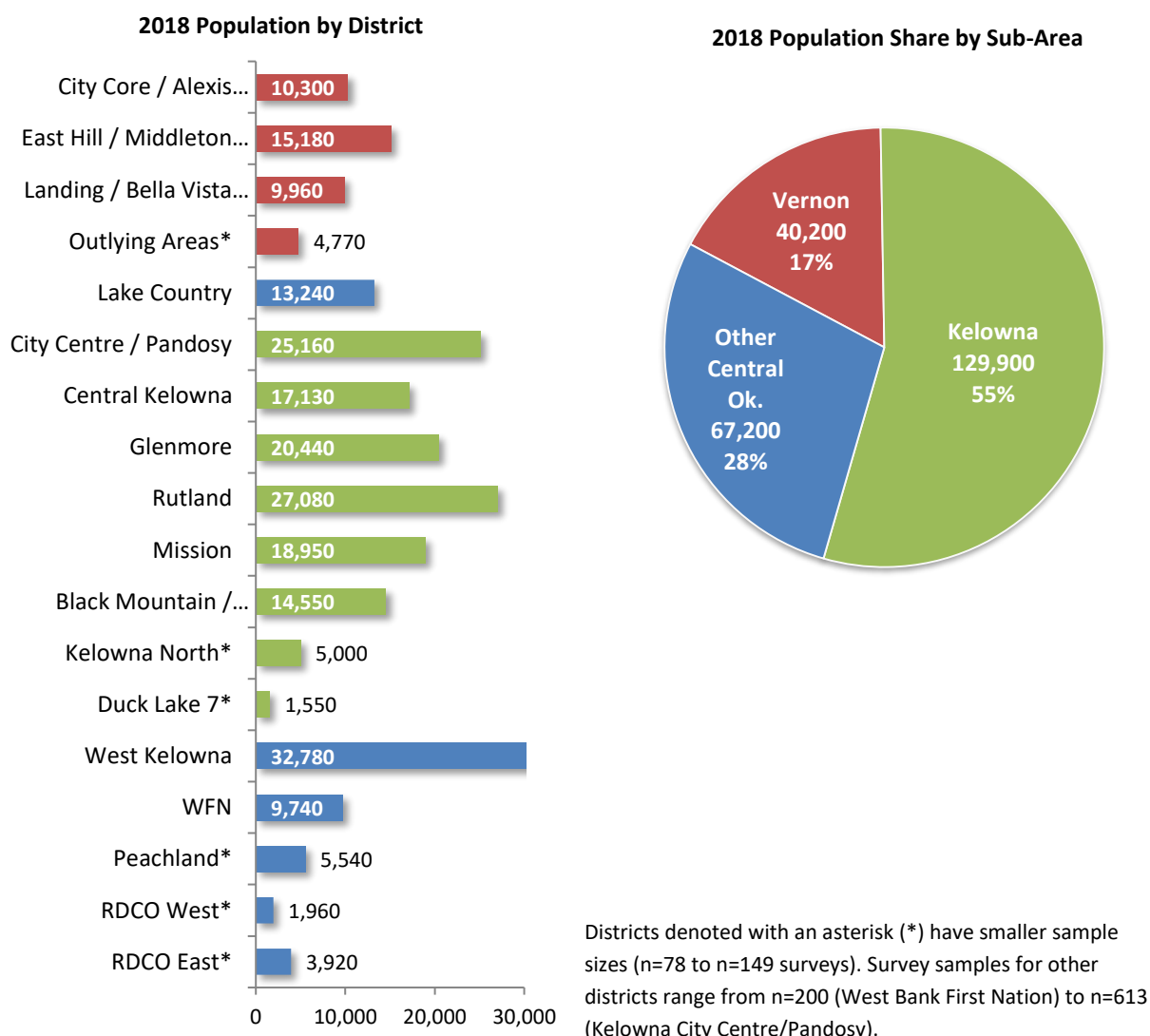




Figure 9 illustrates the population in each of the districts in the study area. Sub-municipal districts in the Vernon and Kelowna areas are grouped as different colours. For analysis, the Okanagan Indian Band community in Duck Lake 7 is grouped with the Kelowna, as its own district, while that in Priest's Valley is grouped with Vernon in a district with the Landing, Bella Vista, and Turtle Mountain neighbourhoods. Districts denoted with an asterisk (*) have smaller survey samples (n=78 to n=149).

Overall, the Kelowna area accounts for 55% of the population in the study area, the rest of the Central Okanagan 28%,¹¹ and Vernon 17%. The analysis in this report focuses on these three study sub-areas.

Figure 9. Population Distribution, 2018



¹¹ It may be noted that within the Other Central Okanagan area, the area formed by the two West Kelowna districts and the Westbank First Nation lands comprises 42,500 residents, or approximately 18% of the total population in the study area, while the communities of Lake Country, Peachland, RDCO East, and RDCO West account for the other 10% (24,700 residents).



3.1.1 Population and Households by District

Table 4 presents 2018 population and household counts by district, with household size and growth in the five years since 2013. The following districts have the smallest household sizes on average: Kelowna City Centre/Pandosy; Central Kelowna; and Vernon City Core/Alexis Park/ Harwood/ North Vernon (ranging from 1.76 to 1.92, compared to the survey average of 2.31). This expected for city centres with more apartments. The changes in household size over time are likely the product of demographic trends (aging population, changing family compositions) as well as neighbourhood growth patterns.

The areas with the highest population growth since 2013 were Westbank First Nation (25% over five years), Kelowna North (13%), Mission (12%), East Hill/Middleton/Mission Hill (11%), Lake Country (10%), Black Mountain/Southeast (10%) and Glenmore (10%).

Table 5. 2018 Households and Population by District

			2018			% change since 2013		
Geography		District	Households	Population in Private Dwellings	Avg. Household Size	Households	Pop'n	Avg. Hhld Size
Study Area			102,590	237,250	2.31	8.4%	7.6%	-0.7%
Study Area	Central Okanagan		84,140	197,030	2.34	8.6%	8.1%	-0.5%
	Vernon		18,460	40,220	2.18	7.4%	5.5%	-1.7%
Central Okanagan	Kelowna		56,530	129,860	2.30	8.1%	7.9%	-0.1%
	Other Central Okanagan		27,600	67,180	2.43	9.7%	8.3%	-1.3%
By District								
Vernon	City Core / Alexis Park / Harwood / North Vernon	1001	5,840	10,300	1.76	8.6%*	1.0%*	-7.0%*
	East Hill / Middleton / Mission Hill	1002	6,400	15,180	2.37	7.0%*	11.2%*	3.9%*
	Landing / Bella Vista / Turtle Mountain / Priest's Valley	1003	4,210	9,960	2.37	11.7%*	6.0%*	-5.1%*
	Outlying Areas	1004	2,010	4,770	2.37	-2.9%*	-2.1%*	0.9%*
Lake Country		2000	5,300	13,240	2.50	12.3%	10.2%	-1.8%
Kelowna	City Centre / Pandosy	3001	13,380	25,160	1.88	7.4%	8.2%	0.8%
	Central Kelowna	3002	8,930	17,130	1.92	6.9%	7.7%	0.7%
	Glenmore	3003	8,230	20,440	2.48	10.6%	9.6%	-0.9%
	Rutland	3004	11,090	27,080	2.44	3.7%	3.5%	-0.2%
	Mission	3005	6,630	18,950	2.86	13.3%	12.1%	-1.1%
	Black Mountain / Southeast	3006	5,350	14,550	2.72	11.5%	9.9%	-1.4%
	Kelowna North	3007	2,110	5,000	2.37	17.2%	13.4%	-3.3%
	Duck Lake 7	3008	810	1,550	1.91	-12.0%	-14.8%	-3.3%
West Kelowna	Glenrosa / Westbank	4001	7,280	18,530	2.55	5.1%	4.7%	-0.3%
	Rose Valley / Lakeview	4002	5,430	14,250	2.62	5.6%	5.2%	-0.4%
	West Kelowna Sub-Total**		12,710	32,780	2.58	5.3%	4.9%	-0.4%
WFN		5001	4,660	9,740	2.09	28.7%	25.2%	-2.7%
Peachland		6000	2,500	5,540	2.22	6.4%	5.5%	-0.8%
RDCO West		7000	910	1,960	2.15	4.6%	1.0%	-3.4%
RDCO East		8000	1,520	3,920	2.58	0.0%	3.4%	3.4%

* For Vernon districts, interpret changes since 2013 with caution due to issues with geographic boundaries when reweighting the 2013 data.

**For some analyses by district in this report, the two West Kelowna districts have been combined to provide the overall municipal result.



3.2 Household Characteristics

3.2.1 Dwelling Type

Dwelling type often has a strong relationship to household income, vehicle availability, proximity to transit, and the closeness of services. Household dwelling types for Kelowna, the rest of the Central Okanagan and Vernon are compared in **Figure 10** to the right.

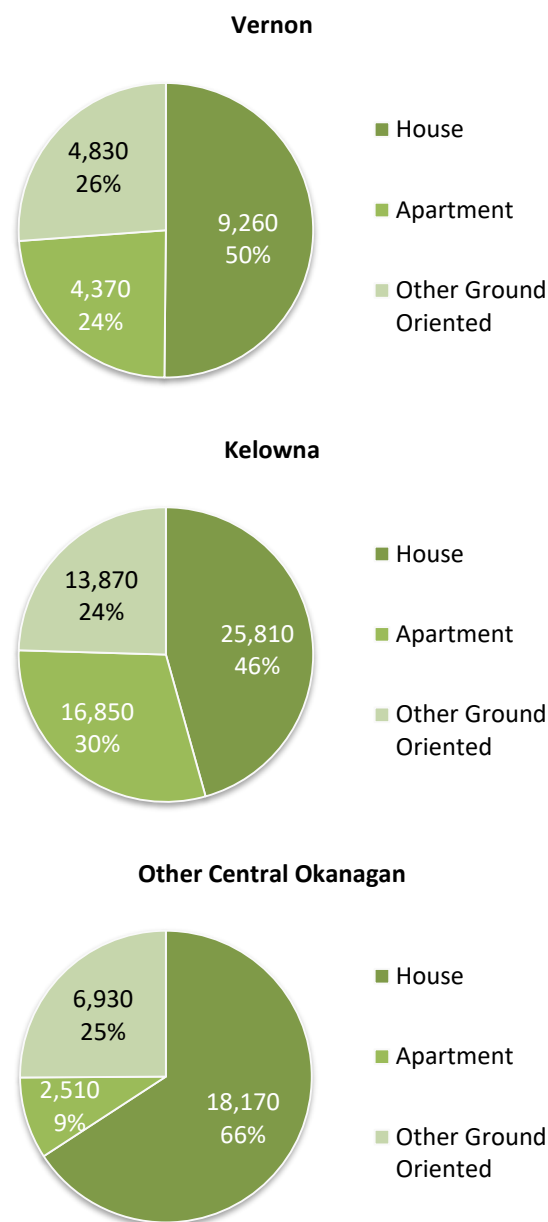
In Kelowna, 46% of households live in single-family (single-detached) dwellings, with another quarter living in other ground-oriented dwellings (row or town house, semi-detached, or mobile home), while three in ten live in apartments. Closer examination of the data reveals that the City Centre/Pandosy and Central Kelowna districts are comprised of 50% apartments.

In the rest the Central Okanagan, two-thirds of households live in single family dwellings.

In Vernon, half of households live in single-family dwellings, while apartments and other ground oriented dwelling types account for about one-quarter of households each. Within the city, the City Centre/North Vernon district has the highest concentration of apartments, with 52% of households living in apartments.

Comparison against the previous cycle revealed that in Vernon and Kelowna, apartments and in other ground oriented dwelling units are each being built at about 3 to 4 times the rate of new single-detached houses, while in the rest of the Central Okanagan, the greatest growth is in other ground oriented units.

Figure 10. Households by Dwelling Type, 2018



*other ground oriented = row/town house, semi-detached, secondary suite, mobile home



3.2.2 Household Size

The distribution of households by number of household members is presented in the charts in **Figure 11**.

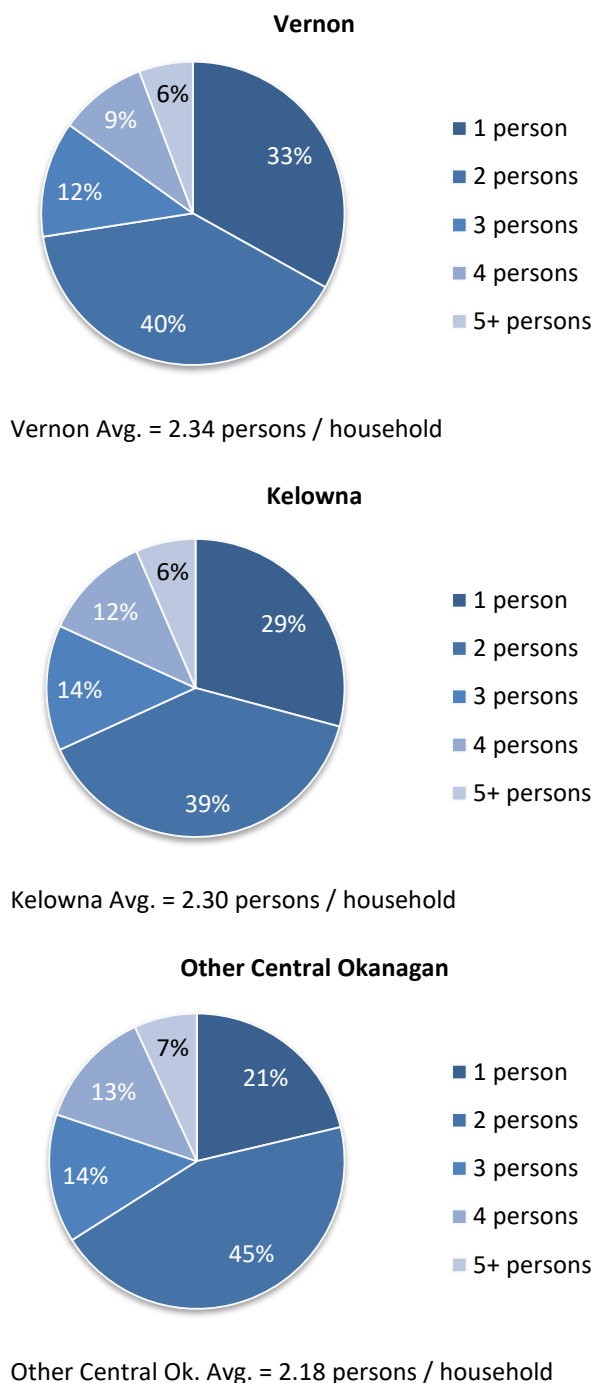
The Other Central Okanagan sub-area has proportionately more two-person households and fewer one-person households than Kelowna and Vernon.

Households with three or more persons comprise only 27% of households in Vernon, compared to 32% and 34% in Kelowna and the rest of the Central Okanagan respectively, which may be indicative of a slight drop in the number of families with children in the sub-area and consistent with the somewhat slower population growth compared to the Central Okanagan.

Comparison of the survey data to the 2013 cycle confirms that the proportions of three and four person households is declining in most areas, although the proportion of households with five or more persons has experienced a slight uptick.

See also in **Table 5** in **Section 3.1** for more information on average household size by district and the trend since 2013.

Figure 11. Households by Size, 2018





3.2.3 Household Income

Income is an important consideration for transportation as it is often correlated to transportation behaviours. The household income profile of each of the geographic areas is presented in **Figure 12**.

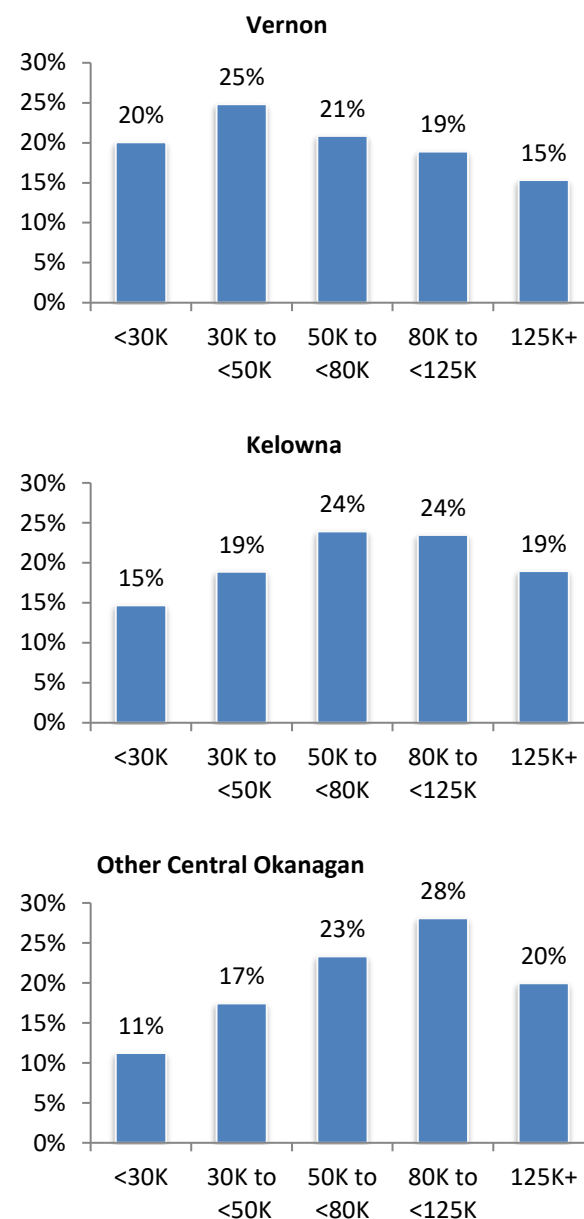
The Other Central Okanagan area appears to be generally more affluent as a whole, with almost 48% of all households having incomes of more than \$80,000 per year, and only 11% under \$30,000 per year.

Vernon appears to be the least affluent as a whole, with 20% of households having incomes of less than \$30,000 per year. Overall, close to half (46%) make less than \$50,000. Just over one-third (34%) make more than \$80,000.

Kelowna sits between these extremes, with 15% of households bringing in less than \$30,000 per year and a more even profile curving across the other income brackets. A total 43% of households have incomes of greater than \$80,000.

It should be noted that fully 17% of households surveyed either declined to provide their household income range or did not know it, and it is not known whether their income distributions follow the same distribution profile as for those who did.

Figure 12. Household Income (% of Households), 2018



The survey question on household income was subject to 17% non-response. In the data weighting there was no correction for non-response bias by income level. Therefore the survey results may not necessarily be representative of all households in the area.



3.3 Household Vehicles

3.3.1 Household Vehicles, 2007 to 2018

The expanded survey results suggest that across the study area there are about 186,800 insured household vehicles (including cars, light trucks, vans, and motorcycles, and including vehicles provided by employers that household members use for commuting or personal business). This is up from expanded survey counts of 184,400 in 2013 and 160,700 in 2007, for a 16% increase over 11 years. Across the 11 years since the 2007 baseline survey, the 16% increase in vehicles has lagged a bit behind population growth (19% across this period).

Figure 13 illustrates this growth by region. It is unclear whether the uneven growth pattern for Kelowna is the result of sampling error or other biases in the survey data in one or more of the survey cycles, or an actual trend of slower rates of vehicle acquisition followed by higher recent growth.

Figure 13. Total Household Vehicles, 2007-2018

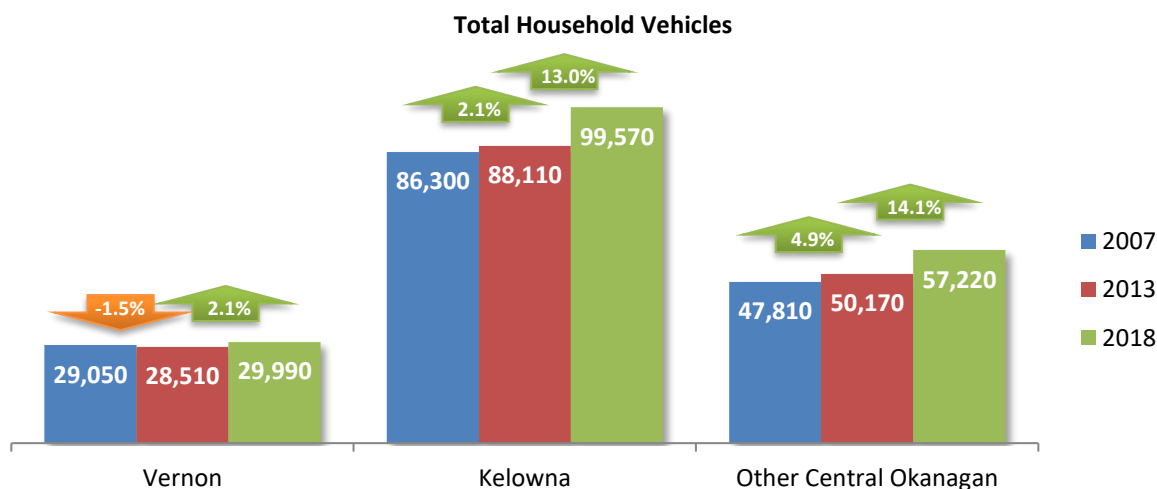
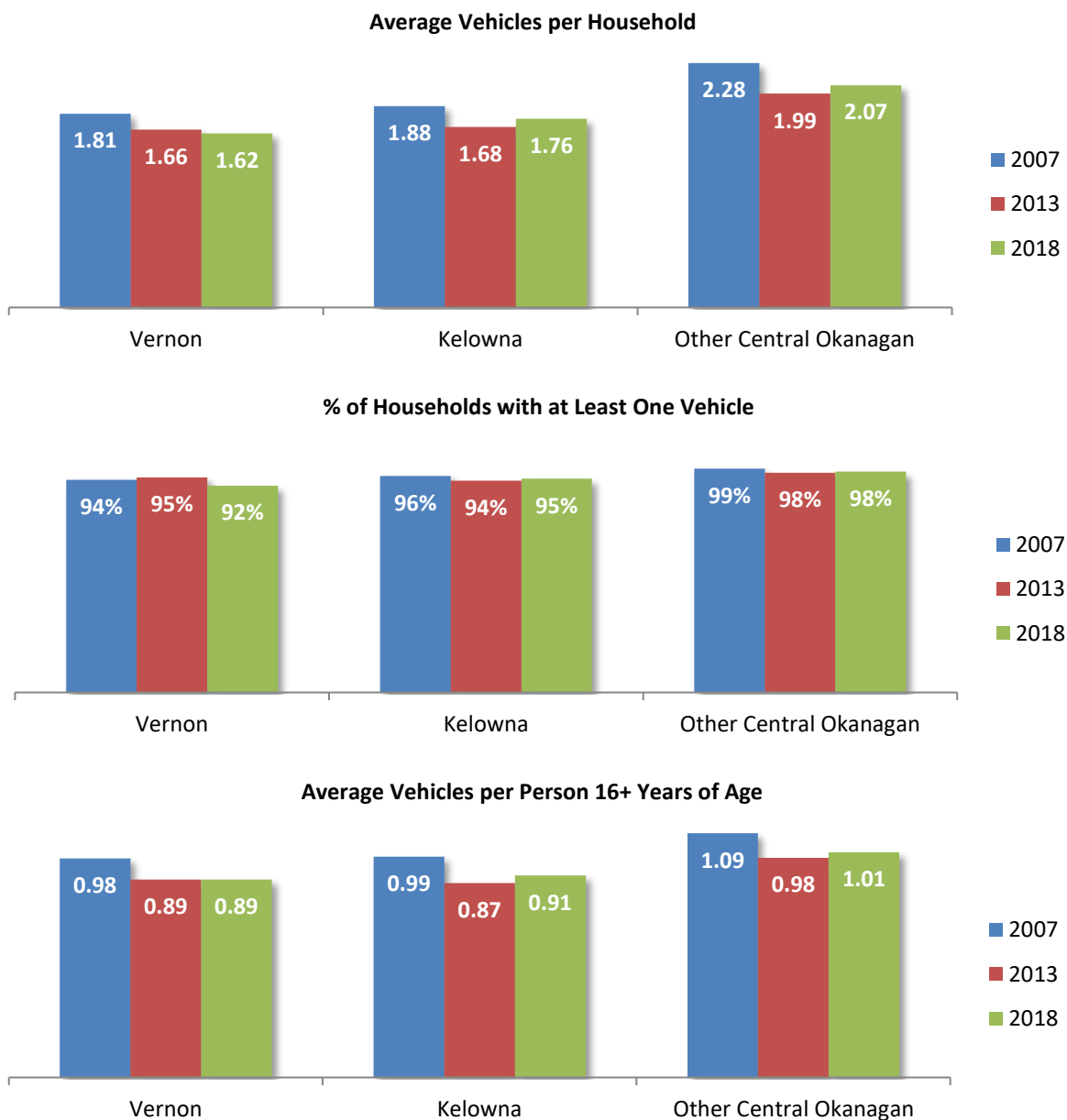


Figure 14 below illustrates trends in vehicle ownership. As noted above, some of the fluctuations between survey cycles may be attributable to sampling error and/or different biases in the data collected in each cycle. Nevertheless, overall trends do appear in the data. The average number of vehicles per household has dropped slightly overall. This is consistent with a slight decrease in household size.

The percentage of households with at least one vehicle has been relatively constant in each of the communities. A small portion of households in Vernon and Kelowna are without a vehicle (8% and 5% respectively), with fewer still in the rest of the Central Okanagan (2%). The survey results also suggest slight drops in the number of vehicle per person eligible for a driver's license with about 0.9 vehicles per person 16+ years of age in Vernon and Kelowna, and 1.0 vehicles per person 16+ in the rest of the Central Okanagan (when compared to 2007, a drop of about 8%-9% in each region).



Figure 14. Trends in Vehicle Ownership, 2007-2018





3.3.2 Vehicle Types

The distributions of household vehicles by type and fuel types are presented in **Figure 15** and **Figure 16**. As might be expected given its geography, the Other Central Okanagan sub-area has proportionately more pickups and vans than Kelowna and Vernon. Looking at use of alternative fuels, the Other Central Okanagan sub-area leads in terms of diesel vehicles (6% of vehicles in this area), while Kelowna has more hybrid and electric vehicles (1.8% and 0.4% respectively) compared to the other sub-areas.

Figure 15. Vehicle Type, 2018

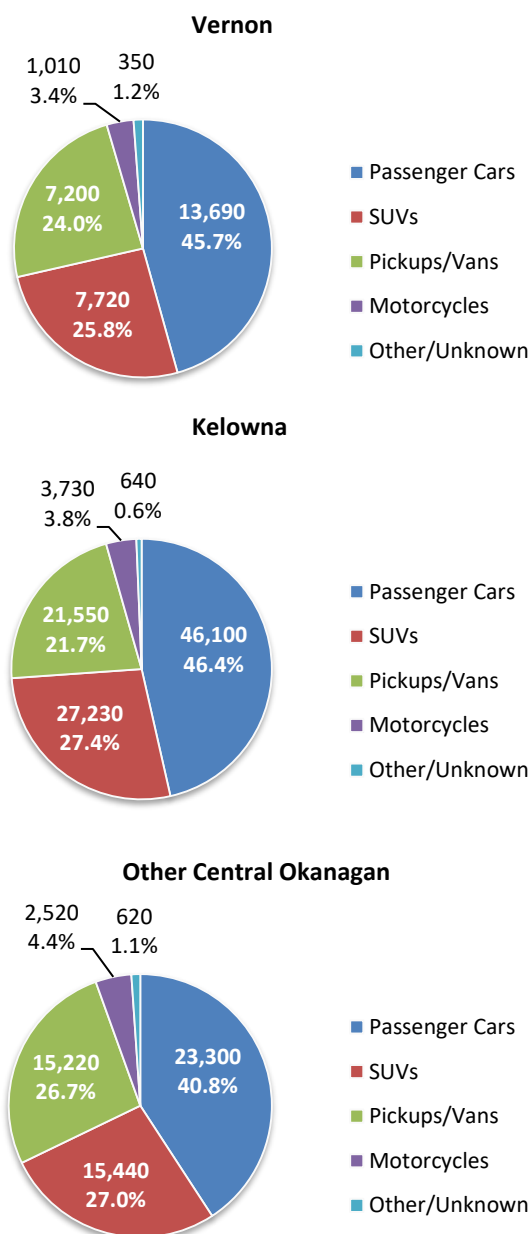
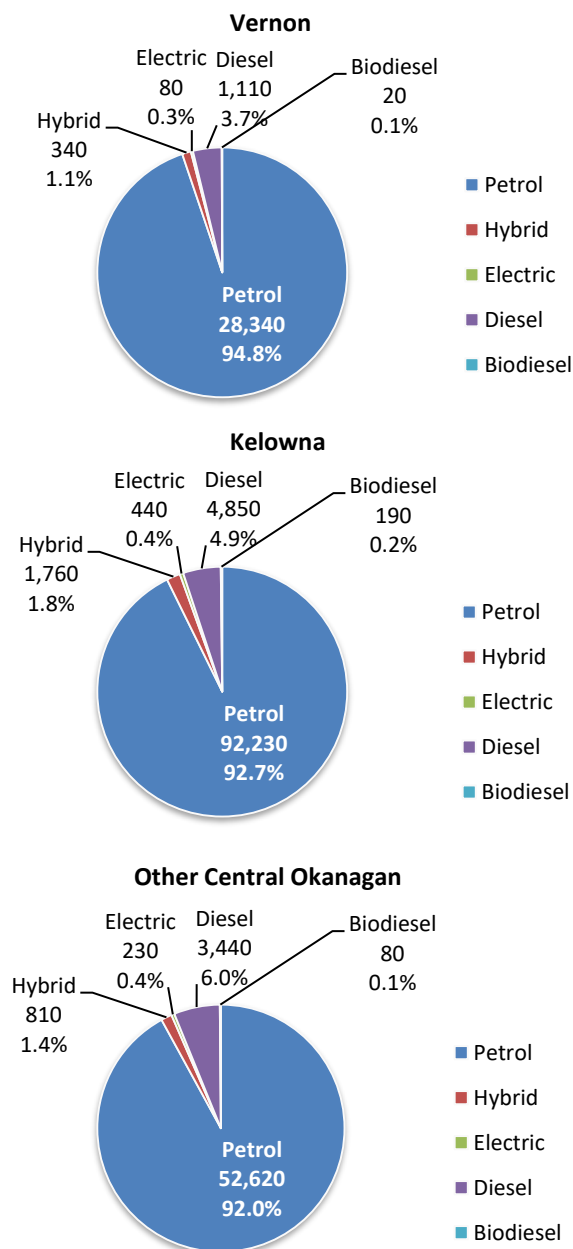


Figure 16. Vehicle Fuel Type, 2018



Figures in the table are estimates based on a survey sample of 4.8% of all households and may be subject to non-response bias.



3.3.3 Relationship between Household Characteristics and Vehicle Availability

Figure 17 illustrates the relationship between household size and availability of household vehicles across the study area. Single-person households are somewhat less likely to have vehicles, whereas almost all households with two or more people are likely to have at least one vehicle. As household size increases from one person to two and three persons, the number of vehicles per household increases, but flattens off at four persons and above. As household size increases, there is corresponding decline in the number of vehicles required per household member over the age of 16 years age.

Figure 18 illustrates the relationship of dwelling type to vehicle availability. The average number of vehicles per single-detached house is 2.21, dropping to 1.63 vehicles per households for other ground-oriented dwellings (townhouses, duplexes, etc.) and 1.15 for apartments.

Figure 17. Relationship of Household Size to Vehicle Access – Study Area, 2018

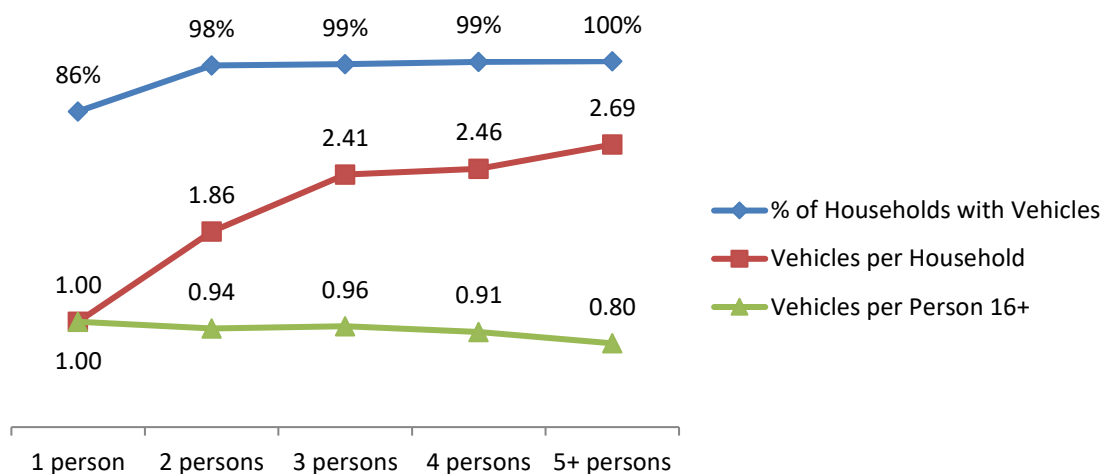
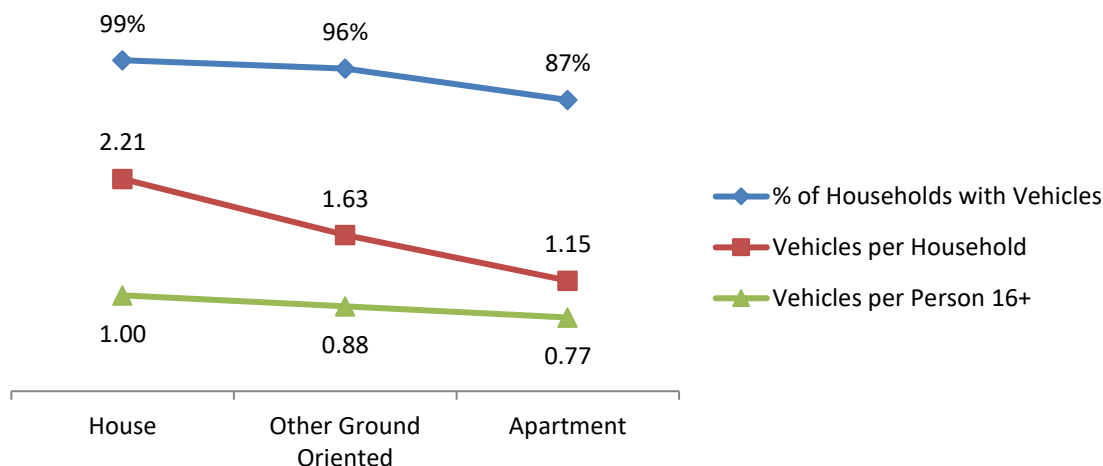




Figure 18. Relationship of Dwelling Type to Vehicle Access – Study Area, 2018



The survey results by geographic sub-area are detailed in Table 6. The patterns within each geographic area are very similar to the overall trend presented for the study area above, with some differences in the Other Central Okanagan sub-area having more vehicles. These differences likely have to do with the more suburban and rural areas included in this area, the type of work residents do, and less concentration of jobs, shopping, and local services. This may result in increased reliance on household vehicles for both work purposes and personal business.

Table 6. Vehicles per Household by Household Size

Geography	Household Characteristic	Households	% of Households with Vehicles	Vehicles	Vehicles per Household	Persons 16+*	Vehicles per Person 16+
Kelowna	Total	56,530	95%	99,570	1.76	110,020	0.91
Rest of Central Ok.	Total	27,600	98%	57,220	2.07	56,760	1.01
Vernon	Total	18,460	92%	29,990	1.62	33,840	0.89
Household Size							
Kelowna	1 person	16,490	86%	16,150	0.98	16,490	0.98
	2 persons	22,060	98%	39,690	1.80	43,660	0.91
	3 persons	7,700	99%	18,010	2.34	19,090	0.94
	4 persons	6,610	100%	15,760	2.38	18,220	0.86
	5+ persons	3,670	100%	9,960	2.71	12,560	0.79
Other Central Okanagan	1 person	5,880	92%	6,920	1.18	5,880	1.18
	2 persons	12,350	100%	25,210	2.04	24,570	1.03
	3 persons	3,890	99%	10,100	2.60	10,030	1.01
	4 persons	3,590	99%	9,600	2.67	9,600	1.00
	5+ persons	1,900	100%	5,410	2.85	6,680	0.81
Vernon	1 person	6,110	80%	5,520	0.90	6,110	0.90
	2 persons	7,280	98%	12,800	1.76	14,520	0.88



	3 persons	2,280	97%	5,260	2.31	5,600	0.94
	4 persons	1,730	98%	3,970	2.29	4,510	0.88
	5+ persons	1,060	96%	2,450	2.31	3,090	0.79
Dwelling Type							
Kelowna	House	25,810	98%	56,740	2.20	58,430	0.97
	Other Ground Oriented	13,870	97%	22,770	1.64	25,830	0.88
	Apartment	16,850	89%	20,060	1.19	25,760	0.78
Other Central Okanagan	House	18,170	99%	41,940	2.31	40,160	1.04
	Other Ground Oriented	6,930	96%	11,990	1.73	12,720	0.94
	Apartment	2,510	94%	3,300	1.31	3,870	0.85
Vernon	House	9,260	98%	19,070	2.06	19,300	0.99
	Other Ground Oriented	4,830	94%	6,930	1.43	8,570	0.81
	Apartment	4,370	75%	3,980	0.91	5,970	0.67

*Population 16 years or older who are eligible for a driver's licence, whether or not they hold a licence.

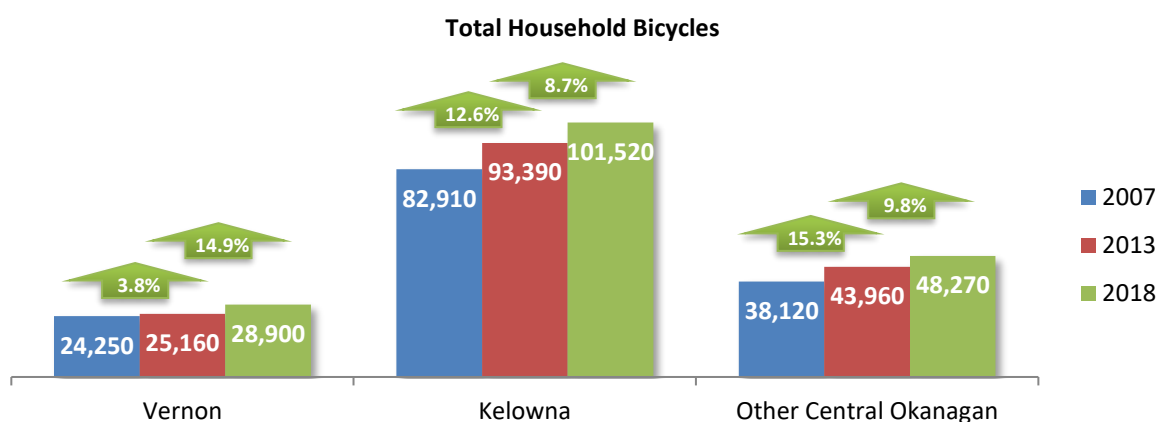


3.4 Household Bicycles

3.4.1 Household Bicycles, 2007 to 2018

The 2018 survey asked respondents to report all working adult bicycles and e-bikes and all working children's bicycles that have been used in the last year. The survey results suggest a steady increase in the number of bicycles to a total of 178,700 bicycles across the study area. This is up from 162,500 in 2013 and 145,300 in 2007, or a 17% increase across 11 years (compared to a 19% increase in population in the same period).¹² **Figure 19** illustrates the increase in bicycles by sub-area.

Figure 19. Household Bicycles, 2007-2018



Trends in bicycle ownership are illustrated on the following page (**Figure 20**). The percentage of households with at least one bicycle has seen a decline over the last few years. This might be the product of a decrease in average household size (see **Section 3.1**).

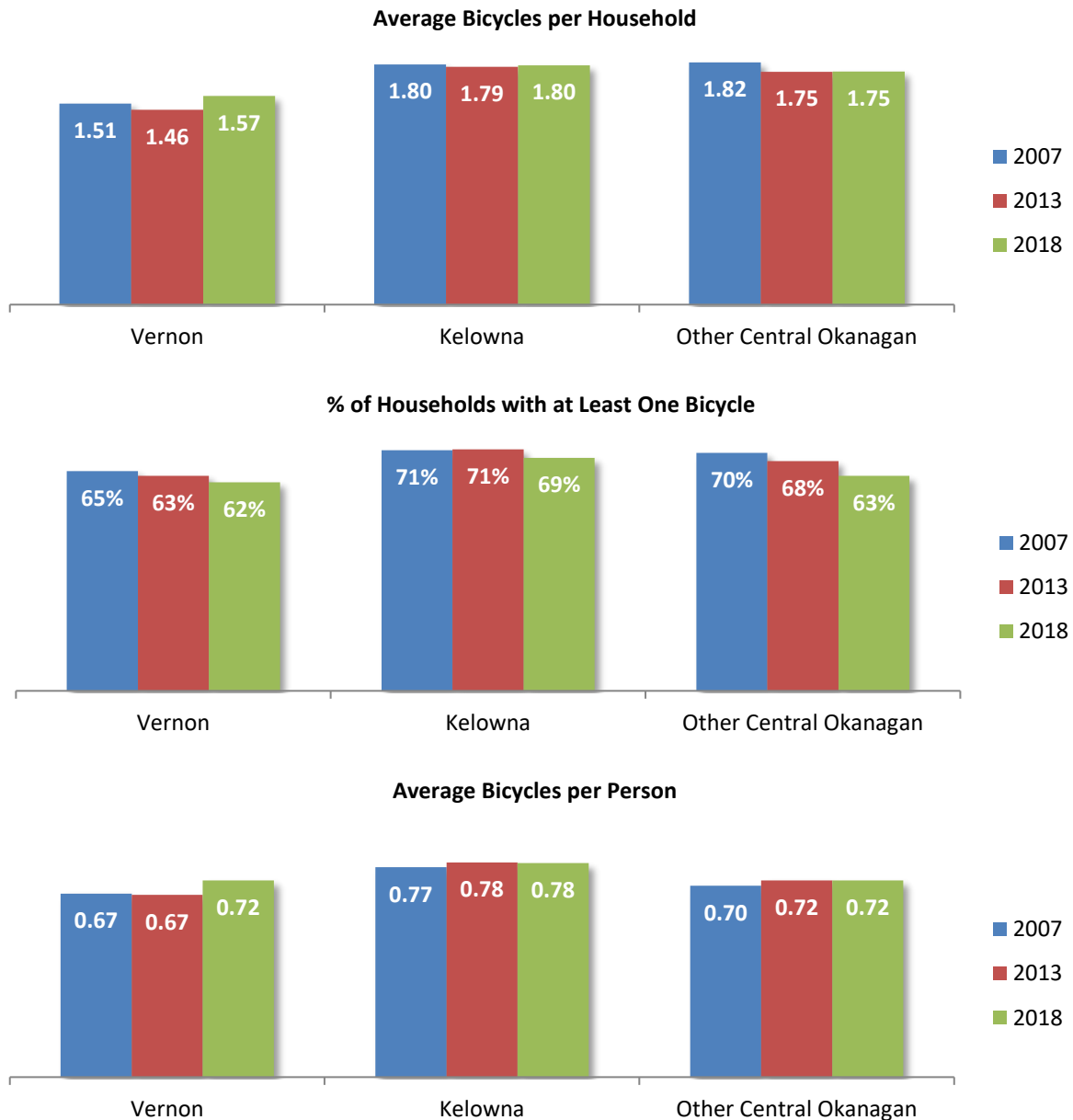
Average bicycle ownership per person has stayed relatively flat, however, at 0.78 bicycles/person in Kelowna, and 0.72 in the rest of the Central Okanagan. This statistic appears to have increased slightly in Vernon from 0.67 in 2007 through 2013 to 0.72 in 2018.

Of note, examination of the expanded trip data revealed that while the female population accounts for 54% of all trips, they make only 32% of bicycle trips. This may be a consideration for initiatives that promote cycling.

¹² It may be noted that there may be some differences in definition that could affect the longitudinal comparisons: The 2018 survey asked respondents to report all working adult bicycles and e-bikes and all working children's bicycles that have been used in the last year, whereas the 2013 survey asked for a count of all bicycles in working condition, and the 2007 survey asked simply for a count of all bicycles.



Figure 20. Trends in Bicycle Ownership, 2007-2018

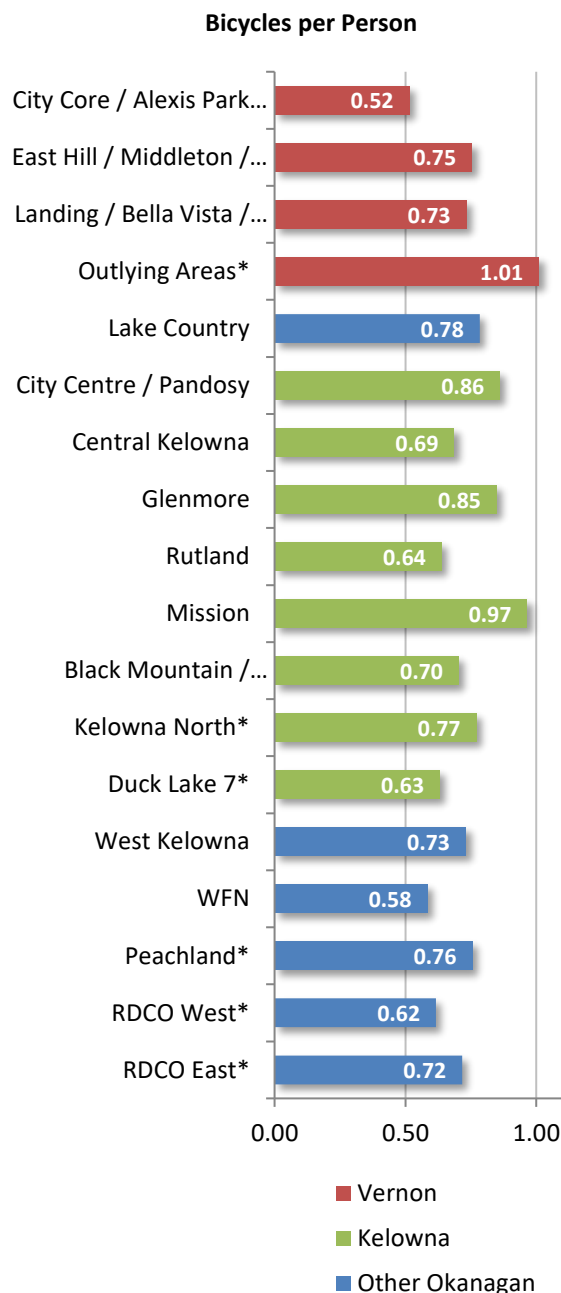




3.4.2 Levels of Bicycle Ownership by District

Figure 21 breaks out levels of bicycle ownership per capita by district. The variation in average bicycles per person may be the product of a number of geographical or demographic factors. This might include the age distribution of residents, the number of families with children, proximity to jobs and services, the rideability or safety of local streets and arterial roads, and/or other socio-economic factors.

Figure 21. Bicycles per Person by District, 2018



* results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.



3.4.3 Bicycle Types

Figure 22 breaks out the bicycles in each sub-area into adult bicycles, adult e-bikes (electric assist bicycles with an integrated electric motor), and working children's bicycles.

In each sub-area, about four-fifths of bicycles are adult bicycles, whether regular bicycles or e-bikes.

While e-bikes are still a relatively small proportion of the total pool of bicycles, the growing adoption of e-bikes may be of interest to transportation planners. Closer examination of the data revealed certain districts with above-average proportions of adult e-bike ownership:

Kelowna

- Mission (e-bikes represent 2% of all household bicycles)

Other Central Okanagan:

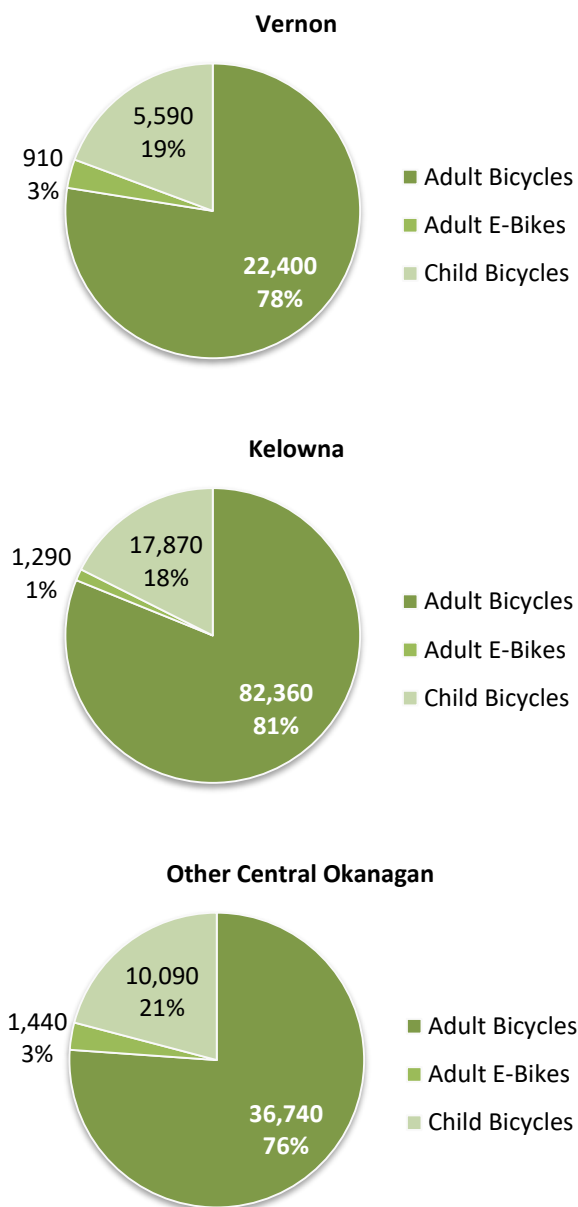
- Rose Valley/Lakeview (4%)
- Westbank First Nation (4%)
- Peachland (4%)

Vernon:

- Outlying Areas (5%)
- Landing/ Bella Vista/ Turtle Mountain/ Priest's Valley (4%)

The results of this survey should provide a useful baseline against which to track the growth in adoption of e-bikes.

Figure 22. Types of Bicycle, 2018





3.5 Age Distribution

The age profile of each survey sub-area is presented in **Figure 23** on the following page, based on Census 2016 distributions scaled up to estimated 2018 levels. The green sections of the bars show the increase in population in the given age range in the five years since 2013. The red dotted lines show population loss in the given age range. Increases or decreases in population in a given age range may be due to births, population aging out of one range and into another, and/or migration into or out of the area. Comparison is not made to 2007 data as the 2007 survey data were not weighted by age.

Both Vernon and the Other Central Okanagan area have a large older population which is growing. Both areas show a 'bubble' of older population in the age ranges between 50 and 74. There have been substantial gains for these population groups in the past five years, and somewhat more modest gains for those 75+ years of age. In age groups younger than 50, there have only been modest increases, or even decreases. Both sub-areas show modest losses in the 45-49 age group and in the 15-19 age group, without a corresponding increase in the next age bracket up. The latter may be the result of youth moving away for post-secondary education and employment after high school. While Kelowna also shows increases in its population 55 to 74 years of age, it has more growth in the age ranges between 20 and 39, and more in the 5 to 9 age bracket. The overall profile is less senior-heavy than the other two regions.

The survey data suggest that the average age is 42.3 years in Kelowna, 44.2 in Other Central Okanagan, and 45.1 in Vernon (up from 41.9, 42.4, and 43.8, respectively, in 2013).

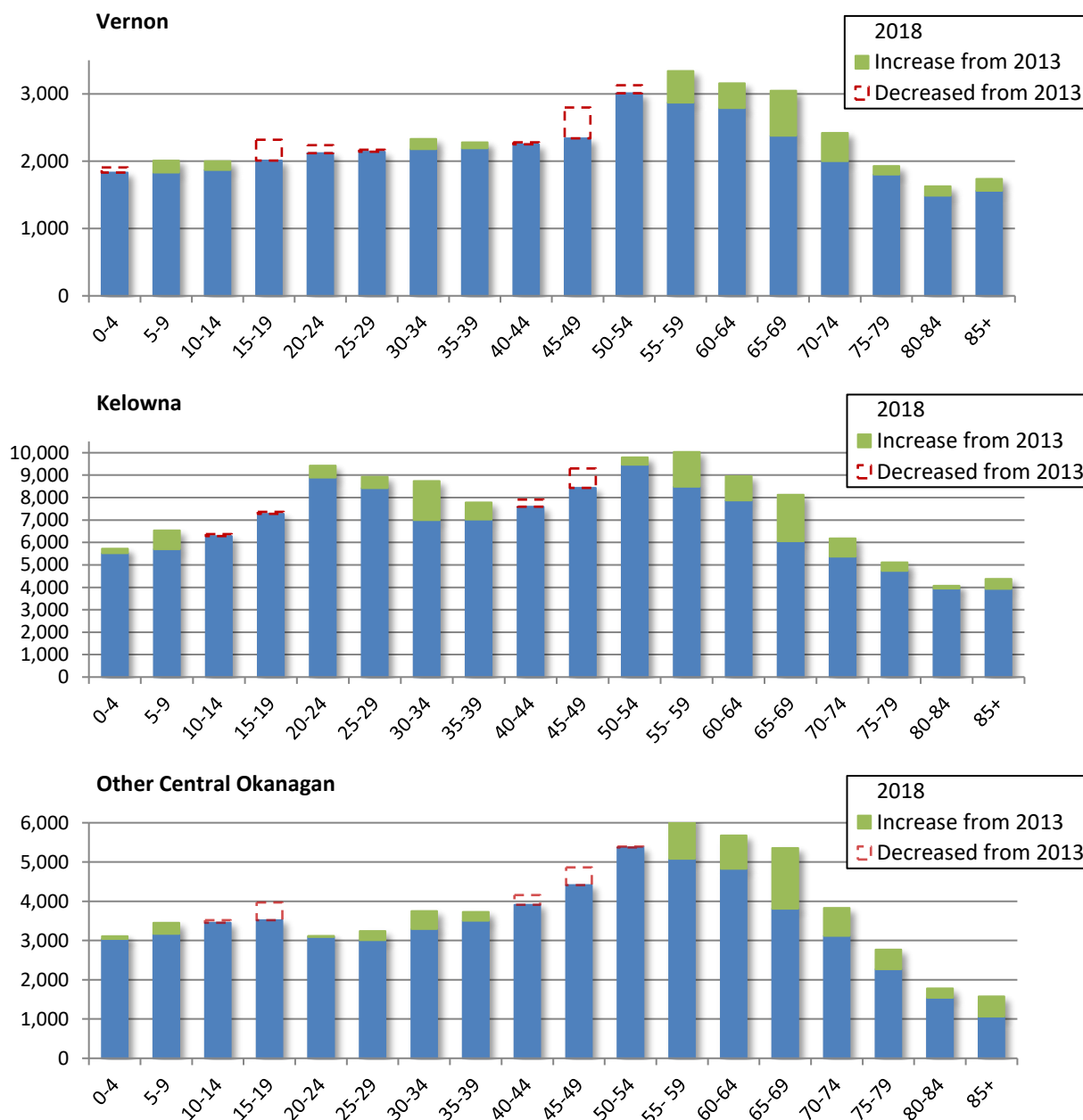
Table 7 below summarizes the percentage distributions aggregated to 10-year groups (except 0-4 years) as well as the changes in proportion since 2013. Green highlighting indicates an increase in the proportion in the given age group, while orange indicates a decrease. Summing up counts reveals that proportion of the population that is 65 years of age or older is 20.9% in Kelowna, 22.5% in the rest of the Central Okanagan and 25.9% in Vernon.

Table 7. Population by Age Group, 2018, with Change in Proportions since 2013 (Based on Census Stats)

Age Group	Vernon				Kelowna				Other Central Okanagan			
	Pop.	% of Total	%-Pt Change Since 2013	% Female	Pop.	% of Total	%-Pt Change Since 2013	% Female	Pop.	% of Total	%-Pt Change Since 2013	% Female
Total	41,570	100%	-	53%	133,390	100%	-	52%	68,210	100%	-	51%
0-4	1,830	4.4%	-0.4%	48%	5,720	4.3%	-0.2%	49%	3,110	4.6%	-0.3%	48%
5-14	4,000	9.6%	+0.3%	49%	12,830	9.6%	-0.2%	50%	6,900	10.1%	-0.6%	50%
15-24	4,130	9.9%	-1.5%	49%	16,710	12.5%	-0.7%	49%	6,630	9.7%	-1.5%	48%
25-34	4,470	10.8%	-0.2%	50%	17,670	13.2%	+0.7%	49%	7,000	10.3%	+0.2%	51%
35-44	4,530	10.9%	-0.3%	52%	15,370	11.5%	-0.6%	50%	7,640	11.2%	-1.0%	50%
45-54	5,350	12.9%	-2.0%	53%	18,220	13.7%	-1.6%	52%	9,780	14.3%	-2.0%	52%
55-64	6,500	15.6%	+1.4%	54%	19,000	14.2%	+1.0%	54%	11,820	17.3%	+1.5%	52%
65-74	5,470	13.2%	+2.1%	54%	14,310	10.7%	+1.5%	53%	9,200	13.5%	+2.4%	51%
75-84	3,570	8.6%	+0.3%	55%	9,180	6.9%	-0.1%	55%	4,550	6.7%	+0.6%	49%
85+	1,720	4.1%	+0.2%	66%	4,380	3.3%	+0.1%	63%	1,580	2.3%	+0.6%	58%



Figure 23. 2018 Population by Age, with Gains or Losses since 2013 (Based on Census Statistics)



Source: 2011 and 2016 Statistics Canada Census projected to 2013 and 2018 with a single factor across all age groups. Therefore, the distributions represent Census year distributions, but the counts represent 2013 and 2018.

Note: The age profile in the Okanagan Travel Survey datasets from both years is close to this profile but does not yield a perfect match, since most weighting by age group was undertaken for 10-year age brackets. Also, the age distributions presented above include all population, whereas the survey only represents population in private dwellings. Approximately 2.4% of the total population live in collective dwellings, although the proportion is much higher amongst those older than 75 years of age.



3.5.1 Average Age by District

The figure to the right profiles the average age of the population in each district as reflected in the survey responses. This provides an idea as to which districts are generally 'younger' or 'older' (although it cannot provide insight into the spread across different age ranges).

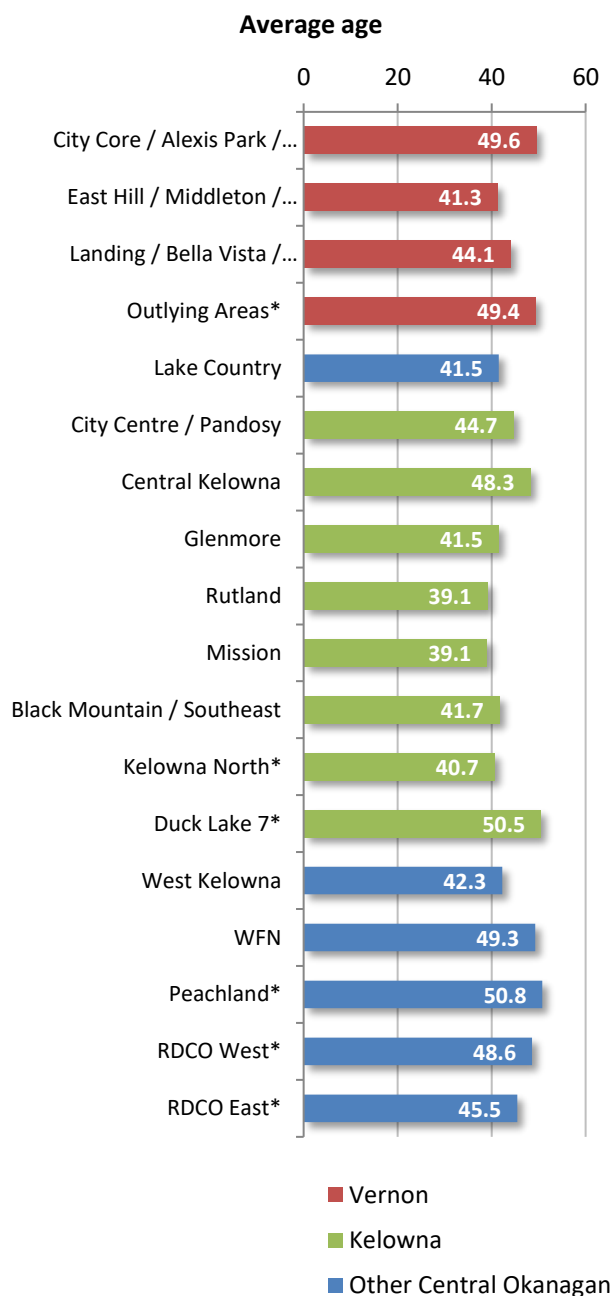
Interestingly, the more central districts in Vernon and Kelowna have higher average ages. Closer examination of the survey data reveals that, while all these central areas have lower than average incidence of children, the reasons differ:

- For the both the City Core/North Vernon and Central Kelowna areas, the higher average ages (49.6, 48.3) are due to larger proportions of seniors (33% of the population in each district is over the age of 65, compared to the Kelowna average of 22%).
- For the City Centre/Pandosy district, the higher average age (44.7) is mainly due to a higher incidence of 25-44 year olds (at 29%), while seniors are just slightly above the Kelowna average (at 25%).

Other districts with 30% or more seniors include Peachland, Westbank First Nation, and Duck Lake.

RDCO West and East are differentiated from other districts by having proportionately high populations of 45-64 year-olds (41% and 37%, respectively compared with the study area average of 29%). These districts have lower than average proportions in other age ranges.

Figure 24. Average Age by District, 2018



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.

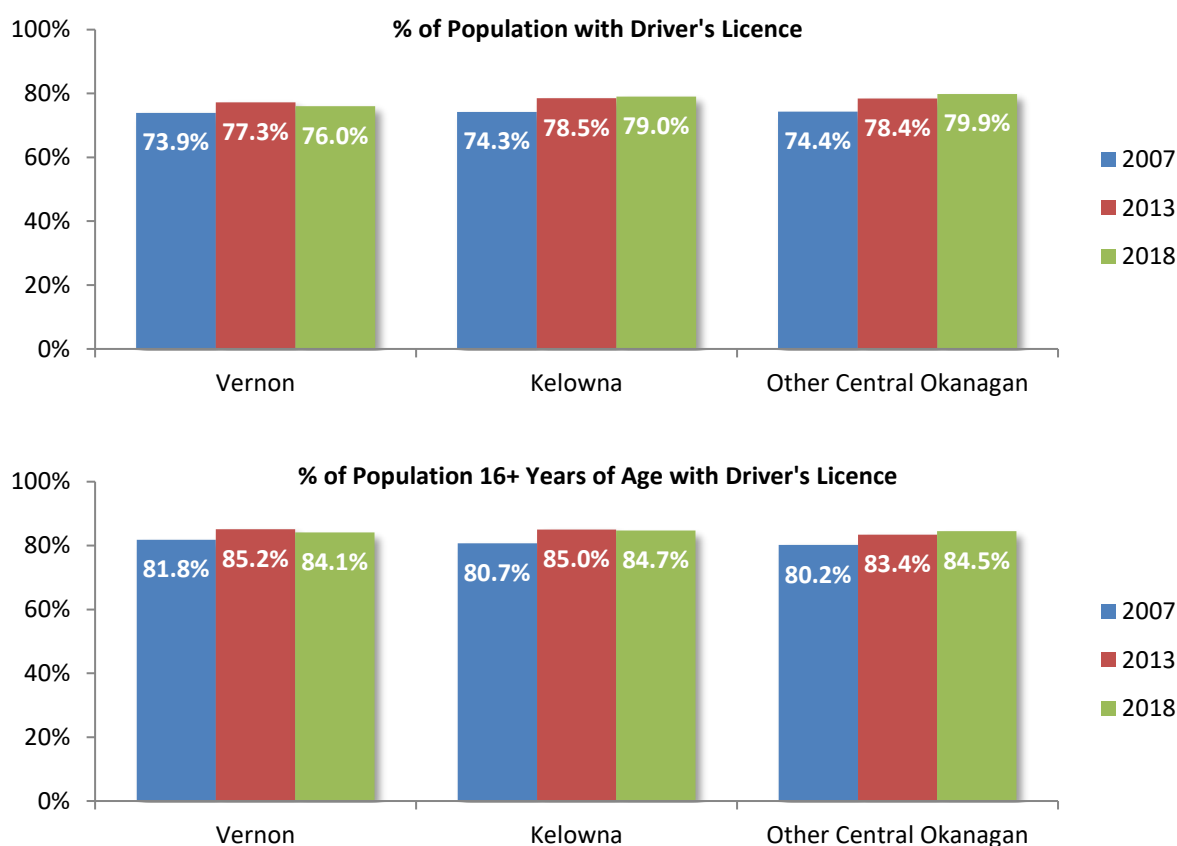


3.6 Licensed Drivers

Across the study area, approximately 79% of the population has a driver's licence, which is just a slight increase from 78% in 2013. Looking at just population 16+ years of age (those eligible for a licence) the percentage has been steady at close to 85% since 2013. Results are presented by region below ([Figure 25](#)).

Overall, the survey results suggest that there are 186,500 people with driver's licenses in the region, with about 102,600 of these in Kelowna, 53,700 in the rest of the Central Okanagan, and 30,600 in Vernon.

Figure 25. Possession of a Driver's Licence, 2007-2018



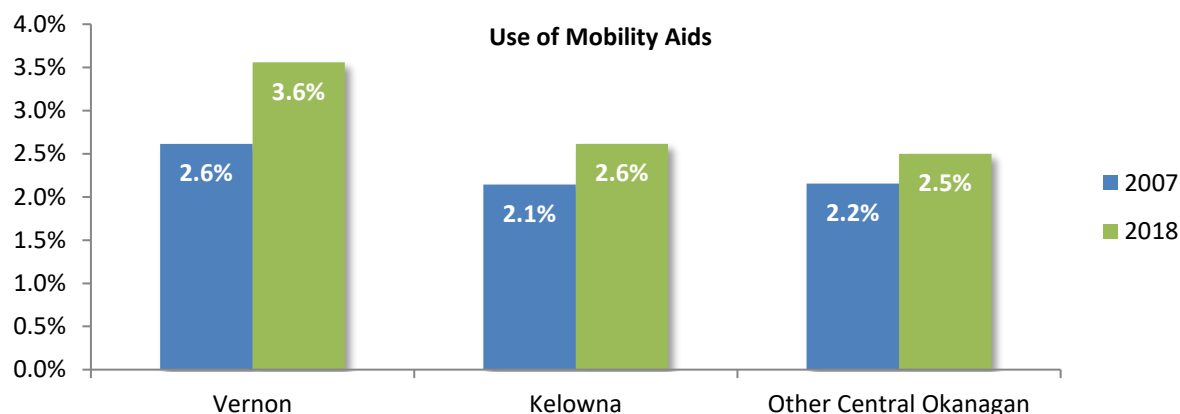


3.7 Mobility Challenges

Across the study area, the proportion of residents who reported having a physical disability or condition that limits their mobility is 6.2%. This proportion is 5.7% in both Kelowna and the Other Central Okanagan area, and highest in Vernon at 8.5% of the population. Not all of these people use a mobility aid.

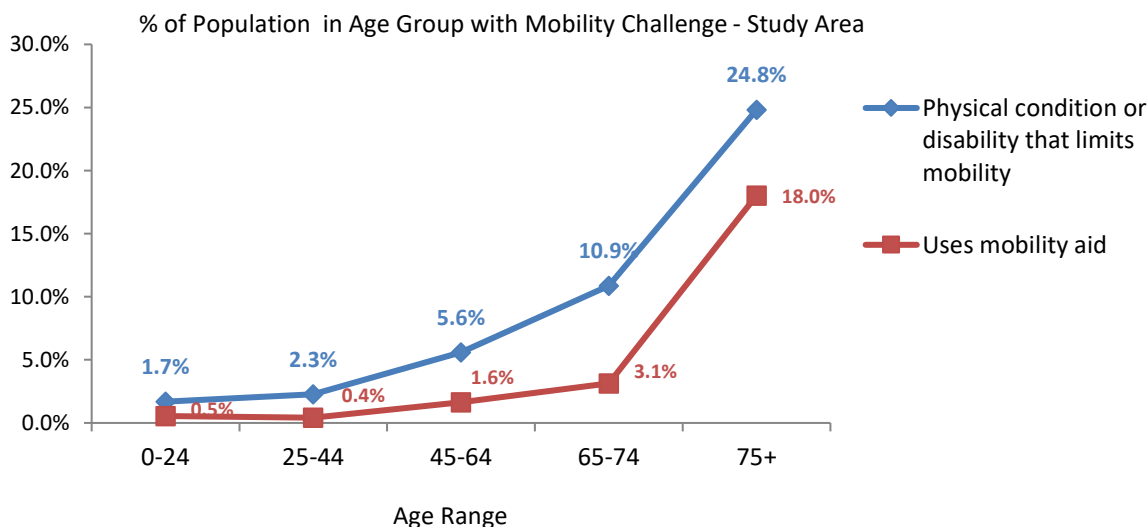
Across the study area, 2.7% of the population reported using a mobility aid. This proportion is highest in Vernon, at 3.6%, up from 2.6% in 2007 ([Figure 26](#)). Rates in Kelowna and the rest of the Central Okanagan were similar, at 2.5%-2.6%, up from 2.1%-2.2% in 2007. The increase may be consistent with the aging of the population. [Figure 27](#) highlights the relationship between age and mobility challenges.

Figure 26. Percent of Population Using a Mobility Aid, 2007-2018



The 2013 survey results are not displayed due to irregularities in the data for this one question.

Figure 27. Increase in Mobility Challenges with Age – Study Area, 2007-2018





Canes are the most common mobility aid used (used by 1.8%), followed by walkers (1.1%), with wheelchairs scooters and crutches reported by fewer respondents ([Table 1](#)). Readers are reminded that these statistics apply to people living in private dwellings, and do not include people living in collective dwellings such as care homes and group homes.

Table 8. Mobility Challenges and Mobility Aids, 2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
Population living in private dwellings	237,300	40,200	129,900	67,200
No mobility challenges	93.8%	91.5%	94.3%	94.3%
Has physical disability or condition that limits mobility	6.2%	8.5%	5.7%	5.7%
Has limits to mobility, but does not use an aid	3.5%	4.9%	3.1%	3.2%
Uses mobility aid	2.7%	3.6%	2.6%	2.5%
Type of Mobility Aid Used*				
Wheelchair	0.3%	0.3%	0.2%	0.4%
Scooter	0.2%	0.2%	0.2%	0.1%
Walker	1.1%	1.4%	1.1%	1.0%
Cane	1.8%	2.2%	1.9%	1.4%
Crutch	0.2%	0.2%	0.1%	0.5%

*Answers may add to greater than the total % who use a mobility aid as some people use more than one mobility aid.



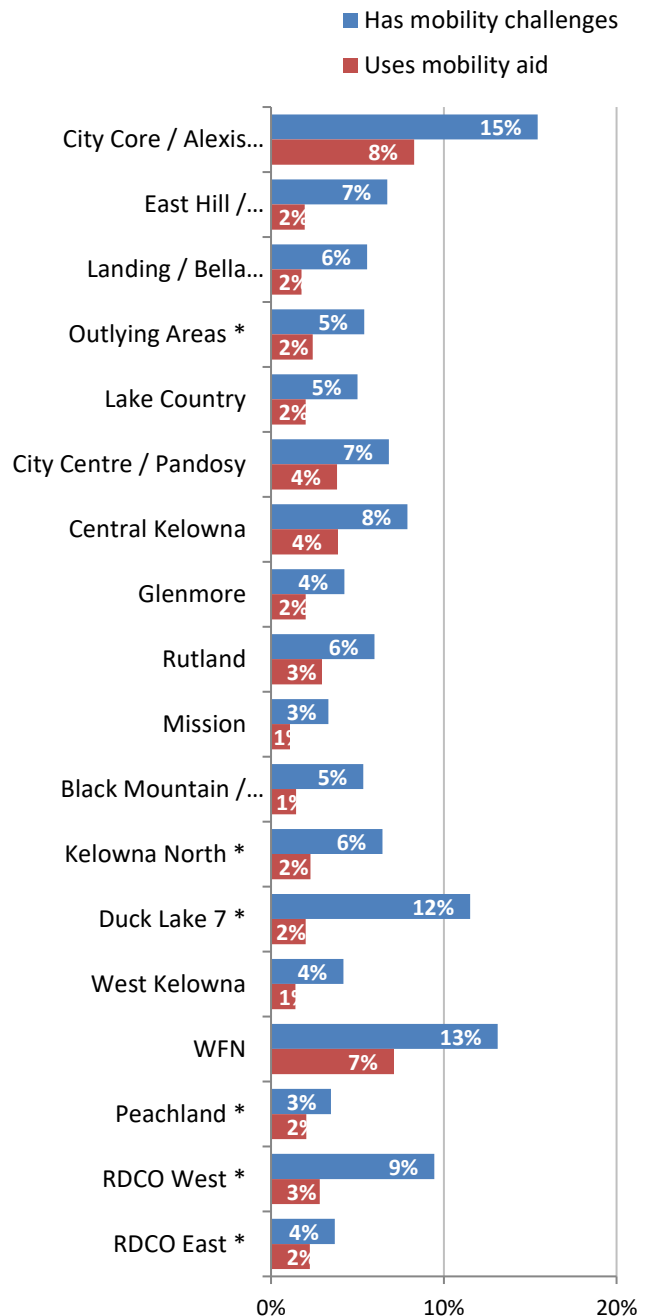
3.7.1 Mobility Challenges by District

The chart to the right provides information on the incidence of physical disabilities/conditions that limit mobility and use of mobility aids by district (Figure 28).

Readers are reminded that the results for districts with smaller sample sizes should be interpreted with caution.

Figure 28. Mobility Challenges by District, 2018

% of Population with Mobility Challenges



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.



3.8 K-12 and Post-Secondary School Enrolments

The student population in the study area comprises about one-fifth of the total population, or about 46,700 students. Across the study area, about 64% of students (29,900) are in the K-12 (Kindergarten to Grade 12) system. **Table 9** presents figures on the number of students by school type for each sub-region. Readers are reminded that all numbers in the charts are based on a survey sample expanded to represent the population. All figures should be interpreted as approximate estimates.¹³

Changes in the size of the K-12 and post-secondary student populations over time are examined on the next page.

Table 9. Students by Type by Sub-Area of Residence 2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
Total Pop	237,250	40,220	129,860	67,180
Total Students	46,710	7,050	27,180	12,480
% of Population	19.7%	17.5%	20.9%	18.6%
K-12 students	29,940	4,920	16,350	8,680
Full-Time PSE/other	12,940	1,660	8,310	2,970
Part-Time PSE/other	3,820	480	2,520	820
PSE/other – breakdown				
College or university - FT	11,980	1,240	8,040	2,700
College or university - PT	2,300	240	1,400	660
Alternate, adult basic education, or other*	500	40	340	120
Online / distance learning - FT**	810	410	230	170
Online / distance learning - PT**	1,160	200	820	140

PSE = Post Secondary Education

K-12 = Kindergarten to Grade 12

*includes mix of full-time and part-time

**includes some middle or high school students taking online/distance learning

¹³ The K-12 survey counts have not been validated against actual school enrolment figures, although may be expected to be within a reasonable range given that the survey data were weighted by age distribution.



Table 10 presents the change in the number of K-12 students between 2013 and 2018 based on the survey data. Figures for the 2007 baseline survey are not listed, as school type was not captured as part of the dataset. Based on the survey data, it appears that the number of K-12 students has increased by 9% in Kelowna, but has decreased by 8% in Vernon and by over 4% in the Other Central Okanagan sub-area. The 2018 survey figures have not been verified against school enrolments, although as the data compare well to Census counts by age range, and the vast majority of those aged 5 to 18 years of age are coded in the data as attending K-12 school, the survey figures are likely fairly reliable.

The main public post-secondary campuses in the region are: UBC Okanagan Campus (UBCO), Okanagan College, Okanagan College, and Okanagan College Vernon campus. **Table 11** outlines the increase in enrolments since 2013 (using enrolment figures put out by the institutions), with comparison to the expanded 2018 survey counts. The survey represents the most but not all enrolments at these campuses, which is expected, as some students would not have been within the survey scope.¹⁴

Table 10. K-12 Students by Place of Residence, 2013-2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
2013	29,420	5,370	14,960	9,090
2018	29,940	4,920	16,350	8,680
% change 2013-2018	1.8%	-8.4%	9.3%	-4.5%

K-12 = Kindergarten to Grade 12

Figures are based on survey data, not school enrolment figures. Figures are counts of students living in each sub-area (place of residence). The location of the school enrolled will usually but not always been in the same community.

Table 11. Post-Secondary School Enrolments, 2013-2018

	2013 Enrolment	2018 Enrolment	% Change Since 2013	2018 Survey Count
UBC Okanagan Campus (UBCO)	8,388*	9,973*	+19%	7,670
Okanagan College	4,193	6,126	+46%	5,540
Okanagan College Vernon	714	1,088	+52%	770
Total	13,295	17,187	+29%	13,980

*Within these enrolments, UBCO houses up to 1,676 students in on-campus housing, which was not surveyed.

¹⁴ Students living in UBCO on-campus residences are not counted in this total as collective dwellings were not surveyed. Also, all three institutions may attract students who live in outside the survey area and are not represented in the survey data.



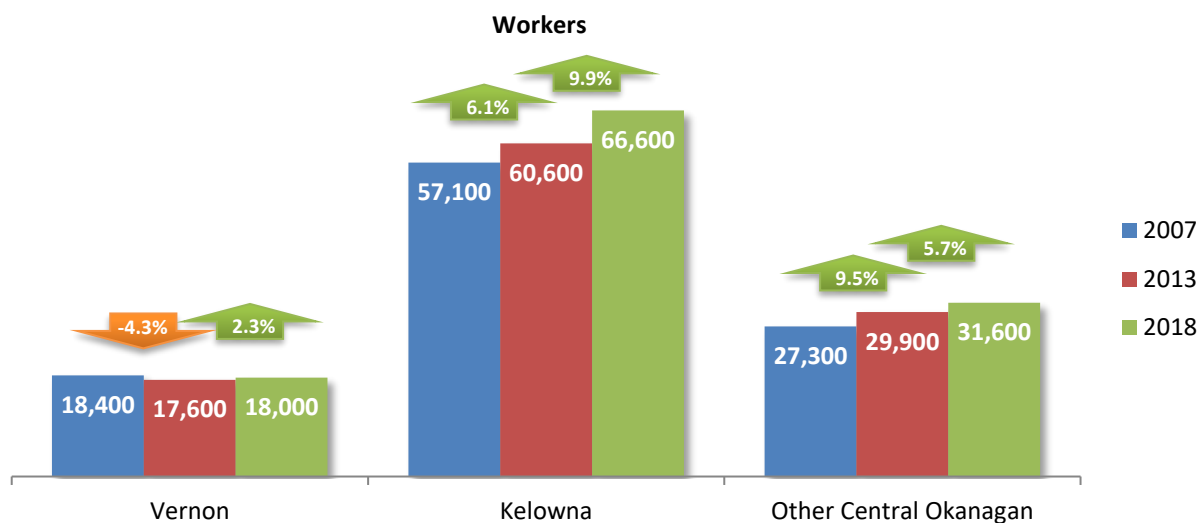
3.9 Employed Labour Force

3.9.1 Total Workers, 2007-2018

Based on the survey results, the total employed labour force in the study area in 2018 is estimated to be 116,200 workers¹⁵, up from 108,100 in 2013 and 102,900 in 2007. Growth has been somewhat accelerated since 2013, at 7.5% over the past five years, compared to 5.8% over the previous six years from 2007 to 2013. Overall, this represents a 13% increase over 11 years, not quite keeping pace with the 19% increase in population over the same period.

This growth has been focused in Kelowna, which in the past five years has experienced 9.9% growth in working population (Figure 29). Growth in the rest of the Central Okanagan has been more modest at 5.7% since 2013. The survey data suggest that the size of the employed labour force in Vernon has remained comparatively flat over the last 11 years. Census figures for Vernon differ slightly but are for different time frames and support this general pattern in the survey data: 16,310 employed labour force in the 2006 Census, 16,710 in the 2011 National Household Survey, and 17,505 in the 2016 Census.¹⁶

Figure 29. Employed Labour Force, 2007-2018



¹⁵ The expanded survey result compares favourably with 2016 Census figures projected forward to 2018 (117,800 workers).

¹⁶ Sources: Statistics Canada profiles for Vernon, British Columbia (Code5937014): *2006 Community Profiles* (Statistics Canada Catalogue no. 92-591-XWE. <https://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E>), *National Household Survey (NHS) Profile* (Statistics Canada Catalogue no. 99-004-XWE. Ottawa. Released September 11, 2013. <http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E>), *Census Profile. 2016 Census* (Statistics Canada Catalogue no. 98-316-X2016001. <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>).



3.9.2 Detailed Occupation Status

Table 12 presents a breakdown of occupation status across the entire population, combining the survey responses on questions about employment, student status, or other status. Summing up across categories, 49% of the population is employed (38% full-time, 11% part-time), and 20% are students (of all levels). The pie charts that follow (**Figure 30**) summarize the distributions for the sub-areas. As indicated, Kelowna has the largest proportion of population being full-time employed (39%), as compared to 37% in the rest of the Central Okanagan, and 33% in Vernon.

Table 12. Occupation Status, 2018

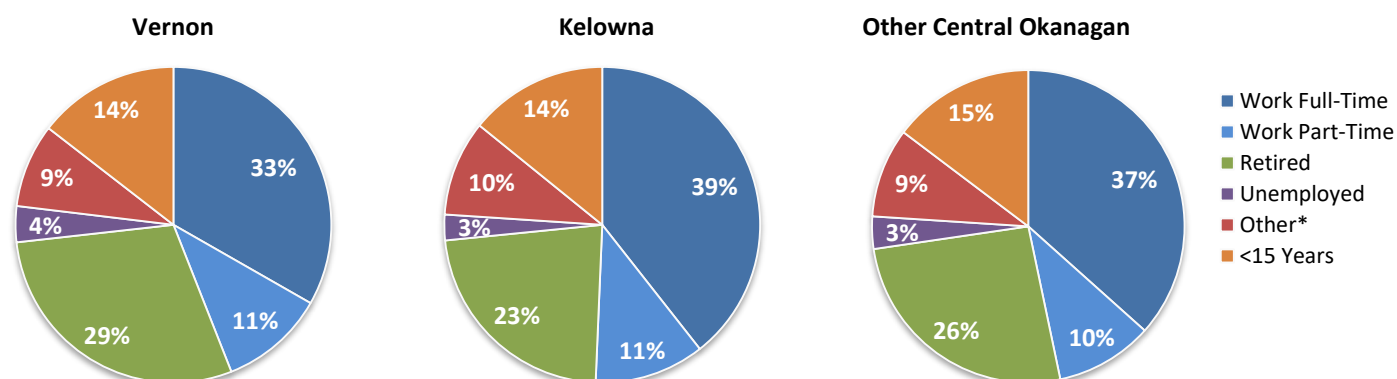
	Expanded survey counts				% of Total Population				% of Population 15+ Years of Age (eligible for labour force)			
	Study Area	Vernon	Kelowna	Other Central Ok.	Study Area	Vernon	Kelowna	Other Central Ok.	Study Area	Vernon	Kelowna	Other Central Ok.
Total Population	237,250	40,220	129,860	67,180	100%	100%	100%	67,180				
Population 15+ years of age	203,140	34,390	111,460	57,280	86%	86%	86%	85%	100%	100%	100%	100%
Work Full-Time	89,130	13,380	51,160	24,590	37.6%	33.3%	39.4%	36.6%	43.9%	38.9%	45.9%	42.9%
Work Part-Time	26,980	4,610	15,320	7,040	11.4%	11.5%	11.8%	10.5%	13.3%	13.4%	13.7%	12.3%
Unemployed	7,140	1,480	3,410	2,250	3.0%	3.7%	2.6%	3.3%	3.5%	4.3%	3.1%	3.9%
Other	5,510	1,170	2,550	1,790	2.3%	2.9%	2.0%	2.7%	2.7%	3.4%	2.3%	3.1%
Retired	58,730	11,750	29,540	17,440	24.8%	29.2%	22.7%	26.0%	28.9%	34.2%	26.5%	30.4%
Student (PSE/Other)	16,330	1,930	10,740	3,650	6.9%	4.8%	8.3%	5.4%	8.0%	5.6%	9.6%	6.4%
High School Student 15+ Yrs	6,850	1,130	3,810	1,920	2.9%	2.8%	2.9%	2.9%	3.4%	3.3%	3.4%	3.4%
5-14 Years of Age (student)	23,670	4,040	12,730	6,900	10.0%	10.0%	9.8%	10.3%				
0-4 Years of Age	10,450	1,800	5,670	2,980	4.4%	4.5%	4.4%	4.4%				

PSE = Post Secondary Education, FT= Full Time, PT=Part Time.

*The vast majority of those 5-14 years of are K-12 students, with the exception of some with disabilities, early entry to post-secondary education, or other reasons. In this table, #'s add to greater than total population and %'s add to greater than 100% due to overlapping categories (multiple responses)

Overlapping categories												
Work FT + Student FT or PT	1,800	240	1,400	160	0.8%	0.6%	1.1%	0.2%	0.9%	0.7%	1.3%	0.3%
Work PT + Student FT or PT	4,520	540	2,990	980	1.9%	1.3%	2.3%	1.5%	2.2%	1.6%	2.7%	1.7%
Work PT + High School Student 15+ Years	1,210	280	680	260	0.5%	0.7%	0.5%	0.4%	0.6%	0.8%	0.6%	0.5%

Figure 30. Occupational Status (% of Population), 2018



*Other includes post-secondary and high school students aged 15+ years who are not employed



3.9.3 Type of Occupation

The survey asked employed respondents what type of occupations they worked at, using major occupational groups from the National Occupational Classification (NOC) system, with further breakdowns of categories of interest.

The distribution of workers by occupational group was close to that in the 2016 Census, validating the general representativeness of the survey data, but with some apparent over- and under-sampling of certain occupations. **Table 13** presents both the survey distributions and the Census data for reference. Most notably, the survey data somewhat under-represent the incidence of people in sales and service occupations (e.g., in Kelowna the survey proportion is 23% compared to 28% per the Census. This is the most common occupation (both per the Census and the survey data).

The comparisons should be interpreted with caution as survey respondents were asked to self-identify their occupational group, whereas the Census data are rigorously coded to the NOC system using information on specific job titles and job responsibilities. Occupation Type was not used as one of the data weighting controls in the preparation of the weighted survey data.

Table 13. Occupational Type (Employed Persons), 2018

Occupation Type	Vernon		Kelowna		Other Central Okanagan	
	Census	Survey	Census	Survey	Census	Survey
Total workers living in area	18,000	18,000	67,300	66,600	32,400	31,600
Management Occupations	10%	9%	12%	10%	13%	12%
Business Finance and Admin Occupations	14%	12%	15%	15%	16%	15%
Natural and Applied Science Occupations	6%	5%	6%	6%	5%	5%
Health Services Occupations	10%	12%	9%	11%	8%	10%
Education, Law & Social, Community & Government Services excl. K-12 Teachers	10%	5%	11%	7%	9%	5%
Secondary and Elementary School Teachers		4%		5%		3%
Performing and Facilitating Art, Culture, Recreation, and Sports	2%	2%	3%	3%	3%	3%
Sales & Service Provision	29%	22%	28%	23%	27%	22%
Trades, Transport & Equipment Operators excl. Commercial Driver	17%	15%	16%	13%	19%	16%
Commercial Driver		2%		1%		1%
Natural Resources, Agriculture & Related Production	4%	3%	3%	2%	4%	3%
Manufacturing and Utilities	5%	5%	3%	2%	3%	2%
Unknown	n/a	3%	n/a	3%	n/a	3%



3.9.4 Place of Work

About three-quarters of workers in the study area work at a usual place of work outside their home, while 12% work from home and 13% have no fixed workplace address (e.g., plumber, travelling salesperson, commercial driver, etc.), **Table 15**. Of note, the survey results suggest that the Other Central Okanagan sub-area has proportionately more residents who do not have a fixed workplace and more who work from home.

Table 14. Workplace Type, 2018

	Study Area	Vernon	Kelowna	Other Central Okanagan
Total workers living in area	116,200	18,000	66,600	31,600
Usual place of work outside the home	74%	76%	76%	69%
No fixed workplace address	13%	14%	11%	16%
Work from home	12%	10%	12%	14%
Unknown	1%	0%	0%	1%

3.9.5 Place of Work by District

Table 15 (following page) presents the distribution of workers by place of residence vs. places of work. For the purpose of this analysis, respondents with no fixed workplace have been coded to their home district, although for many it is likely that their work cover many districts. In reviewing the results, it is important to note that the distribution of places of work does not include jobs held by residents who live outside the study area (for example, a resident of Coldstream who works in Vernon). Nevertheless the survey likely captures the great majority of employment located in the surveyed communities and provides useful information in understanding the concentrations of jobs and where workers live.

The survey results reveal that Kelowna is a net attractor of workers from the study area, with about 74,900 jobs relative to the 66,600 workers who live in Kelowna.

- In particular, one-fifth (20%) of all jobs in the study area are located the Kelowna City Centre/Pandosy district, with a similar proportion in Central Kelowna (19%).
- Other districts which are net attractors of work commutes are the Vernon Core (7% of places of work), Kelowna North (8%).

Districts which are net generators of commutes from home with low ratios of jobs to workers (of about 0.5 or below) are:

- in Vernon: Landing / Bella Vista / Turtle Mountain / Priest's Valley;
- in Kelowna: Glenmore, Rutland, Mission, and Black Mountain / Southeast; and
- in the rest of the Central Okanagan: Peachland, RDCO West, and RDCO East.

Of note, the West Kelowna total (two districts combined) reveals that this city represents fully 13% of all workers and 9% of all places of work (with many workers living in West Kelowna commuting outside the City boundaries for work).


Table 15. Distribution of Workers' Places of Residence and Places of Work by District

Geography	District	Workers (by place of residence)	% of Workers	Jobs† (workers by place of work)	% of Jobs†	Ratio of Jobs to Workers
Study Area		116,230	100.0%	109,560	94.3%	0.94
External to Study Area				6,670	5.7%	
Sub-Areas						
Vernon		18,010	15.5%	15,100	13.0%	0.84
Kelowna		66,580	57.3%	74,900	64.4%	1.12
Other Central Okanagan		31,640	27.2%	19,560	16.8%	0.62
Districts						
City Core / Alexis Park / Harwood / North Vernon	1001	4,160	3.6%	7,710	6.6%	1.85
East Hill / Middleton / Mission Hill	1002	7,370	6.3%	4,750	4.1%	0.64
Landing / Bella Vista / Turtle Mountain / Priest's Valley	1003	4,450	3.8%	1,450	1.2%	0.33
Outlying Areas *	1004	2,030	1.7%	1,190	1.0%	0.59
Lake Country	2000	6,920	6.0%	4,190	3.6%	0.61
City Centre / Pandosy	3001	13,900	12.0%	23,250	20.0%	1.67
Central Kelowna	3002	8,120	7.0%	22,330	19.2%	2.75
Glenmore	3003	10,530	9.1%	5,020	4.3%	0.48
Rutland	3004	14,430	12.4%	7,330	6.3%	0.51
Mission	3005	8,960	7.7%	4,160	3.6%	0.46
Black Mountain / Southeast	3006	7,380	6.3%	3,040	2.6%	0.41
Kelowna North *	3007	2,590	2.2%	9,450	8.1%	3.65
Duck Lake 7 *	3008	670	0.6%	320	0.3%	0.48
Glenrosa / Westbank	4001	8,610	7.4%	4,830	4.2%	0.56
Rose Valley / Lakeview	4002	6,860	5.9%	5,410	4.7%	0.79
<i>West Kelowna Subtotal (4001+4002)</i>		<i>15,470</i>	<i>13.3%</i>	<i>10,240</i>	<i>8.8%</i>	<i>0.66</i>
WFN	5001	3,870	3.3%	2,950	2.5%	0.76
Peachland *	6000	2,400	2.1%	1,240	1.1%	0.52
RDCO West *	7000	930	0.8%	450	0.4%	0.48
RDCO East *	8000	2,050	1.8%	490	0.4%	0.24
North Okanagan outside Vernon S				760	0.7%	
North Okanagan outside Vernon N				1,610	1.4%	
South Okanagan				1,160	1.0%	
Unknown				590	0.5%	
Outside of Okanagan				2,540	2.2%	

Blue shading highlights areas with a greater share of workers or jobs.

Green or orange shading highlights areas with greater or lesser jobs-to-workers ratios.

† The expanded estimates of jobs should not be taken to be definitive. In addition to jobs captured by the survey, these counts cannot account for jobs held by workers who live outside the survey area. This may be particularly relevant for Vernon, which may attract workers from the various other communities in North Okanagan.

* results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution, although the large number of jobs in the Kelowna North area may be more reliable, as the figure is a product of survey responses from many other districts reporting that their workplace is located in this district.



3.10 Retirement

Retired people have different travel habits (leisure activities, trip purposes, time of day of travel) and transportation needs. The survey estimates suggest that across the entire study area, there are about 58,700 retirees, up from 48,200 in 2013 and 41,860 in 2007. This is an increase of 21.8% over the last 5 years, compared to 15.2% over the previous six years; this amounts to a 40% increase over the 11 years since the baseline survey, more than double the increase in total population over the same period (19%). Some of this growth is due to the aging of long term residents (as seen earlier in the ‘moving hump’ in the age distribution in [Figure 23, Section 3.5](#)), but some of this increase is likely also attributable to the attractiveness of the Okanagan as a retirement destination due to its natural features, amenities and leisure opportunities.

Of note, not all retirees are over the age of 65 (age of eligibility for full CPP benefits): 75% are 65 years or older, 15% are between 60 and 64, and 9% are under 45. Also of note, 11% of residents 65+ years of age are still employed (4% full-time, 7% part-time), which is up from 10% in 2007 and 8% in 2007.

The charts below ([Figure 31, Figure 32](#)) present the results for the three sub-areas.

Figure 31. Total Retirees, 2007-2018

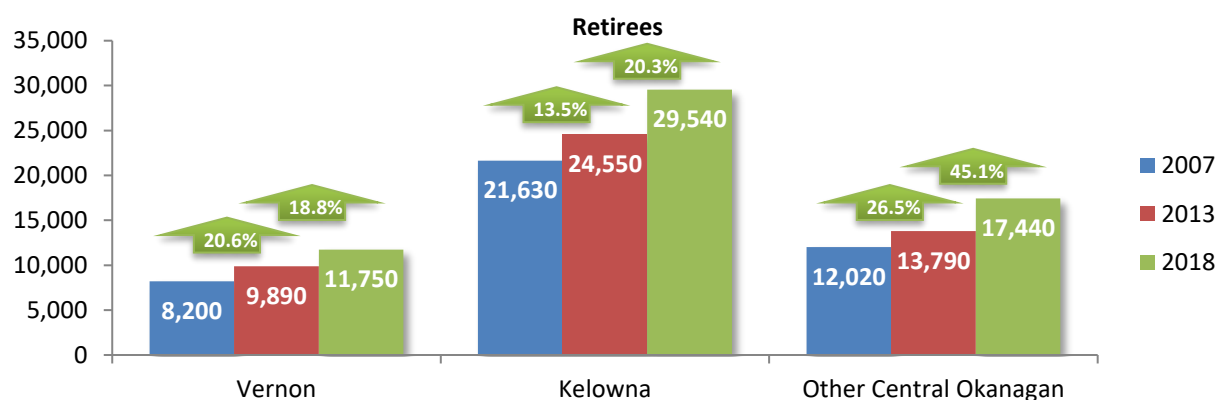
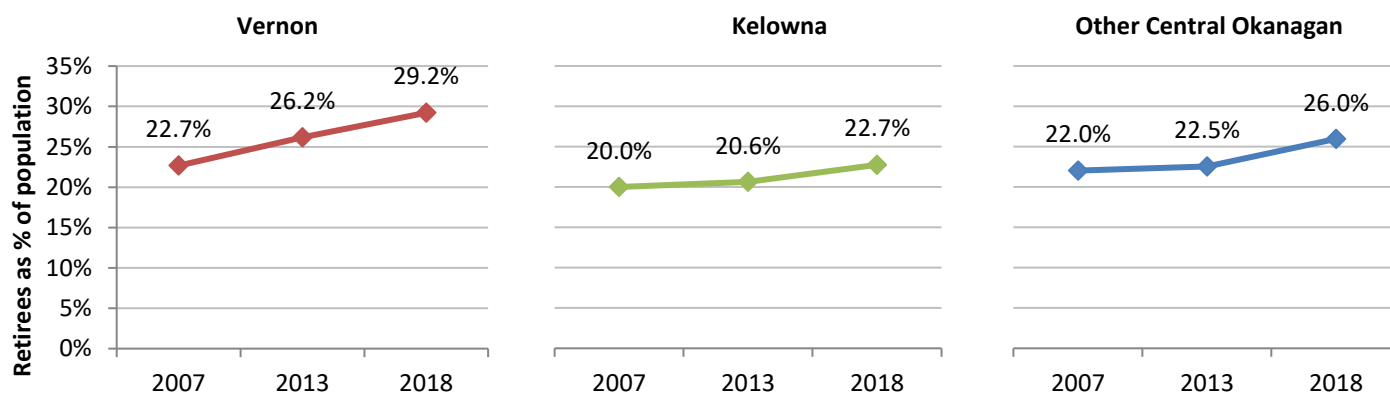


Figure 32. Retirees as % of Population, 2007-2018





4 Travel Patterns and Trends

4.1 About the Trip-Level Survey Results

This chapter of the report presents trips characteristics for the weighted data. Trip details were collected from household members who were 5 years of age or older for a sampled weekday in the fall of 2018 (with travel days ranging from late October through mid-December). For this survey, a trip is defined as a journey from one location to another for a single purpose that may involve more than one mode of travel (for example, in the instance of a Park & Ride trip, or walking from a transit stop to a destination more than 100 metres away). Key trip characteristics captured by the survey included the time of departure, mode of travel used, purpose of the trip (or activity at the destination location), and the specific location of each trip's origin and destination.

As with the results in the previous chapter, the expanded survey results should be understood to be estimates only. When presenting expanded survey data on estimated trip volumes, many of the results are rounded to the closest 100, so as not to give an undue impression of precision. Therefore, sometimes breakdowns of rounded trip counts for individual categories may not appear to sum to the rounded survey total across all categories. Trip rates and percentages have generally been computed using the unrounded expanded counts, so attempts to reproduce these statistics using the rounded trip counts may not always provide the same result.

Some differences between 2007, 2013, and 2018 survey cycles may be fluctuations due to the error associated with random sampling of a population or methodological differences, although overall trends usually should be apparent when comparing 2018 against the 2007 baseline year. This chapter includes sections providing context for certain of the differences observed between survey cycles.

This chapter is generally organized as follows:

- The first section looks at trends in total trips and trip rates (average daily trips per person or per household), followed by a section examining the trip volumes and trip rates for different household and demographic characteristics. ([Sections 4.2](#) , [4.3](#))
- The next section presents a profile of trips by hour of day, illustrating the AM Peak and extended PM Peak periods. ([4.4](#))
- The next two sections present key survey results on trips by mode of travel and by purpose, looking more closely at these measures from a number of different perspectives. ([4.5](#), [4.6](#))
- Following sections examine other trip characteristics, such as number of passengers in vehicle trips, bus routes used for transit trips, and distances travelled. ([4.7](#), [4.8](#) , , [4.10](#), [4.11](#))
- The final sections examine the trip flows between different communities, the extent to which trips in each community are internalized, and origin-destination matrices. ([4.12](#), [4.13](#), [4.14](#))



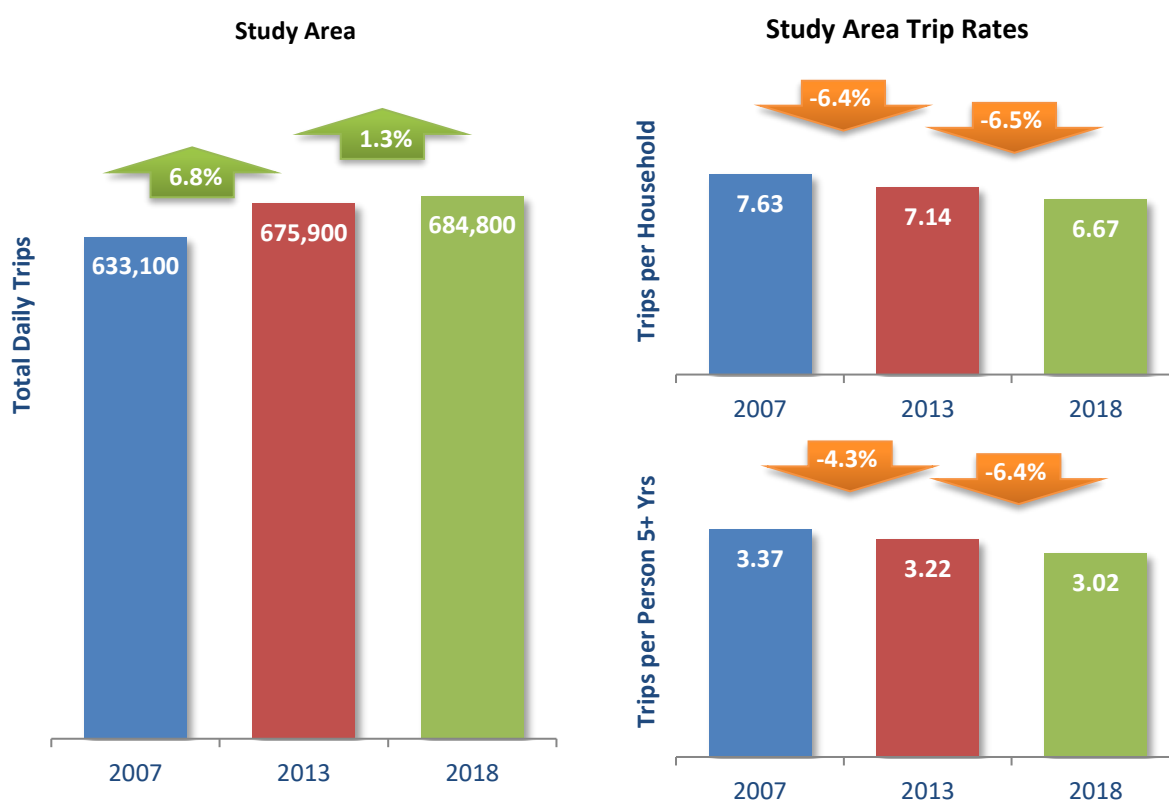
4.2 Total Trips and Trip Rates

Over the course of a typical 24-hour fall day, residents of the study area make a total of 684,800 trips. On average, each household makes 6.67 trips each day, while each person over the age of five makes 3.02 trips per person each day.

The current volume of trips is an increase of 8.0% over the 11 years since the baseline survey in 2007, but only 1.3% growth over the last five years. This compares to 20.6% growth in persons 5+ years of age (those for whom trips were surveyed) over the past 11 years, and 8.2% over the last five years. The fall in household- and person-level trip rates provides interesting context. Unlike total trips, the declines in trip rates have been relatively steady trend over the same time periods. At the household level, trip rates have declined from an average of 7.63 trips per household in 2007 to 6.67 in 2018. This is consistent with shrinking average household size. At the person level, trip rates have declined from 3.37 trips per person in 2007 to 3.02 trips per person in 2018.

It may be noted that some of the fluctuation between survey cycles may be attributed to sampling error (the error associated with randomly sampling a percentage of the population to survey), and the results may also be affected by differences in methodology. Nonetheless, underlying the overall trend across the study area, a very interesting regional picture emerges, as discussed on the following pages.

Figure 33. Total Trips and Trip Rates – Study Area, 2007-2018





On a given day, not all people travel: 85.5% of all persons 5+ years of age were reported to have made at least one trip in the survey area (with the remaining 14.5% either being outside of the survey area or not having a reason to leave home¹⁷). This result was slightly up from both 2007 (84.3%) and 2013 (85.5%), despite the decline in overall trip rates. This might suggest a similar number of outings leaving home but fewer individual destinations / reasons to stop on those outings, though further investigation of trip tours would be needed to confirm this. By sub-area, the proportion of persons 5+ travelling was 87.2% in Kelowna, 84.4% in Vernon, and 82.8% in Other Central Okanagan.

Looking at the results of the survey by sub-area reveals that the decline in trip rates is not uniform (Figure 34, following page). The survey results suggest that Kelowna has seen overall growth in person trips (+5.9% in the last 5 years), albeit somewhat below population growth due to the decreases in trips per person (-2.5% in the last 5 years). In contrast, Vernon and the Other Central Okanagan sub-areas have witnessed significant decreases in person trip rates despite increases in population. The information in the charts is summarized in Table 16 below.

The declining trip rate may be consistent with demographic trends such as an aging population and static number of workers, but could also be the product of other societal trends such as shifts in work arrangements, the expansion of at-home leisure options (streaming entertainment, video games), and changes in household maintenance activities (online banking, online shopping) which are beyond the scope of this survey to definitively correlate to the observed trip patterns. Later sections in this report explore related trends in trips by purpose, by age group, and in total trip distances or VKT per person.

