DISTRICT OF SUMMERLAND
TRANSPORTATION MASTER PLAN

2007

Boulevard Transportation Group

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GLOSSARY

Arterial Road: traffic movement is the primary consideration with direct access being a secondary consideration. Carries traffic between collector roads and highways.

Bicycle Collector Road: a collector road with a limited right of way, but is a key bicycle route within the District.

Bicycle Parking - Class I: long term parking or storage for bicycles in an enclosure that provides protection from theft and damage to both the bicycle and its accessories. Ie. bicycle lockers.

Bicycle Parking - Class II: short term parking facility, typically located outside of commercial or residential land uses. Class II parking is usually open to the environment and does not protect a bicycle from theft on its own. Ie. bicycle racks.

Carbon Monoxide (CO) Emissions: a product of the partial combustion of carbon-containing compounds, notably in internal-combustion engines.

Collector Road: balances need for direct access for land use with movement of traffic. Connects neighbourhoods to arterial roads.

Collisions per Million Entering Vehicles: the number of collisions at an intersection per million vehicles entering the intersection.

85th Percentile Speed: the speed at which 85% of vehicles are travelling at or below and is the typical index used in classifying a roadways speed characteristics.

Heavy Vehicles: large vehicles used for the transportation of goods and people. Examples of heavy vehicles include semi-trucks, buses and multi-axle vehicles.

Level of Service (LOS): qualitative measure describing operation conditions within a traffic stream in terms of amount of delay experienced, equated to letter grades from A (best) to F (worst).

Local Road: provides direct access for land use and serves traffic of local importance.

Low Speed Vehicles (LSV): defined in the Motor Vehicle Safety Act as a distinct vehicle class. A LSV is a vehicle that is powered by an electric motor, produces no emissions, and is designed to travel on four (4) wheels at a maximum speed of between 32 km/h and 40 km/h. LSVs include features such as headlights/taillights, turn signals, windshields, a parking brake and seatbelts in compliance with Motor Vehicle Safety Regulations.

Million Entering Vehicles (MEV): is calculated as the number of vehicles entering an intersection in a 24 hour period multiplied by 1 million. MEV is used to determine exposure to collisions at intersections.

Neighbourhood Electric Vehicles (NEV): the American (USA) name for Low Speed Vehicles.

Nitrogen Oxide (NOx) Emissions: formed when fuel burns at high temperatures, such as in motor vehicle engines.

Official Community Plan (OCP): an OCP is a planning document which has objectives and policies to guide decisions on planning and land use management, within the area covered by the plan, respecting the purposes of local government.

Operational Analysis: the use of capacity analysis to determine the level of service (LOS) of an existing or proposed intersection or road link.

Peak Hour: the highest hour of traffic in a specific period. (Typically mornings (am), and afternoon (pm).)

Road Function: how the road is designated or intended to be used in terms of mobility and accessibility.

Road Use: how the road is actually used, regardless of official road classification.

Road Classification: the identifying of a road's function on a map. Road classification is not necessarily the same as road use.

Road Cross Section: a standard drawing for each road classification to identify the width and features of the road.

Safe Routes to School: a program that offers tools to help schools and parents develop safe, alternative travel modes to school.

Synchro: a traffic operations software package that models traffic operations at an intersection level.

Traffic Calming: a combination of physical measures that reduce the negative effects of vehicle use (speed and/or volume), an alteration of driver behaviour and improvement of conditions for non-motorized users.

Traffic Demand Management (TDM): a group of measures, policies and programs which seek to reduce increased demand for more roads by influencing travel choice and shifting motorists from single occupied vehicles to alternative modes.

Transit Oriented Development (TOD): the use of policies and design standard to increase density, increase the mixture of land uses and improve pedestrian and bicycle facilities in close proximity to transit stations. These practices maximize the effectiveness of transit.

VISUM: transportation growth modelling software program used to determine long term traffic volumes and demand on a road network at the community-wide scale.

Volatile Oxygen Compounds (VOC) Emissions: organic chemical compounds, found in fuel, that have high enough vapour pressures under normal conditions to significantly vaporize.

EXECUTIVE SUMMARY

This document is the Transportation Master Plan for the District of Summerland. It includes the development of transportation plans for all modes of transportation within the transportation system in the District. A Transportation Master Plan identifies current deficiencies and anticipates future growth and deficiencies within the transportation system. The development of a Transportation Master Plan provides a framework to guide the development of transportation infrastructure over the next 25 years.

The objectives met in this Transportation Master Plan are:

- Develop network plans to guide infrastructure spending
- Ensure all travel modes are addressed and reviewed
- Continue to develop trails and pedestrian networks
- Encourage alternative transportation modes through the provision of appropriate infrastructure
- Explore opportunities for new transportation modes including transit and electric vehicles
- Address accessibility issues and ensure universal design
- Provide information and background for infrastructure grants to improve the transportation system
- Provide information on expectations for new developments in regards to transportation

COMMUNITY CONSULTATION

A series of staff workshops, a resident survey, bike-about/walkabout and a series of public open houses were held to gather community priorities, concerns and barriers as well as feedback on options for the transportation plans. Information gathered from the community formed an important component of the Transportation Master Plan.

ROAD NETWORK

Twenty four hour traffic volume and speed data were collected at seven locations as well as manual intersection counts (in 2007 and from previous studies in 2005/2006.) The am peak hour was typically from 7:45 to 8:45am and the pm peak hour 3:00 to 4:00pm. The pm peak hour traffic is approximately 10.5% of the daily traffic volume. The 85th percentile speeds at the majority of the seven locations were within 10-15km/h of the posted speed limit. 85th percentile speeds greater than 15km/h over the speed limit were in the more rural and steeper grade road areas.

Collision data was collected from ICBC for the entire District for collisions from 2002 and 2006. The average number of collisions and the average collision rate per MEV were calculated. (The average collision rate per million entering vehicles (MEV) is equal to the number of collisions in one year times one million divided by the daily entering vehicles times 365 days of the year.) The intersections of Highway 97/Prairie Valley Road, Highway 97/Rosedale Avenue, Victoria Road/Jubilee West Road and Rosedale Avenue/Jubilee West Road/Peach Orchard Road are the top four highest collision locations for the average number of collisions per year. These intersections also rank in the top ten collision locations by collision rate. Intersection and road improvements are proposed for these locations; however the Ministry of Transportation is responsible for any improvements on Highway 97.

In terms of level of service (LOS), the majority of intersections operate at a LOS C or better in the am and pm peak hours. Three unsignalized Highway 97 intersections are operating at a LOS D or worse in the am and pm peak hours. The intersections of Victoria Road/Prairie Valley Road and Rosedale Avenue/Jubilee West Road operate at LOS D or worse in at least one of the two peak hours. Long term traffic volumes (25 year horizon) were projected assuming an additional 1,995 single family lots, 1,855 multi-family units, 244,000 sq. ft. of commercial space, 2 new schools, and 9 acres of industrial land use. VISUM software was used to model the 2032 traffic demand on the road network and an annual growth rate. Using the 2% per year growth rate, traffic operations at the key intersections were analyzed to determine when intersection improvements are required. The following intersection improvements are recommended over the next 25 years:

Intersection	**Recommended Improvement**
Cartwright Ave/Prairie Valley Rd	Re-alignment of intersection skew in short term. Traffic signal in long term.
Prairie Valley Rd/Victoria Rd	Roundabout (single lane)
Prairie Valley Rd/Rosedale Ave	Roundabout (single lane)
Prairie Valley Rd/Atkinson Rd	Re-alignment of intersection and commercial accesses
Peach Orchard Rd/Lakeshore Dr	3 way stop
Kelly Ave/Jubilee West Rd	4 way stop and curb extensions. Improve sightlines when re-development occurs.
Main St/Victoria Rd	3 way stop. Improve sightlines when re-development occurs.
Garnet Valley Rd/Jones Flat Rd	Create 4 way intersection with Cartwright extension
Jubilee West Rd/Rosedale Ave	Roundabout (single lane)
Prairie Valley Rd/Giant's Head Rd	Traffic Signal
Highway 97/Jones Flat Rd	Review traffic volumes and signal warrants. If warrants are met hold discussions with MoT for new signal.
Jubilee West Rd/Victoria Rd	Roundabout (single lane)

Due to the high density of future development in the western portion of the District (Summerland Hills, Summerland Vistas, Deer Ridge, etc.) a new road link between Jones Flat Road and Cartwright Avenue is recommended to provide an alternative route to the west of the District without having to pass through the downtown core area or adding capacity on Rosedale Avenue. If development, south of the municipal boundary, occurs, the District should work with the road authority and developer to explore opportunities for a new southern route into the District. The District should utilize any re-development opportunity to obtain property at locations where the geometry is below a 50km/h design standard.

Road classifications create a hierarchy of roads with a gradation in function from direct access to vehicle mobility on the road. The existing road network classification map (from the 1996 OCP) was reviewed based on the existing traffic volumes, speeds and heavy vehicle routes and counts. The road classifications were simplified to provincial highway, arterial, collector and local roads. The following changes in the road classification map are proposed:

- Reclassify Nixon Road between Johnson Street to Thornber Street to a local.
- Reclassify Thornber Street from Nixon Road to Highway 97 to a local.
- Reclassify Logie Road between Jones Flat Road to Highway 97 to a local.
- Reclassify Garnet Valley Road from Jones Flat Road to Quinpool Road to a collector.
- Reclassify Jones Flat Road from west of Highway 97 to Garnet Valley Road to an arterial.
- Reclassify Cartwright Avenue from Prairie Valley Road to Jones Flat Road as future arterial.
- Add Deer Ridge connection between Hermiston Drive and Cartwright Avenue as a collector road.
- Reclassify Quinpool Road between Garnet Avenue and Rosedale Avenue and Garnet Valley Road south of Jones Flat Road, Tingley Road and Garnet Avenue to a bicycle collector road.