Table 16. Average Daily Trips per Household and per Person by Geography of Residence, 2007-2013

Measure	Year	Expanded Estimates and Trip Rates					% change on previous cycle				
		Study Area	Central Okanagan	Vernon	Kelowna	Other Central Ok.	Study Area	Central Okanagan	Vernon	Kelowna	Other Central Ok.
Households	2007	83,000	66,900	16,100	46,000	21,000					
	2013	94,700	77,500	17,200	52,300	25,200	+14.0%	+15.7%	+7.0%	+13.8%	+20.0%
	2018	102,600	84,100	18,500	56,500	27,600	+8.4%	+8.6%	+7.4%	+8.1%	+9.7%
Persons 5+ Years of Age	2007	188,100	154,200	33,900	102,600	51,600					
	2013	209,700	173,200	36,500	114,400	58,800	+11.5%	+12.3%	+7.9%	+11.5%	+14.0%
	2018	226,800	188,400	38,400	124,200	64,200	+8.2%	+8.8%	+5.3%	+8.6%	+9.2%
Total Trips	2007	634,200	515,200	119,000	353,500	161,700					
	2013	675,900	548,700	127,300	367,300	181,400	+6.8%	+6.6%	+7.3%	+4.0%	+12.4%
	2018	684,800	566,700	118,100	389,000	177,700	+1.3%	+3.3%	-7.2%	+5.9%	-2.1%
Household Trip Rate	2007	7.64	7.70	7.41	7.69	7.71					
	2013	7.14	7.08	7.40	7.02	7.21	-6.5%	-8.0%	-0.1%	-8.7%	-6.5%
	2018	6.67	6.74	6.40	6.88	6.44	-6.5%	-4.9%	-13.6%	-2.0%	-10.8%
Person Trip Rate	2007	3.37	3.34	3.51	3.45	3.13					
	2013	3.22	3.17	3.49	3.21	3.09	-4.4%	-5.2%	-0.7%	-6.8%	-1.5%
	2018	3.02	3.01	3.07	3.13	2.77	-6.4%	-5.1%	-11.9%	-2.5%	-10.3%

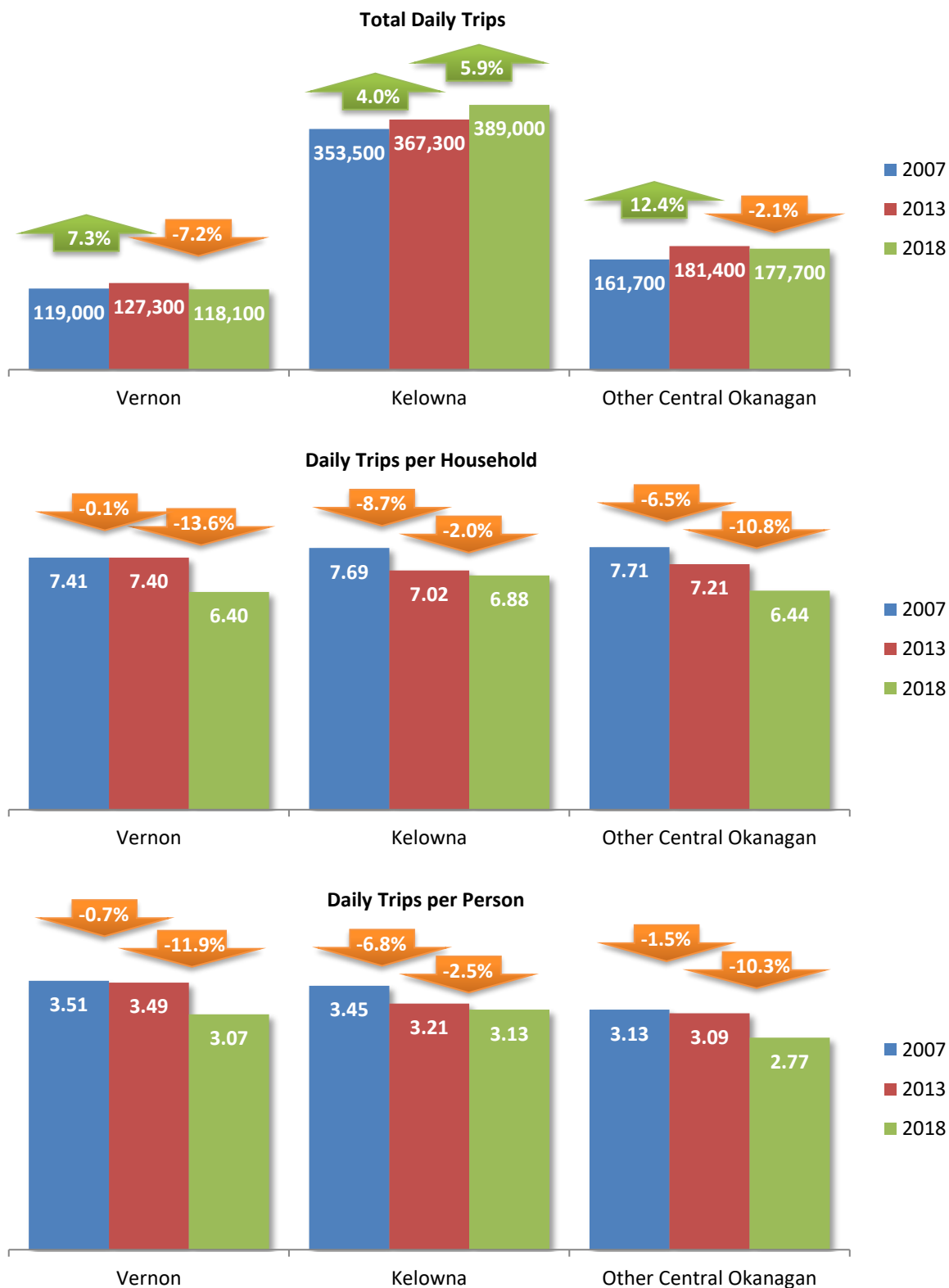
¹⁷ Note: Some may have left home for leisure or exercise without a destination. Such outings for walking the dog, going for a run, or going for a bicycle ride returning home without stopping for another purpose were not captured as trips.



Expanded counts have been rounded to the closest 100



Figure 34. Total Trips and Trip Rates – by Sub-Area of Residence, 2007-2018





4.2.1 Trips and Trip Rates by District

The number of daily trips and trip rates are broken out by district in the following charts (Figure 35 and Figure 36). The figure on the right provides an illustration of the 11-year growth or decline in trips made by residents of each district. As illustrated, the survey results suggest that the growth or decrease in trips has not been uniform within each sub-area. Also, the daily person trip rates can be seen to vary by individual district.

Figure 35. Total Daily Trips by District of Residence, with Net Change from 2007 to 2018

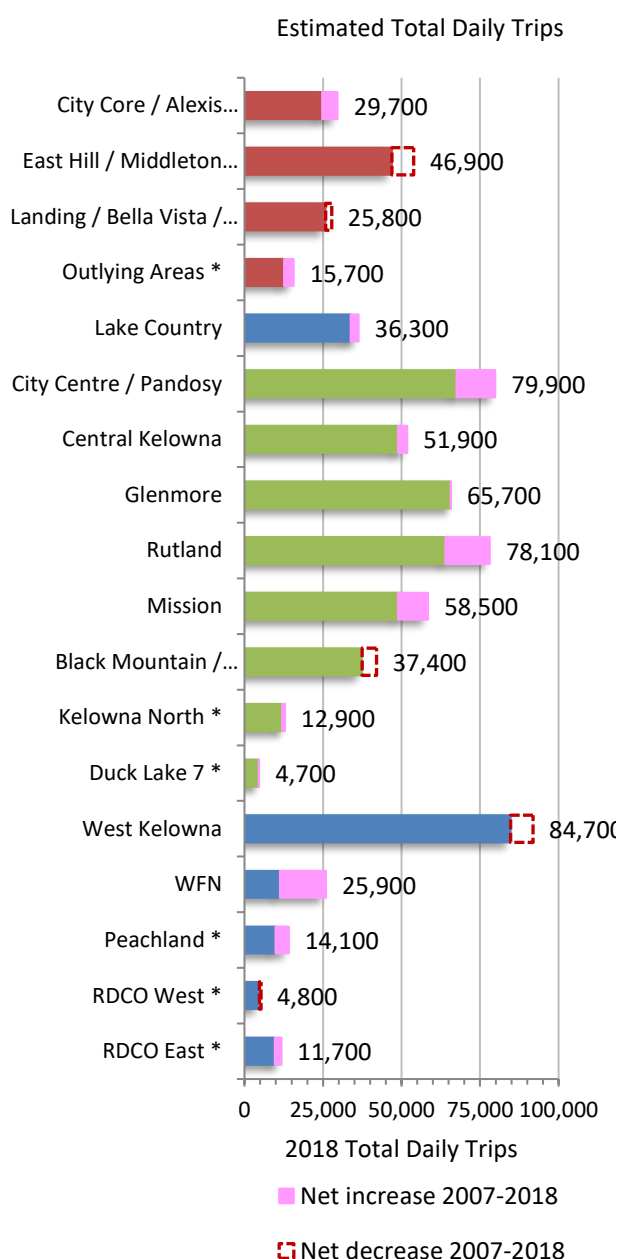
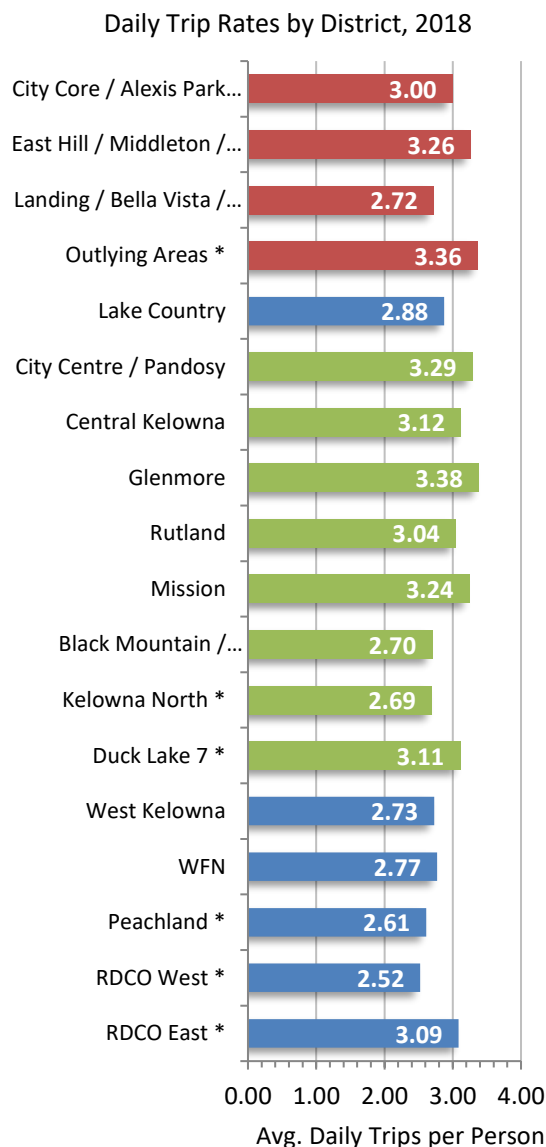


Figure 36. Person Trip Rates by District of Residence, 2018



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.



4.3 Trip Rates by Selected Characteristics

4.3.1 Trip Rates by Household Characteristics

The following table demonstrates the relationship of household characteristics to trip rates (Table 17). As dwelling type, household income and vehicle ownership all have a correlation to household size, the household trip rates vary considerably by category. While this is meaningful for modelling purposes, to understand the differences it may be more meaningful to look at the person trip rates. Of note, the highest trip rates are for one-person households (which stands to reason as one person is responsible for all trips for shopping and household errands) and for four-person households (which are more likely to be multi-child families). Overall, there were few differences by dwelling type, although in Vernon, those living in apartments had notably lower trip rates (2.56 trips per person), perhaps a product of a larger senior population living in condominiums or apartments and lack of employment growth. People living in lower income households (less than \$30,000 per year) had lower trip rates (2.71 trips per person), while those in the highest income bracket had the most (3.20 trips per person). The small proportion of the population living in households without vehicles also incurred fewer trips per person (2.25 on average). Within the three main sub-areas, there may be variations from the overall pattern for the study area that are in keeping with different demographic profiles of these sub-areas.

Table 17. Total Daily Trips and Trip Rates by Household Characteristics, 2018

Household Characteristic	Study Area			Vernon			Kelowna			Other Central Okanagan		
	Trips	Hhld Trip Rate	Person Trip Rate	Trips	Hhld Trip Rate	Person Trip Rate	Trips	Hhld Trip Rate	Person Trip Rate	Trips	Hhld Trip Rate	Person Trip Rate
Survey Total	684,750	6.67	3.02	118,100	6.40	3.07	389,000	6.88	3.13	177,660	6.44	2.77
By Household Size												
1 person	94,890	3.33	3.33	20,440	3.34	3.34	57,010	3.46	3.46	17,450	2.97	2.97
2 people	240,640	5.77	2.89	41,760	5.73	2.87	133,100	6.03	3.03	65,780	5.33	2.66
3 people	110,480	7.97	2.86	20,960	9.20	3.26	62,810	8.15	2.95	26,720	6.87	2.46
4 people	141,190	11.84	3.23	19,550	11.32	3.09	79,090	11.97	3.27	42,550	11.85	3.24
5+ people	97,550	14.73	2.97	15,400	14.57	3.07	56,990	15.53	3.13	25,160	13.28	2.62
By Dwelling Type												
House	416,310	7.82	3.01	70,620	7.63	3.09	215,290	8.34	3.12	130,390	7.18	2.80
Apartment	109,540	4.62	3.01	15,760	3.61	2.56	82,480	4.89	3.14	11,300*	4.51*	2.79*
Other ground-oriented	158,910	6.20	3.05	31,720	6.57	3.36	91,220	6.58	3.14	35,970	5.19	2.64
By Household Income												
Less than \$30K	50,930	3.97	2.71	13,240	4.15	2.70	28,170	3.99	2.77	9,520*	3.71*	2.55*
\$30K to <\$50K	94,030	5.53	3.08	22,300	5.64	3.24	51,510	5.67	3.24	20,220	5.08	2.59
\$50K to <\$80K	135,750	6.74	3.08	21,090	6.36	2.95	79,230	6.89	3.18	35,440	6.66	2.94
\$80K to <\$125,000	163,370	7.88	3.08	23,550	7.82	3.34	88,640	7.85	3.13	51,170	7.98	2.91
\$125,000 or more	150,460	9.34	3.20	23,510	9.64	3.41	90,560	9.93	3.37	36,390	7.99	2.76
Unknown	90,210	5.71	2.70	14,420	5.66	2.59	50,870	6.00	2.82	24,920	5.22	2.54
By Vehicle Ownership												
At least 1 vehicle	670,540	6.87	3.04	114,200	6.74	3.14	379,620	7.08	3.15	176,720	6.53	2.78
No household vehicles	14,220	2.87	2.25	3,910*	2.60*	1.86*	9,380*	3.23*	2.68*	930*	1.72*	1.30*

* Interpret with caution due to smaller sample sizes.



4.3.2 Trip Rates by Demographic Characteristics

The next table demonstrates the relationship of household characteristics to trip rates ([Table 18](#)).

As shown, employed people have the highest trip rates (3.19 daily trips per full-time worker and 3.39 per part-time worker, on average), with retirees having the next highest (2.84 trips per person). Students tend to have lower trip rates, particularly post-secondary students. People who use mobility aids make the fewest daily trips on average (2.00 trips per person).

Of note, 55% of all daily trips made by residents of the study area are made by employed people, and 24% are made by retirees. This pattern differs by sub-area, with 30% of Vernon residents' trips being made by retirees, and 51% being made by workers, while 22% of all trips made by Kelowna residents are made by retirees, with 57% made by workers.

Table 18. Total Daily Trips and Trip Rates for Selected Demographic Characteristics, 2018

Demographic Characteristic	Study Area		Vernon		Kelowna		Other Central Okanagan	
	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate
Survey Total	684,750	3.02	118,100	3.07	389,000	3.13	177,660	2.77
By Employment Status								
Work Full-Time	284,140	3.19	45,610	3.41	166,070	3.25	72,460	2.95
Work Part-Time	91,450	3.39	14,930	3.24	55,200	3.60	21,320	3.02
Unemployed	19,470	2.73	3,100*	2.10*	11,490*	3.37*	4,880*	2.17*
Other**	58,000	2.74	8,890*	2.81*	33,020	2.75	16,090	2.70
Retired	166,510	2.84	35,300	3.01	87,070	2.95	44,130	2.53
Not applicable (5-14 yrs)	65,190	2.75	10,270*	2.54*	36,150	2.84	18,770	2.72
By Student Status								
K-12 student	82,790	2.76	12,440	2.53	47,220	2.89	23,130	2.66
PSE	37,770	2.64	5,250*	3.55*	25,120	2.66	7,400*	2.20*
Other / online	8,440*	3.42*	2,090*	3.19*	5,340*	3.84*	1,020*	2.39*
Not a student	555,750	3.09	98,330	3.13	311,320	3.21	146,110	2.83
Mobility Challenges								
No mobility challenges reported	648,160	3.05	109,230	3.11	370,770	3.17	168,160	2.78
Has physical disability or condition that limits mobility but not use mobility aid	23,610	2.98	6,320*	3.31*	10,640*	2.73*	6,660*	3.15*
Uses mobility aid	12,980	2.00	2,550*	1.79*	7,590*	2.24*	2,840*	1.69*

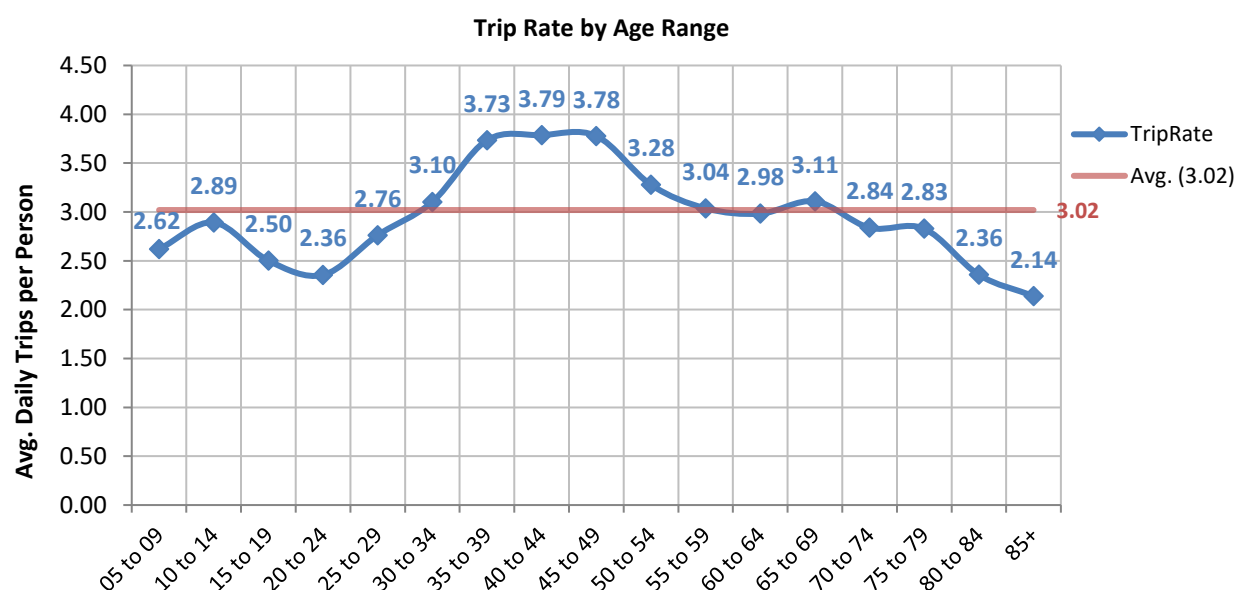
* Interpret with caution due to smaller sample sizes.

**Other employment status includes post-secondary and high school students >15 years of age who are not employed.



Figure 37 illustrates the relationship between age and trip rates for the entire study area. As shown, the highest trip rates are amongst those 35 through 49 years old (averaging 3.73 to 3.78 trips per day). This is to be expected as these are prime productive years for careers and raising families (which often require serve-passenger trips to/from school and activities). The average age of mothers at childbirth in BC was 31.6 years in 2016, and has been over 30 years of age since 2004.¹⁸ The lowest trip rates are amongst children and youth, with the lowest rates observed for those 20 to 24 years of age (2.36 trips per days on average), with those 20 to 24 being the lowest at 2.36 trips per day on average, and amongst the elderly, showing a decline in trip rates from age 80 onwards. Readers are reminded that the survey does not represent population living in collective dwellings, and so does not include elderly people living in care homes, for whom trip rates may be different.

Figure 37. Trip Rate by Age – Study Area, 2018



¹⁸ Source: Report on the Demographic Situation in Canada, Fertility: Overview, 2012 to 2016, Statistics Canada (<https://www150.statcan.gc.ca/n1/pub/91-209-x/2018001/article/54956-eng.htm>).



Figure 38 provides another perspective: trip rates for women and men by age group. Trip rates for both genders follow a similar pattern, with trip rates peaking between the ages of 35 and 49. However, between the ages of 15 and 69, the trip rate is consistently higher for women, with significantly higher trip rates during the peak from ages 35 to 49.¹⁹

Figure 38. Trip Rate by Age and Gender – Study Area, 2018

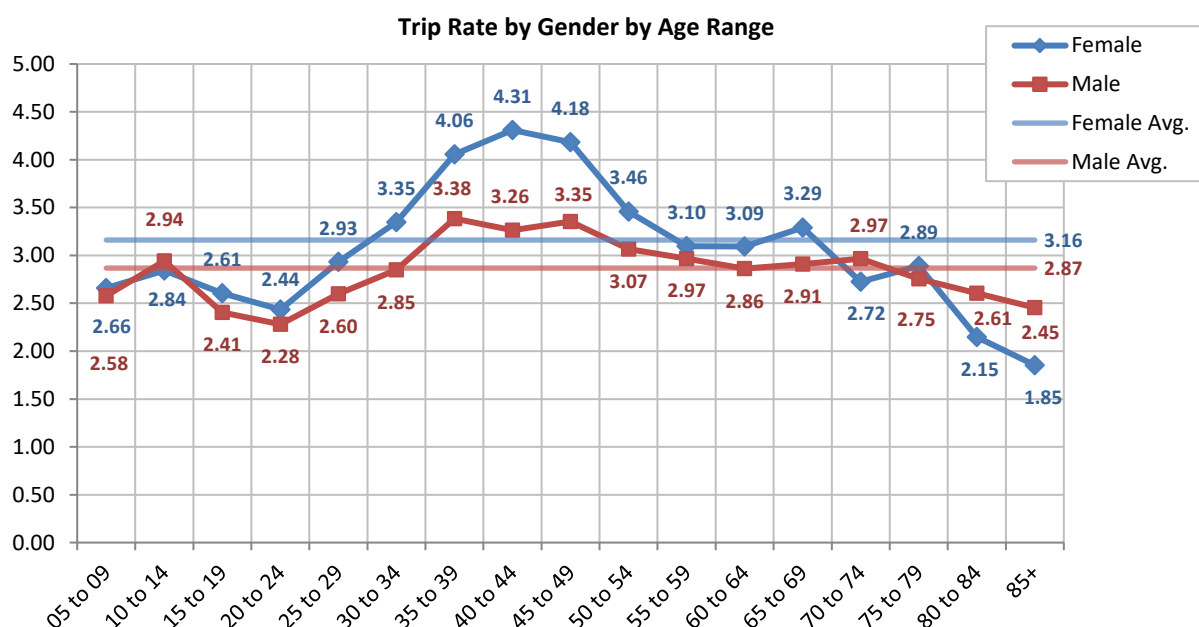


Figure 39 on the next page presents the trip rates by age for 2018 compared to 2007 and 2013. The survey results suggest that between 2007 and 2013, trip rates fell for all age ranges between 25 and 49 years of age, but were relatively steady for children and youth under 25 years of age, and also for those 50 to 74. It may be noted that the higher fluctuation in 2013 for those 75 years and older is more likely to be a product of sampling error, as the sample sizes for older age groups are considerably smaller. Between 2013 and 2018, trip rates for those between 30 and 49 (prime productive years) stayed about the same; however there appears to have been a further reduction in trip rates for those between the

¹⁹ Of note, amongst the 72% of households with two adults of mixed genders, the primary respondent who filled out the survey for the household was a woman 57% of the time. The primary respondent can be expected to report all their own trips. While they may be aware of important trips made by other household members (to work, drop off children, etc.) they may not always be aware of all discretionary trips made by others (e.g., lunch trips). The higher proportion of women primary respondents might result in more under-reporting of discretionary trips for men as other household members. However, the gender split in primary respondents may not be sufficient to explain the entire difference illustrated. Even if the difference might be over-emphasized, it is likely that women in the noted age groups do in fact make more trips than men, as has been observed in other surveys. No trip correction factors to compensate for under-reporting of other household members' trips were applied in any of the three survey cycles. Of note, the same trend was observed in 2007 and 2013, even with the different trip diary method.



ages of 15 to 29, as well as those 50 to 64 years of age. Again, one can speculate that the reasons could be to do with societal changes in terms of work, leisure, entertainment, and/or shopping patterns.

Figure 39. Trip Rate by Age – Study Area, 2007-2018

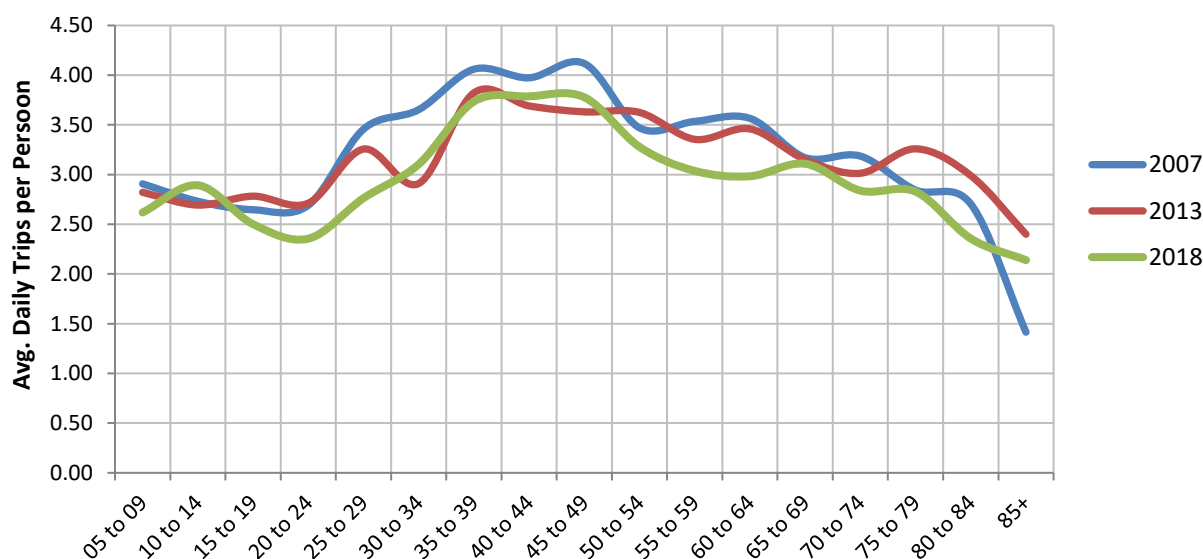


Table 19 below presents the trip rate profile by age for each of the sub-areas. The profile fits the same general trend, however, some caution should be exercised as the sample sizes in some of the five-year age ranges are on the smaller size, particularly in Vernon and Other Central Okanagan.

Table 19. Total Daily Trips and Trip Rates by Age (5-Year Age Range), 2018

Age Range	Study Area		Vernon		Kelowna		Other Central Okanagan	
	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate	Daily Trips	Person Trip Rate
5 to 9 years	31,490	2.62	4,700	2.30	18,020	2.77	8,770	2.52
10 to 14 years	33,700	2.89	5,570	2.78	18,130	2.91	10,000	2.92
15 to 19 years	31,680	2.50	4,320	2.20	19,640	2.72	7,720	2.22
20 to 24 years	33,100	2.36	4,230	2.34	22,610	2.45	6,260	2.08
25 to 29 years	38,800	2.76	6,120	2.90	25,160	2.88	7,510	2.35
30 to 34 years	45,510	3.10	7,680	3.33	27,050	3.15	10,790	2.86
35 to 39 years	53,850	3.73	10,030	3.95	31,140	3.86	12,680	3.32
40 to 44 years	49,060	3.79	7,380	3.74	28,080	3.90	13,600	3.60
45 to 49 years	55,160	3.78	10,580	5.00*	29,940	3.64	14,640	3.43
50 to 54 years	60,850	3.28	9,610	3.01	34,570	3.52	16,670	3.01
55 to 59 years	55,630	3.04	9,870	3.11	29,300	3.07	16,450	2.95
60 to 64 years	55,650	2.98	10,020	3.07	29,180	3.19	16,450	2.64
65 to 69 years	51,820	3.11	9,890	3.24	27,410	3.31	14,530	2.73
70 to 74 years	33,710	2.84	6,910	2.96	17,520	3.06	9,290	2.43
75 to 79 years	28,240	2.83	4,970	2.61	16,400	3.00	6,870	2.63
80 to 84 years	16,280	2.36	4,610	2.73	8,140	2.34	3,530	2.04



85+ years	10,230	2.14	1,610	1.68	6,720	2.49	1,900	1.68
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* interpret with caution; extreme value may be the result of smaller sample sizes by five-year age range.



4.4 Trips by Start Hour

4.4.1 Profile of Trips by Start Hour

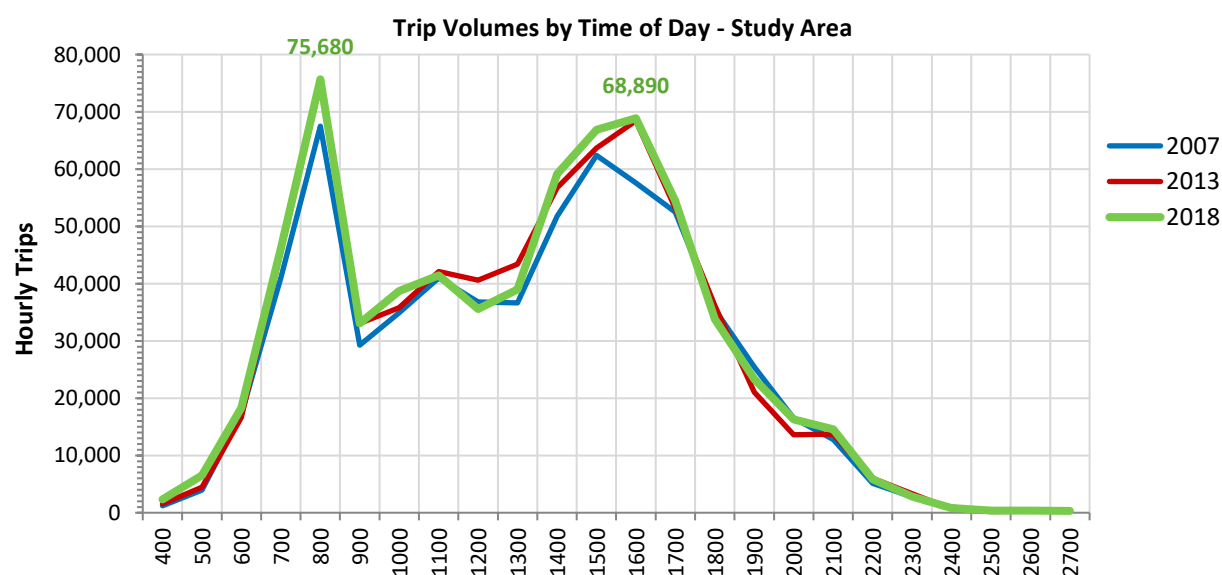
Overall, across the entire study area, the distribution of trips across the day by trip start time (**Figure 40**) shows a classic pattern, with the following profile:

- A concentrated AM peak that begins its build at 6 AM with only 18,300 trips, then 46,200 in the hour starting at 7 AM, then reaches about 75,700 trips in the hour from 8 AM, this peak largely being formed of commute trips and drop off trips serving other household members' commutes.
- This is followed by a five-hour inter-peak period from 9 AM to 2 PM, which fluctuates between 33,000 to 41,000 trips per hour.
- After this is an extended four-hour afternoon peak period starting at 2 PM (59,000 trips that hour) that continues to rise until it maxes out at 4 PM (with about 69,000 trips that hour) then dropping again to about 54,500 trips in the hour starting at 5 PM, followed by a steady decline after 6 PM.

Looking at the change in the profile over time shows some variability in growth by time of day:

- The AM Peak appears to have almost exactly the same profile in 2018 as in 2013 (after a notable increase from 2007 to 2013).
- The PM peak has seen some spreading with increases in volumes in the first two hours starting at 2 PM, but the next two hours from 4 PM following about the same profile as 2013.
- There appears to have been an increase in trips at the start of the inter-peak period but a decrease in the two hours starting at noon.
- The 2018 survey data also suggest a modest increase in evening trips in the three hours from 7 PM, which is up from 2013 but fairly equivalent to 2007.

Figure 40. Trip by Start Hour – Study Area, 2007-2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).



By sub-area, comparing the 2013 and 2018 trip distributions by hour ([Figure 41](#), following page), different patterns emerge for each community:

- Looking first at Vernon, this community appears to have experienced a slight decrease in trip volumes in the 8 AM to 9 AM peak hour, although the volume of trip starts in the neighbouring hours of 7AM and at 9AM have remained steady each cycle. This community has also seen some spreading of the afternoon peak, with a drop in the 3 PM to 4 PM hour and small increases in the other hours. Furthermore, the survey suggests drops in trips in the four-hour period between 10 AM and 2 PM. The lack of growth in trips made by Vernon residents during the morning and afternoon peak may be consistent with the size of the workforce appearing to be relatively stable according to the survey results (see [Section 3.9](#)).
- Kelowna has experienced growth in trip volumes in the 8 AM to 9 AM peak hour and across the four hours between 2 PM and 6 PM. This is consistent with a growth in workers living in the city. Trip volumes appear to have remained relatively steady or had only slight increases at other times of day, with the exception of a slight drop in trips between noon and 2 PM.
- The rest of the Central Okanagan has seen morning peak trips remain steady since 2013, but, similar to Vernon, it shows an overall reduction in trips during the afternoon between 3 PM and 6 PM, and a slight drop in trips between noon and 2 PM.

The differences from cycle to cycle appear to be generally consistent with the different demographic trends within each community (increased employment in Kelowna, increased seniors population in Vernon, etc.). Some of the change may also be associated with changes in work (e.g., increased work from home), leisure (e.g., increased options for home-based entertainment) or other patterns (e.g., online shopping). Readers are reminded that, as noted earlier, differences between survey cycles may be the product of sampling error and/or differences in methodology.²⁰

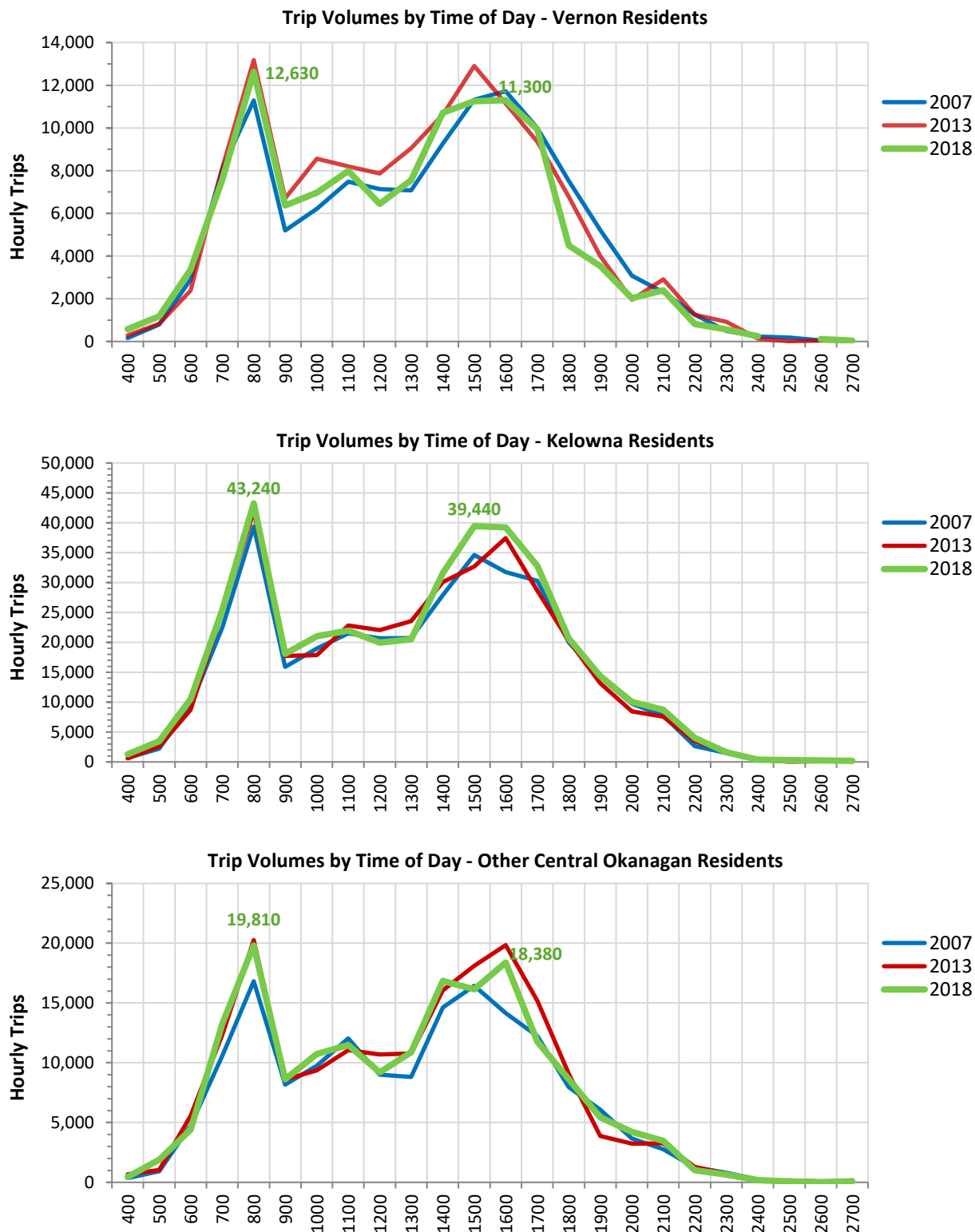
Readers are also reminded that the survey captured the personal (non-commercial) trips of residents of the above-noted areas. These figures may not necessarily align with screen line counts in these communities, as the survey did not capture commercial trips, nor trips made by residents of nearby communities (for example, residents of Coldstream travelling to and from Vernon).

Readers are also referred to [Section 4.5.8](#) Trip Mode by Start Hour, [Section 4.6.3](#) Trip Purpose by Start Hour, and [Section 4.6.1](#) Home-Based Trip Purposes for further exploration of hourly trip patterns.

²⁰ The fact that the survey shows a decrease in trips during the noon hour in all sub-areas could either indicate a real reduction in trips at this time, or a difference that may be attributable to differences in data collection methods. It may be possible that a portion of respondents to the 24-hour recall method employed in 2018 may have more easily neglected to report short walking trips for lunch (not considering them important) or certain discretionary trips for other household members (as the main respondent might know about others' important commute trips, but not certain other trips, such as going to get lunch or a coffee outside the workplace), as compared with the trip diary method employed in 2013 (which asked each household member to carry around a diary to document all of their trips on their pre-assigned travel day). Further investigation of the data would be required to test this theory.



Figure 41. Trips by Start Hour – by Sub-Area of Residence, 2007-2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).



4.4.2 Trips by Start Hour by Gender and Employment Status

While the gaps between women and men in terms of rates of employment and vehicle ownership may be changing, taken as groups, women and men may have different travel patterns and/or transportation choices. This section of the report provides a gender-based analysis of the pattern of trips by start hour.

As presented earlier, on average, women have higher trip rates than men. Overall, the female population accounts for 51.5% of the population but 54.1% of trips. The first graph in [Figure 42](#) on the next page illustrates the higher volume of trips by time of day. As illustrated, it appears that females account more of the total trips made between the hours of 8 AM to 4 PM but have similar profiles after 5 PM.

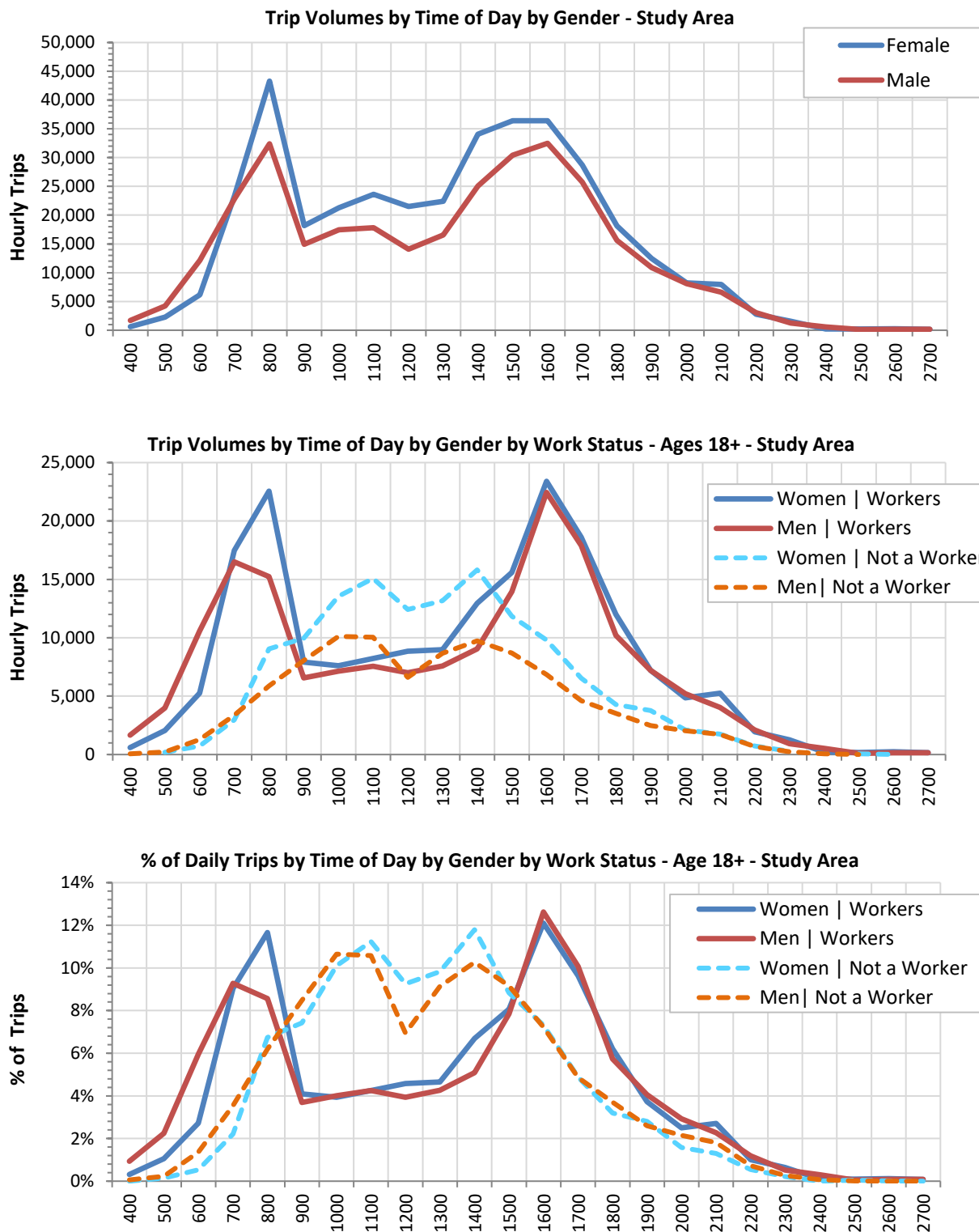
To explore this further, the second graph plots the hourly trip volumes by gender, separating out workers and non-workers 18+ years of age (to exclude the trips of school-age children). Of note, 48.7% of workers in the study area are women, and they account for 52.1% trips made by workers. In particular they appear to account for considerably more trips in the AM Peak hour (8 AM) than working men.

The third graph is normalized to the percentage of daily trips (to remove differences associated with higher or lower daily trip rates). This graph confirms that working men as a group tend to make more early morning trips between 4 AM and 6 AM. By comparison, working women make more of their trips in the hour starting at 8 AM, and also somewhat more in the hour starting at 2 PM. This may be due to differences in the type of work done by some women and some men as well as due to women having more trips picking up or dropping of children at school. Interestingly, the profile of trips for working women and men is very similar at other times during the daytime, and almost identical from 3 PM on through the evening.

Looking at non-workers reveals another interesting pattern. Looking again at the second graph, it illustrates the fact that, non-working women account for a larger volume of trips than non-working men. Women account for 56.2% of non-workers and 58.5% of all non-workers' trips. Interestingly, amongst non-workers, the trip profile by hour of day in the third graph is very similar for both men and women, with slight differences: non-working men make proportionately slightly more early-morning and mid-evening trips, and non-working women make more trips during the mid-day.



Figure 42. Trips by Start Hour by Gender, Study Area



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

Survey respondents who indicated non-binary gender or who refused to say were randomly assigned to one gender or another.





4.5 Primary Mode

The following table and chart (Figure 43, Table 20) provide an outline of the mode shares, based on the primary mode of the trip.²¹ Automobile trips dominate, with 67.8% of all person-trips being made by auto drivers, and 18.0% as auto passengers. Transit mode share is modest, accounting for about 2.8% of all trips. The low mode share for cycling (1.6%) is almost certainly tied to the time of year dictated by the survey project timelines, with the survey results covering travel dates from October 24 to December 21, 2018. Walking trips, at 7.8% may also be influenced by the time of year.

Of note, examination of the expanded trip data revealed that while women account for 54% of all trips, women make only 32% of bicycle trips. This may be a consideration for initiatives that promote cycling. The only other mode with a gender imbalance was auto passenger trips, with 62% made by women.

Figure 43. Daily Mode Shares – Study Area, 2018

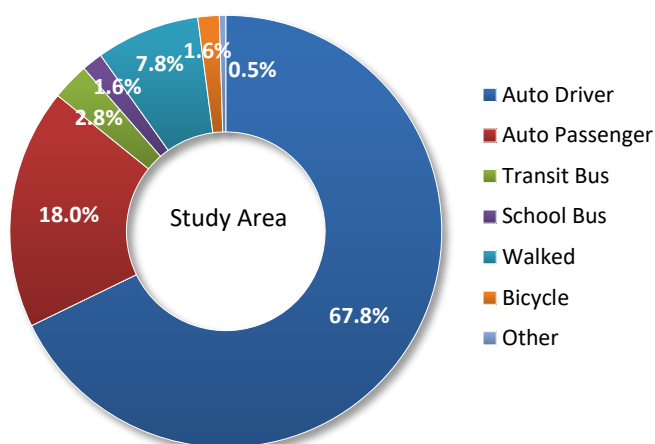


Table 20. Estimated Total Daily Trips by Primary Mode of Travel

Mode	Expanded Trips	Mode Share (%)
Auto driver	684,800	67.8%
Auto passenger	464,300	18.0%
Transit bus	123,300	2.8%
Bicycle	19,100	1.6%
Walked the entire way	10,700	7.8%
School bus	53,100	1.6%
Other	11,000	0.5%

²¹ A trip may entail more than one mode of travel (such as Park & Ride trips). In such instances, the primary mode was assigned based on the following hierarchy (with transit, at the top of the hierarchy, always being assigned if a trip involved transit and another mode): transit, school bus, auto driver, auto passenger, other, bicycle, walked. Generally speaking, the primary mode assigned to a multi-mode trip is usually the mode by which the greatest distance would be travelled. The 'Other' mode classification includes motorcycle, taxi, intercity bus, HandyDart or shuttle bus.

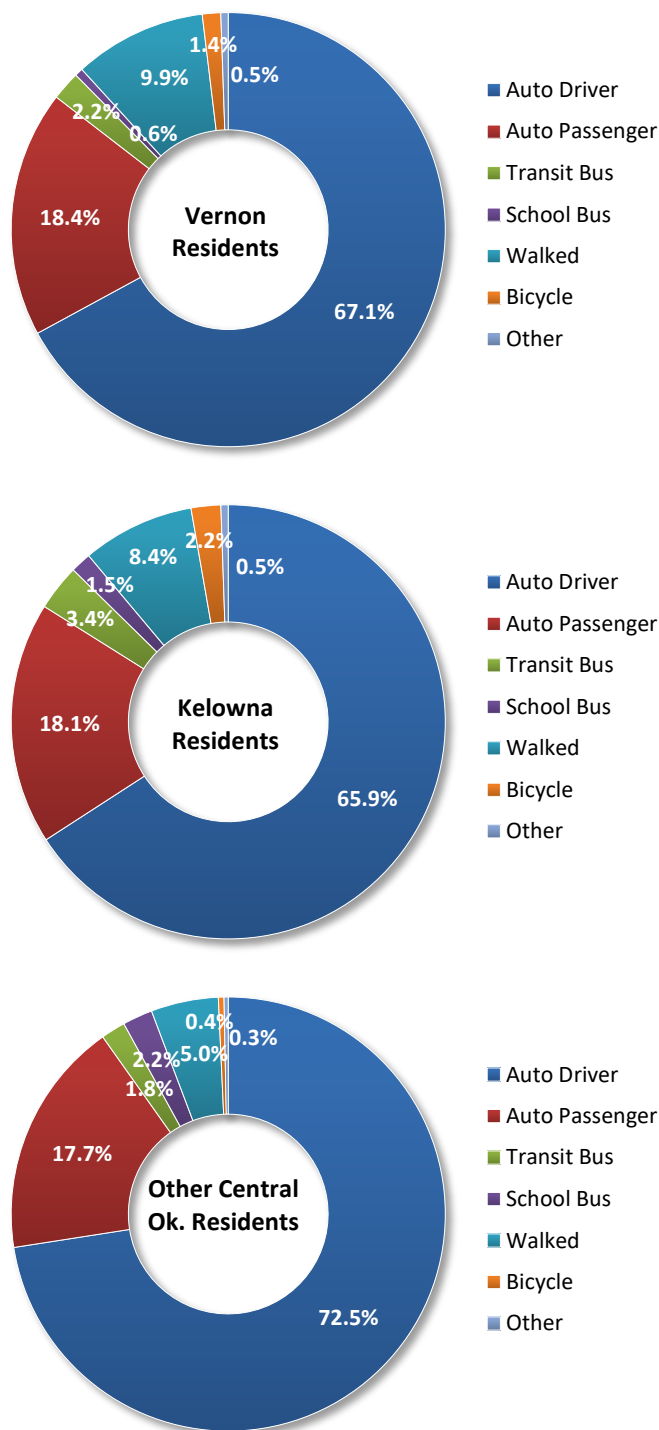


4.5.1 Mode Shares by Sub-Area

The mode shares in the sub-areas follow the same general pattern as the overall result, with some notable differences (Figure 44). The following observations can be made:

- Vernon has the highest walk mode share (9.9% of all trips); although transit (2.2%) and bicycle (1.4%) are somewhat lower than the average for the study area; while school bus mode shares are the lowest in the study area (0.6%). Just over two-thirds (67.1%) of all trips are auto driver trips.
- Similar to Vernon, auto driver trips represent two-thirds (65.9%) of all trips made by Kelowna residents. However, the residents of this area are most likely to rely on transit, with 3.4% of trips being transit trips. Walk shares are also high at 8.4%, and bicycle shares are higher than average for the study area, at 2.2%.
- The communities that comprise rest of the Central Okanagan have, on average, the highest reliance on automobiles, with 72.5% of all trips being auto driver trips. The sub-area shows the lowest shares of walking (5.0%), transit use (1.8% of all trips), and bicycle use (0.4%). The mode share profile is not surprising given the spread out geography of the area and mix of urban, suburban and rural land use.

Figure 44. Mode Shares by Sub-Area, 2018





4.5.2 Mode Shares, 2007-2018

The survey data for three surveys (**Figure 45**) suggest modest positive changes in mode shares since 2007, with much of that change happening from 2007 to 2013. Overall, driving mode shares are down from 70.4% in 2007, currently at 67.8% of trips (only slightly less than in 2013). Auto passenger mode shares (18.0% of all trips) have modestly increased since a dip in 2013, and are equivalent again to 2007. Walk mode shares have increased since 2007, remaining steady at 7.8% since 2013.

Transit mode shares (2.8%) are double that in 2007 (1.4%). The 2013 survey's higher transit mode share may be somewhat overstated. A comparison of the survey data to ridership figures is presented in the next section for context (**Section 4.5.3**).

Bicycle mode shares for the 2018 survey were 1.6%, but it should be noted that the 2018 survey started later than in 2013 and mode shares may have been influenced by the weather at the time of the survey (as explored in more detail in **Section 4.5.4**).

Table 21 outlines the changes in terms of estimated trip counts for each mode as well as mode shares. Shading highlights larger changes. It is important to note that while auto driver mode shares have decreased, the total number of such trips has increased. Readers are reminded that some of the differences between survey cycles may be the result of actual trends in evolving travel patterns, while others may be fluctuations due to random sampling or methodological differences.

Figure 45. Mode Shares – Study Area, 2007-2018

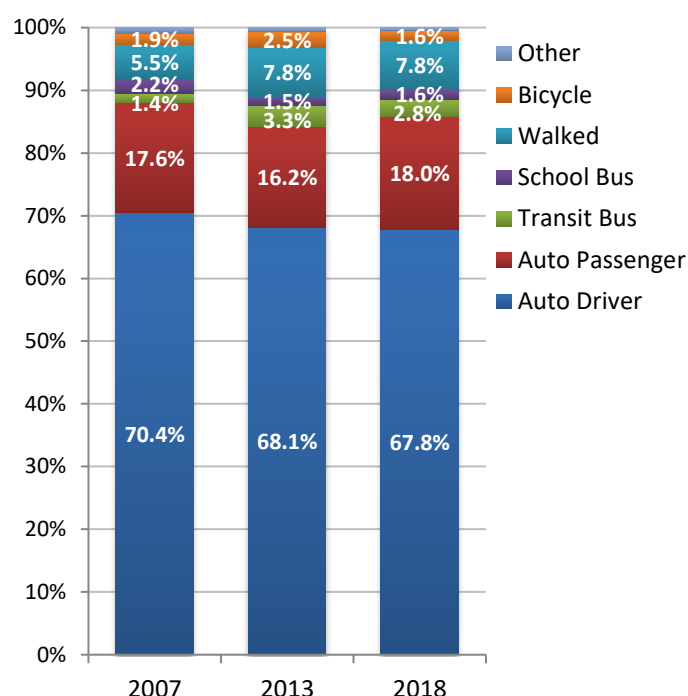


Table 21. Total Trips by Mode, Mode Shares – Study Area, 2007-2018

Primary Mode	Trips			% Change in # of Trips			Mode Shares			%Pt Change		
	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change
Total Trips	634,200	675,900	684,800	+6.6%	+1.3%	+8.0%	100.0%	100.0%	100.0%			
Auto Driver	446,700	460,500	464,300	+3.1%	+0.8%	+3.9%	70.4%	68.1%	67.8%	-2.3%	-0.3%	-2.6%
Auto Passenger	111,800	109,200	123,300	-2.3%	+12.9%	+10.3%	17.6%	16.2%	18.0%	-1.5%	+1.9%	+0.4%
Transit Bus*	9,000	22,500*	19,100	+150.0%*	-14.9%	+112.7%	1.4%	3.3%*	2.8%	+1.9%*	-0.5%	+1.4%
School Bus	14,200	9,900	10,700	-30.7%	+8.2%	-25.0%	2.2%	1.5%	1.6%	-0.8%	+0.1%	-0.7%
Walked	34,800	52,500	53,100	+50.9%	+1.1%	+52.6%	5.5%	7.8%	7.8%	+2.3%	+0.0%	+2.3%
Bicycle**	11,800	17,100	11,000	+45.5%	-36.1%	-7.1%	1.9%	2.5%	1.6%	+0.7%	-0.9%	-0.3%
Other	5,800	4,200	3,300	-28.0%	-21.0%	-43.1%	0.9%	0.6%	0.5%	-0.3%	-0.1%	-0.4%

* Interpret with caution: transit use in 2013 may be somewhat over-stated. See Section 4.5.3 of this report.

** Interpret with caution: the surveys were conducted at different times of year and bicycle use may be tied closely to weather. See Section 4.5.4



Table 22 details information on mode share by sub-area. Where fluctuations between the three survey cycles show unusual variations, some trends may be better discerned by looking more broadly at the 11-year differences between 2007 and 2018, for which the overall trend may still emerge through the noise between individual cycles. Readers are encouraged to read the caveats regarding cycle-to-cycle fluctuations discussed elsewhere in this report.

Table 22. Total Trips by Mode, Mode Shares – by Sub-Area, 2007-2018

Primary Mode	Trips			% Change in # of Trips			Mode Shares			%Pt Change		
	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11- Year Change
Vernon												
Total Trips	119,000	127,300	118,100	+7.0%	-7.2%	-0.7%	100.0%	100.0%	100.0%			
Auto Driver	83,500	86,400	79,200	+3.4%	-8.3%	-5.1%	70.2%	67.9%	67.1%	-2.3%	-0.8%	-3.1%
Auto Passenger	21,100	22,600	21,700	+7.1%	-4.1%	+2.7%	17.8%	17.8%	18.4%	0.0%	+0.6%	+0.6%
Transit Bus*	1,200	1,600	2,500	+26.8%	+63.6%	+107.5%	1.0%	1.2%	2.2%	+0.2%	+0.9%	+1.1%
School Bus	2,800	1,600	700	-42.6%	-55.1%	-74.2%	2.3%	1.3%	0.6%	-1.1%	-0.6%	-1.7%
Walked	8,300	12,600	11,600	+52.0%	-7.3%	+40.9%	6.9%	9.9%	9.9%	+2.9%	0.0%	+2.9%
Bicycle**	1,100	1,800	1,600	+67.6%	-9.5%	+51.6%	0.9%	1.4%	1.4%	+0.5%	0.0%	+0.5%
Other	1,000	800	600	-23.5%	-15.5%	-35.3%	0.8%	0.6%	0.5%	-0.2%	-0.1%	-0.3%
Kelowna												
Total Trips	353,500	367,300	389,000	+3.9%	+5.9%	+10.0%	100.0%	100.0%	100.0%			
Auto Driver	245,300	243,900	256,200	-0.6%	+5.1%	+4.4%	69.4%	66.4%	65.9%	-3.0%	-0.5%	-3.5%
Auto Passenger	61,800	54,600	70,300	-11.7%	+28.6%	+13.6%	17.5%	14.9%	18.1%	-2.6%	+3.2%	+0.6%
Transit Bus*	6,200	16,000	13,300	+157.9%	-16.9%	+114.5%	1.8%	4.4%	3.4%	+2.6%	-0.9%	+1.7%
School Bus	5,800	4,300	6,000	-25.5%	+39.1%	+3.7%	1.6%	1.2%	1.5%	-0.5%	+0.4%	-0.1%
Walked	21,400	32,300	32,500	+50.8%	0.8%	+52.0%	6.1%	8.8%	8.4%	+2.7%	-0.4%	+2.3%
Bicycle**	9,600	13,700	8,600	+42.6%	-37.2%	-10.5%	2.7%	3.7%	2.2%	+1.0%	-1.5%	-0.5%
Other	3,300	2,500	2,100	-24.6%	-15.3%	-36.1%	0.9%	0.7%	0.5%	-0.3%	-0.1%	-0.4%
Other Central Okanagan												
Total Trips	161,700	181,400	177,700	+12.2%	-2.1%	+9.9%	100.0%	100.0%	100.0%			
Auto Driver	117,900	130,300	128,900	+10.6%	-1.1%	+9.3%	72.9%	71.8%	72.5%	-1.1%	+0.7%	-0.4%
Auto Passenger	28,800	32,000	31,400	+10.9%	-1.9%	+8.8%	17.8%	17.6%	17.7%	-0.2%	+0.0%	-0.2%
Transit Bus*	1,500	4,900	3,200	+215.9%	-33.6%	+109.7%	1.0%	2.7%	1.8%	+1.7%	-0.9%	+0.9%
School Bus	5,700	4,000	4,000	-30.3%	+0.2%	-30.1%	3.5%	2.2%	2.2%	-1.3%	+0.1%	-1.3%
Walked	5,100	7,600	8,900	+49.3%	+16.7%	+74.2%	3.2%	4.2%	5.0%	+1.0%	+0.8%	+1.9%
Bicycle**	1,100	1,700	700	+48.7%	-55.5%	-33.9%	0.7%	0.9%	0.4%	+0.2%	-0.5%	-0.3%
Other	1,500	900	600	-38.4%	-40.9%	-63.6%	0.9%	0.5%	0.3%	-0.4%	-0.2%	-0.6%

* Interpret 2013 transit counts and mode shares with caution: transit use in 2013 may be somewhat over-stated. See Section 4.5.3 of this report.

** Interpret with caution: the surveys were conducted at different times of year and bicycle use may be tied closely to weather. See Section 4.5.4

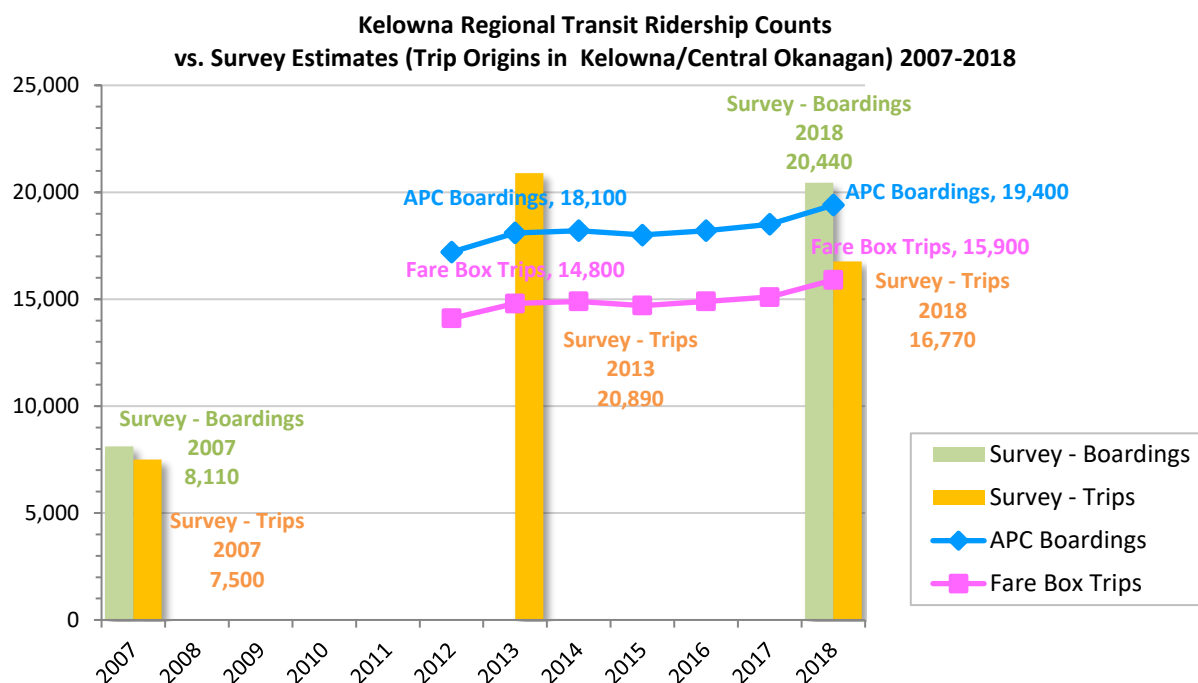


4.5.3 Interpreting Differences in Transit Mode Shares

The differences between survey cycles in terms of mode share should be interpreted with caution. A comparison of BC Transit ridership data suggests that 2018 survey estimates are in line with both fare box and Automatic Person Counter (APC) counts for the same year (Figure 46). Fare box counts capture the approximate number of trips, and APC counts capture boardings, with some trips entailing transfers, i.e., multiple boardings per trip. By contrast, the 2013 survey estimates exceed the fare box counts by a considerable volume. No official ridership data were available to validate the 2007 survey estimates. The reasons for the differences between the fare box trips and the survey estimates in 2013 are difficult to determine, as ridership counts are not always precise.

Given the above, it is difficult to draw conclusions about the differences between 2007 and 2013 and between 2013 and 2018. What the data do seem to clearly suggest, however, is that transit ridership has increased significantly over the entire 11 years since the baseline survey in 2007.

Figure 46. Comparison of Survey Transit Estimates to BC Transit Ridership Figures, 2007-2018



Survey estimates of trips with first transit boarding location in the Central Okanagan, i.e., excludes transit trips with boarding locations in Vernon (served by the Vernon Regional Transit System) and outside of the Central Okanagan.

APC = Automatic Person Counter. APCs may underestimate the number of boardings during busy periods.

Fare Box = fares paid via cash, ticket, bus pass, or UPass. UPass fares may be undercounted as UPasses only need to be flashed to the bus driver, and bus drivers may not always manually register each UPass flashed.

Survey estimates for 2007 and 2018 transit boardings are based on the number of bus routes reported for each transit trip; 2013 bus routes were not included in the data, so it was not possible to estimate the number of boardings for each trip.



4.5.4 Interpreting Differences in Bicycle Mode Shares

The difference in bicycle mode shares by cycle may be attributable to the different time frames of each of the surveys, with the majority of the surveys for the 2018 OTS completed a month later than the majority of surveys for the 2013 cycle,²² while the 2007 cycle was undertaken in the spring (**Table 23**). Given the different weather conditions, a difference in cycling mode shares does not necessarily indicate a clear overall reduction in use of bicycles as mode of transport. It may also be noted that the differences in survey timing may also contribute to fluctuations between cycles in terms of other modes shares such as walking.

In this context, it may be difficult to speculate as to the extent to which cycling in equivalent weather might have increased or decreased since 2007. Readers are reminded that the growth in bicycles in the region has been very close to the population growth (17% increase in bicycles over 11 years, compared to a 19% increase in population in the same period), while the average number of bicycles per person has been relatively steady, although other trends such as the aging population may contribute to a reduction in bicycle usage (**Section 3.4**). Also, examination of mode shares by age group later in this report (**Section 4.5.7**) reveals that the significant 2013-to-2018 decrease in bicycle usage amongst children is balanced somewhat by an increase in their walking trips, which is consistent with the theory that the colder weather during the time frame of the 2018 survey had an impact on the measurements.

It may be noted that the survey data on bicycle trips have not been validated against bicycle screenline counts in the region. Longitudinal examination of the bicycle screenline counts was outside the scope of this research but could provide useful context into the survey results and insight into trends in bicycle usage.

Table 23. Survey Time Periods and Temperature Norms, 2007-2018

Survey	Range of travel dates surveyed	Average daily min - max, average daily temperature*	Monthly precipitation*	Bicycle Mode Share
2007	13 April to 18 May 2007	April: 1.3°C to 15.5°C, avg. 8.4°C May: 5.4°C to 20.0°C, avg. 12.8°C (most surveys)	April: 29 mm May: 40 mm	1.9%
2013	23 Sept. to 30 Nov. 2013 90% of surveys by 4 Nov	Sept: 5.9°C to 21.7°C, avg. 13.9°C Oct: 1.3°C to 13.4°C, avg. 7.4°C (most surveys) Nov: -2.4°C to 5.6°C, avg. 1.6°C	Sept: 32 mm Oct: 29 mm	2.5%
2018	24 Oct. to 21 Dec. 2018, 90% of surveys by 6 Dec	Oct: 1.3°C to 13.4°C, avg. 7.4°C Nov: -2.4°C to 5.6°C, avg. 1.6°C (most surveys) Dec: -5.9°C to 0.7°C, avg. -2.6°C	Oct: 29 mm Nov: 40 mm	1.6%

* Environment Canada Canadian Climate Normals 1981-2010 Station Data, Kelowna Station A, (https://climate.weather.gc.ca/climate_normals/index_e.html)

²² Of note, examination of the weighted 2018 survey data showed an average bicycle mode share of 1.8% prior to the end of November, and 0.9% in December, however, it may be noted that the data were not tested to see if the two sub-samples examined had similar representation of population characteristics.



4.5.5 Sustainable and Active Mode Shares

Aggregating the figures for sustainable and active modes provides another perspective on mode shares (Table 24):

- Combined, sustainable modes (transit, school bus, walking, and cycling) comprise a 13.7% mode share, which is a 2.7%-pt increase from 11.0% in 2007.
- Looking at just active modes (walking and cycling) reveals that, combined, the active modes comprise a 9.4% mode share, up 2.0%-pts from 7.3% in 2007.

The overall increases since 2007 in sustainable mode share and within this, active mode share can be looked upon positively. This finding is tempered somewhat by the fact that the survey results suggest that much of this increase was in the earlier period from 2007 to 2013, and there even appears to have been a slight decline in sustainable modes in the later period from 2013 to 2018. As discussed previously, shorter-term survey cycle to survey cycle trends can be difficult to assess as comparisons may be affected by survey timing, random sampling error, and/or methodological differences. This includes the possible over-representation of transit trips in 2013 as discussed earlier (see Section 4.5.3) and the likelihood that the active mode shares reported in 2018 were likely dampened by colder weather in the period of the 2018 survey cycle (see Section 4.5.4), with some of the decrease in bicycle trips made by children being offset by an increase in their walking trips (see Section 4.5.7 later in this report). The aging of the population may also be a factor in the changes from 2013 to 2018, with the greater population increase being amongst older age groups having greater automobile ownership and the highest auto mode shares. Nevertheless, the net changes since 2007 are positive ones, and the impact of the over-representation of transit trips in 2013 and the colder weather in 2018 survey would suggest that the decrease since 2013 may not necessarily be as significant as it appears to be.

Table 24. Sustainable and Active Mode Shares – by Sub-Area, 2007-2018

Primary Mode	Trips			% Change in # of Trips			Mode Shares			%Pt Change		
	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11-Year Change	2007	2013	2018	'07-'13 6-Year Change	'13-18 5-Year Change	'07-'18 11- Year Change
Sustainable Modes (Transit Bus + School Bus + Bicycle + Walk)*, **												
Study Area	69,800	102,000	93,900	46.1%	-8.0%	34.4%	11.0%	15.1%	13.7%	4.1%	-1.4%	2.7%
Vernon	13,300	17,500	16,500	31.2%	-5.6%	23.8%	11.2%	13.8%	14.0%	2.5%	0.2%	2.8%
Kelowna	43,000	66,300	60,500	54.2%	-8.8%	40.6%	12.2%	18.1%	15.5%	5.9%	-2.5%	3.4%
Other Central Ok.	13,500	18,200	16,900	34.9%	-7.1%	25.3%	8.3%	10.0%	9.5%	1.7%	-0.5%	1.2%
Active Modes (Bicycle + Walk)**												
Study Area	46,600	69,700	64,100	49.5%	-8.0%	37.5%	7.3%	10.3%	9.4%	3.0%	-0.9%	2.0%
Vernon	9,300	14,400	13,300	53.8%	-7.6%	42.1%	7.8%	11.3%	11.2%	3.4%	0.0%	3.4%
Kelowna	31,000	46,000	41,100	48.3%	-10.6%	32.6%	8.8%	12.5%	10.6%	3.7%	-1.9%	1.8%
Other Central Ok.	6,200	9,300	9,700	49.2%	3.8%	54.8%	3.9%	5.1%	5.4%	1.3%	0.3%	1.6%

* Interpret 2013 sustainable counts and mode shares with caution: transit use in 2013 may be somewhat over-stated. See Section 4.5.3 of this report.

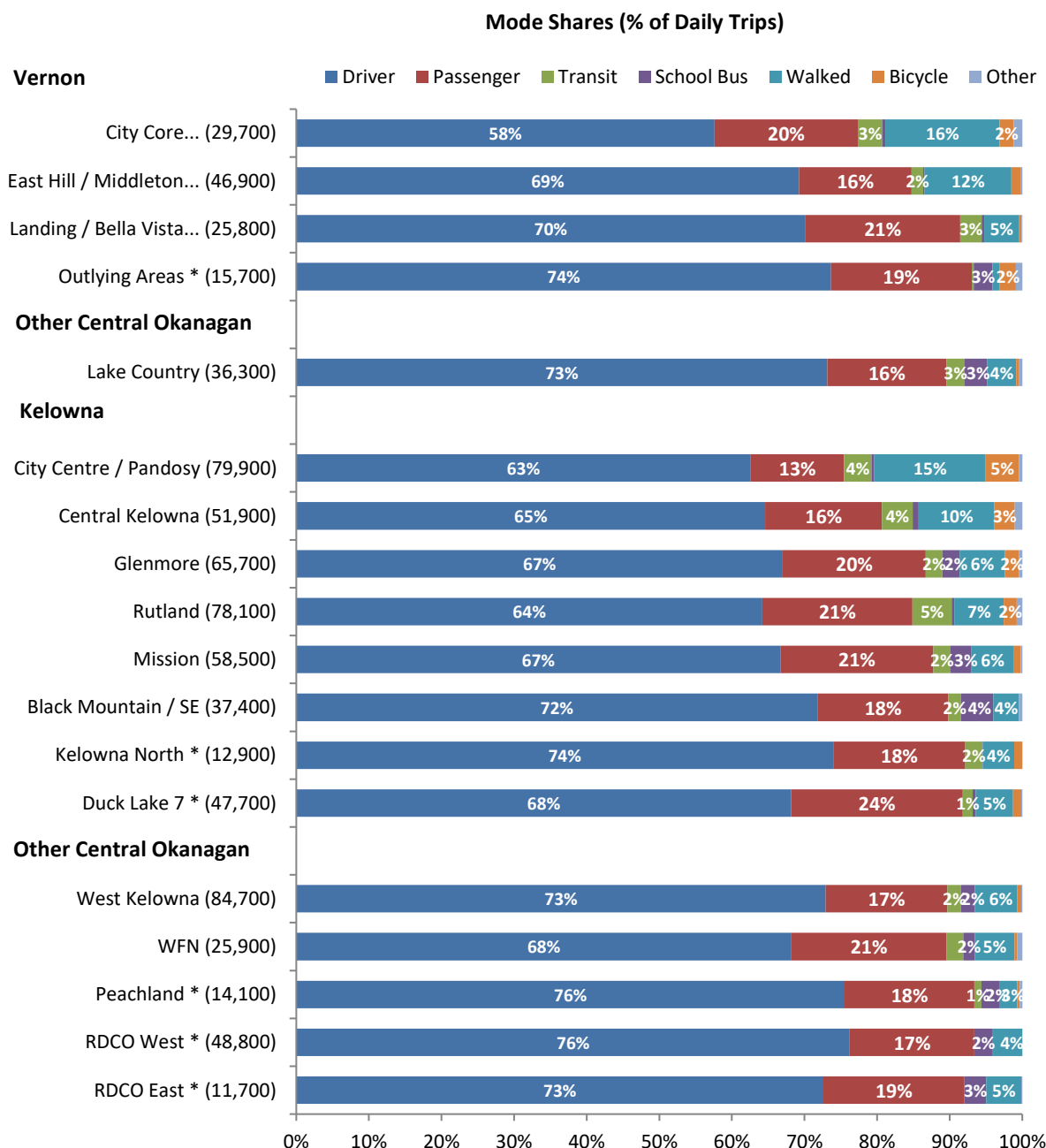
** Interpret with caution: the surveys were conducted at different times of year (2007: April-May; 2013: Sept-Nov; 2018: Oct-Dec). See Section 4.5.4



4.5.6 Mode Shares by District of Residence

The chart below highlights the variation in mode shares by district within each sub-area (**Figure 47**). The figures in brackets on the right indicate the expanded number of trips made by residents of each district.

Figure 47. Mode Shares by District, 2018



* Results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.



4.5.7 Mode Shares by Age Group

The following two tables illustrate travel mode shares by age group ([Table 26](#)), and estimated volumes of trips by mode ([Table 26](#)). For the latter table, readers are reminded that trip volumes presented are estimated volumes based on weighted survey data, not exact counts. In both tables, age groups are organized into ten-year ranges, with the exception of 15 to 19 and 20 to 24 which are split out to highlight distinct differences in mode shares, and 85+ which aggregates all of the smaller-population age ranges above 85 years.

The survey results reveal the following:

- Over two-thirds of trips made by those 5-14 years are as auto passengers, and 11% are via school bus, with the highest walk share of any age group, at 18%.
- Amongst 15-19 year olds, just over one-quarter (27%) of trips are as auto drivers, one-third are as passengers, while 14% are via transit bus, the highest reliance on transit of any age group. Walk shares are also high, at 14%.
- Amongst 20-24 year olds, driving trips are dominant at two-thirds of all trips, passenger trips drop to 12%. This age group shows the second-highest reliance of transit, at a 13% share of all trips.
- Amongst 25-34 year olds, driving trips are dominant at three-quarters of all trips, and transit drops to a little over 3%.
- Cycling mode shares are highest for those 25-34 and 35-44 (at 2.4% of trips for each age range).
- Those between 35 and 54 years (20-year span) show peak reliance on auto driving. Driving trips account for the vast majority of all trips (ranging from 82% to 83%), with passenger trips dropping to 7%-8%, and walking shares dropping to 6% starting at age 45-54. Transit trips are a very small minority for all age ranges above 35 years of age.
- For age ranges from 64 years up, as age increases, there is a modest decrease in reliance on auto driver trips (dropping from three-quarters for 65-74 to two-thirds for ages 85+), though they are still the majority, and increased reliance on passenger trips. Walking mode shares decline from 6% to 4% starting at age 75-84.

The charts that follow the tables ([Figure 48](#), page 102) track changes in mode share by age cohort over time. The following observations can be made:

- From 2007 to 2018, overall, there is a noticeable reduction in auto driver mode shares for age cohorts between 15 and 44, with some fluctuation between in 2013 and 2018 depending on the age group. There is just a slight reduction amongst those in age cohorts from 45 through 75.
- Transit mode shares show a marked increase from 2007 to 2018 amongst youth in the 15 to 19 and 20 to 24 cohorts, and little new uptake amongst those over the age of 35.



- Walk mode shares show an increase amongst children in the 5 to 14 and 15 to 19 cohorts, although this is offset by decreases in bicycle mode shares. As discussed earlier in Section 4.5.4, the later start to the 2018 survey may affect the comparability of the data sets with respect to this mode. Combining both of these active transportation modes shows a more even trend. While the timing of the survey cycles makes it somewhat more difficult to draw conclusions from the longitudinal comparison, the patterns presented here do provide an insight: it appears that as the weather turns in the fall, bicycle trips amongst children under 20 years of age appear to be likely replaced by other active travel in the form of walking trips. Overall, in the 11 years from 2007 to 2018 there appears to have been an increase in active mode shares for most age groups, albeit with levels higher in 2013 than in 2018 for some age groups (which might be influenced by the dampening effect of colder weather at the time of the 2018 survey).

Table 25. Mode Shares by Age Group – Study Area, 2018

Age	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Survey Total	684,800	67.8%	18.0%	2.8%	1.6%	7.8%	1.6%	0.5%
5 to 14 years	65,200	-	67.4%	2.2%	10.8%	18.0%	1.5%	0.2%
15 to 19 years	31,700	27.1%	33.4%	13.8%	10.7%	13.7%	1.4%	-
20 to 24 years	33,100	65.9%	12.4%	12.9%	-	6.5%	1.5%	0.9%
25 to 34 years	84,300	73.8%	11.2%	3.4%	0.1%	8.8%	2.4%	0.4%
35 to 44 years	102,900	81.8%	6.9%	1.5%	-	7.1%	2.4%	0.3%
45 to 54 years	116,000	82.8%	8.2%	1.5%	0.1%	5.8%	1.1%	0.6%
55 to 64 years	111,300	78.5%	12.2%	1.2%	0.1%	5.8%	1.8%	0.5%
65 to 74 years	85,500	75.8%	15.5%	0.9%	0.0%	5.8%	1.3%	0.6%
75 to 84 years	44,500	73.2%	20.5%	1.3%	0.1%	4.1%	0.3%	0.6%
85+ years	10,200	66.5%	25.8%	2.5%	-	3.2%	-	2.0%

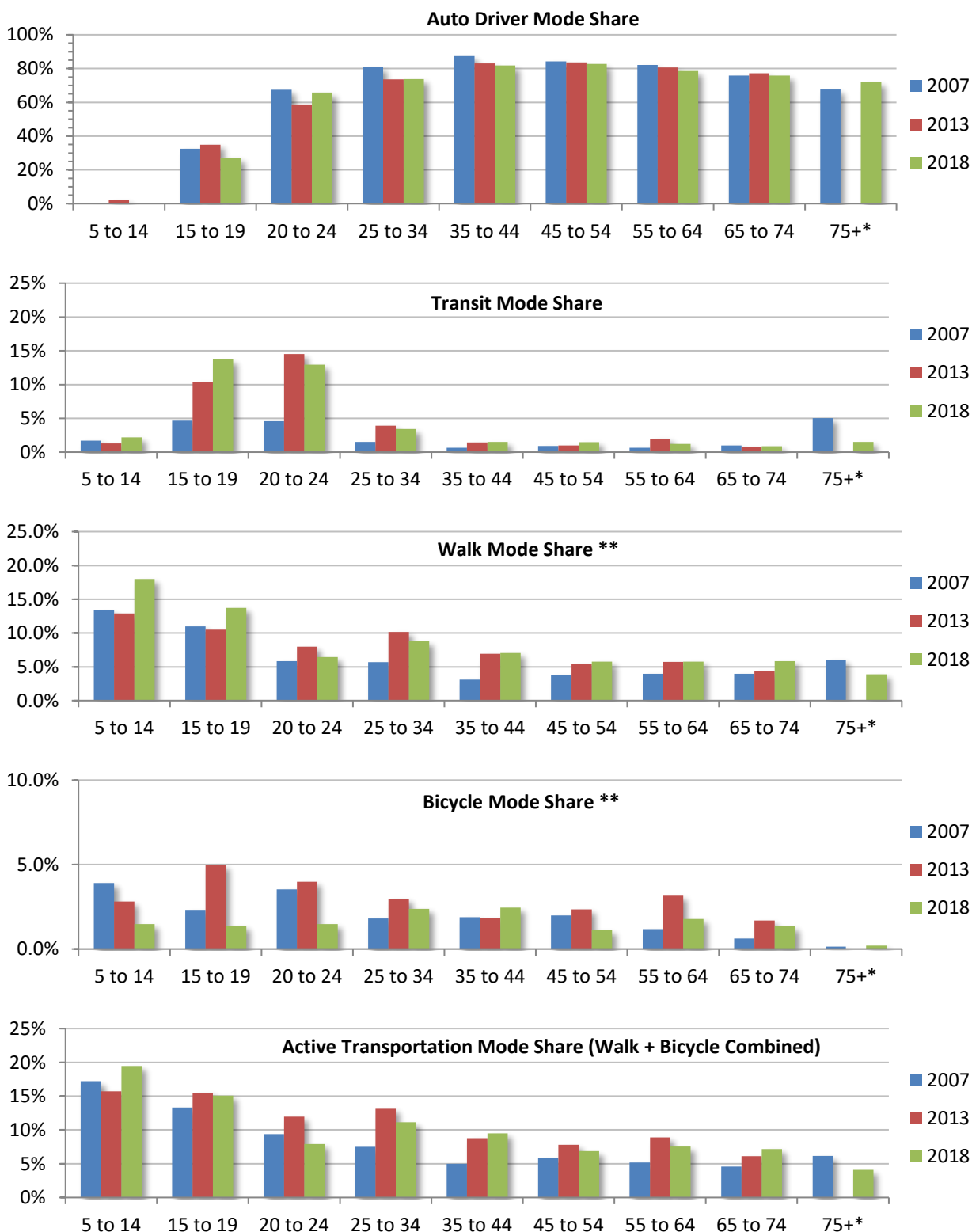
Table 26. Estimated Daily Volume of Trips by Mode by Age Group – Study Area, 2018

Age	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Survey Total	684,800	464,300	123,300	19,100	10,700	53,100	11,000	3,300
5 to 14 years	65,200	-	43,900	1,400	7,000	11,700	1,000	100
15 to 19 years	31,700	8,600	10,600	4,400	3,400	4,300	400	-
20 to 24 years	33,100	21,800	4,100	4,300	-	2,100	500	300
25 to 34 years	84,300	62,200	9,400	2,900	<50	7,400	2,000	400
35 to 44 years	102,900	84,100	7,100	1,500	-	7,300	2,500	300
45 to 54 years	116,000	96,000	9,600	1,700	100	6,700	1,300	700
55 to 64 years	111,300	87,300	13,600	1,300	100	6,400	2,000	500
65 to 74 years	85,500	64,800	13,300	800	<50	5,000	1,100	500
75 to 84 years	44,500	32,600	9,100	600	100	1,800	100	300
85+ years	10,200	6,800	2,600	300	-	300	-	200

Expanded trip estimates are rounded to the closest 100.



Figure 48. Mode Share Changes by Age, 2007-2018



* 2013 results for 75+ removed due to smaller samples. ** Walk and bicycle shares are likely to have been affected by different weather conditions when surveyed: the 2007 survey was Apr. 13-May18; 2013 was Sept 24-Nov. 30; and 2018 was Oct. 24-Dec 21.



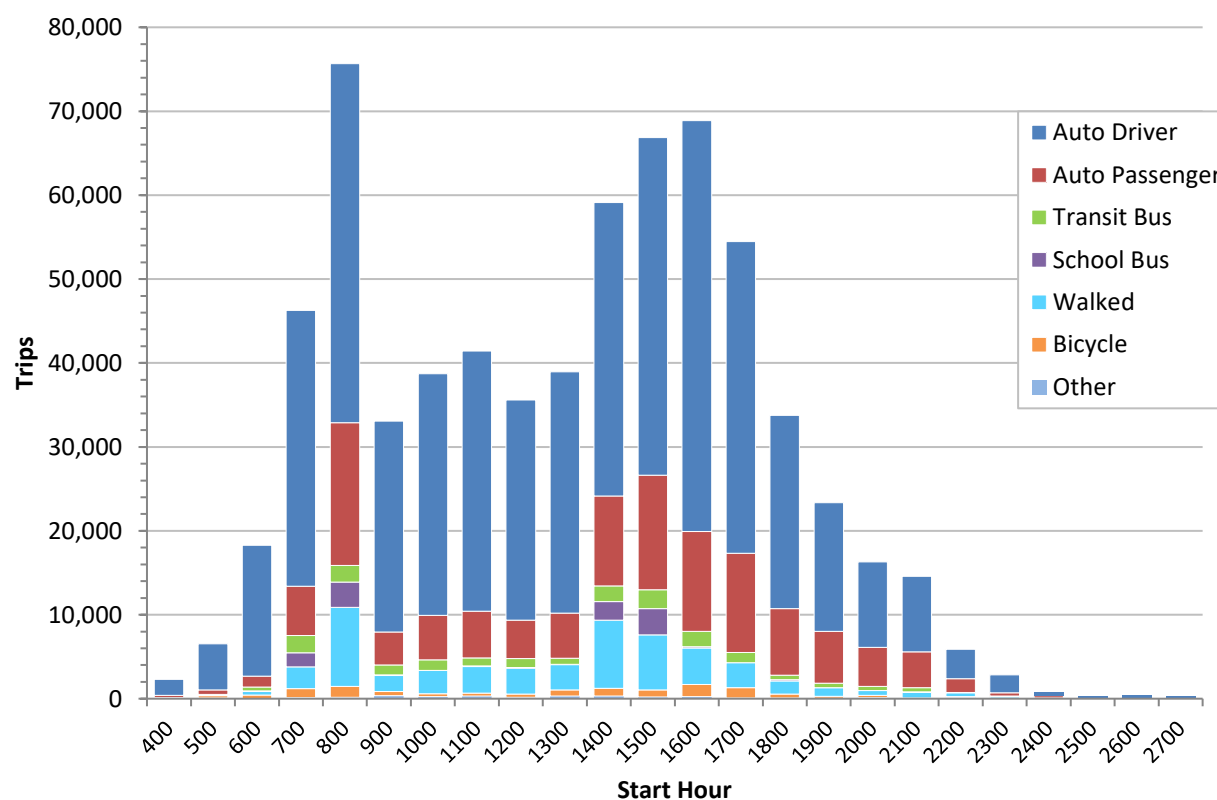
4.5.8 Trip Mode by Start Hour

The hourly distribution of trips by mode is presented in **Figure 49**. Auto driver trips are the dominant mode for every hour of the day. During the morning peak hour at starting at 8 AM, there are almost 42,800 auto driver trips. However, proportionately, auto driver trips comprise only 57% of all trips during that hour (vs. the 24-hour average of a 68%) since auto passenger, transit bus, school bus, walking, and cycling trips either peak or are at near their daily peak during in this hour. The highest volume of auto driver trips (49,000) is in the hour starting at 4 PM. Auto passenger trips peak at 17,000 during the hour starting at 8 AM. Walking trips peak in the hour starting at 8 AM (9,400 trips) and again at 2 PM (8,100 trips).

Transit mode shares are the greatest between 7 AM and 9 AM, at about 2,000 transit trips each hour, and again between 2 PM and 5 PM, with volumes ranging from 1,800 to 2,300 trips in each of the three hours (with the peak of 2,300 in the hour starting at 3 PM).

Cycling trips are highest in the two hours between 7 AM and 9 AM (1,000-1,300 trips each hour) and again between 4 PM and 6 PM (1,500-1,200 trips each hour), with volumes of 700 to 900 trips per hour between 1 PM and 4 PM. As noted elsewhere, cycling volumes may be higher than this during warmer weather earlier in the fall (as the 2018 survey started collecting travel data October 24).

Figure 49. Trips by Mode by Start Hour – Study Area, 2018



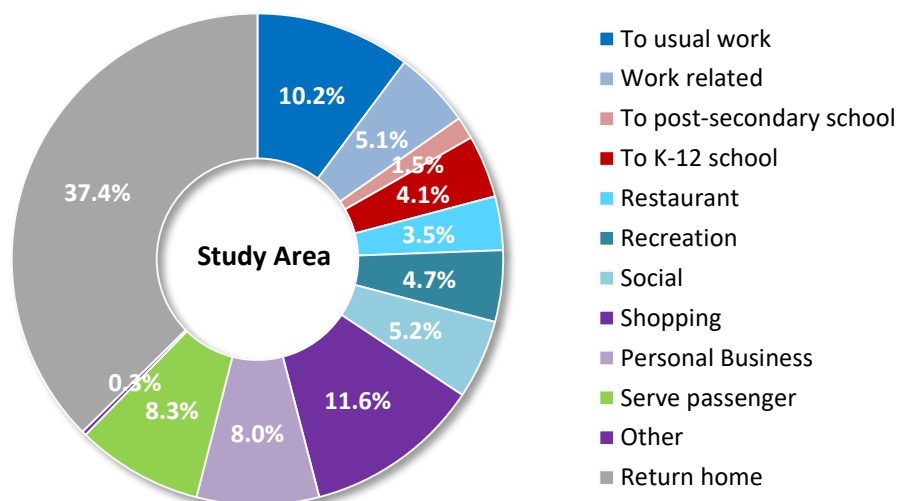
The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).



4.6 Trip Purpose

Trips to work and work-related destinations account for a total of 15% of all trips, followed by shopping at 12%, personal business at 8% (Figure 50). Trips to social and recreational destinations account for about 5% each. Trips to school account for a little under 6%, while trips to serve passengers (pick-up or drop-off) account for 8% (with many of those trips being to school or work of other household members). Of the total, 37% of trips are returning home from these various destinations. The patterns for the three sub-areas all have a very similar profile (Table 27), with a few variations. Vernon residents have proportionately fewer work, work-related, school, and restaurant trips and more social, shopping, and personal business trips, which is consistent with the older demographics of this community. Kelowna, on the other hand has proportionately more work and school related trips. The Other Central Okanagan area has the greatest percentage of work-related trips, which may reflect the overall profile of jobs held by these residents (with more workers reporting not having a fixed workplace address).

Figure 50. Trips Purposes – Study Area, 2018



*Work-related may include business errands, meetings, or trips to worksites for workers without a usual workplace.

Table 27. Trips Purposes (Trips and % of Trips) by Sub-Area, 2018

Geography	Total	To usual work	Work related*	To post-secondary school	To K-12 school	Restaurant	Recreation	Social	Shopping	Personal Business	Serve passenger	Other	Return home
Daily Trips													
Study Area	684,800	69,900	34,800	10,100	28,200	24,200	32,100	35,700	79,700	55,100	57,100	1,900	256,000
Vernon	118,100	11,000	5,100	1,200	4,500	3,600	5,900	6,400	14,600	10,800	10,300	500	44,100
Kelowna	389,000	41,800	18,600	6,700	15,700	13,900	19,300	20,300	43,200	29,500	32,900	1,300	145,700
Other Central Ok.	177,700	17,100	11,000	2,100	8,000	6,700	7,000	8,900	21,800	14,800	13,900	200	66,200
% of Trips													
Study Area	100%	10.2%	5.1%	1.5%	4.1%	3.5%	4.7%	5.2%	11.6%	8.0%	8.3%	0.3%	37.4%
Vernon	100%	9.4%	4.4%	1.0%	3.8%	3.1%	5.0%	5.5%	12.3%	9.1%	8.7%	0.4%	37.3%
Kelowna	100%	10.7%	4.8%	1.7%	4.0%	3.6%	5.0%	5.2%	11.1%	7.6%	8.5%	0.3%	37.5%
Other Central Ok.	100%	9.6%	6.2%	1.2%	4.5%	3.8%	3.9%	5.0%	12.3%	8.3%	7.8%	0.1%	37.2%

Expanded trip estimates are rounded to the closest 100. *Work-related: business errands, meetings, or trips to worksites for workers without a usual workplace.



4.6.1 Trip Purposes, 2007-2018

The table below highlights trends in trip purposes over time (Table 28). Given that there may have been differences in how trips recorded as 'other purpose' were treated or recoded in the data processing, some of the year-over-year comparisons may be difficult to interpret for discretionary trip purposes (such as recreation, social, and personal business). Readers are reminded that some fluctuations between survey cycles may be the product of random sampling or differences in methodology. Nevertheless, some trends do emerge with respect to work and school purposes:

- Overall, from 2007 to 2018, the total number of trips to work or for work-related purposes have diminished (a 7% decrease over the entire 11 years, despite a modest increase in the last five years since 2013). This compares with a 14% increase in workers and 19% increase in population over this period. This may be due in part to demographic trends (aging of the population, net in-migration of retirees settling in the area) and in part due to the changing nature of work, such as a possible increase in flexible work arrangements or telecommuting.
- The overall number of school trips has increased 15% over 11 years. This is consistent with the population growth in school-age children and youth lagging behind total population increase.
- Of note, the increase in the proportion of trips that are 'return home' trips may suggest that residents may be undertaking fewer individual trips on each outing that they undertake.

Table 28. Trips Purposes (Trips and % of Trips), 2007-2018

	Total Trips	To Usual Work or Work Related	To post-secondary school*	To K-12 school*	Restaurant	Recreation	Social	Shopping	Personal Business	Serve passenger	Other / Unknown **	Return home
Trips												
2007	634,200	112,700	33,300*		22,600	28,900	24,000	75,000	36,800	52,600	28,800	219,500
2013	675,900	101,700	10,200	26,400	19,400	34,600	33,500	75,200	53,800	55,600	24,000	241,600
2018	684,800	104,700	10,100	28,200	24,200	32,100	35,700	79,700	55,100	57,100	1,900	256,000
% Change in Trips												
'07-'13 (6-yr change)	+7%	-10%	+10%*		-14%	+20%	+40%	0%	+46%	+6%	-16%	+10%
'13-18 (5-yr change)	+1%	+3%	-1%	+7%	+25%	-7%	+6%	+6%	+3%	+3%	-92%**	+6%
'07-'18 (11-yr change)	+8%	-7%	+15%*		+7%	+11%	+49%	+6%	+50%	+9%	-93%**	+17%
% of Trips												
2007	100%	17.8%	5.3%*		3.6%	4.6%	3.8%	11.8%	5.8%	8.3%	4.5%	34.6%
2013	100%	15.1%	1.5%	3.9%	2.9%	5.1%	5.0%	11.1%	8.0%	8.2%	3.6%	35.7%
2018	100%	15.3%	1.5%	4.1%	3.5%	4.7%	5.2%	11.6%	8.0%	8.3%	0.3%	37.4%
%-Pt Change												
'07-'13 (6-yr change)		-2.7%	+0.2%*		-0.7%	+0.6%	+1.2%	-0.7%	+2.2%	-0.1%	-1.0%	+1.1%
'13-18 (5-yr change)		+0.2%	0.0%	+0.2%	+0.7%	-0.4%	+0.2%	+0.5%	+0.1%	+0.1%	-3.3%**	+1.6%
'07-'18 (11-yr change)		-2.5%	+0.3%*		0.0%	+0.1%	+1.4%	-0.2%	+2.3%	0.0%	-4.3%**	+2.8%

* The 2007 survey did not record school type, so school types have been aggregated for the 2007-2013 and 2007-2018 comparisons.

** 2007 and 2013 surveys had 4.5% and 3.6% of trips with 'other' or unknown purpose, whereas the 2018 survey had few trips (0.3%) that could not be coded to a specific category. It is possible that many of the 2007 and 2013 trips with other or unknown purpose were discretionary trips with actual purposes such as serve passenger, recreation, social, or personal business. Interpretation of the categories by respondents or in data processing may also be a factor. Given this, year-to-year comparisons for the various discretionary trip purposes should be interpreted with caution, and there may be some impact on the comparisons for individual trip purposes.



4.6.2 Trend in Daily Number of People with Work Commutes

Given the overall decrease in trips to work or for work-related purposes, it is of interest to focus in on whether the number of workers travelling to or for work has changed similarly. As illustrated in [Table 29](#), the number of full-time workers has grown 14% in the 11 years since 2007, while the number of full-time workers who took at least one work trip (to work or for a work-related purpose) has also increased by 14% over this time period. Overall, 78% of full-time workers reported a work trip on their travel day. The story is different for part-time workers, the number of which increased by 15% since 2007 but with only a 4% increase in the number reporting travelling for work at 4%. Proportionately fewer part-time workers reported at least one trip to work in 2018 (44%) as compared to 2007 (50%). This is not enough to explain the drop in the total number of trips to work or with work-related purposes presented in the preceding section. Possible reasons may include a drop in the number of trips for work-related purposes while at work or under-reporting of work-related trips or discretionary trips while at work (e.g., going to get lunch and returning to work). The 2018 survey also asked workers who did not travel to work why not ([Table 30](#)). The results reveal that on an average weekday 7% of full-time workers and 11% of part-time workers either work from home or telecommute.

Table 29. Workers with at Least One Work Trip, 2007-2018

	# of Workers			% change		
	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
Workers						
Full-time	78,200	81,600	89,100	+4%	+9%	+14%
Part-time	24,000	25,500	27,500	+6%	+8%	+15%
Total	102,200	107,000	116,700	+5%	+9%	+14%
Workers with at least 1 work trip						
Full-time	61,200	62,200	69,500	+2%	+12%	+14%
Part-time	11,900	10,000	12,400	-15%	+24%	+4%
Total	73,100	72,300	81,900	-1%	+13%	+12%
	% of Workers			%pt change		
	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
Workers with at least 1 work trip						
Full time workers	78%	76%	78%	-2%	+2%	0%
Part time workers	50%	39%	44%	-10%	+6%	-4%
Total Workers	71%	68%	70%	-4%	+3%	-1%

*Excludes trips with work purpose for people who were not reported as employed. Such trips may be a result of errors in reported trip purpose (e.g., reporting 'work-related' when travelling for volunteer work) or reported employment status.

Table 30. Reasons for not Travelling to Work, 2007-2018

% of Workers Who...	Full-Time	Part-Time	Total
Went to work or had work related trip	78%	44%	70%
Worked from home / telecommuted	7%	11%	8%
Out of town / away on business	3%	2%	3%
Sick/ill or caring for other sick/ill household member	1%	1%	1%
Other reason	0%	1%	1%
Not scheduled / did not work	10%	41%	18%

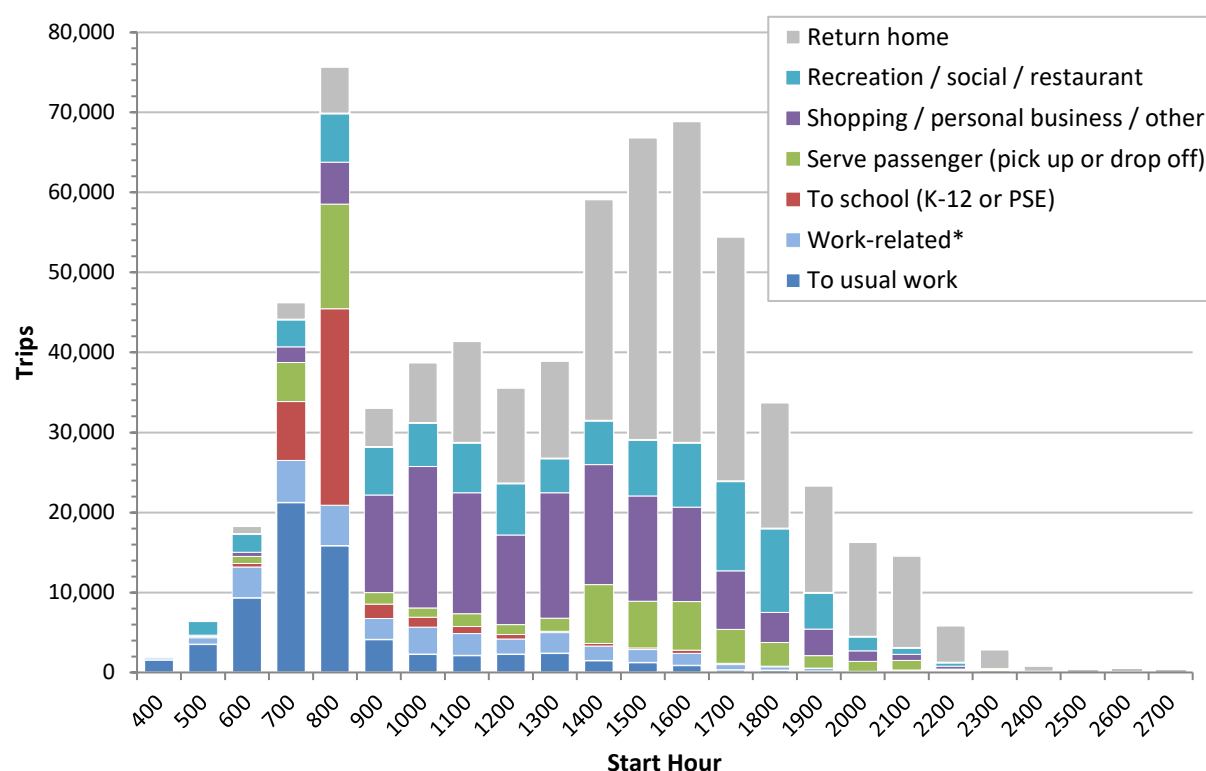


4.6.3 Trip Purpose by Start Hour

Figure 51 provides another view of daily trips, illustrating the distribution of trip purposes by time of day (by one-hour interval based on the time of departure). Some trip purposes have been grouped to reduce the number of categories displayed in the chart.

This classic profile has a concentrated AM peak dominated by commute trips to work and school, as well as related trips to drop off passengers, ending by 9 AM. Other kinds of trip purposes such as shopping and personal business begin to increase by 10 AM. The extended PM peak, which begins mid-afternoon, is dominated by return-home trips, but with notable proportions of trips with pick-up/drop-off, shopping/personal business and social/recreational purposes.

Figure 51. Trips by Grouped Purposes by Start Hour – Study Area, 2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

*Work-related may include business errands, meetings, or trips to worksites for those without a usual workplace.



4.6.4 Mode Shares by Trip Purpose

Mode shares and volumes by trip purpose are presented in the following two tables ([Table 31](#), [Table 32](#)). The survey results illustrate the predominance of driving as a travel mode for work commutes (with four out of five trips to a usual workplace outside the home), while the small auto passenger share (5%) for underlines the fact that most work commutes are in single-passenger vehicles. Transit is important for a good portion (31%) of post-secondary school commutes, although it may be noted that despite the existence of a free U-Pass system for public post-secondary students, 50% of trips to post-secondary school are as an auto driver. Of note, travel to post-secondary school is the single most common use of the transit system: 3,100 out of 19,100 transit trips, with presumably a similar number of associated return-home trips. Also of note, while walking and school buses are important for K-12 school commutes (17% and 22% mode shares), just over half of trips to school are as an auto passenger (53%).

Table 31. Mode Shares by Trip Purpose – Study Area, 2018

Trip Purpose	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Total Trips	684,800	67.8%	18.0%	2.8%	1.6%	7.8%	1.6%	0.5%
To usual work	69,900	80.3%	5.3%	3.1%	0.1%	7.0%	3.6%	0.6%
Work related*	34,800	85.2%	7.7%	1.7%	0.2%	3.7%	1.0%	0.5%
To post-secondary school	10,100	49.9%	11.7%	30.8%	-	5.2%	1.4%	1.0%
To K-12 school	28,200	1.9%	53.3%	3.9%	17.4%	21.8%	1.8%	-
Restaurant	24,200	63.3%	22.7%	0.8%	-	11.9%	0.6%	0.7%
Recreation	32,100	65.3%	22.5%	1.6%	0.0%	8.0%	2.3%	0.2%
Social	35,700	62.0%	25.1%	2.3%	0.8%	7.8%	1.2%	0.9%
Shopping	79,700	73.4%	16.8%	2.1%	0.0%	6.7%	0.8%	0.2%
Personal Business	55,100	72.4%	18.3%	1.2%	0.2%	5.5%	1.4%	0.9%
Serve passenger	57,100	81.1%	13.4%	0.2%	0.2%	4.7%	0.4%	0.1%
Other	1,900	28.4%	22.0%	3.2%	14.4%	30.6%	0.0%	1.4%
Return home	256,000	66.1%	18.6%	3.2%	1.9%	8.0%	1.8%	0.5%

*Work-related may include business errands, meetings, or trips to worksites for those without a usual workplace.

Table 32. Estimated Daily Volume of Trips by Mode by Trip Purpose – Study Area, 2018

Trip Purpose	Total Trips	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other
Total Trips	684,800	464,300	123,300	19,100	10,700	53,100	11,000	3,300
To usual work	69,900	56,100	3,700	2,200	100	4,900	2,500	400
Work related*	34,800	29,700	2,700	600	100	1,300	300	200
To post-secondary school	10,100	5,000	1,200	3,100	-	500	100	100
To K-12 school	28,200	500	15,000	1,100	4,900	6,100	500	-
Restaurant	24,200	15,300	5,500	200	-	2,900	200	200
Recreation	32,100	21,000	7,200	500	<50	2,600	800	100
Social	35,700	22,100	8,900	800	300	2,800	400	300
Shopping	79,700	58,500	13,400	1,700	<50	5,400	600	200
Personal Business	55,100	39,900	10,100	700	100	3,000	800	500
Serve passenger	57,100	46,300	7,600	100	100	2,700	200	100
Other	1,900	600	400	100	300	600	-	<50
Return home	256,000	169,300	47,600	8,100	4,800	20,400	4,500	1,300

Expanded trip estimates are rounded to the closest 100. *Work-related: business errands, meetings, or trips to worksites for workers without a usual workplace.



4.6.1 Home-Based Trip Purposes

The preceding sections examine trip purposes in terms of the reporting destination activity. It can also be useful to examine trips in terms of an overall purpose as identified from looking at both the origin and the destination. The following four ‘home-based purpose’ categories take into account both the origin and destination location or purpose: home-based work (HBW), home-based school (HBS), home-based other (HBO), and non-home-based (NHB). These categories or ones similar to them are often used in the development of transportation models. Table 33 presents the trip distributions for each of the sub-areas in 2018, while Table 34 highlights the change across the study area since 2007.

Overall, HBW trips account for 19% of all trips, while HBS accounts for half that. The largest category is HBO trips at 46%, followed by NHB (the trips between destinations away from home) at 25%. Looking at the results over time, the apparent increase in the share of HBO trips and reduction in the share NHB trips should be interpreted with caution, as a portion of the change may be the result of methodological differences,²³ as much as the result of other trends explored elsewhere in this report (changes in age distribution, work patterns, leisure and shopping patterns, and trip rates).

Table 33. Home-Based Trip Purposes, 2018

Purpose		Study Area	Vernon	Kelowna	Other Central Ok.
Total Trips		684,800	118,100	389,000	177,700
# of Trips	HBW	131,700	20,800	76,700	34,200
	HBS	65,600	9,900	38,500	17,300
	HBO	315,300	57,200	177,300	80,800
	NHB	172,200	30,200	96,600	45,400
% of Trips	HBW	19.2%	17.6%	19.7%	19.2%
	HBS	9.6%	8.3%	9.9%	9.7%
	HBO	46.0%	48.4%	45.6%	45.5%
	NHB	25.1%	25.6%	24.8%	25.5%

Table 34. Home-Based Trip Purposes – Study Area, 2007-2018

Purpose	2007	2013	2018	Change:	2007-2013 (6-Year)	2013-2018 (5-Year)	2007-2013 (11-Year)
Total Trips	634,200	675,900	684,800		+6.6%	+1.3%	+8.0%
#	HBW	126,500	125,200	131,700	% Change	-1.0%	+4.1%
	HBS	54,900	58,200	65,600		+6.0%	+19.6%
	HBO	269,000	305,400	315,300		+13.5%	+17.2%
	NHB	183,800	187,200	172,200		+1.8%	-6.3%
%	HBW	19.9%	18.5%	19.2%	%Pt Change	-1.4%	-0.7%
	HBS	8.7%	8.6%	9.6%		0.0%	+0.9%
	HBO	42.4%	45.2%	46.0%		+2.8%	+3.6%
	NHB	29.0%	27.7%	25.1%		-1.3%	-3.8%

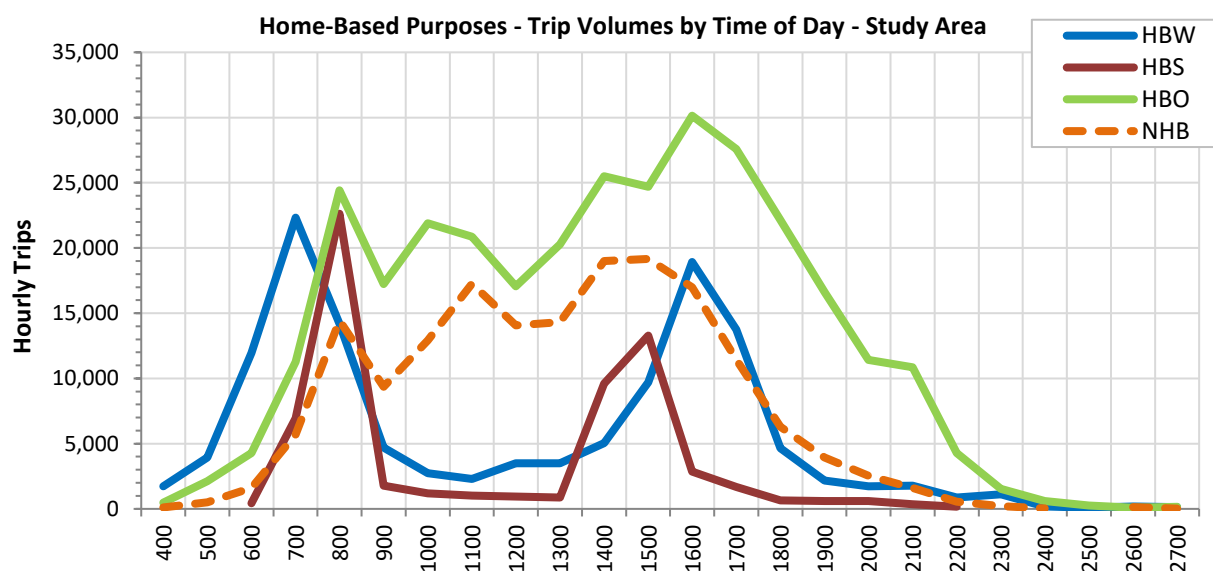
²³ On the one hand, it is possible that the trip diary approach used in 2007 and 2013 may have resulted in the capture of more discretionary NHB trips such as other householders going somewhere for a lunch break which the primary respondent in the 2018 survey method might not be aware of. On the other hand, the 2018 survey took a rigorous approach to correcting ‘return home’ trip purposes that went to the same location coordinates of home but stated a different purpose (such as going home to pick someone up or for recreation), whereas this approach might not have been undertaken in the earlier surveys.



Looking at the trips for different home-based purposes by hour across the day (**Figure 52**) reveals a more complete picture of travel patterns than just looking at purposes at the destination end, as the return-home trips get categorized by the previous activity (at the trip origin).²⁴

- The survey results show a morning peak in HBW trips in the hour starting at 7 AM and an afternoon peak in the hour starting at 4 PM, with a considerable volume in the 5 PM hour also.
- HBS trips peak at 8 AM, with the afternoon peak HBS trips spread across two hours, 2 PM and 3 PM, likely the result of different school day end times at different types of school.
- HBO trips also peak at 8 AM in the morning, then are steady throughout the day, and peak again across two hours from 5 PM to 6 PM. A portion of the HBO trips during the morning and afternoon peaks may be part of work and school commutes if there is a stop along the way for another purpose in between home and the commute destination.
- Non home-based trips are spread throughout the daytime, dying down after 5 PM. A portion of such trips may be the result of trips made between work or school and another activity.

Figure 52. Home-Based Trip Purposes by Time of Day – Study Area, 2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).

HBW = home-based work/work-related. HBS = home-based school (K-12 or PSE). HBO = home-based other. NHB = non-home-based.

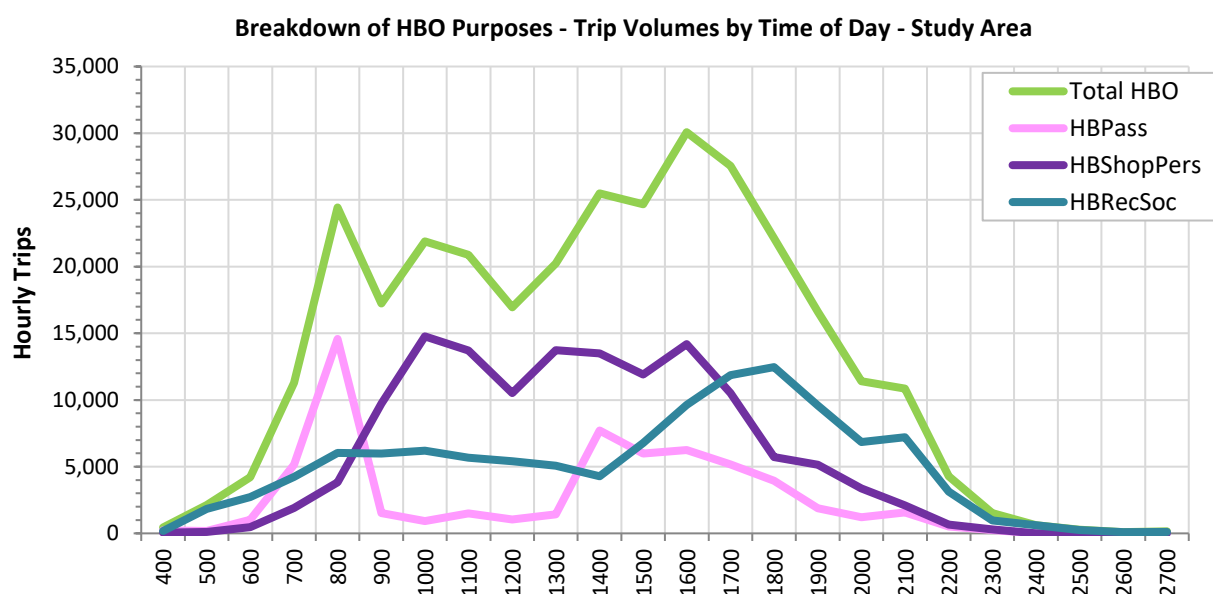
²⁴ It may be noted that HBW and HBS categorizations do not necessarily capture all commute-related trips. Commutes that stop along the way (e.g., to grab a coffee or drop of/pick up a child at school) are split into HBO trips between home and the stop along the way, and NHB trips between work/school and the stop. Even so, HBW and HBS trips should provide a good picture of commute patterns without undertaking more complex tour identification work (not part of the research scope).



Figure 53 provides a breakdown of just the HBO trips into HBPass, home-based serve passenger (pick-up or drop off trips); HBShopPers, home-based shopping and personal business; and HBRecSoc, home-based recreational, social, and restaurant trips.

This breakdown reveals that home-based trips to serve passengers peak in the morning at the same time as the school trips peak (see previous chart) but when they pick up again at 2 PM, they are spread across the afternoon and early evening. The majority of shopping and personal business related trips that leave or return to home are spread from 10 AM to 5 PM. Social, recreational, and restaurant trips have modest volumes from the morning through early afternoon, but starting at 4 PM they rise to a peak at 6 PM which declines steadily until 10 PM.

Figure 53. Breakdown of Home-Based Other (HBO) Purposes by Time of Day – Study Area, 2018



The surveyed travel day begins at 0400 (4:00 AM) and ends at 2759 (3:59 AM the following day).
 HBO = home-based other. HBPass = home-based serve passenger (pick up or drop off someone else).
 HBShopPers = shopping, personal business (medical appointment, banking, personal care, etc.), other
 HBRecSoc = recreation, social outing, restaurant (whether eat-in or take out)
 Chart excludes HBW, HBS, and NHB trips (see previous chart).



4.7 Vehicle Occupancy

The survey asked respondents who reported auto driver trips to indicate the total number of vehicle occupants, including the driver. The survey results for the study area are reported in [Figure 54](#).

As illustrated, three-quarters of all vehicle trips (74%) were in single-occupant vehicles (SOVs). One-fifth of trips were two-person high-occupancy vehicle trips (HOV-2), while only 6% had three or more vehicle occupants (HOV-3). The average vehicle occupancy in 2018 was 1.35 occupants per vehicle.

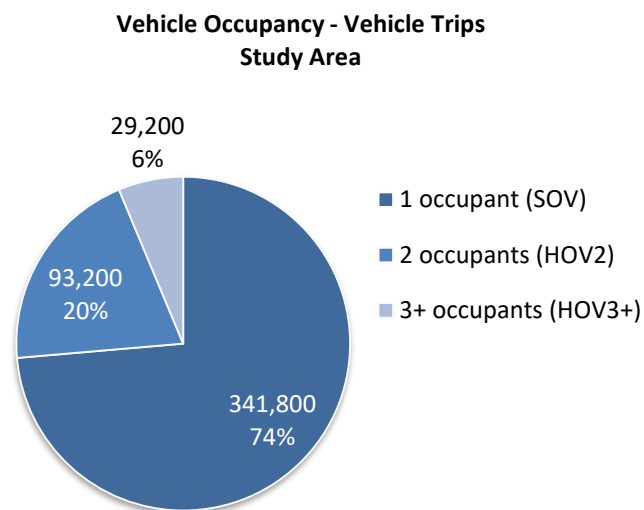
Both the distribution of SOV, HOV-2, and HOV-3+ vehicle trips and the average vehicle occupancy were virtually identical to the survey average for Vernon, Kelowna, and Other Central Okanagan.

When the data for the districts within each of the sub-areas were examined, the average vehicle occupancy was remarkably uniform at around the average, with only a few exceptions (ranging from a low of 1.28 for resident of both Kelowna City Core/Pandosy and Central Kelowna, perhaps related to the higher proportions of workers and smaller households, to 1.42 in Mission, perhaps related to the higher average household size).

Comparisons were not made with the previous survey cycles because the 2007 survey did not collect information on vehicle occupancy and the 2013 survey data were missing responses for a number of auto driver trips. The fact that the mode share for auto passenger trips in 2018 was about the same in 2007 and a bit lower in 2013 (see [Section 4.5.2](#)) suggests that vehicle occupancy is likely about the same as in 2007 and slightly higher than in 2013.

Readers are reminded that the figures above are based only on trips made via vehicles available to the household. These trips may have included some work-related travel for business meetings, errands, or in the case of people who drive as part of their living, their first trip to their first worksite, but would not have captured commercial travel.

Figure 54. Vehicle Occupancy – Study Area, 2007-2018





4.8 Transit Boardings and Transit Access Modes

Table 35 provides information on transit trips made in the study area. The 2018 survey results suggest transit ridership of just over 19,100 person-trips, with just over 23,800 bus boardings in total across both the Kelowna Regional Transit System and Vernon Regional Transit System. In total, about 23% of trips involved transfers, but very few involved more than one transfer. The proportion varies by geography. Transit riders who reside in the Vernon and the Other Central Okanagan sub-areas are more likely to take more than one bus route in a single trip (with 41% and 38% of trips, respectively, requiring either one or more transfers).

A portion of transit riders travel to (or from) their boarding (or alighting) bus stop via a mode other than walking. Overall, just over one-tenth (11%) of transit trips entail modes other than walking: 4% drive-access transit ('park and ride'), with this being more than twice as common in Kelowna and Other Central Okanagan compared to Vernon; almost 6% drive-access passenger ('kiss and ride' or taxi), most common in Other Central Okanagan; and 1% bicycle-access transit, observed only in the survey data only amongst Kelowna residents.

The table on the next page (**Table 36**) provides a breakdown of the expanded survey data on transit routes reported by respondents living in the different sub-areas. The table has been provided to illustrate the survey results, which are based on a relatively small sample of transit users (n=308 persons out of an estimated daily 10,600 daily users). These results not been validated against actual boarding counts by route and may or may not be representative of actual route usage by the entire population.

Readers are also referred to **Section 4.5.3** earlier in this report for trends in ridership counts since 2007.

Table 35. Number of Bus Routes Taken, Transit Access Modes, 2018

	Survey Total	Vernon Residents	Kelowna Residents	Other Central Ok. Residents
Transit Trips	19,110	2,550	13,320	3,250
Boardings	23,810	3,760	15,470	4,590
Avg. Boardings per Transit Trip	1.25	1.48	1.16	1.41
# of buses taken (% of trips)				
1 route (no transfers)	77.2%	59.2%	84.4%	61.7%
2 routes (1 transfer)	21.0%	34.0%	15.0%	35.5%
3 routes (2 transfers)	1.8%	6.8%	0.6%	2.9%
Transit Access (% of trips)				
Walk-Access Transit (WAT)	89.2%	92.8%	91.1%	78.5%
Drive-Access Transit (DAT)	4.2%	1.8%	4.6%	4.0%
Drive-Access Transit - Passenger (DAT-P)	5.6%	5.4%	2.8%	17.5%
Bicycle-Access Transit	1.0%	-	1.5%	0.0%

WAT = both transit access and egress mode were walking (or bus stop was right at trip origin and/or destination).

DAT = at least one end of the transit trip had access or egress mode of auto driver or motorcycle.

DAT-P = at least one end of the transit trip had access or egress mode of auto passenger or taxi, and did not have auto driver at the other end.


Table 36. Bus Routes Taken (Expanded # of Boardings from Survey Responses), 2018

Route Name	Survey Total	Vernon Residents	Kelowna Residents	Other Central Ok. Residents
Total Boardings	23,810	3,760	15,470	4,590
Kelowna Regional Transit System - Subtotal	20,120	440	15,440	4,240
1 Lakeshore	1,890		1,580	320
2 North End Shuttle	40		40	
3 Dilworth Mt.	260		260	
4 Pandosy / UBCO Express	750		630	120
5 Gordon	690		560	140
6 Glenmore / UBCO Express	1,310	100	1,070	150
8 University / OK College	3,930	170	3,730	30
9 Shopper Shuttle	30		30	
10 North Rutland	1,510		1,510	
11 Rutland	1,870		1,710	160
12 McCulloch	150		150	
13 Quail Ridge	120		120	
14 Black Mountain	240		240	
16 Kettle Valley	410		410	
17 South Ridge	260		260	
18 Glenmore/Downtown	420		420	
19 Glenmore/Orchard Park	330		330	
20 Lakeview	180			180
21 Glenrosa	500		60	440
22 Peachland	190		70	120
23 Lake Country	510		90	420
24 Shannon Lake	380			380
25 East Boundary	100		40	60
28 Smith Creek	30			30
29 Bear Creek	50			50
97 Okanagan	3,970	170	2,140	1,660
Vernon Regional Transit System - Subtotal	3,690	3,320	30	350
1 Coldstream (Vernon)	190	190		
2 Pleasant Valley (Vernon)	260	260		
3 Alexis Park (Vernon)	560	560		
4 East Hill (Vernon)	70	70		
5 South Vernon (Vernon)	180	180		
6 College (Vernon)	410	410		
7 Okanagan Landing (Vernon)	510	510		
8 Bella Vista (Vernon)	240	240		
9 North End (Vernon)	380	380		
60 Enderby (Vernon)	10	10		
90 UBCO Connector (Vernon)	880	500	30	350

Boardings by surveyed residents of the study area (n=308 persons reporting 554 transit trips).

Transit systems may also serve residents of neighbouring communities outside the survey area, whose trips are not included above.



4.9 Vehicle Availability for Trips Made via Sustainable Modes

The survey asked respondents who reported using non-automobile modes of travel whether or not a vehicle was available for the first trip in each trip chain that left home. This question gets at whether people are exercising a choice to travel via sustainable modes or have no choice but to do so. The question was only asked of those 16+ years of age who had a driver's licence. In 2018, to reduce survey response burden, this question was only asked of respondents leaving home via a sustainable mode, as that is when the key choice to drive or not is made (and can be assumed to carry on to other trips via sustainable mode in the trip chain until they return home again).

The survey results reveal that overall, the great majority of applicable travellers (16+, have a licence) who travel via a sustainable mode make the choice to do so rather than drive, with 70% of trips leaving home reflecting this choice (Table 37). The people who make the other 30% of sustainable-mode journeys leaving home either did not have access to a household vehicle or the household has no vehicles. These journeys may therefore be considered dependent on the sustainable mode. Dependence on sustainable modes varies: the survey results suggest that 62% of those who use transit are reliant on this mode, compared to 20% of those who walked, and 26% who travelled via bicycle (Table 38). The high reliance on transit amongst users underscores both the importance of this mode to serve the needs of the population and the challenge of making transit an appealing choice to those with vehicles.

Table 37. Vehicle Availability for Trips by Sustainable Mode, by Sub-Area, 2013-2018

	Study Area		Vernon**		Kelowna		Other Central Okanagan**	
	2013	2018	2013	2018	2013	2018	2013	2018
Applicable trips leaving home via sustainable mode *	25,350	21,240	4,330	3,230	18,190	15,180	2,820	2,830
Yes, vehicle available	71%	70%	70%	67%	72%	71%	64%	70%
No, not available	29%	30%	30%	33%	28%	29%	36%	30%

* Filtered to just the sub-sample of trips leaving home via a non-automobile mode (transit, walked, bicycle, school bus, other). Those without household vehicles were not asked the question, but answers of no are assumed, and they are included in the results. Trips made by people under the age of 16 or with no licence are excluded.

Note: the different survey periods may affect the # of walking and cycling trips, with 2018 being lower due to colder weather.

**Interpret results for Vernon and Central Okanagan with caution due to smaller sample sizes.

Table 38. Vehicle Availability for Trips by Sustainable Mode, 2013-2018

	Transit		Walked		Bicycle	
	2013	2018	2013	2018	2013	2018
Applicable trips leaving home via sustainable mode *	5,530	4,050	14,180	12,370	5,690	3,810
Yes, vehicle available	42%	38%	75%	80%	92%	74%
No, not available	58%	62%	25%	20%	8%	26%

* Filtered to just the sub-sample of trips leaving home via a non-automobile mode (transit, walked, bicycle, school bus, other). Those without household vehicles were not asked the question, but answers of no are assumed, and they are included in the results. Trips made by people under the age of 16 or with no licence are excluded.

In this table school bus and other mode trips are not detailed due to very small sample sizes of applicable trips by persons over the age of 16 with driver's licenses.

Note: the different survey periods may affect the # of walking and cycling trips, with 2018 being lower due to colder weather.



4.10 Trip Distances

4.10.1 Average Trip Distance

Mean trip distances are presented below (Table 39). In this analysis, trip distance was calculated as the straight-line distance between origin and destination (not actual distance travelled on streets).

Work trips are longest (average of 9.0 km). School trips are shortest (4.9 km), although auto driver school trips are longer (11.4 km) as many of these would be post-secondary commutes to UBCO or one of the OC campuses. Other home-based purposes averaged 6.0 km, with non home-based trips averaging 5.0 km.

The average auto driver trip distance was 6.9 km, and auto passenger trips 6.4 km. Transit trips averaged 7.1 km and school bus trips averaged 4.1 km. The average cycling trip was 2.9 km and the average walking trip was 700 m.

Averages vary by sub-area, with residents of Vernon and Other Central Okanagan tending to make longer trips for all modes, other than walking and HBS school bus trips, which are relatively similar across the entire region.

Table 39. Average Trip Distance (km) by Trip Purpose and Mode, 2018

Purpose	Auto Driver	Auto Passenger	Transit Bus	School Bus	Walked	Bicycle	Other	Total
Study Area								
HBW	9.8	9.1	7.1	*	1.0	3.6	5.2	9.0
HBS	11.4	3.9	9.2	4.1	0.7	2.5	9.0	4.9
HBO	6.2	7.5	4.6	*	0.7	2.7	7.0	6.0
NHB	5.3	5.2	5.5	13.7	0.5	1.6	16.3	5.0
Total	6.9	6.4	7.1	5.3	0.7	2.9	8.8	6.2
Vernon								
HBW	10.9	15.4	13.0	*	0.9	2.3	*	10.2
HBS	15.8	2.8	22.5	4.1	0.6	*	-	5.4
HBO	6.9	8.3	5.0	-	0.5	2.5	*	6.6
NHB	6.1	7.0	*	*	0.5	1.4	*	6.1
Total	7.6	7.6	12.0	4.2	0.6	1.8	*	7.0
Kelowna								
HBW	7.9	6.5	5.1	*	1.0	3.8	6.3	7.1
HBS	6.9	3.7	6.1	4.4	0.7	2.7	*	4.0
HBO	4.7	5.8	4.1	-	0.8	2.6	5.6	4.6
NHB	4.5	4.1	5.5	*	0.4	1.8	2.6	4.2
Total	5.4	5.0	5.3	6.5	0.7	3.1	5.2	4.9
Other Central Okanagan								
HBW	13.0	11.0	11.7	-	0.8	3.6	*	12.4
HBS	18.3	4.9	14.1	3.8	0.6	*	*	6.8
HBO	8.6	10.7	6.0	*	0.7	*	*	8.7
NHB	6.3	6.5	5.7	*	0.4	*	*	6.0
Total	9.3	8.4	10.5	3.8	0.6	3.8	10.1	8.5

HBW=home-based work, HBS=home-based school, HBO=home-based other, NHB=non-home based. *suppressed (small n).

Distances of >100 km for inter-city travel were excluded (the top 0.5% of all trip distances), so as not to overly skew averages.



4.10.2 Trends in Trip Distance, 2007-2018

Given decreasing daily trip rates (3.37/person in 2007 to 3.02/person in 2018) it is of interest to further explore the impact changing travel patterns on transportation networks. **Table 40** presents average straight-line trip distances by survey for trips with known distance. **Table 41** extrapolates these averages to all trips (compensating for unknown distances for some trips). While people may be making fewer daily trips, the average length of those trips has increased. Possible explanations for this trend include: increasing urban sprawl increasing distances some residents travel for jobs/services; fewer discretionary stops when travelling for other main purposes (e.g., reduced shopping due to increased e-commerce or food delivery services); differences in how trips were reported in different cycles; and/or population trends. Looking at the cumulative straight-line distances across all cycles suggests that the daily total has increased by 18% over 11 years (in line with the 19% population increase). By mode, the 13% increase in cumulative distance for auto driver trips compares to only a 4% increase in the number of such trips. The increase in total distance for all passenger trips is more significant (36%). Transit trip distance figures should be interpreted with caution for reasons discussed in **Section 4.5.3**. The recent declines in the total distance associated with walking and cycling trips may be due to colder weather for the 2018 survey (and/or perhaps an increase in urban densification or walkability in some areas).

Table 40. Trend in Average Trip Distance by Mode, 2007-2018

Average Daily Trip Distance	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
All Trips	5.7	5.8	6.2	+1%	+8%	+9%
Auto Driver	6.3	6.3	6.9	-1%	+9%	+9%
Auto Passenger	5.2	6.1	6.4	+18%	+4%	+23%
Transit Bus	4.6	8.4	7.1	+82%	-15%	+54%
School Bus	5.1	4.5	5.3	-12%	+19%	+5%
Walked	0.9	1.0	0.7	+12%	-34%	-25%
Bicycle	3.5	2.8	2.9	-22%	+6%	-17%
Other	6.9	4.2	8.8	-39%	+110%	+29%

Distances of >100 km for inter-city travel were excluded so as not to overly skew averages.

Table 41. Estimated Cumulative Distance of All Daily Trips by Mode, 2007-2018

Cumulative Daily Distance	2007	2013	2018	2007-2013 6-Yr Change	2013-2018 5-Yr Change	2007-2018 11-Yr Change
Total Distance	3,625,900	3,906,600	4,260,800	+8%	+9%	+18%
Auto Driver	2,821,200	2,887,100	3,186,600	+2%	+10%	+13%
Auto Passenger	577,900	668,100	784,100	+16%	+17%	+36%
Transit Bus	41,500	188,200*	135,600	+354%*	-28%*	+227%
School Bus	72,000	44,000	56,800	-39%	+29%	-21%
Walked	32,100	54,500	36,500	+70%	-33%	+14%
Bicycle	41,500	47,200	32,000	+14%	-32%	-23%
Other	39,700	17,500	29,100	-56%	+66%	-27%

Cumulative distance estimated as the average for trips with known distance X the total trips of each mode. This approach was undertaken rather than summing up all straight-line distances calculated for each trip because the 2007 and 2013 data had notable proportions of trip destinations with unknown XY coordinates (14% in 2007 and 4% in 2013). As the average trip distances were computed excluding trips of greater than 100 km, this also serves to limit the inclusion of distance travelled outside the study area. The total cumulative distance listed above is the sum of the distances for all of the individual modes.

* Interpret with caution: the number of transit trips in 2013 may be somewhat over-stated.



4.11 Vehicle Kilometres Travelled (VKT)

As part of the 2018 study, trip origins, destinations, departure times, and modes of travel were processed via a Google API to determine the most likely actual distance travelled, based on Google's recommended route for that mode for that time of day.²⁵ This section focuses on only auto driver trips, which represent the vehicle trips. For these trips, the Google distances were used to estimate the actual daily vehicle kilometres travelled (VKT) by residents of the study area. While the average straight-line distance of auto driver trips is 6.9 km, the average actual distance driven is estimated to be 9.3 km (for trips in or near the study area, i.e., excluding longer trips of >150 km; or 10.4 km when including longer trips). VKT is often of interest as it has a direct relationship to vehicle emissions. VKT also provides estimates of actual daily usage of the available kilometers of road network for personal trips.

The survey results suggest that the 464,100 daily auto driver trips incur an estimated 4.81 million daily kilometres of vehicle travel (including trips >150 km). Of note, while the Other Central Okanagan area accounts for 27% of population, it accounts of fully 37% of daily VKT. This stands to reason given the nature of the communities and often longer journeys to access jobs, services or shopping. Kelowna, which has higher urban density, accounts for 55% of population and 45% of the daily VKT. Projecting the results across a year of weekdays suggests that 1.24 billion kilometres of road travel are generated each year by personal vehicle trips on weekdays. Of note, the Google distances also suggest that each weekday residents cycle a total of 44,506 km, walk 51,942 km, and travel 210,062 km via transit.

Readers are reminded that these results only account for VKT for personal trips made by residents of the area on weekdays in mid to late fall 2018. The survey did not capture commercial trips or travel on weekends, which also contribute to VKT and emissions.

Table 42. VKT-Related Statistics, 2018

Measure	Study Total	Vernon	Kelowna	Other Central Ok.
Households	102,600	18,500	56,500	27,600
Population	237,200	40,200	129,800	67,200
Vehicles	186,700	30,000	99,600	57,200
Drivers	186,800	30,600	102,600	53,700
Persons Driving on a Given Weekday	133,700	21,700	73,000	39,000
Est. Household Vehicles Driven*	131,007	21,244	71,301	38,461
Total Vehicle Trips	464,300	79,200	256,200	128,900
Total Daily VKT	4,813,400	875,600	2,150,400	1,787,400
Average VKT per Trip	10.37	11.06	8.40	13.88
Average Daily VKT per Household	46.91	47.33	38.06	64.76
Average Daily VKT per Capita**	20.29	21.78	16.56	26.61
Average Daily VKT per Vehicle***	25.78	29.20	21.60	31.24
Total VKT per Year from Weekday Driving	1,254,922,100	228,281,400	560,640,000	466,000,700

²⁵ Distances returned by the Google Map Directions may differ from actual distance travelled, as the survey respondent may not have taken the same route recommended by Google for the time of day and typical driving conditions. Estimates were not returned for some multi-mode auto-transit trips or school bus trips. Missing Google distances for driving trips were imputed.



*Estimated from assigning each driver to a household vehicle, adjusting for households with fewer or more vehicles than drivers.

Total population (all ages), whether drove or not on a given day. *Total registered household vehicles, whether driven or not.



4.12 Inter-Regional Travel

The travel area examined in this survey is divided up into three sub-areas within the study area (Vernon, Kelowna, and Other Central Okanagan). This section examines trip flows between these regions. Of approximately 684,800 daily trips undertaken by residents of the study area, approximately 126,300 or 18.5% are inter-regional flows between sub-areas within the region and/or external areas (Table 43). During the AM Peak period, the proportion of total trips that are inter-regional is higher, at 20.9%.

The most significant inter-regional flows are between the communities in the Other Central Okanagan sub-area and Kelowna, at over 40,400 trips flowing each way over the course of the day. The AM Peak flows from these communities to Kelowna (about 14,700) are higher than those from Kelowna to the rest of the Central Okanagan (about 4,700) due to Kelowna's status as a locus of jobs for many residents.

The flows between Vernon and external areas (9,000-9,500 trips each way) serve as a reminder that Vernon is adjacent to Coldstream (and near other communities in the North Okanagan) with jobs and other purposes that attract trips from Vernon. The two-way Vernon-External flows are greater than those between Vernon-Kelowna and Vernon-Other Central Okanagan combined. Of note, of the Vernon-External trips, approximately 5,100 each way are to and from the North Okanagan South external area (which includes Coldstream) and about 3,000 each way are to and from the North Okanagan North external area, with the remainder to places either further north or east of the study area.

Table 43. Inter-Regional Flows, 2018

	24-Hour Total	AM Peak 6AM-8:59AM (3 hours)	PM Peak 2PM-5:59PM (4 hours)	Off-Peak (all other times of day)
Total Trips	684,750	140,230	249,340	295,190
Vernon internal	90,020	17,680	32,630	39,720
Kelowna internal	380,630	75,410	139,430	165,780
Other Central Okanagan internal	85,750	17,520	31,800	36,450
Entirely external	2,020	280	780	960
Inter-Regional Flows	126,340	29,340	44,700	52,290
Inter-Regional Flows				
Other Central Okanagan → Kelowna	40,530	14,690	9,200	16,640
Kelowna → Other Central Okanagan	40,400	4,730	19,160	16,510
Other Central Okanagan → Vernon	2,210	770	710	720
Vernon → Other Central Okanagan	2,400	490	850	1,060
Other Central Okanagan → External	3,380	1,480	510	1,390
External → Other Central Okanagan	3,590	180	2,050	1,370
Vernon → Kelowna	4,820	1,280	1,030	2,510
Kelowna → Vernon	4,860	560	2,330	1,960
Vernon → External	9,060	3,010	2,320	3,740
External → Vernon	9,470	770	4,540	4,150
Kelowna → External	3,030	1,130	660	1,240
External → Kelowna	2,590	250	1,340	1,000



The Other Central Okanagan sub-area is comprised of a number of communities that are geographically spread out throughout the study area. These communities can be organized into three geographies considering the geographic separations between them: Westside, comprised of all of the adjacent communities to the west of Okanagan Lake (City of West Kelowna, WFN, Peachland, and RDCO West); Lake Country to the east of the lake, between Vernon and Kelowna; and RDCO East, to the east of Kelowna. For those interested in the flows between these geographies, they are presented in [Table 44](#). Detailed flows between individual districts can also be found in the Origin-Destination matrices in [Section 4.14](#) of this report. Readers are reminded that all figures are survey estimates and have not been validated against screenline counts.

Table 44. Other Central Okanagan – Flows between Westside, Lake Country and RDCO East, 2018

	24-Hour Total	AM Peak 6AM-8:59AM (3 hours)	PM Peak 2PM-5:59PM (4 hours)	Off-Peak (all other times of day)
Total Trips to from or within Other Central Okanagan	178,260	39,860	64,280	74,140
Westside internal	69,830	13,560	25,530	30,790
Lake Country internal	14,180	3,460	5,550	5,170
RDCO East internal	690	250	380	60
Inter-regional and between the three areas within Other Central Okanagan	93,560	22,580	32,850	38,180
Trip Flows				
Westside → Kelowna	26,170	9,490	5,820	10,860
Kelowna → Westside	26,040	2,890	12,690	10,470
Westside → Vernon	660	300	180	190
Vernon → Westside	730	130	310	310
Westside → Lake Country	160	20	50	90
Lake Country → Westside	190	110	80	<5
Westside → RDCO East	220	20	20	180
RDCO East → Westside	90	30	50	20
Westside → External	2,590	1,160	350	1,080
External → Westside	2,870	150	1,600	1,120
Lake Country → Kelowna	9,880	3,350	2,490	4,040
Kelowna → Lake Country	9,870	1,580	4,360	3,940
Lake Country → Vernon	1,530	480	520	530
Vernon → Lake Country	1,630	350	540	740
Lake Country → RDCO East	190		50	140
RDCO East → Lake Country	160		100	60
Lake Country → External	740	310	150	270
External → Lake Country	650	30	420	200
RDCO East → Kelowna	4,490	1,860	890	1,740
Kelowna → RDCO East	4,490	270	2,110	2,100
RDCO East → Vernon	40	<5	30	10
Vernon → RDCO East	40	30	<5	10
RDCO East → External	50	20		40
External → RDCO East	80		40	40

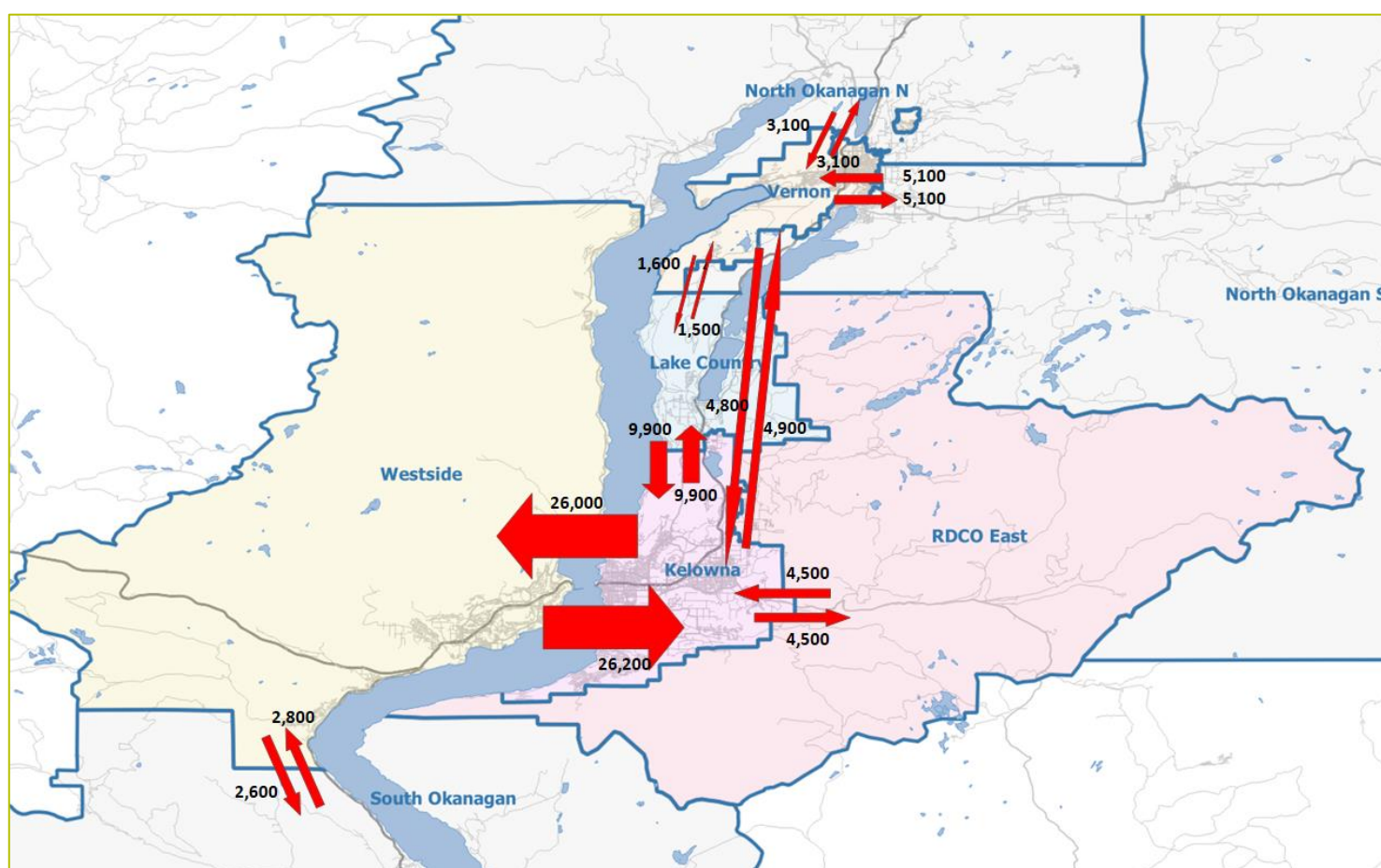


The map below highlight the 24-hour flows discussed above ([Figure 55](#)). Only flows with more than 1,500 trips are displayed. The map on the next page presents the AM Peak trip flows ([Figure 56](#)). Only flows with more than 350 trips are displayed.

The maps reveal considerable flow of traffic throughout the region, with much of it being between the Westside communities and Kelowna, with the AM Peak map showing that this travel is heavier from Westside to Kelowna than in the reverse direction, likely due to work commutes.

Readers are also referred to the origin destination tables in [Section 4.14](#) of this report which detail the trip flows between districts, and the section on places of work ([Section 3.9.5](#)), which provides a more detailed breakdown on the locations of places of employment at businesses within Kelowna and Vernon.

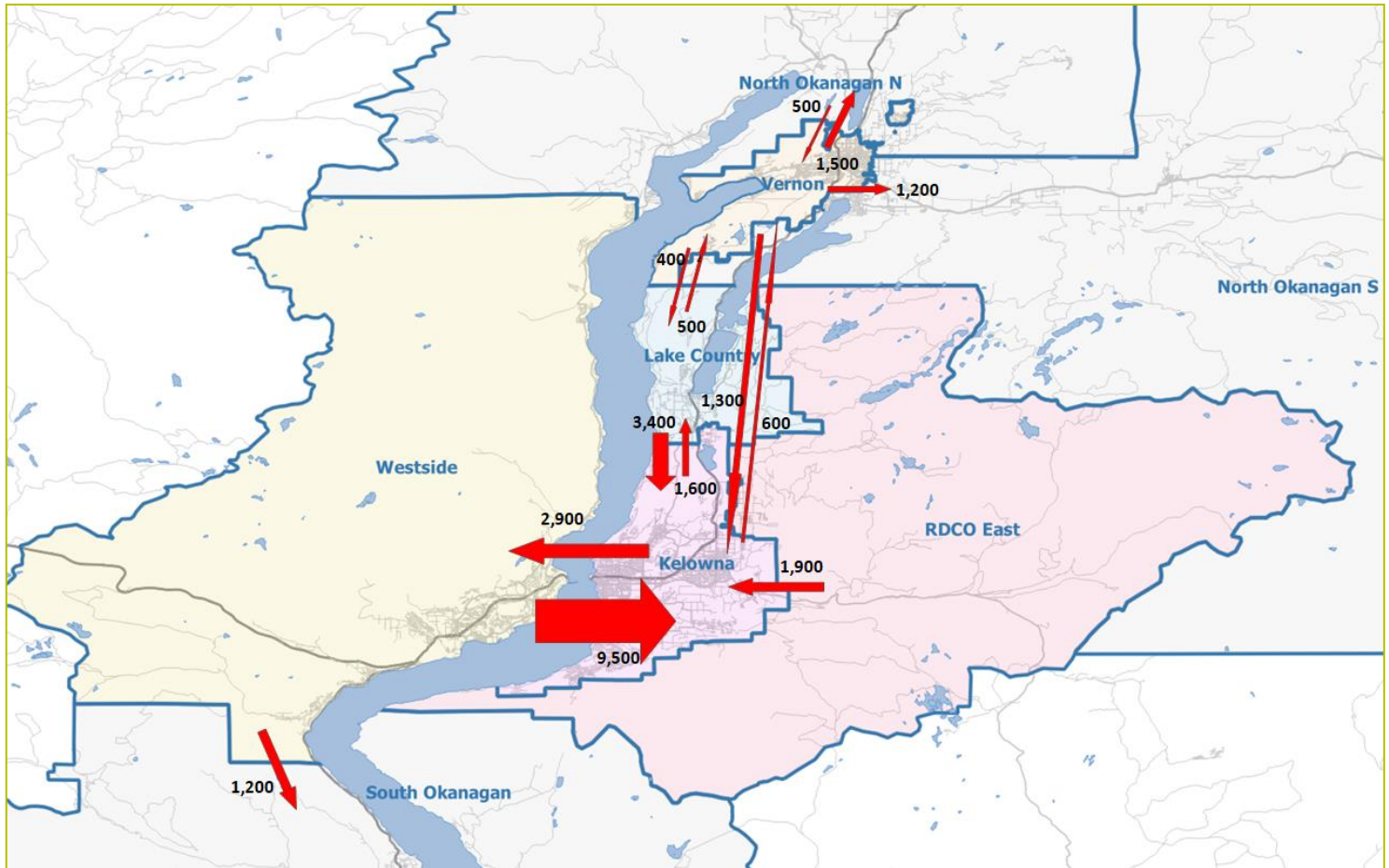
Figure 55. 24-Hour Inter-Regional Flows



24-Hour inter-regional trip flows by residents of the survey area. The Other Central Okanagan Sub-Area has been broken out into Westside, Lake Country, and RDCO East. Only flows with more than 1,500 trips are represented. The trip estimates from the survey are rounded to the nearest 100. Only personal trips captured by the survey are represented. Commercial trips and trips made by residents of nearby communities external to the survey area are not accounted for.



Figure 56. AM Peak Inter-Regional Flows



AM Peak inter-regional trip flows by residents of the survey area. The Other Central Okanagan Sub-Area has been broken out into Westside, Lake County, and RDCO East. Only flows with more than 350 trips are represented. The trip estimates from the survey are rounded to the nearest 100. Commercial trips and trips made by residents of nearby communities external to the survey area are not accounted for.



4.13 Internalization of Travel

The chart to the right examines internal travel. This is a measure of the accessibility of opportunities – work, school, shopping and so on – relative to a traveller's place of residence. The closer proximity of these activities to one's home can be more conducive to sustainable transportation alternatives to driving alone, especially walking and cycling.

Across the entire study area, 27% of residents' trips are made within the same district their home is located in. Readers are referred to [Figure 4](#) on page 25 of this report for a map illustrating the district geographies. Within the cities of Vernon, Kelowna, and West Kelowna, the districts are aggregations of adjacent neighbourhoods.

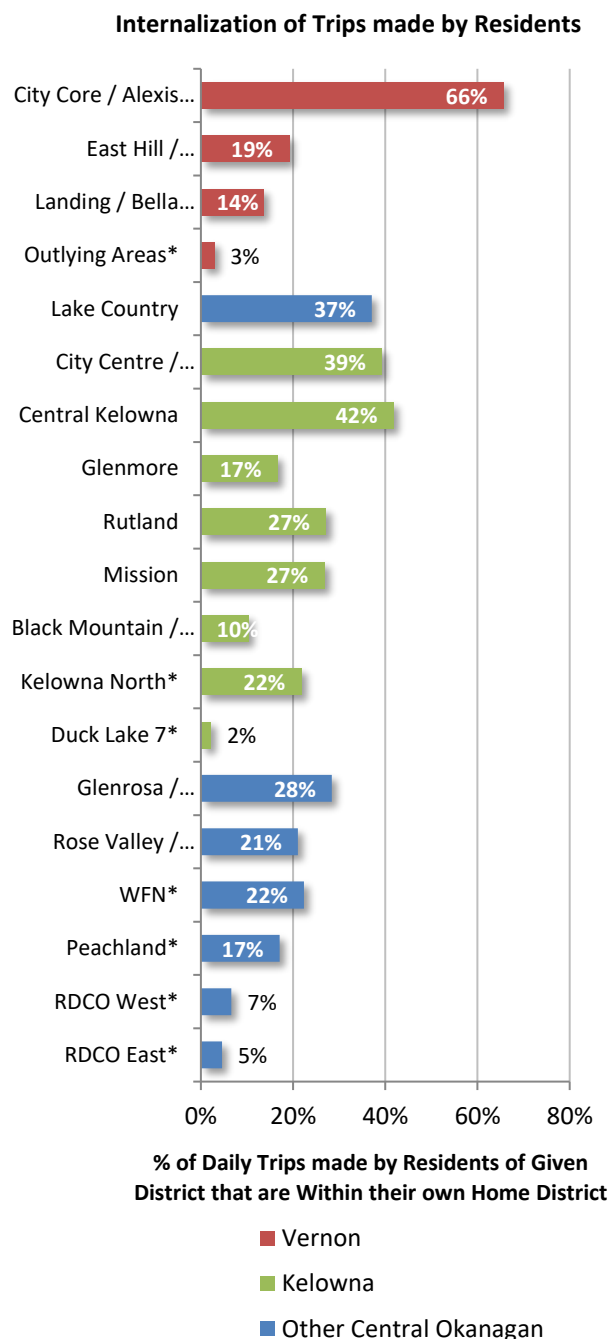
The chart to the right ([Figure 1](#)) summarizes the extent to which residents' travel is internal to their own home community.

As indicated, residents of the Vernon City Core / Alexis Park / Harwood / North Vernon fulfill most of their trip purposes within the set of neighbourhoods that comprise this district, with 66% of trips being internalized.

Next highest are Central Kelowna and Kelowna City Centre / Pandosy, at 39% and 42% respectively. Lake Country also has a high degree of internalization at 37%.

Lower levels suggest districts that are more suburban or rural in nature for which fewer jobs and services are close to home.

Figure 57. Internalization of Trips by Home District



* results for districts with smaller survey samples (n=78-149 households surveyed) should be interpreted with caution.



Table 45 summarizes internalization rates for HBW, HBS and HBO trip for residents of each district.²⁶ Degrees of blue shading highlight areas with higher rates of internalization. Overall, one-fifth (20%) of HBW trips are internal to the district of the trip maker's residence, one-third (33%) of HBO trips are internalized, while a higher rate (45%) of HBS trips are internalized (reflecting the proximity of K-12 schools to residential neighbourhoods). As might be expected, the city centres have the highest rates of internalization of HBW trips. Kelowna North has the highest HBS rate, at 69%, which may be related to UBCO students living near to the school.

Table 45. Internalization of Trips by Home District for HBW, HBS and HBO purposes, 2018

Total Trips Made	Total Trips Made by Residents of District		HBW Trips Made by Residents of District		HBS Trips Made by Residents of District		HBO Trips Made by Residents of District	
	Total Trips Made	% Internalized to Home District	HBW Trips	% Internalized to Home District	HBS Trips	% Internalized to Home District	HBO Trips	% Internalized to Home District
Total Daily Trips (% of Total Daily Trips)	684,800 (100%)	27%	131,700 (19%)	20%	65,800 (46%)	45%*	315,500 (10%)	33%
1001 City Core / Alexis Park / Harwood / North Vernon	29,700	66%	5,400	47%	1,700	66%*	16,200	74%
1002 East Hill / Middleton / Mission Hill	46,900	19%	8,600	22%	5,400	43%	21,700	18%
1003 Landing / Bella Vista / Turtle Mountain / Priest's Valley	25,800	14%	4,800	9%	2,000	50%*	12,700	16%
1004 Outlying Areas	15,700	3%	2,100	6%	900	0%*	6,600	5%
2000 Lake Country	36,300	37%	7,400	20%	4,000	68%	14,900	49%
3001 City Centre / Pandosy	79,900	39%	16,800	43%	4,600	61%	38,100	44%
3002 Central Kelowna	51,900	42%	9,700	34%	3,500	13%	26,000	53%
3003 Glenmore	65,700	17%	11,600	9%	7,100	27%	30,900	23%
3004 Rutland	78,100	27%	16,800	14%	8,800	43%	32,500	38%
3005 Mission	58,500	27%	9,600	9%	7,600	58%	26,300	34%
3006 Black Mountain / Southeast	37,400	10%	8,400	3%	4,900	31%	15,900	12%
3007 Kelowna North	12,900	22%	2,900	17%	1,600	69%*	5,200	19%
3008 Duck Lake 7	4,700	2%*	800	2%	400	0%*	2,400	4%
4001 Glenrosa / Westbank	46,600	28%	9,700	18%	5,800	61%	20,500	33%
4002 Rose Valley / Lakeview	38,200	21%	7,600	17%	3,700	55%	17,000	26%
5001 WFN	25,900	22%	4,100	15%	1,500	0%*	13,900	33%
6000 Peachland	14,100	17%	2,200	18%	900	44%*	8,000	19%
7000 RDCO West	4,800	7%*	800	5%	300	15%*	1,900	11%
8000 RDCO East	11,700	5%	2,400	2%	1,100	12%*	4,800	7%

HBS, HBW and HBO trips include trips from home or returning to home. NHB trips are included in the total trips but not broken out separately. 'Internal' = both origin and destination are in the same district at the traveller's home. Trip estimates are rounded to the closest 100.

*Interpret with caution: smaller sample size (n<100 trip records).

²⁶ The trip counts do not capture all work and school commutes, only home-based work and school trips. I.e., the counts do not include trips to/from work or school that have been interrupted by a stop along the way for another purpose. Nevertheless, these statistics should still provide a good indicator of the extent to which commutes are internalized within a given district.



4.14 Origin-Destination Matrices

The tables on the following pages provide origin-destination matrices for the 19 districts in the study area and the external geographies. Sub-totals are provided for each of the three sub-areas and for all external geographies combined, as well as a total across all trips reported.

Origin-destination matrices have been provided for four time periods:

- 24-hour daily total
- AM Peak: trips with departure times between 6 AM and 8:59 AM (3-hour period)
- PM Peak: trips with departure times between 2 PM and 5:59 PM (4-hour period)
- Off Peak: all other times outside the peak periods, including the inter-peak period, evening, and overnight.

It may be noted that while the hour starting at 6 AM has a relatively modest volume of trips, it was included in the AM Peak period noted above as most of the trips in this hour are commute trips and contribute to our understanding of commute flows.

Blue shading is used to highlight origin-destination trip flows with higher trip volumes.

The expanded survey counts are based on a random sample of the population and should be understood to be estimates. All expanded survey counts have been rounded to the closest 10. The sum of individual cells may not add to the listed survey totals or sub-area subtotals due to rounding.

Table 46. Origin - Destination Matrix by District (24-Hour Trips)

Continued on next page...

24-Hour
Total

	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Destinations					Lake															North				Survey
Origin	City Core...	East Hill ...	Landing ...	Outlying ...	Coun-try	City Ctr...	Central	Glenmore	Rutland	Mission	Black Mtn...	Kelowna North	Duck Lake	Glenrosa ...	Rose Vly...	WFN	Peachland	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Total
1001 City Core...	29,550	11,150	5,480	2,730	890	330	440	170	150	10	140	570	40		60	50		380		1,090	2,390		470	56,080
1002 East Hill...	11,470	9,320	1,930	870	390	400	480	60	80	150		360		80	30			30	30	1,520	1,490		140	28,820
1003 Landing...	5,600	2,080	3,960	950	140	220	260	20	30	20	30	250		70				20	0	230	640		190	14,710
1004 Outlying	2,670	950	840	470	220	60	260	110	20	10	30	130	10	20		20			10	180	560	30	130	6,710
2000 Lake Ctry	770	390	160	210	14,180	1,510	2,740	980	790	150	240	2,520	960	80	10	80	10	10	190	140	260	60	270	26,710
3001 City Ctr...	440	170	210	70	1,480	41,660	24,950	7,250	5,680	10,060	3,190	3,140	70	3,010	3,380	2,710	370	220	650	40	100	150	240	109,230
3002 Central...	510	510	370	210	3,180	23,050	45,430	11,070	13,770	6,890	6,310	3,650	330	2,010	3,190	2,910	470	190	1,480	110	40	180	570	126,420
3003 Glenmore	100	100	20	30	870	7,830	10,780	11,520	2,950	1,050	600	3,660	40	540	400	290	50	10	300	70	130	90	50	41,440
3004 Rutland	240	110	10	70	710	6,140	12,260	2,930	23,330	1,560	4,010	4,100	150	970	410	550	30		1,200	90		170	370	59,410
3005 Mission	30	130	20	10	180	10,450	6,820	930	1,200	16,350	540	1,370		510	730	280	70	0	60	10		30	210	39,910
3006 Black Mtn.	160		40	30	160	3,480	6,250	610	3,440	710	4,010	1,390	10	110	380	160		40	220			90	90	21,340
3007 Kelowna N.	590	330	190	160	2,350	3,380	4,370	3,730	4,160	1,430	990	4,330	260	1,010	410	330	270	20	560	20	10		190	29,060
3008 Duck Lake	0	10	20	10	940	60	360	30	160		10	280	180		10	20			20				10	2,100
4001 Glenrosa...	50		70	20	40	2,970	2,480	380	930	320	200	1,050		14,240	4,920	5,500	1,450	130		50		530	120	35,470
4002 Rose Vly...	60				60	3,230	3,450	370	460	700	310	690	10	4,740	8,610	3,520	790	210	150	50	10	420	20	27,870
5001 WFN	40					2,620	2,780	200	420	160	110	400		5,760	3,790	8,030	1,100	220	70			280	170	26,130
6000 Peachland	10				10	480	400	30	30	20		400		1,450	790	1,030	2,550	110		10		710	40	8,040
7000 RDCO W.	360	10	20	0	50	240	240	10	10	10	50	20		140	210	90	120	330		10	160	0	20	2,110
8000 RDCO E.	10	20		0	190	700	1,160	540	1,250	30	200	610	20		10	80			690			10	40	5,550
North Ok. S	1,020	1,530	370	130	160	40		50	130	10		40		30	70			10		300	10		40	3,940
North Ok. N	2,050	1,900	650	540	230	20	40	160	100			10			10			170	20	40	790		90	6,820
South Ok.				10	20	90	270	90	130	30	100			520	270	350	740	0				580	10	3,190
Other External	440	330	370	110	240	190	130	260	240	190	180	80	30	220	70	160	240	20	60		80		70	3,710
Vernon	49,300	23,490	12,220	5,010	1,630	1,010	1,440	360	280	190	190	1,320	50	170	80	60		420	40	3,020	5,080	30	930	106,300
Kelowna	2,060	1,350	860	580	9,870	96,050	111,210	38,060	54,680	38,050	19,640	21,910	1,020	8,150	8,900	7,250	1,260	480	4,490	340	270	700	1,730	428,910
Other Central Ok.	1,300	430	250	240	14,540	11,750	13,240	2,520	3,880	1,380	1,100	5,680	990	26,410	18,350	18,330	6,030	1,000	1,100	260	430	2,020	680	131,870
External	3,510	3,760	1,400	800	650	320	430	570	610	230	270	130	30	770	420	500	990	190	80	340	890	580	210	17,670
Survey Total	56,160	29,030	14,730	6,620	26,690	109,130	126,320	41,500	59,450	39,850	21,190	29,030	2,090	35,500	27,750	26,140	8,270	2,090	5,700	3,950	6,680	3,320	3,550	684,750

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24-Hour Total

Destinations					
Origin	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core...	48,920	1,850	1,360	3,940	56,080
1002 East Hill...	23,590	1,530	550	3,150	28,820
1003 Landing...	12,590	820	230	1,070	14,710
1004 Outlying	4,930	620	260	900	6,710
2000 Lake Ctry	1,530	9,880	14,570	740	26,710
3001 City Ctr...	870	96,000	11,830	520	109,230
3002 Central...	1,600	110,490	13,430	910	126,420
3003 Glenmore	250	38,420	2,450	330	41,440
3004 Rutland	440	54,470	3,860	630	59,410
3005 Mission	190	37,660	1,820	240	39,910
3006 Black Mtn.	220	19,880	1,070	180	21,340
3007 Kelowna N.	1,260	22,640	4,950	220	29,060
3008 Duck Lake	30	1,070	990	10	2,100
4001 Glenrosa...	150	8,340	26,280	710	35,470
4002 Rose Vly...	60	9,230	18,080	500	27,870
5001 WFN	40	6,680	18,960	450	26,130
6000 Peachland	10	1,340	5,940	750	8,040
7000 RDCO W.	400	580	950	180	2,110
8000 RDCO E.	40	4,490	970	50	5,550
North Ok. S	3,050	280	270	350	3,940
North Ok. N	5,140	330	430	930	6,820
South Ok.	10	690	1,910	590	3,190
Other External	1,260	1,300	1,000	150	3,710
Vernon	90,020	4,820	2,400	9,060	106,300
Kelowna	4,860	380,630	40,400	3,030	428,910
Other Central Ok.	2,210	40,530	85,750	3,380	131,870
External	9,470	2,590	3,590	2,020	17,670
Survey Total	106,540	428,570	132,140	17,500	684,750

Table 47. Origin - Destination Matrix by District (AM Peak)

Continued on next page...

AM Peak

(6AM-8:59AM)

	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Destinations					Lake															North				Survey
Origin	City Core...	East Hill ...	Landing ...	Outlying ...	Coun-try	City Ctr...	Central	Glen-more	Rutland	Mission	Black Mtn...	Kelowna North	Duck Lake	Glen-rosa ...	Rose Vly...	WFN	Peach-land	RDCO West	RDCO East	North Ok. S	Ok. N	South Ok.	Other External	Total
1001 City Core...	4,220	1,050	300	150	160	100	30		70			230						30		390	420		90	7,240
1002 East Hill...	3,250	3,070	330	230	130	170	70		30	60		110		80					30	710	350		110	8,730
1003 Landing...	1,980	420	1,060	100	40	80	20		10		10	100								10	300		20	4,160
1004 Outlying	960	350	120	70	20	30	100	20				20				20				30	450	30	100	2,320
2000 Lake Ctry	250	120	20	90	3,460	560	960	490	200	30	40	1,030	50	20	10	80				60	90		160	7,720
3001 City Ctr...	40	30			60	7,440	3,750	640	330	870	200	930		380	460	190		40	40	30	20	20	70	15,490
3002 Central...	40			130	240	3,610	3,530	810	700	390	140	1,270		230	160	110		0	20		10	100	250	11,740
3003 Glenmore	20	100			350	3,470	2,710	2,540	780	290	40	1,690		240	70	40	20		50	10	30	30	50	12,510
3004 Rutland	30			60	90	2,320	3,310	650	5,730	350	1,240	2,060	10	260	170	40			40	30		110	40	16,550
3005 Mission				10	40	3,360	2,250	210	220	5,360	50	730		50	150	50			30				110	12,610
3006 Black Mtn.			20		60	1,750	1,720	230	1,240	180	1,450	690		10	70	50		40	80			90	30	7,710
3007 Kelowna N.	70	20			490	570	840	660	350	20	150	1,270		70		10	20	10	10		10		70	4,630
3008 Duck Lake		10			250	40	30		80		10	160	10		10				0					600
4001 Glenrosa...	20		70			1,380	930	140	410	90	30	580		4,270	1,270	720	190	10		40		310	30	10,490
4002 Rose Vly...	20					1,230	1,320	150	70	230	80	350		1,190	2,650	250	180	20	20	50		150	20	7,980
5001 WFN	20					830	720	20	130	30	10	210		350	530	400	50					140	70	3,510
6000 Peachland					10	200	60		20			50		340	310	140	440	40				280		1,870
7000 RDCO W.	150	10		0	10	70	140			10	20	10			140	10	40	20		10	50			670
8000 RDCO E.	0				70	340	530	100	600		50	240			10	20			250			10	0	2,220
North Ok. S	180	50										20								50	10			310
North Ok. N	80	290	20	60																	100		20	580
South Ok.																	20					80		100
Other External			80		30		10	160		20		20	20	80		50					30			500
Vernon	10,410	4,900	1,810	550	350	380	220	20	110	60	10	470		80		20		30	30	1,150	1,530	30	300	22,460
Kelowna	200	150	20	190	1,580	22,550	18,140	5,740	9,430	7,460	3,290	8,790	20	1,230	1,090	490	30	50	270	80	80	350	620	81,840
Other Central Ok.	460	130	90	90	3,550	4,600	4,650	900	1,430	380	230	2,460	50	6,170	4,930	1,620	900	90	270	160	140	890	290	34,460
External	260	350	100	60	30		10	160		20		40	20	80		50	20			50	130	80	20	1,480
Survey Total	11,330	5,530	2,030	890	5,510	27,530	23,020	6,820	10,970	7,920	3,530	11,760	90	7,540	6,020	2,170	950	170	570	1,440	1,880	1,350	1,230	140,230

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AM Peak

Destinations					
Origin	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	5,730	430	190	900	7,240
1002 East Hill...	6,880	450	230	1,170	8,730
1003 Landing...	3,570	220	40	340	4,160
1004 Outlying	1,500	180	40	610	2,320
2000 Lake Ctry	480	3,350	3,580	310	7,720
3001 City Ctr...	70	14,150	1,120	150	15,490
3002 Central...	170	10,450	770	360	11,740
3003 Glenmore	110	11,520	760	120	12,510
3004 Rutland	80	15,670	610	190	16,550
3005 Mission	10	12,180	310	110	12,610
3006 Black Mtn.	20	7,260	310	120	7,710
3007 Kelowna N.	90	3,860	600	80	4,630
3008 Duck Lake	10	320	260		600
4001 Glenrosa...	100	3,550	6,470	380	10,490
4002 Rose Vly...	20	3,430	4,310	230	7,980
5001 WFN	20	1,950	1,330	210	3,510
6000 Peachland		320	1,270	280	1,870
7000 RDCO W.	160	240	220	60	670
8000 RDCO E.	0	1,860	340	20	2,220
North Ok. S	230	20		60	310
North Ok. N	460			120	580
South Ok.			20	80	100
Other External	80	230	160	30	500
Vernon	17,680	1,280	490	3,010	22,460
Kelowna	560	75,410	4,730	1,130	81,840
Other Central Ok.	770	14,690	17,520	1,480	34,460
External	770	250	180	280	1,480
Survey Total	19,780	91,640	22,920	5,890	140,230

Table 48. Origin - Destination Matrix by District (PM Peak)

Continued on next page...

PM Peak

(2PM-5:59PM)

	1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Destinations					Lake															North				Survey
Origin	City Core...	East Hill ...	Landing ...	Outlying ...	Coun-try	City Ctr...	Central	Glen-more	Rutland	Mission	Black Mtn...	Kelowna North	Duck Lake	Glen-rosa ...	Rose Vly...	WFN	Peach-land	RDCO West	RDCO East	North Ok. S	Ok. N	South Ok.	Other External	Total
1001 City Core...	11,230	4,840	2,580	1,210	250	50	50	60	10			70	20			20		170		190	700		40	21,490
1002 East Hill...	2,880	3,390	760	320	130	70	130	20		90		40			20			10		350	870			9,070
1003 Landing...	1,400	660	1,560	430	50	130	40	20			10	30		70				0	0	10	30		80	4,520
1004 Outlying	540	330	330	170	120		80	70	20	10		20	10	20						30	20			1,750
2000 Lake Ctry	250	90	100	80	5,550	240	620	260	200	20	150	550	450	60			10	10	50	20	110		30	8,840
3001 City Ctr...	160	90	80	70	650	15,240	9,570	3,230	2,660	4,440	1,770	900	30	1,570	1,660	1,150	200	160	260			50	40	43,980
3002 Central...	290	280	240	70	1,660	8,090	15,820	5,250	6,070	3,440	2,290	1,120	150	1,240	1,680	1,360	200	150	730	60	30		110	50,310
3003 Glenmore	50		20	30	380	1,870	3,150	5,260	1,080	350	180	950		200	210	160			190		60			14,120
3004 Rutland	140	20	10		230	1,170	3,190	1,110	9,240	720	1,850	580	120	240	150	270	10		620				180	19,850
3005 Mission	10	60			30	2,940	1,660	430	240	6,260	230	230		130	320	30	70	0	10				100	12,750
3006 Black Mtn.	160		10		70	350	1,500	70	1,450	120	1,560	260	10	50	190	100			70					5,940
3007 Kelowna N.	150	120	190	70	990	1,680	2,150	2,140	2,290	860	420	1,440	140	610	210	170	210	10	230	20			10	14,110
3008 Duck Lake			20		350	20	50		40			50	10											540
4001 Glenrosa...						600	660	140	340	20	10			5,500	1,930	1,730	590	70				20	60	11,670
4002 Rose Vly...	40				10	680	750	110	300	270	200	50	10	1,620	3,450	1,090	210	160	10			70		9,010
5001 WFN	20					470	570	50	80	90	30	20		2,080	960	3,660	500	160	10			30	70	8,790
6000 Peachland						70	80					140		190	160	140	940	70				40		1,840
7000 RDCO W.	100		20		40	50	10				30			40	20	10	80	170			70			630
8000 RDCO E.	10	20		0	110	100	240	160	220		80	70	20			50			380					1,460
North Ok. S	540	820	280	70	100	40			130					10						50			40	2,090
North Ok. N	810	700	310	370	110	10	40	70	100						10			50	20	40	580			3,200
South Ok.				10	20	50	70	70	130		100			450	120	260	440					30		1,750
Other External	170	260	130	80	190	100	90	50	120	120	40	30	10	110	30	60	40	20	20		40			1,660
Vernon	16,050	9,230	5,230	2,130	540	250	300	170	30	100	10	150	20	90	20	20		180	0	580	1,620		120	36,820
Kelowna	960	570	560	240	4,360	31,350	37,080	17,480	23,050	16,200	8,290	5,530	450	4,040	4,420	3,230	680	320	2,110	80	90	50	440	161,590
Other Central Ok.	410	110	120	90	5,710	2,210	2,920	720	1,130	400	500	840	470	9,480	6,520	6,680	2,330	640	450	20	170	170	160	42,220
External	1,520	1,780	720	530	420	200	190	180	490	120	140	30	10	570	160	320	480	70	40	90	620	30	40	8,710
Survey Total	18,920	11,680	6,630	2,980	11,030	34,010	40,490	18,550	24,700	16,820	8,940	6,550	950	14,170	11,110	10,250	3,490	1,200	2,600	760	2,500	260	750	249,340

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PM Peak

Destinations					
Origin	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	19,860	260	440	930	21,490
1002 East Hill...	7,360	340	150	1,220	9,070
1003 Landing...	4,040	230	120	120	4,520
1004 Outlying	1,370	200	140	40	1,750
2000 Lake Ctry	520	2,490	5,680	150	8,840
3001 City Ctr...	390	37,840	5,660	90	43,980
3002 Central...	880	42,220	7,010	190	50,310
3003 Glenmore	100	12,830	1,130	60	14,120
3004 Rutland	170	17,970	1,530	180	19,850
3005 Mission	80	11,980	590	100	12,750
3006 Black Mtn.	170	5,310	470		5,940
3007 Kelowna N.	530	11,110	2,430	40	14,110
3008 Duck Lake	20	170	350		540
4001 Glenrosa...		1,770	9,810	80	11,670
4002 Rose Vly...	40	2,360	6,540	70	9,010
5001 WFN	20	1,310	7,370	90	8,790
6000 Peachland		290	1,500	40	1,840
7000 RDCO W.	120	90	360	70	630
8000 RDCO E.	30	890	540		1,460
North Ok. S	1,710	170	110	90	2,090
North Ok. N	2,190	210	190	610	3,200
South Ok.	10	420	1,300	30	1,750
Other External	640	540	450	40	1,660
Vernon	32,630	1,030	850	2,320	36,820
Kelowna	2,330	139,430	19,160	660	161,590
Other Central Ok.	710	9,200	31,800	510	42,220
External	4,540	1,340	2,050	780	8,710
Survey Total	40,210	151,000	53,860	4,270	249,340

Table 49. Origin - Destination Matrix by District (Off-Peak)

Continued on next page...

Off Peak		1001	1002	1003	1004	2000	3001	3002	3003	3004	3005	3006	3007	3008	4001	4002	5001	6000	7000	8000					
Destinations	Origin	City Core...	East Hill ...	Landing ...	Outlying ...	Lake Country	City Ctr...	Central	Glenmore	Rutland	Mission	Black Mtn...	Kelowna North	Duck Lake	Glenrosa ...	Rose Vly...	WFN	Peachland	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Survey Total
		City Core...	East Hill ...	Landing ...	Outlying ...	Lake Country	City Ctr...	Central	Glenmore	Rutland	Mission	Black Mtn...	Kelowna North	Duck Lake	Glenrosa ...	Rose Vly...	WFN	Peachland	RDCO West	RDCO East	North Ok. S	North Ok. N	South Ok.	Other External	Survey Total
	1001 City Core...	14,100	5,260	2,600	1,370	480	180	360	110	70	10	140	270	20		60	30		180		500	1,260		350	27,350
	1002 East Hill...	5,340	2,850	840	320	140	160	280	40	50			220			10			30		460	270		30	11,020
	1003 Landing...	2,220	990	1,350	420	50	20	200		20	20		120						20		200	310		90	6,020
	1004 Outlying	1,170	270	390	230	70	30	80	20			30	90							10	120	100		40	2,630
	2000 Lake Ctry	270	180	40	40	5,170	720	1,160	230	380	110	40	940	460						140	70	70	60	80	10,150
	3001 City Ctr...	240	50	130		770	18,980	11,630	3,380	2,700	4,750	1,220	1,310	40	1,070	1,260	1,380	170	60	350	10	80	70	130	49,760
	3002 Central...	180	230	130	10	1,280	11,350	26,080	5,010	7,000	3,060	3,880	1,260	180	540	1,360	1,430	280	40	730	60		80	210	64,370
	3003 Glenmore	30				140	2,500	4,920	3,720	1,090	410	380	1,020	40	110	120	100	30	10	60	50	30	60		14,810
	3004 Rutland	80	100		20	390	2,650	5,760	1,180	8,360	490	910	1,460	20	470	90	230	20		540	60		60	150	23,010
	3005 Mission	20	70	20		120	4,160	2,910	290	750	4,730	260	410		330	260	200			20	10		30		14,560
	3006 Black Mtn.				30	30	1,380	3,030	310	760	400	990	440		50	120	20			70				60	7,690
	3007 Kelowna N.	370	180		90	870	1,130	1,370	930	1,520	560	420	1,620	120	330	200	160	50	10	320				110	10,320
	3008 Duck Lake	0			10	340	0	280	30	40			60	160			20			20				10	960
	4001 Glenrosa...	30			20	40	990	890	110	180	200	170	480		4,470	1,720	3,050	680	40		10		200	30	13,310
	4002 Rose Vly...					50	1,330	1,370	110	90	210	40	290		1,940	2,510	2,180	410	40	120		10	190		10,880
	5001 WFN						1,320	1,500	130	210	40	60	170		3,340	2,290	3,970	550	60	60			110	30	13,830
	6000 Peachland	10					210	260	30	10	20		200		920	330	760	1,170	0		10		380	40	4,340
	7000 RDCO W.	120	10				120	100	10	10			10		100	50	70	0	140			40	0	20	820
	8000 RDCO E.		10			20	260	390	280	430	30	60	300	0		10	10			60				40	1,880
	North Ok. S	300	650	100	60	60			50		10		20		20	70			10		190	10			1,550
	North Ok. N	1,160	910	310	110	120	10		100				10						110		10	110		80	3,030
	South Ok.						30	200	20		30				80	150	80	280	0				470	10	1,340
	Other External	270	80	170	40	20	90	30	60	120	50	130	30	0	30	50	50	200		40		20		70	1,550
	Vernon	22,840	9,360	5,180	2,330	740	380	920	170	140	30	160	700	20		60	30		220	10	1,290	1,940		510	47,020
	Kelowna	910	630	280	150	3,940	42,150	55,990	14,850	22,200	14,390	8,060	7,580	560	2,890	3,400	3,530	540	110	2,100	180	100	290	670	185,490
	Other Central Ok.	430	190	40	60	5,280	4,940	5,670	900	1,320	600	370	2,380	470	10,770	6,910	10,040	2,800	280	380	80	120	960	230	55,200
	External	1,730	1,640	580	210	200	130	230	230	120	90	130	60	0	130	260	130	480	120	40	190	140	470	150	7,480
	Survey Total	25,910	11,820	6,070	2,750	10,150	47,600	62,800	16,140	23,780	15,110	8,720	10,720	1,050	13,790	10,630	13,720	3,830	720	2,540	1,750	2,300	1,720	1,560	295,190

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Off Peak

Destinations					
Origin	Vernon	Kelowna	Other Central Okanagan	External	Survey Total
1001 City Core..	23,330	1,170	740	2,110	27,350
1002 East Hill...	9,350	730	170	770	11,020
1003 Landing...	4,980	370	70	610	6,020
1004 Outlying	2,060	240	80	250	2,630
2000 Lake Ctry	530	4,040	5,310	270	10,150
3001 City Ctr...	420	44,010	5,060	280	49,760
3002 Central...	550	57,820	5,650	350	64,370
3003 Glenmore	30	14,070	570	140	14,810
3004 Rutland	190	20,830	1,730	260	23,010
3005 Mission	100	13,500	920	30	14,560
3006 Black Mtn.	30	7,320	290	60	7,690
3007 Kelowna N.	630	7,670	1,920	110	10,320
3008 Duck Lake	10	570	380	10	960
4001 Glenrosa...	50	3,020	9,990	250	13,310
4002 Rose Vly...		3,440	7,240	200	10,880
5001 WFN		3,420	10,270	140	13,830
6000 Peachland	10	730	3,170	430	4,340
7000 RDCO W.	130	250	370	60	820
8000 RDCO E.	10	1,740	90	40	1,880
North Ok. S	1,110	90	150	190	1,550
North Ok. N	2,490	110	240	190	3,030
South Ok.		270	590	480	1,340
Other External	550	530	390	90	1,550
Vernon	39,720	2,510	1,060	3,740	47,020
Kelowna	1,960	165,780	16,510	1,240	185,490
Other Central Ok.	720	16,640	36,450	1,390	55,200
External	4,150	1,000	1,370	960	7,480
Survey Total	46,560	185,930	55,380	7,330	295,190



5 Residents' Views of Transportation Issues in their Community

After completing the survey, respondents were asked to state their opinion as to what is the most important transportation or challenge in their community. A total of 3,345 respondents provided some kind of comment on this question. The number of answers reflects the importance of transportation in area residents' lives.

The comments have not been coded thematically for analysis of the frequency of themes, however, an initial review of the comments revealed a number of recurring themes:

- **Traffic congestion** (traffic congestion generally, during rush hour, during summer, too many cars, desire for bypass, lack of left-hand turn lanes/lights, lack of truck passing lanes, non-auto options limited)
- **Public transit** (lack of buses serving my area, lack of feeder routes, frequency of service, travel time, cost, reliability, lack late night service, school bus issues, empty buses, loss of Greyhound, want LRT)
- **Cycling / bicycle lanes** (need more generally, need more divided lanes, like recent improvements, safety concerns, roads too narrow, no choice but to drive as too hilly to cycle and limited transit options)
- **Traffic lights** (timing of lights, too many lights on highway, need lights in certain locations)
- **Safety** (speed violators, drivers running red lights, bad drivers generally, lack of enforcement, bicycle safety, pedestrian safety, erratic cyclists, inconsistent speed limits, visibility of road lines)
- **Pedestrian Issues** (lack of sidewalks/paths, safety, danger at night due to wildlife or lack of lighting, drivers do not respect crosswalks, amenities not in walking distance, too hilly to walk in some areas)
- **Parking** (too little, inconvenient, payment options, lack parking in specific areas, not match redevelopment)
- **Mentions of specific roads or trouble spots** (Highway 97, Bennett bridge between West Kelowna and Kelowna, HOV lane ineffective, Beaver Lake Road, Chute Lake Road, Glenmore Road, Harvey Avenue, Lakeshore Road, Shannon Lake Road, Silver Star Road, and various other roads and intersections)

A selection of residents' comments is provided over the next few pages. These comments were randomly selected and do not necessarily reflect the opinions of the research consultant or the municipalities. The comments that follow represent about 1% of all comments provided. Readers are referred to [Technical Appendix 2: Verbatim Respondent Comments](#) for a complete listing of all of the comments provided, organized by municipality.

In your opinion, what is the most important transportation issue or challenge in your community? Random selection of answers

Traffic build up on HWY 97, especially coming over the bridge into Kelowna.

- Kelowna resident

Aged and aging population, having accessible and timely public transportation.

- Vernon resident

Reliance on cars. Living in a hilly area makes bike commuting difficult although we do it sometimes in the summer. Hoping to increase with the purchase of an e-bike

- West Kelowna resident

In your opinion, what is the most important transportation issue or challenge in your community?

Random selection of answers

There are too many cars for the amount of roads we have. Everybody wants to live in Kelowna and they flock in here, and there is not enough room for everyone. We need to update the infrastructure to accommodate the number of people.

- Kelowna resident

Congestion, especially in the summer months. Commute time from work to home increases with tourist season. It can also get backed up on Spall road by Enterprise and the HWY in the late afternoon daily - there should be more left hand turn lights throughout the city

- Kelowna resident

Infrequency of buses; lack of consistent bike lanes; heavy traffic making bike travel dangerous; heavy traffic through the Hwy 97 corridor

- Vernon resident

As a family we do not feel safe/confident riding bikes alongside traffic - would like too, but it causes great anxiety - especially thinking of children crossing multiple busy roads to get to school each day independently.

- Vernon resident

The public transit service in my residential area is quite minimal and doesn't provide a realistic alternative to using the car. My neighbourhood is very hilly and so bicycling is not a practical option for most people. Having said that, this is a rural area where there wouldn't typically be an expectation for a very frequent bus service. When I do have to drive in [to Kelowna] I usually encounter congestion coming off the bridge. This does not appear to be due to bridge incapacity but due to the traffic signals at Abbott, Water & Ellis. Linking signals may help but what would probably help even more is to have the signals for eastbound traffic at Abbott to operate only on pedestrian demand but with of course a realistic minimum green.

- West Kelowna resident

Traffic congestion, especially during rush hour. Turning onto Hyw 97 from the north end of Glenmore Road from 4-5:30 often takes 15 minutes or more. Parking in Kelowna is terrible, especially around the Hospital during the day. Side street parking in Kelowna is terrible, especially where multi units are being built without adequate off street parking.

- Lake Country resident

Single lane highway through Peachland, highway going through downtown Westbank, traffic lights on Hwy 97 through to bridge.

- Peachland resident

Public safety and road surface management during the winter season

- Vernon resident

Lots of very slow speed limit zones in rural areas. Way too much congestion at Hospital Hill bottom area. Not enough downtown parking, especially free, so businesses can prosper and employees don't have to plug meters all day.

- Priest's Valley resident



In your opinion, what is the most important transportation issue or challenge in your community?

Random selection of answers

Traffic congestion. There are no bypasses and too many stoplights on the highway. A 80km zone often doesn't get above 60km with all the starts and stops. Need to streamline some areas of traffic to keep traffic moving. Remove the HOV lane and focus on getting commercial trucks into one lane and more signage and education regarding slower traffic keep right.

- Kelowna resident

Bus service from UBCO to points north of the airport i.e. Lake Country could be better. More frequent bus trips from Lake Country to Vernon would be helpful.

- Lake Country resident

Regular dependable bus service. Safe bike lanes away from roads. I would love to see a safe bike route from North Glenmore to Reid's Corner. I would like to ride my bike to work but currently far too dangerous.

- Kelowna resident

In terms of traffic in general I am appalled at the lack of enforcement of speed limits and accepted driving conventions in our city . . . I notice a lot of stop sign and stop light 'creep, of drivers who don't come to a complete stop at the indicated location . . . And, saving the worst for last, the number of people who run red lights is absolutely terrifying.

- Kelowna resident

I appreciate the expansion of walking and biking trails in the community for the use of both pleasure and business.

- Vernon resident

As I previously lived in the UK I feel like we lack consistent bus schedules. They don't come very often. When I try to walk anywhere you feel like you are the only one walking on the streets as most streets are designed for vehicles not walkers

- Vernon resident

Traffic lights along highway 97. Take a page out of Kamloops or Penticton's book and route the highway around town with minimal or no stops. Adding lights constantly has to stop. Lobby the provincial government and then kick in the necessary city contribution to build interchanges instead of lights. That is the #1 reason why we have so much congestion and so many accidents that cause delays.

- Kelowna resident

Lack of public transit options on the Westside to get downtown. Routes take too long to be useful for social outings or work. Not enough taxi service in the peak seasons - very difficult to get home or go out. Taxis don't answer calls.

- West Kelowna resident

We have so many vehicles on the roads with one person, either commuting or running errands. An LRT through and connecting the major cities would be such a step forward for the Okanagan.

- RDCO West resident

I am a cyclist and the excellent bike lanes in Kelowna are an important factor to me. Bottle necks when driving to events or shopping.

- Kelowna resident

In your opinion, what is the most important transportation issue or challenge in your community?

Random selection of answers

Charging parents for school buses. When there are 4 children in the family this becomes more expensive than many families can afford, necessitating arrangements for other family members, if available, to drive them and pick them up from school.

- *Vernon resident*

If there was a bus that came down Commonwealth Road, my neighbor would take it a lot, I would take it sometimes, and there are many other people in our building and the nearby trailer park who would take it as well.

- *Duck Lake resident*

People live too far from their work, play and shopping.

- *Kelowna resident*

Bicycle lanes and sidewalks. I appreciate the bike corridors being built throughout Vernon, let's make more of them! I reside on East Hill in Vernon; it is completely unacceptable that some streets do not have sidewalks on every road (both sides). The catchment for Silver Star Elementary is very small and it is a 'walking school' (very limited bus use). The children need a safe way to walk home. There are too many children walking on streets that do not have sidewalks. In addition, it is difficult for those with mobility issues (this includes my 1 year old) that need a safe space to walk.

- *Vernon resident*

Is there one? The city is well served, in my opinion. Multiple seniors residences close to town centre, streets well laid out. One thing to consider - licence golf carts to travel on non-highway city streets. They can go 40-50 km/hour, easy to handle, easy to park. Multiple US cities have done so. Environmentally friendly, with up to 4 passengers. Think outside the box. Scheduled carriers (i.e. buses) cannot help. Provides independence safely.

- *Vernon resident*

It would seem that Enterprise is a bottleneck of traffic and especially during summer tourist times. Building is going on at a tremendous rate.

- *Kelowna resident*

Traffic! High volume times specifically morning rush hour, any time after 3 until 6:30. The HOV lane needs to be better policed.

- *RDCO East resident*

Urban Sprawl

- *Vernon resident*

The roadways getting into Kelowna. Congestion due to single lanes roads.

- *Lake Country resident*

No left hand turn lanes. Improper settings of street lights. Speed. Road too narrow without extra lanes. Lines not painted bright enough with reflectors.

- *Peachland resident*

Snow removal along tight shoulderless winding roads and pot holes/ road surfacing condition along our Westside Road

- *RDCO West resident*



In your opinion, what is the most important transportation issue or challenge in your community?

Random selection of answers

Bus routes down Carrington Road are not frequent enough. There are now many seniors living in this area (and more coming up) who need more reliable transportation. It is a bit difficult to get to many parts of West Kelowna on the bus. The 97 Express bus is awesome for trips into Kelowna! Thanks for adding that.

- WFN resident

Lots of traffic on Hwy 97 from Kelowna to Lake Country. The speed limit from Commonwealth Rd to Lake Country on Hwy 97 is too fast. The speed limit is 90kmh, but that is easily surpassed. The speed limit in Winfield is 50kmh, but everyone drives well over that. I have seen no radar speed traps set up on Hwy 97 in Winfield in the past year.

- Duck Lake resident

Lights on Hwy 97

- Lake Country resident

Dramatic traffic increase over the last 3-4 years. I feel HOV lanes might be helpful in large cities like Vancouver . . . but believe they are not helpful / practical in Kelowna. Many local residents only stay on the highway for a few blocks . . . The short distance between crossroads makes weaving in / out of traffic even more stressful. Further, I am in full support of re-routing traffic that is only passing through West Kelowna, Kelowna, Vernon to take the burden of the cities.

- RDCO East resident

Having lived in both large metropolitan cities and small towns I find that Vernon streets/roads/intersections etc are simply not large enough to handle the volume of traffic they see. I notice that the sets of lights on 97 and 25th Ave are backed up anytime traffic is heavy. There aren't enough alternate lanes for turning at lights . . . Thank you for working on this.

- Vernon resident

Driving from Vernon to Kelowna during high traffic hours are very slow due to many people having to turn at major intersections but due to the limited number of lanes there are no turning lanes so that traffic can continue to flow . . . Second issue is too many commercial vehicles in the left lane that are trying to pass traffic but do not have the ability to pass that are slowing traffic further.

- Vernon resident

Housing development outpacing road infrastructure construction.

- Kelowna resident

Highway 97 getting on and off it and trying to go left or right. Sometimes you can only go one way.

- WFN resident

Chicken and egg issue of the bus system - i.e. need more people taking the bus to put in a good system, but can't take the bus because the system isn't flexible enough. Few direct routes without having to change, and going somewhere by bus takes 3 times longer than by car. We make it as a single car family because the two parents work primarily from home

- Kelowna resident

Readers are referred to the technical appendix for all 230 pages of comments.

6 Reference Tables by District

Accompanying this report under a separate cover as *Technical Appendix 1: Reference Tables* is a set of tabulations of selected survey results for various geographies used in this study.

Important note on use of the survey data presented in the reference tables:

Readers are reminded that the survey counts presented in the reference tables are estimates based on weighted survey data expanded to represent the size of the population for the given survey geography, with these expanded counts rounded to the nearest ten. These estimates are based on a modest survey sample of 4.6% of the population living in private residences and should not be taken to represent exact counts. When making use of figures in these reference tables in other contexts, we recommend rounding counts to the nearest 100, so as not to give a false impression of the accuracy of the data.

It should also be noted that the sample sizes for individual districts are relatively modest (ranging from 78 to 613 households). Results for districts with small sample sizes should be interpreted with caution, as they are subject to greater likelihood of variance from the true values for the population due to higher margins of sampling error. If greater reliability is required, it is advisable to further aggregate the districts.

All statistics are for households in the given geography, including trip statistics (i.e., trip statistics are not for trips to/from the given geography made by those residing in all geographies). Some figures in the reference tables may differ from figures in this report due to rounding, different filtering, or different treatments for analysis.

The reference tables are presented for the following districts and aggregate geographies. The districts and aggregate geographies are outlined in more detail in [Section 2.2](#) of this report.

Study Area Total	Districts:
	1001 City Core / Alexis Park / Harwood / North Vernon
Regional District of Central Okanagan (Study Area minus Vernon)	1002 East Hill / Middleton / Mission Hill
	1004 Outlying Areas
Sub-Areas:	1003 Landing / Bella Vista / Turtle Mountain / Priest's Valley 6
Vernon (Vernon + Priest's Valley 6)	2000 Lake Country
Kelowna (Kelowna + Duck Lake 7)	3001 City Centre / Pandosy
Other Central Okanagan	3002 Central Kelowna
	3003 Glenmore
Individual cities:	3004 Rutland
City of Vernon (i.e., does not include Priest's Valley 6)	3005 Mission
City of Kelowna (i.e., does not include Duck Lake 7)	3006 Black Mountain / Southeast
City of West Kelowna (districts 4001+4002)	3007 Kelowna North
	3008 Duck Lake 7
Special aggregation:	4001 Glenrosa / Westbank
Westside (all of the communities in the study area to the west of Lake Okanagan: City of West Kelowna, WFN, Peachland, RDCO West)	4002 Rose Valley / Lakeview
	5001 Westbank First Nation (WFN)
	6000 Peachland
	7000 RDCO West (Central Okanagan J CSD)
	8000 RDCO East (Central Okanagan CSD)



Connecting Our Region

Our first region-wide transportation plan



Draft Regional Transportation Plan Engagement summary

November 2020



Introduction

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.

The plan is designed to help improve the movement of people and goods and create a region where more people can choose sustainable and affordable transportation options. It establishes a framework for priorities over the next 20 years so that Central Okanagan governments can plan and seek funding as a unified region.

The interconnected project, 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.

The RTP was developed following more than two-and-a-half years of technical studies, consultation, and unprecedented region-wide partnership and collaboration and was designed to reflect the interests and values heard from people all across the region.

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."

Engaging with people across the region

Consultation over the course of developing the Regional Transportation Plan (RTP) has included engagement with stakeholders and residents across the Central Okanagan.

Consultation has included three online questionnaires, pop-up open houses across the region, the “Let’s Talk Transportation” event, stakeholder interviews, meetings with staff at municipalities across the region, and numerous presentations to elected officials at key milestones.

The RTP 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,

in collaboration with the Ministry of Transportation and Infrastructure and BC Transit.

The plan was also developed based on public input into what’s important, and so the Regional Transportation Plan sets the direction for Central Okanagan governments to work together to:

- move people and goods more efficiently,
- achieve fast and reliable transit,
- create a safe and convenient region-wide bicycling and trails network, and
- incorporate new mobility options.



April-May 2018:

250+ people attended four pop-up open houses

633 completed a survey to help identify the RTP’s vision & goals

April 24, 2019: 90 people participated in the Let’s Talk Transportation event at UBC Okanagan

Spring/summer 2019: 577 people shared their thoughts on potential transportation solutions

August 2020: Draft plan presented to public for feedback



Engagement on the draft plan

In the summer of 2020, the project team publicly released the draft Regional Transportation Plan. After presenting the draft plan to the regional councils for feedback, the project team then sought public input on the draft plan.

This engagement summary provides the highlights of what we heard during this last phase of public consultation. Information collected from the public was used to help inform development of the final Regional Transportation Plan.

Engagement method

Due to COVID-19, engagement activities were hosted in a digital format to align with advice from our Provincial Medical Health Officer. Feedback on the draft Regional Transportation Plan was sought via a virtual open house, online questionnaire, and live video consultation panels.

Virtual open house & questionnaire

In total, 322 people participated in the virtual open house and questionnaire, which was available online from August 4 to 23, and shared their thoughts and opinions.

Respondents reviewed the draft Regional Transportation Plan and provided open-ended comments on the overall direction

and each of the following key themes:

- Moving people & goods more efficiently
- Achieving fast & reliable transit
- Creating a safe & convenient region-wide bike & trail network
- Incorporating new mobility options

Please note that questionnaires of this nature are a mechanism for people to share their interests and opinions. Results are qualitative, not statistically significant, and are not meant to represent the views of all residents.

Live video consultation panels

To broaden the engagement, staff hosted two live video consultation panel discussions on August 19 and 20. Residents were invited to register in advance, and while 24 people registered, a total of 18 people attended the sessions.

Each session was independently facilitated and featured short presentations describing the Regional Transportation Plan and some of its recommendations. Opportunities for participant comment, discussion and questions followed each presentation. Staff took notes during both sessions, and a summary of feedback is included as part of this report.



"Engaged" participants include those who completed the virtual open house or attended a video consultation panel. "Aware" participants visited the project page but did not complete an engagement tool.

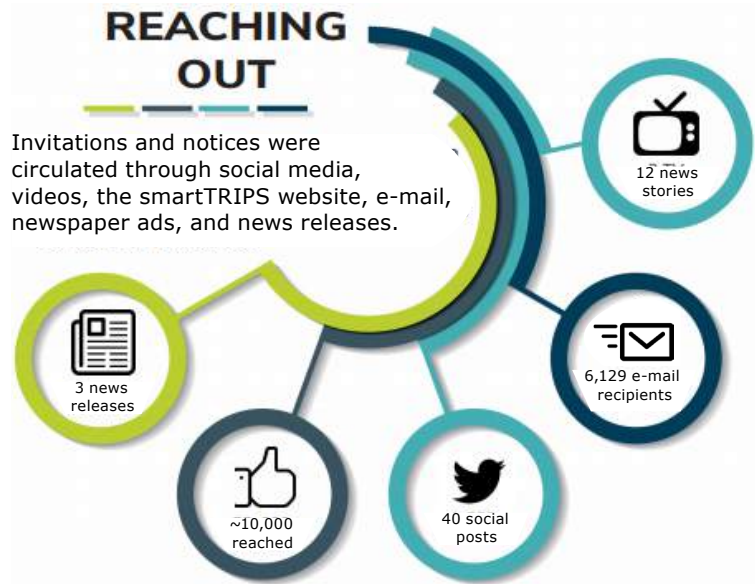
Outreach & promotion

The opportunity for residents to participate and provide comments on the draft Regional Transportation Plan was promoted through a variety of channels and incentives.

Incentives to participate included a prize draw for a \$700 gift card to a local bike shop as well as \$25 gift cards offered to those who attended the live video consultation panels.

Special attention was given to reach out to communities in the project's geographic area, including Peachland, West Kelowna, Westbank First Nation, Lake Country and the Regional District of Central Okanagan. To do this, each partner government created videos of their Mayor, Chair or Chief promoting the engagement opportunity. These videos were then shared through social media.

Efforts to engage diverse audiences and people with varied interests and perspectives included emailing past participants and various community groups and organizations encouraging them to participate and share the engagement opportunity through their networks.



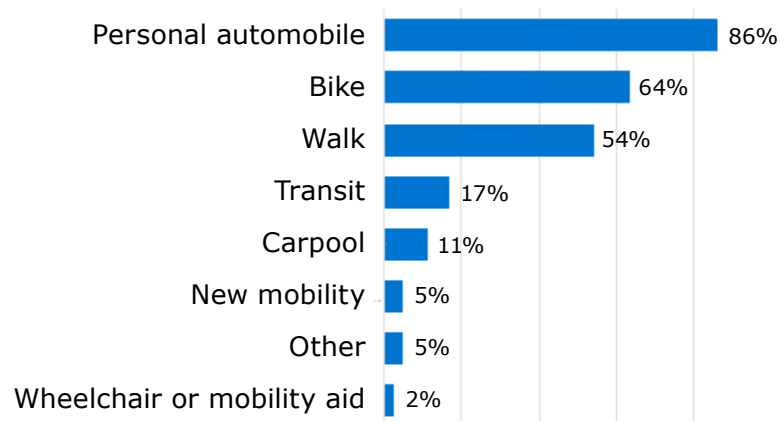
Pictured: Screenshots of partner governments' promotional videos shared via social media

Who we heard from

Participants in the virtual open house and live video consultation panels represented diverse perspectives and interests including cycling, transit, walk-ability, road efficiency, climate change, mobility and accessibility, and communities across the Central Okanagan. The majority of participants in the virtual open house indicated that their typical transportation mode is personal automobile, biking or walking.

Responses were weighted to mirror the distribution of the population by age and geographic location.

Virtual open house respondents' typical transportation mode



"This may be better than an actual open house because I had time to read the study and make up questions that brought out my comments."



What we heard: at-a-glance

Through the live video consultation panels and virtual open house, residents shared open-ended comments about the Regional Transportation Plan.

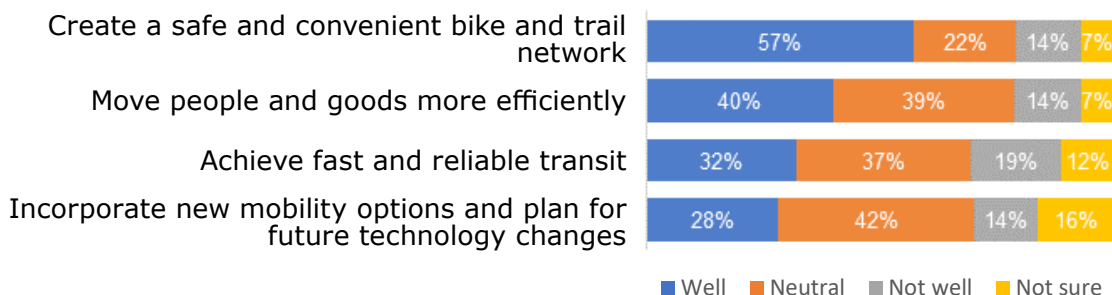
The project team read each of the 1,200 open-ended comments and developed a list of themes based on their content. Each time a theme was mentioned in a comment it was tallied. The top themes that were mentioned most often are shown below, with font sizes corresponding to the number of times each theme was mentioned.



Alignment with outcomes

Question: "Overall, how well do you think the Regional Transportation Plan achieves the following outcomes?"

Most respondents marked either "well" or "neutral" in response to this question. The outcome that the most respondents marked the RTP as achieving "well" was "create a safe and convenient bike and trail network."



What we heard: Virtual open house & questionnaire summary

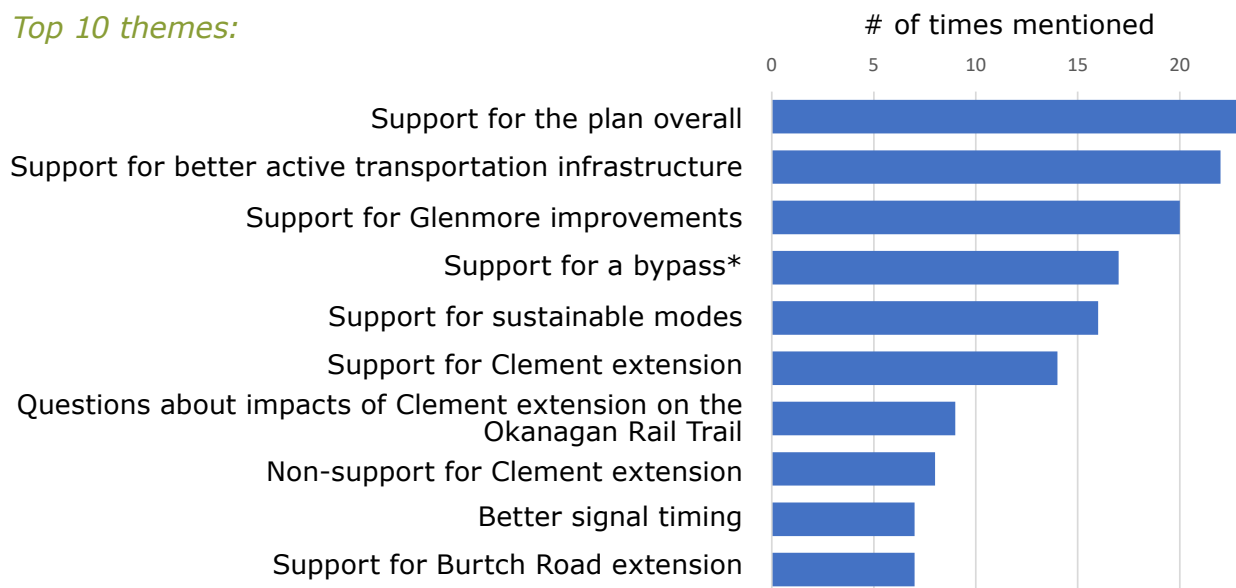
The project team read each comment submitted in the virtual open house questionnaire, identified themes, and tallied each comment based on its content. The top 10 themes that participants mentioned most often are included in this section, and verbatim comments are included in the Appendix.

Moving people and goods more efficiently



Staff shared proposed recommendations to improve the regional road and goods movement network, including potential projects, and asked participants for comments and considerations.

Top 10 themes:



*Note that a bypass or second crossing is the purview of the Province and outside the scope of the Regional Transportation Plan.

"Congestion on Spall Road and Enterprise need to be addressed with the extension of Clement Avenue to Highway 33."

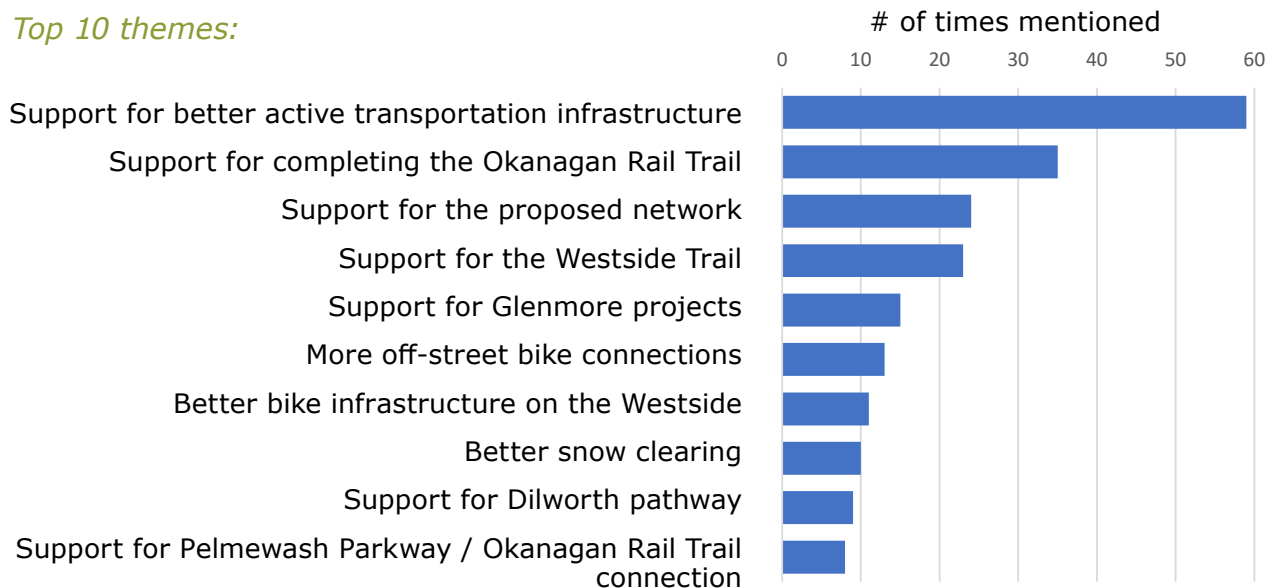


Creating a safe and convenient region-wide bike and trail network



Staff shared proposed recommendations to create a safe and convenient region-wide bike and trail network, including potential projects, and asked participants for their comments and considerations.