A review of the existing road cross sections was undertaken. The District currently has eleven standard cross sections in their Subdivision and Development Servicing Bylaw No. 99-004. The following changes to the existing standard cross sections are recommended to accommodate pedestrians, cyclists and vehicles:

- Updated arterial standards
- Replacement of minor and major collector road with urban and rural collector standards
- Addition of a bicycle collector road standard
- Updated urban and rural local road standards
- Addition of a multi-use path road standard
- Removal of industrial road standard. (Use collector road standards.)

A traffic calming policy will allow the District to determine what areas of the community need traffic calming and how to prioritize the needs. Processes for responding to complaint driven requests, traffic calming in new developments and in new road construction or capital projects are defined in the transportation master plan. The District should work with all schools within the District of Summerland to develop a safe routes to school program.

In order to monitor traffic conditions and operations, the District should implement a data collection program. The data collection program should be a two year program which ensures that any intersection or count location within the program is counted no more than three years apart.

HEAVY VEHICLES

The District should develop a truck route bylaw that designates truck routes, gross weight restrictions and parking areas for trucks. Sidewalks or wide paved shoulders are required along truck routes to provide separation between vehicles and pedestrians (vulnerable users). Engine brake signage can be incorporated into the truck route bylaw.

BICYCLE AND TRAIL NETWORK

Bicycle use is an environmentally, socially and economically viable alternative to automobile travel. In order to promote bicycle use, it is necessary to ensure appropriate infrastructure is provided. On-street primary routes are those routes intended for heavy use by bicycles. Primary routes, along Prairie Valley Road, Cartwright Avenue, Victoria Road, Giant's Head Road, Rosedale Avenue, Lakeshore Drive, Quinpool Road, Garnet Avenue, Tingley Road and Garnet Valley Road south of Jones Flat Road will form the backbone of the District's bicycle network. On-street recreational routes are those routes meant to support the on-street primary routes. Recreational routes are recommended for along Dale Meadows Road, Jones Flat Road, Lakeshore Drive, Simpson Road, Johnson Street, Nixon Road, and Gartrell Road.

There is currently a network of off-street trails meant for use by bicyclists and pedestrians. Off-street trails primarily serve recreational users, but can also be used by commuters as a link to increase connectivity between on-street routes. Future multi-use trail routes are planned for those locations where a key link is missing in the trail network. These future trails include Lakeshore Drive to Trout Creek, Flume Trail, which parallels Denike Street and completion of the Trans-Canada Trail along the Kettle Valley Railway line.

Bicycle parking is typically provided in two (2) ways. Class I parking must be fully secure and weather protected meant for long term parkers. Class II facilities are intended for short-term users, typically residential visitors and retail customers, and are not meant to accommodate bicycles overnight. It is suggested that the Summerland zoning bylaw, be amended to include bicycle parking requirements for developments. A review should be undertaken to determine where there is high demand for public bicycle parking and whether the demand is for short or long term parking. In locations where there is high bicycle parking demand the District should provide additional bicycle parking.

PEDESTRIAN NETWORK

Sidewalks are proposed for main routes that currently lack them or where they would link exiting pedestrian routes. Overall, the proposed and existing routes form a comprehensive network that focuses on the downtown core, but provides sidewalk links along key pedestrian routes, permitting pedestrian access to/from the downtown core. As the Summerland pedestrian network continues to develop, it is important that consideration is given to certain design elements to ensure the pedestrian realm is attractive, safe and accessible. Design elements include sidewalk width, safety, connectivity, accessibility, and signage/wayfinding. The implementation of signed and marked (or higher level of control) crosswalks should not be undertaken unless the location meets the warrant criteria in the *Pedestrian Crossing Control Manual for BC*.

PUBLIC TRANSIT

Transit offers increased mobility for those unable to drive, such as physically- and mentally-disabled users and those who are too young or old to obtain a license. The only existing service, within the District is a loop between Summerland and Penticton, which is operated by the Summerland Transit Society. Service is by reservation only, requiring users to book their trip via telephone.

To improve service, the following transit objectives have been established.

- Establish a fixed-route, intra-city transit route.
- Establish transit route to Kelowna, via Peachland.
- Increase frequency of existing Summerland-Penticton route.
- Establish land use and regulatory policies that support transit.
- Provide guidelines to ensure existing and future infrastructure is designed appropriately.
- Establish two transit exchanges.
- Establish park and ride locations.

The transit exchanges and bus stop should be developed using the BC Transit Stop Installation Checklist, which offers standards for transit stops on issues of site design, connectivity, accessibility, signage and safety.

ELECTRIC CARTS

Electric carts present an opportunity to expand the breadth of transportation options available to Summerland residents, while creating a sustainable alternative to automobile travel. Policy/regulatory steps need to be taken to facilitate LSV use on public roads in Summerland, based on observation of LSV use in other jurisdictions. These policies/regulations include specific routes or areas LSV are allowed, hours of operation, vehicle permits, and driver requirements. The District should, as part of the electric cart program, undertake a promotions/education program.

TRANSPORTATION DEMAND MANAGEMENT

Transportation demand management (TDM) is an integrated approach to planning and development that utilizes existing capacity in certain transportation modes in order to delay or eliminate the need to provide/expand infrastructure for other modes. In essence, TDM aims to influence user travel mode to achieve an environment, social and economic balance. Appropriate TDM measures for the District of Summerland include multi-modal access guides, improved pedestrian facilities, transit service, park and ride facilities for transit users, encourage transit oriented developments, municipal and U-Pass transit passes, carshare, carpooling/vanpooling and priority parking, bicycle parking and facilities, and cash-in-lieu parking.

IMPLEMENTATION PLAN

The implementation of the transportation master plan requires capital plans and funding. Over the next 25 years over $25,000,000 needs to be spent to upgrade the transportation network within the District. Funding opportunities are available from a variety of sources including road development cost charges, sponsorship, special levies, strategic budget allocations, general District revenue and government grants and funds.

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1.0 INTRODUCTION

The District of Summerland started the process to develop a transportation master plan for the District is early 2007. A Request for Proposal (RFP) was developed and consultants sought. Boulevard Transportation Group was the consultant chosen to develop the transportation master plan in late February 2007.

A comprehensive Transportation Master Plan includes the development of transportation plans for all modes of transportation within the transportation system in the District. A transportation master plan identifies current deficiencies and anticipates future growth and deficiencies within the transportation system. The development of a transportation master plan provides a framework to guide the development of transportation infrastructure over the next 25 years. The master plan should be reviewed between 5 and 10 years after adoption to ensure that growth assumptions and community principles and values have not significantly changed.

The District's transportation master plan includes discussions on the road network and intersection improvements, bicycles, pedestrians, heavy vehicles, transit and electric vehicles. Extensive public consultation as well as a number of workshops with council and staff was undertaken during the development of this study to ensure community input on all aspects of the plan and its development.

2.0 OBJECTIVES

The objectives of the Transportation Master Plan are to:

- Develop network plans to guide infrastructure spending
- Ensure all modes are addressed and reviewed
- Continue to develop trails and pedestrian networks
- Encourage alternative transportation modes through the provision of appropriate infrastructure
- Explore opportunities for new transportation modes including transit and electric vehicles
- Address accessibility issues and ensure universal design
- Provide information and background for infrastructure grants to improve the transportation system
- Provide information on expectations for new developments in regards to transportation

3.0 COMMUNITY CONSULTATION

As with any transportation master plan project, it was necessary to undertake a thorough consultation process to ensure the outcome of the transportation master plan process best represents the community vision. Community consultation on this project included four (4) activities – staff workshops, a resident survey, bike-about/walkabout and a series of public open houses.

3.1 Staff Workshops

3.1.1 Workshop no.1 (May 24, 2007)

The initial staff workshop was conducted on May 24, 2007. It was facilitated by the project team and attended by eight (8) District staff and council members. The project team made a presentation on the issues and implication associated with the transportation master planning process. The results of the survey were discussed, bringing staff and council up-to-date on what had been received so far. Specific issues concerned with the project were also discussed, such as planning for seasonal conditions, possibilities for traffic calming, and the need for an electric cart review.

3.1.2 Workshop no.2 (July 18, 2007)

The second staff workshop was held July 18, 2007. It was facilitated by the project manager and attended by nine (9) District staff and council members. The workshop was generally used as a chance for staff/council to be updated on the progress of the master plan and voice specific concerns they have about the project and transportation in the District. Discussion included consideration for planted medians versus planted boulevards and the merit of 2-lanes or 4-lanes on certain road segments. Routes of debate included Prairie Valley Road, Rosedale Avenue and Victoria Road.

3.1.3 Workshop no.3 (October 3, 2007)

The third staff workshop was held October 3, 2007. The project manager gave a presentation on the findings on each mode of transportation, which was followed by discussion with District staff and council.

3.2 Resident Survey

A survey was administered at the onset of the project to gather input from the public. The survey was made available via the Summerland website and was mailed to residents as part of the monthly community newsletter. Responses were received by City Hall and via mail and fax at the Boulevard Transportation Group office in Victoria, BC.

Survey questions were posed to gain a better understanding of where residents travel to/from, preferred and desired travel modes, barriers to certain travel modes and specific issues/problems with the existing transportation infrastructure. The survey asked respondents to provide the following information, as is included as *Appendix A*.

- Outline a typical day's travel and chart it on a map
- Indicate how often each member of the household uses various travel modes
- Identify preferred travel modes
- Is anyone in the house mobility-impaired?
- Indicate barriers to each type of travel mode, including for the mobility impaired
- Indicate a preferred prioritization for transportation infrastructure spending

In total, three-hundred sixty-three (363) survey responses were received. A detailed summary of responses is included as *Appendix B*. Responses were generally varied, but a few consistent themes emerged.

- Approximately 25% of respondents travel to/from Penticton daily
- Cycling and transit represent a very small share of the overall travel mode split
- There is an overall desire to increase transit service and improve pedestrian infrastructure
- Pedestrian, cycling and transit infrastructure/service is poor
- Pedestrian and cycling facilities are unsafe, infrastructure is in poor condition

3.3 Bike-about/Walkabout

A bike-about/walkabout was undertaken on May 26, 2007 with members of the public and consulting team. Members of the community were asked to either bicycle or walk, with the consultants, through two routes (one for bicycles and one for pedestrians) within the District. Flexibility was left in the routes to allow residents to identify issues and concerns regarding transportation (in particular pedestrian and cycling) in the field.

3.4 Open Houses

3.4.1 Open House No. 1 (May 24, 2007)

Open House no.1 was an introduction of the project to the community. Attendees viewed posters showing existing road classifications, traffic volumes and sidewalk plans. Attendees were asked to indicate their pedestrian, bicycle, vehicle and preferred transit routes, as well as indicate areas of pedestrian, bicycle and vehicle concern.

3.4.2 Open House No. 2 (July 18, 2007)

Open House no.2 allowed the project team to gather feedback on the proposed transportation network plans, including pedestrians, bicycles, transit, trucks and roads.

3.4.3 Open House No. 3 (October 3, 2007)

Open House no.3 was a chance for the public to view the proposed plans, as well as offer any final input they thought necessary. Based on feedback gathered from the first two open houses, the posters presented at this open house represented the refined vision of the community.

4.0 ROAD NETWORK

4.1 Existing Traffic Conditions

4.1.1 Traffic Volumes

Traffic volume data was collected from previous studies (Wharton Street Downtown Core Transportation Study – ND Lea and Summerland Hills Golf Resort Traffic Impact Study – Hamilton and Associates in 2005/2006) and by Boulevard Transportation Group in 2007. All traffic volume data was adjusted to 2007 levels and balance for the different years and seasons.

The am and pm peak hour varied slightly through out the District; however the am peak hour was typically from 7:45 to 8:45am and the pm peak hour 3:00 to 4:00pm.

Twenty-four hour automatic counts were undertaken at seven locations within the District to determine the daily traffic volumes on each of these roads.

Table 1: 24 Hour Count Data (2007)

24 Hr Count Location	Average Daily Traffic	% of Pm Peak to Daily
Prairie Valley Road – west of Cartwright Avenue	1,866 vehicles per day	10.7%
Giant's Head Road – between Milne and Harris	1,753 vehicles per day	10.5%
Victoria Road North – between Blair Street & Turner Street	1,583 vehicles per day	10.5%
Victoria Road South – between Dale Meadows Road & Simpson Road	3,865 vehicles per day	12.3%
Johnson Street – west of Highway 97	692 vehicles per day	11.5%
Peach Orchard Road – between Latimer Road and Highway 97 Overpass	1,497 vehicles per day	10.5%
Lakeshore Drive – south of Solly Road	1,232 vehicles per day	10.6%

4.1.2 Traffic Speeds

The 24hr counts also collected speed data for each count location. The 85th percentile speed was determined for each location. The 85th percentile speed is the speed at which 85% of traffic is travelling at or below. The 85th percentile speed should typically be the same as the posted speed limit as literature shows that the 85th percentile speed is the maximum safe and reasonable speed for a roadway under ideal conditions.

Table 2: 85th Percentile Speeds (2007)

24 Hr Count Location	85th Percentile Speed	Posted Speed Limit
Prairie Valley Road – west of Cartwright Avenue	71+km/h	50km/h
Giant's Head Road – between Milne and Harris	66-70km/h	50km/h
Victoria Road North – between Blair Street & Turner Street	51-55km/h	50km/h
Victoria Road South – between Dale Meadows Road & Simpson Road	61-65km/h	50km/h
Johnson Street – west of Highway 97	51-55km/h	50km/h
Peach Orchard Road – between Latimer Road and Highway 97 Overpass	66-70km/h	50km/h
Lakeshore Drive – south of Solly Road	51-55km/h	50km/h

The majority of the roads counted are within 10-15km/h of the posted speed limit. However several of the roads have speeds over 15km/h higher than the posted speed limits. These roads are typically in the more rural areas of Summerland or on steeper grades.

4.1.3 Collision Data

Collision data was collected from ICBC for the entire District for collisions between 2002 and 2006. Table 3 summarizes this data in four columns. Column one is not collision data, but is the total number of entering the intersection. This data is used to help determine the average collision rate per million vehicles entering. Column two is the number of collisions that occurred at the intersection between 2002 and 2006 (a period of five years) based on the ICBC data. Column three is the average number of collisions per year or average yearly number of collisions at that location. The average per year is based on the total number of collisions in five years divided by five (for the number of years in the data set). Column four is based on the average number of collisions per year which is used to compare exposure at intersections. The average collision rate per million entering vehicles (MEV) is equal to the number of collisions in one year times one million divided by the daily entering vehicles times 365 days of the year. See Table 3 for a summary of the collision data for key intersections. The table lists the data based on the highest average number of collisions per year.

Table 3: Collision Data at Key Intersections from 2002 to 2006

Intersection	Daily Entering Vehicles*	# of Collisions in 5 years	Avg. # of Collisions per year	Avg. Collision Rate per MEV
Hwy 97/Prairie Valley	17,314 vpd	64	12.8	2.03
Hwy 97/Rosedale	14,867 vpd	19	3.8	0.70
Victoria/Jubilee West	8,333 vpd	11	2.2	0.72
Rosedale/Jubilee W./Peach Orchard	8,438 vpd	11	2.2	0.71
Hwy 97/Jones Flat	12,419 vpd	9	1.8	0.40
Victoria/Prairie Valley	8,876 vpd	7	1.4	0.43
Hwy 97/Johnson	16,810 vpd	6	1.2	0.20
Victoria/Jones Flat	1,781 vpd	6	1.2	1.85
Hwy 97/Walters	15,448 vpd	5	1.0	0.18
Hwy 97/Bently	11,838 vpd	4	0.8	0.19
Hwy 97/Arkell/Thornber	16,495 vpd	4	0.8	0.13
Prairie Valley/Rosedale/Wharton	11,781 vpd	4	0.8	0.19
Hwy 97/Lakeshore	16,000 vpd	3	0.6	0.10
Victoria/Wharton	4,695 vpd	3	0.6	0.35
Prairie Valley/Giant’s Head	10,152 vpd	3	0.6	0.16
Prairie Valley/Cartwright	2,124 vpd	2	0.4	0.52
Garnet Valley/Jones Flat	790 vpd	2	0.4	1.39
Giant’s Head/Gartrell	914 vpd	2	0.4	1.20
Victoria/Dale Meadows	5,267 vpd	1	0.2	0.10
Victoria/Simpson	1,790 vpd	1	0.2	0.31
Prairie Valley/Atkinson	7,210 vpd	1	0.2	0.08
Peach Orchard/Lakeshore	1,190 vpd	1	0.2	0.46

*Daily Entering Vehicles was determined by dividing the pm peak hour entering vehicles (at an intersection) by 10.5% (based on information in Table 1 on page 5.)

See Table 4 for the top 10 intersections by exposure.

Table 4: Top 10 Intersections by Exposure

Ranking	Intersection	Daily Entering Vehicles*	Avg. # of Collisions per year	Avg. Collision Rate per MEV
1.	Hwy 97/Prairie Valley	17,314 vpd	12.8	2.03
2.	Victoria/Jones Flat	1,781 vpd	1.2	1.85
3.	Garnet Valley/Jones Flat	790 vpd	0.4	1.39
4.	Giant's Head/Gartrell	914 vpd	0.4	1.20
5.	Victoria/Jubilee West	8,333 vpd	2.2	0.72
6.	Rosedale/Jubilee W./Peach Orchard	8,438 vpd	2.2	0.71
7.	Hwy 97/Rosedale	14,867 vpd	3.8	0.70
8.	Prairie Valley/Cartwright	2,124 vpd	0.4	0.52
9.	Peach Orchard/Lakeshore	1,190 vpd	0.2	0.46
10.	Victoria/Prairie Valley	8,876 vpd	1.4	0.43

There have been two fatalities in the past 5 years in Summerland. In June 2005 a vehicle drove into a house at the corner of Darke Road and Prairie Valley Road and killed two individuals in the home. The ICBC data stated that alcohol may have been a contributing factor in this collision. The second fatality occurred in October 2003 at the intersection of Highway 97 and Johnson Street between a southbound left turning vehicle and a northbound through vehicle. The intersection of Highway 97/Johnson Street has recently (October 2007) been upgraded to a fully signalized intersection from a pedestrian activated signal.

Improvements to the top 10 collision locations by exposure are proposed. These improvements include changes in traffic control and improvements to the road cross sections, pedestrian and cycling facilities. See Section 11 for details. For the two Highway 97 intersections, improvements are proposed on the District's streets (Rosedale Avenue and Prairie Valley Road); however the Ministry of Transportation is responsible for improvements on Highway 97.

ICBC has a Road Improvement Program where they will contribute to road improvement projects where countermeasures (or safety improvements) are implemented that will reduce amount of claims at a location. The countermeasures could include paint markings, signage, improved road alignments, signals, roundabouts, and medians or barriers. The Road Improvement Program criterion for funding requires an internal rate of return on claims savings to be 50% over either 2 or 5 years depending on the service life of the countermeasure implemented. The amount of funding would depend on the amount of claims and the type of countermeasures implemented.

4.1.4 Traffic Operations

The existing traffic operations were reviewed and modelled using Synchro software. Synchro uses the Highway Capacity Manual methodology to calculate the delays and levels of service. The levels of service (LOS) are a ranking of the delays with LOS A being excellent operations and a LOS F representing unstable operations. The software program also provides a microsimulation (SimTraffic) of the network using driver behaviours and vehicle characteristics. LOS D is considered to be the border between acceptable and unacceptable traffic operations. An intersection operating with a LOS D may still be acceptable depending on the time of day and the length of time the movement or intersection operates at a LOS D; however consideration should be given to determining improvement options for the intersection or movement within a short to medium time frame. Intersections operating at a LOS C or better are considered to be operating at a reasonable level, while intersections at a LOS E/F is considered to be poor and undesirable for everyday peak hour operations. The following table outlines the LOS and associated range of delays per letter ranking.