Top 10 themes:

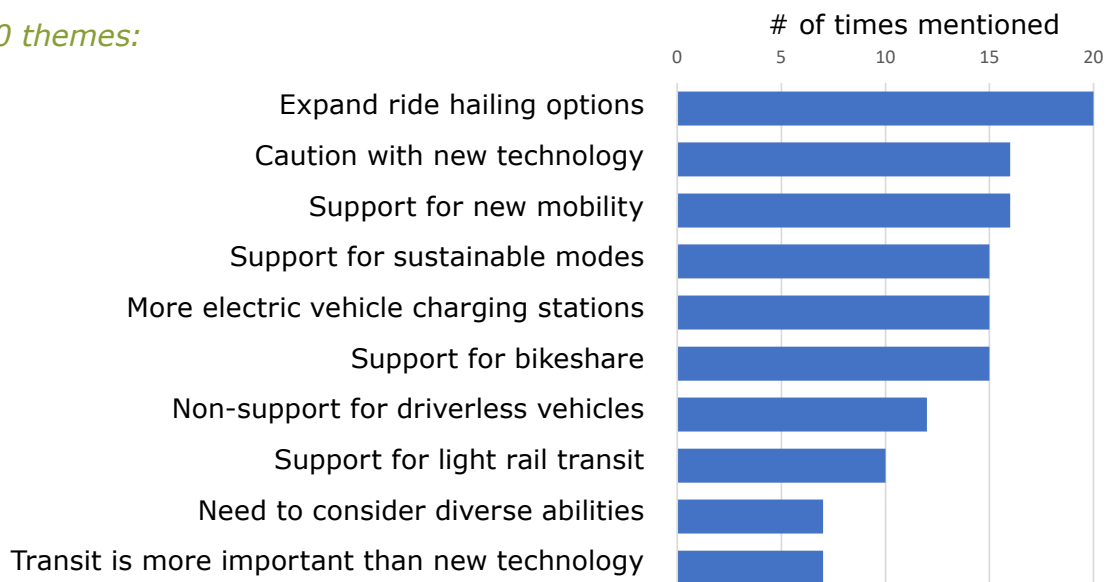


Incorporating new mobility options & preparing for technology change



Staff shared an overview of the draft Regional Disruptive Mobility Strategy, and its approach to prepare for future technology change, and asked participants for their comments and considerations.

Top 10 themes:

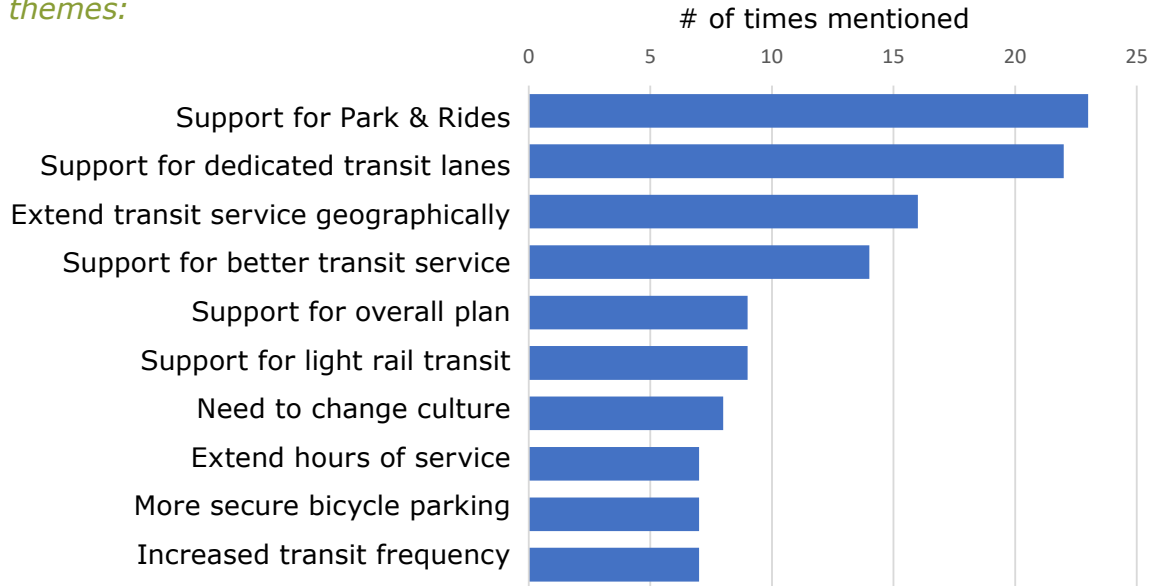




Achieving fast and reliable transit

Staff shared proposed recommendations to achieve fast and reliable regional transit, including potential projects, and asked participants for their comments and considerations.

Top 10 themes:



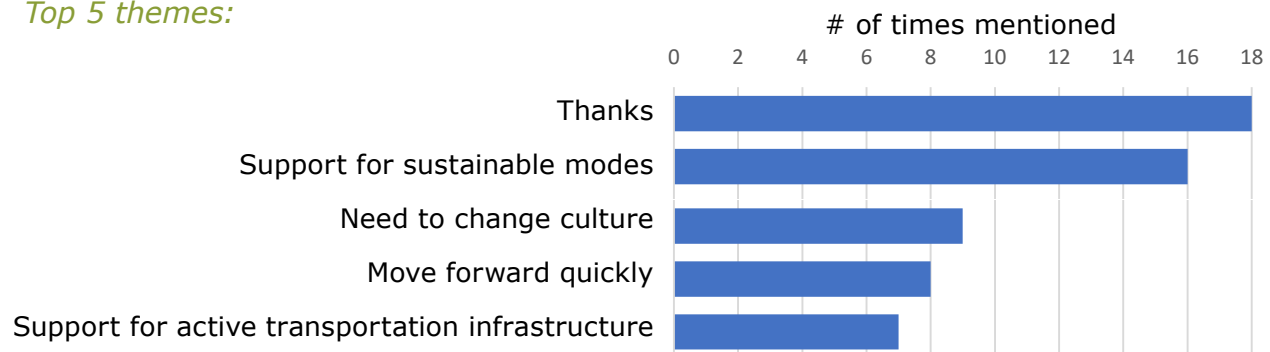
"I love the idea of Park and Rides for a growing city. A forward thinking eco-friendly option for commuters."

General feedback on the plan



Participants had an opportunity to provide further general feedback on the draft Regional Transportation Plan. The comment that was mentioned most often included a general "thank you" from participants.

Top 5 themes:



"This is important and we need to make the necessary (and unpopular with some citizens) investments in the infrastructure and marketing to draw people into adopting a more viable transportation system. You have a difficult challenge but it is one that an increasing number of our residents recognize as an issue that cannot be sidestepped."

What we heard: Live video discussion panel summary

This section includes a summary of the comments and questions heard from participants of the two live video consultation panels hosted on August 19 and 20. All comments have been reviewed by the project team and helped inform development of the final Regional Transportation plan.

Overall direction of the plan

When asked to comment on the overall direction of the plan, participants indicated:

- General ideas are good, and they would like to see a more aggressive and faster roll out (moving people out of cars and into other modes)
- Interest in fast, easy things we could do to move people to transit (e.g. free bus passes for newcomers)
- Like the four pillars, components and connections
- Support for a shift to transit and cycling
- Interested in agriculture and goods movement; didn't see much of that in the plan
- General support for the plan direction, including its emphasis on completing the bike and trail network and achieving fast and reliable transit
- Support for its comprehensiveness and that it is region-wide
- It's important to consider persons with disabilities and vulnerable people, including providing shade and signs in braille
- A desire to see more of a clear vision, commitment and strategy to achieve transit and climate goals

Moving people and goods more efficiently

When asked to comment on the recommendations presented, participants indicated:

- It's important to strengthen the local road network
- Concern about congestion shifting to other roads (especially the roads that provide a less congested alternative to Highway 97)
- Concern that the Clement Avenue extension might encourage more people to drive
- A desire to see more about changing behaviours – for example, getting trucks to deliver at different times of the day to encourage 'peak spreading'
- A desire for better transit to reduce congestion on central routes
- A strong preference to see the Okanagan Rail Trail preserved as part of the Clement Avenue extension
- Support for improvements to Glenmore Road that would make it safer for vehicles and bikes
- Concern about existing traffic volumes to Lake Country
- Interest in an overpass to the Kelowna International Airport
- The importance of the efficient movement of goods and people to the airport and in the industrial area
- Support for better connections from the airport and university to Mission and Glenmore areas
- Suggestion to synchronize traffic lights to reduce greenhouse gas emissions
- Concern that traffic might shift to Clement Avenue

Creating a safe and convenient region-wide bike and trail network

When asked to comment on the recommendations presented, participants indicated:

- Recreational, commuter and exercise cycling should all be considered
- Safer routes would encourage more people to ride, including seniors
- Currently there is no safe way to get from Kelowna to Lake Country by bike
- Educating motorists about sharing the road with cycle lanes and cyclists is important
- Specific and individual preferences for paved vs non-paved bike paths
- Safe and convenient bike routes will make it easier for people to choose cycling
- There are missing links in the network near the ECO Centre and on Springfield
- Suggestion that Leckie Road might be a better location than Dilworth Drive for a connection between the Okanagan Rail Trail and Mission Creek Greenway
- A desire to see more active transportation infrastructure on Glenmore Road to Lake Country

Incorporating new mobility options

When asked to comment on the recommendations presented, participants indicated:

- Lower trust in ride sharing and automated vehicles improving traffic flow
- The “last mile” in Lake Country is the difficulty
- Connecting a mini-bus to a ‘hub’ location might help, especially if it could connect people to hospitals and other services
- Park and Ride doesn’t meet the needs of many potential bus riders; not a great option
- Desire to see light rail transit with options at hubs to connect people to hospitals
- Suggestion to consider that electric vehicles use lithium batteries, which are hard on the environment
- Biking and transit should be more competitive and more appealing than driving a car

Achieving fast and reliable transit

When asked to comment on the recommendations presented, participants indicated:

- Support for the idea of a transit spine (widening the shoulder along Highway 97 from Westlake Road to the bridge, an eastbound transit lane across the bridge during the morning rush hour and dedicated transit lanes along Harvey Avenue from the bridge)
- A direct transit route to the airport is important
- Queue jumping for transit at intersections is important
- More frequent and better transit service is needed
- Park and Rides do not help many potential transit users
- Rapid transit is necessary to reduce congestion
- Safety and convenience are the biggest motivators to change behaviour
- Desire to see the transit spine extend to Lake Country
- Desire for a westbound transit lane during the evening rush hour as well
- Support for more dedicated median transit with smart technology
- Support for improvements to transit, including access to the airport and university
- An interest in light rail transit (LRT)
- Transit needs to be reliable, frequent and fast to attract ridership

Other comments

When asked to provide other comments, participants indicated:

- Safety and convenience is necessary to encourage behaviour change; thinking bigger and more aggressively will trigger behaviour change (for example, don't use bike lanes for snow storage during the winter)
- Behaviour change happens because of economic tools like increased parking rates
- Programs to educate youth to take transit have been successful and should be explored
- The school district has not been helpful in terms of supporting transit or bus solutions for students; a lot of traffic is still generated by parents dropping off their children at school, which is in part because the roads to school are unsafe for cycling or walking
- Suggestion to consider 3-wheeled bikes, which are great for seniors and people with mobility challenges
- Question was asked: By 2040, what percentage of people do we project will be taking transit and what is the strategy for achieving that goal?
- More sustainable transportation requires bold political leadership that sets targets
- Question was asked: How does this plan align with provincial goals around climate change and active transportation? For example, CleanBC.
- Better connections to the airport (transit and bike) may help ensure tourists/visitors have less impact on the roadway; consider a free shuttle for tourists
- Look to tourists/tourism as a way to fund transportation improvements

One thing for the project team to keep in mind

When asked for the one thing they would like the project team to keep in mind as they finalize the RTP, participants said:

- (Transit) hubs and speeds
- Efficiency, safety
- Be bold
- Alleviate bottlenecks
- Make it easy
- Safety for bikes
- Protect downtown for walking and cycling
- Transit is not an option for some people, based on their jobs
- Be bold about the future of transportation and the climate emergency
- Equity – consider all voices including children; talk to transit riders
- I like the direction; ensure there aren't unintended consequences
- (Transit) hub and spoke
- Great job. Feeling good about the plan

Engagement feedback

Virtual open house participants were also asked how they felt about the engagement process. The most common themes heard in the open-ended comments included a general “thank you” as well as a desire to have a clearer understanding of how public feedback is being used.

In response to standard exit survey questions about the engagement process, the majority of respondents had either a positive or neutral response.

71% agreed the information was clear and understandable

53% agreed they understand how public input is being used throughout the process

65% agreed they felt participating was a valuable experience

64% agreed their knowledge and understanding of the Regional Transportation Plan improved

Conclusion & next steps

Since 2018, people from across the region have added their priorities and perspectives to the regional transportation planning process through online questionnaires and in-person events including region-wide pop-up open houses and interactive conversations.

Early public and stakeholder input helped confirm the vision and goals for the project, and the latest virtual open house and live video consultation panels, along with technical considerations, were used to help inform development of the final plan.

The final Regional Transportation Plan will be presented to each of the Sustainable Transportation Partnership of the Central Okanagan (STPCO) partners for endorsement in Fall 2020.



The Regional Transportation Plan is a project of the Sustainable Transportation Partnership of the Central Okanagan (STPCO).

For more information, please email info@smartTRIPS.ca or visit smartTRIPS.ca.





Connecting Our Region

Our first region-wide transportation plan



Final Report

Regional Transportation Plan

Sustainable Transportation Partnership of
the Central Okanagan (STPCO)



November 2020



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Contents

Connecting Our Region	01
01 Introduction	04
1.1 Emerging Trends	06
1.2 Study Area	06
1.3 Purpose of RTP	07
1.4 The Process for the Central Okanagan's First Regional Transportation Plan	07
02 The Vision for Regional Transportation	10
2.1 RTP Vision	11
2.2 RTP Goals	11
2.3 RTP Alignment with Provincial Plans	12
03 Existing and Future Conditions	13
3.1 Regional Demographics	14
3.2 Regional Travel Patterns	18
3.3 Travel Conditions	23
04 The Regional Transportation Network	30
4.1 The Region	31
4.2 Regional Transportation Modes: Background and Considerations	33
05 Recommended Policies, Programs and Recommended Projects	40
5.1 Programs and Services	41
5.2 Regional Transportation Policy Guidance	45
5.3 Recommended Projects	52
06 Moving Forward Together to Achieve Our Regional Transportation Vision	74
6.1 Future of STPCO	75
6.2 Monitoring the RTP Success	76
6.3 Implementation and Partnerships	76
6.4 Implementation Summary	79
Appendices	
Appendix A: Regional Transportation System Maps	
Appendix B: Congestion in the Central Okanagan	



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 Plan¹ and the Regional Disruptive Mobility Strategy² 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 sector³. 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 Strategy⁴ 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 Okanagan⁵. 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

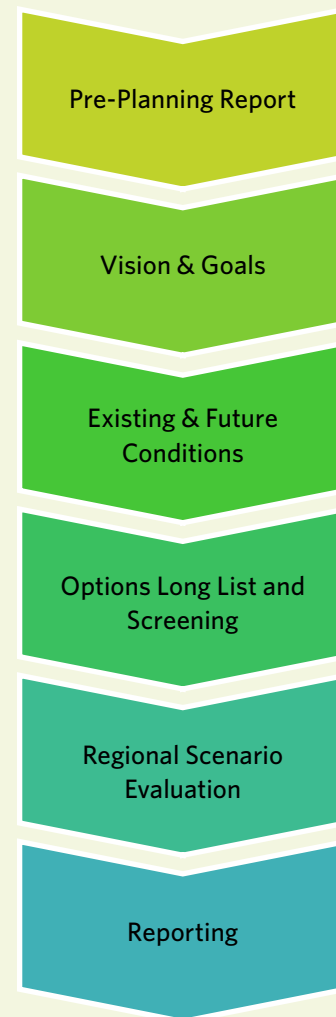
The STPCO is a formal partnership that coordinates the regional delivery of sustainable transportation programs and projects in support of common regional policy, plans and interests (economic, social and environmental). The STPCO also provides a formal forum for discussion among elected officials, senior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

Figure 2. RTP Process

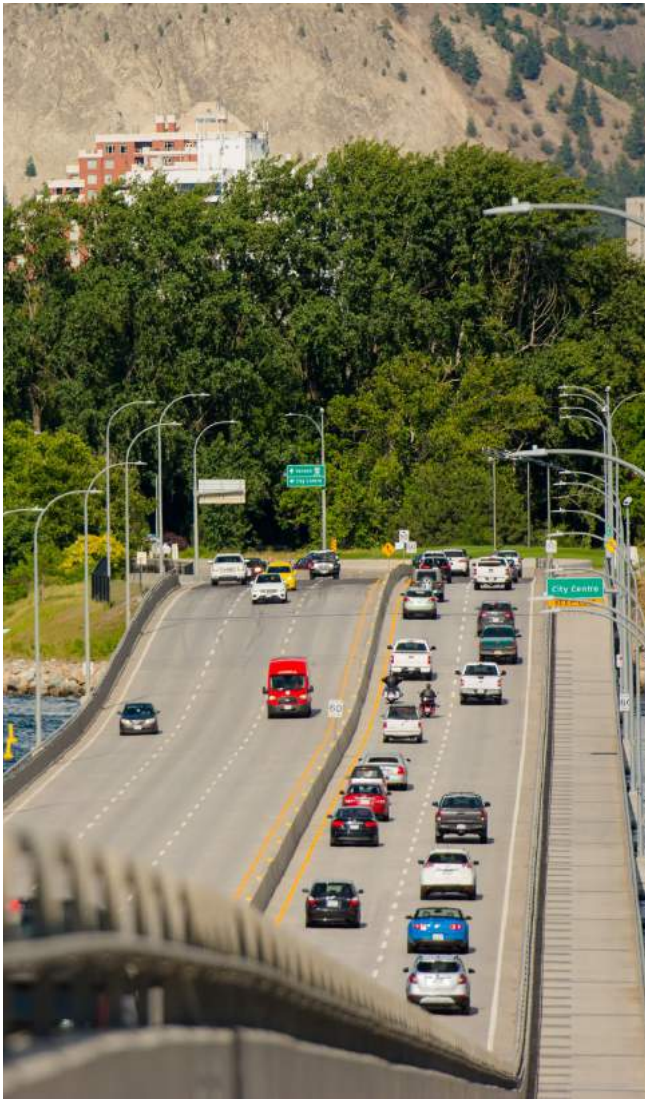


intended to replace local or provincial planning, but enhances planning by other levels of government. There is no firm definition of regional and no hard line between planning that is regional versus local or provincial. The regional component of planning should be easily integrated and consistent with 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

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

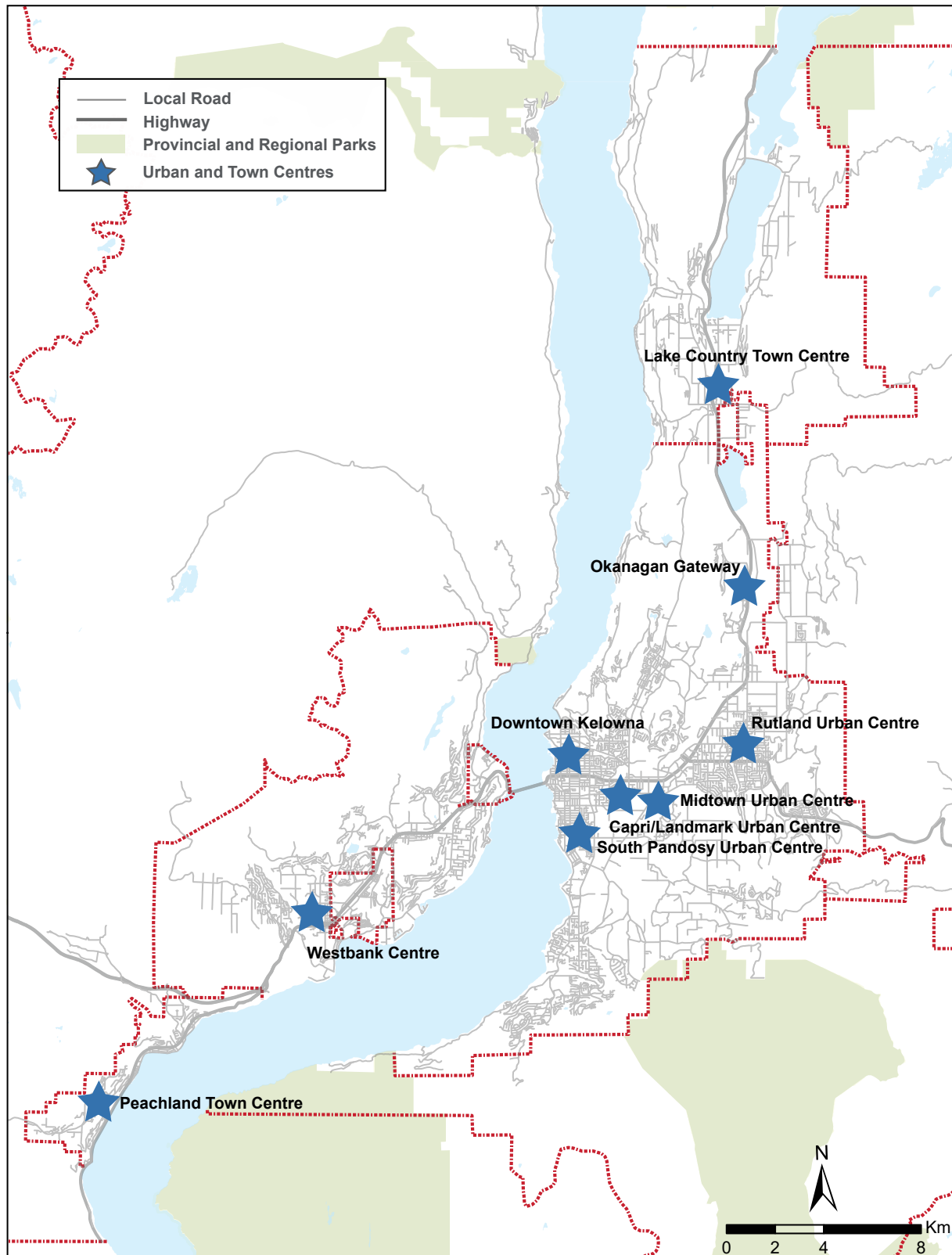


and goods to important regional destinations. Provincial highway planning is not included as regional, except where the highway provides an opportunity to support regional transportation in a way that has not normally been considered, such as high capacity transit. Connecting regional urban and town 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 Padosy 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 through 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 parents⁷.

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 2034⁸.

A profile of seniors transportation habits was completed by Statistics Canada in 2012⁹. 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 drivers¹⁰. Additionally, seniors are more likely than younger people to be killed when they are involved in a collision¹¹. 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 travel¹², and trends over the past 20 years show that children are increasingly traveling to school by car and fewer are walking or bicycling¹³.

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 transportation¹⁴. 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

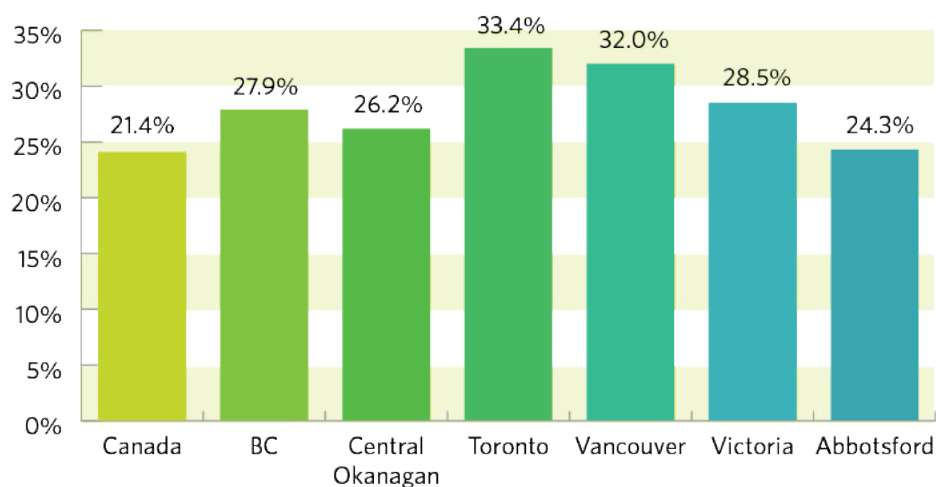
Home ownership rates in the Central Okanagan, at 73.3%, are higher than the provincial and national averages of 68%, and the regional home ownership rate is the third highest of all CMAs in Canada.

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

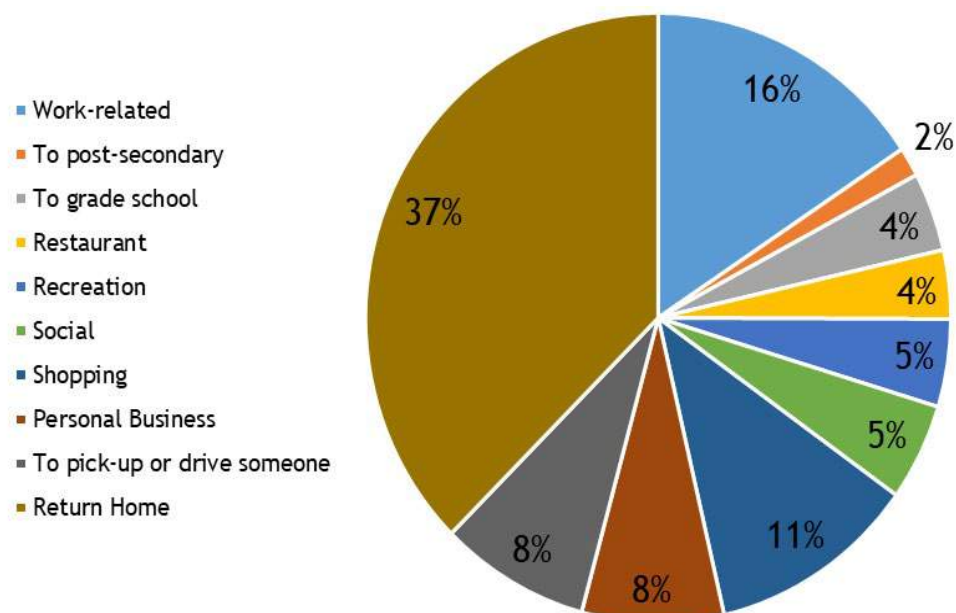
The 2018 Okanagan Travel Survey provides a wide range of travel information in the region, including why people travel, what modes they use, and where they are travelling to and from. Key findings from the survey are as follows:

- 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



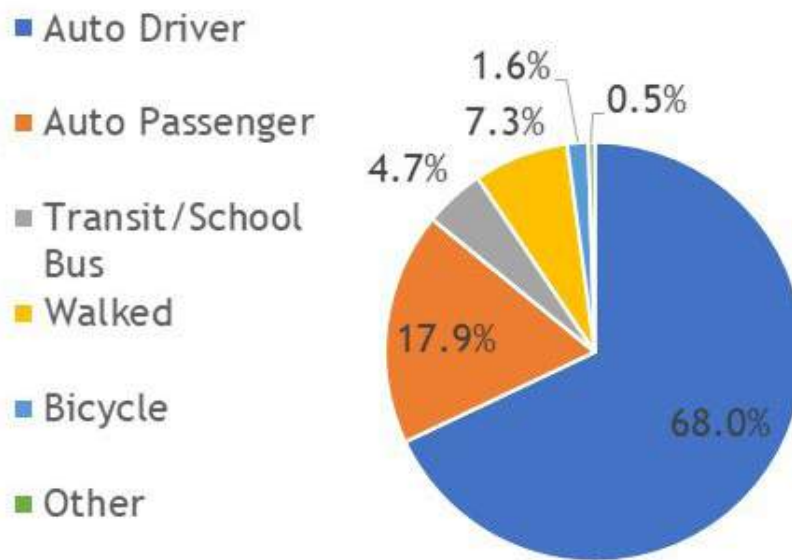
Source: 2018 Okanagan Travel Survey

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

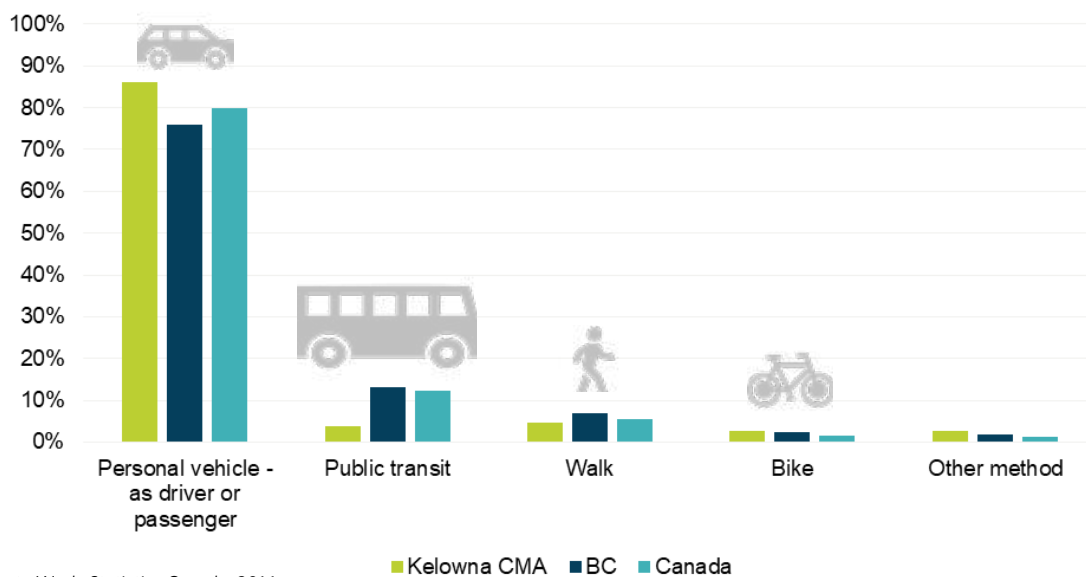
In 2016, based on the National Household Survey Journey to Work data, the majority of work trips (86%) were made by car, which is 10% higher than the provincial share and 6% higher than the national share. Commuting mode shares are illustrated in **Figure 7**.

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%

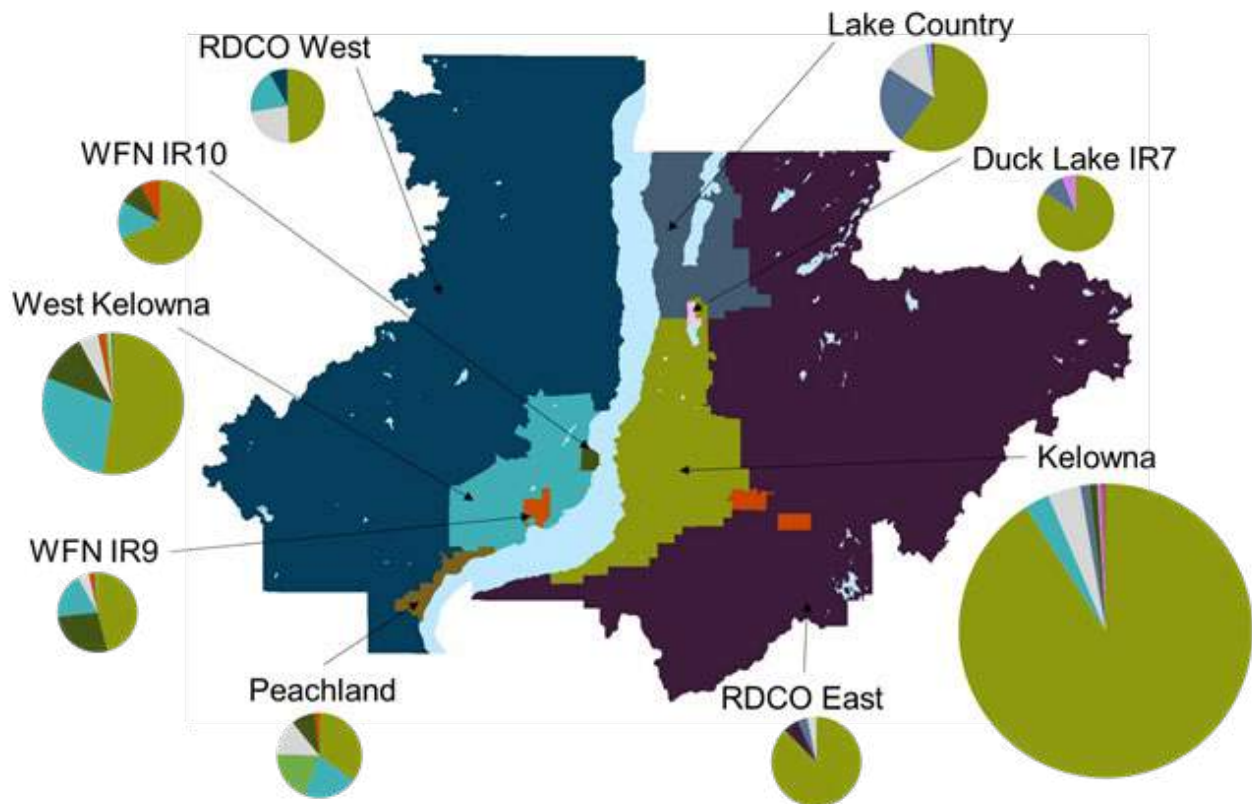
Source: Journey to Work, Statistics Canada, 2016

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.)

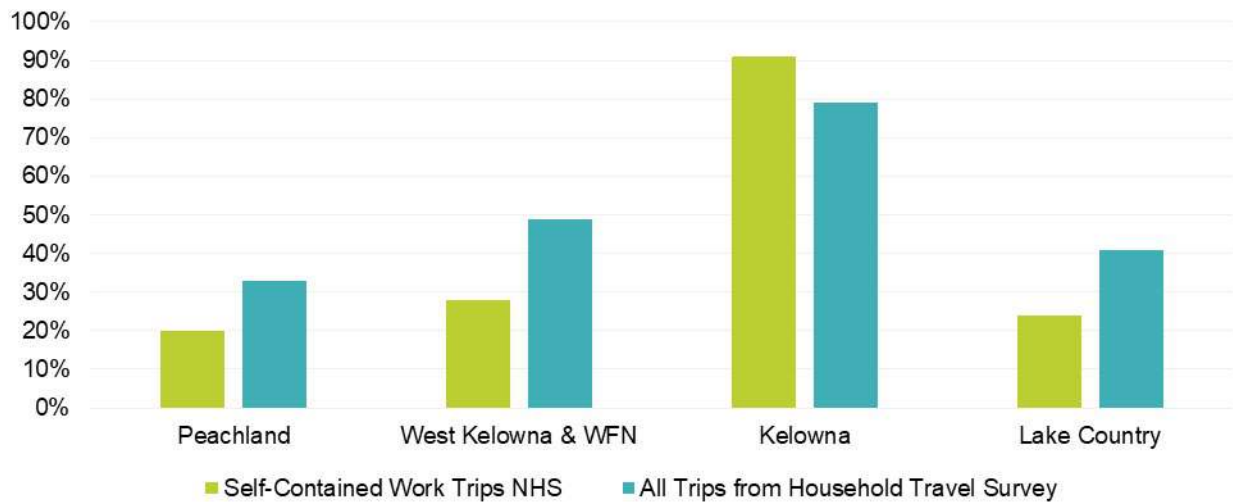
3.2.4 Commute Distances

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**.

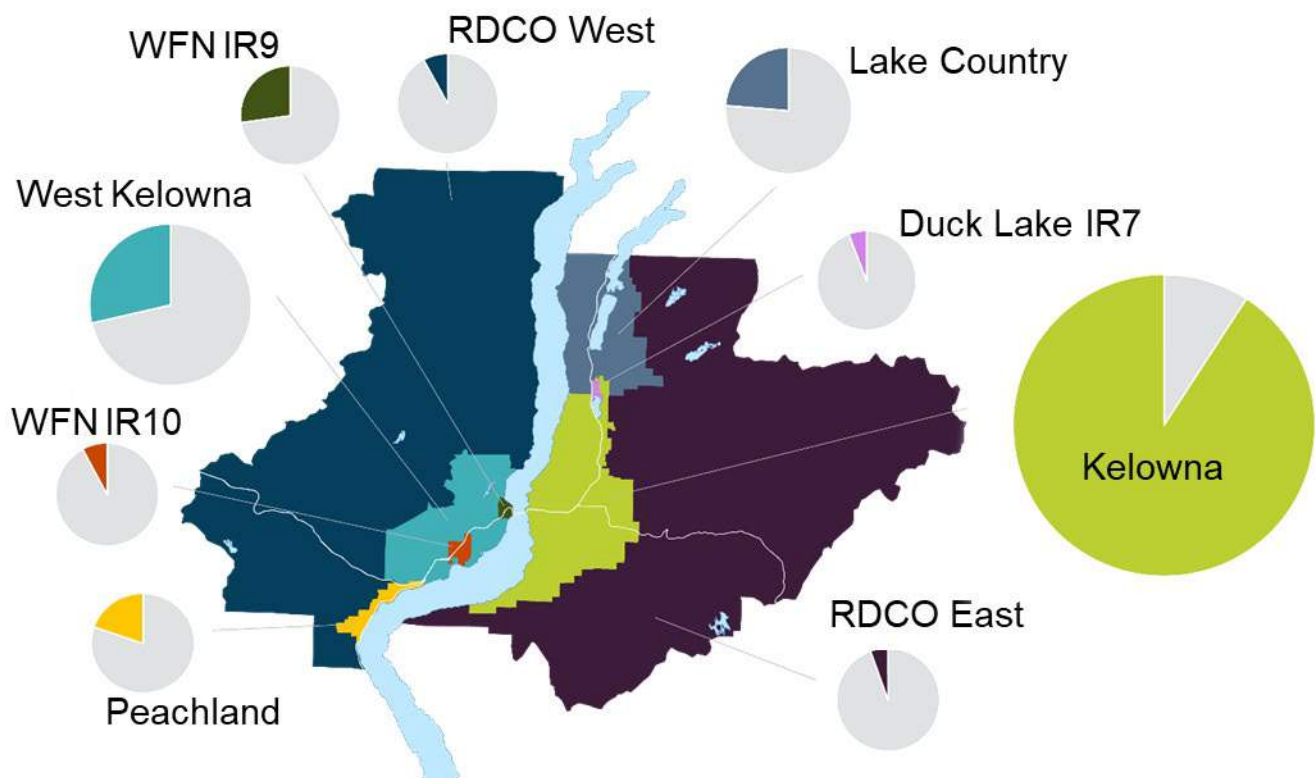
Figure 9. Comparison of Self-Contained Trips (Work Trips vs. Trips for All Purposes)



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 destinations 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 Metrics¹⁷

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.

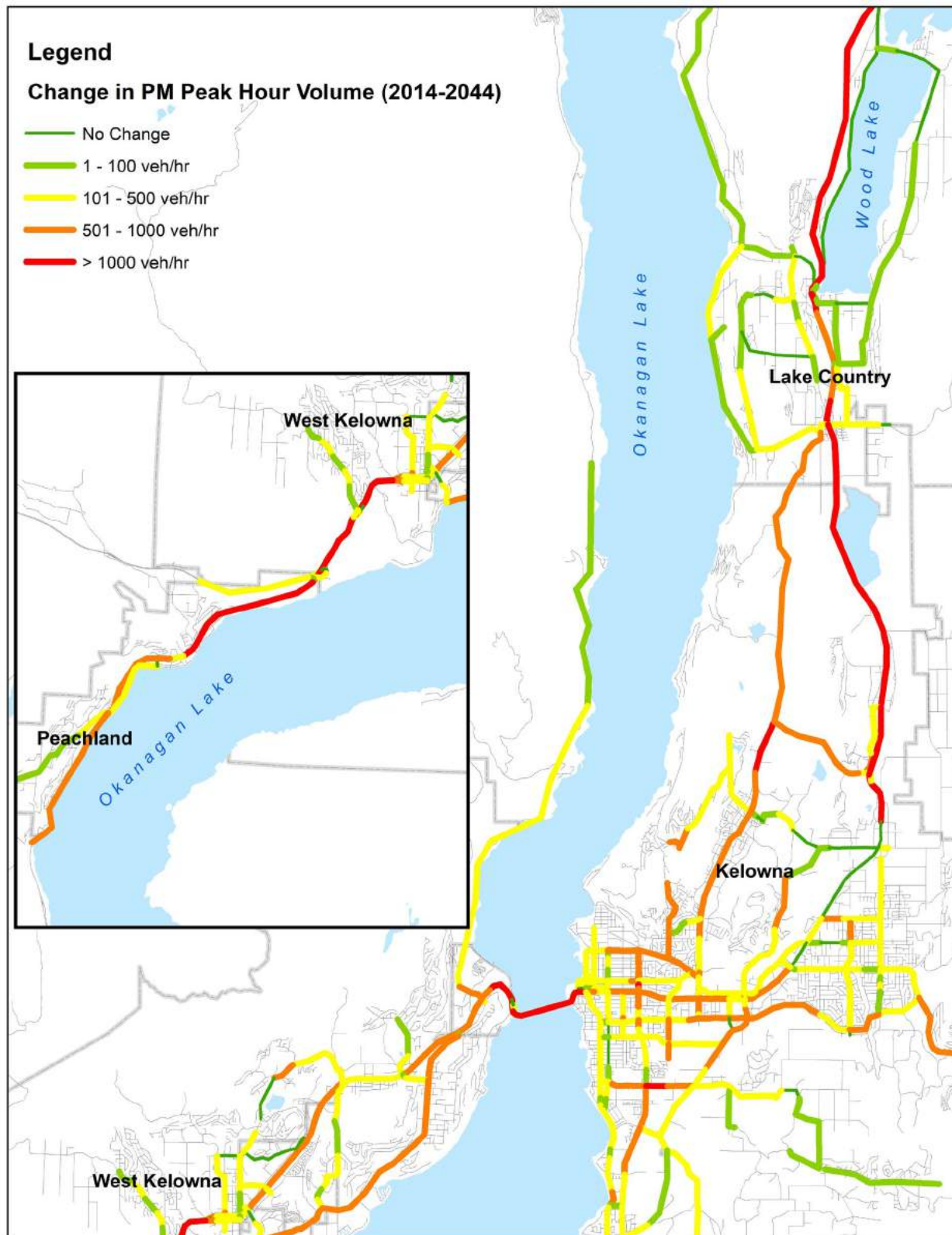
Traffic volumes are the highest within Kelowna and West Kelowna, and decrease along the highway to the north and south. Alternate parallel routes to the highway

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 through 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 Pandozy, 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.

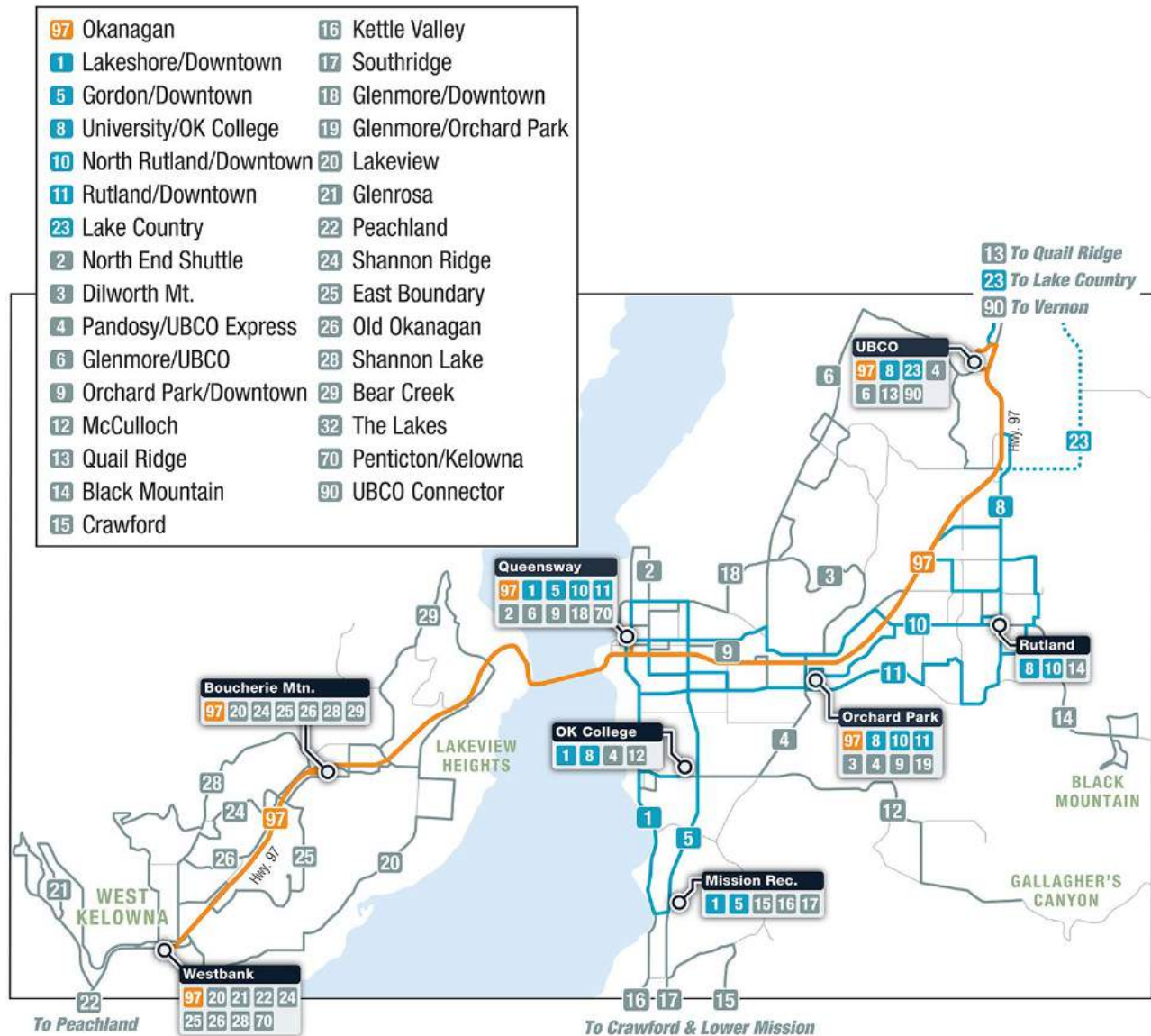
To assess the current performance of the entire transit system relative to other transit systems in Canada, the system was compared with a number of other similar sized metropolitan areas with universities, including Kingston, Moncton and Guelph. This comparison is shown in **Table 7**.

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 Score¹⁹ 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

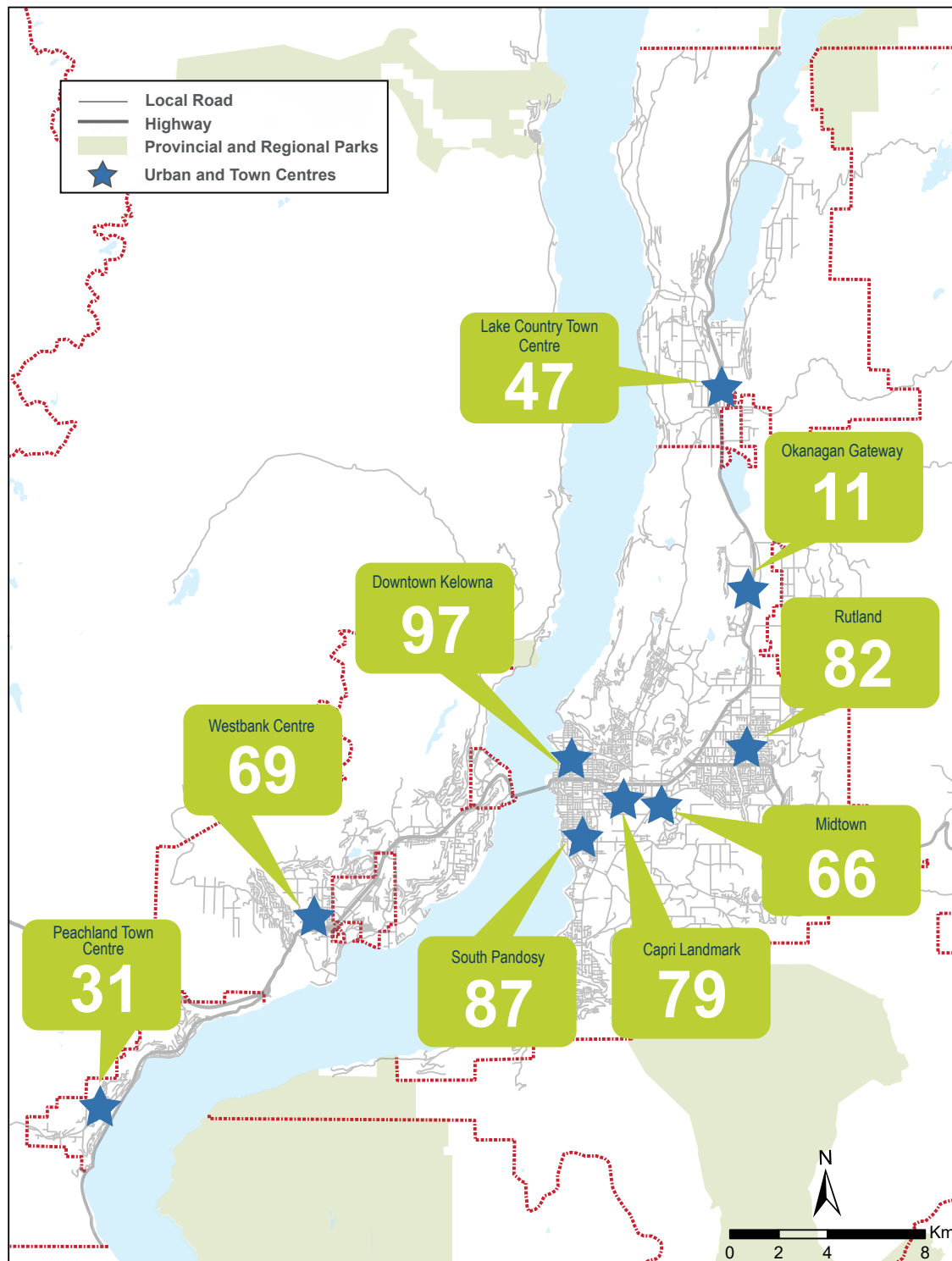
The centroids of the urban and town centres were assessed with Walk Score. Peachland Town Centre, Okanagan Gateway, and Lake Country Town Centre all had scores less than 50, indicating a car-dependent environment. Westbank Centre and Midtown / Orchard were deemed as somewhat walkable. South Padosy, Capri-Landmark, 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.

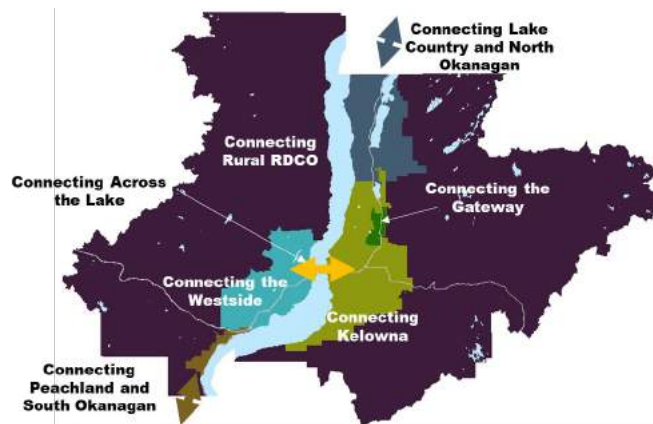
04 The Regional Transportation Network



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 Study²⁰, 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.

Efficiently 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 Study²¹.

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 day²². 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 jurisdictions²³.

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 traffic²⁵.

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 destinations²⁶. 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 Autonomous 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/W55d2d4057a3105895c2e7dab7.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 ferry²⁹.

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.

²⁹ <https://admin.glaciermedia.ca/fileservers/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 Pelmeash 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 Okanagans³¹, 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 Bridge³³. 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 region³⁴. 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.

³⁰Regional Bicycling and Trails Master Plan: <https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final>

³¹Trail of the Okanagans: <https://www.trailoftheokanagans.com/>

³²Regional Bicycling and Trails Master Plan: <https://smartTRIPS.ca/regional-bicycling-trails-master-plan-final>

³³BC Ministry of Transportation and Infrastructure traffic count. Permanent Count Station P-25-1

³⁴Central 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



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.

only serviced when a request is made through the app or by telephone.

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 Strategy³⁵.

Micromobility

Micromobility 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 micromobility 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.

³⁵The 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 the 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 be 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 plans³⁶.

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 Strategy³⁷. 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

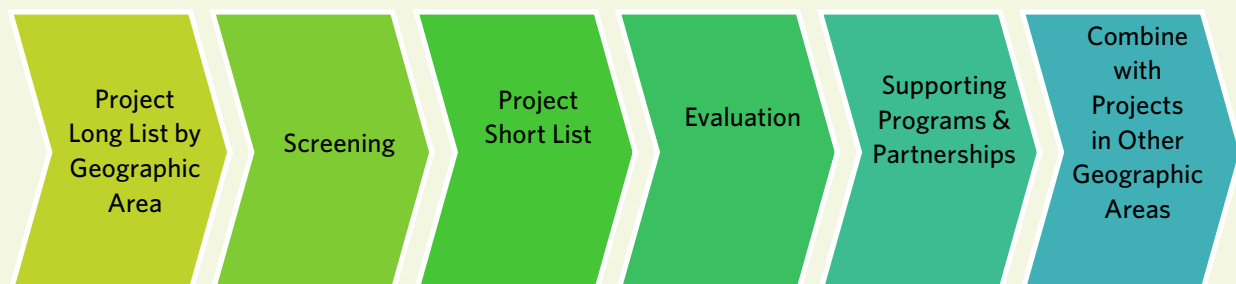
While the projects included in these studies were not evaluated in the RTP, they are referenced where appropriate. Additionally, projects included in the first phase of BC MoTI's Central Okanagan Planning Study (COPS) were not included in the list of projects to be considered in the RTP. However, the 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.

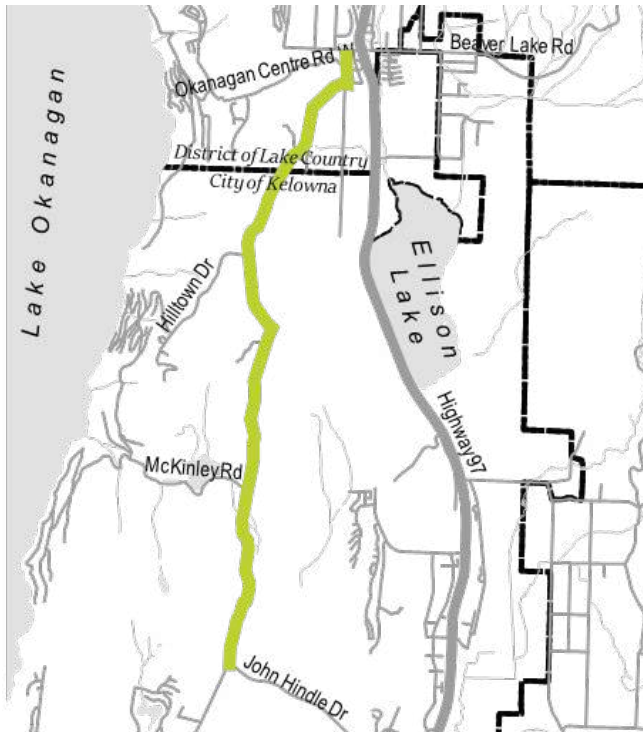
The remaining short list of projects was evaluated against the RTP vision and goals using a triple-bottom line process to further refine the recommended project list. While the evaluation provided some comparative information, an important consideration was how the recommended projects worked together 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





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

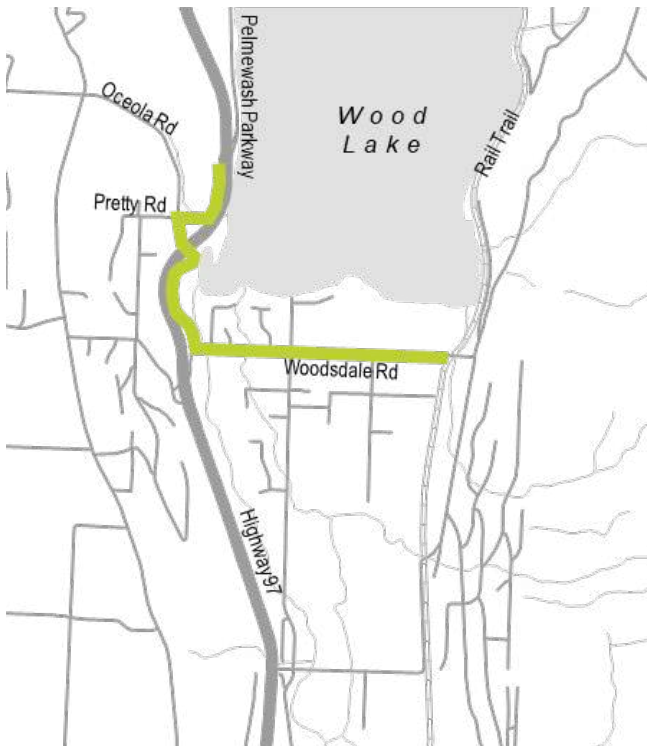
Project Cost Range: \$\$



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



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



Pelmeash 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 Pelmeash Parkway to the Okanagan Rail Trail. An initial routing could be a multi-use pathway on Pretty Road, Ocelia 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 Pelmeash 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 Pelmeash 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



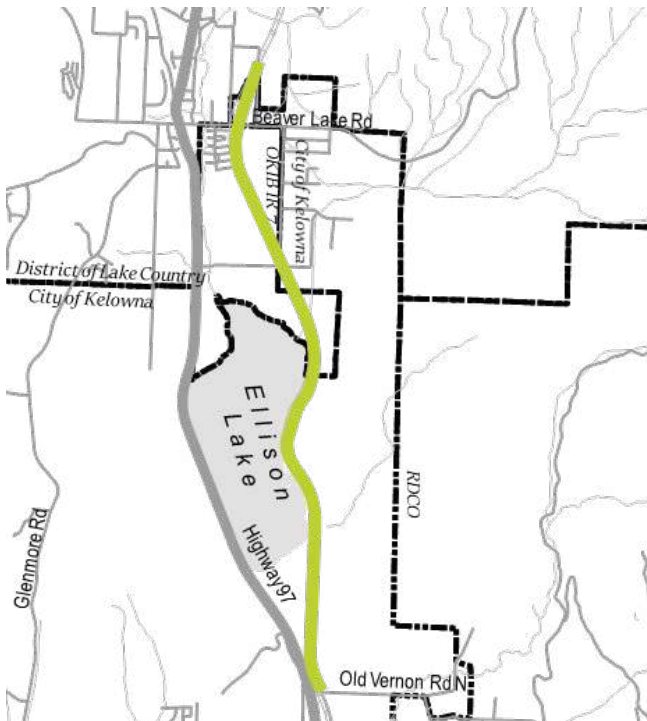
Raised cycle track (Source: Small Town and Rural Multi-modal Networks, FHWA)



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

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: \$



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

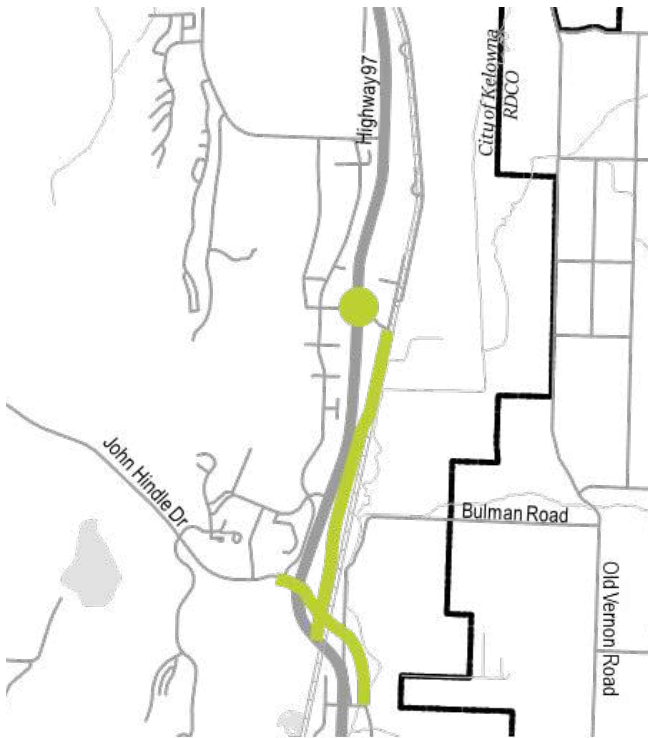
Project Cost Range: \$



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



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



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: \$\$\$\$



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)



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



Protected Bike Lane, Edmonton (Source: HDR)

Partners: BC MoTI, City of Kelowna

Project Cost Range: \$\$



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



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



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



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

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: \$



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: \$\$



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



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: \$\$



Highway 97 Dedicated Median Transit Lanes, Bridge to Hollywood Road

Description:

This project would add dedicated transit lanes in the median along Highway 97 and 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



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



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

Partners: City of Kelowna, BC MoTI, BC Transit

Project Cost Range: \$\$\$



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



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

Partners: City of Kelowna, BC MoTI

Project Cost Range: \$\$\$



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:

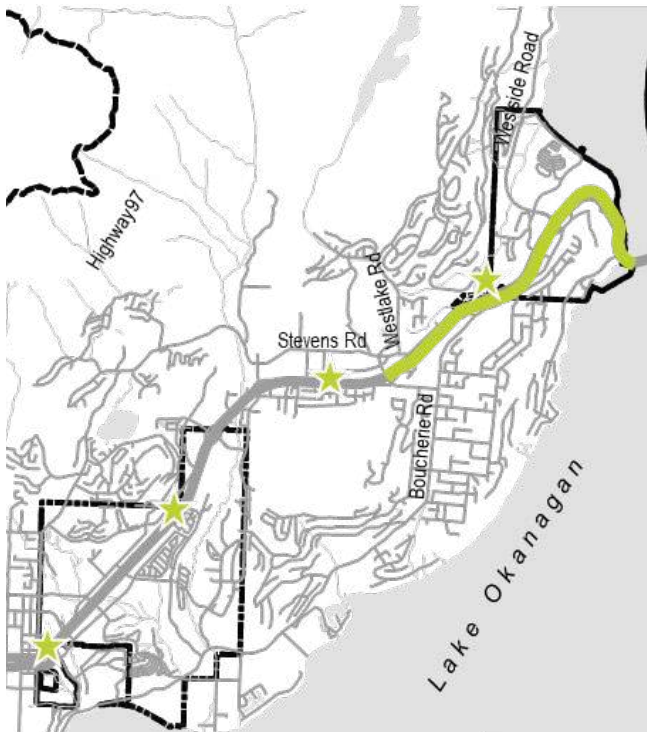
- Coordination with the Hwy 97 Dedicated Median Transit Lanes project
- Expanded RapidBus Service



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

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

Project Cost Range: \$\$



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

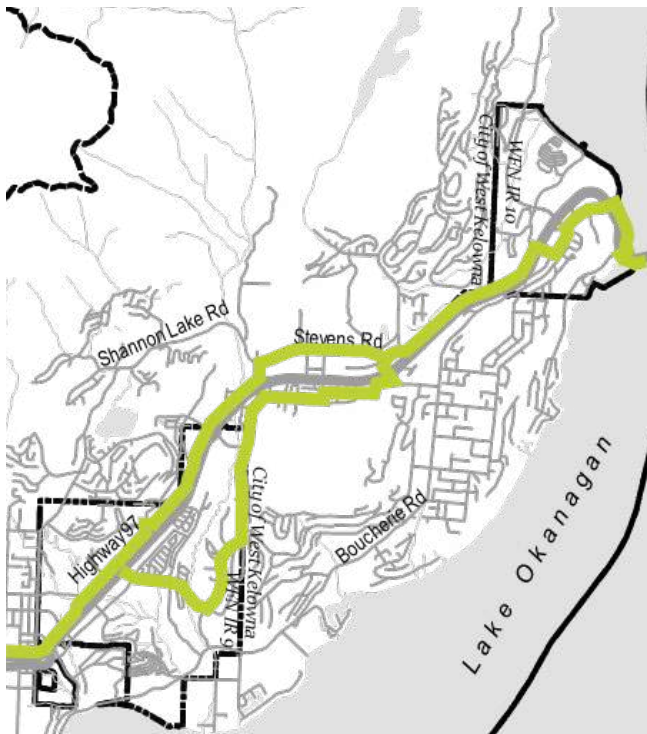
Project Cost Range: \$\$\$



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



Shoulder Transit Lane (Source: Washington State DOT)



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: \$\$



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



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:

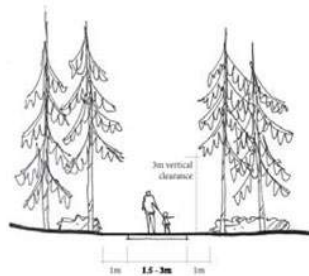
- N/A

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

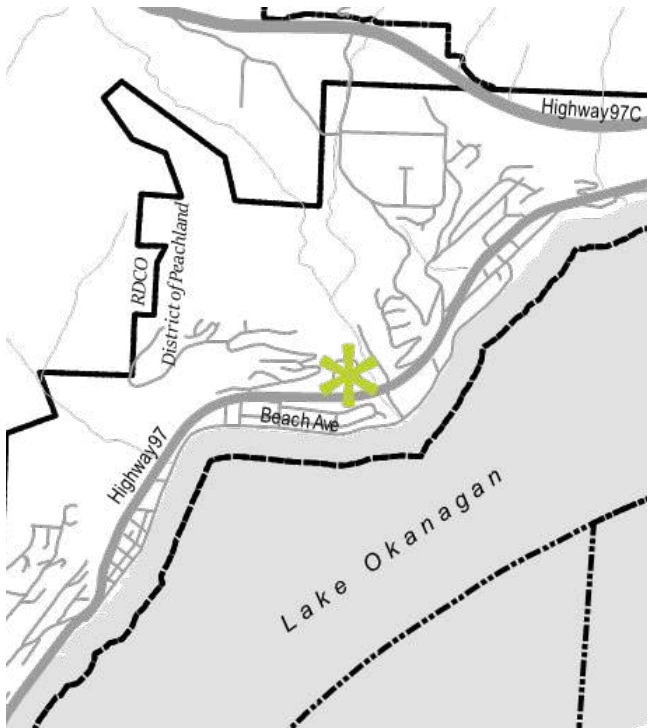
Project Cost Range: \$\$



Okanagan Rail Trail, (Source: Global News)



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



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



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

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

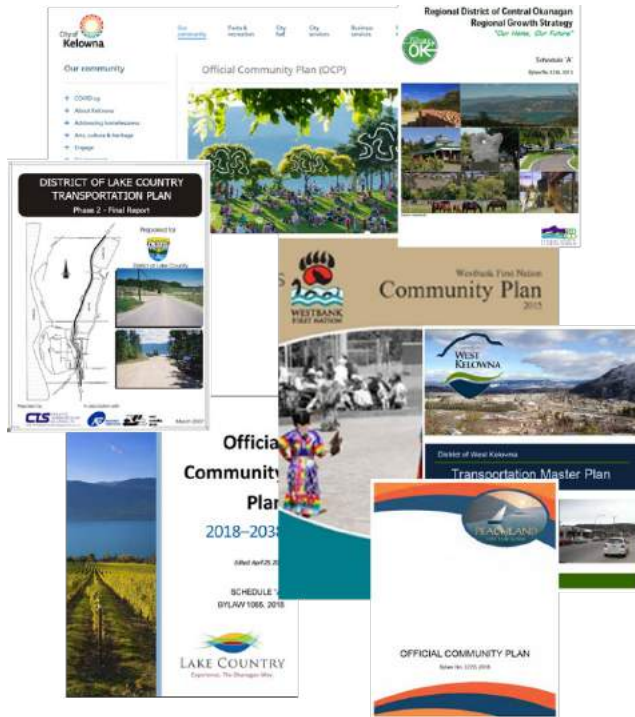
Without a single organization to implement the RTP, long-term success will depend on partnerships to deliver the recommendations. This section provides guidance on implementation priorities and potential partnerships.

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 Ride Hollywood North Extension Transit Corridor
- Winfield and Peachland Mobility Hubs
- Padosy / 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:

- Pelmeash 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.

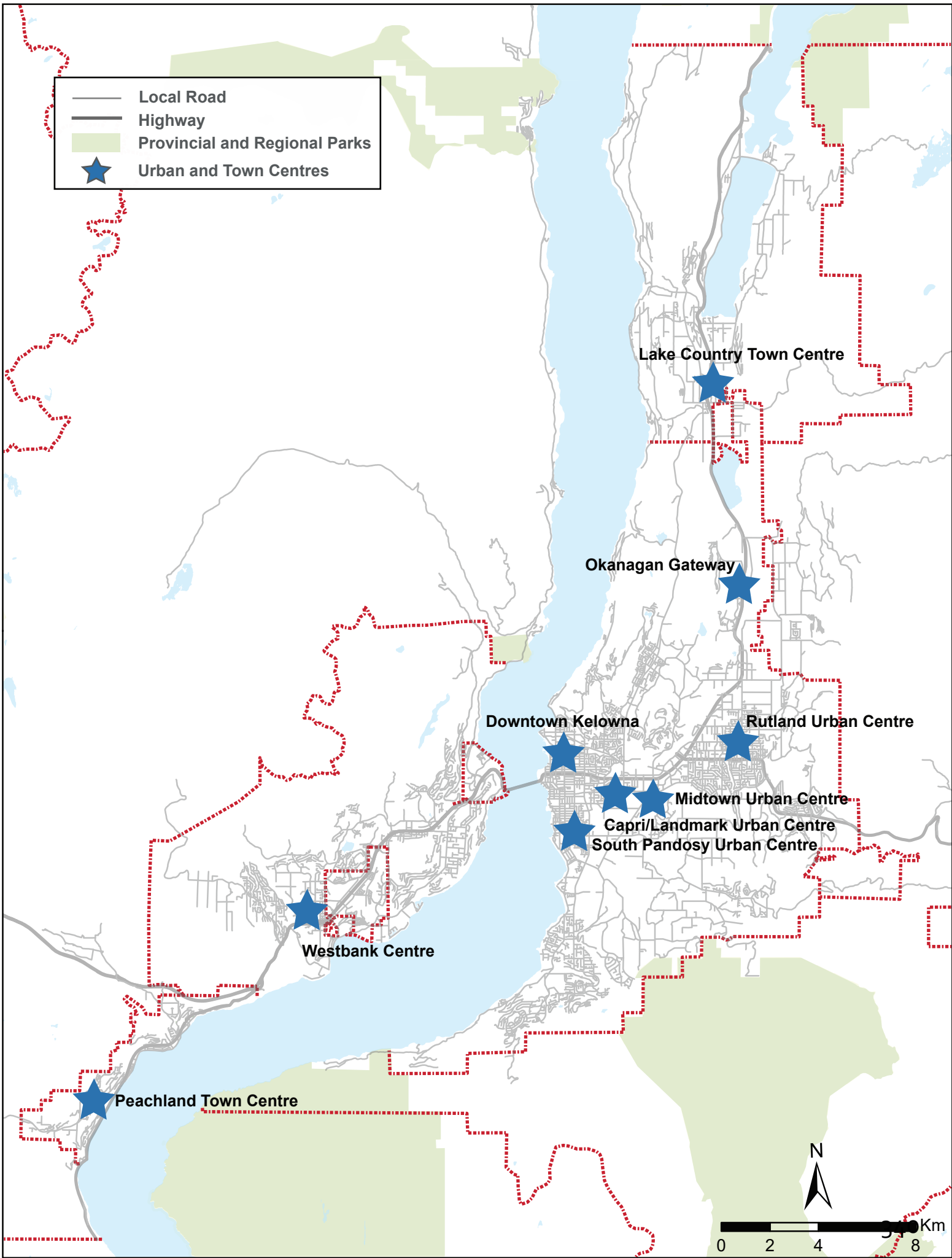


Table 13: Implementation Status

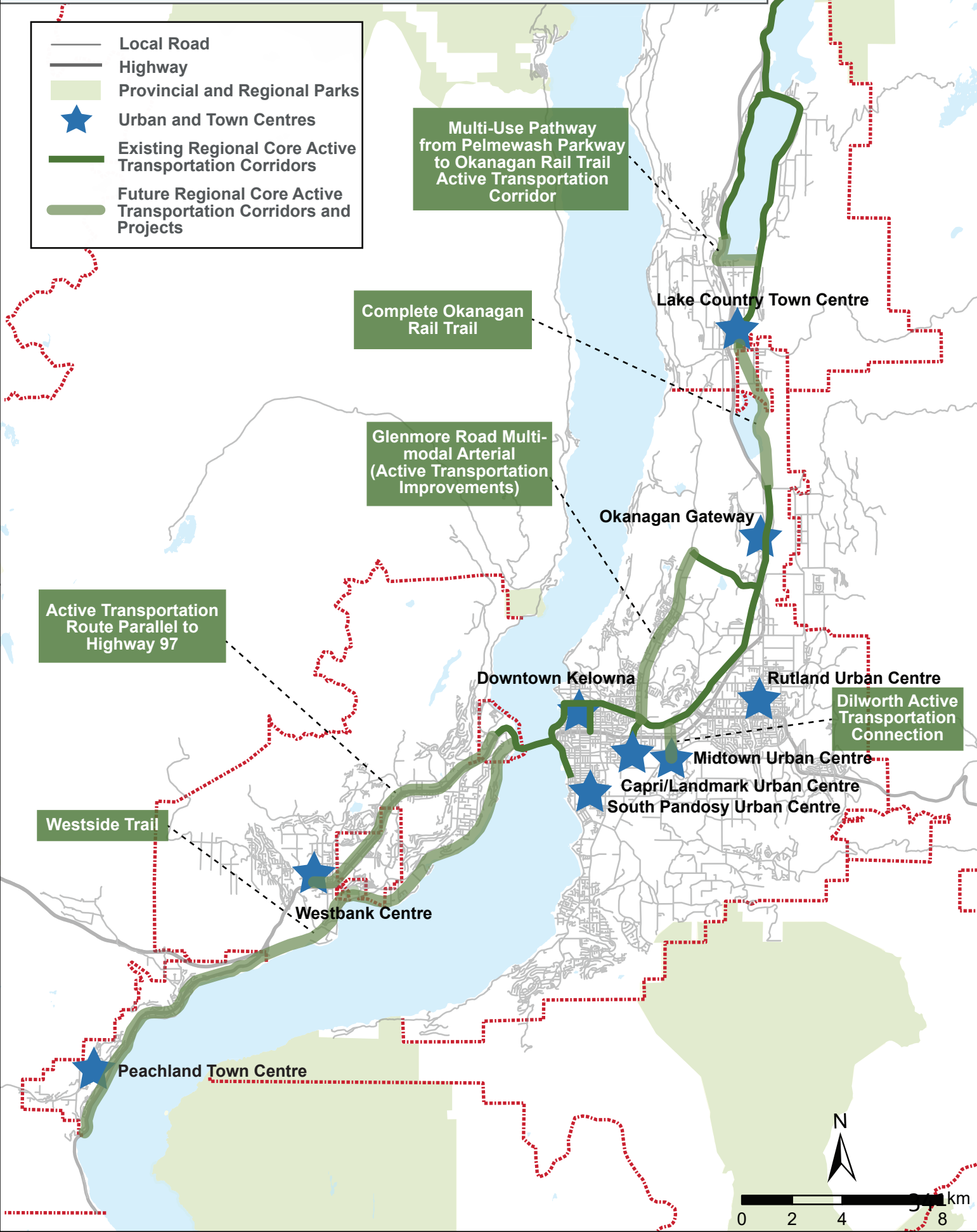
Project / Service	Potential Partners	Status	Key Next Steps
Glenmore Road Safety Upgrades	District of Lake Country, City of Kelowna	Minimal / localized previous planning	<ul style="list-style-type: none"> Confirm alignment within Lake Country, including consideration of effects related to current BC MoTI 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	<ul style="list-style-type: none"> Confirm Oceola Road / Highway 97 crossing configuration Preliminary and detailed design
Complete Okanagan Rail Trail	Okanagan Rail Trail Partners	Design completed	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Identify hub location Transit service planning coordination
Okanagan Gateway	BC MoTI, City of Kelowna, Kelowna International Airport, UBC Okanagan, BC Transit	Localized previous planning	<ul style="list-style-type: none"> Finalize Okanagan Gateway Transportation Study
Dilworth Active Transportation Connection	City of Kelowna, BC MoTI	Alternatives analysis completed	<ul style="list-style-type: none"> Detailed planning, preliminary and detailed design
Glenmore Road Multi-modal Arterial	City of Kelowna, BC Transit	Minimal / localized previous planning	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Preliminary and final design Detailed traffic operation review and signal design
Pandosy / Richter Transit Enhancement	City of Kelowna, BC Transit	Minimal previous planning	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Identify hub location Transit service planning coordination
Westside Road / Highway 33 Ongoing Upgrading	BC MoTI, RDCO, BC Transit	BC MoTI maintenance and rehabilitation planning	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Align with RTP as plans are updated
Demand Responsive Transit Service	BC Transit, STPCO Partners	No previous planning	<ul style="list-style-type: none"> Undertake a feasibility and partnering study
Transit Service Planning	BC Transit, STPCO Partners	Align with next Transit Futures update	<ul style="list-style-type: none"> 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.

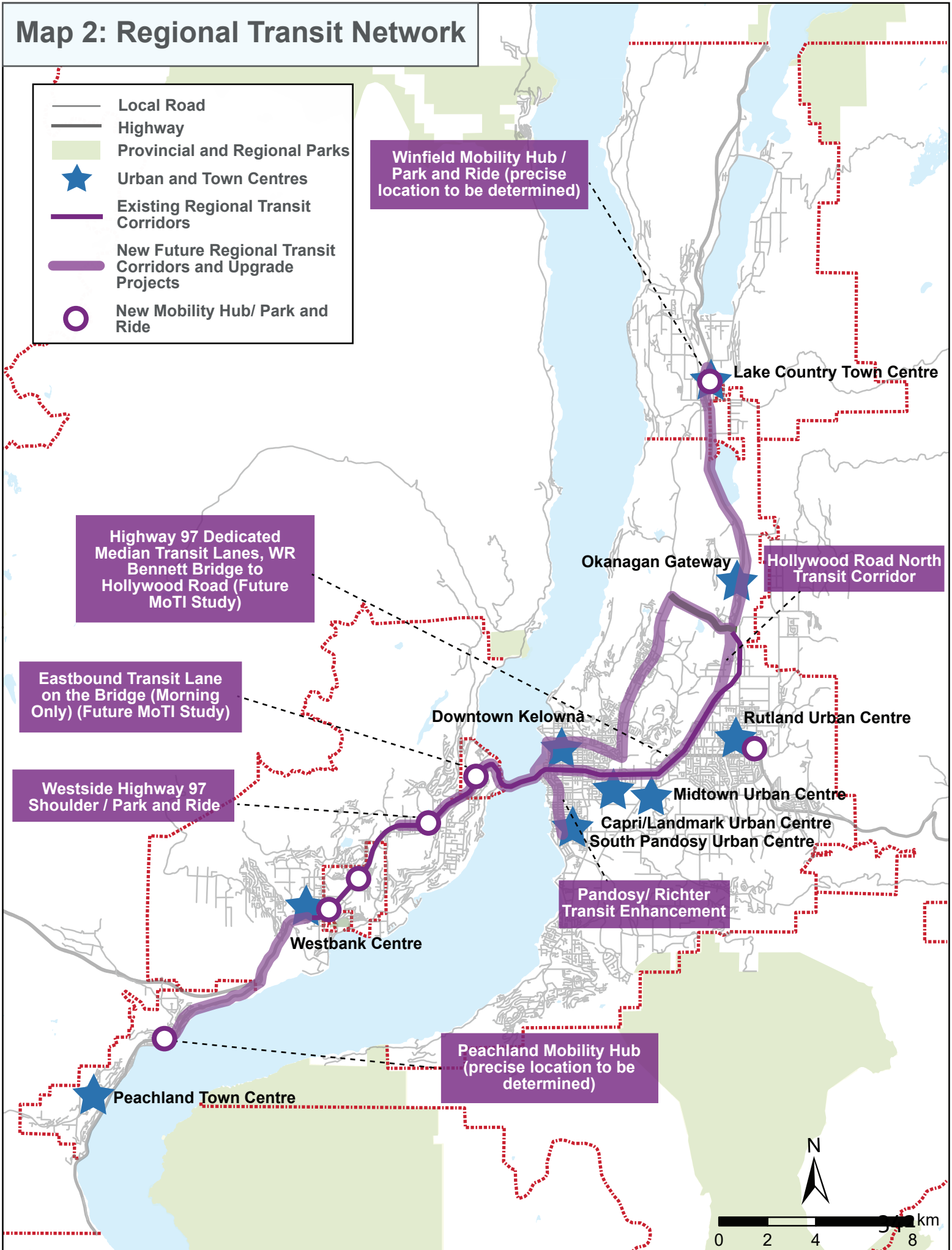
Appendix A: Regional Transportation System Maps



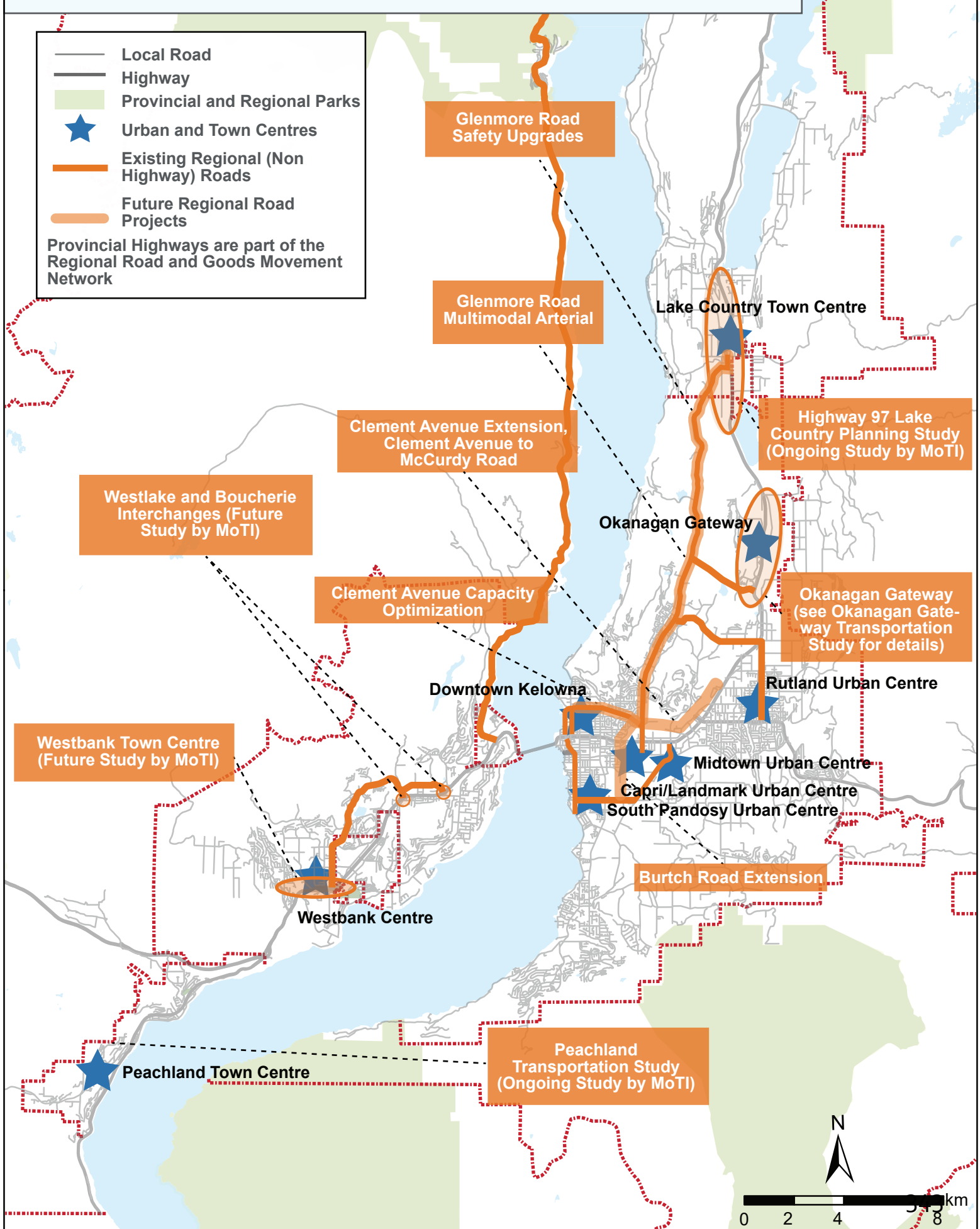
Map 1: Core Regional Active Transportation Network



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

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

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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.

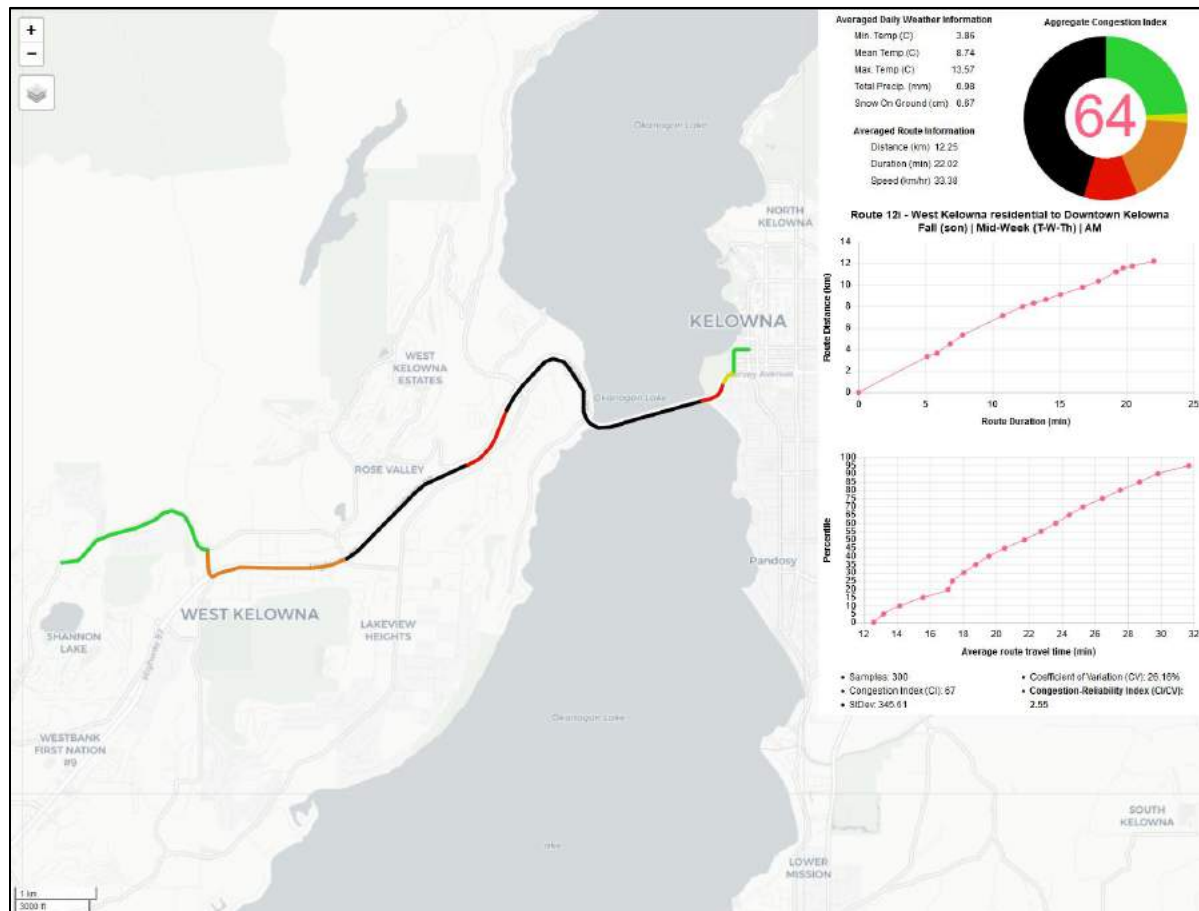
Exhibit ES.2: Route Performance Ranked by the Congestion Reliability Index (Top 10 and Bottom 10)

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

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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 survey¹ 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, Acure Consulting for the City of 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 heart rate 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 heart rate 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 Survey¹ 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%ile
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

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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.

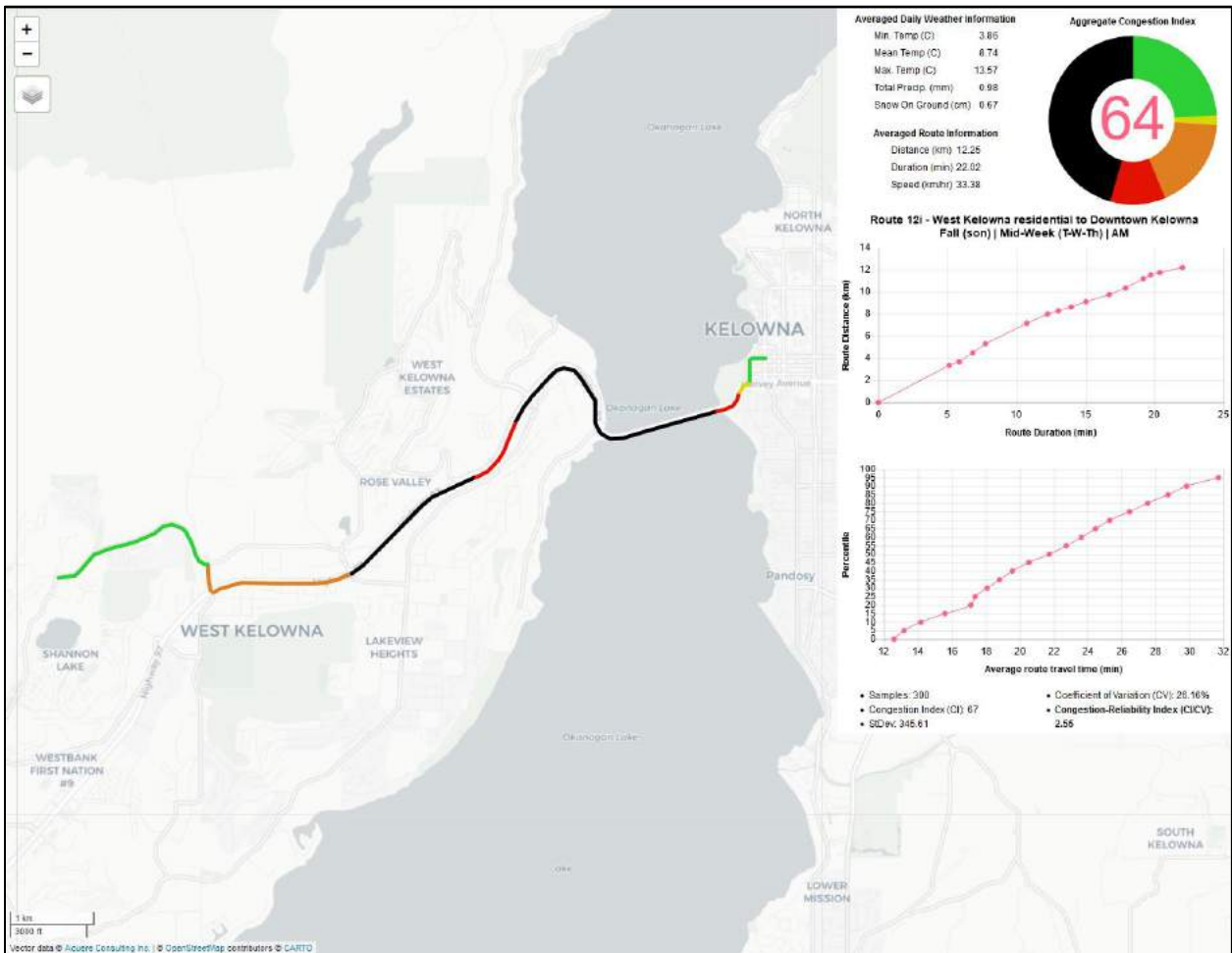
Top 10 Least Congested Route-Times

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 volatile⁴ 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.

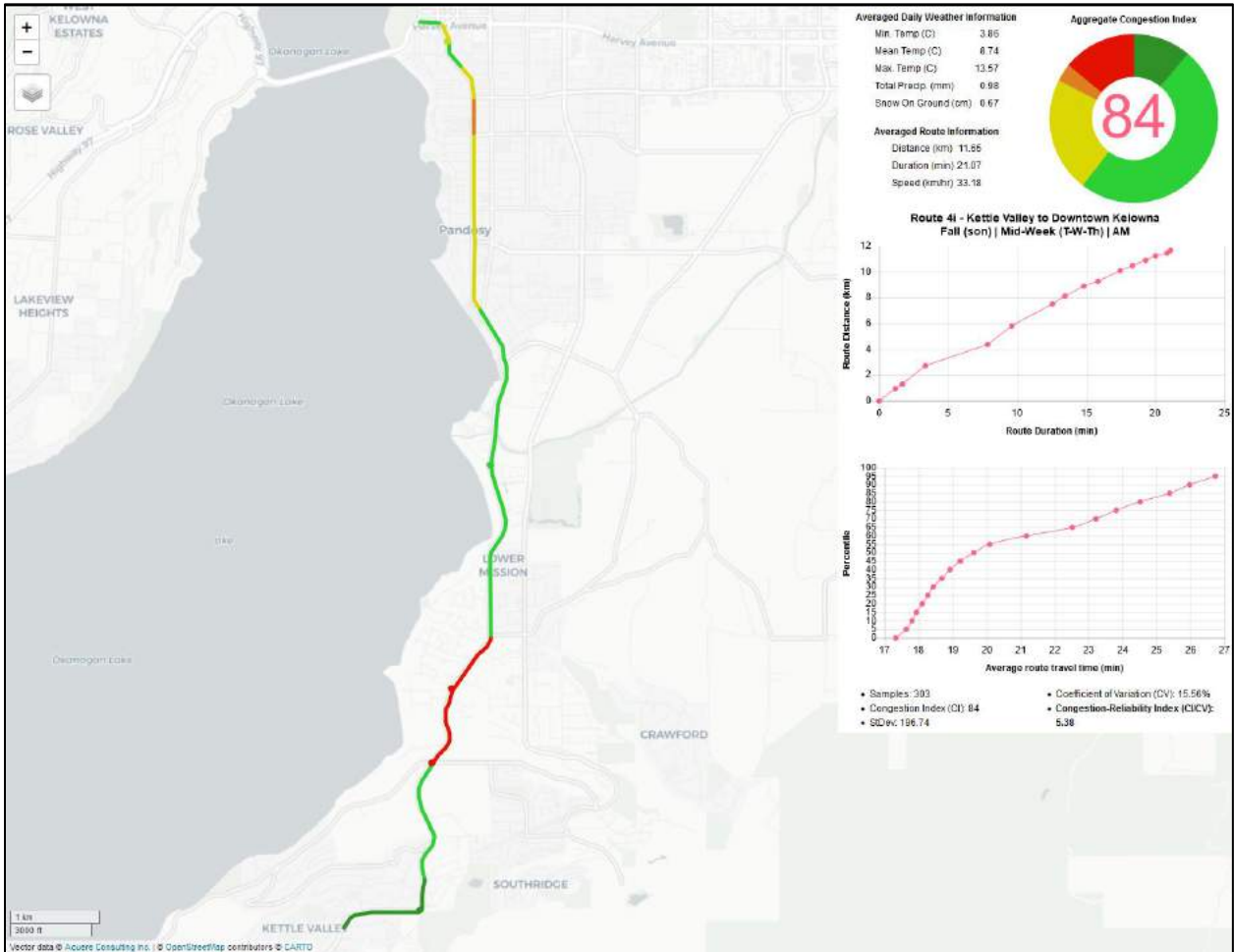
⁴ Based on the calculated coefficient of variation utilizing 100% of the samples such that outliers are included to help identify periods of extreme congestion.

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

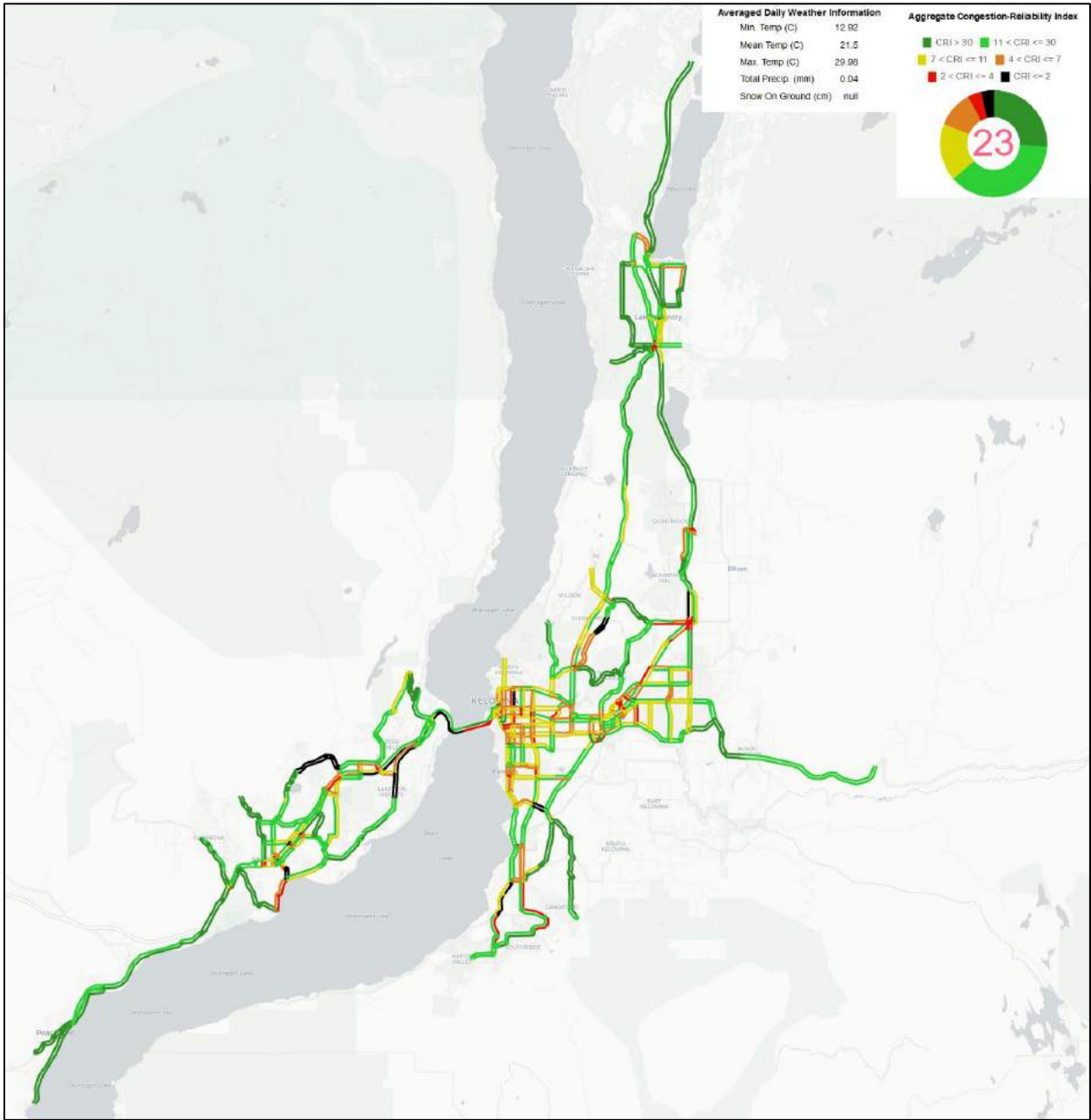
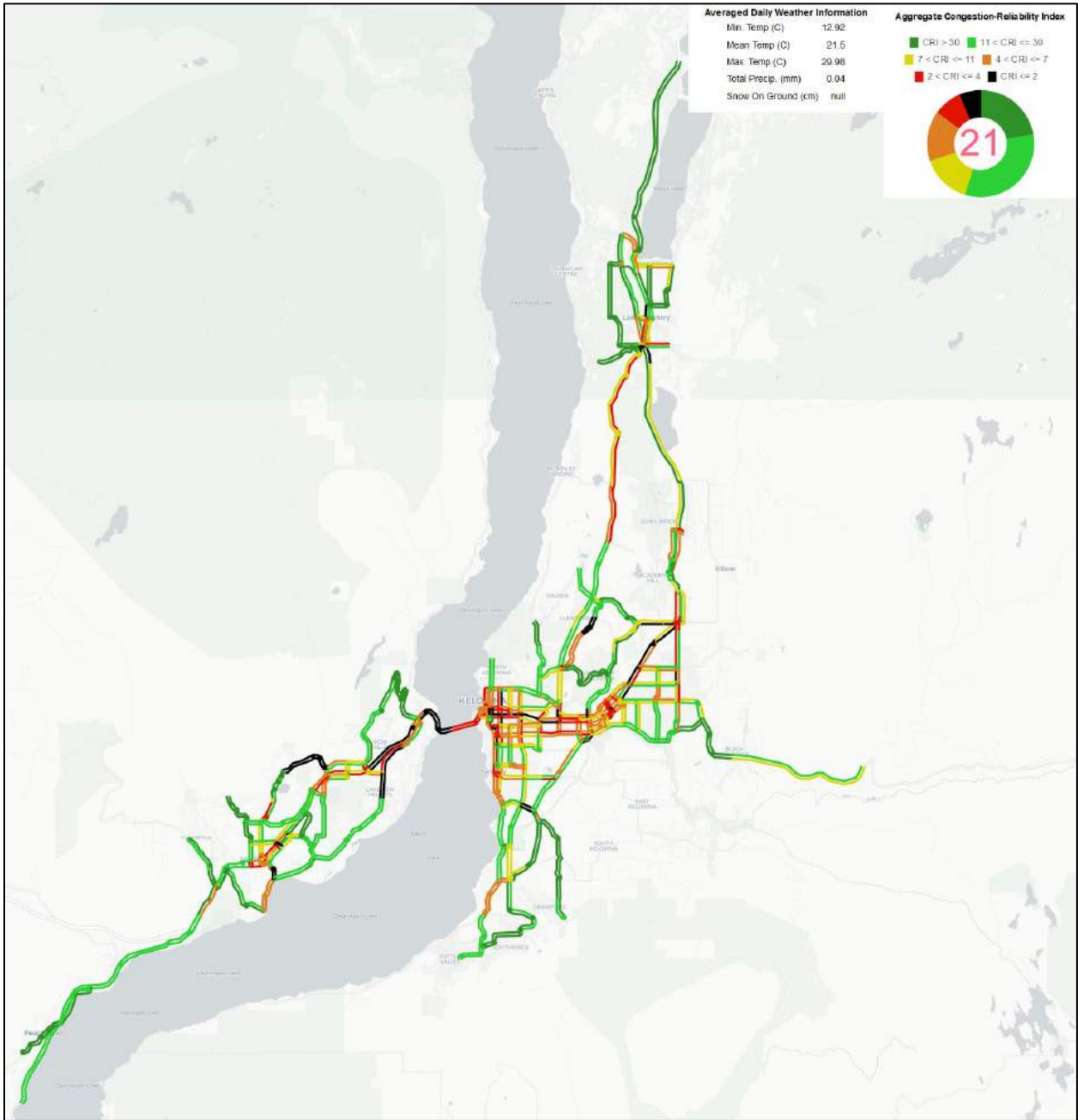


Exhibit 2.2.7: Network CRI for Summer – PM Peak Period, Tues-Thurs



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 Survey⁵** 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, Acuer Consulting for the City of 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.

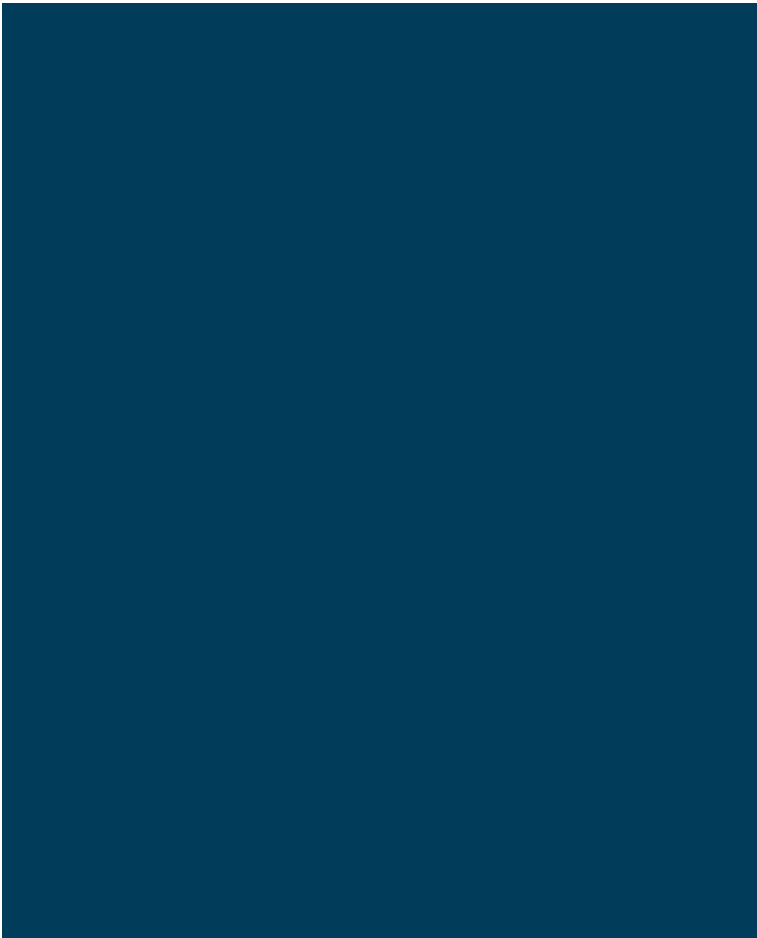
Further investigations, including a comparison of the route travel times in context to the changes to the transportation system between these survey years, would provide further clarity and understanding of the results.