Table 5: LOS Criteria

	Average Control Delay (seconds/vehicle)	
Level of Service	**Unsignalized Intersection**	**Signalized Intersection**
A	Less than 10	Less than 10
B	11 to 15	11 to 20
C	16 to 25	21 to 35
D	26 to 35	36 to 55
E	36 to 50	56 to 80
F	More than 51	More than 81

The majority of intersections, within the District of Summerland, operate at a LOS C or better in the am and pm peak hours. The following table outlines the intersections operating with at least one movement at a LOS D or worse.

Table 6: Intersection Movements Operating at Poor LOS

Intersection	Movement	Am Peak Hour	Pm Peak Hour
Highway 97/Bentley	Eastbound	LOS F	LOS D
	Westbound	----	LOS D
Highway 97/Jones Flat	Eastbound Left	----	LOS E
	Westbound Left	----	LOS E
Rosedale/Jubilee West	Eastbound	----	LOS F
	Westbound	----	LOS E
Highway 97/Arkell/Thornber	Eastbound	----	LOS E
	Westbound	----	LOS F
Victoria/Prairie Valley	Northbound	LOS F	LOS D
	Eastbound	LOS D	----
	Westbound	LOS F	LOS D

See **Figure 1** for pm peak hour traffic volumes and **Figure 2** for pm peak hour levels of service.

4.2 Traffic Projections

Existing and future land use data for the entire District was utilized to determine the future (25 year horizon or 2032) traffic volumes. The District was divided into 12 zones for utilization in the VISUM model. See **Figure 3** for model zones outlined in Table 7. The land use was broken down into the following categories:

- Single family lots
- Multi-family units
- Commercial
- Schools
- Institutional
- Industrial
- Agricultural

The information provided in Table 7 was provided by the District of Summerland and is based on the existing land use. The following table outlines the existing land use per zone.

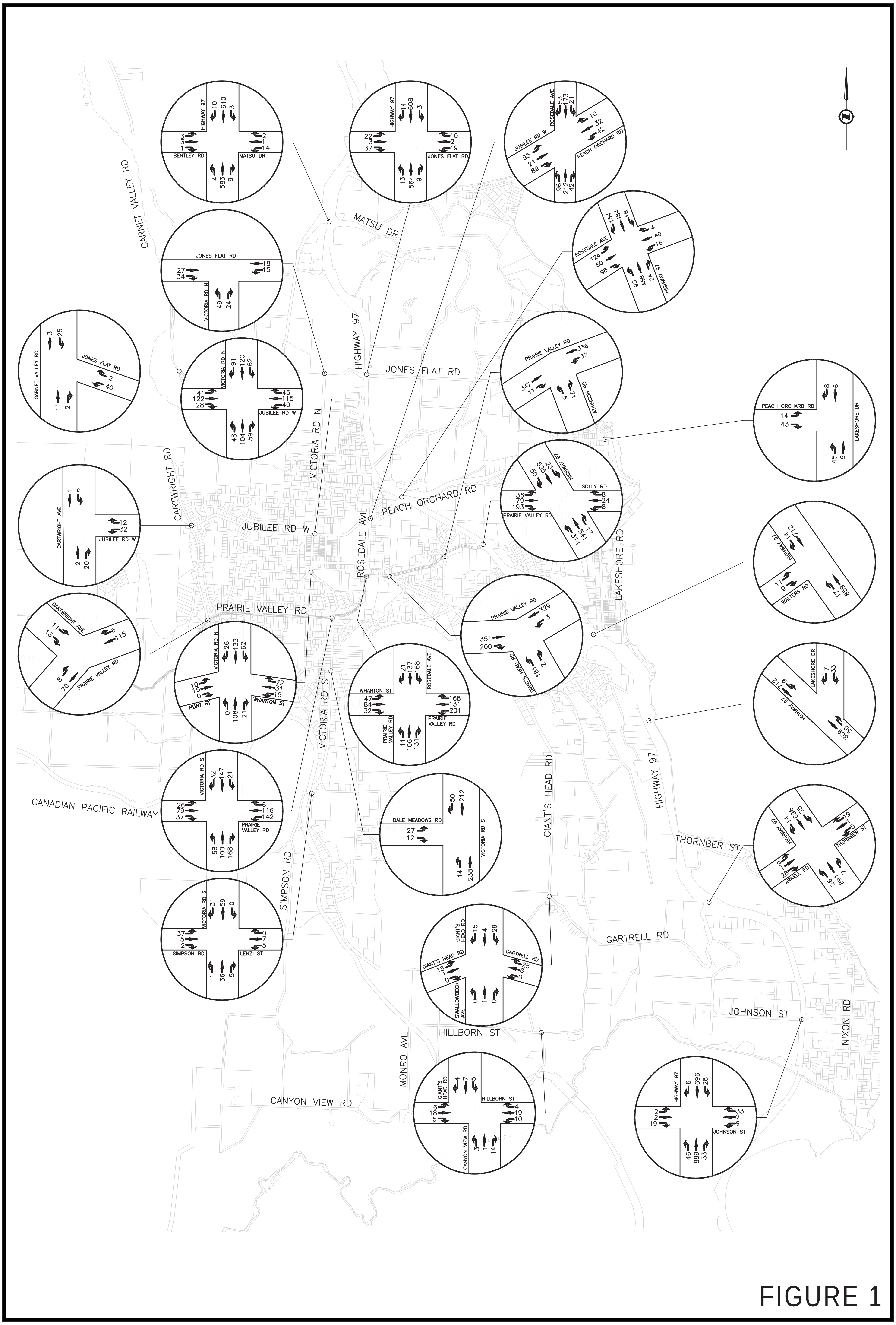


FIGURE 1

SUMMERLAND TRANSPORTATION MASTER PLAN

2007 PM Peak Hour Volumes

Boulevard Transportation Group

FIGURE 2

SUMMERLAND TRANSPORTATION MASTER PLAN

2007 PM Peak Hour LOS

Boulevard Transportation Group

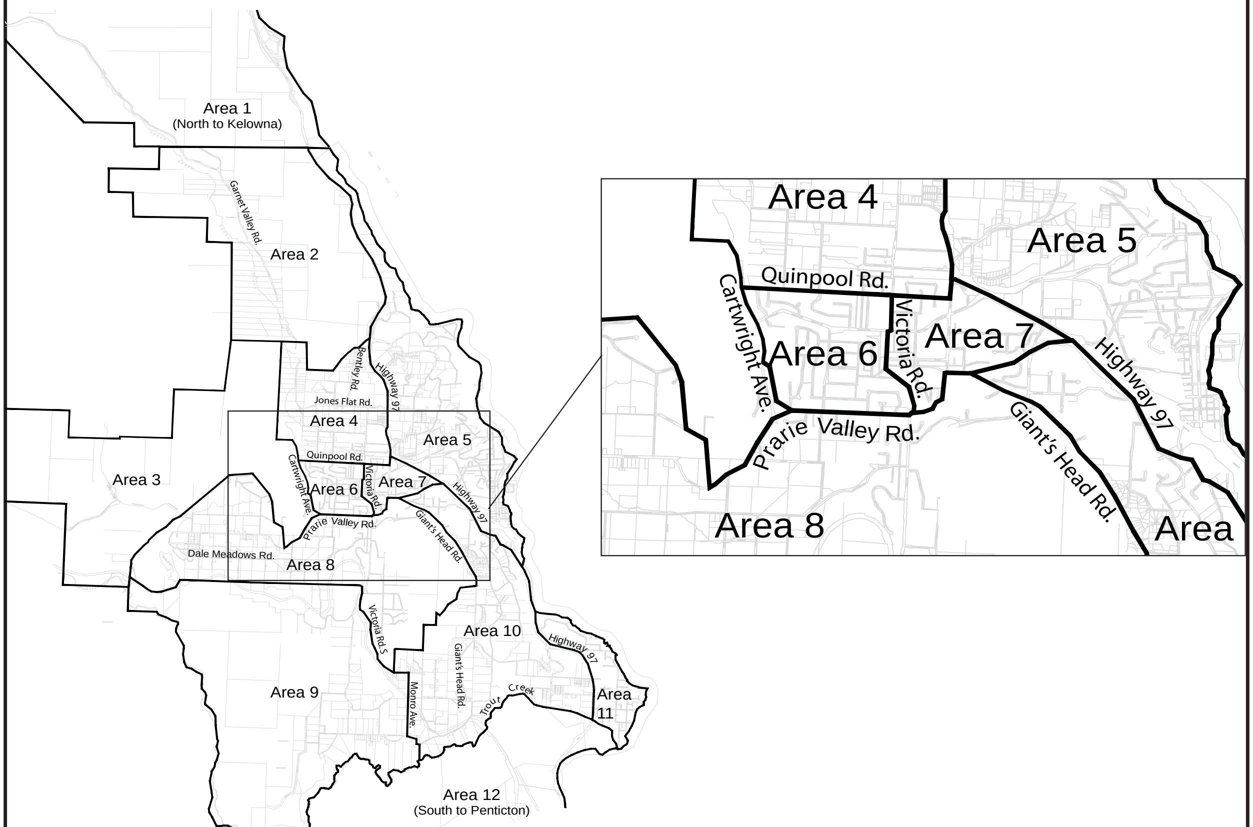


FIGURE 3

Zone Map

Table 7: Existing Land Use (2007)

Zone	Single Family	Multi-Family	Commercial	Institutional	Schools	Industrial	Agricultural
1	0	0	0 sq. ft	0 sq. ft	0 sq. ft	0 acres	70 acres
2	11	0	0 sq. ft	0 sq. ft	0 sq. ft	0 acres	585 acres
3	57	106	0 sq. ft	0 sq. ft	0 sq. ft	10 acres	40 acres
4	205	193	23,000 sq. ft	40,000 sq.ft	0 sq. ft	19 acres	511 acres
5	693	134	170,000 sq.ft.	3,000 sq. ft.	0 sq. ft	32 acres	768 acres
6	479	200	6,000 sq. ft.	0 sq. ft.	0 sq. ft	0 acres	0 acres
7	90	361	584,000 sq. ft	399,000sq.ft.	137,000sq.ft.	0 acres	0 acres
8	402	72	170,000 sq.ft.	14,000 sq. ft.	39,000 sq. ft.	21 acres	501 acres
9	27	0	0 sq. ft.	0 sq. ft.	0 sq. ft.	0 acres	617 acres
10	389	101	56,000 sq. ft	35,000 sq. ft.	0 sq. ft.	1 acre	1117 acres
11	302	0	8,000 sq. ft.	0 sq. ft.	30,000 sq. ft.	0 acres	585 acres
12	0	0	0 sq. ft.	0 sq. ft.	0 sq. ft.	0 acres	0 acres
Total	2,655	1,167	1,017,000sq.ft.	491,000sq.ft.	206,000sq.ft.	83 acres	4,794 acres

In discussions with the District staff, the following additional land use, per zone, is expected over the next 25 years:

Zone 1 & 2 – no change

Zone 3 - add Summerland Hills* and Summerland Vistas neighbourhood plans' proposed units

Zone 4 - add 10% to single family, multi-family and industrial.

Zone 5 - add 10% commercial and industrial. Add 20% to multi-family.

Zone 6 - add 10% commercial and multi-family.

Zone 7 - add 15% commercial and 200% to multi-family.

Zone 8 - add 10% to single family, townhouse and industrial and Deer Ridge proposed units

Zone 9 - add Jersey Lands neighbourhood plan's proposed units

Zone 10 - add 10% single family and multi-family

Zone 11 - add 50% single family and 50 units of multi-family for resort use

* Note Summerland Hills has been incorporated into the OCP; however zoning has not been approved.

Based on the above the following land use was added to each zone:

Zone	Single Family	Multi-Family	Commercial	Schools	Industrial
3	1265	715	50,000 sq. ft.	34,000 sq. ft.	-----
4	21	20	-----	-----	2 acres
5	-----	27	17,000 sq. ft.	-----	4 acres
6	-----	20	1,000 sq. ft.	-----	-----
7	-----	722	88,000 sq. ft.	-----	-----
8	110	8	-----	-----	3 acres
9	409	282	-----	34,000 sq. ft.	-----
10	39	11	-----	-----	-----
11	151	50	-----	-----	-----
Total	1,995	1,855	244,000 sq. ft.	68,000 sq. ft.*	9 acres

*68,000 sq. ft. equals two new schools

4.2.1 VISUM Model

VISUM software is a travel demand model software program which use land uses and origin/destination data to generate trips and assigns traffic to the road network based on demand. The model can determine the impacts of changes in road network (new roads or closure of existing routes).

The above land use for existing and 2032 horizon year were inputted into the model. The ITE Trip Generation rates for each land use was used to determine the existing and future trips for the model. The model was then calibrated and run to determine the traffic volumes per road (link).

The 2032 traffic volumes generated by the model were then used to determine an annual growth rate. The annual traffic growth rate for the District of the next 25 years was determined to be 2% per year.

4.3 Future Traffic Conditions

Applying the 2% per year growth rate in 5 year increments it was determined which intersection improvements are necessary and when. See **Figure 4** for 2032 projected traffic volumes.

4.3.1 Network Improvements

Due to the high density of future development in the western portion of the District (Summerland Hills, Summerland Vistas, Deer Ridge, etc.) a new road link is recommended to provide an alternative route to the west of the District without having to pass through the downtown core area or adding capacity on Rosedale Avenue. This new link would utilize Jones Flat Road to Garnet Valley Road and

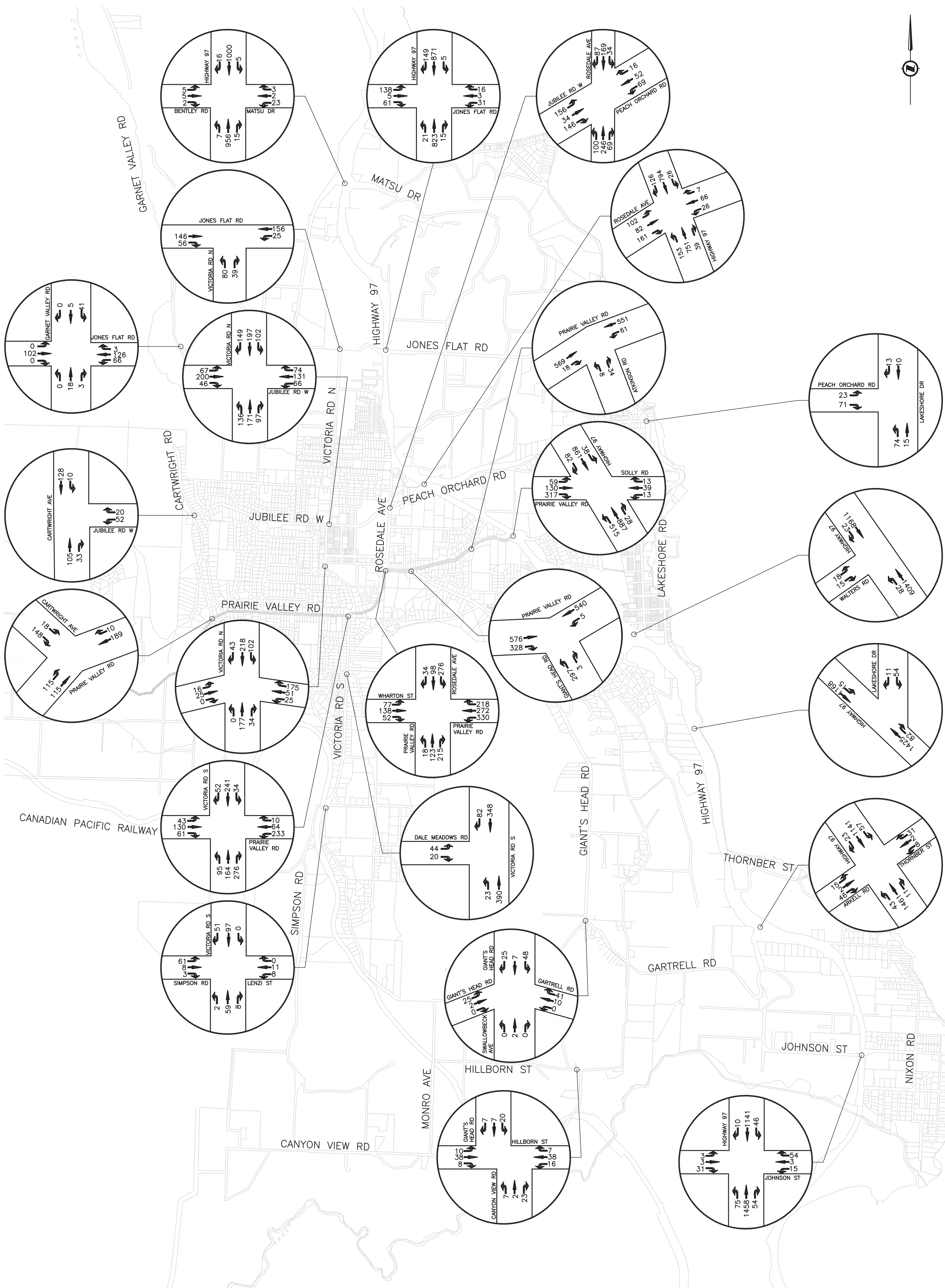


FIGURE 4

SUMMERLAND TRANSPORTATION MASTER PLAN

2032 PM Peak Hour Volumes

Boulevard Transportation Group

Cartwright Road would be extended to the Jones Flat Road/Garnet Valley Road intersection. The new intersection of Garnet Valley Road/Jones Flat Road would be a four way intersection with stop signs on Garnet Valley Road.

In the southern portion of the District, the topography is challenging from a vertical and horizontal perspective. Due to this challenging topography there are numerous routes within the District where the horizontal curve radii are below a 50km/h design standard. The District should utilize any re-development opportunity to improve the horizontal geometry at these locations. Even with improvements to the horizontal geometry, the vertical grades and the number of horizontal curves make the existing southern road network challenging for all types of vehicles.

If development, south of the municipal boundary, occurs, the District should work with the road authority and developer to explore opportunities for a new southern route into the District. The goal of this new route should seek to have less steep grades (under 8%) and larger horizontal radii. A new southern route would allow traffic to/from the south (Penticton) to access Summerland without having to travel through the downtown core, in particular truck traffic to the industrial area on Victoria Road South.

4.3.2 Intersection Improvements

Based on the Synchro analysis of each 5 year horizon (2012, 2017, 2022, 2027, 2032) the following intersection improvements are recommended.

Table 8: Intersection Improvements between 2007 and 2012

Intersection	Recommended Improvement
Cartwright Avenue/Prairie Valley Road	Re-alignment of intersection skew
Prairie Valley Road/Victoria Road	Roundabout (single lane)
Prairie Valley Road/Rosedale Avenue	Roundabout (single lane)
Prairie Valley Road/Atkinson	Re-alignment of intersection and commercial accesses
Peach Orchard/Lakeshore Drive	3 way stop
Kelly/Jubilee West	4 way stop and curb extensions
Main/Victoria	3 way stop

Table 9: Intersection Improvements between 2012 and 2017

Intersection	Recommended Improvement
Garnet Valley Road/Jones Flat Road	Create 4 way intersection with Cartwright extension
Jubilee West/Rosedale	Roundabout (single lane)
Prairie Valley Road/Giant's Head Road	Traffic Signal
Highway 97/Jones Flat	Review traffic volumes and signal warrants. If warrants are met hold discussions with MoT for new signal.