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.





Regional Bicycling and Trails Master Plan

Sustainable Transportation Partnership of the Central Okanagan (STPCO)

November 2020



Executive Summary

The Regional Bicycling and Trails Master Plan (RBTMP) is an update to the 2012 Regional Active Transportation Master Plan. In the years since the 2012 Plan was created, many connections have been completed, additional active transportation plans have been developed, and provincial and federal active transportation design guidance has been updated. This plan reflects those changes, and along with the Central Okanagan's first Regional Transportation Plan (RTP), will help focus investments in the regional bicycling and trail networks.

This plan has been developed through the Sustainable Transportation Partnership of the Central Okanagan (STPCO). The STPCO partners include the Regional District of Central Okanagan (RDCO), the City of West Kelowna, Westbank First Nation, the District of Lake Country, the District of Peachland and the City of Kelowna. Development of the plan was supported by a grant from the Strategic Priorities Fund under the Administrative Agreement on the Federal Gas Tax Fund (GTF) in British Columbia. By developing this Regional Bicycling and Trails Master Plan, the STPCO members have demonstrated a commitment to active transportation and to working together to better connect the Central Okanagan region.

Proposed Regional Bicycling and Trails Network

The proposed network spans 193 km, including 82 km that exist today, 81 km that are not yet constructed, and 30 km that need an upgrade. The proposed network is made up of a primary regional 'spine' system that provides a continuous corridor that connects urban and town centres and regional destinations in the Central Okanagan. Tying into the primary regional spine system is a series of supporting connector routes that link areas within the Central Okanagan to the primary regional system and offer additional connections. Detailed maps and a complete list of projects can be found in Section 5 as well as Appendix 1, 2, 3 and 4.

Costs

High-level cost estimates have been developed based on typical construction costs for each facility type identified in the plan. The total network cost for all facilities not yet in place are estimated to be in the order of \$88million, which includes \$55 million for the primary regional 'spine' network and \$33 million for the supporting connector network. To put this in perspective, a single highway interchange project can cost \$50 million or more. Building the proposed regional bicycling and trails network will enable more people to bike for all types of trips, benefiting the climate, economy, and public health, and can be seen as providing excellent value for the investment cost. Stable long-term funding will be required from all levels of government to fully realize the long-term vision.

Implementation Considerations

A phasing plan was developed in collaboration with local governments to prioritize the projects within short (0 to 5 year), medium (6 to 10 year) and long (11 to 20 year) term time horizons. Priority was

placed on key connections that are required to make biking and walking a practical option for trips to and through urban and town centres and other regionally significant destinations.

Contents

1	Introduction.....	7
1.1	Plan Purpose, Vision and Goals	8
1.2	Active Transportation Planning in the Central Okanagan.....	10
2	Current Status of Active Transportation	15
2.1	2018 Okanagan Travel Survey.....	15
2.2	Current Regional Active Transportation Network	17
3	Development of the Regional Bicycling and Trails Master Plan.....	19
3.1	Planning Framework.....	20
3.2	Guiding Principles	21
3.3	Route Hierarchy.....	22
4	Facility Types	23
4.1	Multi-Use Pathway.....	24
4.2	Separated Bicycle and Pedestrian Pathways.....	25
4.3	Protected Bicycle Lanes.....	27
4.4	Painted + Buffered Bicycle Lanes.....	29
4.5	Neighbourhood Bikeways.....	30
4.6	Bicycle Accessible Shoulders.....	31
	Intersections & Crossings.....	32
5	Proposed Regional Bicycling and Trails Network.....	34
5.1	Regional Network by Facility Type	41
5.2	Costs	42
5.3	Phasing Strategy.....	42
5.4	Priority Projects	44
6	Implementation Requirements	52
6.1	Plan, Design and Build	52
6.2	Operations and Maintenance.....	54
6.3	Education and Promotion.....	55
6.4	Monitoring and Evaluation	57
7	Making it Happen.....	59
	Appendix 1 –Regional Network by Primary Regional & Supporting	
	Appendix 2 – Regional Network by Facility Types	
	Appendix 3 – Regional Network by Phasing Recommendation	
	Appendix 4 – Regional Corridors by Jurisdiction and Cost Estimates	

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1 Introduction

The Central Okanagan has one of the most extensive networks of bike lanes and pathways per capita in Canada. There is reason to be proud of this accomplishment but there are also significant gaps in the regional bicycling and trails network. Additionally, many communities do not have adequate bicycling or trails infrastructure. Additional investment is required to create a safe and convenient network that will link key regional destinations and enable walking, bicycling and transit to become an attractive travel option for more people.

Central Okanagan governments have identified or are in the process of identifying enhanced bicycling infrastructure as a priority in their community plans. Public support for new active transportation infrastructure is growing, and many communities are expanding their pedestrian and bicycling networks to enhance urban livability, mitigate the environmental impacts associated with our current reliance on motorized vehicle transportation, and support tourism opportunities. Additionally, an interconnected regional bicycling and trails network will boost the Central Okanagan's attractiveness as a sustainable tourism destination, building upon a strong reputation as a bicycling destination.



1.1 Plan Purpose, Vision and Goals

The Regional Bicycling and Trails Master Plan (RBTMP) updates the 2012 *Central Okanagan Regional Active Transportation Plan* to reflect recent changes to the existing and planned regional bicycling and trails network.

The primary purpose of the Plan is to establish a regional bicycling and trails network that will provide seamless, comfortable and safe connections with a network of primary regional and supporting bicycle and trail corridors. The network is designed to provide connections to and through regional destinations throughout the Central Okanagan, including urban and town centres, and key major regional destinations such as Kelowna General Hospital, the Kelowna International Airport, and colleges and universities.

1.1.1 Relationship with the Central Okanagan Regional Transportation Plan

The RBTMP has been developed in tandem with, and as a component of, the Regional Transportation Plan (RTP) to ensure full coordination across both planning documents.

While the RTP considers all modes, the RBTMP focuses exclusively, and in more detail, on bicycling and trail facilities across the Central Okanagan. As such, analysis and public engagement has been shared across both the RTP and RBTMP project teams to inform both plans.

The RBTMP supports the RTP vision which is “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.”

1.1.2 Alignment with Provincial Plans

Both the RTP and RBTMP have been developed to align with the strategic direction of Provincial plans, including CleanBC and BC’s active transportation strategy, “Move. Commute. Connect.” While the Central Okanagan region lacks a formal regional governance structure for setting and enforcing region-specific targets, both the RTP and RBTMP have been designed to support achievement of key provincial objectives related to climate and active transportation through regional collaboration.

The Clean BC active transportation strategy *Move. Commute. Connect* aims to double the trips taken by active transportation in the province by 2030.

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 through 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 recommendations in the RTP and RBTMP will help the region trend in the desired direction of provincial GHG and active transportation targets. Both plans recognize the urgency of the global climate crisis and include recommendations that will help create a region where more people can choose low-carbon, sustainable transportation options, such as walking and biking. In particular, the RBTMP includes

recommendations to help make bicycling and walking safe and convenient year-round options for more people. Section 6.4 discusses key performance metrics that will be critical for tracking progress in the region, such as biking and walking mode share, counts, collision data, and the percentage of the network that has been completed.

1.1.3 RBTMP Goals and Benefits

The RBTMP goals are to:

- Increase bicycling mode share across the region;
- Reduce GHG emissions and other environmental impacts produced by the transportation sector;
- Reduce collision and injury rates involving vulnerable road users; and
- Increase the sustainable and affordable transportation options available to all who live, work, and play in the Central Okanagan.

Measurement of progress toward each of these goals is reflected in the performance indicators in Section 6.4.

Additionally, the RBTMP should realize a number of community benefits. Transportation sustainability is about creating communities that are less reliant on the automobile and more on active modes of travel and transit. Investments in sustainable infrastructure will increase mobility choices and improve the social, economic, and environmental health of communities by:

- Enabling residents, especially those without access to a private auto, to participate in the social and economic life of the community.
- Providing lower-cost mobility options for transportation users and society by reducing the need for more expensive new road and parking infrastructure.
- Improving air quality and reducing energy demands and greenhouse gas emissions that are contributing to global climate change.
- Helping to shape and create more compact, mixed-use development within bicycling distance of public transit stops and stations, which in turn, will generate increased transit use, and protect our valuable agricultural and environmental resources.
- Improving transportation safety and by providing safe and comfortable infrastructure for pedestrians and bicyclists, separate from road traffic.
- Providing a network of transportation facilities that can meet the growing demands of emerging micromobility modes (i.e. light, low-speed vehicles often powered by electric assist) that are increasing in popularity throughout North America. According to a report from the National Association of City Transportation Officials (NACTO), trips by shared micromobility (shared bikes, e-bikes and e-scooters) grew from an estimated 35 million trips in the US in 2017 to 84 million trips in 2018. It is anticipated that micromobility demand will continue to grow.

- Fostering a more active, healthy lifestyle for people and helping to reduce public health care costs.
- Boosting local economies by promoting tourism and new economic development.

1.2 Active Transportation Planning in the Central Okanagan

The section provides an overview of existing plans, policies, and partnerships related to active transportation in the Central Okanagan region.

1.2.1 Regional Active Transportation Planning

The first comprehensive assessment of regional bicycling needs was completed in 1996 with the development of The Regional Bicycle Strategy by the Regional District of Central Okanagan (RDCO). The strategy outlined the need for a region-wide approach to bicycle planning and programming aimed at reducing the negative impacts of continued increases in automobile usage and population growth.

The 2012 Plan proposed a regional AT network that included a hierarchy of two systems: a Primary ‘spine’ system, and a Secondary ‘connector’ system. The update to this plan follows the same hierarchy. The proposed network in the 2012 plan spans 155 km and included 88 km of traffic protected facilities. At the time of the plan development, 26 km of the regional network was in place, with 128 km remaining to be developed in the future.



1.2.2 Local Active Transportation Planning

Communities in the Central Okanagan Region have developed, or are in the process of developing, local bike and pedestrian network plans as either standalone documents or components of Recreation Master Plans, Transportation Master Plans, and/or Official Community Plans. These plans seek to provide, over time, a consistent bicycle and pedestrian network that is capable of increasing the proportion of regional trips that are accommodated by sustainable modes of travel – specifically, walking, bicycling and transit. As noted below, many of these plans acknowledge the need to provide active transportation infrastructure and to establish local networks that integrate seamlessly with those of neighbouring jurisdictions.

- **The Regional District of Central Okanagan (RDCO)**’s Regional Growth Strategy (2013) seeks to: Promote physical activity (see policy 3.2.4.1); Support active transportation initiatives (see policy 3.2.4.3); Work towards meeting the provincial target for reducing GHG emissions (see policy 3.2.7.1); Encourage collaboration to improve inter-regional transportation opportunities (see policy 3.2.9.1); Provide active transportation options and connect residents to facilities, recreation, and services throughout the Central Okanagan and its neighbouring communities and

region (see policy 3.2.9.3.a); Support a regional integrated trail system (see policy 3.2.9.4); Place an increased emphasis on sustainable modes (see policy 3.2.9.5); Prioritize funding for transit and non-motorized improvements including projects such as sidewalks, traffic calming, bike lanes...etc. (see policy 3.2.9.7), and Collaborate with School District No. 23 to provide safe routes to school, including walking, cycling and transit options (see policy 3.2.9.11).

- **The City of West Kelowna's Recreational Trails Master Plan (2013)** acknowledges the benefits of working with other governments and local organizations on mutually beneficial projects to achieve connected trail networks and trail linkages.
- **The District of Lake Country's Parks and Recreation Master Plan (2018)** recognizes a growing demand for recreation facilities extending beyond municipal borders. The trail system identified in the plan aligns with the regional routes identified in the *Central Okanagan Regional Active Transportation Master Plan (2012)*. The District's *Official Community Plan (2018)* calls for collaboration with neighbouring communities to plan interconnecting active transportation routes (Policy 8.6.2.c.).
- **The District of Peachland's Parks and Recreation Master Plan (2018)** provides direction for inter-municipal collaboration with RDCO and West Kelowna to establish a trail connection to Goat's Peak Regional Park (Policy 5.2.34) and for working with the Province to develop connections to Peachland and West Kelowna along Highway 97 (Policy 5.2.36).
- **City of Kelowna's Pedestrian and Bicycle Master Plan (2016)** supports inter-municipal connectivity to West Kelowna and Lake Country through routes along a AAA future primary regional active transportation network (page 31).
- **Westbank First Nation's (WFN) Community Plan (2015)** supports the principles of providing safe alternatives to the car such as bicycling (page 58) and infrastructure that supports a healthy lifestyle and improves the quality of life for members and community residents (page 74). WFN also recently completed an Active Transportation Plan (2020). This plan includes off-road connections that make cycling and walking more direct.

1.2.3 Transit Future Plan

The Central Okanagan region's transit master plan, the *Transit Future Plan (2012)*, also acknowledges the importance of integrating the transit network with regional and local bicycling and pedestrian networks; encouraging high quality bicycling links to transit stops and stations; and providing bicycle storage at key stations, stops and on transit vehicles (Goal 3). Due to the longer distances involved with regional trips, integration of pedestrian and bicycling facilities with transit service creates a potential to accommodate longer multi-modal trips, enlarges transit catchment areas, enables people on bikes to bypass topographical barriers and increases transit ridership.

Local jurisdictions have endorsed BC Transit's Transit Future Plan for the Central Okanagan Region, which calls for an increase in transit mode share across the region from 2 percent to 7 percent by 2035¹. The integration of regional and local bicycling and trails networks can support increases in ridership, allowing for improved travel for those linking walking or bicycling trips with transit.



1.2.4 Climate Change Accountability Act

The Provincial Government's *Climate Change Accountability Act* requires the public sector to be carbon neutral and sets a target of reducing 2007 level GHG emissions by 40% by 2030. Additionally, the BC Local Government Act (Part 14, Division 4, 473(3) requires local governments to include a target for GHG emissions reduction and policies and actions to achieve the target (it does not require what the target has to be).

In the Central Okanagan, it is estimated that over 66% of emissions are due to transportation, a significant opportunity for reduction². Achieving GHG reduction goals will require all levels of government and communities to work together to reduce reliance on automobiles and achieve emission reduction targets.

1.2.4.1 SCRAP-IT PROGRAM

The Provincially funded SCRAP-IT program is working to reduce greenhouse gas emissions and improve air quality by getting older vehicles off the road. The SCRAP-IT incentive provides rebates toward the purchase of an electric car, e-bike, e-mobility scooter, transit pass, or credit with a carshare organization.

1.2.4.2 CLIMATE CHANGE ADAPTATION

Reducing carbon emissions is likely not enough to halt the impacts of climate change. Many countries and sub-regions are realizing it is time to start adapting to life in a changing climate. Climate change in

¹ <https://www.bctransit.com/documents/1507213427854>

² https://www.regionaldistrict.com/media/20493/Climate_Change_Issue_Paper.pdf

the Okanagan may mean much hotter summers^{3 4}. It is anticipated that there will be a need to plan for more intense and hotter fires, increasing water shortages, more smokey days, and a greater likelihood of spring flooding.

More precipitation may fall during extreme events, increasing flows and runoff that overburden drainage infrastructure and threaten roads, pathways, and bridges. This may result in periodic disruptions and temporary loss or closures of trail or bicycle corridors. Increased precipitation or heat may mean fewer people participate in active transportation during the peak summer months. Shade and water stations will become increasingly important along active transportation corridors.

1.2.5 Okanagan Rail Trail Partnership

Partnerships play an important part in the development of regional active transportation facilities in the Central Okanagan. One example includes the Okanagan Rail Trail initiative. The City of Kelowna, District of Lake Country, the Regional District of North Okanagan and the Province invested \$22 million to purchase the discontinued CN railway corridor from Coldstream to Kelowna. The volunteer-based Okanagan Rail Trail Initiative served as community champions in supporting campaign partners, business partners, and individual donors to raise \$7.8M over two years.



Several volunteers from the Okanagan Rail Trail initiative continued to form the Friends of Okanagan Rail Trail. The City of Kelowna, District of Lake Country, Okanagan Indian Band, and Regional District of North Okanagan work together with the District of Coldstream and the City of Vernon as the Okanagan Rail Trail Committee, in partnership with the volunteer Friends of Okanagan Rail Trail.

³ http://www.rdno.ca/docs/200104_OK_ClimateReport_Final.pdf

⁴ https://www.kelowna.ca/sites/files/1/docs/related/community_climate_action_plan_june_2018_final.pdf

It is ultimately intended that the Okanagan Rail Trail will serve as a key component of the Trail of the Okanagans, which is envisioned to connect from Vernon, across the bridge, and all the way south to the Canada / US border. To date, a significant portion of the Okanagan Rail Trail has been completed. A section is awaiting completion which lies between Old Vernon Road, just north of the airport, to McCarthy Road in Lake Country.

1.2.6 Westside Trail Collaboration Brief

The *Westside Trail Collaboration Technical Brief* was released in 2016 as an effort to identify, plan and implement regional trail corridor improvements that would complement the Okanagan Rail Trail, extending the route west to Peachland. The Brief is a collaboration between the communities of Peachland, West Kelowna, and Westbank First Nation along with the Regional District of Central Okanagan facilitated by STPCO. The collaboration resulted in the identification of trail additions and improvements required parallel to Highway 97 and along the waterfront. The Brief has been incorporated into this update.

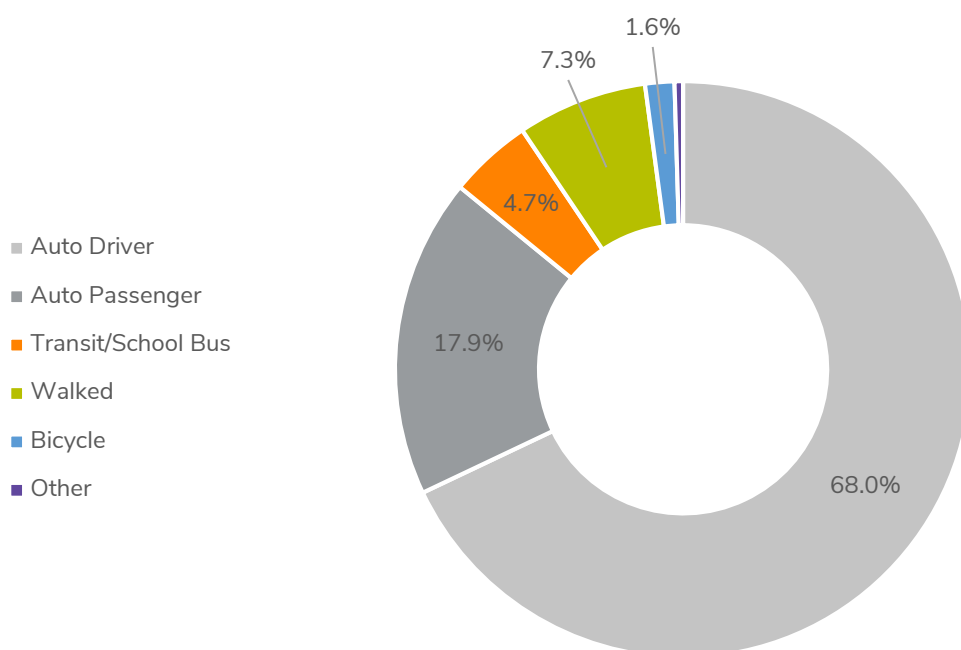
2 Current Status of Active Transportation

The current state of the transportation system, in terms of demand and performance, provides an initial baseline and situational assessment on which desired changes can be based. Key metrics such as regional travel mode share and travel distances can provide a sense of the “health” of the system, and support the identification of improvements required to meet local transportation goals.

2.1 2018 Okanagan Travel Survey

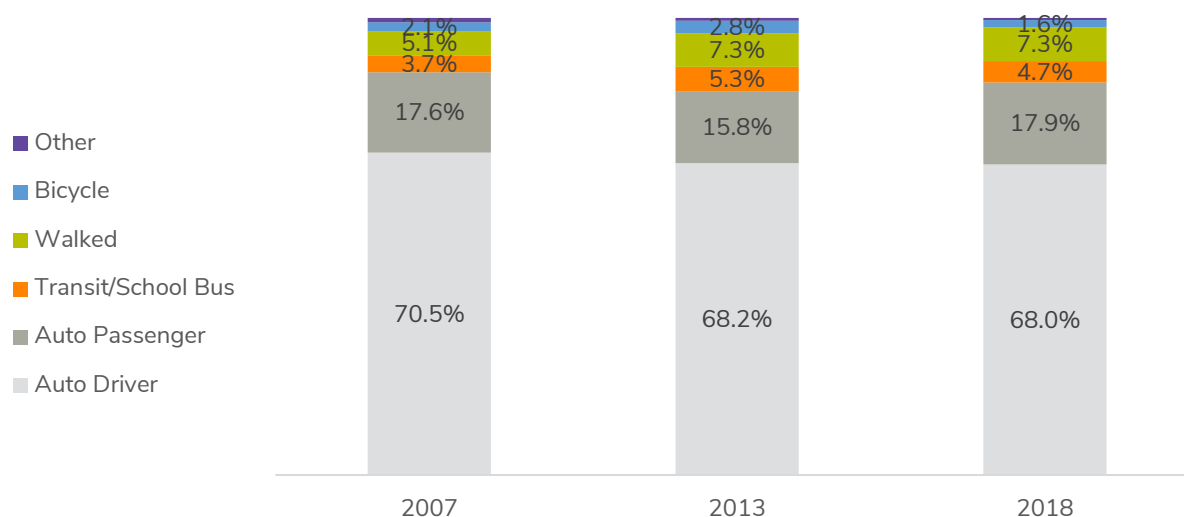
The Okanagan Travel Survey (2018) found that 86% of trips are made as an automobile driver or passenger. Bicycling accounted for 2% of trips, as illustrated in **Error! Reference source not found..**

Figure 1. Mode Share. Source: 2018 Okanagan Travel Survey



Key findings of the 2018 Okanagan Travel Survey are:

- Since 2007, the number of trips made in the region grew more slowly (10%) than population growth (21%);
- The majority of trips continue to be via auto, either as a driver (68%) or passenger (18%); and
- Since 2007, there has been a 2% region-wide shift towards sustainable modes, with increases in walking and transit. As shown in Figure 2, between 2013 and 2018 mode share remained relatively stable (within the margin for error), which means that efforts to encourage mode shift are roughly keeping up with population growth.

Figure 2. Trip Mode Trend. Source: 2018 Okanagan Travel Survey

The current reliance on private auto for regional travel has happened primarily out of necessity. Since the 1950s, land uses have been increasingly segregated, with homes located further away from jobs and amenities. Most population growth has been accommodated in low-density developments, while employment continues to cluster adjacent to Highway 33 and Highway 97. With average trip distances and the number of trips per household increasing over time, the private automobile has remained the preferred travel choice for most trips.

Weather can also influence peoples' decision to bike or walk. It is important to consider variability in climate when comparing results between travel surveys, as shown in the table below. While there has been no statistically significant change⁵ in bike mode share, more people are biking in colder weather. For example, there were roughly the same number of people biking in the warmer spring of 2007 as there were on the colder days of November 2018.

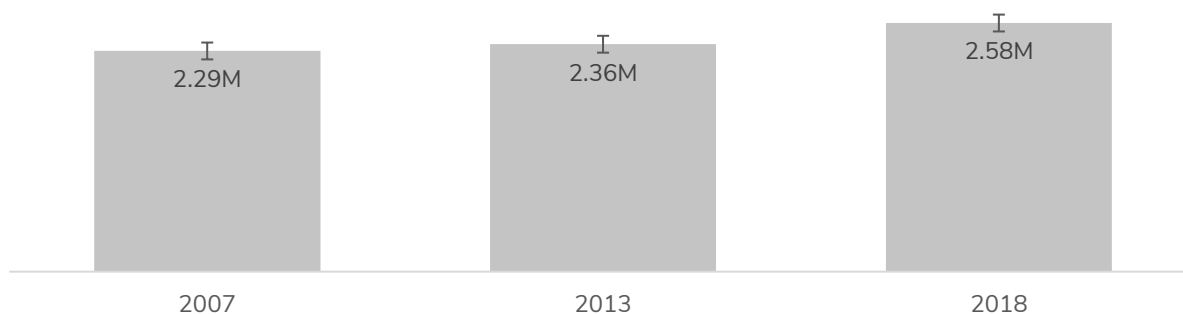
Weather During Travel Surveys ⁶	2007 (May)	2013 (October)	2018 (November)
Avg. Daily High	21°C	12°C	7°C
Avg. Daily Mean	12°C	6°C	3°C
Precipitation	16 mm	6 mm	30 mm
Estimated Bike Mode Share	2.1%	2.8%	1.6%
Estimated Walk Mode Share	5.3%	7.3%	7.3%

It is also important to consider that mode share, as a percentage of total travel, is a metric that changes very slowly over time. Another measure that impacts the uptake of sustainable modes is vehicle kilometres traveled (VKT). Unlike mode share, VKT more directly equates to the emission of greenhouse gases.

⁵ Margin of error for region-wide statistics in the 2018 survey is estimated to be $\pm 1.1\%$

⁶ Historical weather measured at Kelowna International Airport. Source: [Government of Canada](#)

Estimated Daily Vehicle Km Travelled



While the mode share and VKT trends for the region show room for improvement toward meeting climate and active transportation objectives, one encouraging statistic from the 2018 Okanagan Travel Survey is that roughly half (47%) of trips are less than 5 km long⁷. Given that most bicycling and walking trips are shorter distance trips, this indicates a substantial opportunity to shift these shorter trips to biking or walking. By investing in active transportation infrastructure that helps to make biking and walking safe, easy and convenient travel options for more people, and by investing in corresponding programs and services (e.g. education, maintenance and winter snow clearing, etc), Central Okanagan governments can work together to help increase the number of people walking and biking for their daily travel needs in our region.

2.2 Current Regional Active Transportation Network

Currently, there are approximately 87 km of regional bicycling and trail facilities that exist today, up from 26km in the 2012 plan. The majority of these facilities are located on the east side of the Okanagan Lake. The regional bicycling and trails network is just over 45% complete, with another 106 km of bicycling and trail facilities to be added or improved as part of this Plan.

Significant improvements to the regional bicycling and trails network have been made in the Central Okanagan region in recent years. These improvements will help serve the active transportation needs of residents and visitors for many years to come. Some initiatives that stand out include constructing:

- the majority of the Okanagan Rail Trail, mentioned in Section 1.2.5, combined with the Westside Trail, has the potential to combine with other proposed trails to form a future continuous all ages and abilities active transportation route that would link every local jurisdiction in the Central Okanagan region and also connect to the north and south Okanagan regions;

⁷ [2018 Okanagan Travel Survey. All trips made by Central Okanagan residents. Network distances estimated using the Google Maps API.](#)

- sections of the Westside Wine Trail through West Kelowna and Westbank First Nation, which have been redesigned as a multi-modal corridor to better accommodate bicycles. Some sections include Boucherie Road between Hudson Road and the Boucherie/Highway 97 interchange;
- the multi-use path beside the Pelmewash Parkway, which forms the basis for a 17km protected loop that will circle Wood Lake and provide an active transportation amenity that will attract users from throughout the region and beyond; and
- protected bike lanes on a number of roadways including Abbott and Ethel in Kelowna that are built to a high standard and set the bar for future bikeways in the Central Okanagan region.

Further, Kelowna's local active transportation network is one of the most extensive for a community its size in North America, with over 400 km of sidewalks and walkways, 300 km of on-road bike lanes and over 40 km of shared-use pathways.

Together, the local and regional active transportation networks in the region make walking and cycling realistic options for a growing number of people in the region.

3 Development of the Regional Bicycling and Trails Master Plan

The process of developing the RBTMP follows three key phases:



i. Assemble, Review and Confirm

The first phase of developing the RBTMP was to review new studies and planning documents related to biking and walking facilities in the Central Okanagan that were developed after the *Regional Active Transportation Plan (2012)* was published. Many of these plans are mentioned in Section 1.2. In addition, input received during public and stakeholder outreach as part of the Regional Transportation Plan was reviewed for feedback related to regional biking and walking facilities.

ii. Develop a Regional Active Transportation Network

Based on the technical assessment and background information review, a draft regional bicycling and trails network was identified for consideration by municipal, regional and provincial representatives. This plan recommends over 193 kilometres of new or upgraded facilities, the majority (over 70%) of which will be comfortable for people of all ages and abilities (AAA). AAA facilities tend to be physically protected from motor vehicle traffic or involve shared facilities on local roadways with a speed limit of 30 km/h and less than 1,000 motor vehicles per day. Elsewhere, facilities for those that are confident and enthused⁸ are recommended. Examples include painted bike lanes and bicycle accessible shoulders. While these facilities do not offer physical protection to bicyclists, they are recommended on links that are redundant to the AAA network or which serve local destinations.

The project team conducted a series of interviews with representatives of the Provincial Ministry of Transportation and Infrastructure (BC MoTI), and members of the Sustainable Transportation Partnership of the Central Okanagan (STPCO). In the meetings, discussions focused on the guiding principles, proposed route hierarchy and a draft regional bicycling and trails network. Each organization was asked to provide formal feedback on the proposed network and facility types and to identify priority corridors that would provide the most significant benefit.

⁸ Portland Bureau of Transportation have developed a classification system that describes four general categories of transportation cyclists including those who are Strong and Fearless (~1% of the population). Confident and Enthused (~7%), Interested but Concerned (~60%), and No Way No How (32%) those who are reluctant to ride at all.

<https://www.portlandoregon.gov/transportation/article/158497>

iii. Refine Network and Prioritize Projects

The comments received from the initial meetings and public engagement activities were incorporated to produce a revised network plan. Local representatives were invited to review the draft network plan and to provide further input concerning the network, recommended facility types and phasing strategy. The network included in the RBTMP reflects consideration of the information and feedback received from the public and stakeholders throughout the region.

3.1 Planning Framework

The following planning framework is recommended to help connect walking and bicycling facilities to regional destinations across the Central Okanagan.

i. Plan, Design and Build

A connected network of regional trails and bicycle routes will allow people to ride their bicycles to regional destinations safely. Proposed investments focus on connecting urban and town centres, where the most significant gains in sustainable transportation use can be achieved. Planning for a regional bicycling and trails network must also be integrated with local active transportation networks and 'complete streets' that incorporate sidewalks and dedicated bicycling facilities on arterial and major collector roads, as well as landscaping and street furniture.

ii. Operate and Maintain

As part of building a regional bicycling and trails network, it is recommended that budget resources for enhanced operation and maintenance be provided to ensure walking and bicycling are safe, comfortable and practical options year-round. Budget resources should focus on maintaining areas with the highest pedestrian and bicycling demands such as near major urban and town centres, employment areas and connections to transit exchanges.

iii. Educate and Promote

Education and promotion activities complement investment in the regional bicycling and trails network in many ways. Benefits include helping to spread awareness of the facilities, encouraging bicycling and walking, helping to inform people on how to use new types of facilities or treatments, and teaching safe bicycling skills and proper etiquette for shared facilities. It is recommended that the regional Transportation Demand Management (TDM) program currently delivered through the STPCO continue to provide education and promotional activities. Additional funding for regional TDM programs is recommended in conjunction with the expansion of the regional bicycling and trails network over the 20-year planning horizon.

iv. Monitor and Evaluate

Regular monitoring and evaluation are necessary to determine the success of regional bicycling and trails investments. Regular data collection can help to evaluate changes in travel behaviour, bicycle and

pedestrian volumes, greenhouse gas emissions, active transportation safety, and user satisfaction, among other trends. Funding ongoing monitoring and evaluation programs, such as the Okanagan Travel Survey, is recommended to provide essential information to evaluate progress and identify areas for improvement. Additionally, installing automated bicycle and pedestrian counters when new facilities are constructed is recommended to allow for tracking bicycling and walking usage patterns over time.

3.2 Guiding Principles

As described in Section 1.1.3, the goals of the Regional Bicycling and Trails Master Plan are to connect the Central Okanagan with safe bicycling and walking facilities to increase walking and bicycling rates, reduce GHG emissions produced by the transportation sector, improve transportation safety, and increase the sustainable transportation options available to residents and visitors.

To achieve these goals, the proposed regional bicycling and trails network plan has been developed with the following guiding principles in mind:

1. Provide direct connections between and within major urban and town centres, employment nodes and regionally significant destinations such as hospitals, transit exchanges, and post-secondary educational facilities.
2. Plan, design, and build regional bicycling and trail facilities to serve:
 - Trips destined to urban and town centres and regional destinations in a direct, safe and comfortable manner;
 - Utilitarian and commuter bicycling trips with a secondary focus on recreational trips;
 - People of all ages and abilities, with a secondary emphasis on those who are enthused and confident⁹; and
 - Longer regional biking and walking trips of 20 km or more;
3. Design active transportation facilities that are consistent with the British Columbia Active Transportation Design Guide and the Transportation Association of Canada's (TAC) Geometric Design Guide. In particular, these guides should be consulted for questions regarding appropriate facility type, desired bicycle design speeds, and when a facility should be designed for shared use or when separation between people biking and walking is desired. Wherever possible, the recommendations included in this plan have been made to align with these design guides.
4. Improve safety and comfort by providing alternate routes for pedestrians and bicyclists parallel to the Highway 97 corridor, which serves as the major regional transportation spine.
5. Integrate the regional bicycling and trails network with regional rapid transit stations and exchanges.

⁹ <https://www.portlandoregon.gov/transportation/article/158497>

3.3 Route Hierarchy

The proposed regional bicycling and trails network includes a primary regional 'spine' system with supporting 'connector' routes. The primary regional 'spine' system aims to provide a continuous all ages and abilities (AAA) corridor that connects to and through urban and town centres and to regional destinations in the Central Okanagan. The primary spine includes safe and convenient alternatives to Highway 97.

The supporting connector routes link the primary regional spine system with other important destinations such as major transit exchanges, health facilities, and post-secondary schools. In some cases, supporting connector routes provide links to serve commuter cyclists parallel to primary regional links, particularly where design speeds of 30km/h cannot be maintained on a regional link.

The proposed regional bicycling and trails network is linked to, and in some cases, overlaps with local pedestrian and bicycling networks, which helps to provide further connectivity between local and regional destinations. The alignments shown on the maps in Section 5 and in the Appendices are recommendations based on high-level planning analysis. These alignments and associated facility types may change as projects go through more detailed planning and design.

4 Facility Types

This section provides an overview of the different types of bicycle and trail facilities described in this Plan. For guidance related to the design of these facilities, this Plan refers primarily to the BC Active Transportation Design Guide¹⁰ with supporting guidance from the Transportation Association of Canada (TAC) Geometric Design Guide¹¹.

When determining the appropriate bicycle facility type and location, many factors have been considered, including but not limited to, traffic volumes and speeds, available right-of-way, expected pedestrian and bicycling volumes, network connectivity, and the urban context and adjacent land use.

Additionally, recent research has helped to clarify safety outcomes and usage rates associated with particular facilities and for the design of active transportation networks^{12,13,14}.

The findings suggest that facilities that are designated specifically for bicycle use and physically protected from motor vehicle and pedestrian traffic tend to be more comfortable and preferred by both experienced and inexperienced bicyclists. Facilities shared with motor vehicles are generally less preferred by bicyclists, except in instances where the volume of motor vehicle traffic is lower (i.e. less than 2,000 and ideally less than 1,000 vehicles per day) and where motor vehicle speeds are 30 km/h or less. High quality facilities are essential to building the regional bicycling and trails network, particularly on routes designated as appropriate for people of all ages and abilities (AAA).

Bicycling networks that are more likely to positively influence bicycling rates include an interconnected grid of comfortable routes every 200-400 metres in urban settings, to 400-800 metres in more suburban settings and 800-1,600 metres in rural settings¹⁵. Further, bicycle network designs are trending toward an approach more traditionally associated with automotive networks, including designing bicycle facilities so that they can accommodate:

- higher volumes of people riding along arterial routes that link urban and town centres;
- medium volumes of people riding along supporting or collector routes between neighbourhoods; and
- lower volumes of people riding on routes that serve local destinations.

The regional bicycling and trails network is just over 45% complete, with another 106 km of bicycling and trail facilities to be added or improved as part of this Plan.

¹⁰ https://www2.gov.bc.ca/assets/gov/driving-and-transportation/funding-engagement-permits/grants-funding/cycling-infrastructure-funding/active-transportation-guide/2019-06-14_bcatdg_compiled_digital.pdf

¹¹ <https://www.tac-atc.ca/en/publications-and-resources/geometric-design-guide-canadian-roads>

¹² <https://injuryprevention.bmj.com/content/17/2/131>

¹³ <http://cyclingincities-spgh.sites.olt.ubc.ca/files/2019/07/Teschke-2019-Velo-Canada-Bikes.pdf>

¹⁴ <https://bikehub.ca/research/the-state-of-cycling-in-metro-vancouver>

¹⁵ <https://crowplatform.com/product/design-manual-for-bicycle-traffic/>

This Plan takes advantage of provincial and federal design guidance and facility and network design best practices to recommend a network that will serve regional transportation needs and complement and enhance local bicycle and trail networks.

4.1 Multi-Use Pathway

Multi-use pathways are off-street paths that are physically separated from motor vehicle traffic and shared between people walking, bicycling, and using other forms of active transportation such as skateboards, scooters, and in-line skates. Typically, multi-use pathways accommodate bi-directional travel and can be located in a variety of contexts, such as along waterfronts, utility or rail corridors, through parks, or adjacent to a road or highway, among other locations. Ideally, bi-directional multi-use pathways should not operate parallel to two-way roads, particularly where the facility crosses roadways and/or numerous driveways¹⁶. Multi-use pathways are typically considered appropriate for people of all ages and abilities (unless conflicts at intersections and crossings are not mitigated) and may serve as primary arterials, supporting connectors or local connections.

Multi-use pathways may be paved or unpaved. Unpaved sections are considered to meet AAA standards so long as they have a firm and smooth riding surface. If the surface treatment is difficult to ride on, the facility will tend to exclude people using mobility aids (such as wheelchairs) as well as those with thinner tires or smaller wheels.

Multi-use pathways often attract a variety of users, some of which may operate at slower speeds. As a result, providing sufficient space to pass others is an important consideration when designing multi-use pathways.

Figure 3. Beachfront Multi-Use Path in Peachland



¹⁶ See the BC Active Transportation Design Guide, Chapter G. Intersections + Crossings, for options to mitigate potential conflicts at intersections.

Multi-Use Pathway Width Guidance

Roadway Corridor (Arterial and Collector Roads)	Desirable	Constrained
Pathway Width	4.0m+ ^{***}	3.0m
Street Buffer Zone Width [*]	≥ 2.0m	0.6m
Roadway Corridor (Local Roads)		
Pathway Width	3.0 – 4.0m ^{***}	3.0m
Street Buffer Zone Width [*]	≥ 1.5m	0.6m
All Other Contexts		
Pathway Width	3.0m – 4.0m ^{***}	2.7m
Lateral Clearance	0.6m ^{****}	0.6m

^{*}Where a paved shoulder is present, the separation distance begins at the outside edge of the shoulder. The paved shoulder is not included as part of the separation distance.

^{***}For high volume facilities with a variety of different user types, consider using widths at the higher end of the design domain. TAC includes an upper practical limit of 6.0m for this purpose.

^{****}Desirable lateral clearance increases depending on side slope. Source: BC Active Transportation Design Guide, Table E-20

Additionally, pathway design speeds are an important consideration. While there is no single design speed that works for all contexts, for most flat, off-street pathways, a design speed of 30 km/h is generally sufficient. However, a design speed of 20 km/h is more appropriate where multiple conflicts occur, such as driveways, intersections, and where there are higher volumes and a mix of users.

When multi-use pathways become popular, high volumes of people walking and biking and different travel speeds can create conflicts between users. When conflicts occur, they can be mitigated by separating users. Both the TAC Design Guide and the BC Active Transportation Design Guide recommend separating people biking and walking under the following conditions:

- Where there is a high percentage of pedestrians (more than 20% of users) and total user volumes greater than 33 persons per hour per metre of path width; or
- Where there is a low percentage of pedestrians (less than 20% of users) and total user volumes greater than 50 persons per hour per metre of path width.

For facilities that tend to serve higher speed commuter bicyclists, local agencies may wish to pursue separation before the above thresholds are met or a parallel route that is more appropriate for higher speeds. More information on the benefits and limitations of multi-use pathways, typical applications, and design guidance can be found in the BC Active Transportation Design Guide.

4.2 Separated Bicycle and Pedestrian Pathways

Separated bicycle and pedestrian pathways are off-street facilities that are similar to multi-use paths, except that they offer physical separation between people walking and rolling. Separated bicycle and pedestrian pathways create a more comfortable environment and minimize the potential safety conflicts between people walking and faster-moving users, such as people bicycling, in-line skaters, and other wheeled modes. These benefits are especially important along pathways with higher volumes of pedestrians and bicyclists.

A separated bicycle pathway should always be located parallel to a pedestrian pathway or a sidewalk. If a parallel facility for pedestrians is not provided, it is likely that a bicycle pathway will be used by pedestrians and function more as a multi-use pathway. The type of separation between pedestrians and bicyclists can range from a painted line, different surface treatments or features, such as posts, curbs, or landscaping. Bicycle and pedestrian paths are physically separated and typically grade separated from motor vehicle traffic. If appropriate design guidance is followed, separated bicycle and pedestrian pathways are typically considered appropriate for all ages and abilities and may serve as a primary arterial or supporting connector in the active transportation network.

Figure 4. Separated Bicycle and Pedestrian Pathways



Separated bicycle pathways can be designed to accommodate either uni-directional or bi-directional bicycle travel. Separated pedestrian pathways should be designed to be bi-directional and allow people to travel side-by-side and to accommodate users travelling in the opposite directions. General guidance on widths is provided in the table below.

Separated Bicycle and Pedestrian Pathway Width Guidance

Facility	Desired	Constrained
Bicycle Pathway (Uni-directional)	2.0m ^{**}	1.8m
Bicycle Pathway (Bi-Directional)	4.0m	3.0m
Pedestrian Pathway (Adjacent to a Separated Bicycle Pathway)	2.4 – 3.0 ^{***}	1.8m

^{**}If uni-directional bicycle pathway has greater than 150 bicycle users per peak hour for bicycle traffic, or there is a desire for side-by-side riding, then pathway should be 2.5 metres to 3.0 metres.

^{***}For high volume facilities with a variety of different user types, use the higher end of the design range

Source: BC Active Transportation Design Guide, Tables E-23 and E-24

More information on the benefits and limitations of separated bicycle and pedestrian pathways, typical applications, and design guidance can be found in the BC Active Transportation Design Guide.

4.3 Protected Bicycle Lanes

Protected bike lanes (PBL) are dedicated facilities designed for exclusive use by people biking and potentially by people using other compatible forms of micromobility (e.g. scooters, skateboards, etc.), where permitted. These facilities are physically separated from motor vehicle traffic by either vertical or horizontal elements.

Figure 5. Protected Bicycle Lane, Sutherland Ave, Kelowna, BC



Protected Bicycle and Pedestrian Pathway Width Guidance

Protected Bicycle and Pedestrian Pathway Width Elements	Desirable	Constrained	Upper Practical Limit
Bicycle through Zone (uni directional)	2.5m	1.8m	3.0m
Bicycle through zone (bi-directional)	4.0m	3.0m	4.0m
Street Buffer Zone	0.9m ^{**}	0.6m	2.0m
Furnishing Zone	Minimum 2.0m	0.25m	-

This facility is considered appropriate for all ages and abilities and can act as a primary arterial route or a supporting route depending on circumstances. The BC Active Transportation Design Guide recommends this facility type where motor vehicle speeds are posted at 50 km/h (and motor vehicle volumes are greater than 4,000 vpd), or locations with high curbside activity (regardless of posted motor vehicle speeds or motor vehicle volumes). In instances where motor vehicle speeds are posted at higher speeds of up to 80 km/h and volumes are high, this facility type is also recommended, assuming the street buffer is toward the upper practical limit.

Examples of separation elements include raised or landscaped medians, concrete barriers, planter boxes, flexible delineator posts, or even on-street parking, among others. This Plan makes a distinction between an Urban Standard and a Rural or Interim Standard Protected Bike Lane. Urban Standard Protected Bike Lanes are built to a higher standard with separation elements that include raised or landscaped medians and concrete barriers as shown in Figure 5. These facilities are appropriate in more highly developed areas with mixed use and higher density residential development. By contrast Rural or Interim Standard Protected Bike Lanes include separation elements that are quicker and easier to install, including, for instance, standalone planter boxes and flexible delineator posts as shown in Figure 6. These facilities, while providing less physical protection, are appropriate where traffic volumes and curbside activity are relatively low, or as an interim facility. More information on design considerations for protected bicycle lanes is available in the BC Active Transportation Design Guide.

Figure 6. Protected bike lane using flexible delineator posts and on-street parking along Sutherland Ave in Kelowna



4.4 Painted + Buffered Bicycle Lanes

Painted and buffered bicycle lanes are separate travel lanes designated for the exclusive use of people bicycling. Bicycle lanes can be unbuffered or buffered. Bicycle lanes are typically identified by a solid painted line, with signs and pavement markings placed at regular intervals. Bicycle lanes may also be buffered, in which case an additional painted buffer is added to provide more space between people biking and either the vehicle travel lane or parking lane (or sometimes both). Bicycle lanes can help encourage motorists to stay out of the bicyclists' path and discourage bicyclists from riding on the sidewalk.

Bicycle lanes are different from protected bicycle lanes as they do not provide physical separation between bicycle users and motor vehicles. Bicycle lanes are also different from bicycle accessible shoulders because they are for the exclusive use of people biking.

Figure 7. Bike Lanes through school zone along Main Street in Lake Country



Different design considerations are important depending upon the placement of the bicycle lanes which may be curbside, parking adjacent, on the left side, or contraflow. It is important to note that due to recent research and safety considerations, parking adjacent bicycle lanes are no longer recommended in the BC Active Transportation Design Guide.

Bicycle lanes are preferred on roads with speed limits of 50 km/h or less and motor vehicle volumes of 4000 vehicles per day or less. Bicycle lanes typically serve as supporting connectors in a bicycle network.

Curbside Bicycle Lane Width Guidance

Facility Element	Desired	Constrained
Curbside bicycle	1.8m ^{**}	1.5m ^{***}
Buffer ^{****} (between bicycle lane & motor vehicle lane)	0.6m	0.3m

^{**}For any width greater than 1.8 metres, a buffer should be provided to avoid the bicycle lane being mistaken or used for other purposes, such as parking or motor vehicle travel.

^{***}The absolute minimum width of an unbuffered curbside bicycle lane is 1.2 metres. A bicycle lane width between 1.2 metres and 1.5 metres should only be considered for short distances (less than 100 metres), in constrained areas, and when reasonable consideration has been given to an alternate design.

^{****}Where motor vehicles speeds are 50 km/h or greater, adding a buffer is strongly recommended.

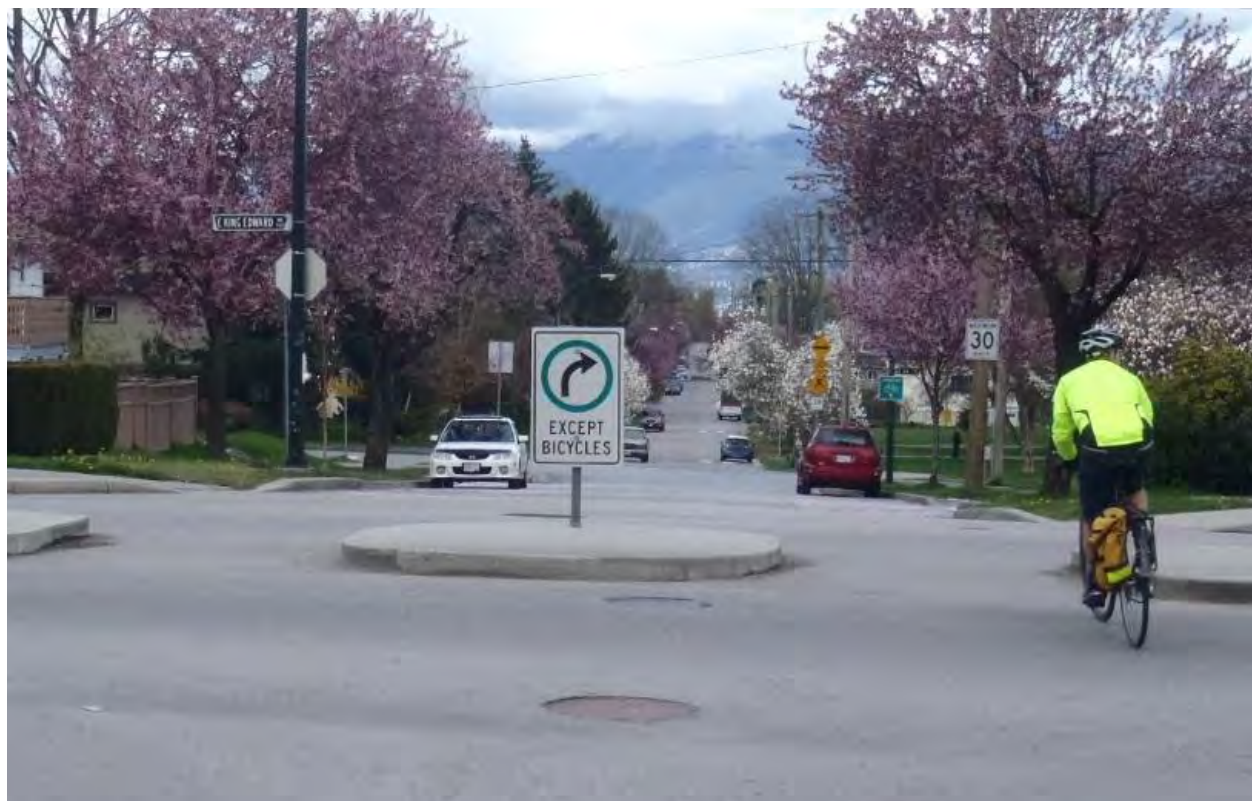
Source: BC Active Transportation Design Guide, Table D-16

More information on different types of bicycle lanes and design guidance can be found in the BC Active Transportation Design Guide.

4.5 Neighbourhood Bikeways

Neighbourhood bikeways are streets with low motor vehicle volumes and speeds that have been enhanced to prioritize biking in a shared road environment. Examples of treatments on neighbourhood bikeways include, signage and pavement markings, crossing treatments, traffic calming, and/or traffic diversion to prioritize bicycles and enhance comfort and safety for people biking and other vulnerable road users. Neighbourhood Bikeways can serve a high volume of people riding bikes, particularly on roadways with lower volumes of motor vehicle traffic.

Figure 8. Neighbourhood Bikeway, Windsor Street at King Edward, Vancouver, BC



In accordance with the BC Active Transportation Design Guide, neighbourhood bikeways can be designed to serve people of all ages and abilities as they can create a safe and comfortable environment for people bicycling and people driving motor vehicles to share the road. In order to be classified as AAA, posted speed limits and operating motor vehicle speeds should be 30 km/h or less and motor vehicle volumes should be 500 per day or less (with a maximum average daily traffic of no more than 1,000 vehicles per day). More information on the benefits and limitations of neighbourhood bikeways, types of treatments and typical applications can be found in the BC Active Transportation Design Guide.

In a bicycle network, this type of facility can act like a local, supporting or a primary arterial route.

One thing to note for this type of facility is that the BC Active Transportation Design Guide recommends a desirable clear width¹⁷ of 5.5m, with a minimum of 4.0m in constrained conditions. However, the Transportation Association of Canada (TAC) Geometric Design Guide recommendations result in clear widths of between 4.0 to 4.5m¹⁸. Given the difference in guidance, this Plan recommends aligning with the BC Active Transportation Design Guide desired clear width wherever possible.

4.6 Bicycle Accessible Shoulders

Bicycle accessible shoulders are designed to accommodate people biking by offering a dedicated space for cycling that is free of parked cars. They are typically found along rural roads and are delineated by a solid white line and can be supplemented by signage and pavement markings. Unlike painted bicycle lanes, however, other road users may also use the shoulder including pedestrians and motor vehicles when needed for safety, operations, and maintenance purposes. Bicycle accessible shoulders are not considered an all ages and abilities bicycle facility particularly on roadways with higher motor vehicle volumes and speeds.

Bicycle accessible shoulders are not a desired facility if posted speeds are greater than 50 km/h unless additional buffer width or separation is provided. If bicycle accessible shoulders are provided on roadways with speeds above 50 km/h, the desired shoulder and buffer width increases, as indicated in the table below.

Bicycle Accessible Shoulder Width Guidance

Vehicle Speeds	Desirable	Constrained Limit
≤ 50km/h or less	1.8m	1.5m
< 70km/h or less	2.5m	1.5m
> 70km/h or more	3.0m or wider	2.0m
Buffer*	1.2m	0.9m

¹⁷ Clear width refers to the roads operating space, either the space between curbs (if there is no on-street parking) or the space between parked cars (if there is on-street parking).

¹⁸ The TAC guide considers total roadway width, with parking on one or both sides. Using a 3.0m parking width (including space for the door swing), this results in total roadway width practical upper limits of 7.5m and 10.0m respectively (resulting in clear widths of 4.0 to 4.5m).

* An engineering exception report would be required to justify a relaxation from the desirable guidelines listed in the Table.

*Between shoulder and moving vehicle lane when speeds or volumes are high

Source: BC Active Transportation Design Guide, Table D-19

This facility type is suitable to serve as a supporting route, or as a local connection where vehicle volumes (i.e. ≤ 2000 vehicles per day) and speeds are lower. More information on typical applications, design considerations, signage and pavement markings for bicycle accessible shoulders is available in the BC Active Transportation Design Guide.

Figure 9. Bike Accessible Shoulder with Markings along Marine Drive, Vancouver, BC



4.7 Intersections & Crossings

The design of intersections and crossings is integral to the comfort and safety of any bikeway or trail facility and must take many factors into consideration. Intersections involve complex interactions between all modes of transportation and are generally the locations where most collisions occur. Special design considerations are needed at locations where bicycle and trail facilities intersect with other roads and where people biking and walking are directly exposed to motor vehicles. In accordance with the BC Active Transportation Design Guide, the following design principles are recommended to provide safe, comfortable, and accessible intersection crossing treatments for all users:

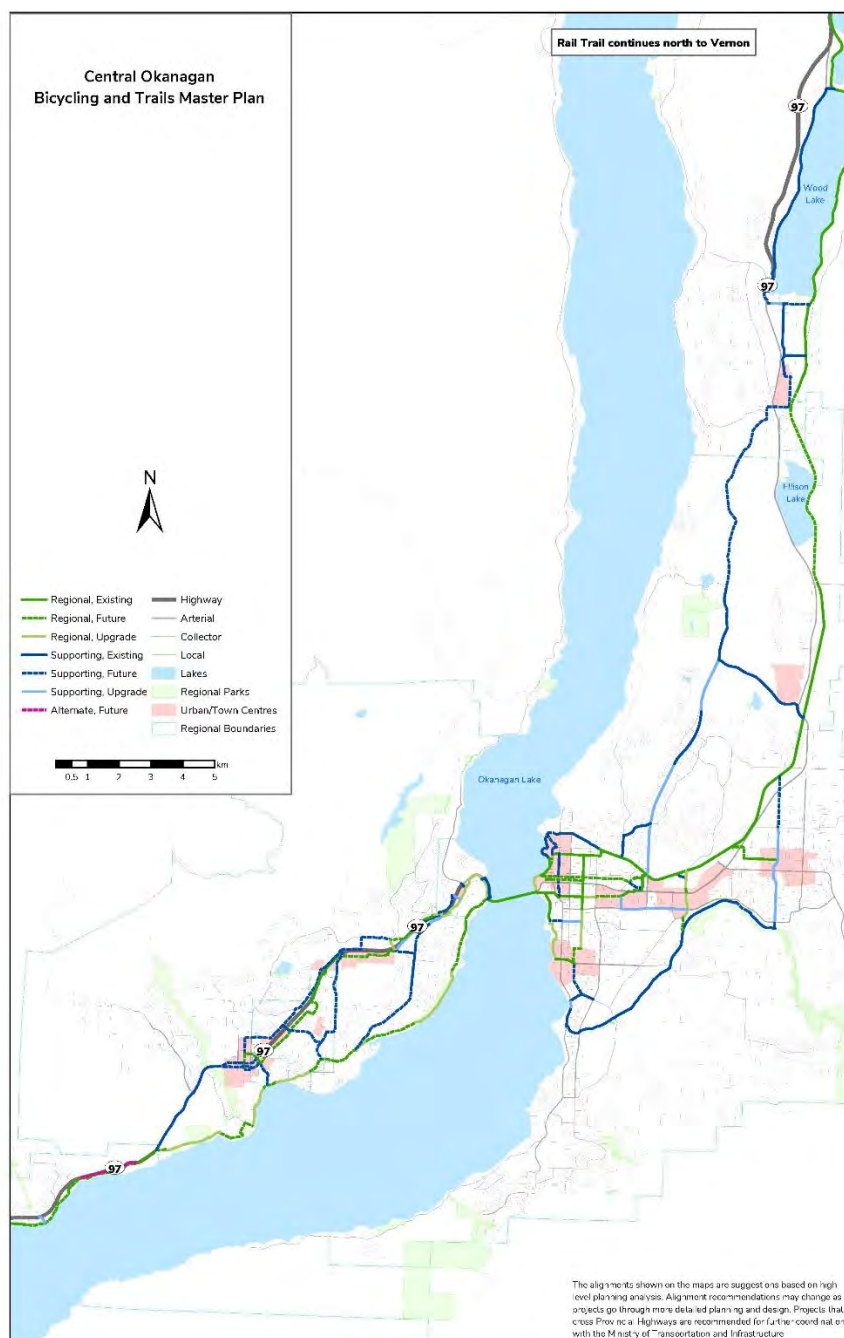
- Design for all ages and abilities
- Minimize conflicts between users
- Ensure clarity of right-of-way
- Reduce speed at conflict points
- Ensure clear sightlines
- Make intersections as compact as possible

For more detailed guidance related to intersection designs and crossing treatments please refer to Chapter G. Intersection + Crossings of the *BC Active Transportation Design Guide*, as well as the TAC *Geometric Design Guide*. Also refer to Section 6.1.3 in this document for additional Ministry of Transportation and Infrastructure requirements.

5 Proposed Network

Figure 10 illustrates the proposed 193 km network, including 82 kms that exist today, 81 km that are not yet constructed, and 30 kms that need an upgrade. Detailed mapping is included in Appendix 1, 2, and 3 that shows the proposed regional bicycling and trail network by primary regional and supporting corridors, facility types, and phasing recommendations. Appendix 4 provides a summary of costs by facility and jurisdiction.

Figure 10. Regional Bicycling and Trails Network broken down by Primary Regional and Supporting Links



The following figures show the network through specific sub-areas in the region. Table 1 provides a summary of the length of recommended new and upgraded facilities by jurisdiction.

Figure 11. Recommended network through Peachland



As shown in Figure 11, the network through Peachland focuses on providing a safe and comfortable route parallel to Highway 97. The proposed primary regional spine route (shown in green on the map) continues the Westside Trail to connect through Peachland's town centre along Drought Road, Buchanan Road and Beach Avenue. The topography and limited right of way make connections through Peachland challenging. Recognizing this constraint, an alternative route in lieu of connecting along Drought Road is along the Highway right-of-way. This alternative requires further investigation and conversations with the Ministry of Transportation and Infrastructure.

Figure 12. Recommended Network through West Kelowna and WFN (IR 9) around the Westbank Town Centre

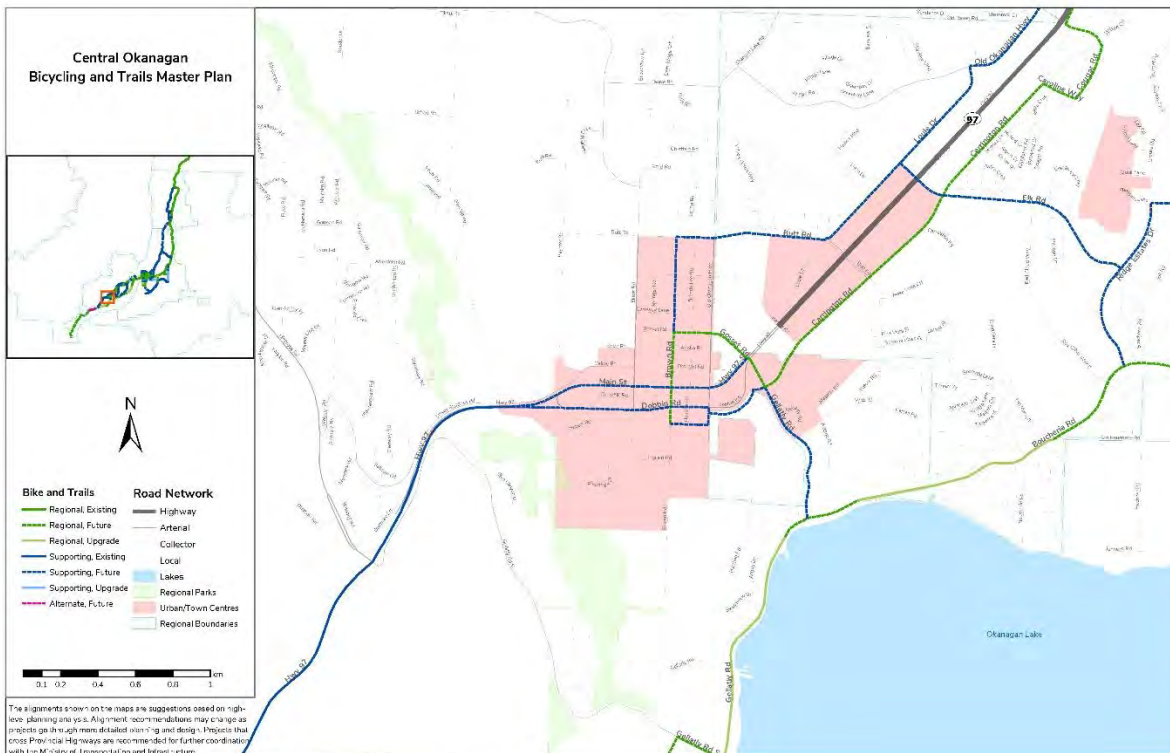
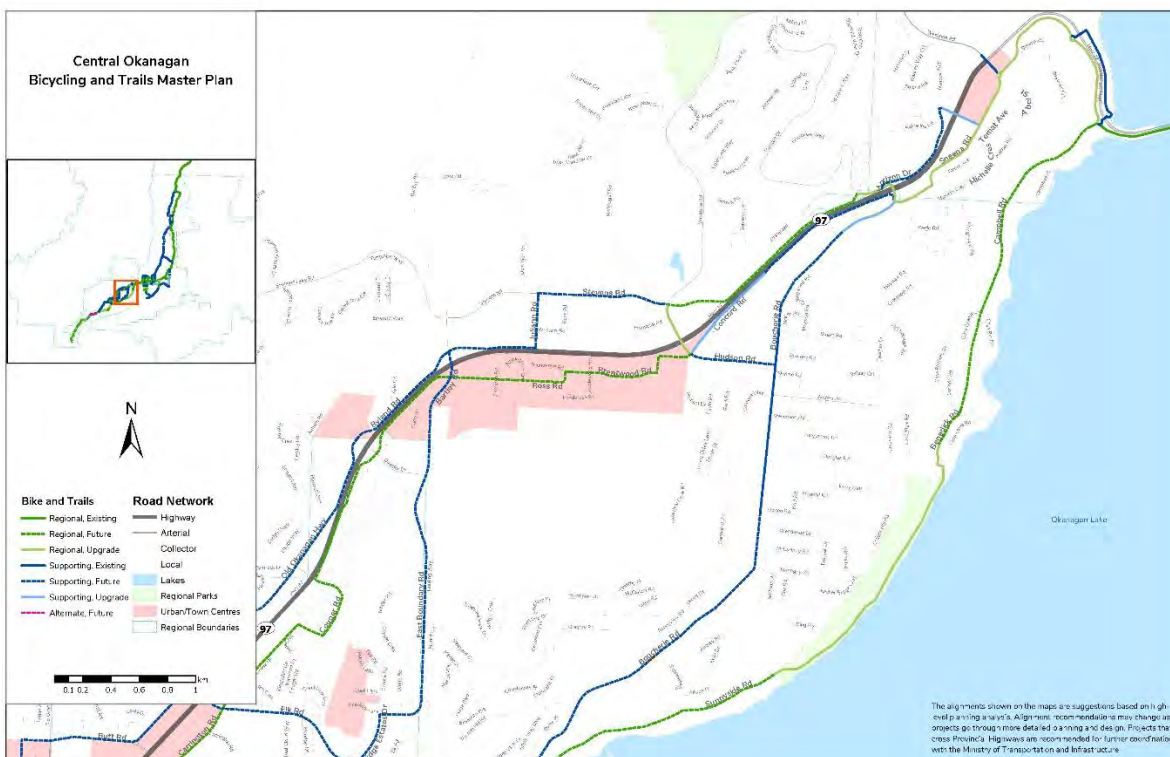
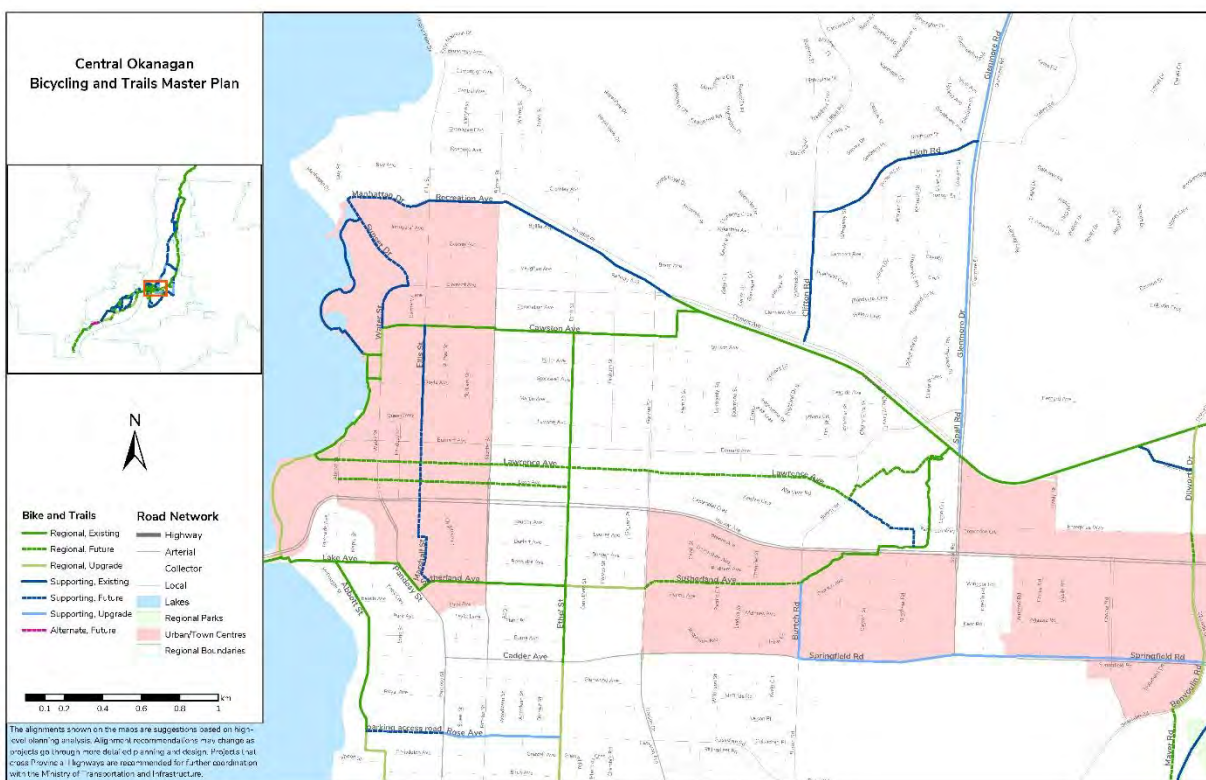


Figure 13. Recommended network in West Kelowna and WFN (IR 10)



As shown in Figure 12 and 13, the network through West Kelowna and Westbank First Nation (WFN) focuses on two primary regional spines: the Westside Trail and a route parallel to the Highway 97 corridor. Supporting connections provide links between the two primary regional spine corridors and offer additional connectivity to town centre areas along the north side of the highway. The proposed network is the beginning of a grid of regional routes that will overlap with a finer grid of local bicycle networks in West Kelowna and WFN. The network offers an opportunity for direct travel for commuters as well as a loop system for recreational users.

Figure 14. Recommended network through central Kelowna



The recommended network for central Kelowna is shown in Figure 14. The network branches at the W.R. Bennett Bridge to provide primary regional spine connections to the Okanagan Rail Trail and downtown north of Highway 97. South of Highway 97 the primary regional spine connects to the Kelowna General Hospital (KGH), Pandosy Urban Centre and Okanagan College, and also east to the Capri/Landmark Urban Centre and Midtown Urban Centre.

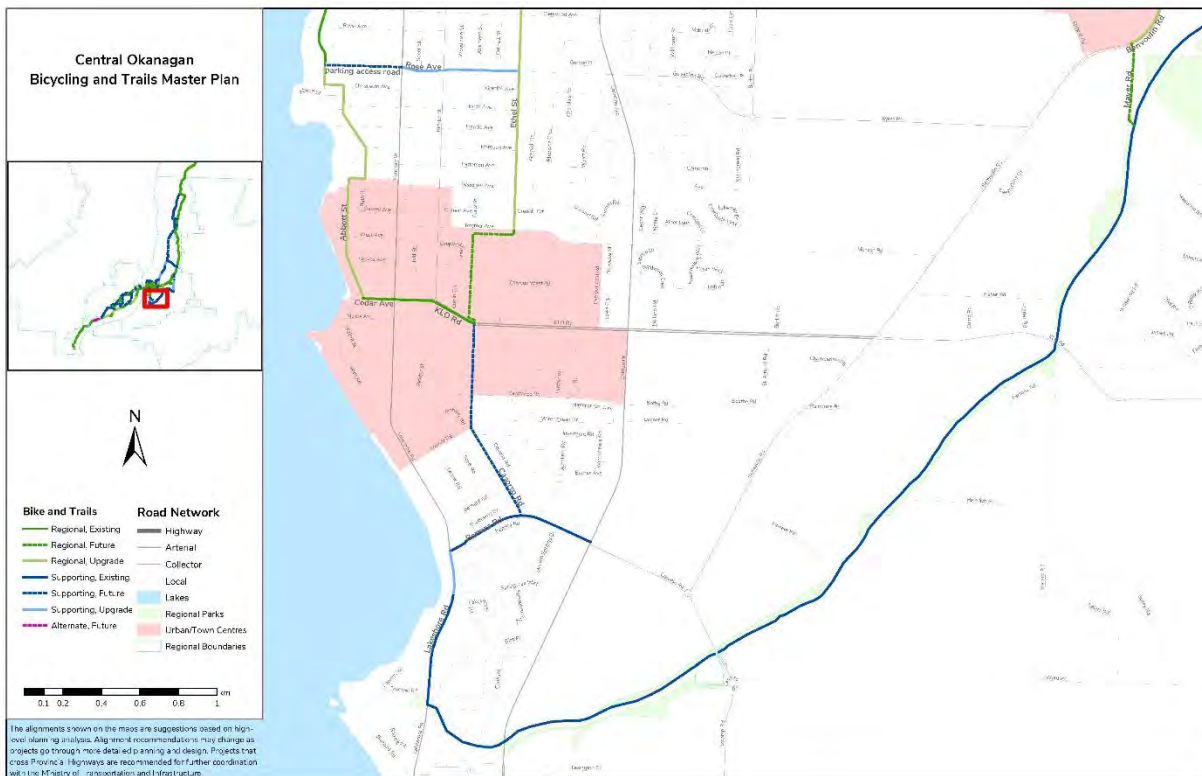
Figure 15. Recommended network south of Highway 97 in Kelowna

Figure 15 shows the recommended network south of Highway 97, providing connections through the Pandosy Urban Centre. Secondary connections link the primary regional spine to the Mission Creek Greenway.

Figure 16, on the following page, shows the recommended network through Okanagan Indian Band (OKIB) Duck Lake IR 7 and Lake Country. The Okanagan Rail Trail forms the primary regional spine through the area. Supporting connections include Glenmore Road, Bottom Wood Lake Road, and the Pelmeash Parkway. Similar to the regional network shown in West Kelowna and WFN, the network through OKIB Duck Lake IR 7 and Lake Country offers direct connections for commuters and also loop opportunities for recreational users.

Figure 16. Recommended network in Lake Country

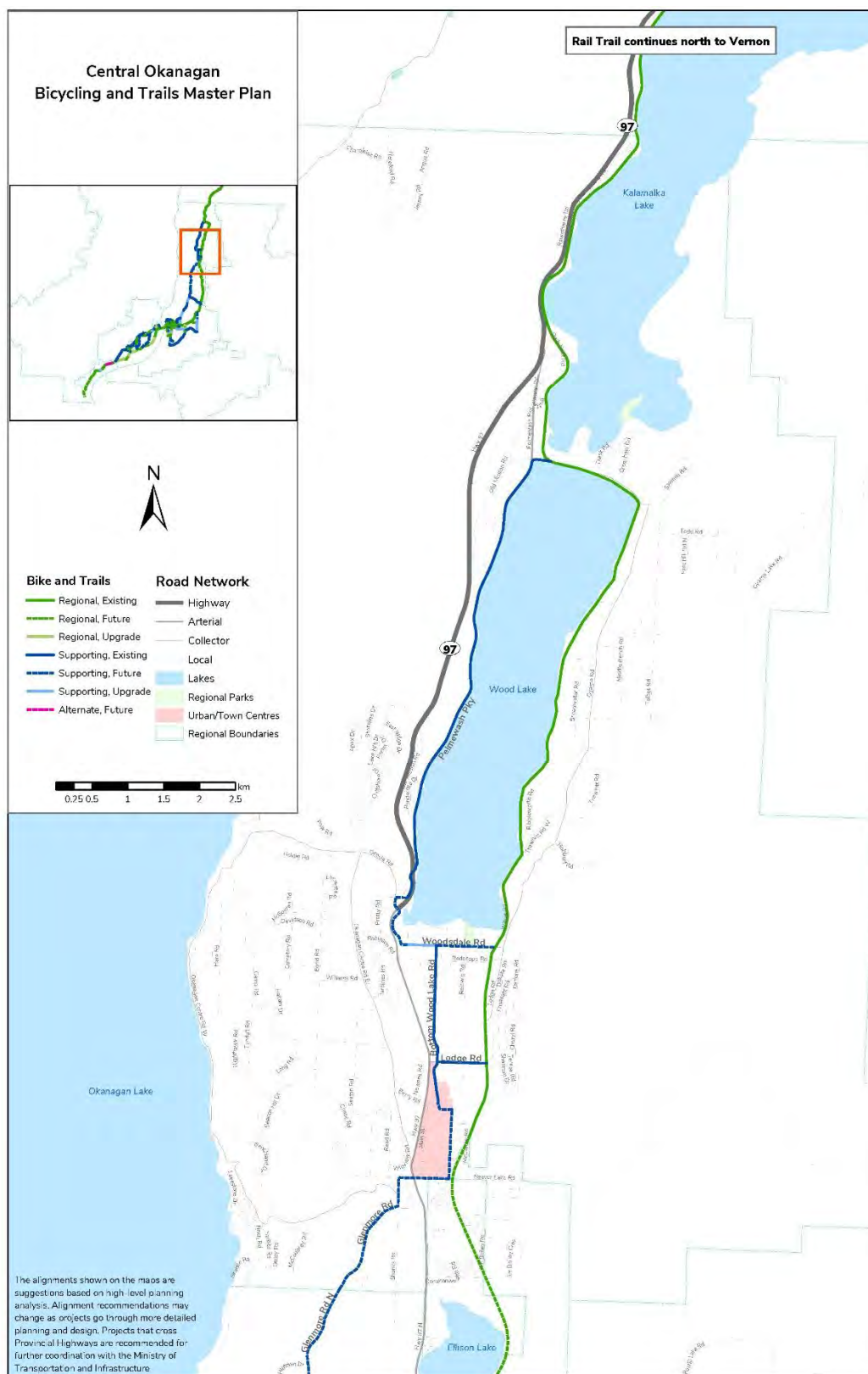


Table 1. Summary of Regional Network by Jurisdiction

Jurisdiction	Length (m)
Peachland	
Regional Network (New)	10,989
Regional Network (Upgrade)	-
Supporting Network (New)	-
Supporting Network (Upgrade)	322
Existing Network	2,096
Total Network	13,407
Total Network (New or Upgrade)	11,311
West Kelowna	
Regional Network (New)	12,060
Regional Network (Upgrade)	6,925
Supporting Network (New)	15,396
Supporting Network (Upgrade)	1,214
Existing Network	4,680
Total Network	40,276
Total Network (New or Upgrade)	35,596
Westbank First Nation	
Regional Network (New)	5,815
Regional Network (Upgrade)	3,536
Supporting Network (New)	6,957
Supporting Network (Upgrade)	291
Existing Network	1,406
Total Network	18,005
Total Network (New or Upgrade)	16,598
Kelowna	
Regional Network (New)	13,904
Regional Network (Upgrade)	5,418
Supporting Network (New)	10,495
Supporting Network (Upgrade)	11,807
Existing Network	48,002
Total Network	89,626
Total Network (New or Upgrade)	41,624
Lake Country	
Regional Network (New)	-
Regional Network (Upgrade)	-
Supporting Network (New)	5,670
Supporting Network (Upgrade)	403
Existing Network	25,848
Total Network	31,922
Total Network (New or Upgrade)	6,074
Regional Summary	
Existing Network	82,033
Total Network	193,234
Total (New or Upgrade)	111,202

5.1 Regional Network by Facility Type

The proposed regional bicycle and trails network includes 154 km of fully separated facilities (e.g., multi-use paths, separated bicycle and pedestrian paths, or protected bicycle lanes), 26 km of on-street painted bicycle lanes and bicycle accessible shoulders, and 13 km of shared facilities (neighbourhood bikeways). With 82 km of the network in place, there remains 81 km to be constructed and 30 km to be upgraded in the future. Figure 17 illustrates the proposed facility types by corridor. The facility types shown are suggestions based on high-level planning analysis. Facility type recommendations may change as the projects go through more detailed planning and final design. Appendix 2 provides more detailed maps by sub-area.

Figure 17. Regional Bicycling and Trails Network by Facility Type

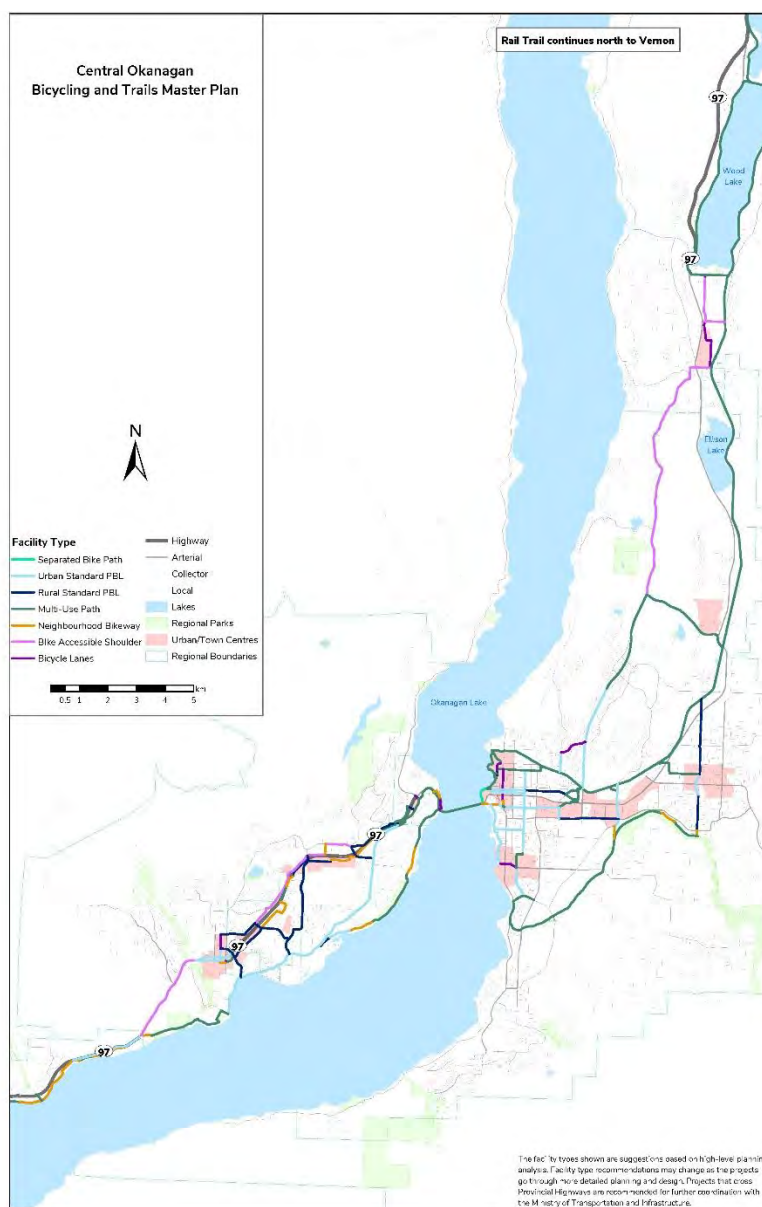


Table 2 provides a summary of facility types by jurisdiction. It is important to note that some routes have multiple facility types, (e.g. bicycle lanes next to a multi-use pathway), but only the higher-order facility type is summarized here. Alternate routes are not included in this calculation.

Table 2. Summary of Facility Types by Jurisdiction

Facility Type	Peachland (m)	West Kelowna (m)	WFN (m)	Kelowna (m)	Lake Country (m)	Total (m)
Urban Standard Protected Bicycle Lane	6,435	11,942	1,724	19,012	-	39,113
Rural Standard Protected Bicycle lane	-	9,701	5,274	7,783	-	22,758
Multi-Use Paths	2,826	7,496	5,745	50,437	25,143	91,647
Neighbourhood Bikeways	4,146	4,677	2,452	2,037	-	13,313
Bicycle lanes	-	573	850	2,972	1,855	6,005
Bicycle Accessible Shoulders	-	5,886	2,205	6,699	4,923	19,713
Separated Bicycle and Pedestrian Pathway	-	-	-	686	-	686
Total (m)	13,407	40,276	18,005	89,626	31,922	193,438

5.2 Costs

High-level cost estimates have been developed for the proposed regional bicycling and trails network, based on typical construction costs for various types of facilities. A 50% percent contingency has been used to reflect the high planning-level cost assumptions and to provide flexibility in determining the final design of the improvements. Based on the above, cost estimates by facility type are included in Appendix 4.

The total network cost for all facilities not yet in place are estimated to be in the order of \$88.1 million, which includes a requirement for \$55.1 million for the primary regional 'spine' network and \$33 million for the 'supporting' connector routes. In comparison, a single highway interchange project can cost \$50 million or more. Building the proposed regional bicycling and trails network will enable more people to bike for all types of trips, benefiting the climate, economy, and public health, and will provide excellent value for the investment.

5.3 Phasing Strategy

Due to the large number of potential projects and magnitude of funding required, a phasing plan has been developed in collaboration with local government representatives to identify projects by priority. Higher priority projects fill critical gaps and are suggested for implementation within 5 years, where

feasible. Medium priority projects are recommended for implementation within 10 years, and lower priority projects are recommended for implementation within 20 years, as illustrated in Figure 18.

Figure 18. Regional Bicycling and Trails Network by Phasing Recommendations

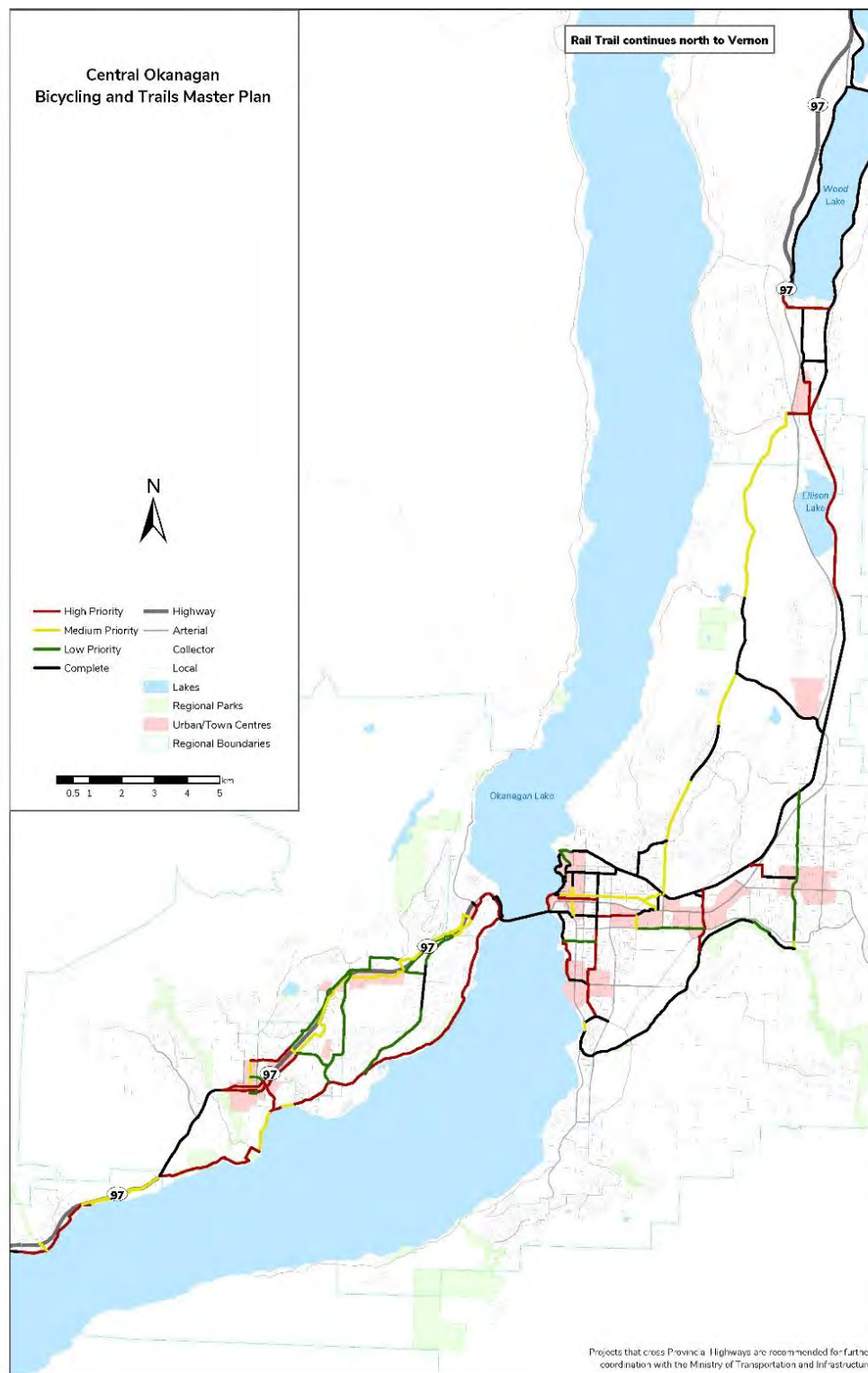


Table 3 provides a summary of the phasing recommendations by jurisdiction.

Table 3. Summary of New or Upgraded Facilities by Phases

Jurisdiction	Length (m)~
Peachland	
High (0 - 5 years)	2,983
Medium (5-10 years)	2,633
Low (10 – 20 years)	5,694
West Kelowna	
High (0 - 5 years)	14,945
Medium (5-10 years)	7,770
Low (10 – 20 years)	12,881
WFN	
High (0 - 5 years)	7,201
Medium (5-10 years)	4,859
Low (10 – 20 years)	4,538
Kelowna	
High (0 - 5 years)	16,793
Medium (5-10 years)	15,290
Low (10 – 20 years)	9,540
Lake Country	
High (0 - 5 years)	3,433
Medium (5-10 years)	1,892
Low (10 – 20 years)	0

~Note that Alternate routes are not included in this count.

5.4 Priority Projects

Local bicycling networks vary considerably throughout the Central Okanagan in terms of their quality and connectivity. In this plan, the highest priority is to establish a high quality primary regional 'spine' system linking urban and town centres throughout the region. Other projects in this Plan that are indicated as a high priority, but which do not fall on the primary regional system, are those which:

- Have high levels of support from internal stakeholders;
- Fill key functional gaps; or
- Have funding sources identified.

High priority projects listed below are also mirrored within the *Central Okanagan Regional Transportation Plan* to create seamless direction for transportation planning within the region.

A list of full projects with detailed costing is presented in Appendix 4. The project list includes reference to where these projects are also supported in existing local policies or plans.

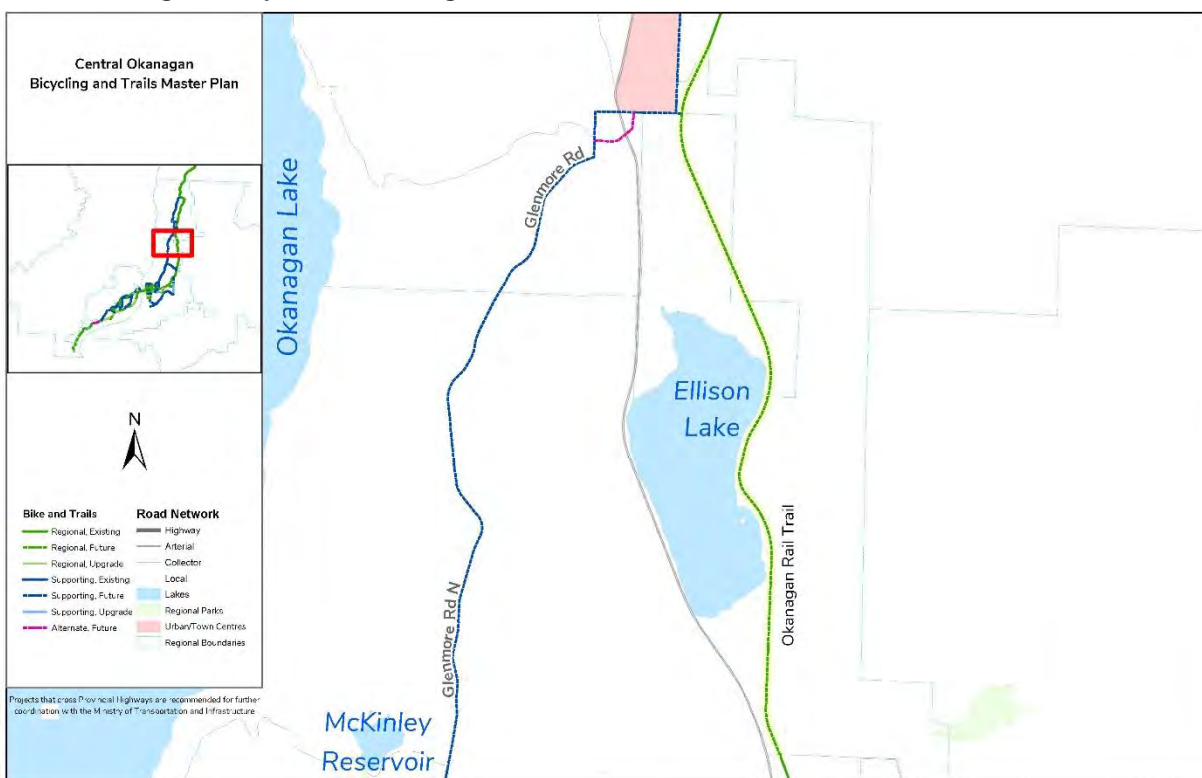
5.4.1 Pelme wash Parkway – Okanagan Rail Trail Connector Multi-use Path



With Lake Country making major investments to their bicycling network by completing multi-use paths on both sides of Wood Lake (Okanagan Rail Trail and Pelme wash Parkway), the final step to complete the loop should be considered a high priority. A high-quality connection can be constructed efficiently and effectively using the available right of way along Pretty Road, Oceola Rd, and Woodsdale Rd. Specific routing should be established through the design process, aiming to limit disturbance to existing street trees and utilities. In the long term, a route that continues down the eastern side of Hwy 97 should be considered, to avoid crossing the Highway. Completing this link would also create a comfortable and accessible ~17 km loop around Wood Lake.

Route On	From	To	Length (m)	Facility Type
Woodsdale Rd	Bottom Wood Lake Rd	Okanagan Rail Trail	822	Multi-Use Pathway
Woodsdale Rd	Bottom Wood Lake Rd	Seymour Rd	403	Multi-Use Pathway
Woodsdale Rd	Hwy 97	Seymour Rd	651	Multi-Use Pathway
Oceola Rd, Petty Rd	Woodsdale Rd	Pelme wash Pky On-ramp MUP	332	Multi-Use Pathway

5.4.2 Closing the Gap in the Okanagan Rail Trail



Completing the Okanagan Rail Trail is essential to the success of the *Regional Bicycling and Trails Master Plan* as this corridor represents the primary regional connection between Kelowna, Lake Country, and Vernon to the north. As there is currently no high-quality connection between Kelowna and Lake Country, this limits the feasibility of active transportation trips to and within the eastern portion of the region. Completing the missing 6.5 km of routes between Kelowna, (through IR#7 Duck Lake), and into Lake Country, would create a 48.5km continuous, high-quality route linking the communities to the eastern side of Okanagan Lake.

The gap exists today as The Department of Indigenous Services Canada is facilitating the transfer of corridor ownership from CN Rail to the Government of Canada and deemed the lands for the use and benefit of the OKIB, through the federal Addition to Reserve (ATR) process. Construction and public use of the Okanagan Rail Trail through IR#7 Duck Lake would not occur until after this process is complete and is also subject to OKIB affirming participation in the Okanagan Rail Trail including public access to the lands. There is no specified time frame for this complex project, and currently no comfortable route around this closed section.

Route On	From	To	Length (m)	Facility Type
Okanagan Rail Trail	Old Vernon Rd	Duck Lake IR Boundary	3,251	Multi-Use Pathway
Okanagan Rail Trail	Duck Lake IR Boundary (south)	McCarthy Road	2,605	Multi-Use Pathway
Okanagan Rail Trail	Beaver Lake Rd	McCarthy Road	632	Multi-Use Pathway

5.4.3 Dilworth Connection



A north-south connection between the Okanagan Rail Trail and Mission Creek Greenway will link regional routes on either side of Highway 97 and provide a connection into and through the Midtown urban centre. It would offer a continuous AAA connection around the heart of Kelowna and enhance connectivity to regionally significant locations such as Landmark and the Orchard Park Shopping Centre. Coordination with the Ministry of Transportation and Infrastructure regarding the crossing of Highway 97 will be an important part of the project planning and design process.

Additionally, it should be noted that a separate study analyzed Cooper Road as another possible alignment to connect the Okanagan Rail Trail and Mission Creek Greenway. The study found that either Cooper Road or Dilworth Drive would provide similar benefits. Since the important and urgent need is to create a safe AAA connection between the Okanagan Rail Trail and the Mission Creek Greenway, this plan considers either Dilworth Drive or Cooper Road to be appropriate alignments. If development and funding conditions enable the completion of an AAA facility along one corridor sooner than the other, the corridor that can be completed the soonest is considered the priority.

Route On	From	To	Length (m)	Facility Type
Dilworth Dr	Enterprise Way	Okanagan Rail Trail	553	Urban Standard Protected Bicycle Lane
Dilworth Dr	Harvey Ave	Enterprise Way	150	Urban Standard Protected Bicycle Lane

Route On	From	To	Length (m)	Facility Type
Benvoulin Rd, Dilworth Dr	Mayer Rd	Harvey Ave	831	Urban Standard Protected Bicycle Lane
Mayer Rd	Mission Creek Greenway	Benvoulin Rd	442	Neighbourhood Bikeway

5.4.4 Westside Trail

Both the Westside Trail and key portions of the route parallel to Highway 97 are identified as high priorities.

Figure 19. Westside Trail



The Westside Trail will be the primary regional corridor for the western communities. This route follows the edge of Okanagan Lake from the WR Bennett Bridge to Peachland. Aiming for an all ages and abilities standard, these facilities are predominantly separated facilities, protecting cyclists from motor vehicle traffic. The routing travels through both Goats Peak and Kalamo Regional Parks, and ecological considerations suggest these sections should remain unpaved. This route will nonetheless serve both commuter and utilitarian cyclists travelling east-west, while also forming part of the Trail of the Okanagans¹⁹, and could help draw tourists to the area as part of a greater 'wine trail'²⁰ route.

¹⁹ <https://www.trailoftheokanagans.com/>

²⁰ <https://www.thewestsidewinetrail.com/>

As noted in Table 4 on the following page, the Drought Road route is preferred. An alternate route connecting Peachland to the Westside Trail and Highway 97 parallel corridor is to be pursued only if Drought Road is not achievable upon further technical analysis and review. Completion of the Westside Trail will require securing the needed right-of-way, which will entail more detailed corridor-level planning and design work.

Table 4. Westside Trail Segments and Proposed Facility Types

Route On	From	To	Length (m)	Facility Type
Hwy 97	Brent Rd	Beach Ave	5,694	Urban Standard Protected Bicycle Lane
Beach Ave	13th St	Buchanan Rd	2,123	Neighbourhood Bikeway
Buchanan Rd, Robinson Pl	Beach	Robinson Lane	860	Neighbourhood Bikeway
Robinson Drought Trail	Robinson Pl	Drought Rd	407	Multi-Use Pathway
Drought Rd	RD Trail	Hwy 97	1,163	Neighbourhood Bikeway
Hwy 97	Drought Rd	Seclusion Bay Rd	741	Urban Standard Protected Bicycle Lane
Seclusion Bay Rd	Hwy 97	Goats Peak Park	394	Neighbourhood Bikeway
Goats Peak Path	Seclusion Bay Rd	Witworth Rd	1,825	Multi-Use Pathway
Witworth Rd	Goats Peak Path	Gellatly Nut Farm Path	767	Multi-Use Pathway
Witworth Rd, Gellatly Rd S	George Crt	Cove Path	753	Multi-Use Pathway
Gellatly Rd	Cove Path	Gellatly Bay Park	1,276	Urban Standard Protected Bicycle Lane
Gellatly Rd, Boucherie Rd	Gellatly Bay Park	WFN Public Beach	457	Urban Standard Protected Bicycle Lane
Boucherie Rd	WFN Public Beach	End of WFN Public Beach	382	Urban Standard Protected Bicycle Lane
Boucherie Rd	End of WFN Public Beach	Old Boucherie Rd	703	Urban Standard Protected Bicycle Lane
Boucherie Rd	Old Boucherie Rd	Pritchard Dr N	997	Urban Standard Protected Bicycle Lane
Boucherie Rd	Pritchard Dr N	Green Bay Rd	785	Urban Standard Protected Bicycle Lane
Green Bay Rd	Boucherie Rd	Green Bay - Sunnybrae Path	483	Rural Standard Protected Bicycle Lanes
Green Bay - Sunnybrae Path	Green Bay Rd	Sunnybrae Rd	728	Multi-Use Pathway
Sunnybrae Rd, Sunnyside Rd	Green Bay - Sunnybrae Path	Kalmoir Park Path	931	Neighbourhood Bikeway
Kalmoir Park Pathway	Sunnyside Rd	Benedick Rd	2,180	Multi-Use Pathway
Benedick Rd, Campbell Rd	Kalmoir Pathway	Lucinde Rd	280	Neighbourhood Bikeway

Route On	From	To	Length (m)	Facility Type
Campbell Rd	Lucinde Rd	Casa Grande Rd	690	Neighbourhood Bikeway
Campbell Rd	Casa Grande Rd	IR #10 Boundary	837	Multi-Use Path and Bicycle Lanes
Campbell Rd	IR #10 Boundary	WR Bennett Bridge	2,347	Multi-Use Path and Bicycle Lanes

5.4.5 Highway 97 Parallel Route

Developing an active transportation route parallel to Highway 97 between the W.R. Bennett Bridge and the Westbank Town Centre should be the next priority for the westside after construction of the Westside Trail. Using routing on both sides of the Highway, this route takes advantage of interchange projects to create a continuous, high-quality active transportation link between West Kelowna and Westbank First Nation's town centres.

Figure 20. Highway 97 Parallel Route



There are several corridors on the Westside that may require additional traffic calming or traffic diversion treatments to achieve comfortable and safe conditions for bicyclists. Brentwood Road serves multiple school trips each day (connecting to Hudson Road Elementary and Mount Boucherie Secondary). Steadily growing traffic volumes may warrant increased traffic calming and/or diversion to achieve conditions that support the implementation of a neighbourhood bikeway. These costs have been considered and accounted for in this plan and are summarized in Appendix 4.

As the bulk of this route is unbuilt, it offers the opportunity to provide a consistent facility and to serve people of all ages and abilities. However, a phased approach for this route may be preferable for implementation. At a cost of \$3.6 million, this route can be completed at a lower standard with all Rural Standard Protected Bicycle Lanes first implemented as standard Bicycle Lanes. Then, over time, these bike lanes can be upgraded to the full Rural Standard Protected Bike Lanes at a cost of an additional \$2 million to finish the route at a full AAA standard.

Table 5. Highway 97 Parallel Route Segments and Proposed Facility Types

Route On	From	To	Length (m)	Facility Type
Gellatly Rd	Hwy 97/Gosset Rd	Carrington Rd	186	Rural Standard Protected Bicycle Lanes
Park Cut Through, Carrington Crt	Old Okanagan Hwy	Carrington Rd/Gellatly Rd	372	Multi-Use Pathway
Carrington Rd	Gellatly Rd	WFN Boundary	233	Rural Standard Protected Bicycle Lanes
Carrington Rd	WFN Boundary	Elk Rd	1,180	Rural Standard Protected Bicycle Lanes
Carrington Rd	Elk Rd	Caroline Way	804	Neighbourhood Bikeway
Caroline Way	Carrington Rd	Cougar Rd	189	Neighbourhood Bikeway
Cougar Rd	Caroline Way	Grizzly Rd	319	Neighbourhood Bikeway
Grizzly Rd	Cougar Rd	Hwy 97	241	Neighbourhood Bikeway
Hwy 97 ROW	Grizzly Rd	Cougar Rd	586	Multi-Use Pathway
Cougar Rd, Ross Rd	Hwy 97 ROW Path	Daimler Dr	433	Neighbourhood Bikeway
Ross Rd	Daimler Dr	Bartley Rd	803	Rural Standard Protected Bicycle Lanes
Ross Rd	Bartley Rd	Brentwood Rd	880	Rural Standard Protected Bicycle Lanes
Brentwood Rd	Ross Rd	Alhambra Dr	655	Neighbourhood Bikeway
Alhambra Dr, Hudson Rd	Brentwood Rd	Hudson Rd	354	Neighbourhood Bikeway
Westlake Rd	Stevens Rd	Concord Rd	399	Rural Standard Protected Bicycle Lanes
Stevens Rd	Westlake Rd	Marshall Rd	924	Rural Standard Protected Bicycle Lanes
Stevens Rd Extension	Marshall Rd	Horizon Dr Interchange	714	Rural Standard Protected Bicycle Lanes
Horizon Dr Interchange	Stevens Rd Extension	Boucherie Rd	380	Rural Standard Protected Bicycle Lanes
Hayman Rd, Sneena Rd	Boucherie Rd	Nancee Way	882	Multi-Use Path
Sneena Rd	Nancee Way	Campbell Rd	1927	Multi-Use Path

6 Implementation Requirements

Implementation of the Regional Bicycling and Trails Master Plan includes a planning framework built around four key elements:

- i. Plan, Design and Build
- ii. Operate and Maintain
- iii. Educate and Promote
- iv. Monitor and Evaluate

So far, the Plan has focused on identifying a vision for a comprehensive network of regional bicycle and trail facilities that will link urban and town centres and major regional destinations (i.e. plan, design, build). However, to achieve the shifts in transportation that are necessary to move from an auto dominated transportation system to one that delivers greater use of sustainable transportation modes (walking, bicycling and transit), additional actions are required to complement and support the projects identified in Section 5.

6.1 Plan, Design and Build

This Plan provides recommendations for a network of routes that will link urban and town centres and regional destinations throughout the region with direct and comfortable bicycling facilities for both commuters and recreational users. There are several supporting elements that, if implemented, will increase the appeal and functionality of the regional network such as wayfinding, end of trip facilities, and integration with transit and shared mobility options, such as bikeshare or scooter share (often referred to as shared micromobility).

6.1.1 Protect and Negotiate Rights of Way

One of the greatest constraints for this network will be where certain segments require travelling through privately owned property. Planning to protect these rights of way will be a critical step in successfully implementing the network. One way to strengthen these connections is to include them in long term planning documents such as Official Community Plans and Transportation Master Plans, and to engage with property owners early in the project planning and design process.

6.1.2 Funding

Stable and long-term funding sources will be required from municipal, provincial and senior levels of governments to fully realize the long-term vision in this plan. Local governments and First Nations should continue to work together to establish a single voice to communicate effectively with other levels of government and demonstrate how new investments in sustainable transportation infrastructure can be allocated effectively and equitably to support economic growth and promote healthy, prosperous communities.

6.1.3 Provincial Highway Crossings

For all Provincial highway crossings, the Ministry of Transportation and Infrastructure requires:

1. An application preferably from the local government as the enduring entity
2. Design layout consistent with the BC Supplement to the TAC Geometric Design Guide which shall include, but not be limited to:
 - Detailed civil design (sealed)
 - Turning Templates using the most appropriate TAC design vehicles (using a minimum of a WB20 and IBUS/Firetruck). The template must show smooth arches with adequate offsets from all civil elements, pedestrians, cyclists, opposing lanes and other turning vehicles, etc.
 - Property lines/available right-of-way with overlay of needed right-of-way.

6.1.4 Wayfinding

In addition to physical bicycling and trail infrastructure, clear wayfinding, including pavement markings and signage, are also important to aid in orientation, navigation, and exploration of the regional network. The Central Okanagan Active Transportation Regional Wayfinding Strategy (2015) provides a common design standard for regional pathway and bikeway signage that should be implemented along existing routes and as facilities are added or upgraded. This guidance is consistent with active transportation wayfinding design guidance in the TAC Manual of Uniform Traffic Control Devices (5th Edition, 2014) and the BC Active Transportation Design Guide (2019).

6.1.5 End of Trip Facilities

End of trip facilities are important components of any bicycle and trail network. Generally, end of trip facilities are places that support bicyclists at the end of their trip or rest stops, such as safe and secure bicycle parking, public washrooms, bike repair stations, water fountains, and seating.

Individual municipalities will often determine the location of these areas. Secure and highly visible bicycle parking in urban areas is also important. For example, The City of Kelowna delivers a bicycle rack program that allows businesses and community organizations to receive subsidized, quality, secure bicycle storage, supplemented by bicycle lockers, available for rent by the month within town centres. Similar bicycle rack cost-share programs are recommended throughout the Central Okanagan.

Recognizing the effects of climate change, shade, rest locations, and water stations should also be provided along key regional routes. Rest areas and water stations help bicyclists reduce discomfort and overheating during hot summer days.

6.1.6 Integration with Transit

The Kelowna Regional Transit system was the first in the province to have its entire fleet equipped with bicycle racks, and these continue to be utilized as a means to support longer trips within the region. This Plan encourages the continuation of this program. Additional transit integration considerations include identifying locations for secure weather-protected bicycle parking near transit exchanges.



6.1.7 Micromobility Considerations

Micromobility is a term typically associated with a rapidly evolving range of shared light vehicles that are increasing in popularity on streets across the globe, such as bikeshare, electric bikes (e-bikes), scooter share and/or e-scooters. Micromobility options are likely to continue rolling out in the Central Okanagan for the foreseeable future. Electric scooters are typically limited to 25 km/h and electric bikes to 32 km/hr. Adjustments to the recommended network and facility types may be needed to ensure the safe accommodation of micromobility in conjunction with other users, as the technology evolves in the future.

6.1.8 Land Use Integration

As routes grow in popularity, there may be land use opportunities such as bicycle rental shops, bicycle-friendly retailers, and food and beverage service locations. These types of services and amenities can help to make regional bicycling and trail routes more attractive and convenient.

6.1.9 Update the Plan

The list of priorities identified in this plan has been developed with input from local government representatives; however, it is inevitable that priorities will change as opportunities arise to incorporate new bicycling infrastructure with new developments and road (re)construction projects. For this reason, this Plan should be reviewed and updated at regular intervals (i.e. every five years) to ensure that it is kept current and continues to reflect local and regional priorities.

6.2 Operations and Maintenance

A well-maintained pathway or road surface is crucial for the comfort and safety of people on bikes and people walking. If the street or pathway surface condition is poor, or if potholes, gravel or snow are

present, active transportation users can find themselves at risk of falling or having to travel uncomfortably close to motor vehicle traffic.

It is recommended that local jurisdictions in the Central Okanagan allocate sufficient funding for gravel sweeping, snow clearing, and ice control on the regional bicycling and trails network to ensure they are usable throughout the year. Higher levels of maintenance should be considered for the entire length of regional AAA routes. To encourage year-round use of bicycle and trail facilities, it is recommended that snow is removed 8 hours following a snowfall on all designated bicycling facilities within 3 km of an urban or town centre.

6.3 Education and Promotion

An effective Regional Bicycling and Trails Master Plan also requires attention to educating and encouraging safe behaviours from all users of the transportation system.

The STPCO has made considerable strides in supporting education and promotion activities, including leveraging Provincial support to pilot the Everyone Rides skills training at 12 schools in the Central Okanagan School District. In recent years school travel plans and follow-up have occurred at George Pringle Elementary, Raymer School, Pearson Road Elementary, Davidson Road Elementary, Belgo Elementary, and South Kelowna Elementary. In 2019, education and promotional programs were rolled out at Okanagan College and UBCO. The STPCO also maintains the development and maintenance of the SmartTrips website, holds annual Bike Rodeos at schools throughout the region, promotes Bike to Work / Bike to School Week, and implements the School Travel Planning / Safe Routes to School Program which targets 1 to 2 schools per year within the region.

It is recommended that these education and encouragement programs continue. In addition, it is recommended that Central Okanagan governments work together to implement the following educational and promotional activities:

- Fund and enhance the Everyone Rides Bicycling Skills training program to ensure that all school children in the region receive comprehensive bicycle skills training by the time they reach grade eight. This training would complement the Safe Routes to School Program and would ensure that students have the skills required to ride a bicycle to and from school.
- Work with stakeholders and partners to ensure that current safe routes to school initiatives are being supported. Provide a dedicated budget for engineering improvements to address deficiencies and potential conflicts so that parents feel comfortable allowing their kids to bike and walk to school.
- Work with stakeholders and community partners to fund and develop an online and print regional bicycling and trails map that can support trip planning for residents and visitors alike.

- Work with stakeholders to promote new bicycling infrastructure, especially before, and on opening day (this may include a summer student ambassador program, educational mail-outs, and promotional construction signage).
- Work with stakeholders and community partners to develop a Bicycle-Friendly Business Program that recognizes employers or businesses for their efforts to encourage, support and promote bicycling among their employees or patrons.



6.4 Monitoring and Evaluation

A monitoring and evaluation program that tracks changes in use and resident perceptions of bicycling and trail infrastructure investment is essential and will allow local governments to gather information to guide future investment decisions. Recommended key performance indicators are grouped into the following four areas:

i. Increase in the share of active transportation in the Region

A broad metric for measuring the change in the use of transportation modes is mode split. The mode split is the proportion of total person trips using each of the various modes of transportation. The proportion using any one mode is its modal share. The best source for this information is the Okanagan Travel Survey, which is typically carried out every five years, and collects data on the daily trips made by households in the region. The most recent survey was conducted in 2018, and findings from the survey are summarized in Section 2.1.

iv. Increase in the number of bicyclists at key count locations

In addition to monitoring regional active transportation mode split, it is also important to monitor the total number of people using a new regional bicycling or trail connection. Permanent or temporary count stations can be used to collect this data and ensure investments are helping to reach active transportation goals. Several permanent counters have been installed in the City of Kelowna, and in the District of Lake Country.

Manual counts are another option that can be conducted by trained staff or volunteers from various community groups and/or students. Monitoring bicycling and walking count data before and after new active transportation projects are constructed is especially important to demonstrate the benefits of investments to decision-makers, which can positively influence funding for additional bicycle and trail facilities.

ii. Improve transportation safety

Safety is paramount in making walking and bicycling viable choices for more people. User perceptions of personal safety and overall satisfaction with the bicycling and pedestrian infrastructure are also crucial in achieving modal shifts from private auto to sustainable transportation modes. Most local governments conduct surveys to measure citizen satisfaction with municipal services. This Plan recommends questions related to pedestrian and bicycling conditions be added to provide an indication of satisfaction with the network as a whole and help identify improvements needed to support increased walking and bicycling.

Data on bicycling and pedestrian collisions are currently available from ICBC and may serve as supplementary information when evaluating bicycle network safety. It is important to note that the ICBC dataset may not be complete, as it often only reflects collisions with vehicles but not injuries associated with a lack of facilities, existing facilities or other objects. Many crashes or 'close calls' do not get

reported; therefore, crash and collision data should not serve as a primary dataset when evaluating real and perceived safety issues along the current and future bicycling and trails network. Datasets from hospitals or clinics (i.e. emergency units) and hospitals will more accurately reflect safety issues related to active transportation users. Effort to collect and analyze alternate dataset should be considered as part of the monitoring and evaluation efforts of this plan.

iii. Increase in sustainable transportation options

Additionally, it is important to track the kilometres of new regional bicycling and trail facilities that have been planned, designed and constructed, as well as the percentage of the proposed regional bicycling and trails network that has been completed.



7 Making it Happen

The implementation of this plan will play a significant role in realizing the RTP vision of “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”. The implementation of the RBTMP plays a significant role in realizing the RTP vision of “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”. The Plan presents a unified regional active transportation network and supports current local, regional, and Provincial goals related to increasing the use of sustainable modes, supporting the region’s economy, improving accessibility, enhancing quality of life, and reducing greenhouse gas emissions.

Implementation of this plan will be delivered in coordination with the RTP, and will require ongoing regional coordination and collaboration between Central Okanagan governments. Additionally, partnerships with senior-level governments will be needed to implement the regional bicycling and trails network and associated policies and programs recommended in this Plan.

By working together, the members of the Sustainable Transportation Partnership of the Central Okanagan (STPCO) are helping to advance the regional bicycling and trails projects necessary to better connect our region, strengthen our economic competitiveness and enhance our quality of life.

Recommendations for Next Steps:

- Central Okanagan governments should align their local bicycling and trails plans to reflect the regional network contained in this plan
- Central Okanagan governments should work together to engage senior levels of government for funding support for the regionally significant bicycling and trails projects, programs, and policies recommended in this Plan.

Central Okanagan governments should work together to implement a performance monitoring program to monitor and assess progress toward Plan implementation.

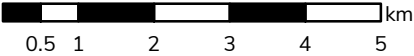
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Appendix 1 –Regional Network by Primary Regional & Supporting

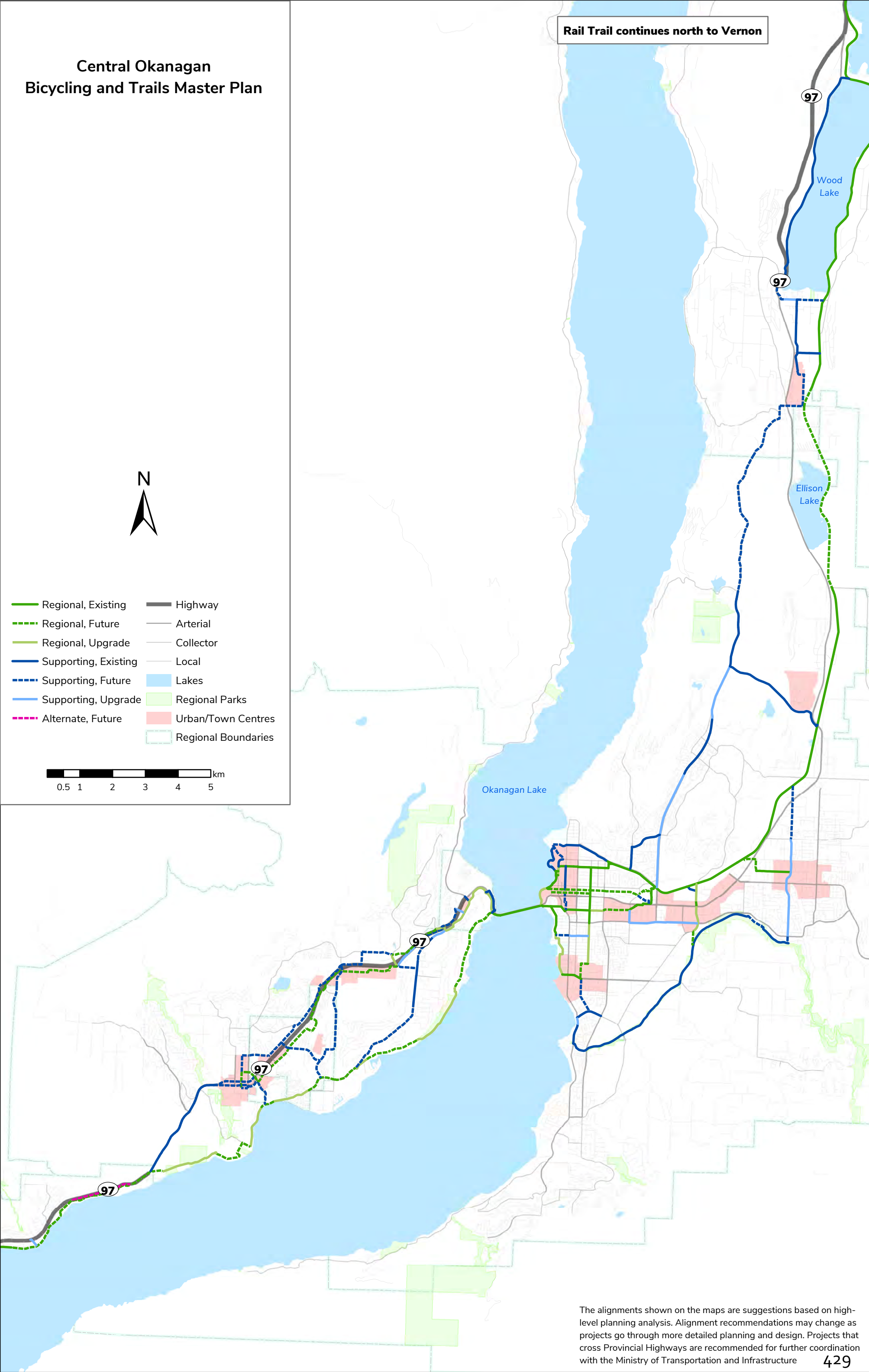
Central Okanagan
Bicycling and Trails Master Plan



- | | |
|----------------------|---------------------|
| Regional, Existing | Highway |
| Regional, Future | Arterial |
| Regional, Upgrade | Collector |
| Supporting, Existing | Local |
| Supporting, Future | Lakes |
| Supporting, Upgrade | Regional Parks |
| Alternate, Future | Urban/Town Centres |
| | Regional Boundaries |

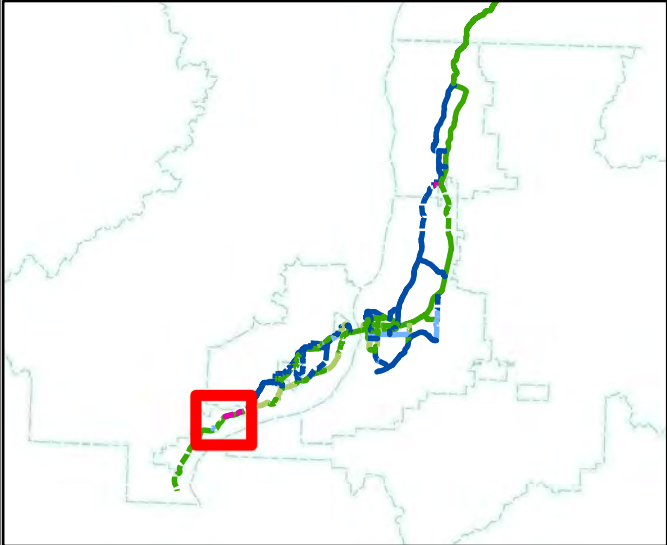


Rail Trail continues north to Vernon

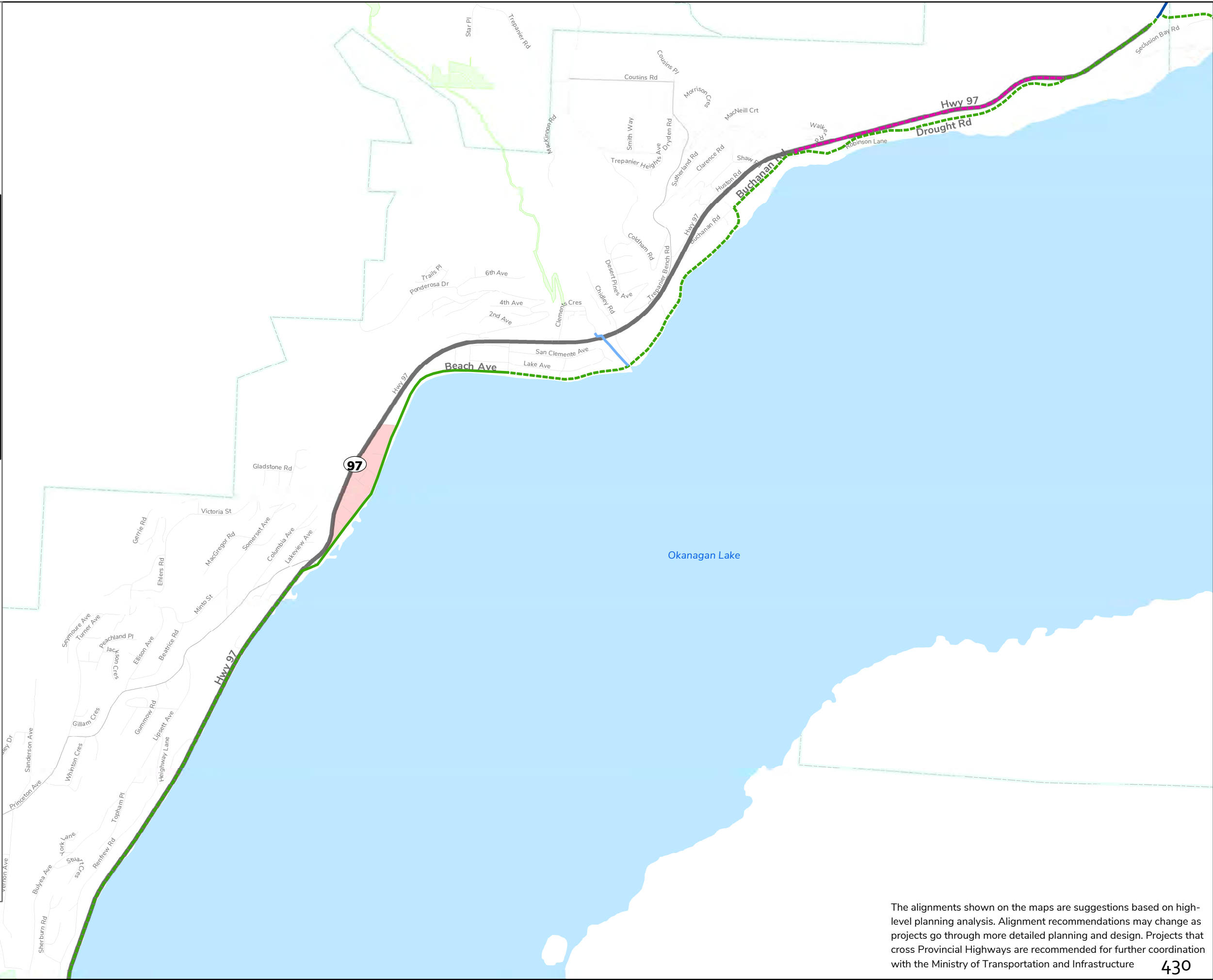
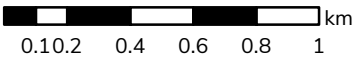


The alignments shown on the maps are suggestions based on high-level planning analysis. Alignment recommendations may change as projects go through more detailed planning and design. Projects that cross Provincial Highways are recommended for further coordination with the Ministry of Transportation and Infrastructure

Central Okanagan Bicycling and Trails Master Plan

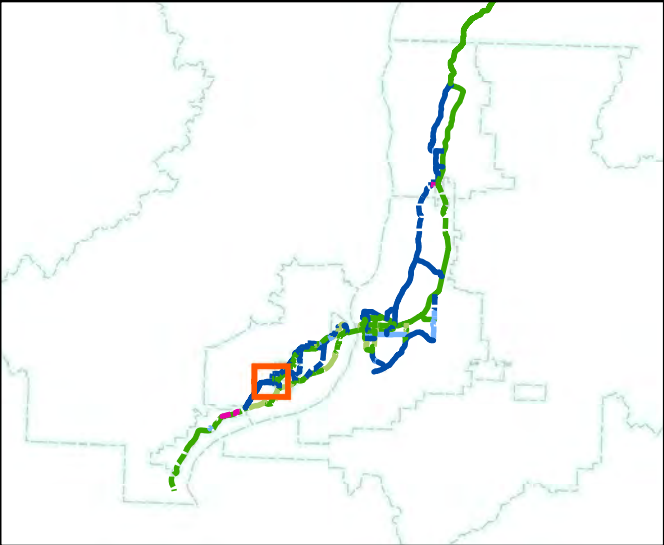


- Bike and Trails**
 - Regional, Existing
 - Regional, Future
 - Regional, Upgrade
 - Supporting, Existing
 - Supporting, Future
 - Supporting, Upgrade
 - Alternate, Future
- Road Network**
 - Highway
 - Arterial
 - Collector
 - Local
 - Lakes
 - Regional Parks
 - Urban/Town Centres
 - Regional Boundaries



The alignments shown on the maps are suggestions based on high-level planning analysis. Alignment recommendations may change as projects go through more detailed planning and design. Projects that cross Provincial Highways are recommended for further coordination with the Ministry of Transportation and Infrastructure

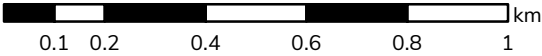
Central Okanagan Bicycling and Trails Master Plan



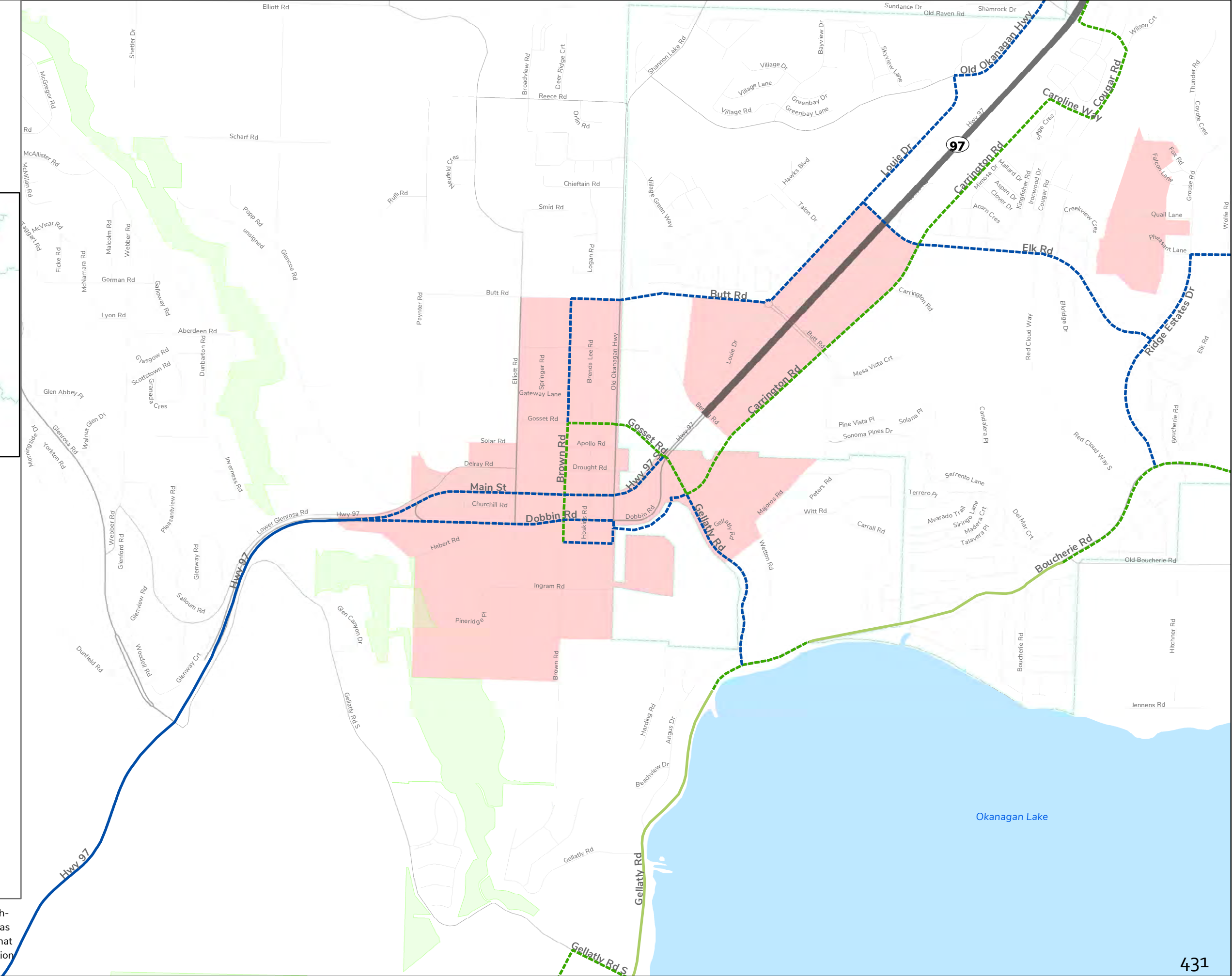
- Bike and Trails**

 - Regional, Existing
 - Regional, Future
 - Regional, Upgrade
 - Supporting, Existing
 - Supporting, Future
 - Supporting, Upgrade
 - Alternate, Future
- Road Network**

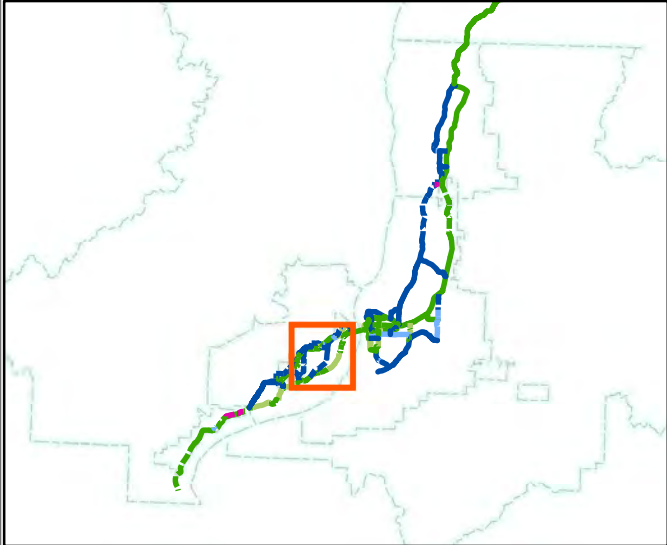
 - Highway
 - Arterial
 - Collector
 - Local
 - Lakes
 - Regional Parks
 - Urban/Town Centres
 - Regional Boundaries



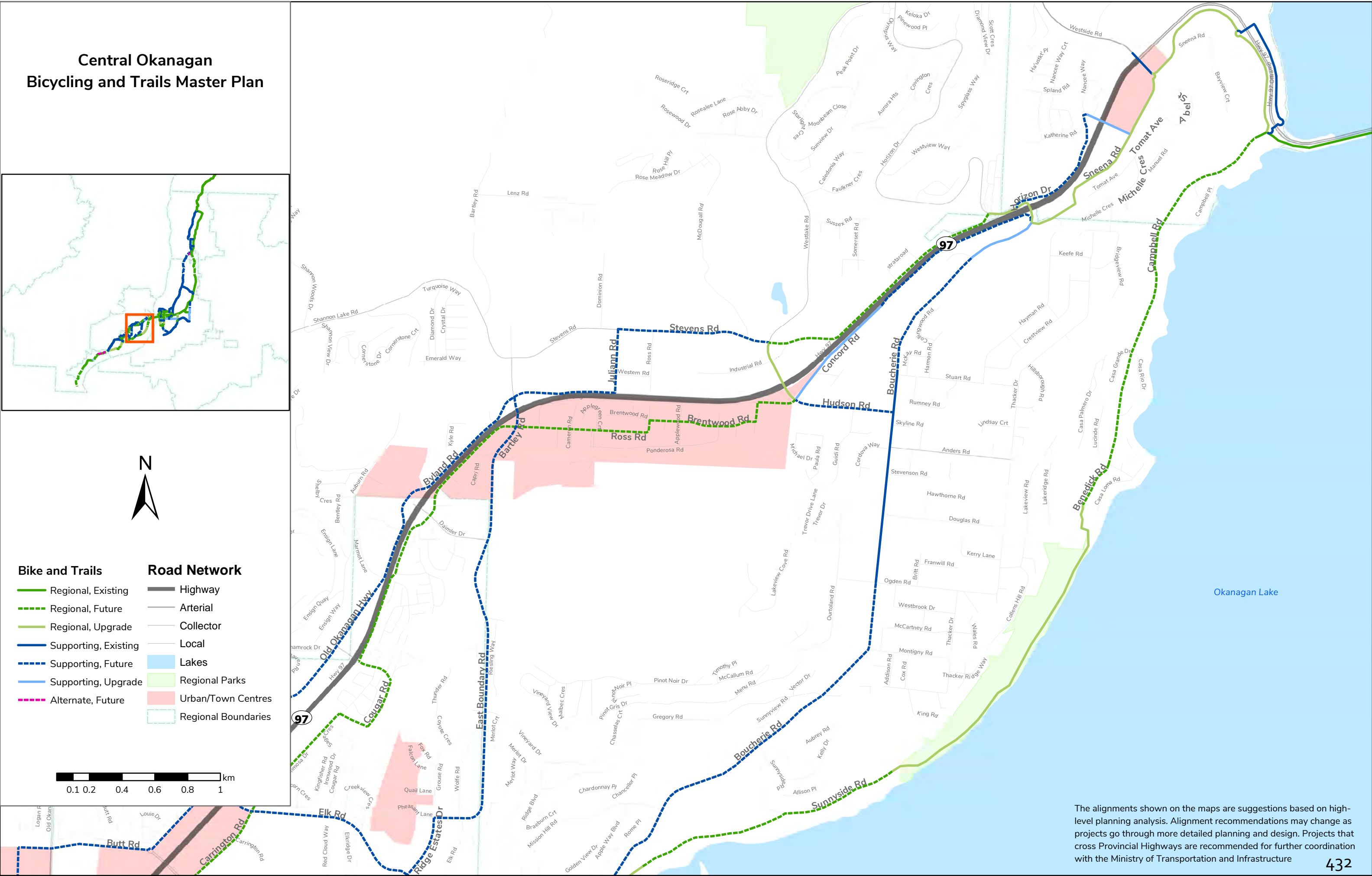
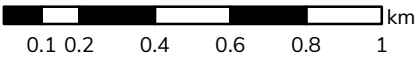
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Central Okanagan Bicycling and Trails Master Plan

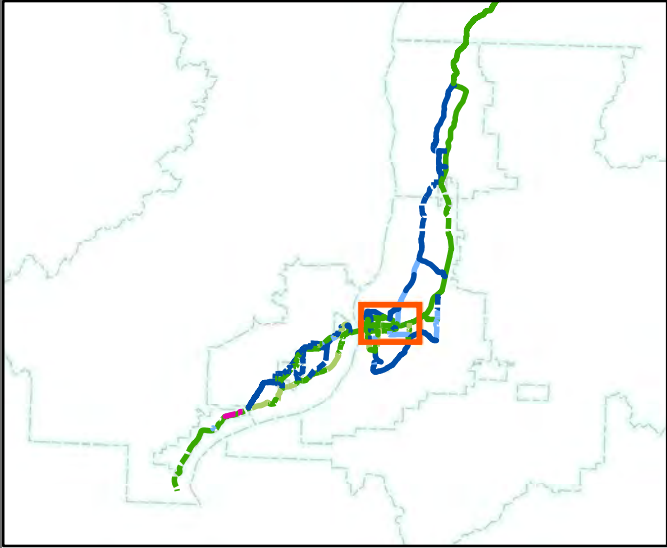


- Bike and Trails**
 - Regional, Existing
 - Regional, Future
 - Regional, Upgrade
 - Supporting, Existing
 - Supporting, Future
 - Supporting, Upgrade
 - Alternate, Future
- Road Network**
 - Highway
 - Arterial
 - Collector
 - Local
 - Lakes
 - Regional Parks
 - Urban/Town Centres
 - Regional Boundaries



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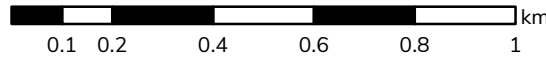
Central Okanagan Bicycling and Trails Master Plan



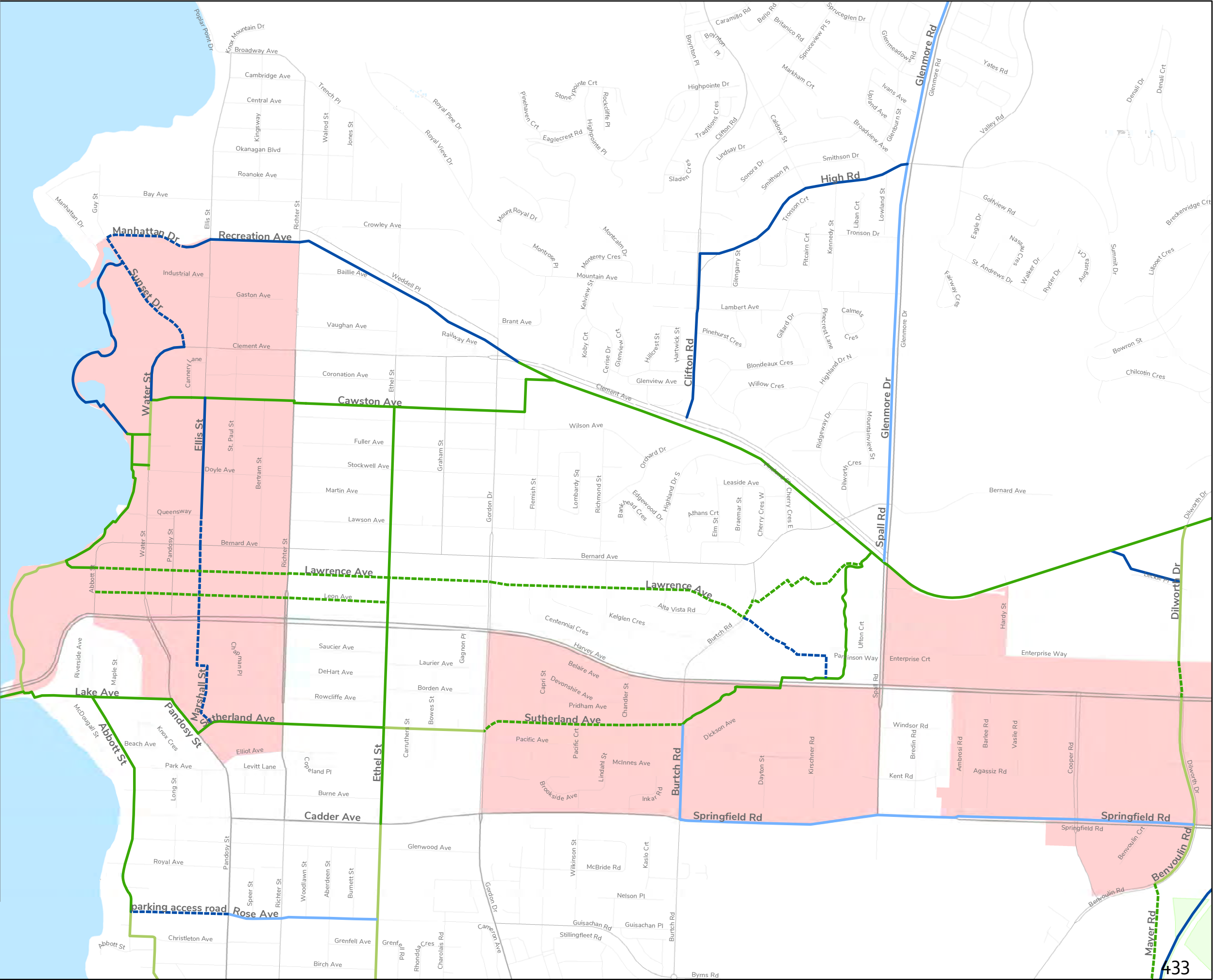
- Bike and Trails**

 - Regional, Existing
 - Regional, Future
 - Regional, Upgrade
 - Supporting, Existing
 - Supporting, Future
 - Supporting, Upgrade
 - Alternate, Future
- Road Network**

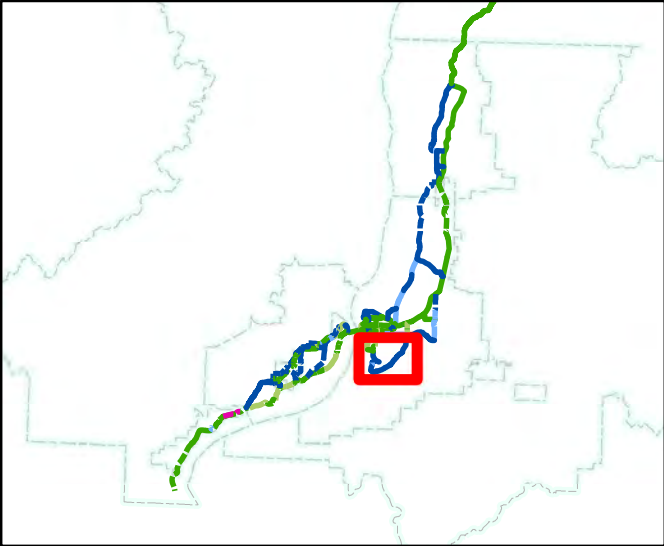
 - Highway
 - Arterial
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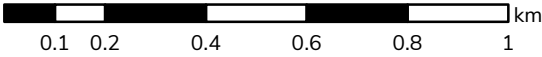
Central Okanagan Bicycling and Trails Master Plan



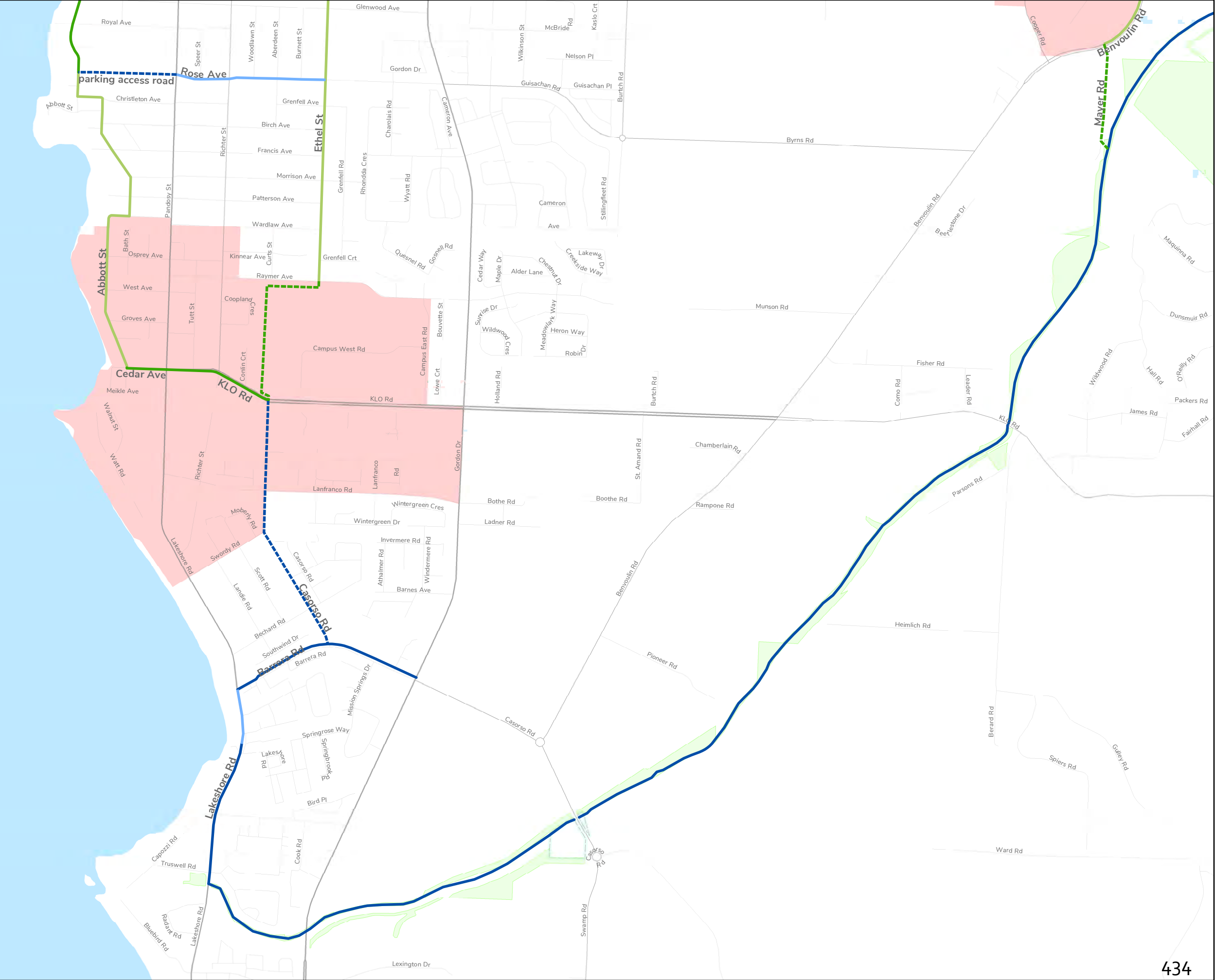
- Bike and Trails**

 - Regional, Existing
 - Regional, Future
 - Regional, Upgrade
 - Supporting, Existing
 - Supporting, Future
 - Supporting, Upgrade
 - Alternate, Future
- Road Network**

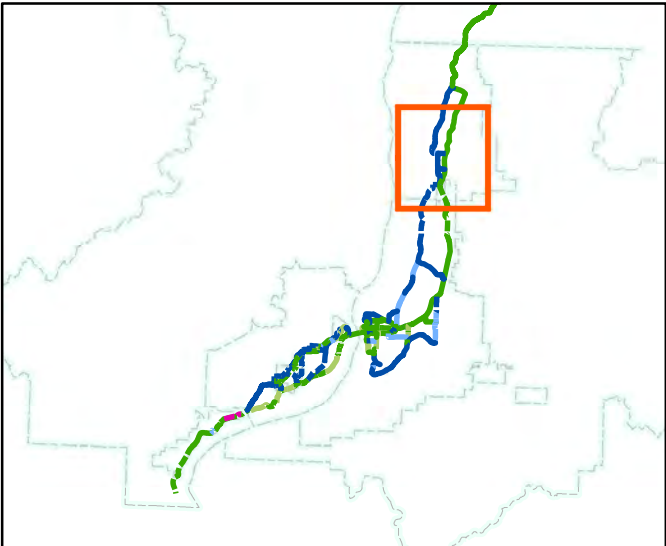
 - Highway
 - Arterial
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 - Local
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Central Okanagan
Bicycling and Trails Master Plan

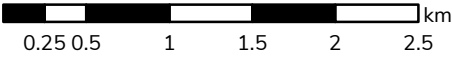


Bike and Trails

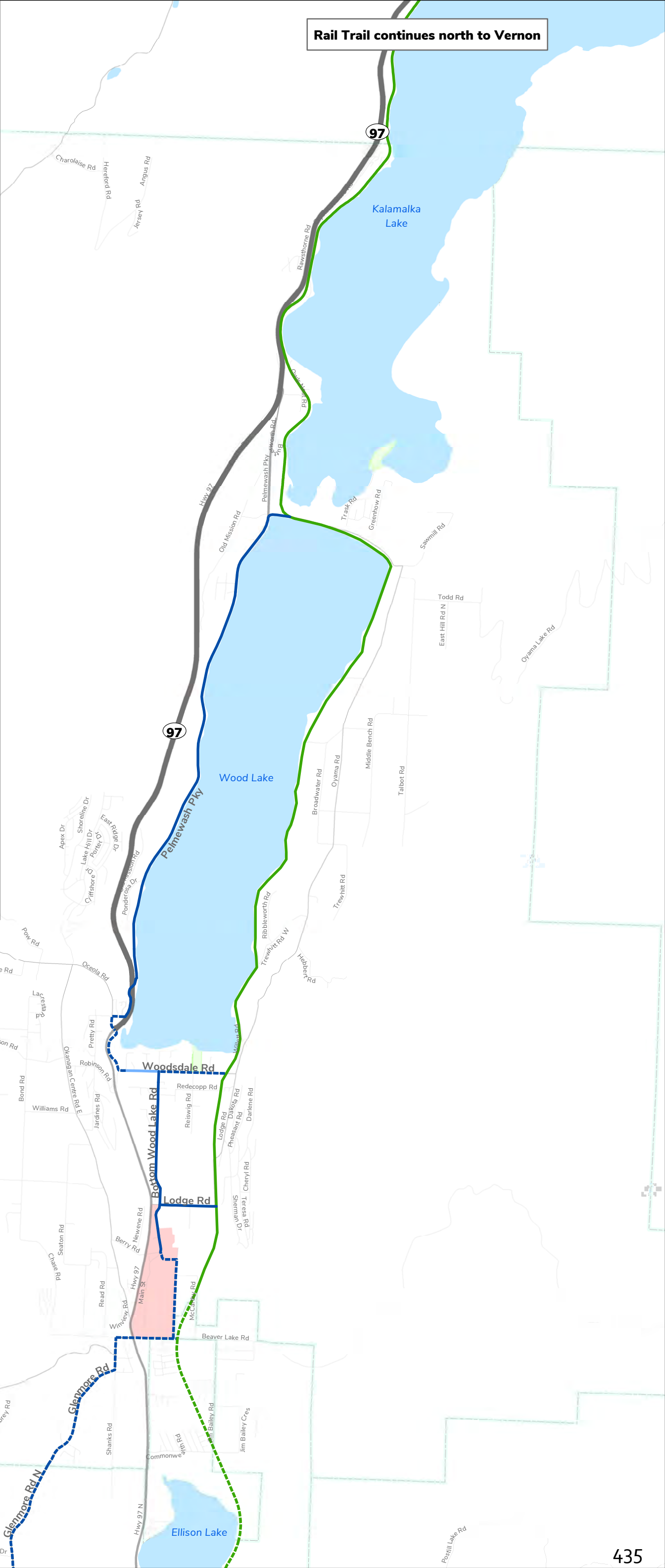
- Regional, Existing
- Regional, Future
- Regional, Upgrade
- Supporting, Existing
- Supporting, Future
- Supporting, Upgrade
- Alternate, Future

Road Network

- Highway
- Arterial
- Collector
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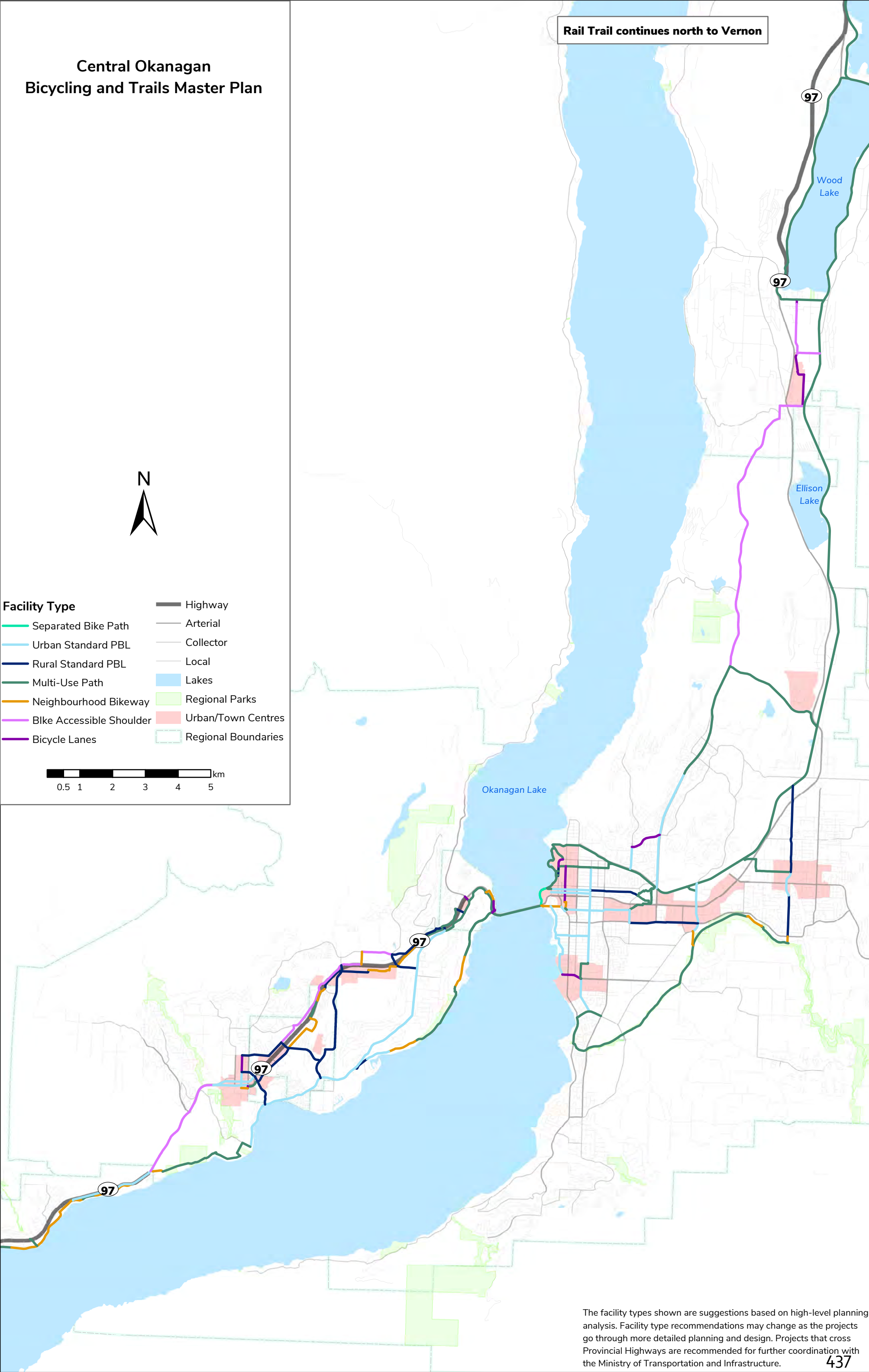
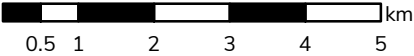
Appendix 2 – Regional Network by Facility Types

Central Okanagan
Bicycling and Trails Master Plan



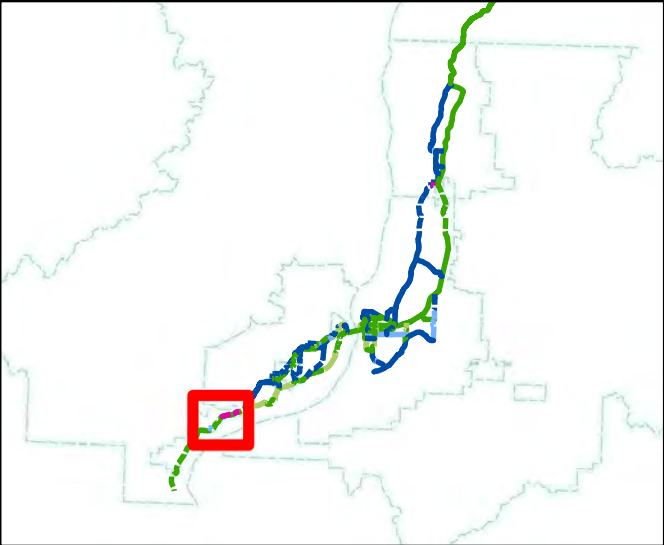
- Facility Type**

 - Separated Bike Path
 - Urban Standard PBL
 - Rural Standard PBL
 - Multi-Use Path
 - Neighbourhood Bikeway
 - Blke Accessible Shoulder
 - Bicycle Lanes
- Highway
 - Arterial
 - Collector
 - Local
 - Lakes
 - Regional Parks
 - Urban/Town Centres
 - Regional Boundaries

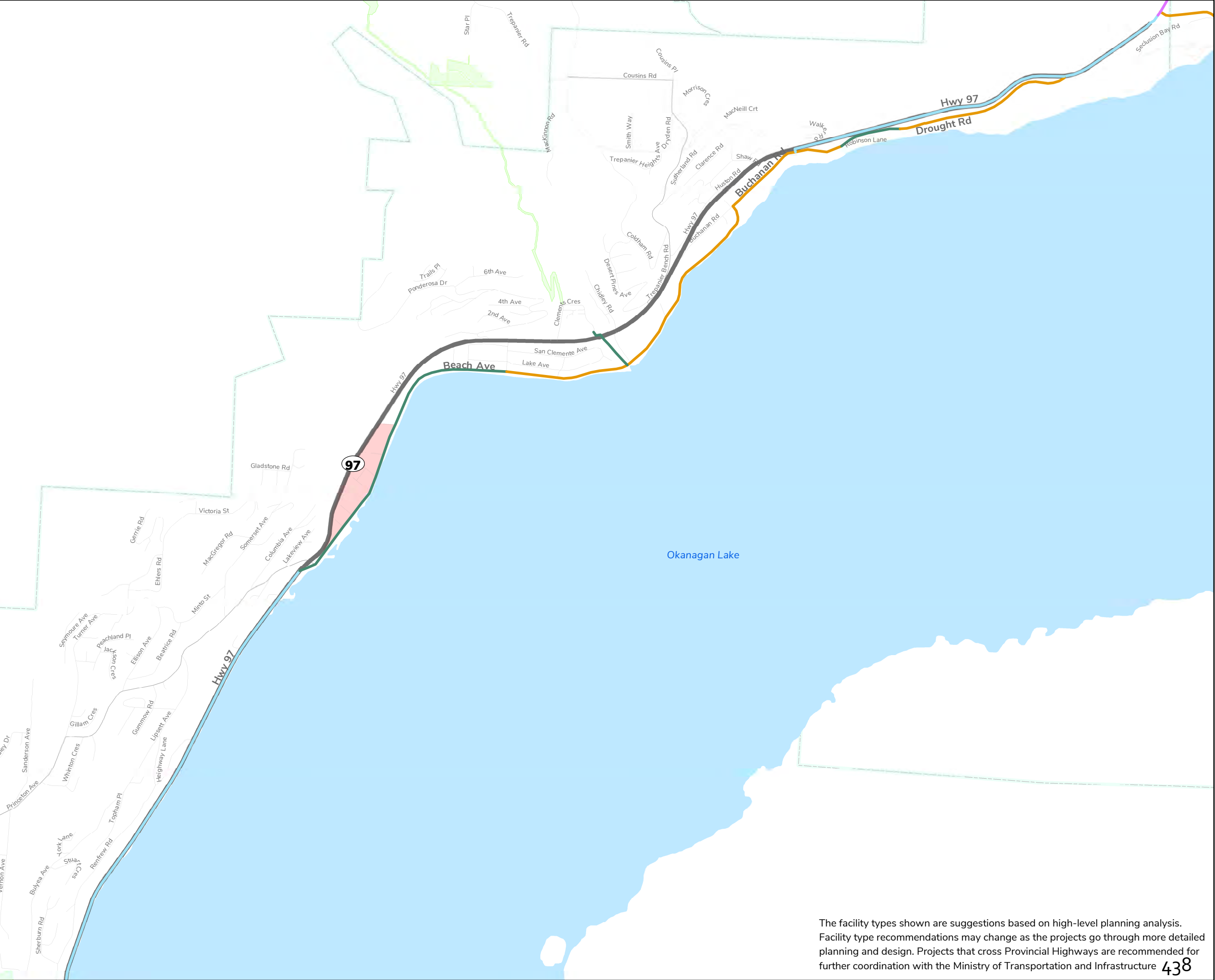
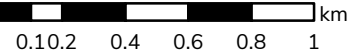


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Central Okanagan Bicycling and Trails Master Plan

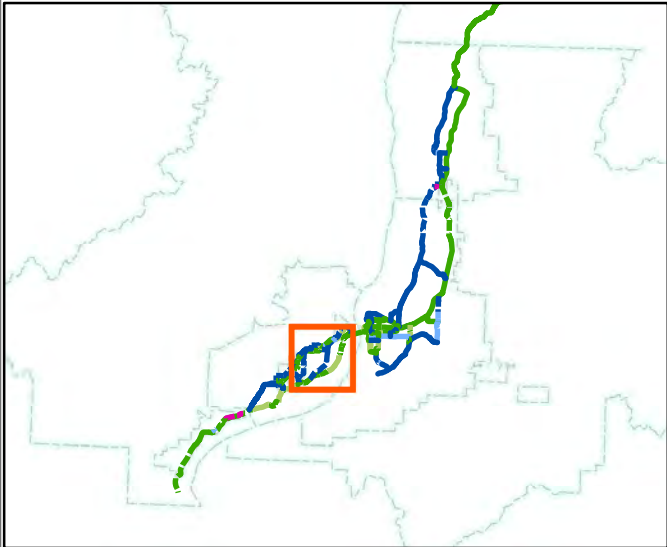


- Bike and Trails**
 - Separated Bike Path
 - Urban Standard PBL
 - Rural Standard PBL
 - Multi-Use Path
 - Neighbourhood Bikeway
 - Bike Accessible Shoulder
 - Bicycle Lanes
- Road Network**
 - Highway
 - Arterial
 - Collector
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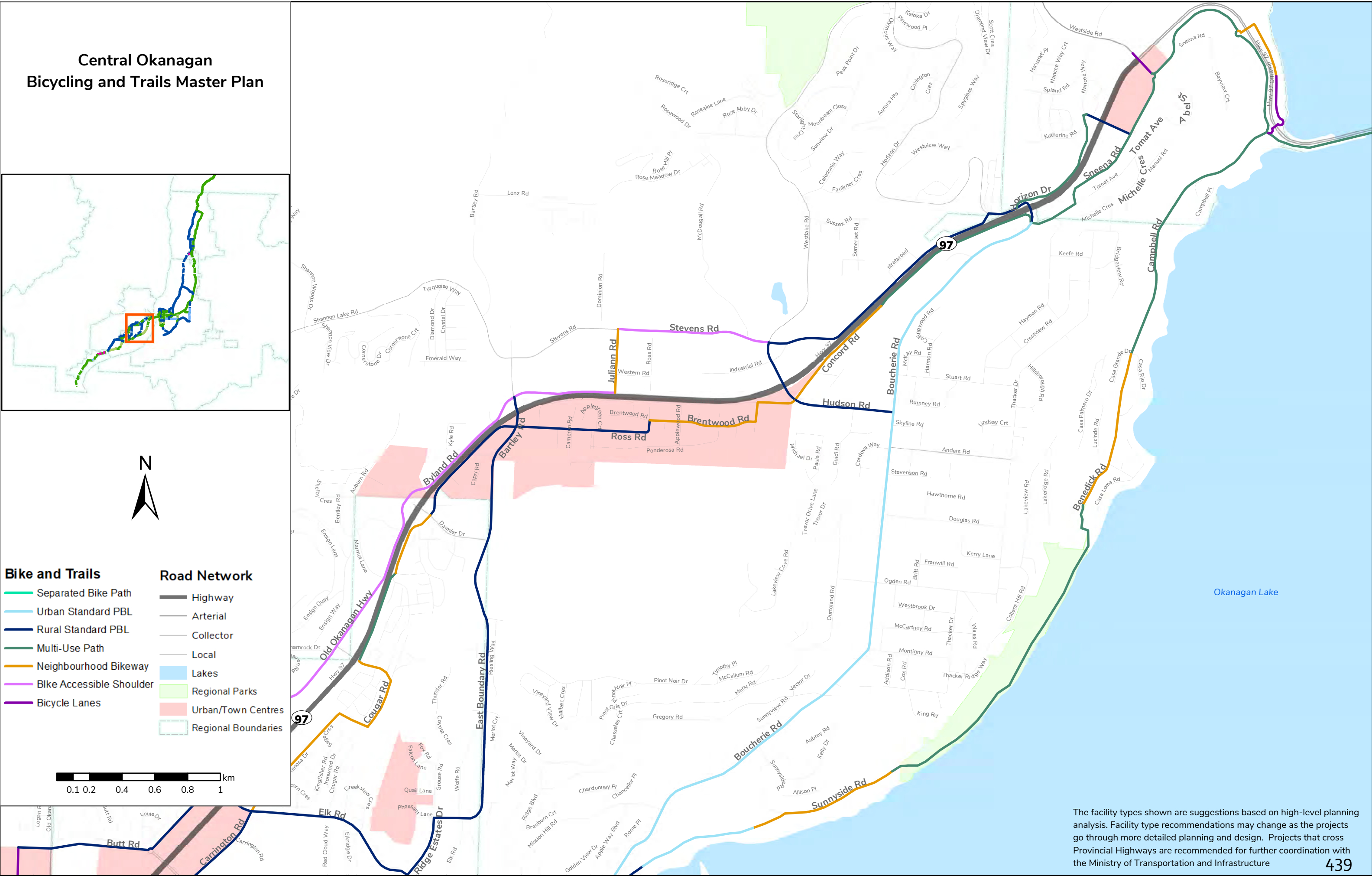
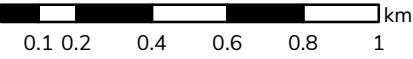


Bike and Trails

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- Urban Standard PBL
- Rural Standard PBL
- Multi-Use Path
- Neighbourhood Bikeway
- Bike Accessible Shoulder
- Bicycle Lanes

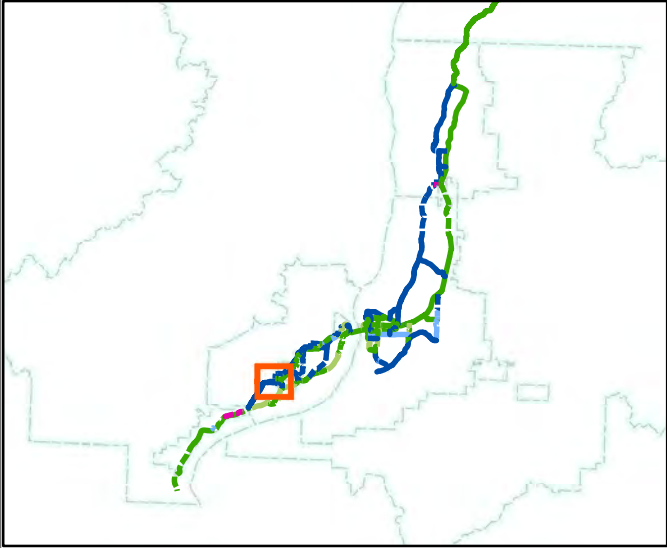
Road Network

- Highway
- Arterial
- Collector
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- Regional Boundaries



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Central Okanagan Bicycling and Trails Master Plan

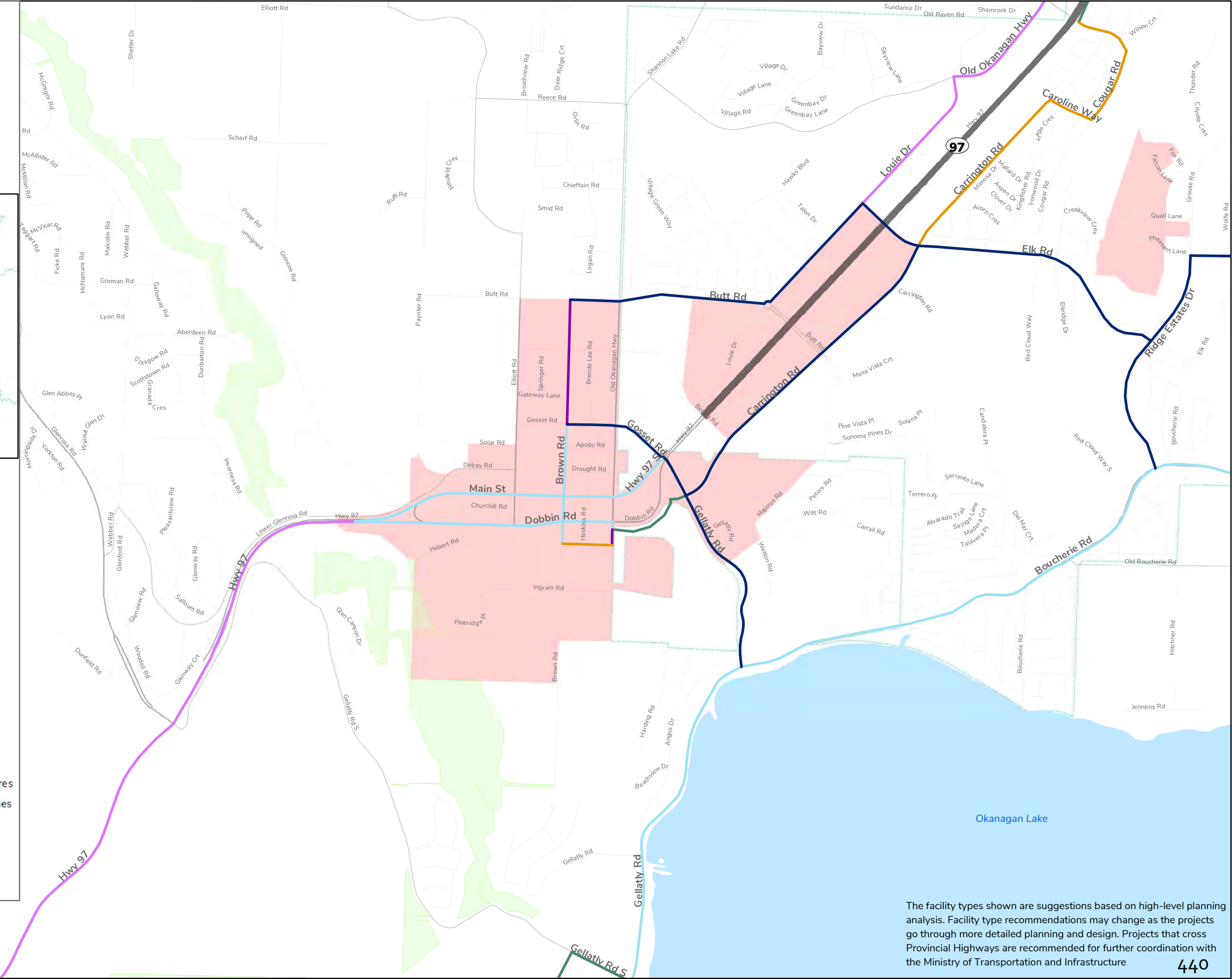
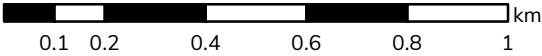


Bike and Trails

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- Urban Standard PBL
- Rural Standard PBL
- Multi-Use Path
- Neighbourhood Bikeway
- Bike Accessible Shoulder
- Bicycle Lanes

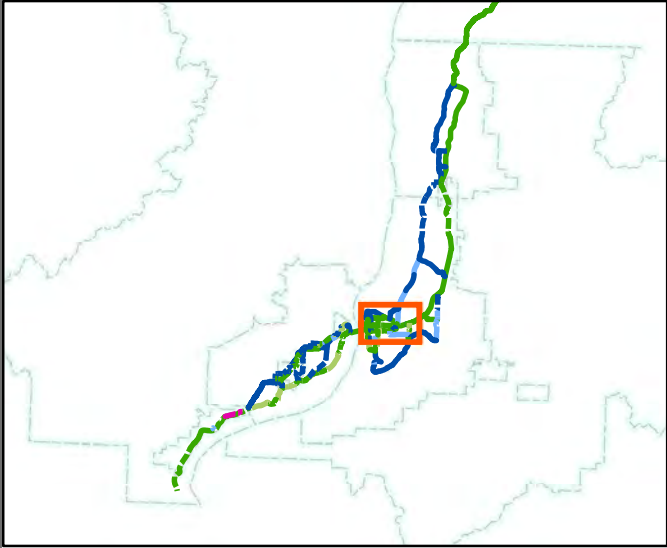
Road Network

- Highway
- Arterial
- Collector
- Local
- Lakes
- Regional Parks
- Urban/Town Centres
- Regional Boundaries

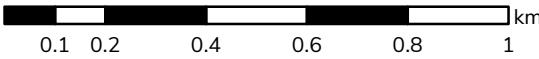


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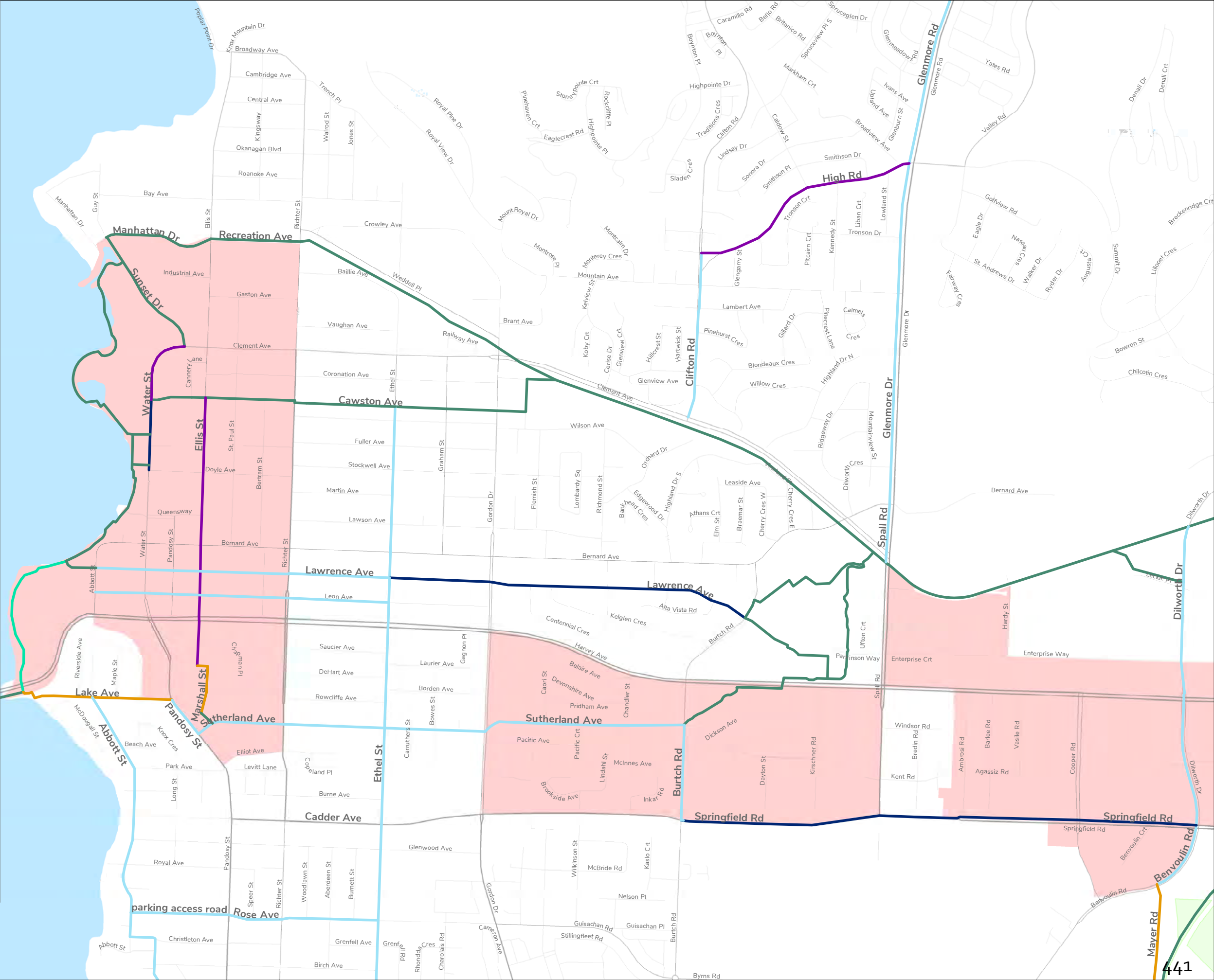
Central Okanagan Bicycling and Trails Master Plan



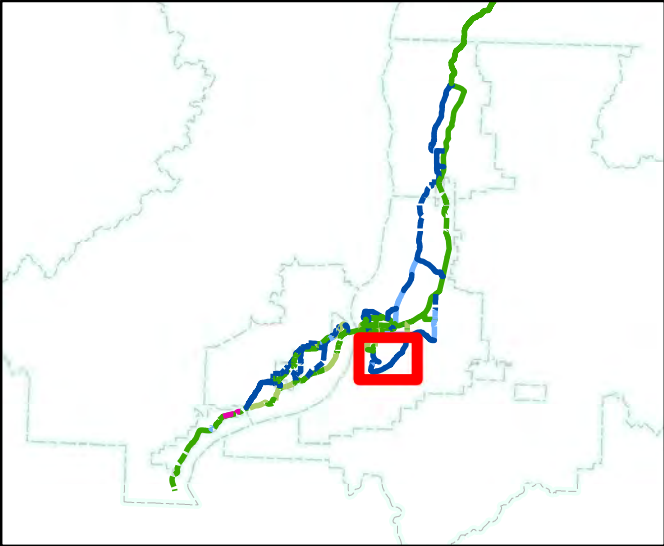
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Central Okanagan Bicycling and Trails Master Plan

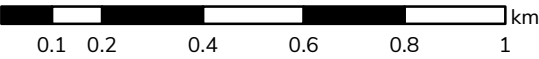


Bike and Trails

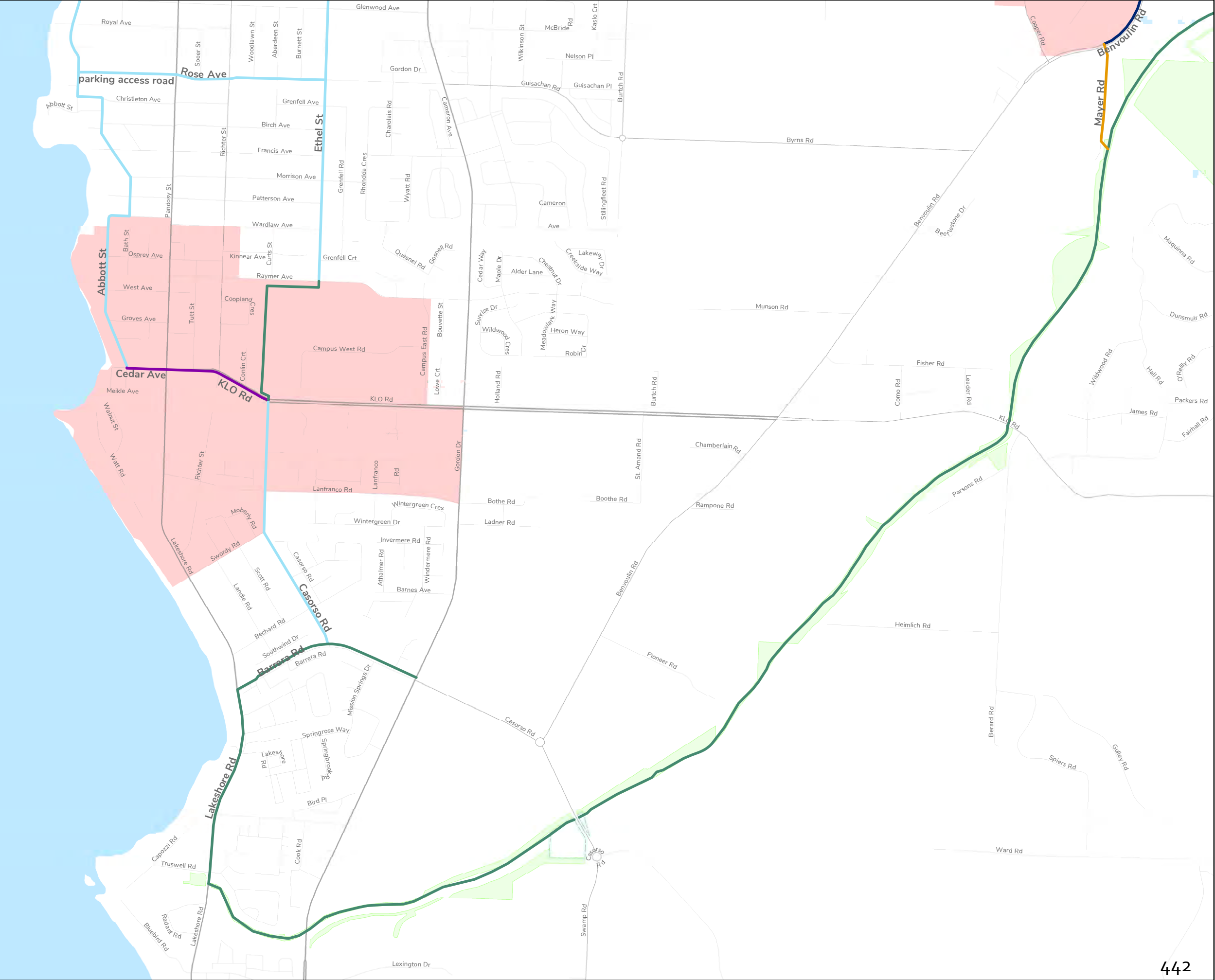
- Separated Bike Path
- Urban Standard PBL
- Rural Standard PBL
- Multi-Use Path
- Neighbourhood Bikeway
- Bike Accessible Shoulder
- Bicycle Lanes

Road Network

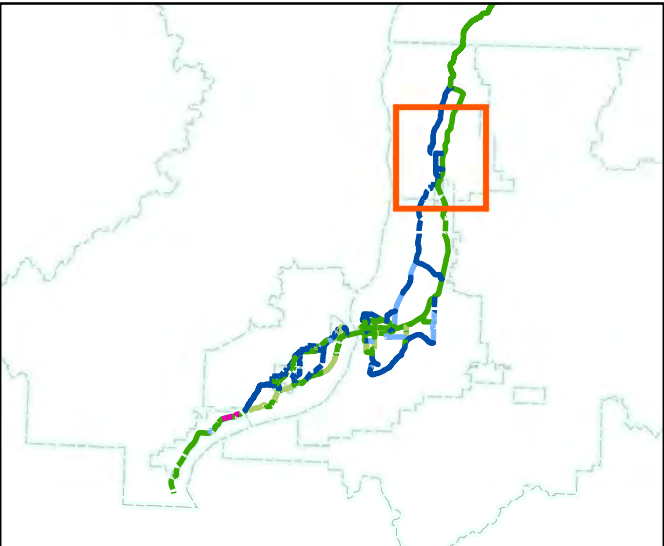
- Highway
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- Lakes
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- Urban/Town Centres
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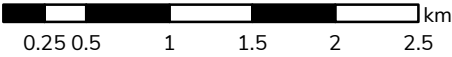


Bike and Trails

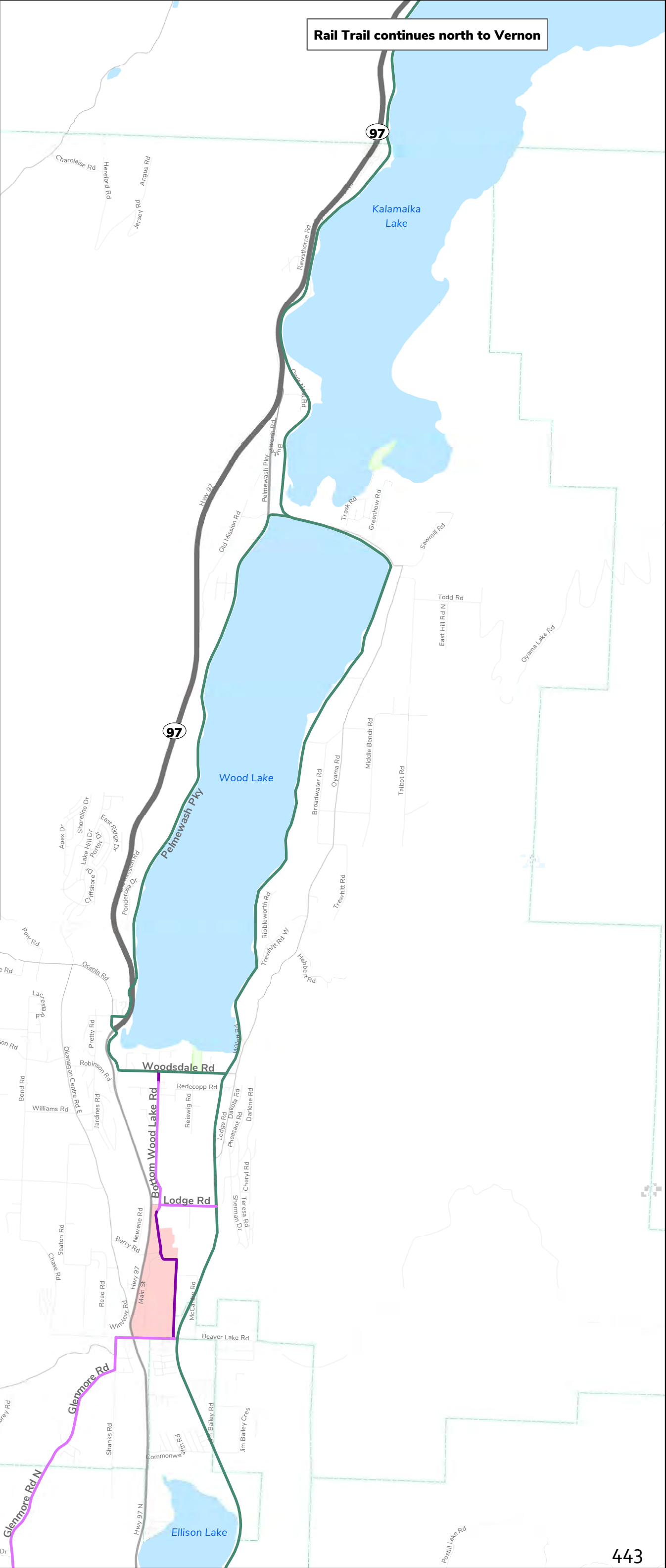
- Separated Bike Path
- Urban Standard PBL
- Rural Standard PBL
- Multi-Use Path
- Neighbourhood Bikeway
- Bike Accessible Shoulder
- Bicycle Lanes

Road Network

- Highway
- Arterial
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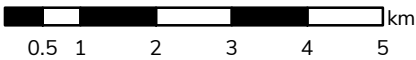


Appendix 3 – Regional Network by Phasing Recommendation

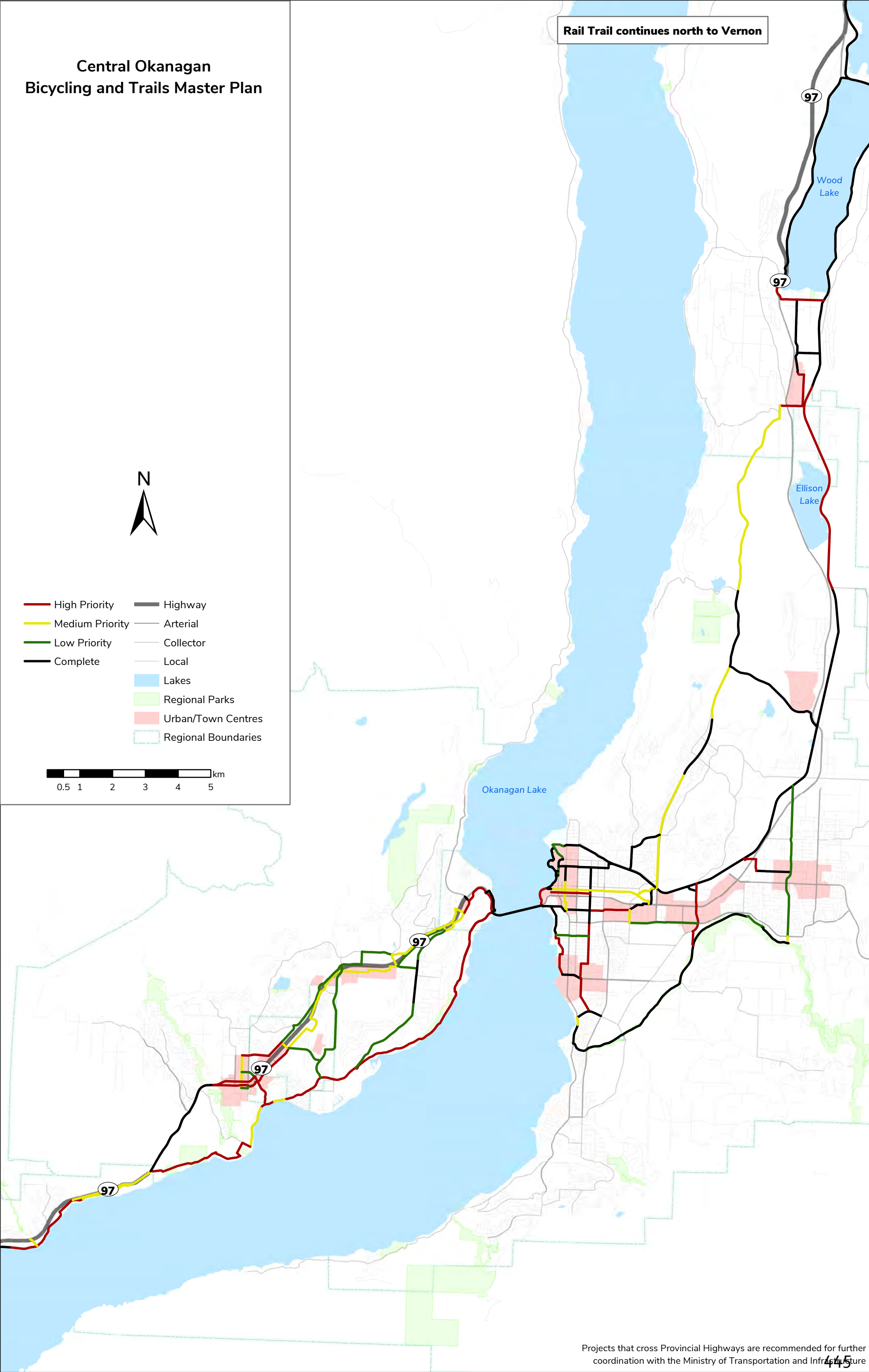
Central Okanagan
Bicycling and Trails Master Plan



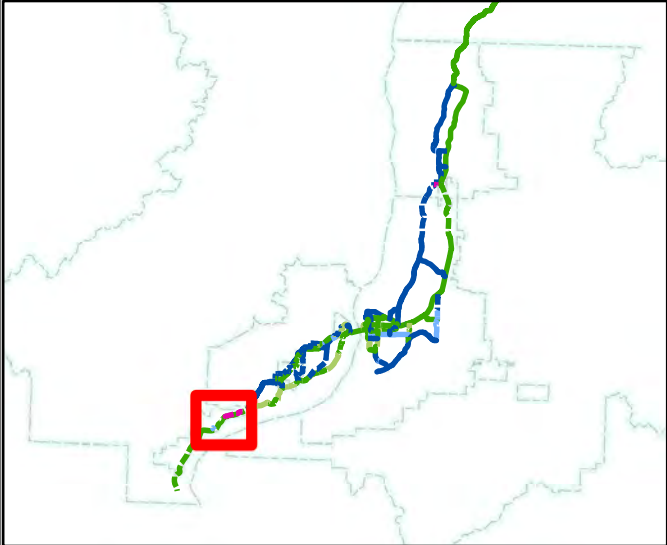
- | | |
|-----------------|---------------------|
| High Priority | Highway |
| Medium Priority | Arterial |
| Low Priority | Collector |
| Complete | Local |
| | Lakes |
| | Regional Parks |
| | Urban/Town Centres |
| | Regional Boundaries |



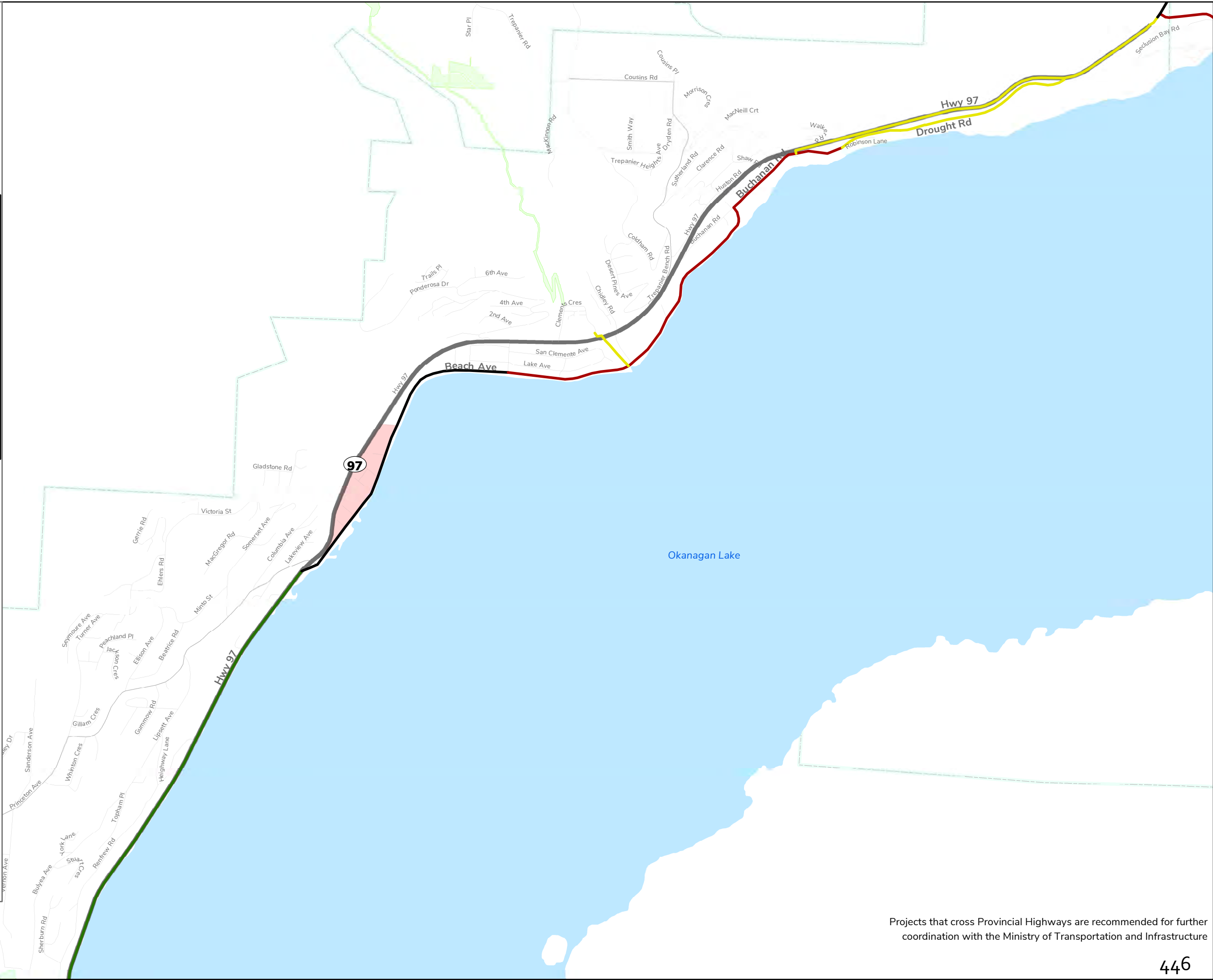
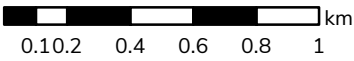
Rail Trail continues north to Vernon



Central Okanagan Bicycling and Trails Master Plan

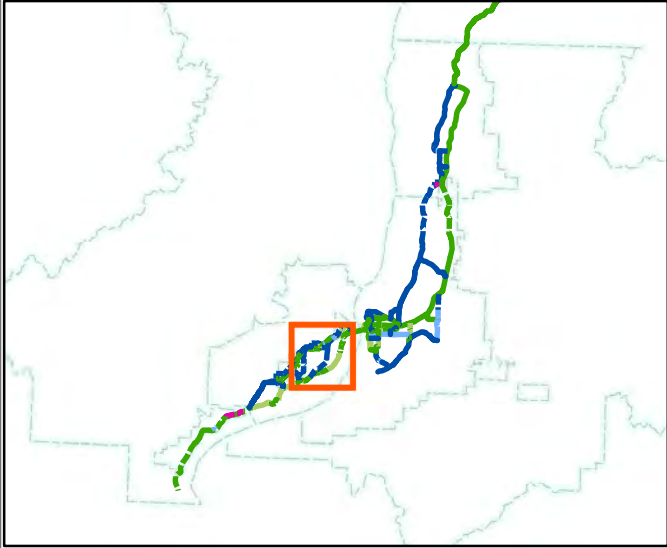


- Bike and Trails**
 - High Priority
 - Medium Priority
 - Low Priority
 - Complete
- Road Network**
 - Highway
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 - Collector
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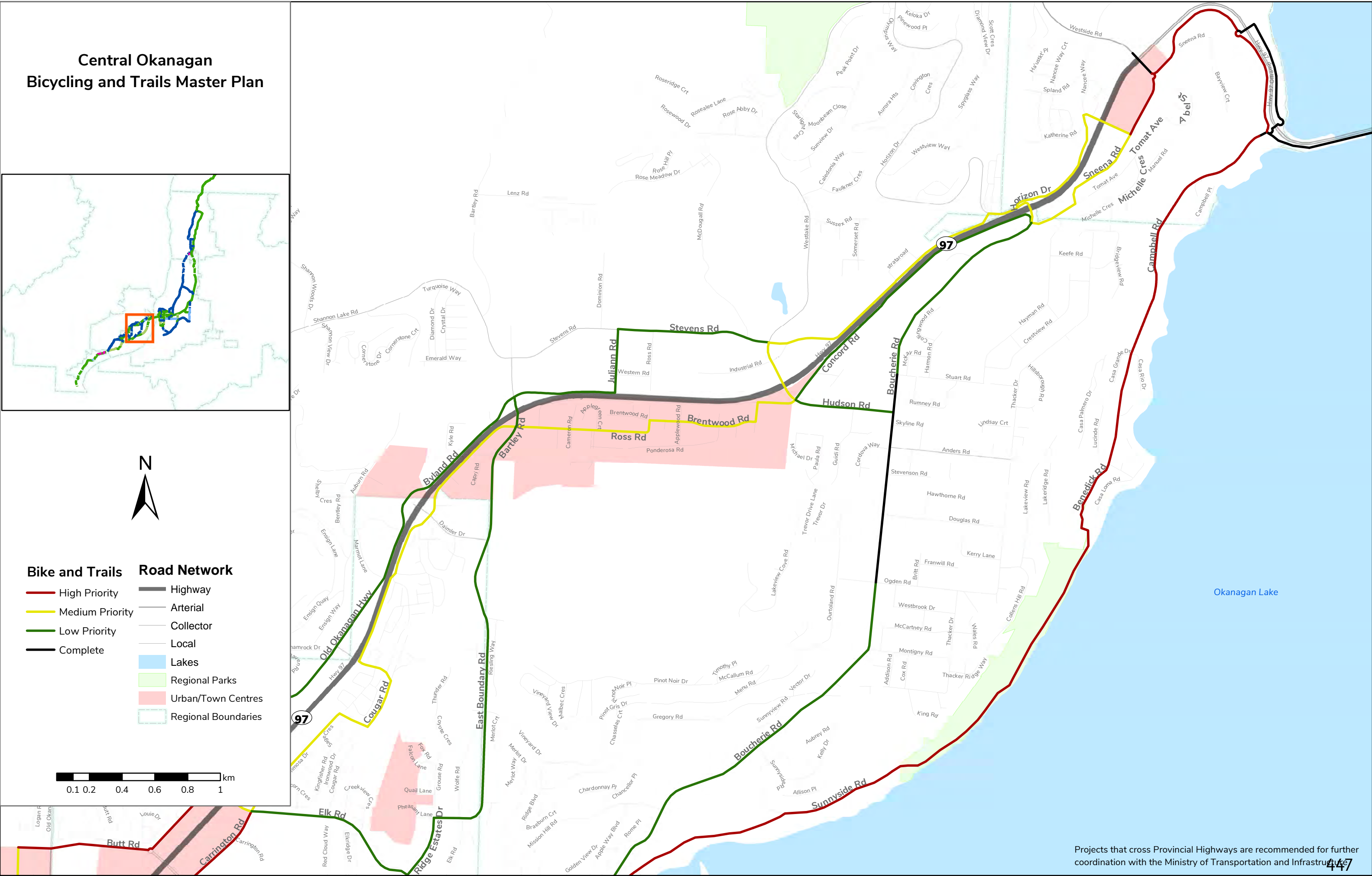
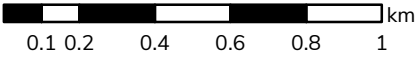
Central Okanagan Bicycling and Trails Master Plan



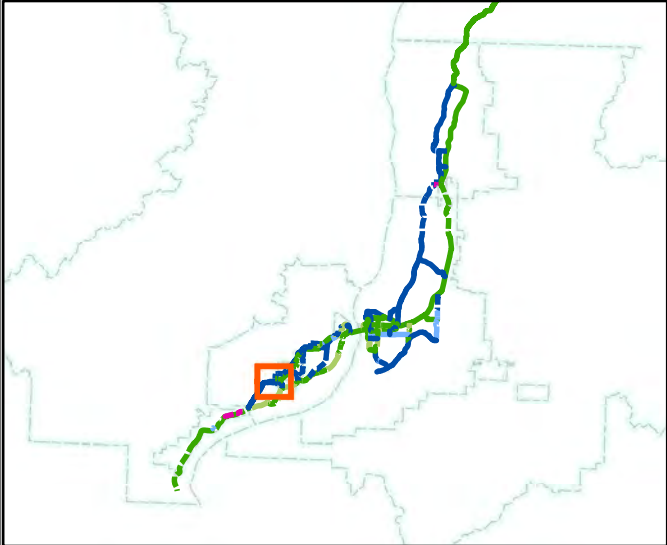
- Bike and Trails**

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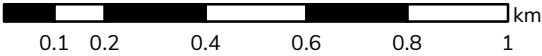
Central Okanagan Bicycling and Trails Master Plan



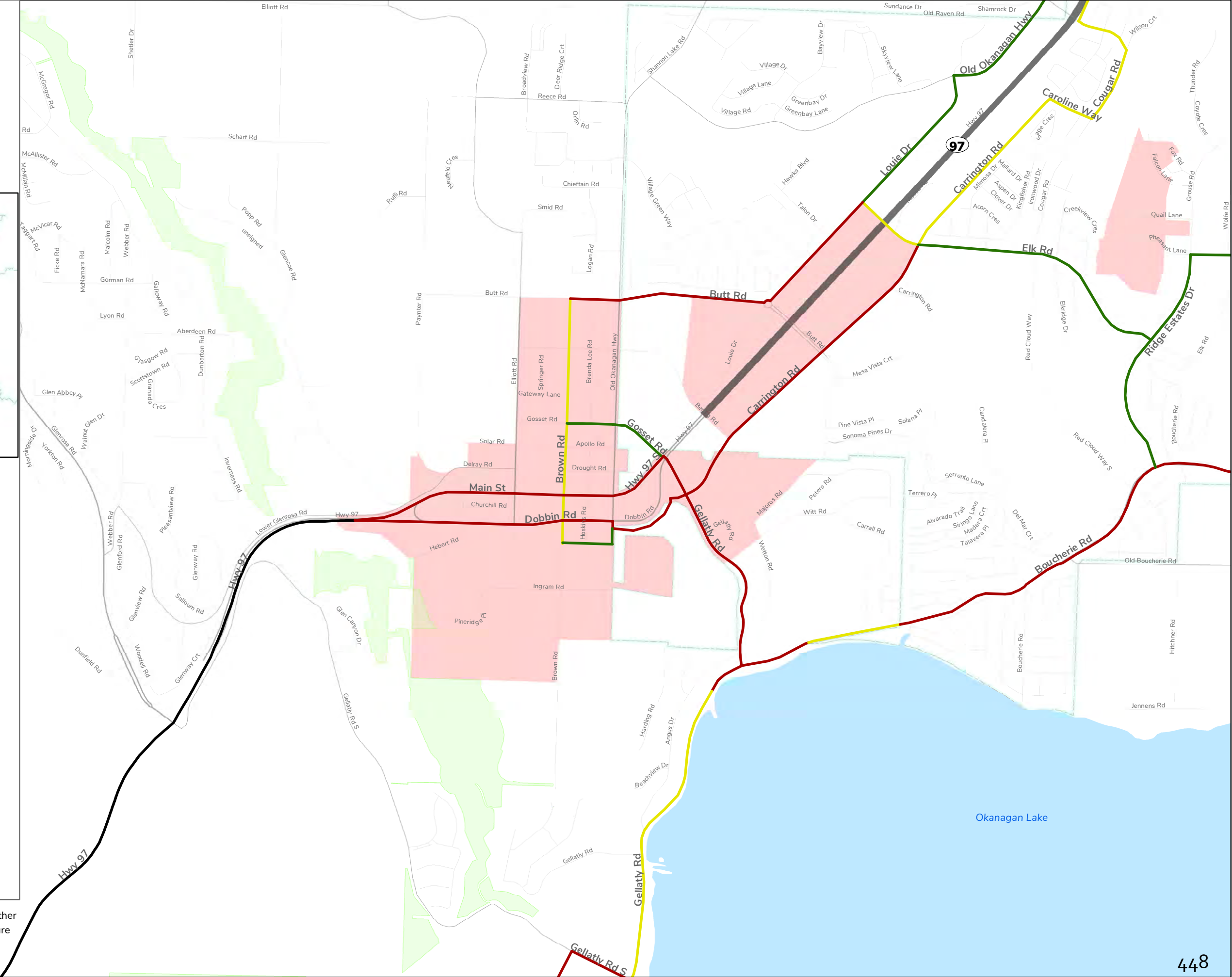
- Bike and Trails**

 - High Priority
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 - Low Priority
 - Complete
- Road Network**

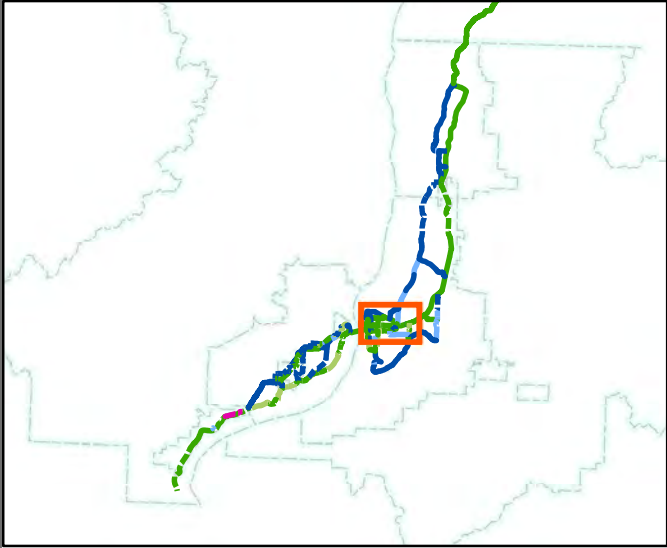
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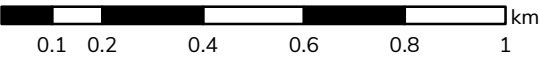


Bike and Trails

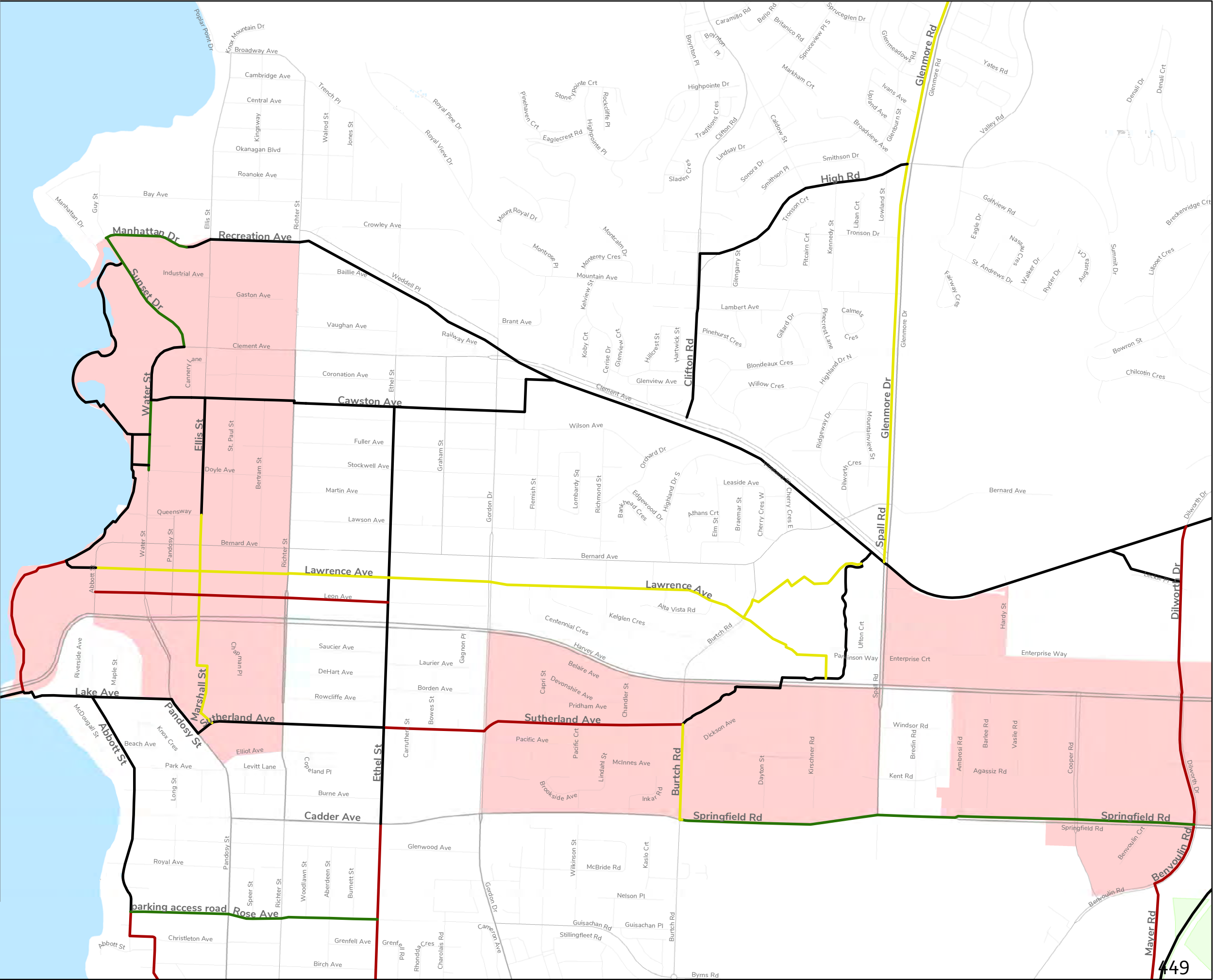
- High Priority
- Medium Priority
- Low Priority
- Complete