Table 10: Intersection Improvements between 2017 and 2022

Intersection	Recommended Improvement
Jubilee West/Victoria	Roundabout (single lane)

Table 11: Intersection Improvements between 2022 and 2027

Intersection	Recommended Improvement
None	None

Table 12: Intersection Improvements between 2027 and 2032

Intersection	Recommended Improvement
Cartwright/Prairie Valley	Traffic signal
Kelly/Jubilee West	Improve sightlines when re-developed
Main Street/Victoria	Improve sightlines when re-developed

See **Figure 5** for 2032 levels of service with the above intersection improvements.

4.4 Road Classifications

Road classifications for a community are typically identified in Official Community Plans (OCP) or in a Transportation Master Plan. The road classifications identify the road function for each road within a municipality. Road classifications and functions do not necessarily correlate to actual observed use of a road, but indicate routes where it is desired for major routes through a community. Ideally, roads should operate as they are classified.

Road classifications create a hierarchy of roads with a gradation in function from direct access to vehicle mobility on the road. Local roads, typically, carry less than 1,000 vehicles per day and give

FIGURE 5

SUMMERLAND TRANSPORTATION MASTER PLAN

2032 PM Peak Hour LOS

priority to direct access over vehicle mobility. Collector roads, typically, carry between 1,000 and 8,000 vehicles per day and give equal priority to direct access and vehicle mobility. Arterial roads, typically carry between 5,000 and 30,000 vehicles per day and give priority to vehicle mobility over direct access. See Table 13 for typical urban and rural road classification characteristics.

Table 13: Road Classification Characteristics

	Local Roads	Collector Roads		Arterial Roads	
		Rural	**Urban**	**Rural**	**Urban**
Service Function	Traffic movement secondary	Traffic movement equal to access	Traffic movement equal to access	Traffic movement primary	Traffic movement primary
Land Service/ Access	Land access primary	Traffic movement equal to access	Traffic movement equal to access	Land access secondary	Land access secondary
Typical Daily Volumes	<1,000 vpd	<5,000 vpd	<8,000 vpd	<12,000 vpd	5,000-20,000 vpd
Typical Vehicle Types	Predominately passenger cars	All types	Passenger cars and service vehicles	All types, higher percentage of trucks	All types, higher percentage of trucks
Parking	Maybe on both sides	No parking	On one or both sides	No parking	On one or both sides. May require restrictions in peak hours
Pedestrians & Cyclists	No special provisions	Paved shoulders	Sidewalks on both sides. Shared lanes for cyclists.	Paved shoulders	Sidewalks on both sides. Shared or bike lanes.
Transit	Generally avoided	Permitted	Permitted	Permitted	Permitted. Consider bus bays

The existing road network classification map (from the 1996 OCP) was reviewed based on the existing traffic volumes, speeds and heavy vehicle routes and counts. The road classification system for the

District currently has five types of roads – provincial highway, arterial, major collector, minor collector and local roads.

The road classifications were simplified to provincial highway, arterial, collector, bicycle collector road and local roads. The distinction between major and minor collector roads is minimal in a relatively small community like Summerland and therefore should be combined into one classification.

The following changes in the road classification map are proposed:

- Reclassify Nixon Road between Johnson Street to Thornber Street to a local.
- Reclassify Thornber Street from Nixon Road to Highway 97 to a local.
- Reclassify Logie Road between Jones Flat Road to Highway 97 to a local.
- Reclassify Garnet Valley Road from Jones Flat Road to Quinpool Road to a collector.
- Reclassify Jones Flat Road from west of Highway 97 to Garnet Valley Road to an arterial.
- Reclassify Cartwright Avenue from Prairie Valley Road to Jones Flat Road as future arterial.
- Add Deer Ridge connection between Hermiston Drive and Cartwright Avenue as a collector road.
- Reclassify Quinpool Road between Garnet Avenue and Rosedale Avenue and Garnet Valley Road south of Jones Flat Road, Tingley Road and Garnet Avenue to a bicycle collector road.

Nixon Road, in Trout Creek, was reclassified as a local road due to the installation of the traffic signal at Highway 97/Johnson Street. The traffic signal reduces the need for a secondary collector route out of Trout Creek. With the future upgrading of Jones Flat Road/Highway 97 to a signalized intersection the need for a collector road on the east side of Highway 97 between Jones Flat Road and the Highway 97/Rosedale Avenue signal is redundant and therefore Logie Road can be reclassified as a local road.

Cartwright Avenue and Jones Flat Road have been upgraded to an arterial road classification. With the Cartwright Avenue connection between Jones Flat Road and Prairie Valley Road this route will provide an alternative access to the Prairie Valley Road area without having to travel through the downtown area.

Quinpool Road and Garnet Valley Road will be major bicycle routes, have no on street parking and have areas of limited right of way. In addition vehicle function on these roads will change when the Deer Ridge collector road and the Cartwright Avenue connectors are implemented. Therefore these two roads are different from the collector and local road standards and should have there own road classification (bicycle collector road). See **Figure 6** for the road classification map.

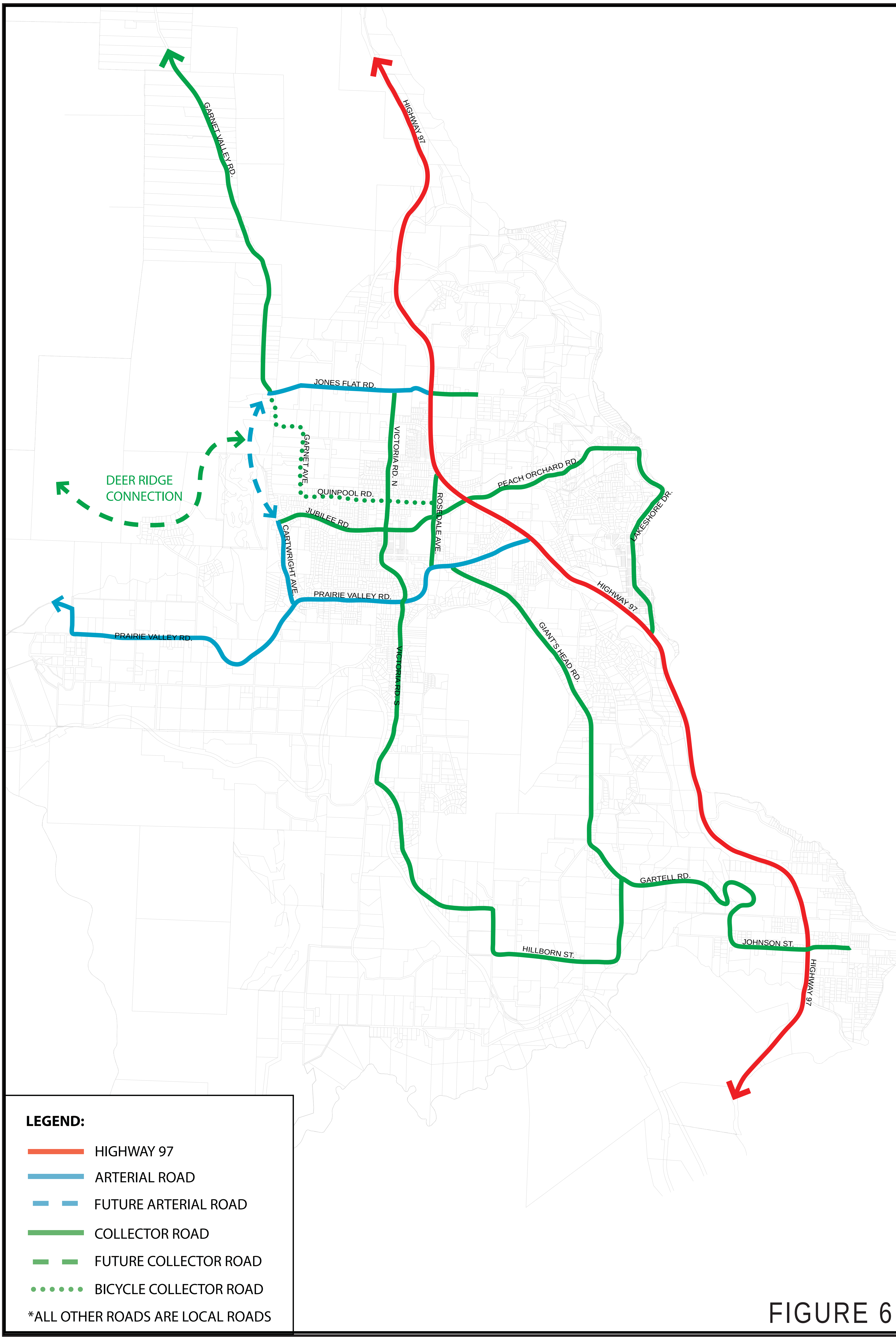


FIGURE 6

SUMMERLAND TRANSPORTATION MASTER PLAN

Road Classification

Boulevard TRANSPORTATION GROUP

4.5 Road Cross Sections

A review of the existing road cross sections was undertaken. The District currently has eleven standard cross sections in their Subdivision and Development Servicing Bylaw No. 99-004. Road function should match the form of the road. Mis-matching of form and function can create speeding, collisions, and unsafe conditions for pedestrians and cyclists. For example a street classified and operating as local road should not have the wider road form of an arterial road.

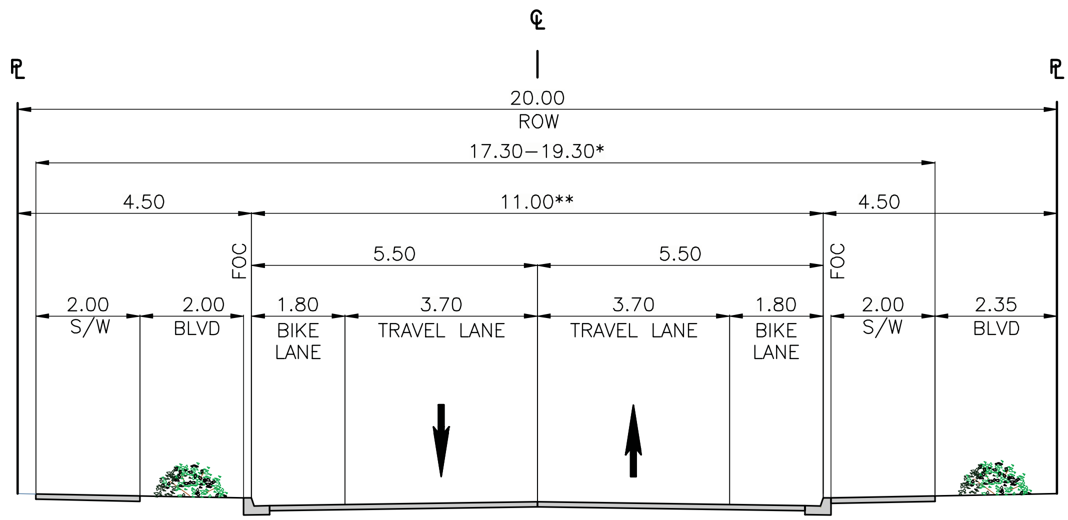
Existing Cross Sections (Dwg No.)	**Proposed Cross Sections**
Arterial (100-1 & -2)	Arterial (**Figure 7)**
Major Collector (100-3)	Collector – urban (**Figure 8)**
Minor Collector (100-4)	Collector – rural (**Figure 9)**
Industrial (100-5)	Collector – bicycle (**Figure 10)**
Local (100-6)	Local – urban (**Figure 11)**
Cul-de-sac (100-7)	Local – rural or hill (steep grade) (**Figure 12)**
Expanded Corner (100-8)	Cul-de-sac (100-7)
Local Rural (100-9)	Expanded Corner (100-8)
Typical Boulevard Construction ((100-10)	Multi-use Path Along Road (**Figure 13)**
Lanes (100-11)	Lanes (100-11)

The following changes to the existing standard cross sections are recommended to accommodate pedestrians, cyclists and vehicles:

- Updated arterial standards
- Replacement of minor and major collector road with urban and rural collector standards
- Addition of a bicycle collector road standard
- Updated urban and rural local road standards
- Addition of a multi-use path road standard
- Removal of industrial road standard. Use collector road standards for industrial roads.

These proposed cross sections are guidelines and exceptions may be made to the cross sections due to grades, availability of property and other factors. For development works and services please refer to the Subdivision and Development Servicing bylaw for specific requirements.

The existing cul-de-sac, expanded corner and lane standard drawings should be retained as these are specialized sections and are not changed by changes in the road classifications.



NOTE:

1. SUB–BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SIDEWALKS AND BOULEVARD CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.

2. FOC DENOTES FACE OF CURB.

3. ALL DISTANCES SHOWN ARE IN METERS.

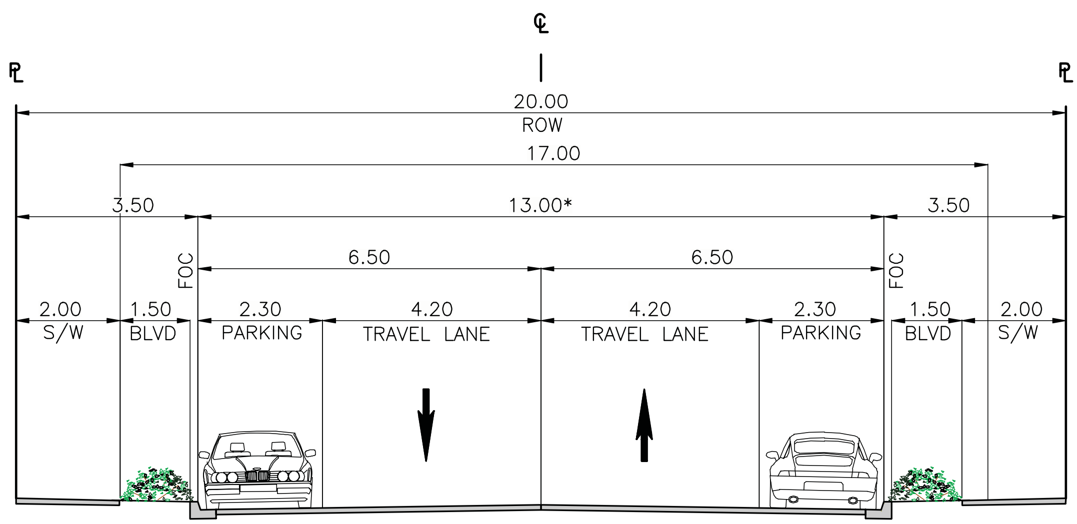
* AT THE DISCRETION OF THE DISTRICT OF SUMMERLAND, THE REQUIRED RIGHT OF WAY (ROW) MAY BE REDUCED BY REMOVING ONE OF THE BOULEVARDS.

** CARRIAGE WAY WIDTHS WILL VARY FROM LOCATION TO LOCATION AS DETERMINED BY TRAFFIC VOLUME, MOVEMENTS AND AVAILABLE RIGHT OF WAY.

DRAWING NOT TO SCALE

FIGURE 7

Arterial Road Cross Section



NOTE:

1. SUB–BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SHOULDER TYPE AND DEPTH AND SIDEWALK CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.

2. FOC DENOTES FACE OF CURB.

3. ALL DISTANCES SHOWN ARE IN METERS.

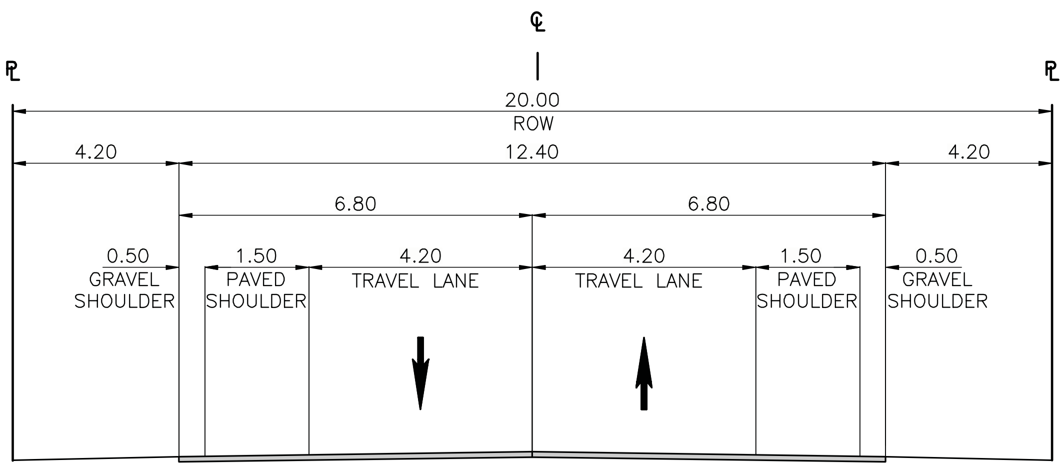
* AT THE DISCRETION OF THE DISTRICT OF SUMMERLAND, THE REQUIRED RIGHT OF WAY (ROW) MAY BE REDUCED BY REMOVING ONE OF THE BOULEVARDS.

** CARRIAGE WAY WIDTHS WILL VARY FROM LOCATION TO LOCATION AS DETERMINED BY TRAFFIC VOLUME, MOVEMENTS AND AVAILABLE RIGHT OF WAY.

DRAWING NOT TO SCALE

FIGURE 8

Urban Collector Cross Section



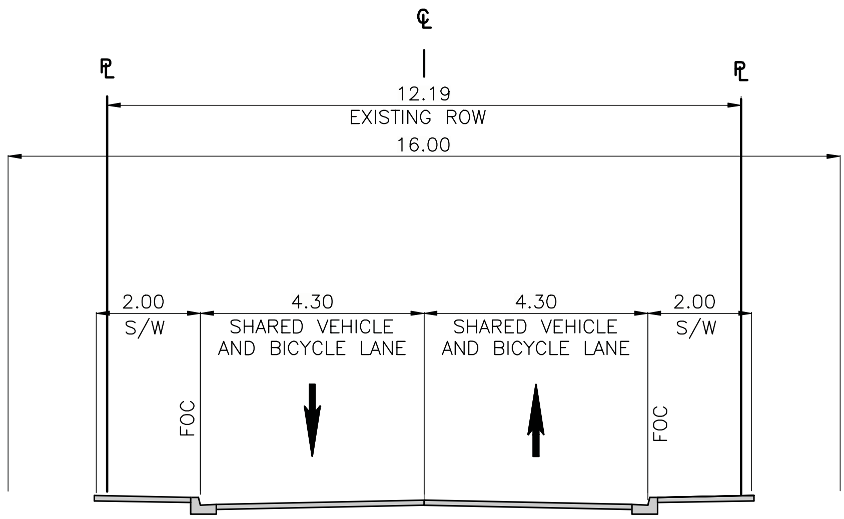
NOTE:

1. SUB–BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SHOULDER TYPE AND DEPTH AND SIDEWALK CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.
2. FOC DENOTES FACE OF CURB.
3. ALL DISTANCES SHOWN ARE IN METERS.

DRAWING NOT TO SCALE

FIGURE 9

Rural Collector Cross Section



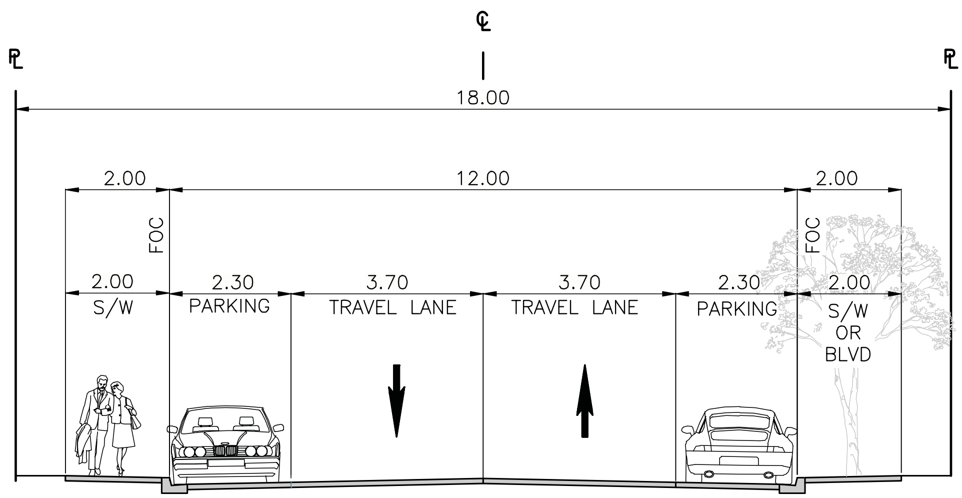
NOTE:

1. SUB-BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SHOULDER TYPE AND DEPTH AND SIDEWALK CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.
2. FOC DENOTES FACE OF CURB.
3. NO PARKING ALLOWED ON EITHER SIDE OF ROAD.
4. SIDEWALKS TO BE 1.5m WIDE WHERE EXISTING RIGHT OF WAY IS 12.19m IN WIDTH.
5. SIDEWALKS TO BE 2.0m WIDE WHERE RIGHT OF WAY WIDTH PERMITS.
6. 2.0m WIDE SIDEWALKS SHOULD BE SEPARATED FROM CURBS BY BOULEVARD WHENEVER THERE IS AVAILABLE RIGHT OF WAY OR OTHER CONDITIONS ALLOW.
7. SIDEWALKS TO BE INSTALLED ON BOTH SIDES OF ROAD WHENEVER POSSIBLE.
8. ALL DISTANCES SHOWN ARE IN METERS.

DRAWING NOT TO SCALE

FIGURE 10

Bicycle Collector Cross Section



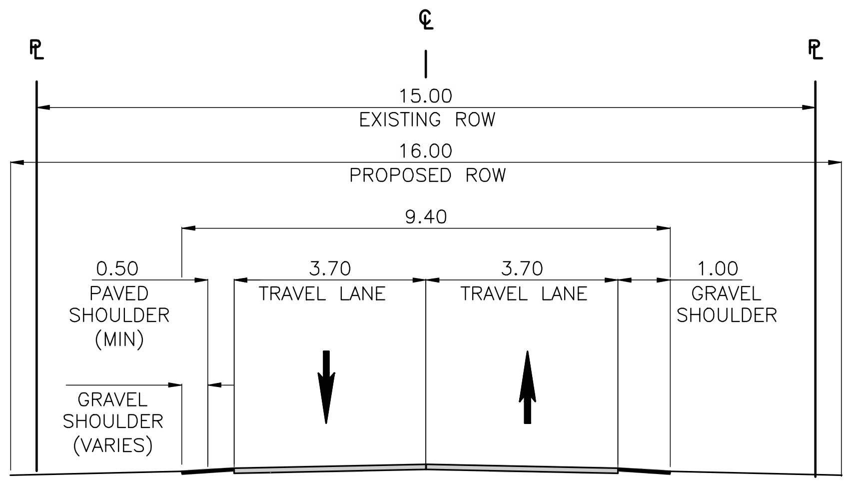
NOTE:

1. SUB-BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SHOULDER TYPE AND DEPTH AND SIDEWALK CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.
2. FOC DENOTES FACE OF CURB.
3. PARKING AND SIDEWALKS TO BE INSTALLED WHERE REQUIRED BY BYLAW, POLICY OR AS DIRECTED BY DISTRICT COUNCIL.
4. WHERE SIDEWALKS ARE NOT INSTALLED, LOW MAINTENANCE TREES COULD BE INSTALLED IN THE BOULEVARD WHEN NOT IN CONFLICT WITH UTILITIES.
5. ALL DISTANCES SHOWN ARE IN METERS.

DRAWING NOT TO SCALE

FIGURE 11

Urban Local Road Cross Section



NOTE:

1. SUB-BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SHOULDER TYPE AND DEPTH AND SIDEWALK CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.

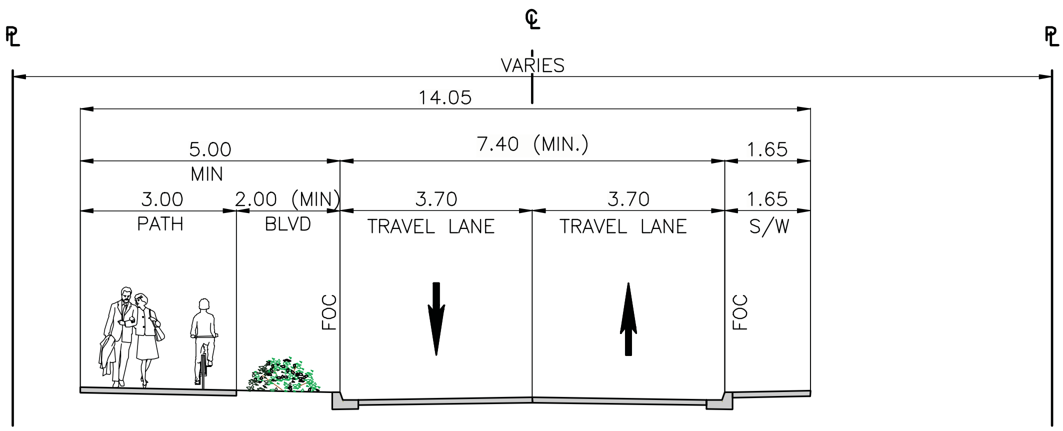
2. ASPHALT WIDTH TO BE WIDENED (8.6m MINIMUM) WHERE RURAL ROAD FORMS PART OF A BICYCLE PATH NETWORK.

3. ALL DISTANCES SHOWN ARE IN METERS.

DRAWING NOT TO SCALE

FIGURE 12

Rural Local Road Cross Section



NOTE:

1. SUB-BASE TYPE AND DEPTH, SUB GRADE TYPE AND DEPTH, SHOULDER TYPE AND DEPTH, SIDEWALK AND PATH CONSTRUCTION AND TREATMENT ARE TO BE TO THE DISTRICT OF SUMMERLAND'S SPECIFICATION.
2. FOC DENOTES FACE OF CURB.
3. ALL DISTANCES SHOWN ARE IN METERS.

DRAWING NOT TO SCALE

FIGURE 13

Road Side Multi-use Path Cross Section

4.6 Traffic Calming

Traffic Calming has been described as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users." Streets are modified to create a driving environment that encourages appropriate vehicle speeds, discourage cut-through traffic and make walking and cycling more comfortable. Traffic calming measures are aimed at vehicles, but should not negatively impact pedestrians, cyclists, transit or emergency and service vehicles.

A traffic calming policy will allow the District to determine what areas of the community need traffic calming and how to prioritize the needs. The Transportation Association of Canada/ITE's *"Canadian Guide to Neighbourhood Traffic Calming (1998)* was utilized to develop a traffic calming policy specifically for the District of Summerland's unique environment.

There is no single "best" solution, when implementing traffic calming, that can be applied based solely on objective criteria. A combination of local knowledge, technical expertise and experience must be applied to determine the best measure or combination of measures. There are five principles that will help create an effective plan and build community acceptance. These principles are:

Identify and Quantify the Real Problem - Ensure that any traffic calming plan is based on reality and not simply perceptions. Anecdotal reports and perceptions alone are not sufficient in triggering a traffic calming study on a roadway. Conducting vehicle volume and classification counts, documented speeding, license plate traces, parking surveys and collecting collision statistics may be required to determine the type and extent of traffic problems.

Consider Area Wide Solutions - Traffic problems on a particular street may have raised the need for a study but those problems may be caused by deficiencies on other roads, or other streets in the area may face similar problems. Applying traffic calming measures on only one road may simply move the problem to neighbouring streets.

Avoid Restricting Access - Closures, diverters and other barriers may eliminate cut-through traffic but they will raise opposition from residents, emergency service providers and others in the community. They can also generate difficulties for large vehicles such as snow plows, garbage trucks and delivery vehicles. These types of measures also tend to move problems to other streets.

Consider All Potential Impacts - Measures implemented may negatively affect emergency vehicles, transit, bicycles, people who are visually impaired, maintenance, local access, parking, street sweeping, and police enforcement. It may be impossible to completely eliminate all negative impacts but proper planning can mitigate these concerns.

Monitor and Follow-up - It is important to perform follow-up evaluations to determine effectiveness of traffic calming measures and public acceptance after implementation. Some traffic calming devices may require maintenance that should be added to maintenance schedules.

4.6.1 Project Initiation

There are generally three different methods for initiating a traffic calming study: 1) Complaint driven requests from concerned residents, 2) Development Applications, and 3) New Roads/Capital Improvement Projects. The process for instituting a traffic calming study will be different depending upon the context.

Responding to a Complaint Driven Request for Traffic Calming

Collector roads and arterial roads are intended for a more regional traffic and therefore local input would bias an outcome that may compromise the intended use of the roadway. The process for collector and arterials is upon receiving a complaint, the staff would utilize Table 14 to determine and quantify the extent of the problem. Staff would then recommend appropriate changes based on the technical guidelines and standards required for the arterial or collector road in question.

A secondary process is needed for local roads as local roads are intended for the local residents. Therefore the process outlined below includes opportunities for the local residents to have input into their street. The following process is for local roads only.

Step 1 - Is the Road an Appropriate Candidate for Traffic Calming?

When a complaint is registered, the first step is to make a determination as to whether the road even qualifies as a candidate for a traffic calming plan. The qualification review begins by referencing the Traffic Calming Qualification