Road Network

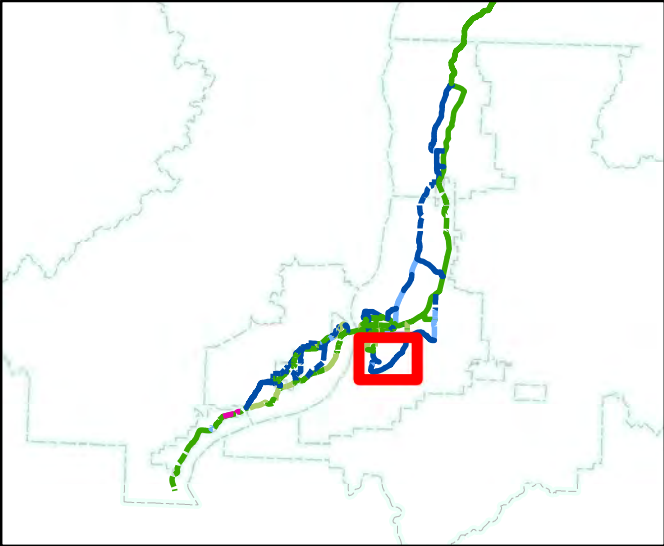
- Highway
- Arterial
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Central Okanagan Bicycling and Trails Master Plan



- Bike and Trails**

High Priority

Medium Priority

Low Priority

Complete
- Road Network**

Highway

Arterial

Collector

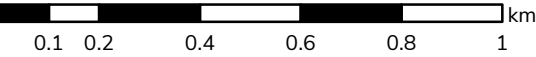
Local

Lakes

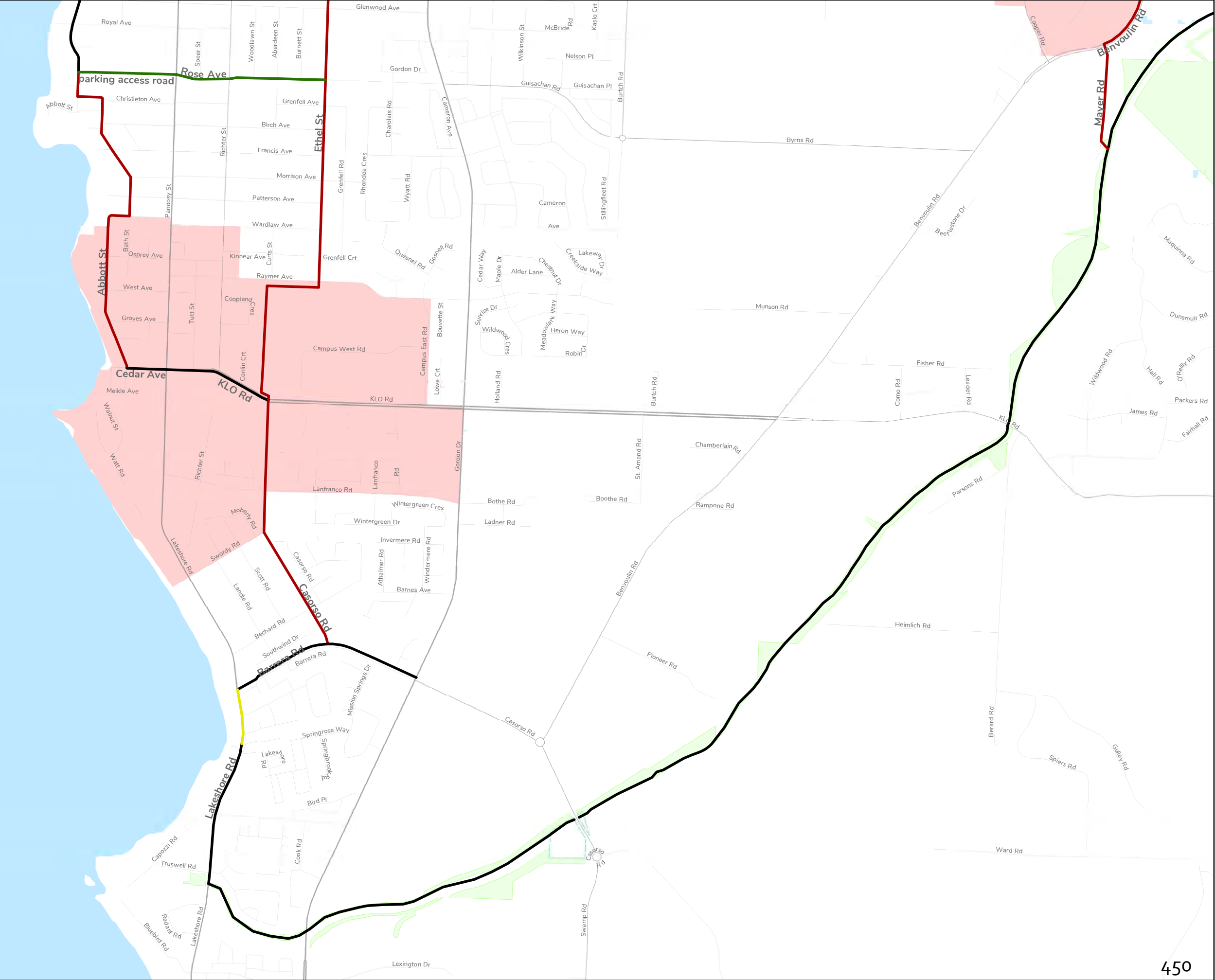
Regional Parks

Urban/Town Centres

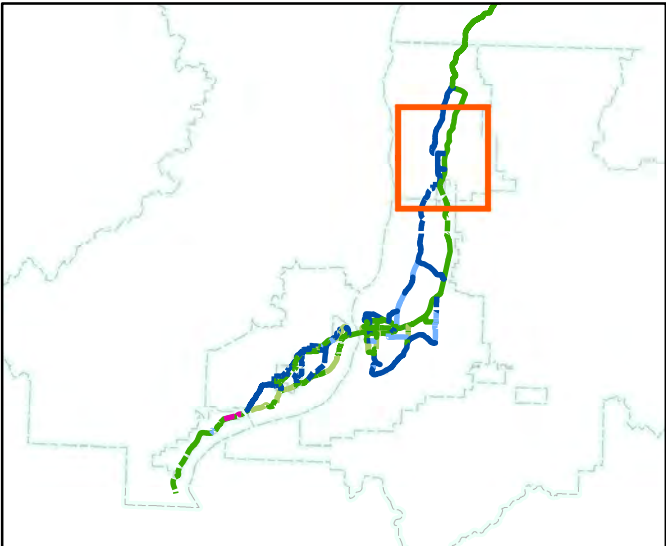
Regional Boundaries



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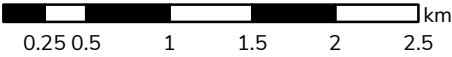
Central Okanagan
Bicycling and Trails Master Plan



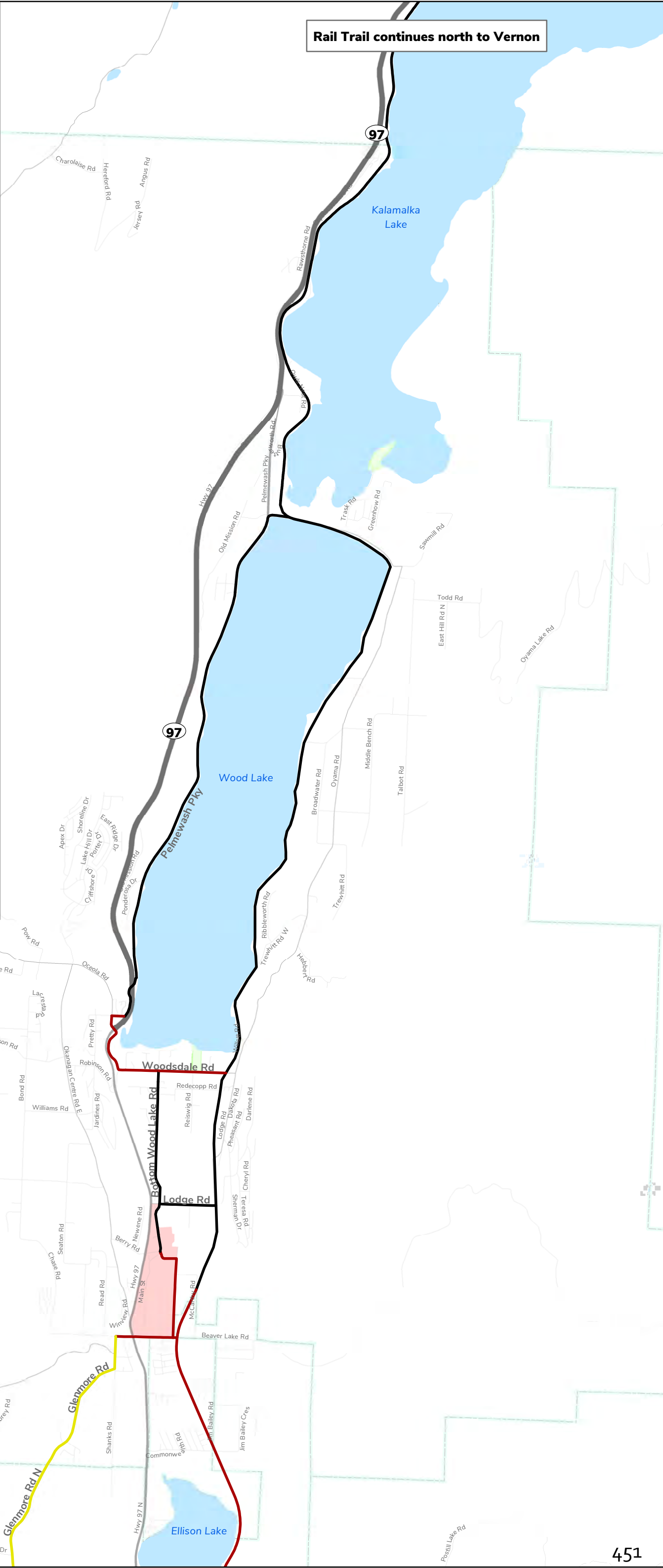
- Bike and Trails**

 - High Priority
 - Medium Priority
 - Low Priority
 - Complete
- Road Network**

 - Highway
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Appendix 4 – Regional Corridors by Jurisdiction and Cost Estimates

Projects	From	To	Length (m)	Spine	Type	Phase	Proposed Infrastructure	Unit Cost (\$/m)	Cost	Alt Cost Needed	Cost w Contingency (Rounded)	Notes
Peachland												
Hwy 97	Brent Rd	Beach Ave	5,694	Regional	Future	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 5,694,000		\$ 9,680,000	
Beach Ave	13th St	Buchanan Rd	2,123	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 53,075		\$ 90,000	
Buchanan Rd, Robinson Pl	Beach Ave	Robinson Lane	860	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 21,500		\$ 35,000	
Todd Rd underpass route (through	Beach Ave	Clements Cres	322	Supporting	Upgrade	Medium	Multi-Use Pathway	\$ 500	\$ 161,000	Yes	\$ 275,000	Upgrade lighting
Robinson Drought Trail	Robinson Pl	Drought Rd	407	Regional	Future	Medium	Multi-Use Pathway	\$ 500	\$ 203,500	Yes	\$ 345,000	
Drought Rd	RD Trail	Hwy 97	1,163	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 29,075		\$ 50,000	
Hwy 97	Buchanan Rd	Drought Rd	1,868	Alternate	Future	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,868,000		\$ 3,175,000	
Hwy 97	Drought Rd	Seclusion Bay Rd	741	Regional	Future	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 741,000		\$ 1,260,000	
Total			11,310						\$ 6,903,150		\$ 11,735,000	
West Kelowna - Southern / Westside Trail												
Seclusion Bay Rd	Hwy 97	Goats Peak Park	376	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 9,400		\$ 15,000	
Goats Peak Path	Seclusion Bay Rd	Witworth Rd	1,825	Regional	Upgrade	High	Multi-Use Pathway	\$ 500	\$ 912,500	Yes	\$ 1,550,000	Upgrade lighting and width
Witworth Rd	Goats Peak Path	George Crt	767	Regional	Future	High	Multi-Use Pathway	\$ 500	\$ 383,500		\$ 650,000	
Witworth Rd, Gellatly Rd S	George Crt	Cove Path	753	Regional	Future	High	Multi-Use Pathway	\$ 500	\$ 376,500		\$ 640,000	
Gellatly Rd	Cove Path / Gellatly Rd S	Gellatly Bay Park	1,276	Regional	Upgrade	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,276,000		\$ 2,170,000	Multi-Use Pathway unsuitable for volumes, consider dropping speed limit to 30km/h at waterfront
Gellatly Rd, Boucherie Rd	Gellatly Bay Park	WFN Public Beach	457	Regional	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 457,000		\$ 775,000	
Boucherie Rd	WFN Public Beach	End of WFN Public Beach	382	Regional	Upgrade	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 382,000		\$ 650,000	Separate users on path and widen
Boucherie Rd	Pritchard Dr N	Green Bay Rd	785	Regional	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 785,000		\$ 1,335,000	
Green Bay Rd	Boucherie Rd	Green Bay - Sunnysbrae Path	483	Regional	Upgrade	High	Rural Standard Protected Bike Lane	\$ 225	\$ 108,675		\$ 185,000	Add bollards
Green Bay - Sunnysbrae Path	Green Bay Rd	Sunnysbrae Rd	728	Regional	Future	High	Multi-Use Pathway	\$ 500	\$ 364,000		\$ 620,000	Through private land
Sunnysbrae Rd, Sunnyside Rd	Green Bay - Sunnysbrae Path	Kalmoir Park Path	931	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 23,275		\$ 40,000	
Kalmoir Park Pathway	Sunnyside Rd	Benedick Rd	2,180	Regional	Upgrade	High	Multi-Use Pathway	\$ 500	\$ 1,090,000		\$ 1,855,000	Upgrade lighting and width
Benedick Rd, Campbell Rd	Kalmoir Pathway	Lucinde Rd	298	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 7,450		\$ 15,000	ROW indicates around 20m of space, but does not seem that way at all
Campbell Rd	Lucinde Rd	Casa Grande Rd	690	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 17,250		\$ 30,000	
Campbell Rd	Casa Grande Rd	IR # 10 Boundary	837	Regional	Future	High	Multi-Use Pathway and Bike Lanes	\$ 525	\$ 439,425		\$ 745,000	
Total			12,768						\$ 6,631,975		\$ 11,275,000	
West Kelowna - North												
Dobbin Rd	Hwy 97	Old Okanagan Hwy	1,083	Supporting	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,083,000		\$ 1,840,000	
Main St	Gellatly Rd	Hwy 97	1,344	Supporting	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,344,000		\$ 2,285,000	Tighten lanes, consider rework of parking lanes
Gellatly Rd	Hwy 97/Gosset Rd	Carrington Rd	186	Regional	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 41,850		\$ 70,000	
Gellatly Rd	Carrington Rd	Boucherie Rd	789	Supporting	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 177,525		\$ 300,000	
Brown Rd	Gosset Rd	Last Rd	493	Regional	Future	Medium	Bike Path	\$ 1,000	\$ 493,000		\$ 840,000	
Last Rd	Brown Rd	Old Okanagan Hwy	204	Supporting	Future	Low	Neighbourhood Bikeway	\$ 25	\$ 5,100		\$ 10,000	
Brown Rd	Gosset Rd	Butt Rd	509	Supporting	Future	Medium	Bike Lanes / Bike Accessible Shoulder	\$ 25	\$ 12,725		\$ 20,000	
Butt Rd	Brown Rd	Old Okanagan Hwy	202	Supporting	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 45,450		\$ 75,000	
Byland Rd	Daimler Dr	Juliann Rd	1,548	Supporting	Future	Low	Bike Accessible Shoulder	\$ 25	\$ 38,700		\$ 65,000	
Juliann Rd	Byland Rd	Stevens Rd	389	Supporting	Future	Low	Neighbourhood St Bikeway	\$ 25	\$ 9,725		\$ 15,000	
Stevens Rd	Juliann Rd	Westlake Rd	933	Supporting	Future	Low	Bike Accessible Shoulder	\$ 25	\$ 23,325		\$ 40,000	
Stevens Rd	Westlake Rd	Marshall Rd	924	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 207,900		\$ 355,000	
Stevens Rd Extension	Marshall Rd	Horizon Dr Interchange	714	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 160,650		\$ 275,000	
Horizon Dr Interchange	Stevens Rd Extension	Boucherie Rd	380	Regional	Upgrade	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 85,500		\$ 145,000	
Old Okanagan Hwy	Last Rd	Park Cut Through	64	Supporting	Future	Low	Bike Lanes	\$ 25	\$ 1,600		\$ 5,000	
Carrington Rd	Gellatly Rd	WFN Boundary	233	Regional	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 52,425	Yes	\$ 90,000	
Ross Rd	Daimler Dr	Bartley Rd	803	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 180,675		\$ 305,000	
Ross Rd	Bartley Rd	Brentwood Rd	880	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 198,000		\$ 335,000	
Brentwood Rd	Ross Rd	Alhambra Dr	655	Regional	Future	Medium	Neighbourhood Bikeway	\$ 50	\$ 32,750		\$ 55,000	Additional level of calming needed along Brentwood
Alhambra Dr, Hudson Rd	Brentwood Rd	Hudson Rd	354	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 8,850		\$ 15,000	
Concord Rd	Hudson Rd	End of Concord Rd	780	Supporting	Upgrade	Low	Neighbourhood Bikeway	\$ 5	\$ 3,900		\$ 5,000	
Hwy 97 ROW	Concord Rd	Hayman Rd	1,135	Supporting	Future	Low	Multi-Use Pathway	\$ 500	\$ 567,500		\$ 965,000	
Bartley Rd, East Boundary Rd	Byland Rd	Ridge Estates Dr	2,906	Supporting	Future	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 653,850		\$ 1,110,000	
Hudson Rd	Westlake Rd/Concord Rd	Boucherie Rd	606	Supporting	Future	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 136,350		\$ 230,000	
Boucherie Rd	Horizon Dr	Prosperpine Rd	433	Supporting	Upgrade	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 433,000		\$ 735,000	
Boucherie Rd	Prosperpine Rd	Stuart Rd	876	Supporting	Future	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 876,000	Yes	\$ 1,490,000	Add Bike Lanes to both sides
Boucherie Rd	Ogden Rd	Green Bay Rd	2,807	Supporting	Future	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 2,807,000		\$ 4,770,000	
Gosset Rd	Brown Rd	Old Okanagan Hwy	198	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 44,550		\$ 75,000	
Westlake Rd	Stevens Rd	Concord Rd	399	Regional	Upgrade	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 89,775		\$ 155,000	
Total			22,827						\$ 9,814,675		\$ 16,685,000	
Total for West Kelowna			35,595									
Westbank First Nation												
Boucherie Rd	End of WFN Public Beach	Old Boucherie Rd	727	Regional	Upgrade	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 727,000		\$ 1,235,000	
Boucherie Rd	Old Boucherie Rd	Pritchard Dr N	997	Regional	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 997,000		\$ 1,695,000	
Campbell Rd	IR # 10 Boundary	WR Bennent Bridge	820	Regional	Future	High	Multi-Use Pathway and Bike Lanes	\$ 525	\$ 430,500		\$ 730,000	
Carrington Rd	WFN Boundary	Elk Rd	1,180	Regional	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 265,500		\$ 450,000	
Butt Rd	Old Okanagan Hwy	Louie Dr	596	Supporting	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 134,100		\$ 230,000	
Louie Dr	Butt Rd	Elk Rd	582	Supporting	Future	High	Rural Standard Protected Bike Lane	\$ 225	\$ 130,950		\$ 225,000	
Louie Dr	Elk Rd	Old Okanagan Hwy	668	Supporting	Future	Low	Bike Accessible Shoulder	\$ 25	\$ 16,700		\$ 30,000	
Old Okanagan Hwy	Louie Dr	Byland Rd / Daimler Dr	1,537	Supporting	Future	Low	Bike Accessible Shoulder	\$ 25	\$ 38,425		\$ 65,000	
Carrington Rd	Elk Rd	Caroline Way	804	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 20,100		\$ 35,000	
Caroline Way	Carrington Rd	Cougar Rd	189	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 4,725		\$ 10,000	
Cougar Rd	Caroline Way	Grizzly Rd	319	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 7,975		\$ 15,000	
Grizzly Rd	Cougar Rd	Hwy 97	241	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 6,025		\$ 10,000	
Hwy 97 ROW	Grizzly Rd	Cougar Rd	586	Regional	Future	Medium	Multi-Use Pathway	\$ 500	\$ 293,000		\$ 500,000	
Cougar Rd, Ross Rd	Hwy 97 ROW Path	Daimler Dr	433	Regional	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 10,825		\$ 20,000	
Ridge Estates	Elk Rd	East Boundary Rd	396	Supporting	Future	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 89,100		\$ 150,000	
Ridge Estates	Elk Rd	Boucherie Rd	584	Supporting	Future	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 131,400		\$ 225,000	
Gosset Rd	Old Okanagan Hwy	Hwy 97	246	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 55,350		\$ 95,000	
Park Cut Through, Carrington Crt	Old Okanagan Hwy	Carrington Rd/Gellatly Rd	372	Supporting	Future	Low	Multi-Use Pathway	\$ 500	\$ 186,000		\$ 315,000	
Elk Rd	Ridge Estates Dr	Carrington Rd	1,107	Supporting	Future	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 249,075		\$ 425,000	

Projects	From	To	Length (m)	Spine	Type	Phase	Proposed Infrastructure	Unit Cost (\$/m)	Cost	Alt Cost Needed	Cost w Contingency (Rounded)	Notes
Elk Rd	Louie Dr	Carrington Rd	291	Supporting	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 65,475		\$ 110,000	
Nancee Way Multi-Use Pathway	Horizon Dr	Nancee Way	823	Supporting	Future	Medium	Multi-Use Pathway	\$ 500	\$ 411,500		\$ 700,000	
Nancee Way	Nancee Way Multi-Use Pathway	Sneena Rd	291	Supporting	Upgrade	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 65,475		\$ 110,000	
Hayman Rd, Sneena Rd	Boucherie Rd	Nancee Way	882	Regional	Upgrade	Medium	Multi-Use Pathway	\$ 500	\$ 441,000		\$ 750,000	Add Multi-Use Pathway, keep bike lanes
Sneena Rd	Nancee Way	Campbell Rd	1,927	Regional	Upgrade	High	Multi-Use Pathway	\$ 500	\$ 963,500		\$ 1,640,000	Add Multi-Use Pathway, keep bike lanes
Total			16,598						\$ 5,740,700		\$ 9,760,000	
Kelowna West, North of Hwy 97 / Harvey Avenue												
Water St	Doyle Ave	Cawston Ave	287	Regional	Upgrade	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 64,575		\$ 110,000	
City Park Path	WRB Bridge	Lawrence Ave	686	Regional	Upgrade	High	Separated Bicycle and Pedestrian Pathways	\$ 1,000	\$ 686,000		\$ 1,165,000	Note changing and unstable conditions along waterfront that may affect future cost estimates
Lawrence Ave	Abbott St	Ethel St	1,200	Regional	Future	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,200,000		\$ 2,040,000	South side better for safety purposes, but would remove more parking as currently constructed
Lawrence Ave	Ethel St	Burtch Rd	1,480	Regional	Future	Medium	Rural Standard Protected Bike Lane	\$ 225	\$ 333,000		\$ 565,000	
Leon Ave	Abbott St	Ethel St	1,198	Regional	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,198,000		\$ 2,035,000	
Burtch Rd	Lawrence Ave	Parkinson Multi-Use Pathway	83	Regional	Future	Medium	Multi-Use Pathway	\$ 500	\$ 41,500		\$ 70,000	
Parkinson Multi-Use Pathway N	Burtch Rd	Rail Trail Connection	546	Regional	Future	Medium	Multi-Use Pathway	\$ 500	\$ 273,000		\$ 465,000	
Parkinson Multi-Use Pathway S	Lawrence Ave	Harvey Overpass	485	Supporting	Future	Medium	Multi-Use Pathway	\$ 500	\$ 242,500		\$ 410,000	
Ellis St	Queensway/Bus Loop	Harvey Ave	430	Supporting	Future	High	Bike Lanes	\$ 25	\$ 10,750		\$ 20,000	
Dilworth Dr	Enterprise Way	Rail Trail	553	Regional	Upgrade	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 553,000	Yes	\$ 940,000	
Dilworth Dr	Harvey Ave	Enterprise Way	150	Regional	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 150,000	Yes	\$ 255,000	
Manhattan Dr, Sunset Dr	W of Ellis St	Water St	900	Supporting	Future	Low	Multi-Use Pathway	\$ 500	\$ 450,000		\$ 765,000	
Total			7,998						\$ 5,202,325		\$ 8,845,000	
Kelowna West, South of Hwy 97 / Havey Avenue												
Ellis St	Harvey Ave	Buckland Ave	183	Supporting	Future	Medium	Bike Lanes	\$ 25	\$ 4,575		\$ 10,000	
Buckland Ave, Marshall St	Ellis St	Sutherland Cut-Through	239	Supporting	Future	Medium	Neighbourhood Bikeway	\$ 25	\$ 5,975		\$ 10,000	
Sutherland Cut-Through	Marshall St	Sutherland Ave	63	Supporting	Future	Medium	Multi-Use Pathway	\$ 500	\$ 31,500	Yes	\$ 55,000	Bridge over stream
Sutherland Ave	Ethel St	Gordon Dr	408	Regional	Upgrade	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 408,000		\$ 695,000	
Sutherland Ave	Gordon Dr	Burtch Rd	828	Regional	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 828,000		\$ 1,410,000	
Rose Ave	Pandosy St	Ethel St	610	Supporting	Upgrade	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 610,000		\$ 1,035,000	
Hospital Cut Through	Abbott St	Rose Ave/Pandosy St	401	Supporting	Future	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 401,000	Yes	\$ 680,000	
Benvoulin Rd, Dilworth Dr	Mayer Rd	Harvey Ave	831	Regional	Upgrade	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 831,000	Yes	\$ 1,415,000	
Mayer Rd	Mission Creek Greenway	Benvoulin Rd	442	Regional	Future	High	Neighbourhood Bikeway	\$ 25	\$ 11,050		\$ 20,000	
Ethel St	Springfield Rd	Raymer Ave	1,214	Regional	Upgrade	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,214,000		\$ 2,065,000	
Kelowna Wastewater Treatment Path	Ethel St/Raymer Ave	KLO Rd/Casorso Rd	721	Regional	Future	High	Multi-Use Pathway	\$ 500	\$ 360,500		\$ 615,000	
Casorso Rd	KLO Rd	Barrera Rd	1,067	Supporting	Future	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,067,000		\$ 1,815,000	
Lakeshore Rd	Barrera Rd	S end of Rotary Beach Park	224	Supporting	Upgrade	Medium	Multi-Use Pathway	\$ 500	\$ 112,000		\$ 190,000	
Abbott St	Rose Ave	Cedar Ave	1,439	Regional	Upgrade	High	Urban Standard Protected Bike Lane	\$ 1,000	\$ 1,439,000		\$ 2,445,000	
Springfield Rd	Burtch Rd	Dilworth Dr	2,107	Supporting	Upgrade	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 474,075	Yes	\$ 805,000	
Burtch Rd	Sutherland Ave	Springfield Rd	410	Supporting	Upgrade	Medium	Urban Standard Protected Bike Lane	\$ 1,000	\$ 410,000		\$ 695,000	
Total			11,187						\$ 8,207,675		\$ 13,955,000	
Kelowna East and North												
Lester Rd	Houghton Rd	Leathead Rd	361	Regional	Future	High	Multi-Use Pathway	\$ 500	\$ 180,500		\$ 305,000	
Leathead Rd, Enterprise Way	Lester Rd	Rail Trail	406	Regional	Future	High	Multi-Use Pathway	\$ 500	\$ 203,000	Yes	\$ 345,000	
Hollywood Rd S	Springfield Rd	Mission Creek Greenway	177	Supporting	Future	Low	Neighbourhood Bikeway	\$ 25	\$ 4,425		\$ 10,000	
Hollywood Rd	Springfield Rd	Argyll Rd	1,259	Supporting	Upgrade	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 283,275		\$ 480,000	
Hollywood Rd	Argyll Rd	Houghton Rd	772	Supporting	Upgrade	Low	Urban Standard Protected Bike Lane	\$ 1,000	\$ 772,000		\$ 1,310,000	
Hollywood Rd	Houghton Rd	McCurdy Rd	1,006	Supporting	Upgrade	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 226,350		\$ 385,000	
Hollywood Rd Extension	McCurdy Rd	Rail Trail	1,645	Supporting	Future	Low	Rural Standard Protected Bike Lane	\$ 225	\$ 370,125		\$ 630,000	
Rail Trail	Old Vernon Rd	Duck Lake IR Boundary	3,251	Regional	Future	High	Continue Rail Trail	\$ 500	\$ 1,625,500		\$ 2,765,000	
Glenmore Rd N	Kelowna Boundary	McKinley Rd	4,353	Supporting	Future	Medium	Continue Bike Accessible Shoulder	\$ 25	\$ 108,825		\$ 185,000	
Glenmore Rd N	John Hindle Dr	Scenic Rd	1,758	Supporting	Upgrade	Medium	Multi-Use Pathway	\$ 500	\$ 879,000		\$ 1,495,000	
Glenmore Dr	Dallas Rd	Clement Ave	3,660	Supporting	Upgrade	Medium	Multi-Use Pathway	\$ 500	\$ 1,830,000		\$ 3,110,000	
Rail Trail	Beaver Lake Rd	McCarthy Road	632	Regional	Future	High	Continue Rail Trail	\$ 500	\$ 316,000		\$ 535,000	
Creekside Rd	Graham Rd	Gertsmar Rd	553	Supporting	Future	Low	Neighbourhood Bikeway	\$ 25	\$ 13,825		\$ 25,000	
Total			19,833						\$ 6,812,825		\$ 11,580,000	
Total for Kelowna			39,018									
OKIB Duck Lake IR 7												
Rail Trail	Duck Lake IR Boundary (south)	McCarthy Road	2,605	Regional	Future	High	Continue Rail Trail	\$ 500	\$ 1,302,500		\$ 2,215,000	
Lake Country												
Bottom Wood Lake Rd	Beaver Lake Rd	Berry Rd	1,224	Supporting	Future	High	Bike Lanes / Bike Accessible Shoulder	\$ 25	\$ 30,600		\$ 50,000	
Woodsdale Rd	Bottom Wood Lake Rd	Rail Trail	822	Supporting	Future	High	Multi-Use Pathway	\$ 500	\$ 411,000		\$ 700,000	
Woodsdale Rd	Bottom Wood Lake Rd	Seymour Rd	403	Supporting	Upgrade	High	Multi-Use Pathway	\$ 500	\$ 201,500		\$ 345,000	
Woodsdale Rd	Hwy 97	Seymour Rd	651	Supporting	Future	High	Multi-Use Pathway	\$ 500	\$ 325,500		\$ 555,000	
Oceola Rd, Petty Rd	Woodsdale Rd	Pelmewash Pky Onramp Multi-Use Pathway	332	Supporting	Future	High	Multi-Use Pathway	\$ 500	\$ 166,000		\$ 280,000	
Glenmore Rd	Kelowna Boundary	Seaton Rd	1,892	Supporting	Future	Medium	Bike Lanes / Bike Accessible Shoulder	\$ 25	\$ 47,300		\$ 80,000	
Beaver Lake Rd, Glenmore Rd	Glenmore Rd/Seaton Rd	Rail Trail	749	Supporting	Future	High	Bike Lanes / Bike Accessible Shoulder	\$ 25	\$ 18,725		\$ 30,000	Limited right of way on eastern edge (~8m)
Total			6,073						\$ 1,200,625		\$ 2,040,000	
							Regional Total		\$ 51,816,450	\$ -	\$ 88,090,000	

Summary			
New	81,285	\$	57,945,000
Upgraded	29,914	\$	30,145,000
Total	111,199	\$	88,090,000
Regional	58,647	\$	55,110,000
Supporting	52,552	\$	32,980,000
Total	111,199	\$	88,090,000





Sustainable Transportation Partnership of the Central Okanagan (STPCO)

Regional Disruptive Mobility Strategy

Helping Central Okanagan Governments Prepare for Transportation Technology Change

Technology will disrupt how we move around the region. Are you ready?

November 2020



Contents

About the Regional Disruptive Mobility Strategy	3
Purpose of the Disruptive Mobility Strategy	3
Transportation, Technology and our Changing Future	4
Connected	6
Self-driving	6
Shared	6
Electric	7
Vision and Goals	8
Glossary of Terms	9
2040 Outlook: Potential Future Challenges and Opportunities	12
Tactical Actions	15
2. Tactical Actions: Self-Driving	21
3. Tactical Actions: Shared	27
4. Tactical Actions: Electric	33
5. Tactical Actions: Funding and Growth	35
Phasing Strategy	38
Next Steps	39
Photo References	40
Endnotes	40

About the Regional Disruptive Mobility Strategy

The Regional Disruptive Mobility Strategy has been developed by the Sustainable Transportation Partnership for the Central Okanagan (STPCO), a partnership between the City of Kelowna, the City of West Kelowna, Districts of Peachland and Lake Country, Westbank First Nation and the Regional District of Central Okanagan.

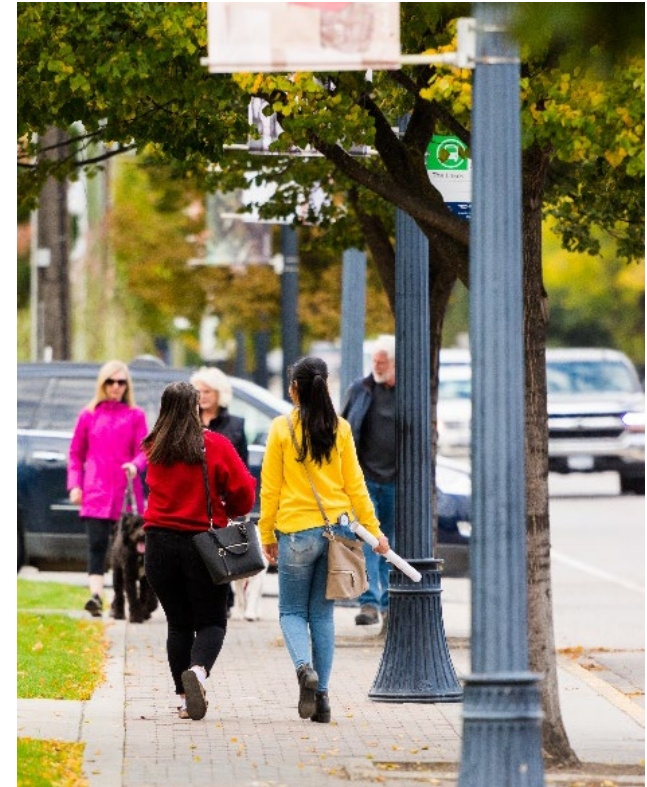
This strategy is a component of *Connecting our Region*, the Central Okanagan's first *Regional Transportation Plan* (RTP). The *Regional Disruptive Mobility Strategy* has been developed in tandem with the RTP to ensure full coordination across both documents. While the RTP considers all modes, the *Regional Disruptive Mobility Strategy* focuses on how to best manage the impacts of new technology on transportation across the Central Okanagan.

What is Disruptive Mobility?

In business theory, disruption refers to an innovation that creates a new market while "disrupting" and displacing existing markets. Typical examples are the creation of the internet and smartphones, which revolutionized the communication industry. "Disruptive mobility" refers to changes in transportation technologies that will fundamentally change how people get around in the future. These changes are making transportation more connected, automated, shared, and electric. These changes can benefit the region; however negative impacts that work against current policy directions are possible. By proactively preparing for the changes coming our way, Central Okanagan governments can work together to harness the benefits of new technology while protecting our regional economic competitiveness and quality of life.

Purpose of the Disruptive Mobility Strategy

The *Regional Disruptive Mobility Strategy* has been designed as a toolkit for local governments in the Central Okanagan to help prepare for technology



change in transportation. It is a resource guide that will help each jurisdiction identify the strategies and tactics best suited for their community. It is recommended that each jurisdiction collaborates with community, nonprofit, and business leaders to carefully consider a range of practical and efficient solutions to the challenges and opportunities presented by rapidly changing mobility technologies.

By its very nature, the *Regional Disruptive Mobility Strategy* must be dynamic to respond to rapid changes in transportation. As such, this strategy is an ongoing and evolving effort to manage the impacts of new technology in transportation and identify tactics to successfully adapt. This strategy provides a foundation for future work and guidance as these changes accelerate. Coordination and collaboration among jurisdictions and partnerships with the private sector, nonprofit organizations, and other regional stakeholders are vital for success. Building upon the *Regional Transportation Plan*, this document shines a light on new technologies and transportation system adaptation tactics that will give the Central Okanagan a strategic advantage.

Transportation, Technology and our Changing Future

For the first time in nearly a century, transformative innovations are coming to transportation. Mobile technologies that enable new shared services will combine with self-driving electric vehicles to reshape our lives, how we move, and our communities for better—or worse. New transportation options and services will emerge and link together to create a mobility ecosystem that offers seamless, multi-modal travel on demand. Some of these coming changes have the potential to increase auto travel and congestion, or if we are proactive, to accelerate the pace towards achieving our shared vision for a more connected and sustainable future, as outlined in the *Regional Transportation Plan*.

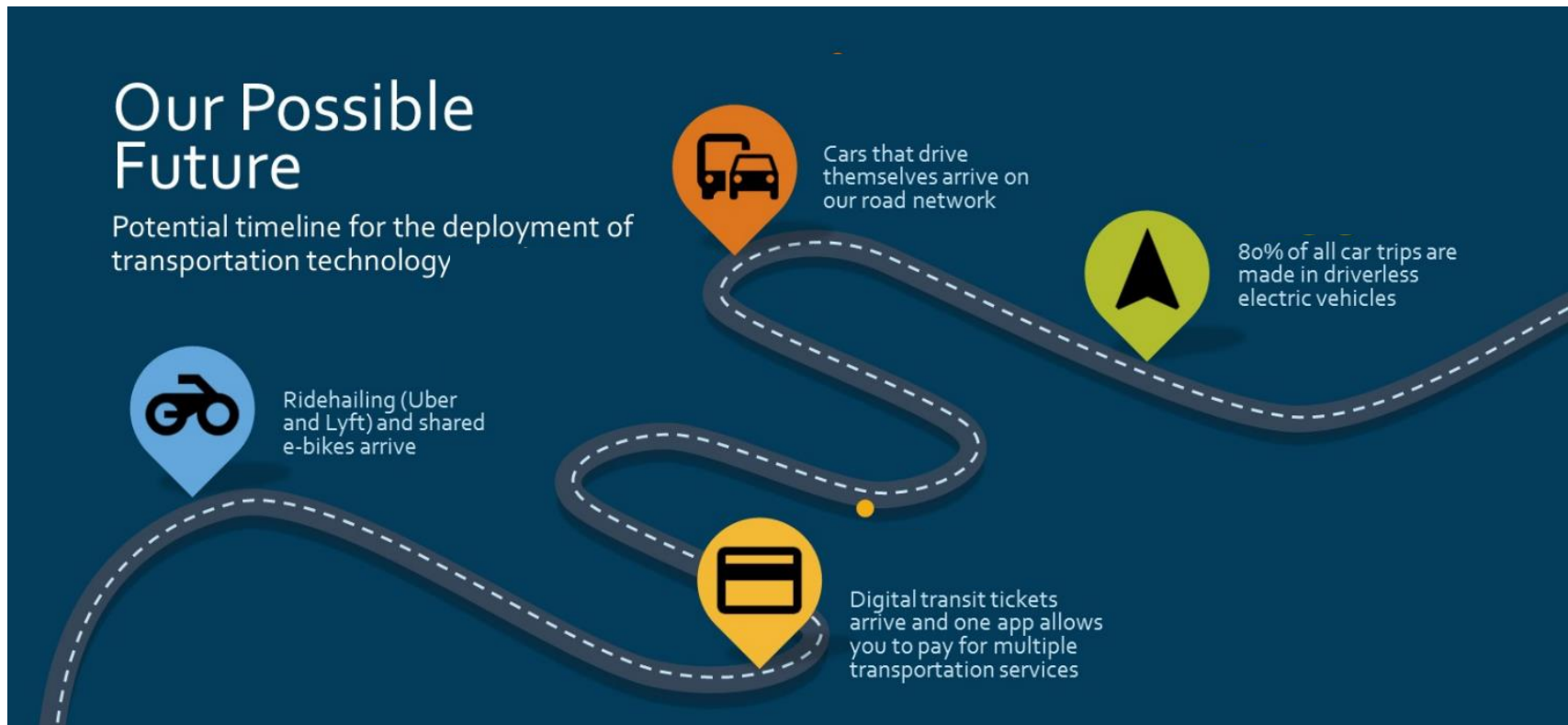


Figure 1 Timeline projection estimates are based on a variety of sources, including announced timelines from the private sector, research organizations, public sector analysis and the Central Okanagan's regulatory environment.ⁱ

We should view technological change in transportation as both an opportunity and a challenge. If we move quickly to shape new public policy, business models, and how they are deployed, we can leverage them to achieve our goals.

Looking forward, there are four distinct trends on the horizon: connected, self-driving, shared, and electric. These trends are described in the following section.

Connected

In the past few years, the number of everyday devices that can connect to the internet and communicate with each other has increased rapidly. This has enabled Central Okanagan residents to use mobile apps to avoid traffic delays, access real-time transit information, and reserve a carshare, bikeshare or other travel options on demand. In the future, improved communication between our smartphones, vehicles and infrastructure will increase our access to information and enhance our ability to choose how to get to where we need to go, in a way that best meets our needs, for any given trip.

Self-driving

Our vehicles are likely to become increasingly automated, to the point where a human driver is not required most of the time.ⁱⁱ Self-driving technologies will enable changes in the demands that cars place on our cities. For example, self-driving vehicles could allow a commuter to send their car home rather than pay for parking at their workplace.ⁱⁱⁱ This possibility would "unlink" parking demand from the locations of destinations, reducing the need for large amounts of parking in our city centres. However, this could create new challenges such as cars without any passengers (or "zero-occupancy" vehicles) on our roadways, increasing traffic congestion. We will need to adapt how we manage our streets as challenges arise.

While the timing of fully self-driving vehicles becoming commonplace is uncertain, the pace of development has been rapid. Self-driving cars have already navigated millions of kilometres on public roads in North America^{iv}, and self-driving taxi service is currently operating in Phoenix, Arizona.^v

Shared

Shared vehicles are used to accommodate multiple people's travel throughout the day. They have the potential to eliminate the cost of ownership while retaining flexibility. In our region, we currently share buses, cars, and bikes through transit, taxi, carshare, and bikeshare networks. Shared vehicles can make it easier to shift travel modes in real-time. For example, a resident could take the bus to work, use a bikeshare for their lunch meeting, and then take a ride-hailing service back home. In the future, this will allow residents to choose the best travel mode for each segment of their trip.



Figure 1 Modo is a carshare provider in the Central Okanagan.

Electric

The price of batteries is dropping, and their storage capacity is increasing. Electric vehicles are already on our streets today, including electric and hybrid cars, e-bikes and other small electric vehicles.^{vi} The transportation sector is the largest GHG emitter in the Central Okanagan. As a result, shifting to electric will be one part of the solution in curbing our carbon emissions.

These four trends of connected, self-driving, shared and electric have the potential to reshape both transportation and our built environment between now and 2040. How we choose to prepare for these changes will influence how new transportation technologies shape our region.

Vision and Goals

The *Regional Disruptive Mobility Strategy* is grounded in the vision and goals developed as part of the *Regional Transportation Plan (RTP)*.

Together, the *Regional Transportation Plan's* vision and goals help provide the strategic direction for the *Regional Disruptive Mobility Strategy*, defining the outcomes we are seeking as we plan and prepare for technology change across the Central Okanagan.

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.

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



Figure 2 We are increasingly making purchases online. At the beginning of 2020 roughly 10% of all retail purchases in Canada came from e-commerce. ^{vii} If numbers from the US are any indication, this figure will grow significantly as a result of COVID-19. This will represent a fundamental shift in how goods are distributed in the Central Okanagan and changing demands on the transportation system.

Glossary of Terms

New mobility technologies cover a broad spectrum of areas that affect transportation and land-use. As these technologies evolve, it becomes critically important to understand the concepts that are emerging and what impact they may have. This glossary, presented in alphabetical order within each category, defines the latest technologies, processes, business models and associated terms.

Shared Mobility

Shared mobility represents the full range of transportation options involving fleet ownership or fleet operation of various modes of transportation. It includes public transit, taxis, bikesharing; carsharing, ridesharing; ride-hailing; scooter sharing; shuttle services, microtransit, and more.

BIKESHARE – A service in which bicycles are made available for shared use to individuals on a short-term basis. Bicycles can either be located at docking stations, or dockless systems allow bicycles to be parked anywhere, usually within a defined service area.

CARSHARE – A service in which cars are made available for shared use to individuals on a short-term basis.

MICROMOBILITY – Refers to personally owned or shared vehicles like bicycles, mopeds, and e-scooters. Micromobility is often used to describe the many types of vehicles that are smaller and lighter than an automobile.

MICROTRANSIT – Microtransit is a form of demand-responsive transport. This transit service offers flexible routing and flexible scheduling of vehicles. Microtransit providers may build routes to match demand (trip) and supply (driven vehicle) and extend the efficiency and accessibility of more traditional fixed-route transit service.

RIDE-HAILING – Procuring a ride from a 'for-fare' driver pool accessible through an app-based platform. Ride-hailing can sometimes be referred to by its regulated name in British Columbia, Transportation Network Services (TNS).

SCOOTER SHARING – Similar to bikesharing, but the mode of transport is an electric scooter. Electric scooter sharing systems can be docked or dockless.

TAXI – A service whereby riders can hail vehicles from the street or an app like ride-hailing. Both ride-hailing and taxi regulations overlap in British Columbia. Over time there will likely be further changes to bring them into alignment.

Vehicle Technology

CONNECTED VEHICLES – Vehicles with the capacity to communicate with other vehicles and infrastructure through wireless communications.

SELF-DRIVING VEHICLES – Vehicles with a high degree of automated driver assistance features that allow no driver to be present in most situations. The Society of Automotive Engineers (SAE) has a classification scheme that categorizes self-driving vehicles into five levels. Self-driving vehicles, referenced in this report, indicates SAE levels 4 and 5.^{ix}

V2I – Short for Vehicle to Infrastructure. Vehicles that are connected by smart technologies to infrastructure (I)

V2V – Short for Vehicle to Vehicle. Vehicles that are connected by smart technologies to other vehicles (V)

V2X – Short for Vehicle to Anything. Passing of information from a vehicle to any entity (X) may affect the vehicle and vice versa. V2X includes V2I and V2V.

Transportation System Optimization

SMART PARKING – A parking system that uses parking occupancy sensors or algorithms to provide stall availability information to users and to inform dynamic pricing.

TRANSIT SIGNAL PRIORITIZATION (TSP) – Adjusts traffic signal timings, if possible as transit approaches, to improve transit travel time and reliability.

Travel Info and Payment

MOBILE TICKETING – An app that allows transit riders to pay for fares with their smartphone, credit or debit card. This could evolve to include more forms of scheduled and on-demand transportation in a unified payment platform.

MOBILITY AS A SERVICE (MaaS) – Refers to a shift away from personally owned modes of transportation and towards mobility solutions that are consumed as a service. The full vision of Mobility as a Service (MaaS) combines planning and payment for a variety of travel modes within one application allowing for users to easily make multi-modal trips that are paid for through a single account.

Freight and Delivery

DRONE FREIGHT – Delivery of packages, food, or other products by an unmanned aerial vehicle or drone.

SELF-DRIVING FREIGHT – Self-driving vehicles that deliver packages, food, or other goods. The application of self-driving technology to freight will initially be focused on long-haul freight, but may incorporate individual package or food delivery in the future.

URBAN FREIGHT – Delivery of goods, packages, and a variety of merchandise within an urban area, with many deliveries to local businesses and restaurants. Urban freight often focuses on the right-sizing of delivery vehicles for safer and more successful operation within dense urban areas.

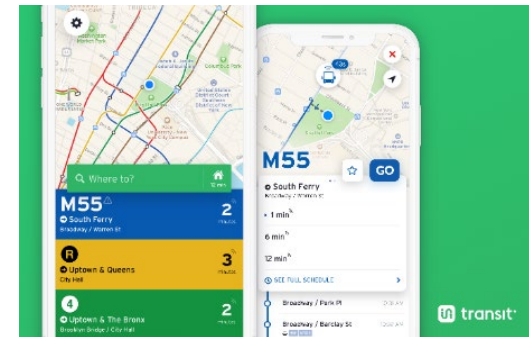


Figure 3 There are roughly the same number of opens of the Transit App as passengers on the Kelowna Regional Transit System (5.2 million/year)^{viii}

2040 Outlook: Potential Future Challenges and Opportunities

The coming changes in transportation have the potential to bring both opportunities and challenges in the future.

Key opportunities that transportation technology change could bring include:




- More affordable transportation options, enabled by Mobility-as-a-Service travel options, that provide people with ways to get around, without the expense of private vehicle ownership.
- More independence of mobility for youth, the elderly, and people with diverse abilities enabled by increased access to ride-hailing and self-driving vehicles.
- Reductions in impaired and distracted driving enabled by increased access to ride-hailing and self-driving cars, resulting in fewer collisions and safer streets.
- Less air pollution and greenhouse gas emissions as electric vehicles become more commonplace.
- An opportunity to repurpose high-value urban land due to self-driving cars being “sent home” rather than paying to park. This may also require adapting to changing parking revenue streams, as parkades could be left empty in urban areas downtown.





Potential challenges that transportation technology change could bring include:

- Increased traffic congestion and vehicle kilometers traveled (VKT) on our roadways from self-driving cars making “zero-occupancy” trips and ride-hailing vehicles making return trips and/or circling for passengers^x
- Increased urban sprawl from self-driving cars enabling people to live farther from their jobs
- Increased demand for passenger loading on urban curb space from ride-hailing services^{xi}
- Safety and ethical considerations as self-driving vehicle technologies are refined.

Proactive measures, policies and regulations, such as the tactics included in the Tactical Actions section could help to mitigate some of these challenges and improve our region's overall economy, quality of life and social equity.

In addition to the challenges and opportunities that transportation technology change may bring, changes in other key areas can potentially affect the success of emerging, new mobility options. For example, without a well-connected and safe active transportation network or widespread access to technology, emerging new mobility options will have more of a challenge being successfully adopted in our region. The following table provides a summary of these and other key areas that have the ability to impact the success of emerging, new mobility options.

Key Area	Potential Future Challenge	Potential Future Opportunity
 Safety and Accessibility	Without enough investment in sidewalks, bike lanes, and safety improvements, many people, including children, the elderly, and people with diverse abilities could be discouraged from walking, biking, and using small shared vehicles for short trips; this lack of mobility could result in social isolation for many residents. The cost of collisions in the Central Okanagan will result in less money spent in the local economy	If there are more mobility options available to serve the needs of residents, citizens of all ages and abilities would be able to choose the best way to travel based on their needs. Investment in safe streets would result in fewer vehicle collisions and make it more attractive for people to walk and bike.
 Congestion	Without providing a greater variety of transportation options that compete with the car, many people could have no choice but to drive, leading to additional traffic congestion and frustration on our roads.	If improvements are made to walking and biking infrastructure, transit, and policies that support shared mobility operators, residents would have plenty of alternatives to driving. This would result in fewer cars on the road and help reduce future traffic congestion.
 Access to Technology	With systems not designed for various types of user groups, including those without credit cards or without smartphone access, many already marginalized members of society could be shut out from accessing emerging, new mobility options.	If new and old transportation technologies become available in the same smartphone app and also remain accessible to those without smartphones and credit cards, technology will not become a barrier to access transportation.

Key Area	Potential Future Challenge	Potential Future Opportunity
 Transportation Costs	<p>In a car-focused transportation system without other convenient options, people could be locked into the expense of car ownership and maintenance, leading to transportation continuing to consume a significant portion of household income.</p>	<p>If more affordable transportation choices, such as transit, walking, biking, or shared mobility are provided, people will be able to save costs by not needing to own a private vehicle. This would make it easier for people to choose to live without a car if they desire, allowing them to save on the cost of car ownership, while not sacrificing their personal mobility.</p>
 Economy	<p>If all the region's future residents drive as much as we do today, traffic congestion will get worse, resulting in more time in traffic and higher costs for the goods movement community.</p>	<p>If commuter trips can shift more to work from home, biking, walking and transit, road space can be freed up for goods movement. Additionally, curb management practices and urban freight strategies could help goods move more seamlessly, supporting the competitiveness of local businesses.</p>
 Well-being	<p>Continuation of the status quo would mean travel mainly by gasoline-powered vehicles. This would result in continued air pollution and the acceleration of climate change. Obesity and illnesses resulting from exposure to air pollutants and a sedentary lifestyle would also become more prevalent.</p>	<p>Walking and biking are great ways to stay physically healthy while also getting people to their destination. Investments in biking and walking infrastructure can help people be more active and healthier. Additionally, shifting driving trips to walking and biking reduces air pollution and greenhouse gas emissions.</p>
 Privacy	<p>If rapid technology change unfolds without regulatory preparation by governments, citizens could become more vulnerable to breaches of privacy (for example, payment and trip data could be exposed, allowing companies to exploit information on where people live and work).</p>	<p>Proactive work by governments will allow citizens to reap the benefits of transportation technologies while keeping their data secure.</p>

Tactical Actions

The following section identifies tactical actions that local governments in the Central Okanagan may wish to take to prepare for technology change in transportation. The tactical actions were identified by reviewing existing trends and best practices, and informed by a broad literature review.^{xii}

The tactical actions range in approach from shaping how new technologies are deployed to delivering transportation improvements that are adaptable and can evolve with rapid changes in technology. Other tactics focus on fundamentally resetting the web of incentives related to transportation choices as they exist today. It is worth noting that the tactical actions listed do not all belong in the typical wheelhouse of a municipal transportation department. Instead, they reflect how transportation works as a system tied to a variety of incentives from multiple levels of government, the private sector, nonprofit organizations, and the broader community.

The following themes organize the tactical actions listed below: connected, self-driving, shared mobility, electrification and funding and growth.

The funding and growth category attempts to group actions that are related to how we retain stable funding streams for transportation-related initiatives in the future and stay resilient in the face of significant workforce changes that may occur as a result of the disruptions coming to transportation.

Each tactical action includes a description, an action initiator, additional participants, and notes regarding related actions. The action initiator sub-heading refers to the lead government agency (local jurisdiction or regionally coordinated). The additional participants sub-heading identifies other agencies and key stakeholders that may be critical for successful implementation (e.g. provincial agencies such as the Ministry of Transportation and Infrastructure or BC Transit, the private sector, nonprofit organizations, or educational institutions).

Connected

- 1.1 Install bicycle and pedestrian detection at signalized crossing locations
- 1.2 Implement measures to improve customer service and speed up transit
- 1.3 Pilot improvements to roadways with modular and temporary materials
- 1.4 Engage universities in mobility technology research and development

Self-Driving

- 2.1 Eliminate parking minimums in zoning bylaws region-wide for all uses
- 2.2 Support legislative efforts to ensure that self-driving vehicles operate safely
- 2.3 Minimize zero occupant trips and encourage shared use of self-driving vehicles
- 2.4 Pilot self-driving transit
- 2.5 Develop incentives to optimize ride-hailing operations
- 2.6 Test assumptions on roadway capacity and utilization in a self-driving future
- 2.7 Invest in lane markings that enhance the effectiveness of lane departure warning and prevention systems
- 2.8 Structure public parking systems to limit large capital expenditures

Shared

- 3.1 Develop and implement a curb space management plan
- 3.2 Pilot mobility hubs at key transit exchanges
- 3.3 Partner with the private sector to provide transportation in mobility-challenged communities
- 3.4 Establish a mobility data platform
- 3.5 Establish data sharing requirements for private-sector mobility providers
- 3.6 Ensure equity in the Delivery of Mobility as a Service (MaaS)
- 3.7 Update regulations to include new and emerging modes
- 3.8 Protect public privacy
- 3.9 Launch a service that provides real-time infrastructure data to connected vehicles and trip planners
- 3.10 Make it easier to work with local jurisdictions to deploy and test new technologies related to transportation

Electric

- 4.1 Create a community electric vehicle strategy
- 4.2 Transition government fleets to electric or other zero-emission vehicles

Funding and Growth

- 5.1 Develop a mobility pricing study for the Central Okanagan
- 5.2 Support legislative efforts to ensure that self-driving vehicles generate appropriate funding
- 5.3 Develop a disruptive mobility innovation fund
- 5.4 Prepare the workforce for changes driven by innovation in transportation technology
- 5.5 Hire and train staff on new technologies and trends

1. Tactical Actions: Connected

1.1 Install bicycle and pedestrian detection at signalized crossing locations

Implement pedestrian and bicycle detection at signalized crossing locations on both local and regional active transportation networks.

Currently intersections across the region have minimal amounts of pedestrian and bicycle detection. This can make movements like left-hand turns more challenging for people on bikes if they are physically incapable of triggering a signal change or a required advance turn arrow. A similar situation occurs for those with accessibility challenges when it comes to pushing pedestrian buttons. This is important to deploy at key intersections within urban and town centres on routes that prioritize people walking and biking.

Action Initiator

Local governments

Additional Participants

MOTI

Related Actions

N/A



Figure 4 Intersection of Ethel and Sutherland in Kelowna where two protected bike lanes meet.

1.2. Implement measures to improve rider experience and speed up transit

A variety of different technologies and policies exist that can improve the transit rider experience, improve transit speed and reliability, and enhance customer satisfaction. Examples include:

- Digital payments that allow riders to pay for transit through credit, debit or mobile phone
- Proof of payment policies that enable all door boarding
- Establishing fare paid zones where payment is required in advance of boarding
- Digital displays at high use transit stops
- Providing WiFi on transit vehicles

These technologies and policies are a new piece of the puzzle to grow transit ridership into the future.

Action Initiator

Regional collaboration

Additional Participants

BC Transit

Related Actions

N/A

1.3. Pilot improvements to roadways with modular and temporary materials

Rapid prototyping and experimentation have arrived in departments of transportation across the world. As a way of painting a picture of what could be, these departments are shedding a concrete mindset for quickly learning and adapting using lighter and more temporary materials. Rapid implementation can be used to quickly remake streets, providing much of the value in the short term at a fraction of the cost. Testing ideas quickly can help unearth real-world challenges, bring much of the benefits sooner while building momentum around long term changes. Across the world changes to transportation infrastructure happened in a matter of days to allow more space for people during the COVID-19 pandemic, but this has been happening for quite some time. This approach proves useful in showing the speed at which local governments can move and deliver benefits to residents in a way that is flexible to changing needs or unforeseen circumstances.

Action Initiator

Local governments

Additional Participants

N/A

Related Actions

N/A

1.4. Engage universities in mobility technology research and development

Build capability around emerging mobility technologies by partnering with academic institutions to establish research related to transportation technology change. By partnering with educational institutions, local governments can aid them in accessing funding sources and allow them to securely access data to assess elements of the transportation network, opening the door to potential improvements.

This action is an ongoing effort.

Action Initiator

Local governments

Additional Participants

UBCO, Okanagan College

Related Actions

N/A

2. Tactical Actions: Self-Driving

2.1. Eliminate parking minimums in zoning bylaws region-wide for all uses

One of the most significant potential impacts of self-driving vehicle technology is the likelihood that drivers will send their cars elsewhere rather than pay for parking. Self-driving technology may fundamentally unlink a traveler's final destination with the destination of their vehicle. This and other changes may lead to a significant dampening in demand for parking onsite at destinations.

Currently, minimum parking requirements exist to help protect the availability of unmanaged curb parking. Unfortunately, these regulations also hinder the potential of the region by filling our developed areas with unproductive and costly parking infrastructure. They push homes and businesses further apart, impede the walkability of our neighbourhoods, raise the cost of housing, and place a costly burden on small business owners. Eliminating this requirement would allow new businesses to flourish and treat land as a valuable resource.

By eliminating required parking minimums, developers can still build parking—but will weigh its value against the other things they could do with the finite capital dollars and valuable land. These measures need to be implemented with a resourced parking management effort that manages public parking assets to maximize public benefit.

Action Initiator

Local governments

Additional Participants

N/A

Related Actions

2.8



Figure 5 Self-driving technology is getting better and now only needs human input roughly every 21,000 km on public roads.^{xiii}

2.2. Support legislative efforts to ensure that self-driving vehicles operate safely

Develop recommendations for the Province on potential approaches to testing, licensing, and regulating private and shared self-driving vehicles to ensure the safe operation of such vehicles in the Central Okanagan region.

Action Initiator

Regional collaboration

Additional Participants

Local governments

Related Actions

2.3, 2.4, 2.6

2.3. Minimize zero occupant trips and encourage shared use of self-driving vehicles

Self-driving vehicles can operate without passengers, creating "zero-occupancy" trips. This presents a challenge as zero-occupant vehicles would increase the number of vehicle kilometers travelled (VKT) and increase traffic congestion.

Everyone values their time differently, and if congestion exists, some people will decide to travel earlier or later to avoid it, or they may choose to eliminate their trip altogether. However, self-driving vehicles do not have a value of time. Other than the cost of running the vehicle for the trip, the amount of time spent sitting in traffic is not a consideration. This has the potential to fundamentally reshape travel decisions and increase traffic congestion. If left unmanaged, this issue could cripple the Central Okanagan's road network.

This action recommends developing policies to discourage zero-occupant trips. Examples include:

- congestion pricing based on the number of vehicle occupants,
- placing limits on the amount of zero-occupant miles travelled, and
- regulating businesses that contribute significant zero occupant trips to the road network.

Incentivizing shared rides in self-driving vehicles as they enter the regional market would also be critical but may require some zero occupant trips. Zero occupant trips would be necessary for any shared vehicle fleets. Therefore, banning zero occupant trips could mean worse outcomes than ensuring there is a balance of zero occupant trips.

Action Initiator

Local governments

Additional Participants

Regional collaboration, Private sector

Related Actions

2.1, 2.2, 2.4, 2.6

2.4. Pilot self-driving transit

In the future, driverless transit services will allow the provision of more flexible service and could potentially lower the operating cost of transit service. This would allow transit to benefit more people and serve a greater variety of trips.

Microtransit (smaller) vehicles with self-driving technology are currently available. As a result, an initial test might involve deploying a service that improves first and last mile connections to higher-order transit. Deploying a more niche service initially will create more opportunities for the general public to experience self-driving vehicle technology firsthand and for staff to understand challenges and opportunities related to these vehicles.

Action Initiator

Regional collaboration

Additional Participants

BC Transit, Local governments, Private sector

Related Actions

2.2, 2.3, 2.6, 2.7

2.5. Develop incentives to optimize ride-hailing operations

Ride-hailing vehicles have a disproportionate impact on traffic congestion and air quality in urban areas, where it is felt most acutely. However, ride-hailing services are also beneficial since they provide mobility for people unable to drive (e.g. youth, seniors, people who have been drinking), mitigate the need for additional parking in town centres, and make it easier to get around without having the expense of owning a private vehicle.

This action recommends developing policies and incentives to encourage ride-hailing vehicles to:

- Use fleets with low carbon emissions^{xiv}
- Ensure safe passenger pick-up and drop off procedures
- Offer "pooling" services to increase vehicle occupancy rates^{xv}
- Integrate with the regional transit network
- Assist in mobility-challenged communities
- Minimize travel without a passenger, and
- Decrease idling times^{xvi}.

Action Initiator

Regional collaboration

Additional Participants

Local governments, Private sector

Related Actions

3.10

2.6. Test assumptions on roadway capacity and utilization in a self-driving future

There are many projections for how people would behave in a variety of service delivery models for self-driving vehicles. These include scenarios where self-driving vehicles are primarily operated as a shared subscription service or privately owned.

This action recommends working to gauge the window of possibilities for congestion on our road network across multiple scenarios.

Action Initiator

Academic institutions

Additional Participants

Regional collaboration, Local Governments, MoTI

Related Actions

2.2, 2.3, 2.4, 2.7

2.7. Invest in lane markings that enhance the effectiveness of lane departure warning and prevention systems

Currently, self-driving vehicles are being developed to operate without significant retrofits to existing local networks. However, this action recommends investing in high visibility lane markings now, since they can help improve the performance of existing systems, such as lane departure warning and improve the safe operation of self-driving vehicles in the future.

Action Initiator

Local governments

Additional Participants

MOTI, Private sector

Related Actions

2.2, 2.3, 2.4, 2.6

2.8. Structure public parking systems to limit large capital expenditures

As discussed in 2.1, one of the most significant potential impacts of self-driving vehicle technology is the likelihood that drivers will send their cars elsewhere rather than pay for parking. Self-driving technology may fundamentally unlink a traveler's final destination with the destination of their vehicle. In addition, ride-hailing and other shared transportation services may reduce parking demand. These changes will have a significant impact on public parking demand and expected revenues. This action recommends structuring public parking expenditures in favour of lower capital-intensive solutions that can be repurposed. This would be prudent in the near-term to avoid long-term capital obligations for single-use parking assets.

Investments in smart parking systems that manage parking using variable rates based on demand and provide availability information to users should continue to be pursued.

This action is an ongoing effort.

Action Initiator

Local governments

Additional Participants

N/A

Related Actions

1.6, 2.1



Figure 6 The figure above depicts the output of a LIDAR sensor installed in downtown Kelowna. LIDAR technology, which works similarly to radar, powers most self-driving vehicles. Within the Central Okanagan, LIDAR is currently being used in flood mapping and transportation studies among other applications.

3. Tactical Actions: Shared

3.1. Develop and implement a curb space management plan

Curb space is where mobility meets access. This valuable space is not always optimized to achieve a broad set of outcomes. Historically, regulating and managing curb space has been assembled bit-by-bit in response to residents or businesses, and has primarily been dedicated to the storage of private vehicles. The conversation about what uses should be allowed in curb space is quickly changing.

Curb space has a variety of possible uses including car parking, bike lanes, sidewalk cafés, transit stops, trash collection, landscaping, rain gardens, delivery zones, bicycle parking, shared mobility, widened sidewalks, ride-hailing drop-off, and taxi stands. This space is also often contested, and reassigning it is politically challenging.

New shared services like ride-hailing, bikeshare, and increasing deliveries (due to rises in online shopping) have intensified the demand for curb space and laid bare the urgency for this space to be governed flexibly to achieve a variety of outcomes.

This action recommends that Central Okanagan governments develop curb space management plans to prepare for increasing demands and proactively manage curb space as a lever to achieve stated policy goals. Additionally, it is recommended that tools to manage and optimize the usage of curb space in real-time be explored.

Action Initiator

Local governments

Additional Participants

Private sector

Related Actions

2.5



3.2 Pilot mobility hubs at key transit exchanges

A mobility hub consists of an area where different forms of transportation come together, often at a transit exchange. A mobility hub may include transportation services and amenities such as short and long-term bicycle parking, shared mobility options (e.g. bikeshare, scooter share, carshare), ride-hailing and taxi-stands, park and ride, electric vehicle charging stations and other services. Fixed-route transit service often lacks the ability to get a person directly to their destination (called the “last mile” challenge). Mobility hubs, where multiple forms of transportation come together, can bridge this gap and shorten overall transit travel times by making multi-modal trips seamless. As transit exchanges transform, they should function as mobility hubs in addition to a place to transfer between busses.

Action Initiator

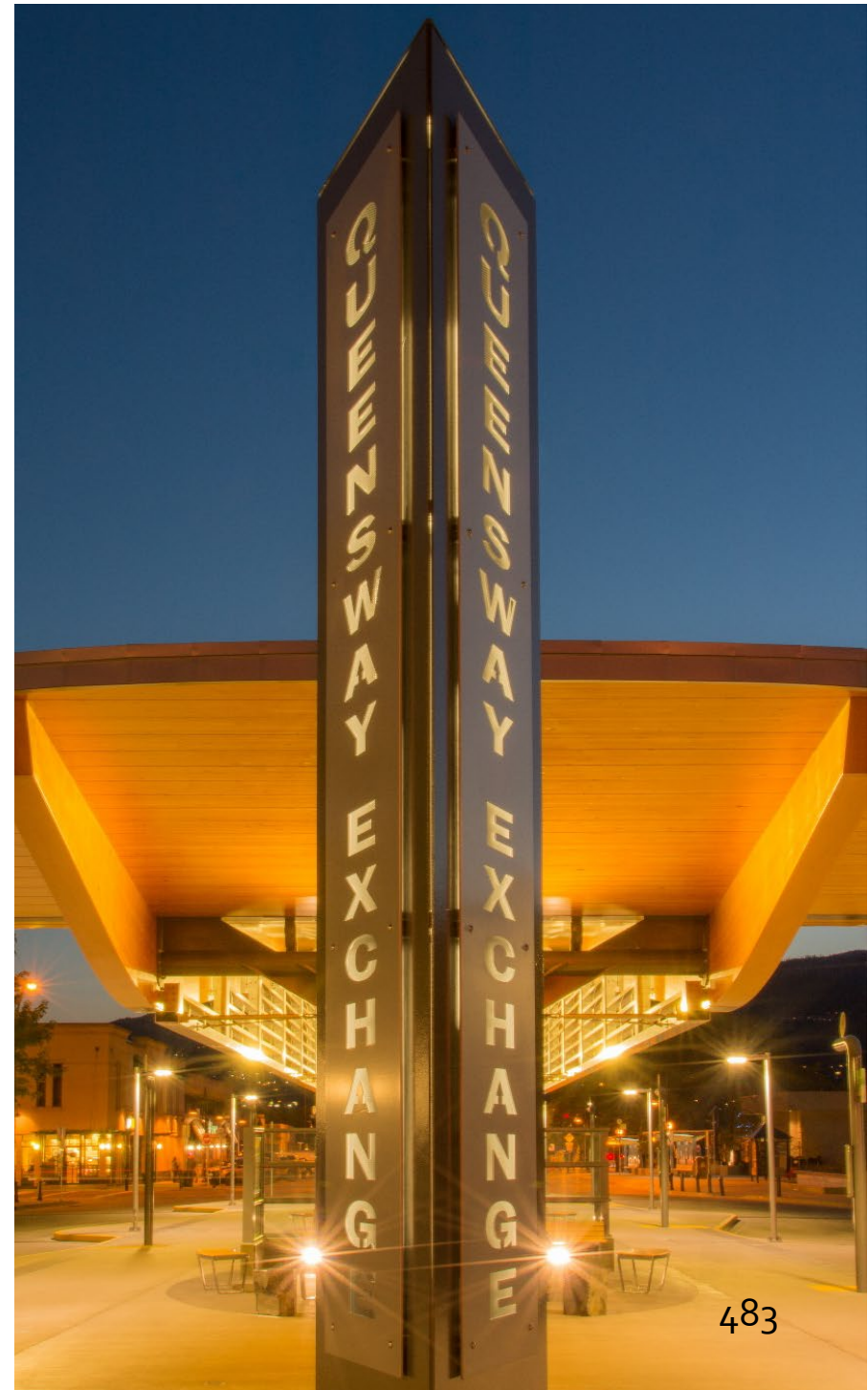
Local governments

Additional Participants

BC Transit, Private sector

Related Actions

2.4



3.3 Partner with the private sector to provide transportation in mobility-challenged communities

The Central Okanagan region is in a unique position in Canada. In the majority of the country's heavily populated areas, outlying suburban areas often correspond with low-income communities and are where delivering transportation services can be the most challenging. However, in the Central Okanagan many of these outlying areas also happen to be some of the wealthiest. This makes the challenge of effectively delivering transportation options to these communities through the private sector potentially easier because residents may be able to pay higher costs for improved, or on-demand service.

This action recommends working with BC Transit and/or the private sector to deliver on-demand transit services in low-density areas that don't meet fixed-route bus service standards. Consider connections to and from senior housing, low-income neighbourhoods, and medical facilities as key focus areas.

Action Initiator

Local governments

Additional Participants

BC Transit, Private sector

Related Actions

3.6

3.4 Establish a mobility data platform

As multiple transportation service providers enter the market, it will be important to organize transportation data and facilitate access to ensure transparency and informed decision-making.

This action recommends creating a regional mobility data platform that houses transportation-related data from all transportation sources with access provided to all agencies. The platform would consolidate archived and real-time data from multiple agencies and private providers into a single data repository. Implementation of the data platform would involve:

- Establishing policy standards for data sharing between regional stakeholders for interoperability
- Setting security standards for maintaining privacy and data anonymity

Action Initiator

Regional collaboration

Additional Participants

Local governments, BC Transit, MOTI, Private sector

Related Actions

3.5

3.5 Establish data sharing requirements for private-sector mobility providers

This action recommends establishing standard data-sharing agreements with private sector mobility providers. The agreements should address use cases, privacy, and data security for mobility data to ensure it is handled and shared with local jurisdictions, other public agencies and academic institutions in the region. This would help manage the growing number of new mobility service providers and pull insights into how their services are performing and contributing to the regional transportation network.

Action Initiator

Regional collaboration

Additional Participants

Local governments, BC Transit, MOTI, Private sector

Related Actions

3.4

3.6 Ensure Equity in the Delivery of Mobility as a Service (MaaS)

Mobility as a Service (MaaS) offers a single point of access to public and private mobility services through which users travel across a variety of modes. Residents would be able to choose from a selection of travel pass packages or pay-as-you-go options with different price structures for peak and off-peak travel. This would make buying transportation services more like a cellphone plan where various services

can be bundled or purchased on-demand, as appropriate, based on customer needs.

This action recommends that public agencies coordinate across the various private and public sector service providers to ensure social equity in how transportation services are provided. Specifically, MaaS should be delivered to all travelers equitably by developing subsidies or equal access policies that focus on low-income and unbanked individuals. Additionally, transit fares should be structured to allow for greater customization and flexibility for different market segments. For example, digital “smart” transit tickets could enable customers to choose from a menu such as off-peak usage or to buy a multi-modal trip through one purchase. This would afford the Kelowna Regional Transit System greater flexibility in pricing.

Action Initiator

Regional collaboration

Additional Participants

Local governments, BC Transit, MOTI, Private sector

Related Actions

3.3

3.7 Update regulations to include new and emerging modes

Local traffic and parks bylaws often unintentionally ban new modes by not explicitly mentioning them. Unfortunately, this presents challenges for the adoption of a variety of new mobility modes. As new vehicle types are released on the market, especially related to the electrification of active transportation, they may be added to the Motor Vehicle Act. These vehicle types should be considered candidates for inclusion in local bylaws that govern active transportation facilities to broaden the potential and appeal for low carbon and space-efficient transportation.

This action is an ongoing effort.

Action Initiator

Local governments

Additional Participants

Regional collaboration, MOTI

Related Actions

N/A

3.8 Protect public privacy

Data about an individual's transportation patterns can contain sensitive personally identifiable information (PII) even when anonymized correctly. Due to the risks associated with the collection and sharing of data between private industry and public agencies, this will be a new challenge for local governments. As a result, this will require staff to have a strong understanding of guarding privacy when handling or allowing for the collection of mobility data.

This action recommends robust mechanisms be put in place regarding the governance of data generated by shared mobility services in order to protect the privacy of transportation system users.

This action is an ongoing effort.

Action Initiator

Local governments

Additional Participants

Regional collaboration, MoTI, Private sector

Related Actions

N/A



3.9 Launch a service that provides real-time infrastructure data to connected vehicles and trip planners

In the future, the role of public agencies will involve not only physical infrastructure but also digital infrastructure that can be built to power a variety of different applications.

This tactical action recommends providing real-time digital outputs from transportation infrastructure to connected vehicles and trip planning apps. Connected vehicle technology is currently being sold on cars available for purchase in the Central Okanagan.

Action Initiator

Local governments

Additional Participants

Regional collaboration, MoTI, BC Transit

Related Actions

N/A

3.10 Make it easier to deploy and test new technologies related to transportation

As delivery mechanisms for transportation services change in the future, there is a trend to not require a significant reinvestment in the transportation network for new solutions to work well. There is a clear understanding that even small retrofits, when applied across the entire transportation network, is not feasible and can be

challenging to accomplish for local governments with competing priorities. As a result, delivery of many transportation technologies does not require buy-in from local governments.

That said, some partnerships can be mutually beneficial. This action recommends local governments look to partner with the private sector, allowing them to utilize public assets to add value in new ways that may not have been fully considered in the past. Examples include providing dedicated on-street carshare spaces or allowing bikeshare systems to operate from within the right of way using public land. This benefits local governments with additional sustainable and space-efficient mobility choices for residents to choose from often at minimal public cost.

In the future, local governments will need to assess these opportunities and move on them quickly to leverage the opportunities they bring for low-cost achievement of public policy goals.

Action Initiator

Local governments

Additional Participants

UBCO, Private sector

Related Actions

N/A

4 Tactical Actions: Electric

4.1 Create a community electric vehicle strategy

Zero-emission vehicles help reduce tailpipe emissions of air pollutants and greenhouse gases, and improve public health. Additionally, the electrification of bicycles and other small vehicles has claimed an increasing market share.

This action recommends developing an electric vehicle strategy that would identify regulatory hurdles and develop recommendations to encourage the adoption of electric vehicles by public and private fleets. The strategy should identify opportunities to retrofit existing assets and provide new charging infrastructure for electric cars and small electric vehicles.

Action Initiator

Local governments

Additional Participants

Private sector, Regional collaboration

Related Actions

N/A



4.2 Transition local government fleets to electric vehicles

This action recommends creating goals for converting City fleets to zero-emission vehicles. The goals may be tailored to fleet types, as well as available vehicle technology. While the switch to alternative fuels for some fleet vehicles is a long way off, new purchases of light-duty fleet vehicles should prioritize electric vehicles. Fleet vehicles are operated much more extensively than personally owned vehicles and as a result, they create more GHG emissions.

Additional staff training and charging infrastructure would be needed as the fleet transitions.

Action Initiator

Local governments

Additional Participants

Private sector

Related Actions

4.1

5. Tactical Actions: Funding and Growth

5.1 Develop a mobility pricing study for the Central Okanagan

As new transportation technologies proliferate into the transportation network, new challenges like zero-occupancy trips and shared mobility services competing for road and curb space will emerge. In this future, a dynamic user pay system for access to the transportation network could become a critical tool to manage congestion and the use of curb space.

This action recommends working collaboratively across the region and with the Province to explore mobility pricing options or other transportation-related revenue tools that would enable a more dynamic, real-time management of regional transportation assets and infrastructure to help prepare for the future.

Action Initiator

Regional collaboration

Additional Participants

Province, local governments

Related Actions

5.2

5.2 Support legislative efforts to ensure that self-driving vehicles generate appropriate funding

Self-driving vehicles come with a significant potential for overuse of transportation infrastructure with zero-occupancy trips. Infrastructure has significant maintenance costs and traffic congestion presents significant negative impacts on society. While local governments are expected to manage traffic flow, it can be challenging to secure the needed funds to make improvements. It will be important to ensure that self-driving vehicles contribute revenues commensurate with their impact on the transportation network.

This action recommends developing partnerships with the Provincial and Federal governments (potentially through FCM and UBCM) on new user fees, registration fees, or other possible revenue streams to prepare the region for the arrival of self-driving vehicles.

Action Initiator

Regional collaboration

Additional Participants

Province, local governments

Related Actions

5.1

5.3 Develop a disruptive mobility innovation fund

Opportunities to test new and innovative ways of service delivery in transportation come up outside the normal government budget cycle.

This action recommends creating a fund for disruptive mobility projects and initiatives to seize new opportunities as they emerge. A specific fund would open the door to quickly act on emerging opportunities aligned with local policy direction. This would enable local governments to learn quickly, build expertise and adapt while implementing pilots more quickly.

Action Initiator

Local governments

Additional Participants

N/A

Related Actions

N/A

5.4 Prepare the workforce for changes driven by innovation in transportation technology

As automation disrupts transportation, it will impact the Central Okanagan's workforce. Transportation and warehousing accounted for 4% of regional employment in 2016. While the direct impacts of self-driving and other transportation technologies deployed locally will be significant, many other areas will see an indirect effect. The impact will likely be felt across the local economy with substantial effects on insurance, auto body repair, legal services, and property development.

This action recommends that local governments prepare for future changes in the needed skillsets and size of the transportation-related workforce in the Central Okanagan. It will be essential to prepare the local workforce to be ready for these shifts over the coming decades.

Action Initiator

Regional collaboration

Additional Participants

Private sector, Local governments

Related Actions

5.5

5.5 Hiring and Training Staff on New Technologies and Trends

As transportation rapidly evolves, it will be important to build staff capacity to address these changes in the Central Okanagan region.

This action recommends working collaboratively across the region, sharing expertise and resources, and building local government staff capacity in new transportation technologies, including emerging new mobility options, multimodal integration and active transportation and transit through training and hiring staff with the required skill sets.

Action Initiator

Local governments

Additional Participants

Regional collaboration

Related Actions

5.4



Phasing Strategy

Due to a large number of tactical actions and the magnitude of effort required, a phasing hierarchy has been developed to identify a rough approximation of priority. Timing for many actions will be impacted by the deployment of new technologies globally and therefore, a more flexible phasing and prioritization strategy is preferred.

The phasing strategy looks to two metrics to score each tactical action, "Ease of Implementation" and "Value".

Ease of implementation: refers to the obstacles and structural change needed to enable the tactical action by the Action Initiator and Key Stakeholders. This may include staff effort, political capital, the level of public support required or a variety of other factors.

Value: is a measure of the impact of a tactical action's implementation specifically related to moving the region toward the vision of the Regional Transportation Plan.

The table below provides a summary of the tactics sorted by the ease of implementation and overall value to give some guidance in terms of priority.

		Value		
		Low	Medium	High
Ease of Implementation	Hard			1.2 2.1, 2.3 3.3 5.1
	Medium	2.4 4.1	1.3 3.1, 3.6, 3.7, 3.8 5.3, 5.5	2.5, 2.8 3.2, 3.4, 3.5, 3.9
	Easy	1.4 2.2, 2.6, 2.7 4.2 5.2, 5.4	1.1 3.10	

Next Steps

Technology is being integrated into the transportation network in the Central Okanagan region today. The Next Ride real-time transit information, the piloting of bike and e-scooter share in Kelowna, the arrival of ride-hailing and the surge in food and grocery delivery during Covid-19 are just a few examples of how technology in transportation is already delivering benefits to our residents. This suite of transportation options will likely increase in the future.

Considering both the opportunities and challenges of these future transportation trends, there are steps that Central Okanagan governments can take to maximize the benefits of technology change while minimizing potential challenges.

By focusing on how future technologies are likely to roll out, and working to mitigate potential negative impacts, Central Okanagan governments can work together to maintain our region's economic prosperity and high quality of life. No one future technology will be the silver bullet, but by understanding the tradeoffs and proactively shaping our approach, we can keep people moving throughout the region.



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Report to Council



Date: November 16, 2020
To: Council
From: City Manager
Subject: Area Based Water Management Plan Update
Department: Infrastructure Engineering

Recommendation:

THAT Council receives for information, the report from Infrastructure Engineering dated November 16th, 2020, with regard to the Kelowna Area Based Water Management Plan update.

Purpose:

To update Council on the Kelowna Integrated Water Supply Plan and to comment on progress to date in area-based water resource management.

Background:

In 2017, a team of senior water supply planning specialists assisted the City on long-term water supply through a Value Planning Review. The team recommended the integration of the many existing independent water purveyors into a single city-wide system and provided a vision of what it would look like. The vision was later adopted by City Council in 2019 along with Policy #378, Water Systems Integration Policy. Since 2019, staff have been in the process of developing the Kelowna Water Integration Plan (KWIP), a fully funded long term implementation plan that provides the framework for integration of the many independent water systems within the City, and meets the requirements for uniform water quality meeting Canadian Drinking Water Quality Guidelines, improved resiliency, better transparency and meeting the growth expectations of the community.

On August 10, 2020, Council was presented with the '20 Year Servicing Plan – Utilities Update', which incorporated many elements of the KWIP vision. The reality, however, is achieving the goals of the full KWIP will take longer than twenty years, and depends on significant efforts to obtain outside agencies' involvement, including the provincial government and the individual water purveyors. The Level of Service anticipated in 2040 for the Kelowna Water Utility is described in the following customer Service Level Statement:

Residents and customers in the City are provided a safe, resilient and sustainable supply of high-quality drinking water and a reliable supply of water for agriculture. Water quality will be consistent with a multi-barrier approach (source control, treatment & distribution). Non-potable irrigation water will be gravity supplied from upland watersheds.

This Level of Service goal is achievable by the utility and water purveyors by focusing on strategies to improve resiliency, interconnections and a consistent water quality to all customers.

The KWIP relies heavily on the City's ability to sustain a filtration deferral over an extended period (beyond 40 years). For the KWIP to be successful, the Province needs to formally accept it and approve a fiscal strategy that includes funding.

Lessons learned from the Kelowna Water Integration Plan - Stage 1

Since the adoption of Policy #378, the South East Kelowna Irrigation District assets and operations have been absorbed into the City Water Utility. The Stage 1 plan included new infrastructure and coordinated capacity improvements within the City Utility to expand the City's potable water supply into southeast Kelowna and create a new non-potable water system. There have been 'lessons learned' from the Stage 1 project to use in future planning and implementation of the KWIP plan into the future. One important lesson is that the City needs to be better prepared and informed of the condition of the system being integrated.

The oversight of the independent water systems falls to the provincial government. Therefore, support from the Province in many forms is vital going forward. Staff believe it's also in the Province's interest to work proactively with the City to stage these integrations in a way that minimizes negative impacts to the City over time. Staff are therefore need the assistance of the Province in the development and staging of the KWIP.

The other lesson is that the City must align its many resources, including staff and funding, to include practices and needs outside the City Boundary. This includes the need to better understand our own practices, and how they impact Okanagan Lake, our main water source. Out of this coordination, the City can work to develop policies and processes in line with local, regional, provincial and federal best management practices. In working with the Okanagan Basin Water Board and Regional District, staff have discovered several gaps and opportunities to improve stewardship and better define the language that different groups use to define water and local practices.

Area Based Water Management Planning (ABWMP)

One of the recommendations from the 2017 Value Planning Review of the Water Supply in Kelowna was for the City to look at broader water resource planning and management. Water management and its governance are critically important for local governments. Clean reliable water supply is required by residents, agriculture and business to meet both their existing and future needs. Cities must also manage the water resource to avoid flooding while maintaining riparian values to maintain a sustainable ecosystem.

The Province regulates water and has made access to new water licenses more complex as demand for it grows. The Water Sustainability Act, the legal framework for water licensing, includes the need of addressing environmental (or critical low flow) needs in channels as part of a new or modified license

application. Licenses are required for all water extractions, diversion, storage and consumptive use from any watercourse or lake in the Province. Kelowna has experienced events that have demonstrated the need for strategic multi-agency planning to apply best management practices to its local water resource.

The ABWMP is a three-stage strategic planning initiative being prepared in collaboration with regional and provincial agencies. Stage 1 is ongoing and assesses current management practices to identify areas where water management improvements are needed. This initial work sets up Stage 2, best management practice reviews which would be researched for application in the Kelowna watershed.

The ABWMP has been broken into different but inter-related management sectors that form part of the water cycle: Water supply, Source Water Protection, Environmental and Critical Flow Needs, Storm water, Wastewater and Natural Assets.

The ABWMP is being prepared concurrently and consistent with the 2040 Official Community Plan to reflect existing Council policy and to provide input to the drafting of new policy. Other engineering plans are underway to address the need to integrate the many independent water utilities operating within the City and to mitigate flooding. These initiatives inform and guide the development of the ABWMP.

Direct collaboration is taking place with the Regional District of Central Okanagan and the Okanagan Basin Water Board. In addition, the Provincial government has been engaged through a Provincial Liaison Team (representing three Ministries) and with staff from Interior Health.

Stage 1 Status Update

A significant amount of effort was placed on understanding the background of the City's base operations, resources and regulatory challenges within each of the management sectors. For example, a concise draft background document was produced for the Wastewater sector, briefly outlining its operations, practices and resources of the City, and the relationship of that Sector with Okanagan Lake. The document was reviewed internally, and other sector leads to better understand that sector's challenges, as well as the perceived concerns from other areas, such as Source Water Protection, or Environmental Flow Needs. Workshops and online sessions were conducted for each sector led by different sector leads, along with regional or provincial guests providing feedback.

Risk Analysis

Each sector group identified potential risks within their sector. The risks varied from operational to situational, were then assessed on a grading scale of low, medium, high, very high and extreme risks. A final review tallied risks with high to extreme grades for further review in future stages of this plan. Risks graded as medium or low will be compiled and addressed through internal City operational plans. It is noted that there were no "extreme" risks identified in the City at this time.

Strategy Development

Using the results of an assessment of Strengths, Weaknesses, Opportunities and Threats (SWOT), risk and gap analyses, a broad list of strategies were developed. These strategies, currently under review, demonstrate the breadth of work and shared responsibilities between agencies required to achieve such broader goals as flood resiliency, safe water to all citizens, shared environmental flow management and better stewardship of our natural assets. It becomes very clear that the road to an

Area Based Water Management Plan requires participation and resources from all levels of government and industry.

A key next step will be to secure Provincial participation in developing various strategies and areas for best management practices review in Stage 2. This could include participation by a number of Ministries. Once the level of participation by the Province is confirmed staff will complete Stage 1 and initiate Stage 2 in consultation with the participants.

Key Considerations

This initiative is considered relevant and important to the Province as it overlaps with many of their stated goals, current practices and past issues. The Province has responded to our invitation to participate by providing staff liaison representing three Ministries, and there is a need moving forward to participate in Stage 2.

Summary and Next Steps

Stage 1 of the Area Based Management plan is nearing completion. Tasks are underway to formally complete the various documents, strategies and assessment along with a thorough review. The Kelowna Water Integration Plan is being developed concurrently, with policies found in the ABWMP driving some of the activities in the next few years.

Staff is investigating the following steps as part of a scope of work to proceed. A scope of work needs to be vetted through the Partnership and Investments Division for priority discussion with the Province and brought to Council in the near future.

1. Examine provincial support options and assistance in the staging of the proposed Kelowna Water Integration Plan. This would include determining a long-term funding model and financing strategy that includes City customer funding along with a consistent approach to provincial and federal supports. This would also include the development of an interim governance plan, and appropriate legislation to address funding interjurisdictional projects.
2. Create a Management Plan for both Mission Creek and Mill Creek. These creeks and supporting watersheds are critical natural features that both supply and impact City residents. The Province should lead a coordinated effort to help address Flood Protection, water quality and agricultural water supply, as these will shape the long term water supply and protection needs into the future.
3. To undertake a review of existing multi-agency roles in protecting Okanagan Lake water quality and to work with these agencies to develop a twenty-year best management plan for the lake. Maintaining Okanagan Water Quality is the City's highest priority in the water portfolio. Stewardship of the Lake is a Provincial responsibility, however regional entities have resources that can provide significant stewardship and enforcement opportunities.

Internal Circulation:

Community Communications Manager
Infrastructure Engineering Manager
Utility Services Manager
Water Operations Manager

Considerations not applicable to this report:

Alternate Recommendation

Communications Comments

Existing Policy

Financial/Budgetary Considerations

Legal/Statutory Authority:

Legal/Statutory Procedural Requirements

Personnel Implication

Submitted by:

Rod MacLean, P.Eng., Utility Planning Manager

Approved for inclusion:



Alan Newcombe, Divisional Director, Infrastructure

Attachment: Presentation to Council

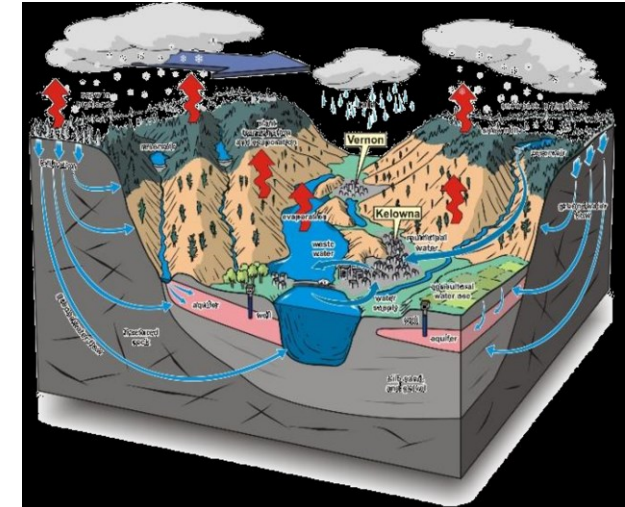
cc: Divisional Director, Civic Operations, Deputy City Manager
Divisional Director, Corporate Strategic Services
Divisional Director, Financial Services
Divisional Director, Infrastructure
Community Communications Manager
City Clerk



November 16, 2020

Project Update

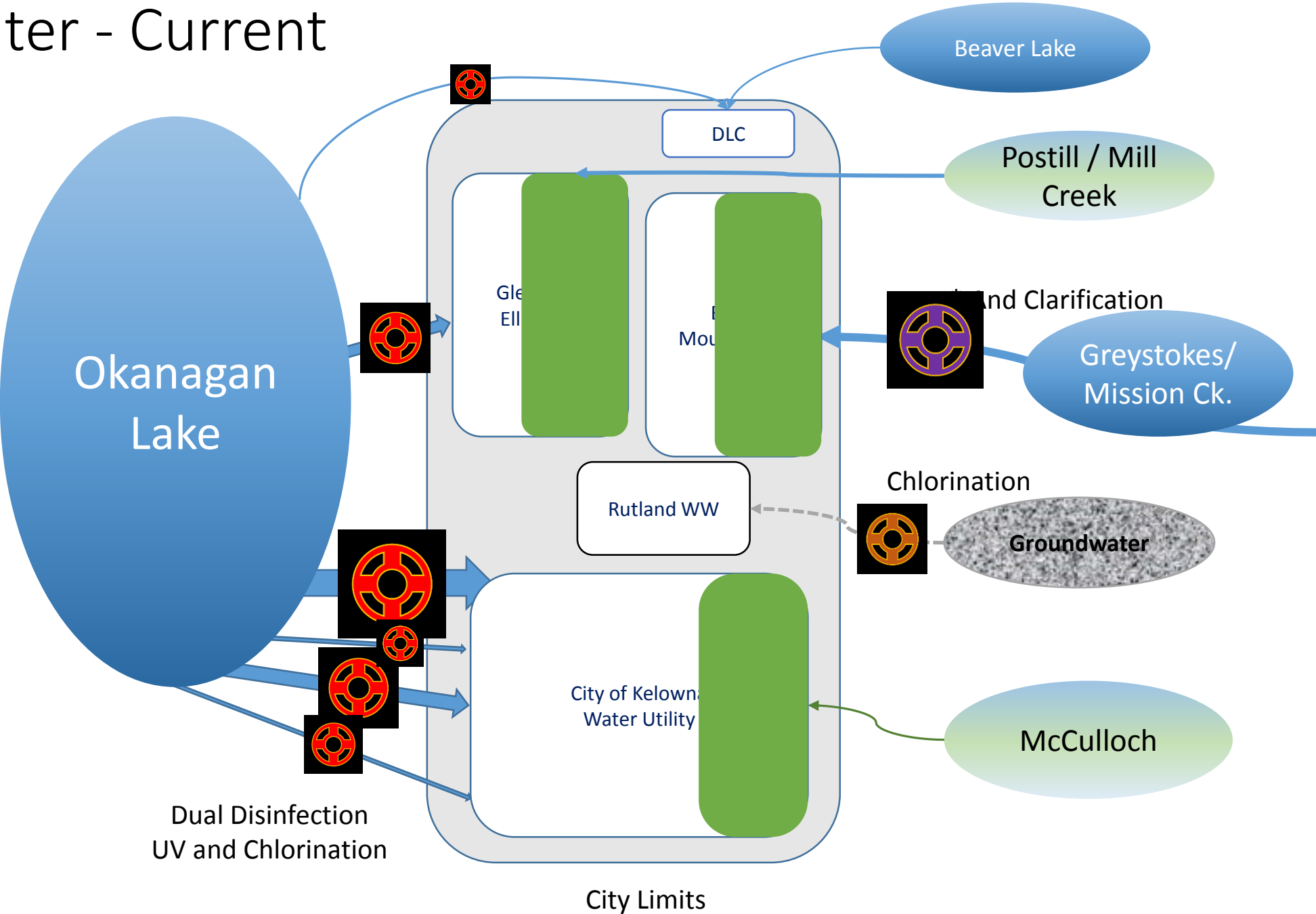
Kelowna Area-Based Water Management Plan



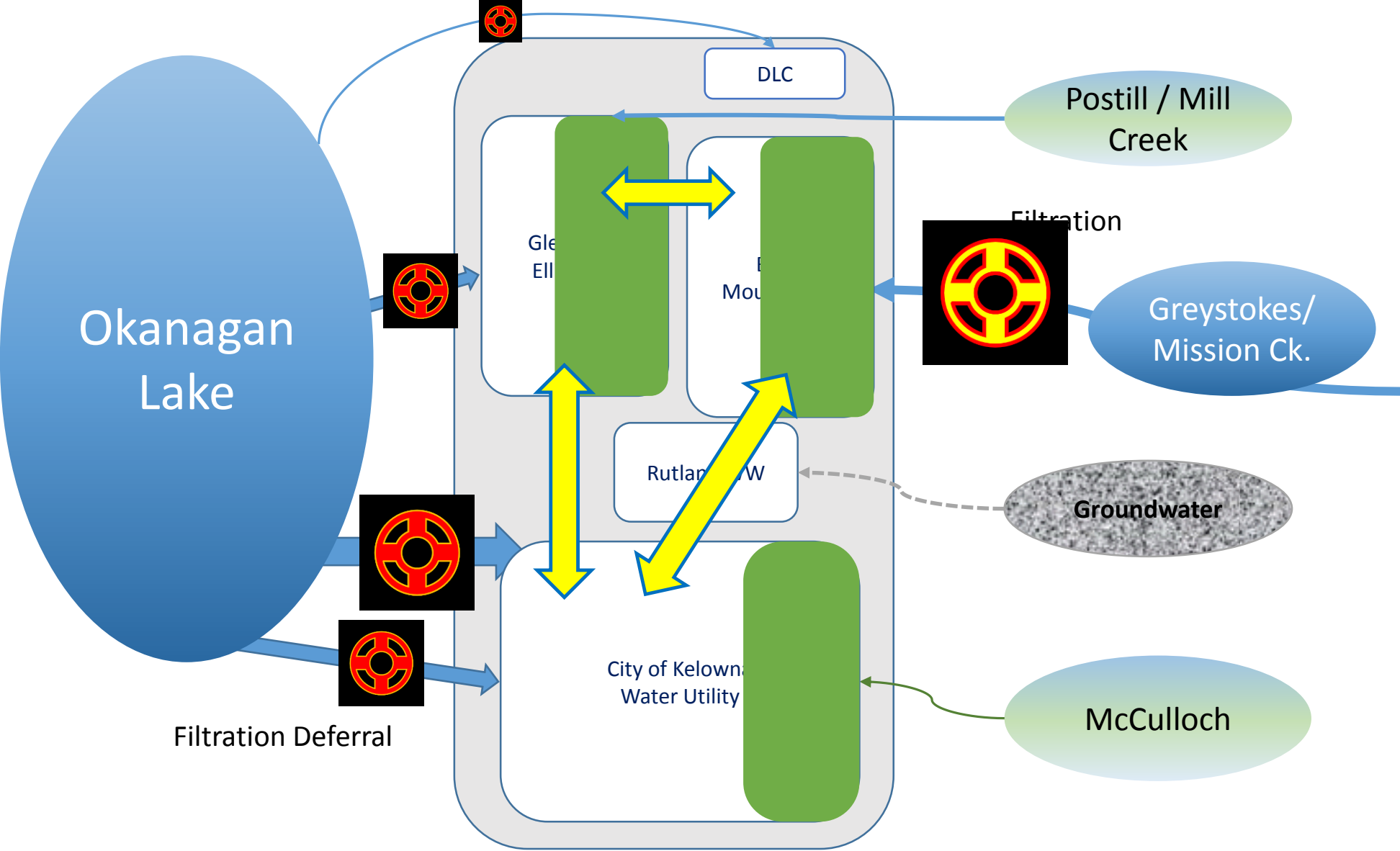
AGENDA

- Purpose
 - Kelowna Water Integration Plan
- Area Based Water Management Planning
- Sector Highlights
- Next Steps
- Questions

Water - Current

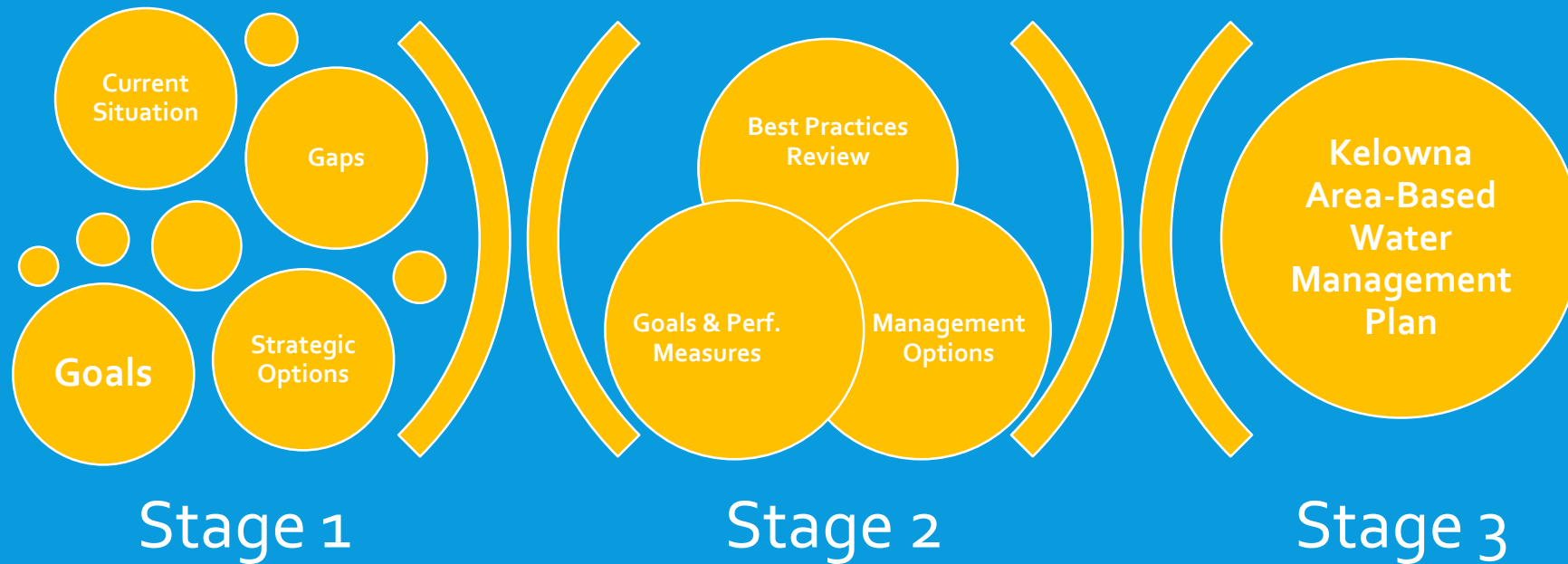


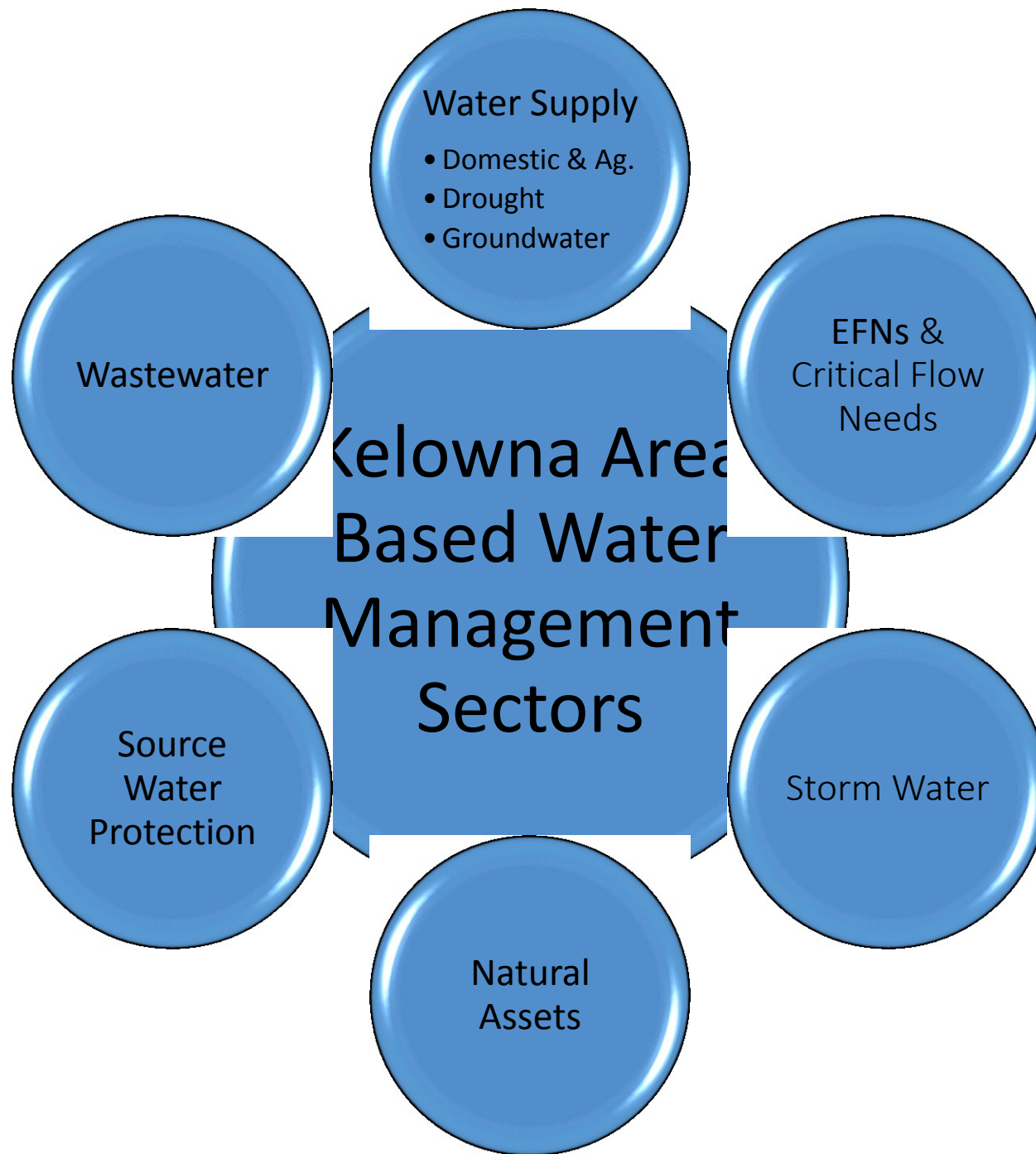
Kelowna Water Integration Plan - 2017



STRATEGIC MANAGEMENT PLANNING

A STAGED PROCESS





REFERENCES

Province of BC*

- Liaison Team
 - Ministry of MA&H
 - Ministry of E&CC
 - Ministry of FLNRORD
- Provincial policy & legislation.
- Planning & management priorities.
- PHO's Drinking Water Report

First Nations & Canada

- Canadian Drinking Water Quality Guidelines
- First Nation Principles
 - Respect for Water.
- ONA Flood & Debris Movement Study
- Fishery enhancement.



Current policy, guiding principles and current practice write-ups



Risk Registry



Provincial engagement



Stakeholder engagement



Goals and gap analysis

WORK AREAS

STAGE 1 STATUS

Work Completed - 2019

- Guiding Principles and Existing Policy Review
- Current Practice Review & Documentation
- Participant Engagement – SWOT Analysis

Near Completion - 2020

- Risk Registry
- High-level Goal Setting
- Gap Analysis
- Prioritize Best Management Practice Reviews

Water Management Risk Level Rating & Mitigation Assignments

Overall Risk Level	Strategic Plan		Priority for Action	Assigned To
EXTREME	}	Requires the attention of Area Based Water Management Plan to address	Requires action from City Council or other jurisdiction.	Mayor and City Manager.
VERY HIGH			Requires direction and long-term plan with support from multiple departments.	Senior Management Team
HIGH			Priority changes requires in 10 Yr plan and within a Division.	Division Manager
MODERATE	}	Managed within a Division or Department Plan or by others.	Issues must be addressed by assigned Division(s).	Assigned to Manager(s)
LOW				

SECTOR HIGHLIGHTS

Area Based Water Management Plan

Stage 1 – Late stage

Preliminary Goals, Gaps & Strategies

Water Supply



Safe Drinking
Water

Agriculture

Domestic Uses

Landscape Irrigation

Institutional

Industrial

Commercial

Recreation

Fire Fighting

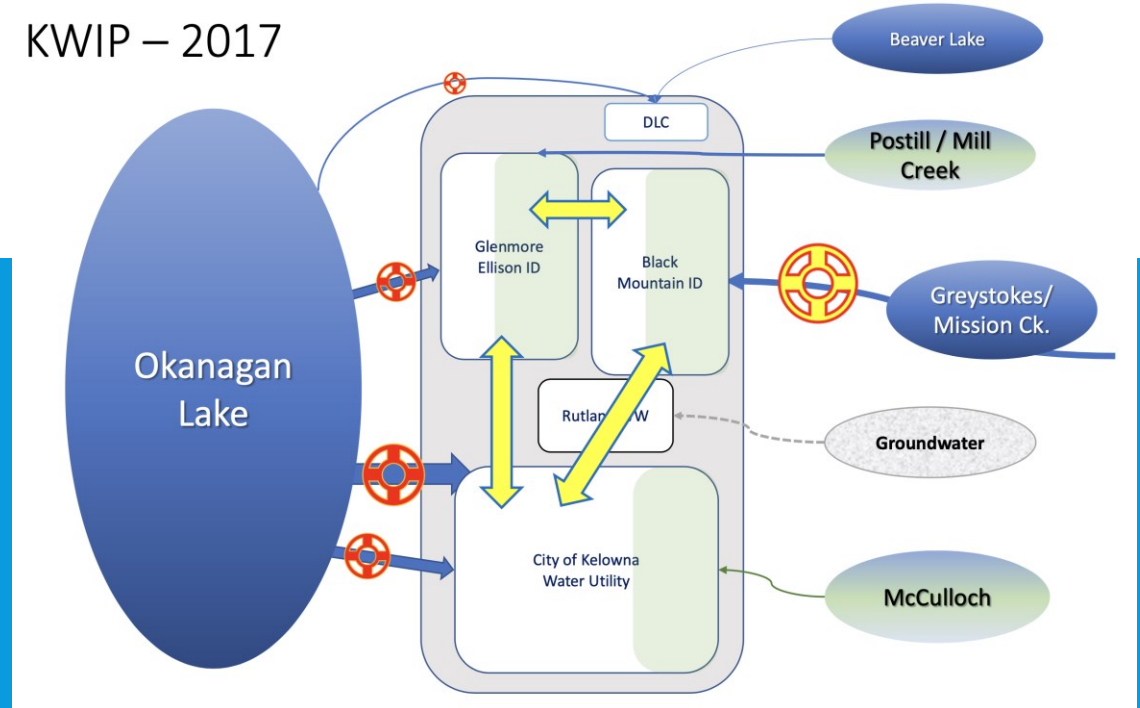
WATER SUPPLY

2040 Level of Service

All residents and customers in the City are provided a safe, resilient and sustainable supply of high-quality drinking water and a reliable supply of non-potable water for agriculture.

- Emphasis on Okanagan Lake protection.
- Multiple and interconnected suppliers.
- Domestic & agricultural capacity.
- Filtration deferral still in effect.
- Regulatory compliant and forward looking.

KWIP – 2017



Management Issues and/or Gaps:

- *Multiple water systems & sources*
- *Domestic & Agricultural Customers*
- *Differences in Water Quality*
- *Infrastructure Decisions*
- *Governance*
- *Funding*

STRATEGIES FOR KELOWNA WATER INTEGRATION PLAN (KWIP)

WATER SUPPLY

Infrastructure Plan:

- Water supply to meet growth
- Separate agricultural and domestic systems
- Water resiliency – interconnection
- Mission Creek source & treatment
- Asset replacement (independent systems)

Develop financial strategy and funding structure:

- Capital plan (10yr and 20yr)
- Asset management
- New taxation method and/or borrowing
- Senior government funding

Implementation Plan:

- Staging of integrations to match capital plans
- Funding strategy

Plan Approval – Agreement with Province

- Staging of infrastructure work
- Funding sources
- Schedule of integrations

Source Water Protection

Creek Water Quality

Okanagan Lake Water
Quality

Land Use Control

Operation Permits

Multiple Agencies with
Partial Control

Public Education

**Major Infrastructure
Implications**

SOURCE WATER PROTECTION

City Goals:

To provide a consistent water quality; whether raw or at the tap.

To establish or foster a consistent and transparent SWP management system for all Kelowna purveyors.

*SWP is the single most
complex water
management issue in the
Okanagan Valley.*

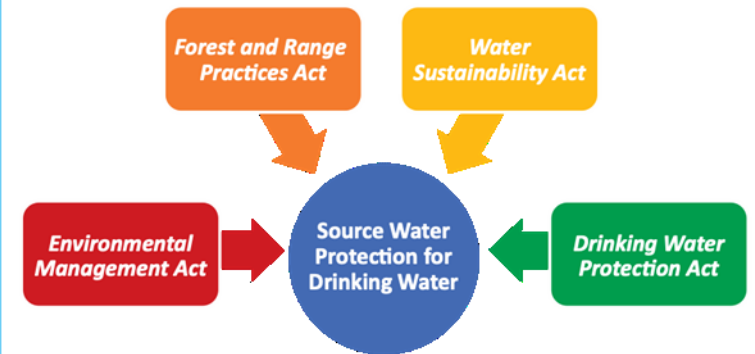
Anna Warwick Sears (OBWB)

STRATEGIES FOR KWIP

SOURCE WATER PROTECTION

- Management Issues and/or Gaps:
 - How do we protect the Lake?
 - Ensuring CDWQ guidelines given the many independent water systems in the City.
 - Lack of City control of watershed activities, land development and operations that impact water quality in creeks and Okanagan Lake.
 - Many actors with limited government oversight – forestry, farming & general public.
 - Numerous and overlapping legislation.
 - Insufficient funding and resources to date for SWP.
 - City interest in Mission Creek – KWIP vision.

Figure 4.1: Primary Legislation for Source Water Protection in BC



Source: Adapted from BC Ministry of Environment and Climate Change Strategy, Hutter (Cicoh) equifier response plan report 2008.³

STRATEGIES FOR CONSIDERATION

SOURCE WATER PROTECTION

Planning/Engineering

- Participate in source water plans that include local intakes, *headwaters and Okanagan Lake*.

Policy Governance

- *Investigate/negotiate/implement best governance and shared management approaches.*
 - *Elevate role of local stewardship /agency consortium (City, RDCO, IDs & IHA) to manage SWP in Kelowna's watersheds.*
 - *Elevate role of OBWB to manage SWP in Okanagan Lake.*

**Yellow*

Strategies developed with other jurisdictions



Environmental Flow Needs

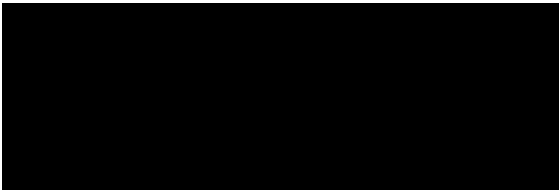
Fish & Aquatic Life

First Nations

Regulations

Water Supply Licensing





ENVIRONMENTAL/CRITICAL FLOW NEEDS

City Goals:

To assure a resilient and safe supply of water to the City.

To foster a healthy aquatic ecosystem demonstrated by regular and consistent seasonal migration of fish stocks.

Management Issues and/or Gaps:

- City operations currently only support Hydraulic Creek and lower Mission Creek flow.
- Other major creek flows supported by GEID & BMID reservoir storage release.
- Lack of common understanding on species that rely on Critical Flows, seasonal flow rate demands and ideal temperatures (include climate change).
- Impacts from regulatory changes. EFN understanding is still in infancy. Changes to regulation can be expected.
- New water licenses will require an EFN review.
- City policies require review to incorporate EFN.

STRATEGIES FOR CONSIDERATION

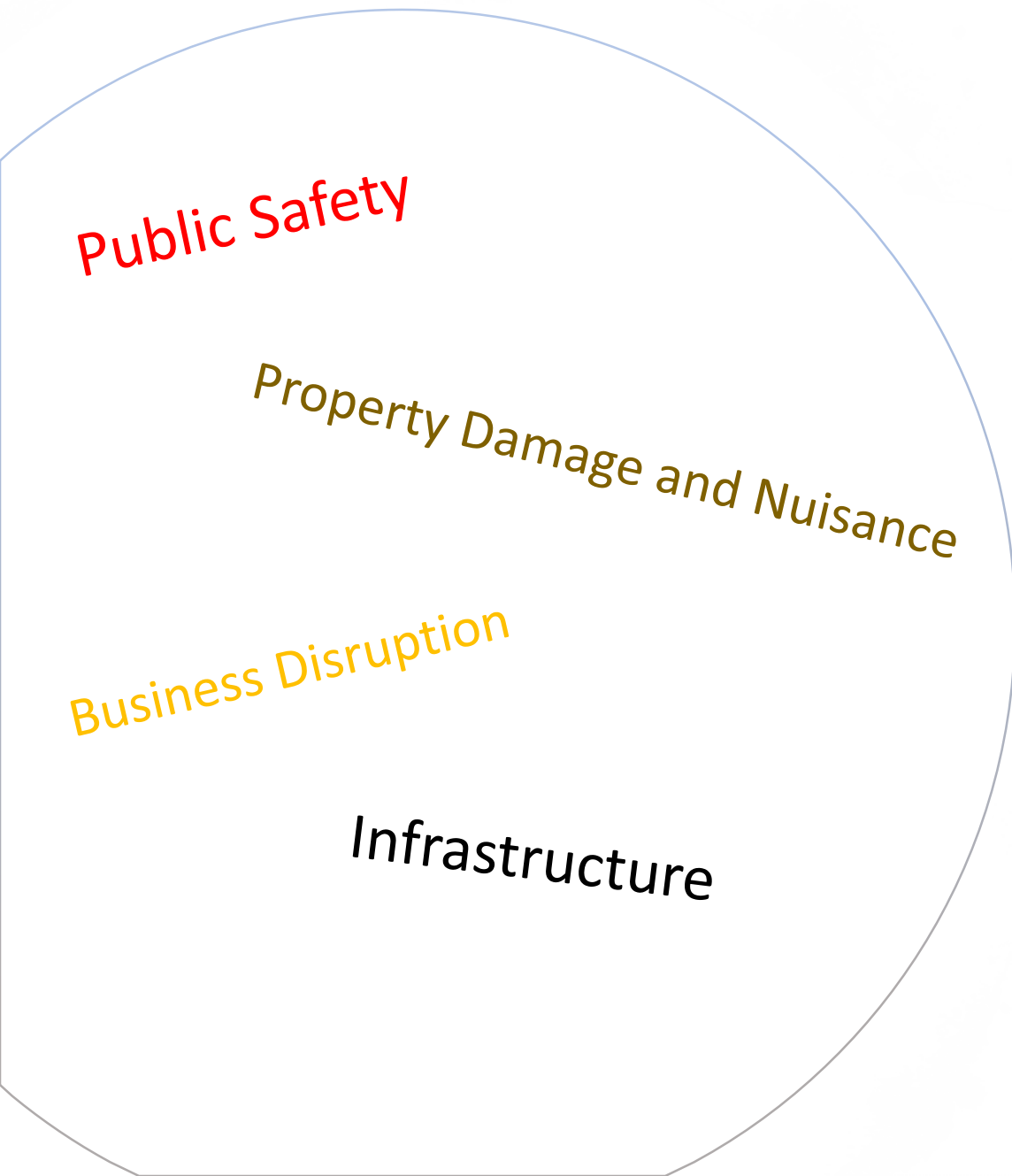
ENVIRONMENTAL/CRITICAL FLOW NEEDS

Planning/Engineering

- Educate agencies on base flow depth and temperature conditions for key natural and major water systems.
- Develop, update & implement Water Management Plans for fish-bearing creeks.
 - Identify/develop storage in headwater creeks that support flood mitigation and EFN.
 - Review headwater reservoir discharge practices.
- Plan for drought conditions and practices.

Policy & Governance

- Support aquatic enhancement within City.
- Investigate/negotiate/implement best governance/shared management approaches.



Stormwater Management

STORM WATER

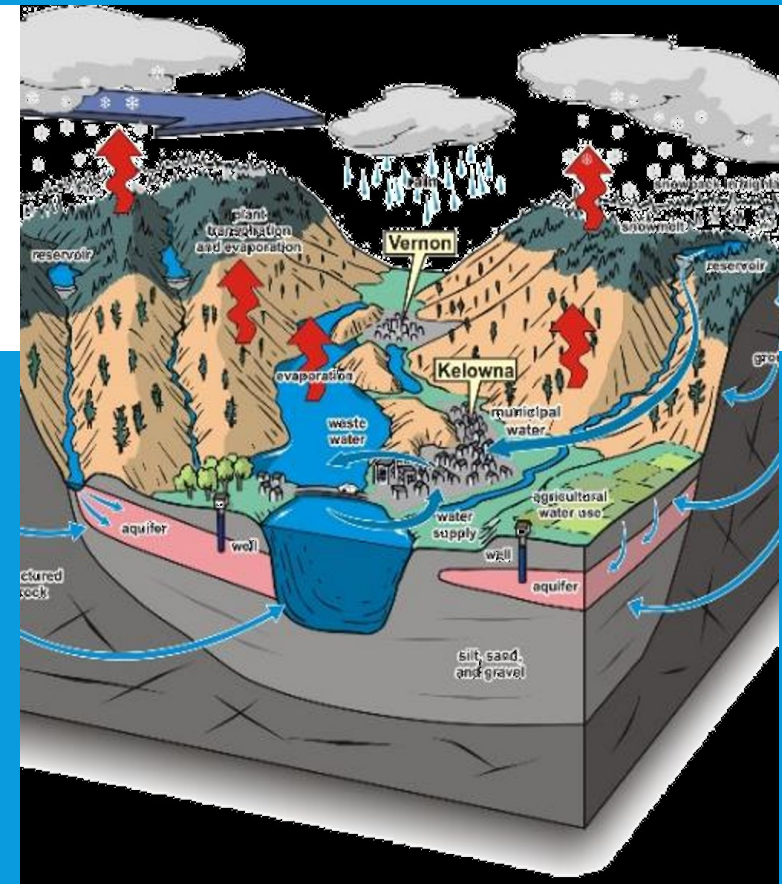
City Goals

To provide efficient and reliable minor system collection and conveyance to natural water features, thereby minimizing impact to other infrastructure, water quality and Okanagan Lake.

To plan and construct major system infrastructure to mitigate flooding, soil erosion and pollution to protect our community and preserve our natural assets.

Management Issues

- Lack of dedicated funding for Storm Water management.
- Creek water quality.
- OCP growth impact along Mill Creek.
- Lack of City control or role in headwaters outside its jurisdiction.
- Creek/flood management requires access to private property.
- Climate Change impacting peak runoff from upper watersheds.
- More frequent and intense rain events.
- Irrigation reservoirs are not purposed for flood management (peak shaving).



STRATEGIES FOR CONSIDERATION

STORM WATER

Planning/Engineering

- Work to develop & implement flood mitigation plans for all City impacted watersheds.
- Improve riparian conditions of creeks to improve flood management and water quality characteristics.
- Position City for Senior Government Grants.
- Improve stormwater management practices to reduce impacts to major creeks and Okanagan Lake.

Policy & Governance

- Achieve agency support for major system and natural asset definitions to allow maintenance of creeks and ponds.
- Provide for ground infiltration of Minor Systems where possible.

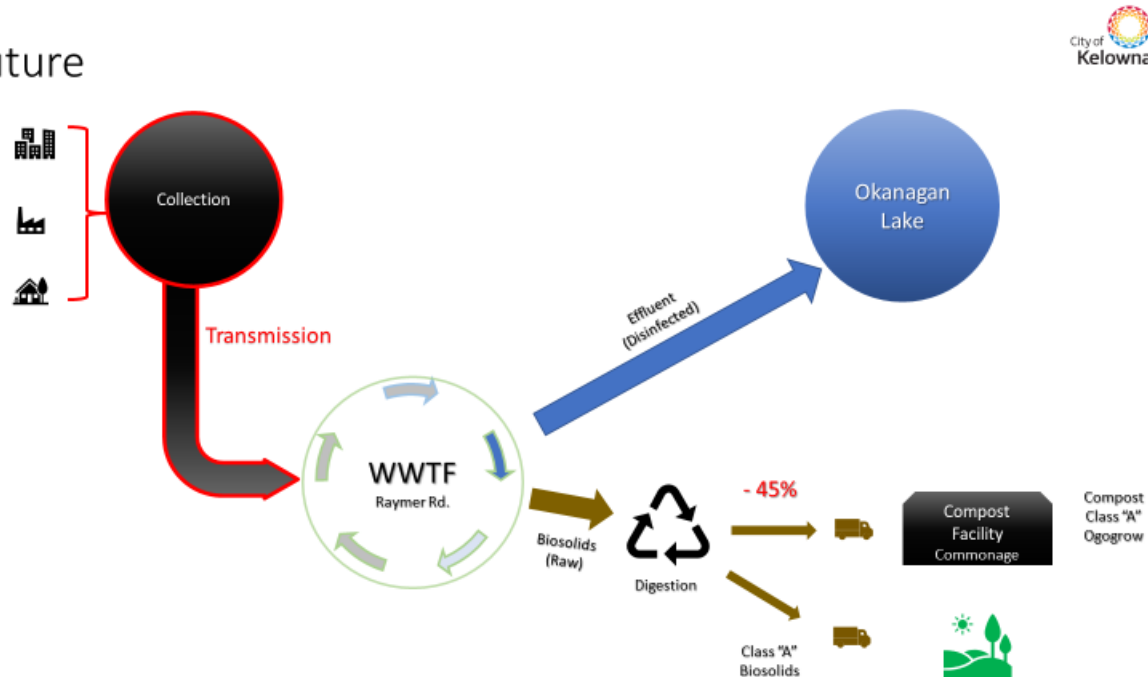


Wastewater Management

- Wastewater is a result of humans.
- It can be toxic, degrading to receiving waters and/or distasteful (ie. odour) to the public without proper treatment.
- Many communities or individuals contribute wastewater to Okanagan Lake.

WASTEWATER

Future



City Goals:

To expand and enhance a wastewater management system that is sustainable, meets the needs of the City's growth and discharges safely to Okanagan Lake.

Management Issues:

- Effluent quality to Okanagan Lake must always be excellent.
- Existing developments that are still on septic.
- Access to senior government funding.
- Biosolids Management
- BNR process is highly effective, but sensitive to shocks to the system.
- Tracking viruses or pharmaceuticals.
- The City's wastewater practice is sustainable. What about other communities?

STRATEGIES FOR CONSIDERATION

WASTEWATER

Planning/Engineering

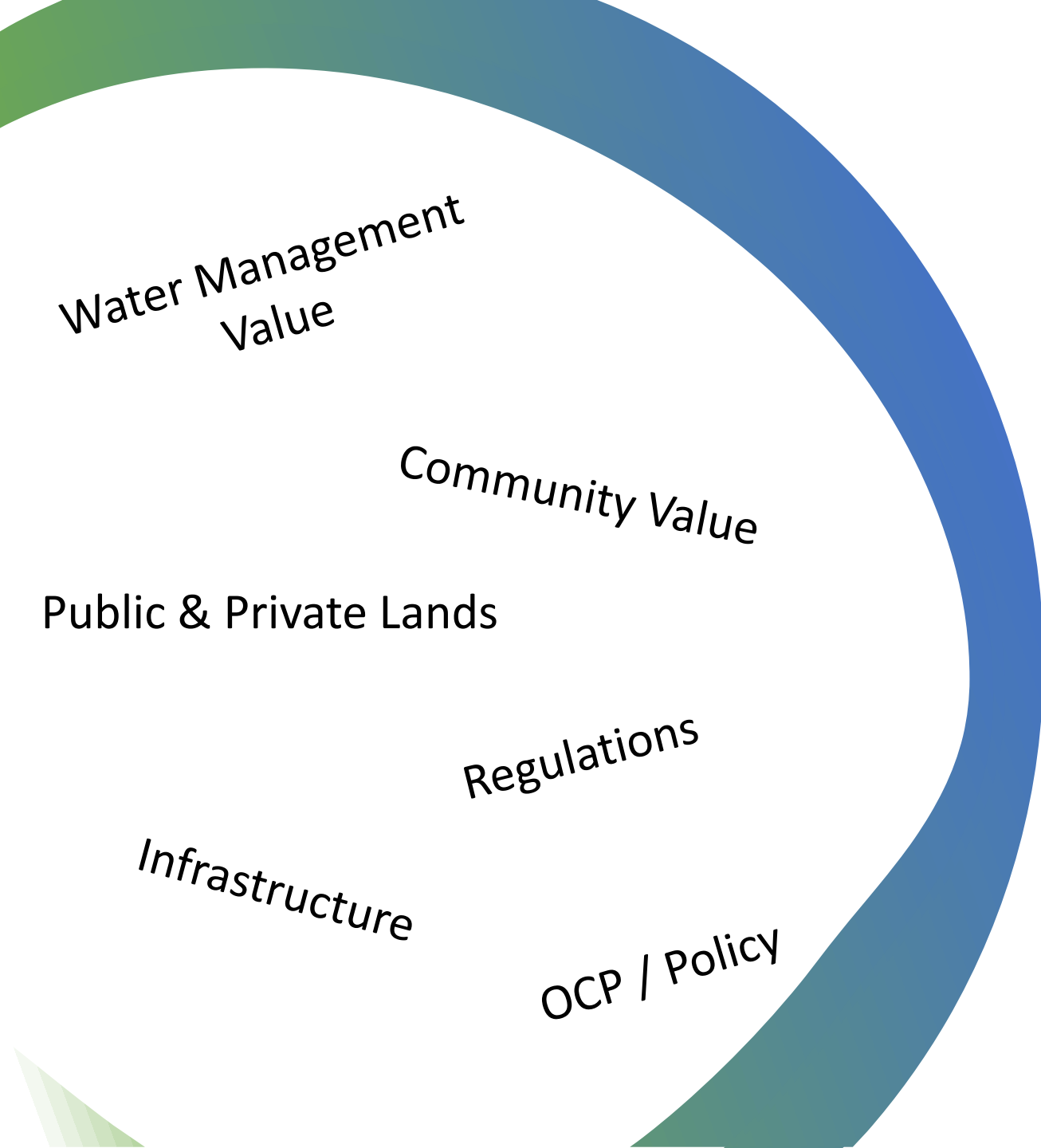
- Implementation of new Biosolids management plan (Digestion).
- Research BMP for new identified pollutants.
- Position City for Senior Government Grants.

Operational

- Improve monitoring and enforcement of illegal or extraneous inputs (Sewer Bylaw).
- Adapt wastewater treatment and discharge management/measures to match source water protection controls on Okanagan Lake.

Policy Governance

- ***Investigate best governance or shared management approaches for all jurisdictions that discharge to Okanagan Lake.***



Natural Assets

NATURAL ASSETS

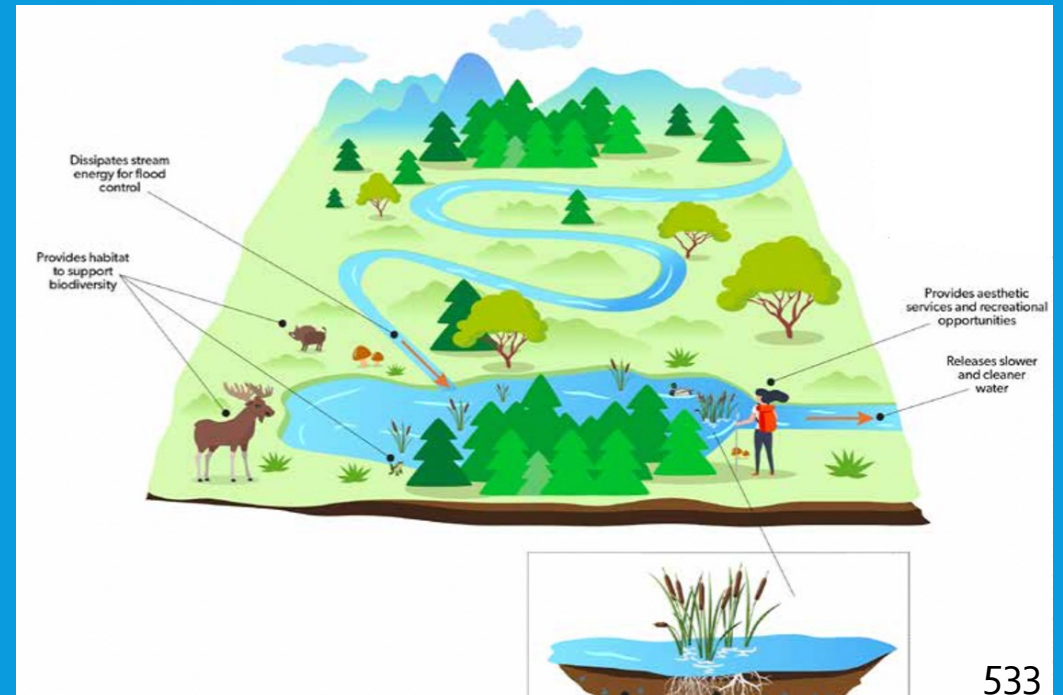
City Goals:

- To account for key natural assets in its area-based water management activities.
- To establish administrative protocols and relationships with stakeholders and others to manage NA decisions into the future.

Management Issues/Gaps:

- Accounting of Regulated vs Unregulated Natural Assets
- Clarity between regulatory constraints of Major Systems and Natural Assets
- Understanding NA values
- Governance and protection of NAs that impact the City.
- Devaluation of Natural Assets & impacts
- Incorporating NA in Asset Management

Kelowna's reputation and quality of life are dependent on our Natural Capital. We can't manage what we don't measure, and today Natural Assets are absent in the City's asset management framework.



STRATEGIES FOR CONSIDERATION

NATURAL ASSETS

Planning/Engineering

- *Improve natural asset understanding & inventory.*
- *Improve creeks and riparian areas for flood management and fish attraction.*
- *Work with the Province to define Minor, Major and Natural Assets.*

Operational

- *City involvement in watershed related activity decisions that impact water quality. Forestry, ATV, Farming, mining, etc.*
- Incorporate Natural Asset definitions into land management decision process.
- *Address natural asset management in support of Mission Creek and Okanagan Lake.*

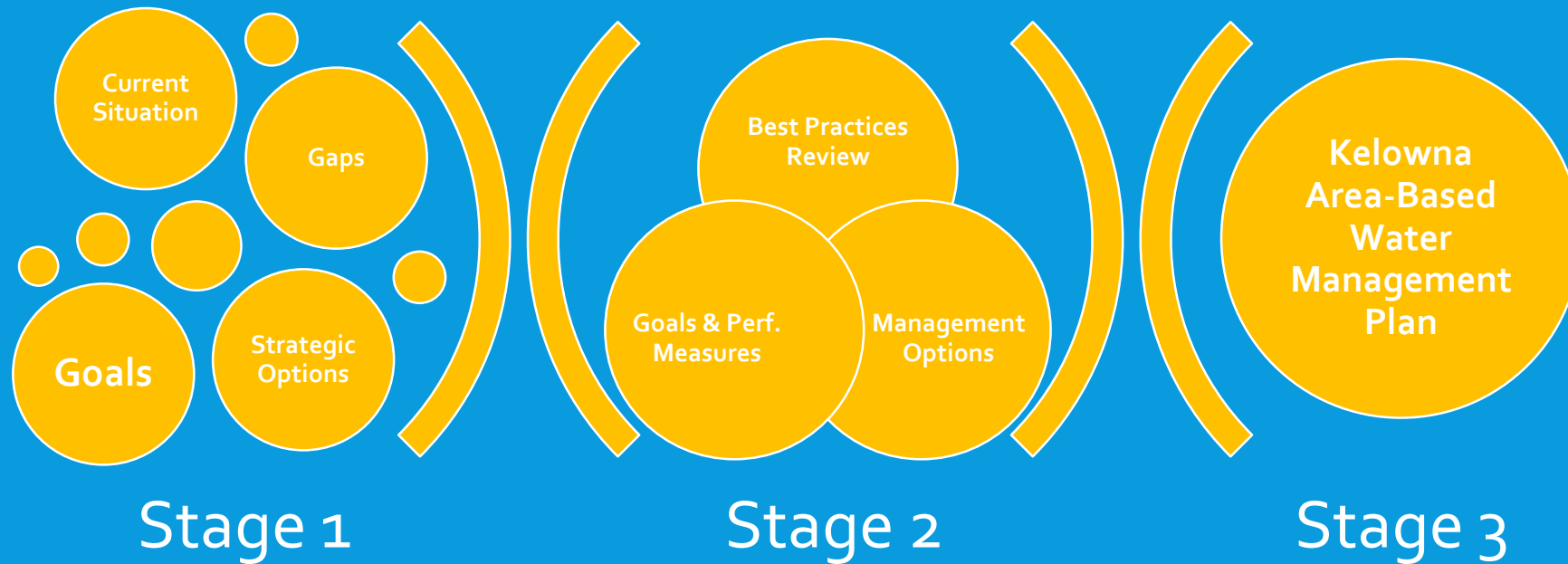
Policy Governance

- *Investigate/negotiate/implement best governance/shared management approaches.*
- Develop natural asset policy support systems for the City.

**Yellow*

Strategies developed with other jurisdictions

STRATEGIC MANAGEMENT PLANNING A STAGED PROCESS



Provincial Health Officer
Report update released 2019

Clean, Safe, and Reliable Drinking Water



An Update on
Drinking Water
Protection in BC and
the *Action Plan for
Safe Drinking Water
in British Columbia*



Office of the
Provincial Health Officer

Provincial Health Officer's Drinking
Water Report: 2012/13-2016/17

KEY PHO RECOMMENDATIONS FOR PROVINCIAL ACTION

#	Recommendation	Responsible Agency
3	Inter-agency Collaboration & Coordination: Identify a new framework for inter-agency and coordination that aligns with current structures and issues.	Ministries of Health and Environment
4	Legislative Framework Review: Evaluate available tools to protect drinking water and establish improved processes for coordinating actions to protect drinking water.	MoH, MoE&CCS, MoFLNRO&RD, IHA & drinking water agencies
5	Drinking Water Protection Plans: Review objectives and effectiveness of drinking water protection plans under existing legislation to determine if changes are needed.	MoH and PHO office.
6	Regulatory Conflict with the Water Sustainability Act: Collaborate on policy options to address regulatory conflicts between DW Act and WS Act.	MoE&CCS & MoH with regional health authorities and MoFLNRO&RD
7	Public Assent Processes & the Community Charter: Review the waiver of public assent for purposes related to treatment works for local governments. (financial staging of KWIP to include resiliency)	MoMA&H & MoH
9	Small Water System Strategy: Recommit to an oversight body to develop a small water system strategy to prevent new small systems and promote amalgamations	MoH with support from MoMA&H, MoFLNRO&RD & MoT&I
10	Amalgamation, Acquisition and Conversion: Develop and resource a strategic approach to encourage and facilitate the conversion of improvement districts.	MoMA&H
13	Source & System Assessment: Develop a work plan to ensure that all water suppliers have a source system assessment that identifies potential risks and vulnerabilities.	IHA
14	Treatment Objectives: Develop process to review water systems for conformance with BC surface groundwater treatment objectives.	MoH, MoMA&H & IHA
24	Asset Management & Financial Planning: Review training needs and develop guidance for drinking	MoH & MoMA&H in consultation

Next Steps? Develop a plan to engage the Province?

1

Assist City with staging the Kelowna Water Integration Plan.

2

Assist City to Develop and Implement Best Management Plans for Mission Creek & Mill Creek.

3

Undertake a Best Management Plan Review of Okanagan Lake Water Quality Protection.

Questions



Report to Council



Date: November 16, 2020

To: Council

From: City Manager

Subject: Bernard Avenue Road Closure – Assessment of 2020 and Recommendations for 2021

Department: Real Estate, Active Living and Culture, and Parks Planning Departments

Recommendation:

THAT Council receive, for information, the report of Real Estate, Active Living and Culture, and Parks Planning departments dated November 16, 2020, with respect to the Bernard Avenue Road Closure;

AND THAT Council direct staff to operationalize the closure of the 200 and 300 blocks of Bernard Avenue during the summer months on an annual basis;

AND THAT Council direct staff to work with stakeholders to develop and animate a demonstration “Green Street” on the 400 and 500 blocks of Bernard Avenue for the summer of 2021, as described in the Report from the Real Estate Department dated November 16, 2020;

AND FURTHER THAT Council direct staff to bring forward necessary bylaw amendments and guidelines to implement the recommendations in the report from the Real Estate, Active Living and Culture, and Parks Planning Departments dated November 16, 2020.

Purpose:

To update Council on “lessons learned” associated with the temporary vehicular closure of Bernard Avenue and to make recommendations pertaining to the on-going seasonal closure of vehicular traffic on Bernard Avenue in 2021 and beyond.

Background:

In the spring of 2020, the City of Kelowna (the “City”) made a decision to close four blocks of Bernard Avenue as part of an economic recovery tool to support local business and to increase the pedestrian realm, thereby allowing for expanded social distancing in the downtown core. This report summarizes the data and observations that were collected during this closure. As well, this report will assess the success of the initiative, lessons learned and recommendations for coming years.

Participating Businesses

Twenty-three (23) businesses within the closure area of Bernard Avenue participated in the roadway program, including 21 food establishments and 2 retailers. A total of 10,661 sq. ft. of additional patio space

was created, resulting in 443 additional restaurant seats. A breakdown of business participation by block is shown in the table below.

Block of Bernard	200	300	400	500	TOTAL
# of Participating Businesses	12	7	0	4	23

Despite the short-notice and inherent uncertainty associated with this year's pilot program, the overall feedback from participants was positive. Staff received comment that during the road closure period, the downtown was relatively vibrant, energized and had a positive atmosphere. A summary of a staff survey of businesses in the program indicated that 88% of participants experienced financial results in 2020 that were the same or better than 2019, and the same percentage of participants indicated a willingness to participate in the program again in future years.

Key Survey Results of Participating Businesses	Yes	No/Unsure
Financial results were the same or better than the summer of 2019	88%	12%
Willingness to participate in the program again	88%	12%

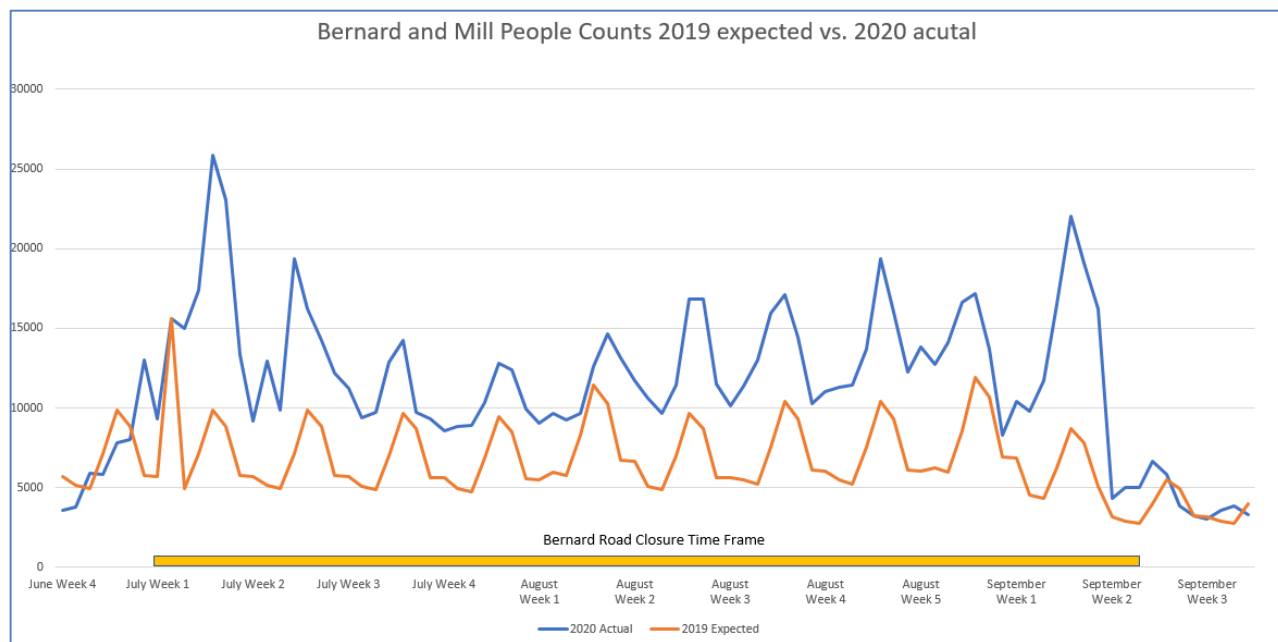
Further to the above, 53% of respondents indicated a desire to see the road closure for a longer period of time, 41% of respondents indicated a desire to see the road closure for the same length of time and 6% indicated a desire to see the closure one weekend a month. Respondents also indicated their preferred extent of the road closure as shown in the table below.

Preferred Extent of Road Closure			
From the Sails:	to Pandosy (2 blocks)	to Ellis (3 blocks)	to St. Paul (4 blocks)
Respondents	41%	35%	24%

Overall, the businesses that participated in the program were very pleased and supported this initiative taking place on an annual basis.

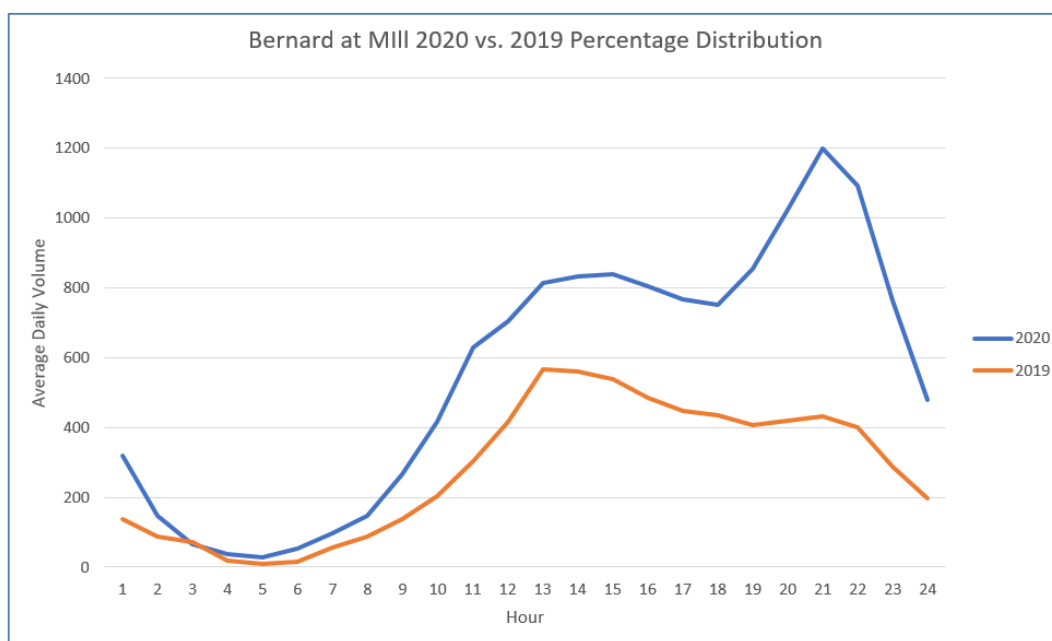
Pedestrian Activity

Nine automated pedestrian counters were placed along the corridor during the summer of 2020. These counters operated 24/7 and captured valuable data to understand patterns of activity on the corridor. The graph below shows that pedestrian counts increased dramatically with the start of the road closure period. Average pedestrian volumes were up by 88% compared to 2019's expected counts at the intersection of Bernard Avenue and Mill Street throughout the closure. Ten percent (10%) of the pedestrian activity on the road closure was comprised of bikes, skateboards and rollerblades.



Graph 1. Bernard and Mill People Counts 2019 expected vs 2020 actual

A combination of the road closure and changes in social habits due to COVID-19 influenced when pedestrians experienced Bernard Avenue. In 2019, the average daily volume peaked at 1pm. This summer, the 2019's peak was achieved two and a half hours earlier (10:30 am) and pedestrian volumes continued to grow until 9:00 pm. There were more people at Bernard and Mill over a longer period of time than historically seen.



Graph 2. Bernard at Mill 2020 vs 2019 Percentage Distribution

Public Life Observation Study

Several Staff participated in a public life study in mid-July and in mid-August between 6:00 pm and 8:00 pm on Saturday evening. The goal of the exercise was to study how the public was using the expanded space.

Key observations from the study were as follows:

- The car-free roadway:
 - Transformed the street into a park-like atmosphere with more people lingering or talking on the street.
 - Encouraged greater utilization of street furniture at corners on Bernard Avenue and highlighted the value of shady areas (e.g. street trees).
 - Created more of a seamless transition between Bernard Avenue and adjacent public spaces (City Park and Kerry Park).
- There was greater utilization of the roadway as a pedestrian thoroughfare on the busier sections of Bernard Avenue toward the sails, indicating the added pedestrian space was necessary for physical distancing.
- People were attracted to areas where there was more animation (e.g. musicians) or activity (e.g. temporary patio areas).

DKA Survey

In mid-September, the Downtown Kelowna Association (the “DKA”) surveyed its membership regarding the Bernard Avenue road closure. The survey included businesses both on Bernard (regardless of whether or not they had participated in the program) and off Bernard. A breakdown of key results for each of these areas is provided below:

Key DKA Survey Results – Members on Bernard	Yes	No	Unsure
Did the closure impact your business in a positive way?	34%	47%	19%
Should the road closure happen again?	84%	16%	
Would you like to see street vendors (if possible due to COVID)?	66%	34%	

Key DKA Survey Results – Members off of Bernard	Yes	No	Unsure
Did the closure impact your business in a positive way?	10%	51%	39%
Should the road closure happen again?	87%		13%
Would you like to see street vendors (if possible due to COVID)?	79%	11%	

As anticipated, the positive impact of the road closure was more significant for businesses on Bernard than businesses off of Bernard. Both groups overwhelmingly indicated a desire to see the closure happen again, with a strong willingness to seeing street vendors animate the road closure area.

The DKAs letter of support with respect to the recommendations in this report is attached as Schedule A.

Community Safety

There were no substantive concerns from a community safety perspective, RCMP and City Bylaws, regarding the road closure this summer.

Tourism Kelowna

Tourism Kelowna was contacted regarding the Bernard Avenue pedestrian zone. Tourism Kelowna indicated that they “received many positive comments about the atmosphere and general feel of the downtown during the closure of Bernard Avenue.”

Tourism Kelowna has offered a letter of support (Schedule B) for the City of Kelowna to consider a pedestrian friendly Bernard Avenue program in future years. In the letter they mention the positive comments their staff received while manning the tourism cart on the 400 block of Bernard Avenue in August. Residents and visitors appreciated the opportunity to ask questions, enjoy the music, or speak with business they might not have seen in previous years when Bernard Avenue was open to cars.

Overall, Tourism Kelowna felt that the Bernard Avenue road closure had a positive effect on Downtown Kelowna and would like it to continue in some form or another in future years.

Discussion:

The 2020 Bernard Avenue road closure was precipitated by a response from the need to take innovative action in regard to economic recovery and social distancing. It was planned swiftly and without the full understanding of how COVID-19 would impact the program. Throughout the summer, businesses and the general community were faced with uncertainty regarding how to safely respond to changing government mandates concerning social distancing and the prevention of COVID-19 during the pandemic.

As such, this year’s experience was not necessarily reflective of the road closure experience in a non-COVID environment and shouldn’t be indicative of the program in future years. That said, key lessons learned this year and outlined below will help guide future planning. A summary of these key lessons is as follows:

Topic:	Lessons Learned:
Traffic Management Plan	A traffic management plan with greater detail needs to be created to ensure adequate signage regarding the road closure, particularly for vehicles coming off of the highway.
Concrete Barricades	The concrete barricades at the active intersections created safety within the pedestrian zone; however, Staff feel that more aesthetically pleasing solutions could be pursued to accomplish similar objectives.
Signage Where Pedestrian Zone Meets Active Intersection.	Maintaining active cross streets is important for the vehicular functionality of the remainder of downtown. Staff feel additional solutions would be warranted to increase pedestrian awareness at active intersections.
Sidewalk and Roadway	With increased pedestrians and takeout food, there is a need for

Cleanliness	additional street and sidewalk cleaning and emptying of garbage cans.
Type of program for road closure should be reflective of businesses on the roadway	The 200 and 300 blocks of Bernard, which contain a significant number of restaurants close together, organically embraced the road closure. The energy and vibrancy felt natural and didn't require extra resources to program the space. The 400 and 500 blocks require additional programming to make the space feel vibrant and lively.
Space in front of retail business may need to be programmed	While businesses will be given priority to the space in front of their brick-and-mortar location, Staff acknowledge that future initiatives should be devised to animate the roadway in front of retail businesses that do not participate in the program.

200 and 300 Block of Bernard Avenue:

Assessment of 2020

Based on the preceding discussion, Staff feel that the 2020 Bernard Avenue road closure pilot experience was proven to be successful for the 200 and 300 blocks of the roadway. With the simple act of closing the roadway and creating a safe zone for businesses and pedestrians, the street was transformed into a public plaza, which became an extension of City Park. Participating business were generally very pleased and support this initiative becoming an annual event.

Recommendation for 2021 and Beyond

Given the success of the program in 2020, Staff's recommendation is to make the closure an annual event overseen by the Active Living and Culture Department (ALC), who will engage the necessary stakeholders regarding the logistics and implementation associated with the road closure. The City's Property Management department would maintain involvement regarding approving and regulating patios as per the regulations of the City's Consolidated Sidewalk Patio Program.

400 and 500 Block of Bernard Avenue:

Assessment of 2020

The 2020 pilot program revealed a number of challenges associated with the closure of Bernard Avenue in the 400 and 500 blocks, largely as a result of the limited number of food and beverage establishments which were critical to the program's success in the 200 and 300 blocks. While the program was intended to provide space for retail establishments to expand and use the roadway, retailer businesses found it difficult to take advantage of this opportunity due to staffing and the additional expenses associated with protecting their merchandise. The trial experience in 2020 suggests that additional programming and animation is required to make the closure of these two blocks vibrant and successful.

Recommendation for 2021

Throughout the world, cities and towns are taking their parks to the streets, as a result of greater constraints in urban environments. COVID-19 has accelerated and emphasized the need for streetscapes and laneways to function beyond the requirements of the automobile. Outdoor movies, social distanced

hockey nights, and outdoor game nights are some examples of activities taken to the street. Through the pandemic, residents are looking with a new perspective to these spaces as social and interactive opportunities.

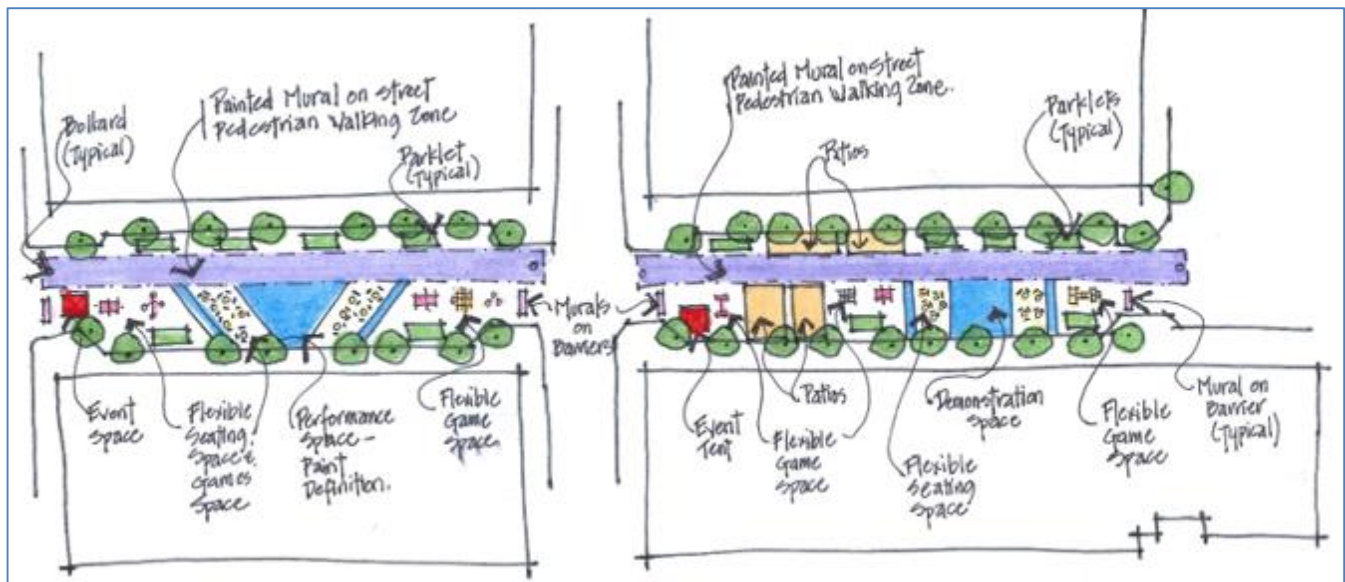
This is a timely change in perspective as we embark towards greater urban density in our City, with a trajectory of less outdoor space per person, and with many residents who will be relying more and more on public outdoor space for recreation. With this increased reliance comes the demand of providing traditional park space at urban land values, and the corresponding challenges therein. In light of these changes, the vehicular closure of Bernard Avenue presents a unique demonstration opportunity to illustrate first-hand how streets can be enjoyed as park space.

Accordingly, Staff propose developing the 400 and 500 blocks of Bernard Avenue as a demonstration "Green Street". The objective would be to design and install physical elements creating an inviting outdoor 'living room'. Such assets may include: parklets, murals, public art, pianos, bike racks, busking stops, etc. Additionally, the City's Outdoor Events team would work with various community stakeholders to animate the roadway and provide COVID compliant programming.

Four distinct components will be considered as part of the proposed Green Street Project:

- Component 1 – provide an opportunity for businesses to expand into the patio space, as was done this year.
- Component 2 – incorporate elements such as parklets¹ and street painting.
- Component 3 – provide flexible games and furniture
- Component 4 – provide additional animation opportunities through designated programming areas.

A high-level concept of the proposed "Green Street" on the 400 and 500 blocks of Bernard Avenue is provided below.



¹ Small pop-up parks, approximately the size of a parking stall, that are publicly available for use.

Financial/Budgetary Considerations:

Staff anticipate total costs associated with a closure of Bernard Avenue – not including the elements associated with the proposed “Green Street” – to be in the range of \$15,000. This includes items such as additional cleaning, waste removal, fencing, planters, additional security, and installation of signage and barriers. As revenue associated with the expanded patio program is in the range of \$15,000, there is no net taxation impact associated with the closure of the 200 and 300 blocks of Bernard Avenue.

With respect to the 400 and 500 blocks, Staff anticipate the “Green Street” to increase the overall costs of the initiative by approximately \$25,000. These additional resources would be used to not only create elements such as the parklets, street painting, street furniture, trees, etc. but also animate the space with unique programming opportunities, crucial to the success of the road closure. It should be noted that Staff believe that a number of the key physical elements associated with the “Green Street” could be funded by sponsorships; accordingly, net costs associated with this initiative may be further reduced.

Conclusion

Main streets and traditional downtowns are at the heart of communities. Our downtown is arguably the heart of Kelowna, a social and commercial hub that serves the City as a whole. Investments in downtown have been shown to drive tourism, community engagement, and civic pride.

While the Bernard Avenue road closure originated as an economic recovery tool, it has evolved into a mechanism to animate and create vibrancy along the main street. The recommendations presented in this report build upon the experience and lessons learned this past summer and are specific to the two distinct sections of the road closure area. The proposed Green Street concept is an innovative and necessary step forward regarding how the public views and interacts with streetscapes. Further, the demonstration project aligns with the Imagine Kelowna’s principles of becoming a collaborative, connected, responsible, and smarter community.

Next steps involve staff convening with key stakeholders to begin the design work for the Green Street space and commence the program planning process. It’s important to note that the COVID-19 pandemic is unpredictable and may impact the 2021 program delivery model. That said, program plans will be developed to align with provincial health guidelines and provide safe and effective animation of the space.

Internal Circulation:

Finance
Community Safety
Transportation
Parking
Partnerships

Considerations not applicable to this report:

Legal/Statutory Authority:
Legal/Statutory Procedural Requirements:
Existing Policy:
External Agency/Public Comments:
Communications Comments:

Submitted by: J. Adamson, Property Management
D. Nicholas, Active Living and Culture
M. Steppuhn, Parks Planning

Approved for inclusion: J. Säufferer, Department Manager, Real Estate Services

Attachments: 1. Schedule A –DKA, Letter of Support
2. Schedule B – Tourism Kelowna, Letter of Support
3. Schedule C – PowerPoint Presentation

November 10, 2020

City of Kelowna
1435 Water Street
Kelowna, B.C. V1Y 1J4

Dear Mayor and Council and JoAnne Adamson,

The Downtown Kelowna Association (DKA) represents businesses and commercial property owners in the Downtown core of our City. The DKA acts in the best interests of our members to promote Downtown Kelowna as a thriving place to work, live and play.

The closure of Bernard Avenue from Sails to St Paul this summer was met with mixed reviews at its outset. Traffic during the first two weeks was exceptionally busy until the public announcement of Covid-19 in the Downtown area occurred. It subsequently took some time to rebuild traffic.

We appreciate participating and being provided the opportunity to offer suggestions, ideas, and concerns about the possibilities for further closures next year and in the future. We welcome all opportunities to be involved with discussions of projects that directly affect Downtown Kelowna.

In September, we executed a survey with the membership of the DKA to gather information about this year's closure from Sails to St Paul. The survey was split in two with one version for Bernard businesses and the other for all other businesses within the borders of the Association. Results were positive, for the most part, of closing Bernard Avenue and creating the pedestrian walkway.

In the results of the survey, businesses on Bernard are in support of closing Bernard again in 2021 in the 200 & 300 blocks from the Sails through to Pandosy. 57.9% support this idea while only 13% supported repeating the closure through to St Paul. Therefore, the DKA supports another temporary closure of Bernard Avenue from Sails to Pandosy in 2021. This would include the portion of Abbott from Bernard to Lawrence and Mill Street to the laneway behind Kelly O'Bryans. Further, we make note that this area needs more attention paid to cleanliness. The DKA can only do so much as this section of Bernard was the busiest during the closure and we do not have the equipment or personnel to stay ahead while still addressing issues of cleanliness in the rest of Downtown Kelowna.

The largest concern voiced by membership, particularly in the 400 and 500 blocks of Bernard, was the lack of consultation prior to the 2020 closure. While participating

restaurants and some businesses were positive about the closure in these blocks, the underlying comments referred to the lack of consultation, lack of programming, and lack of activity during the period of the closure. This resulted in what is felt was a lack of traffic in these 2 blocks. In the Report to Council, the suggestion is to create a “Green Street Project” in these blocks. In the description, plans are presented in 4 components with imagery of the vision. While the proposal addresses the concerns, we feel that consultation with the businesses in these blocks is necessary prior to committing to closing the 400 and 500 blocks in 2021.

The DKA continues to support the allowance for food service establishments to expand their patio spaces beyond their current footprint again in 2021. We support this allowance for all food service in Downtown Kelowna, not only on Bernard Avenue.

The Downtown Kelowna Association appreciates the consideration given to all Downtown businesses with this project as ultimately all businesses are affected when any road is closed in Downtown. We look forward to continuing to work with the City on projects that enhance the experience of shopping, living, and working in Downtown Kelowna.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mark Burley". The signature is fluid and cursive, with the first name "Mark" and last name "Burley" clearly distinguishable.

Mark Burley
Executive Director, Downtown Kelowna Association

JoAnne Adamson
Manager, Property Management – City of Kelowna

Dear Ms Adamson:

We would like to take this opportunity to share some feedback of the City's Bernard Avenue closure and patio program in 2020.

We received many positive comments about the atmosphere and general feel of the downtown during the closure of Bernard Avenue. These comments were received by residents, visitors, volunteers and staff alike. Our staff and volunteers were out and about almost every day on breaks to enjoy coffee or the atmosphere along the closed portion of Bernard. One visitor made the correlation that on Sunday it was possible to visit a market with fresh Okanagan fruits and vegetables at one end of the street, and then walk down and dine in a restaurant featuring similar product just a few steps away.

Although difficult to plan and manage due to COVID-19 the activation block became another very positive and vibrant space when the performers or Downtown Kelowna Association vendor booths were installed. When our staff and volunteers were on site with our mobile visitor centre they chatted with many residents and visitors that appreciated the opportunity to ask questions, enjoy the music, or speak with businesses they might not have seen while walking Bernard Avenue.

Tourism Kelowna also participated in the patio program this year to expand our service area due to the limited capacity inside of our building. This additional outdoor space allowed us to service more visitors and residents while ensuring proper physical distancing and other safety protocols. Our summer would not have been as successful as it was without this additional space.

Given public health announcements regarding COVID-19 cases linked to Kelowna, the closure of Bernard Avenue, or the wildfire smoke seen in the late summer, it was very difficult to tell what factors were overall influencing the number of people visiting our centre week over week. We found that although our traffic drastically decreased in 2020 compared to the same months in 2019, our average daily traffic remained quite steady from our re-opening date on June 28, until mid-September.

Tourism Kelowna supports the City Staff recommendation to council to turn the closure of the 200 & 300 block of Bernard Avenue into an annual event in the summer months. We also support the trial of a green streets initiative on the 400 & 500 block of Bernard Ave for the summer of 2021. Following consultation of businesses on these blocks we believe these initiatives will enhance the Downtown Kelowna experience for visitors to our city and also enhance the quality of life for local residents.

Sincerely,

Chris Lewis
Director of Visitor Experience



City of
Kelowna

Bernard Avenue Road Closure

Review of 2020 and Recommendations for 2021

November 16, 2020

Participating Businesses



Block of Bernard	# of Participating Businesses
200	12
300	7
400	0
500	4

10,661 sf
Patio
Space

443
Seats

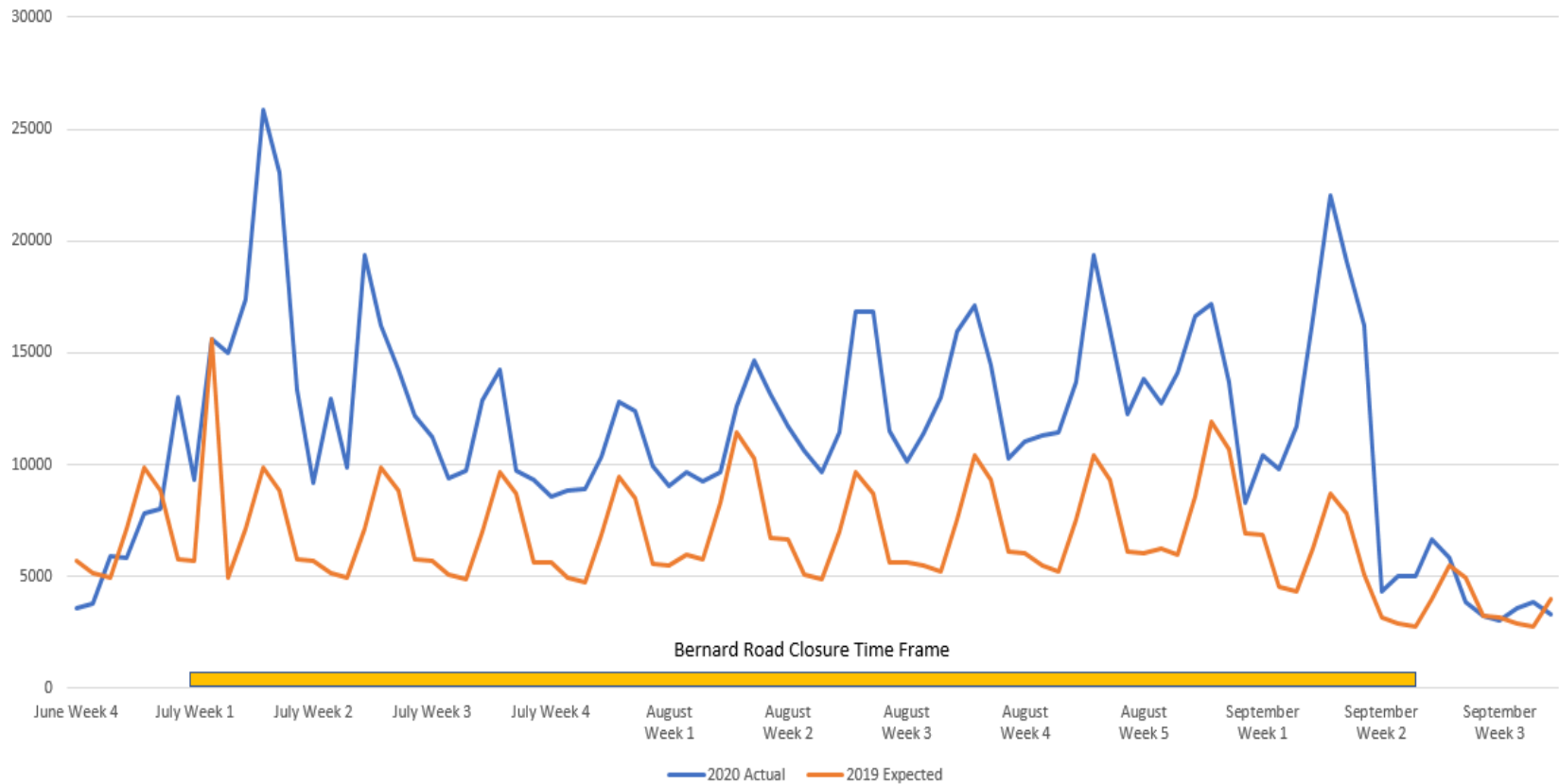
Participating Businesses – Key Results

	Yes	No/Unsure
Financial results were the same or better than the summer of 2019	88%	12%
Willingness to participate in the program again	88%	12%

Preferred Extent of Road Closure			
From the Sails:	to Pandosy (2 blocks)	to Ellis (3 blocks)	to St. Paul (4 blocks)
Respondents	41%	35%	24%

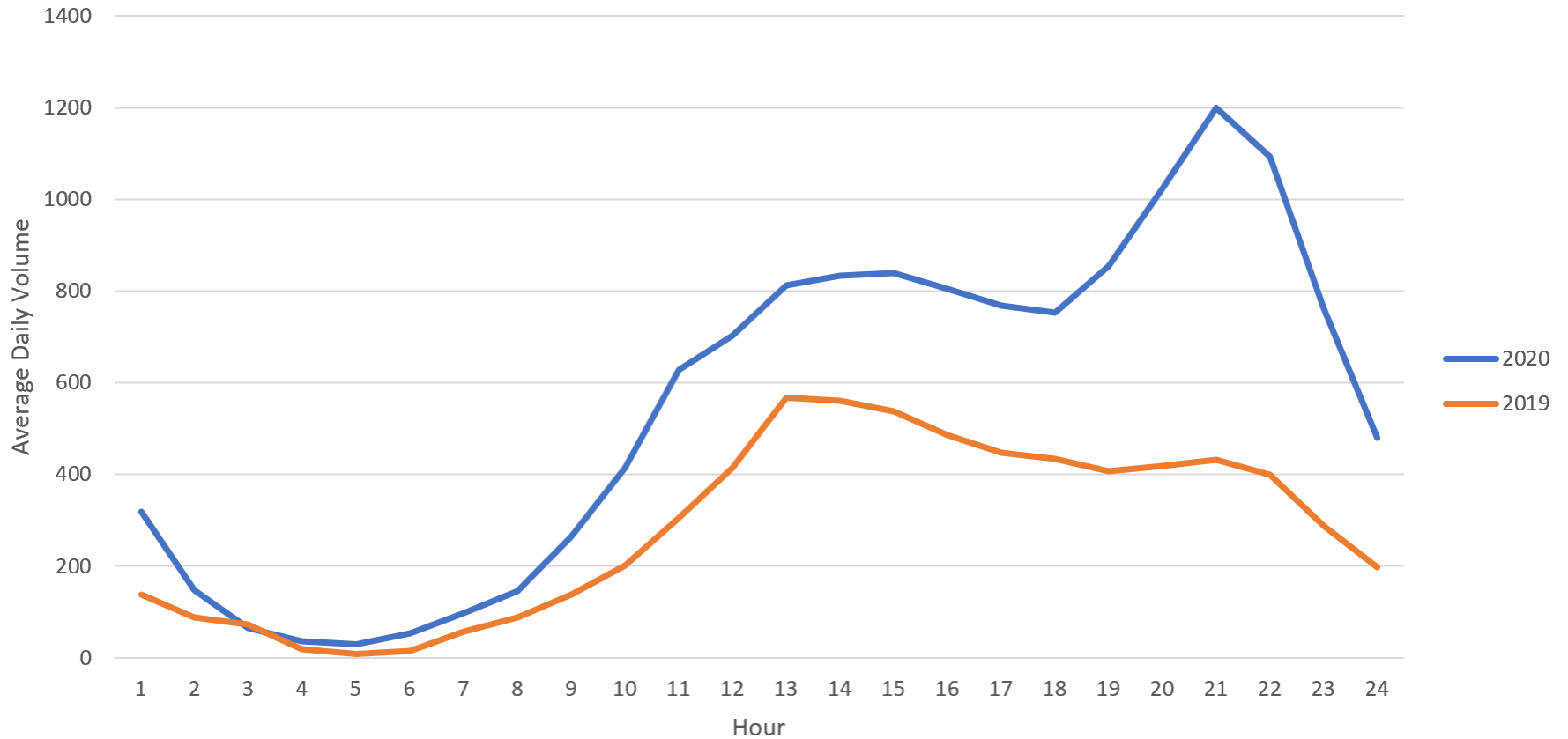
Pedestrian Activity

Bernard and Mill People Counts 2019 expected vs. 2020 actual



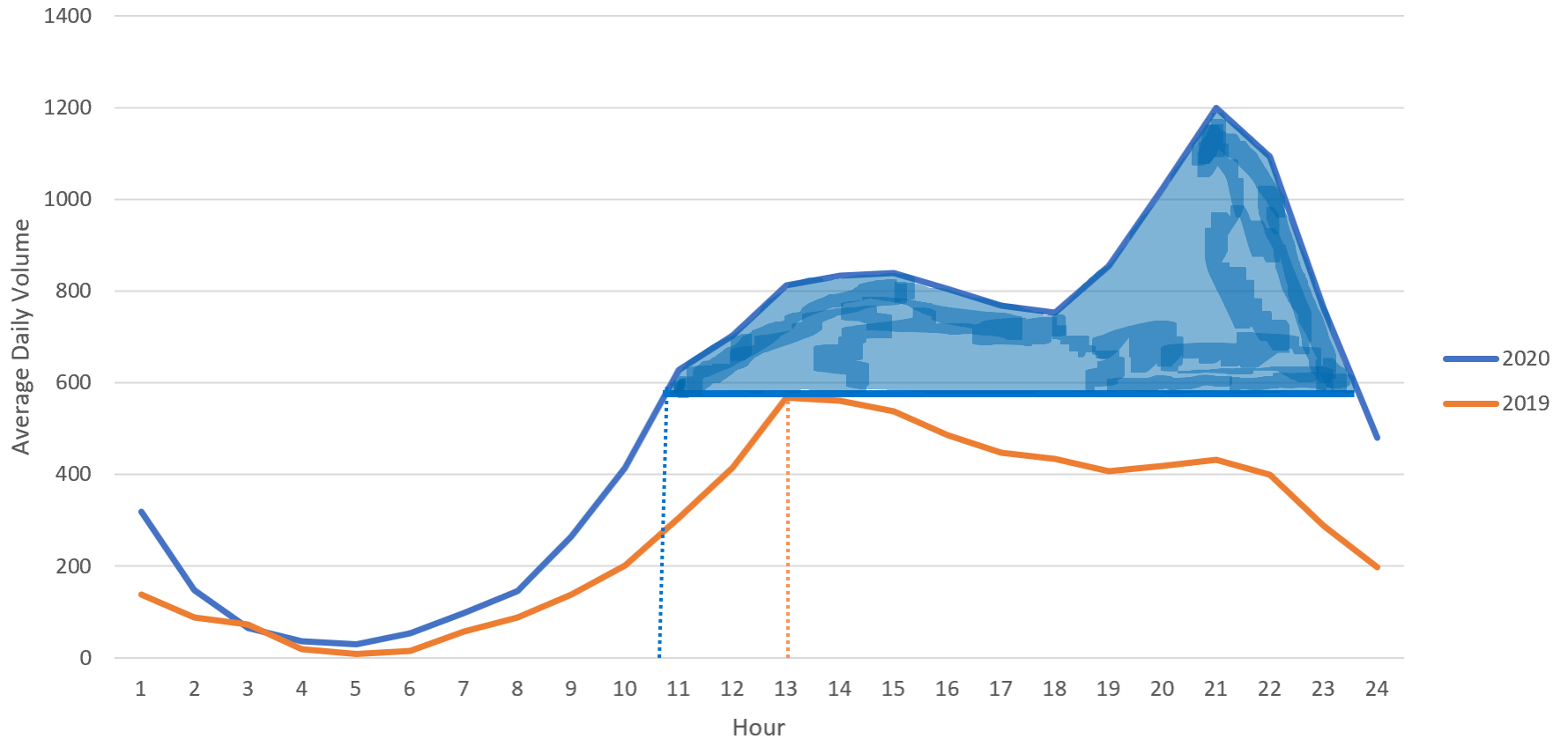
Pedestrian Activity

Bernard at Mill 2020 vs. 2019 Percentage Distribution



Pedestrian Activity

Bernard at Mill 2020 vs. 2019 Percentage Distribution





DKA Survey – Key Results

Members on Bernard	Yes	No	Unsure
Did the closure impact your business in a positive way?	34%	47%	19%
Should the road closure happen again?	84%	16%	
Would you like to see street vendors (if possible due to COVID)?	66%	34%	

Members off of Bernard	Yes	No	Unsure
Did the closure impact your business in a positive way?	10%	51%	39%
Should the road closure happen again?	87%		13%
Would you like to see street vendors (if possible due to COVID)?	79%	11%	

Community Safety



Tourism Kelowna

- ▶ Received many positive comments regarding the closure
- ▶ Had a tourism cart on 400 block in August
- ▶ Would like to see the road closure continue in some form in future years



Lessons Learned

- ❖ Traffic Management Plan
- ❖ Concrete Barricades



- ❖ Signage Where Pedestrian Zone Meets Active Intersection
- ❖ Sidewalk and Roadway Cleanliness



Lessons Learned

- ❖ Type of program for road closure should be reflective of businesses on the roadway
- ❖ Space in front of retail business may need to be programmed

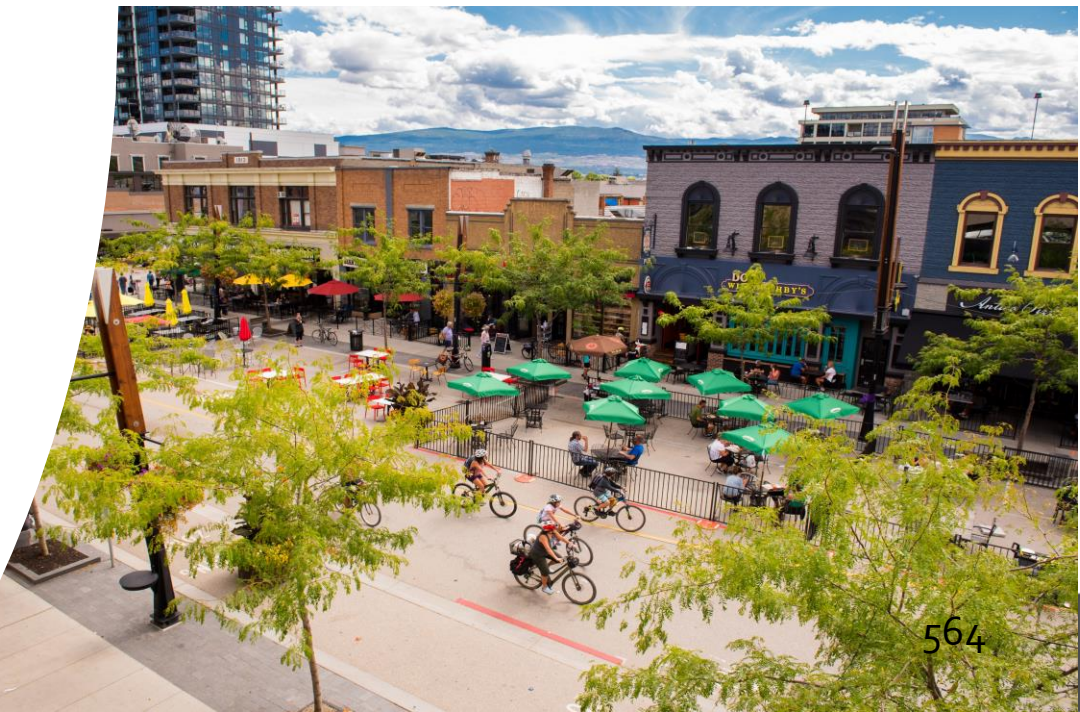


200 & 300 Block

- ▶ Majority of businesses naturally embraced the road closure and patio program
- ▶ Participating businesses want to program to continue

Staff recommendation:

Make the road closure an annual summer event on these two blocks



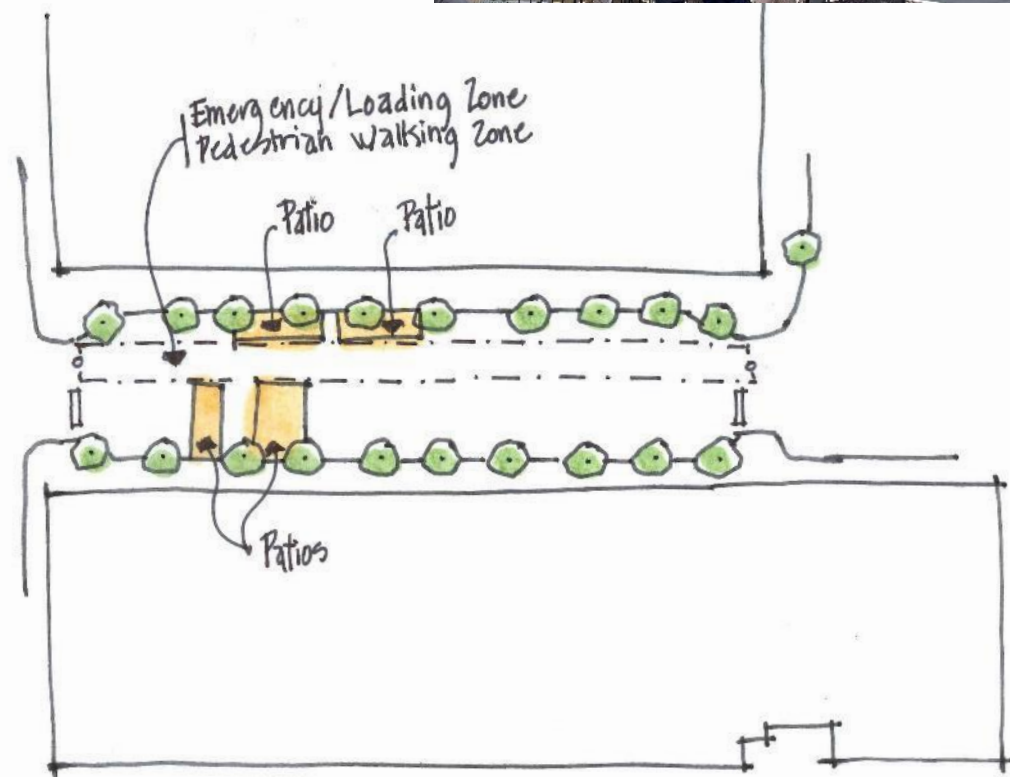
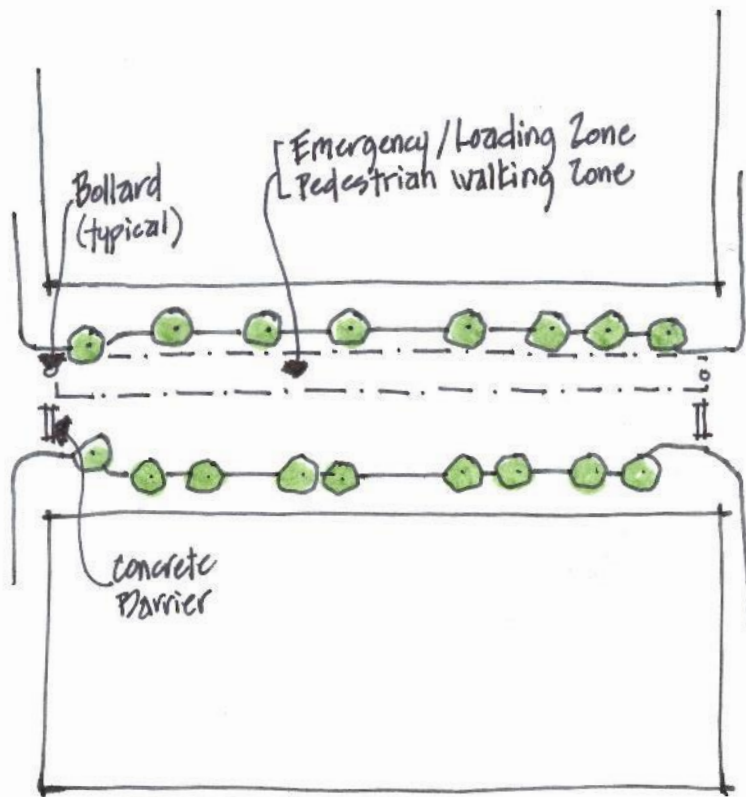
400 & 500 Block

- ▶ Majority of businesses found it a challenge to animate the roadway
- ▶ A lot of underutilized roadway
- ▶ To create vibrancy, the space requires programming



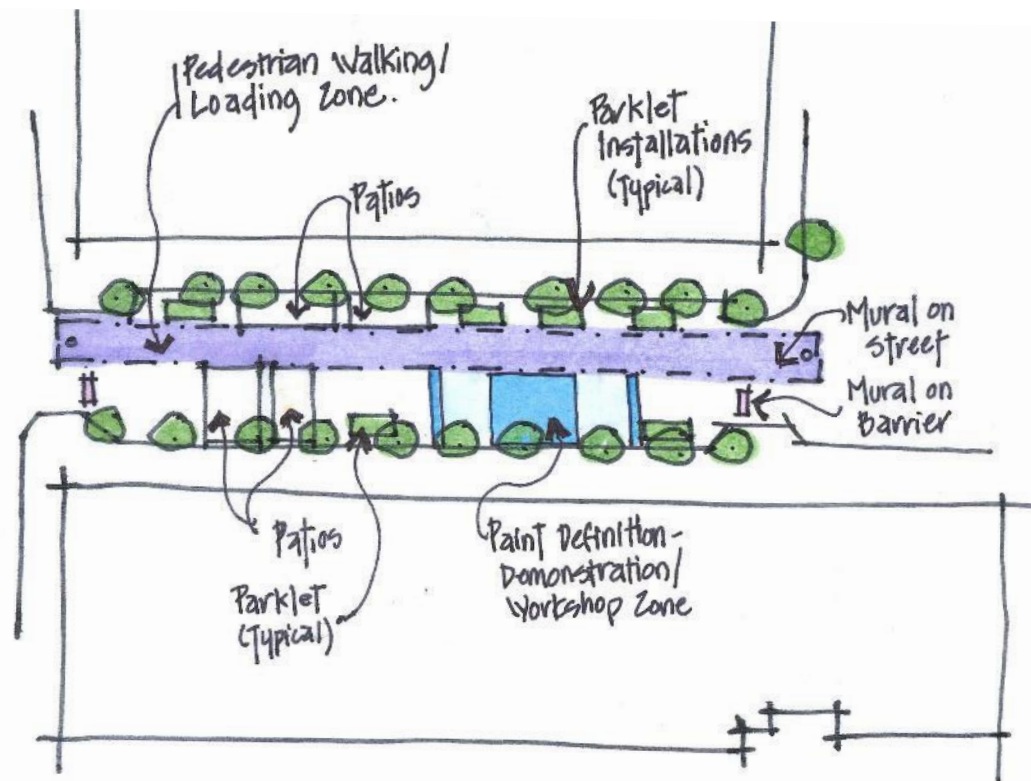
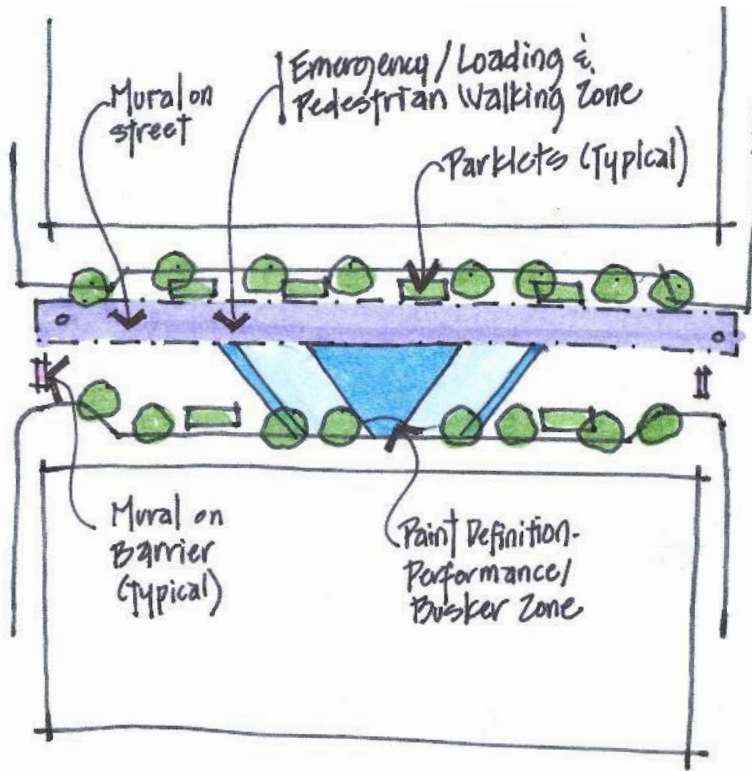
A new concept for 400 and 500 Block of Bernard

+ Patios – 500 Block (4)



+ Patios

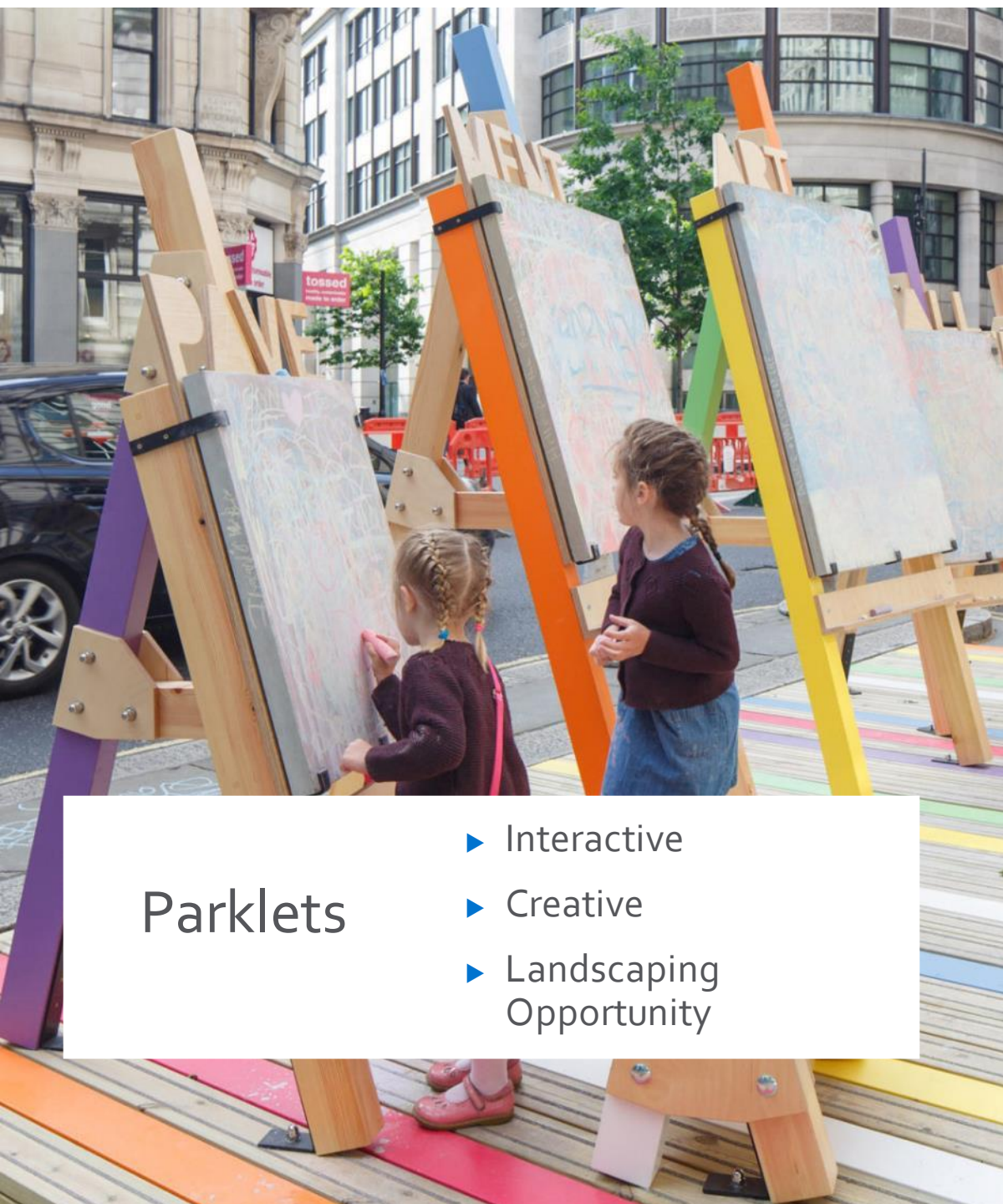
+ Parklets & Paint



Parklets

- ▶ Small spaces
- ▶ Contest potential
- ▶ Community Involvement
- ▶ Seasonal Use



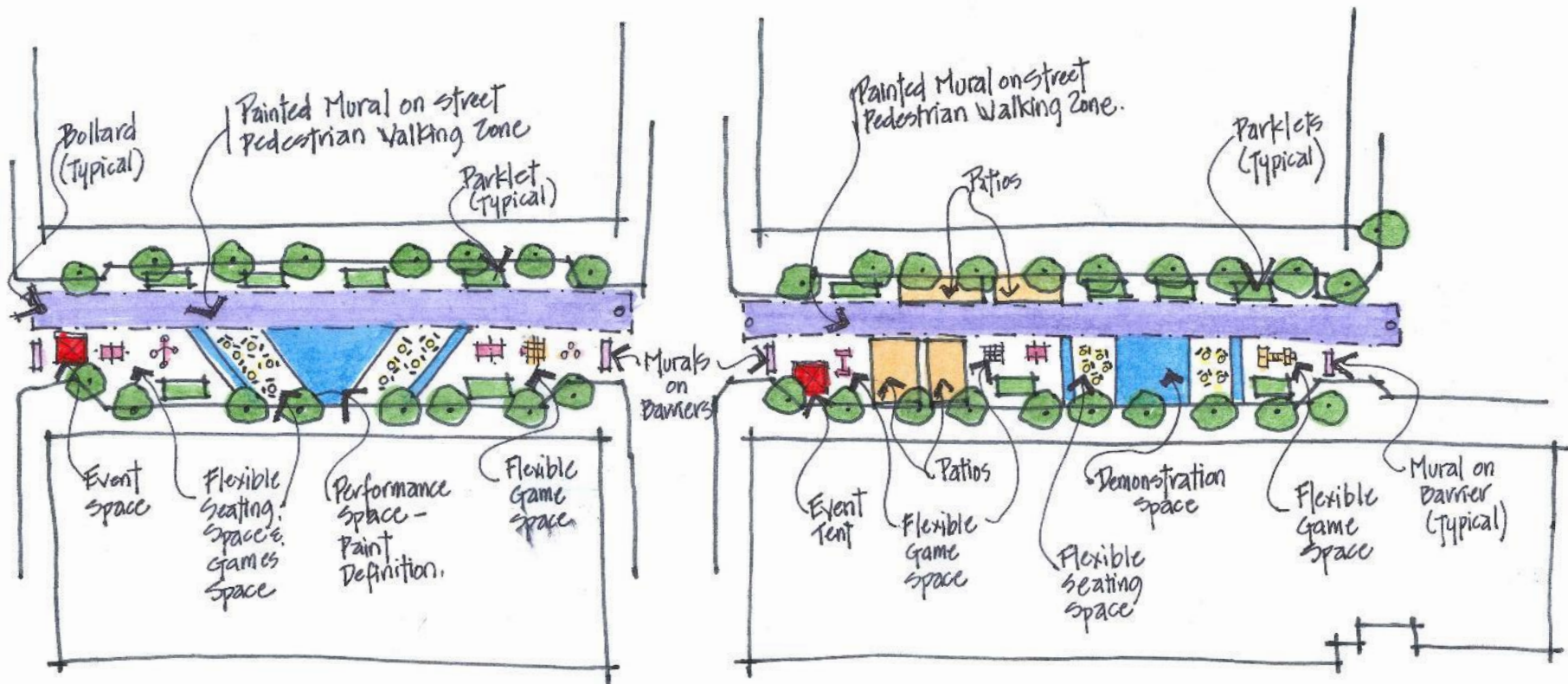


Parklets

- ▶ Interactive
- ▶ Creative
- ▶ Landscaping Opportunity



- + Patios
- + Parklets & Paint
- + Movable Elements





Movable Elements

- ▶ Table Tennis
- ▶ Badminton
- ▶ Chess
- ▶ Checkers
- ▶ Limbo
- ▶ Tables and Chairs



Activation through Events

- ▶ Flee Markets
- ▶ Music
- ▶ 'Disco Day'
- ▶ Workshops
- ▶ Arts & Crafts Fairs
- ▶ Demonstrations (Clubs etc.)
- ▶ Outdoor Movies



Revelstoke and Peachland

Revelstoke

- ▶ MacKenzie Avenue blocked off
- ▶ Movable chairs
- ▶ Music



City of Vancouver Viva Program

- ▶ Viva – street life program
- ▶ Events and programs for activation



New York City

- ▶ Public Plaza Program
- ▶ Transition of street into plaza – Macy's Department Store



Barcelona

- ▶ Superblocks Program
- ▶ Capturing 90% of intersections for public space
- ▶ Reconfiguring vehicular routing



Recommendations

- ▶ 200 & 300 Block of Bernard
 - ▶ Council direct staff to operationalize the closure of the 200 and 300 blocks of Bernard Avenue during the summer months on an annual basis

- ▶ 400 & 500 Block of Bernard
 - ▶ Council direct staff to work with stakeholders to develop and animate a demonstration “Green Street” on the 400 and 500 blocks of Bernard Avenue for the summer of 2021



City of
Kelowna

“The City demonstrates leadership and flexibility in leading innovative solutions, capitalizing on opportunities and responding with agility to emerging issues.”

City of Kelowna Land Use Strategy 2018

Report to Council



Date: November 16, 2020
To: Council
From: City Manager
Subject: Road Closure Adjacent to 2105 – 2255 Glenmore Road North
Department: Real Estate Services

Recommendation:

THAT Council receives, for information, the report from the Manager, Real Estate Services dated November 16, 2020, recommending that Council adopt the proposed closure of a portion of road adjacent to 2105 – 2255 Glenmore Road North, for consolidation with the adjacent land;

AND THAT Bylaw No. 12098, being a proposed road closure of a portion of road adjacent to 2105 – 2255 Glenmore Road North, be given reading consideration.

AND FURTHER THAT the Mayor and City Clerk be authorized to execute all documents necessary to complete the above referenced road closure.

Purpose:

To seek Council approval for the closure of road adjacent to 2105 – 2255 Glenmore Road North, for consolidation with the adjacent lands.

Background:

The closure of the road right of way between Glenmore Road and the Dry Valley Road intersection will accommodate an expansion of the City landfill footprint to the north as per the Glenmore Landfill Fill Plan (as approved by Council on October 2, 2017).

The road right of way is currently unconstructed, unused and has been deemed to be surplus to the City's needs. As a condition of the landfill expansion, the Ministry of Environment requires that the City close the road right of way within 50 meters of the landfill expansion area.

As a result of this road closure, the City will grant FortisBC a statutory right of way in order to protect their existing electrical works within the right of way.



Financial/Budgetary Considerations:

All costs associated with this road closure, including subdivision application fees, land title registration fees, and related costs will be the responsibility of the City and will be captured under the capital project #3443 – Landfill Liner and Design, Area 2.

Internal Circulation:

Integrated Transportation
Infrastructure Delivery
Landfill & Compost Operations

Legal/Statutory Authority:

Community Charter, SBC 2003, c. 26 s. 26 and s.40

Considerations not applicable to this report:

Legal/Statutory Procedural Requirements:
Existing Policy:
External Agency/Public Comments:
Communications Comments:

Submitted by: M. Olson, Real Estate Services Manager


Approved for inclusion: J. Säufferer, Real Estate Department Manager

Attachments: Schedule A – Road Closure Area
Schedule B – Council Presentation

cc: C. Williams, Senior Transportation Planning Engineer
J. Netzel, Senior Project Manager
Landfill & Compost Operations

PLAN EPP104542

SCALE 1:2000



20 0 20 40 100

THE INTENDED PLOT SIZE OF THIS PLAN IS 864mm IN
WIDTH BY 560mm IN HEIGHT (D SIZE) WHEN PLOTTED AT
A SCALE OF 1:2000



THIS PLAN LIES WITHIN INTEGRATED SURVEY AREA No. 4, CITY OF
KELOWNA, NAD83 (CSRS) 4.0.0.BC.1, UTM ZONE 11.

GRID BEARINGS ARE DERIVED FROM OBSERVATIONS BETWEEN
GEODETIC CONTROL MONUMENTS 96H2124 AND 96H2125 ARE
REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 11. (117°
WEST LONGITUDE)

THIS PLAN SHOWS HORIZONTAL GROUND LEVEL DISTANCES, UNLESS OTHERWISE SPECIFIED. TO COMPUTE GRID DISTANCES, MULTIPLY GROUND LEVEL DISTANCES BY THE AVERAGE COMBINED FACTOR OF 0.9999029. THE AVERAGE COMBINED FACTOR HAS BEEN DETERMINED BASED ON AN ELLIPSOIDAL ELEVATION OF 435 METRES

- - DENOTES STANDARD IRON POST FOUND
- ⊕ - DENOTES GEODETIC CONTROL MONUMENT
- NF - DENOTES NOT FOUND
- US - DENOTES UNSUITABLE TO POST

UTM COORDINATES OF ISA MONUMENTS (PUBLISHED)				
DATUM: NAD83 (CSRS) 4.0.0.BC.1, UTM ZONE 11.				
MARKER	NORTHING	EASTING	ESTIMATED ABSOLUTE ACCURACY	COMBINED FACTOR
96H2124	5537747.975	327824.197	0.01	0.998913
96H2125	5537175.752	327859.825	0.01	0.998881

NOTE: COORDINATES FOR MAPPING PURPOSES ONLY.

THE UTM COORDINATES AND ESTIMATED ABSOLUTE ACCURACY ACHIEVED ARE DERIVED FROM THE MASCOT PUBLISHED COORDINATES AND STANDARD DEVIATIONS FOR GEODETIC CONTROL MONUMENTS 96H2124 AND 96H2125.

LAND SURVEYING LTD.
BC LAND SURVEYORS
#201 - 1470 ST. PAUL STREET
KELOWNA, BC
V1Y 2E6
TEL 250-763-5711
www.bennettsurveys.com

FB687 P14-27 (AB)
v2020-May-05

THIS PLAN LIES WITHIN THE
REGIONAL DISTRICT OF CENTRAL OKANAGAN

THE FIELD SURVEY REPRESENTED BY THIS PLAN WAS
COMPLETED ON THE 4th DAY OF AUGUST, 2020
WAYNE BROWN, BCLS 758

Proposed Road Closure

Adjacent to 2105 - 2255 Glenmore Road N.





Road Closure Area

2105 - 2255 Glenmore Road North

GLENMORE RD N

Subject Parcels



"The City's actions align with strategic objectives to achieve a range of short and long-term benefits for the municipality and the residents of Kelowna."

City of Kelowna Land Strategy 2018

CITY OF KELOWNA

BYLAW NO. 12098

Road Closure and Removal of Highway Dedication Bylaw **(Portion of 2105 – 2255 Glenmore Road N)**

A bylaw pursuant to Section 40 of the Community Charter to authorize the City to permanently close and remove the highway dedication of a portion of highway on Glenmore Road N

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, hereby enacts as follows:

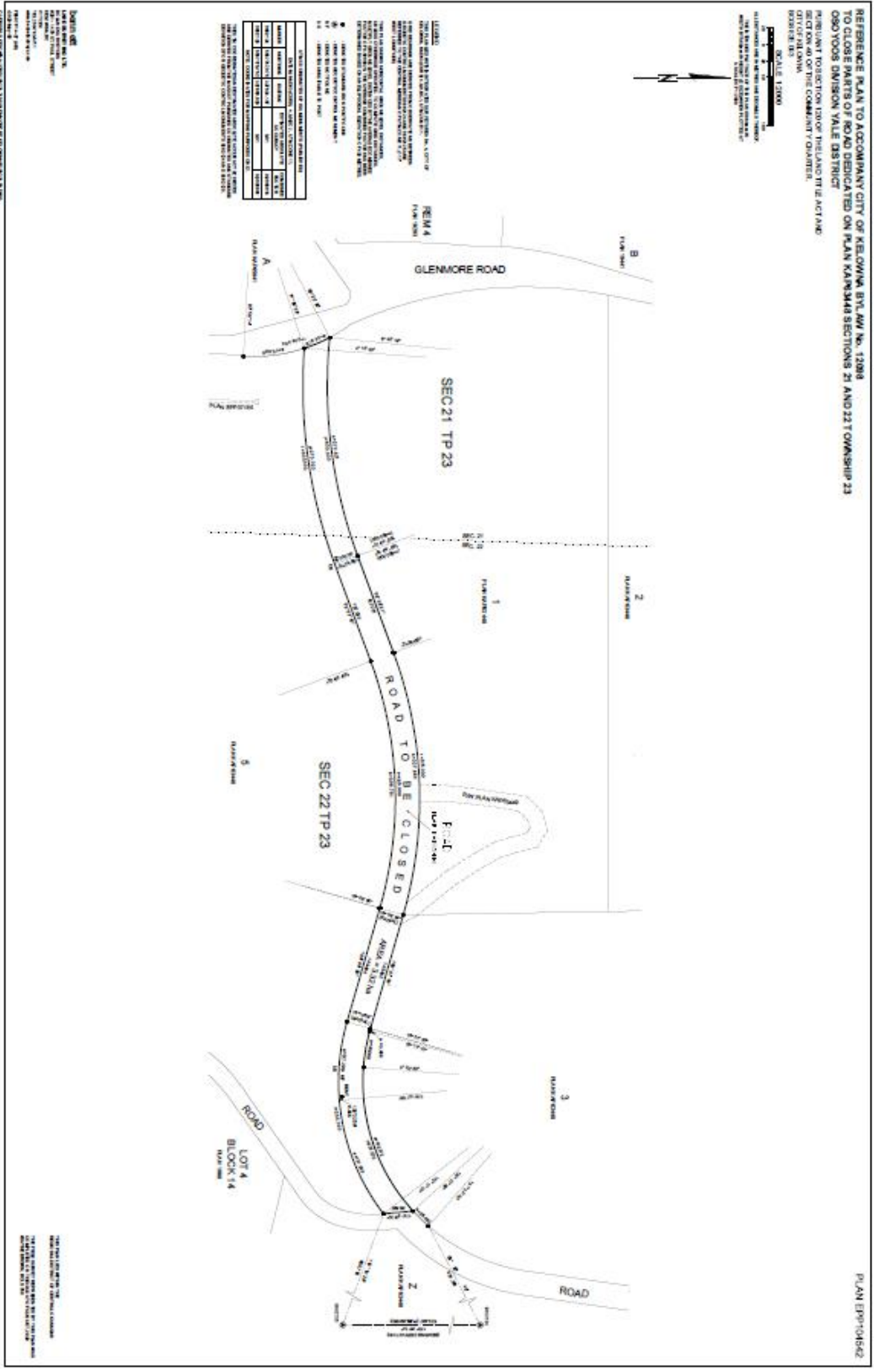
1. That portion of highway attached as Schedule "A" comprising 3.32 ha shown in bold black as Road to be Closed on the Reference Plan EPP104542 prepared by Wayne Brown, B.C.L.S., is hereby stopped up and closed to traffic and the highway dedication removed.
2. The Mayor and City Clerk of the City of Kelowna are hereby authorized to execute such conveyances, titles, survey plans, forms and other documents on behalf of the said City as may be necessary for the purposes aforesaid.

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk



CITY OF KELOWNA

BYLAW NO. 12093

Road Closure and Removal of Highway Dedication Bylaw **(Portion of Abbott Street (East of))**

A bylaw pursuant to Section 40 of the Community Charter to authorize the City to permanently close and remove the highway dedication of a portion of highway on Abbott Street (East of)

NOW THEREFORE, the Municipal Council of the City of Kelowna, in open meeting assembled, hereby enacts as follows:

1. That portion of highway attached as Schedule "A" comprising 198.5m² shown in bold black as Closed Lane on the Reference Plan prepared by Colin Ferguson, B.C.L.S., is hereby stopped up and closed to traffic and the highway dedication removed.
2. The Mayor and City Clerk of the City of Kelowna are hereby authorized to execute such conveyances, titles, survey plans, forms and other documents on behalf of the said City as may be necessary for the purposes aforesaid.

Read a first, second and third time by the Municipal Council this 28th day of September, 2020.

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Schedule "A"

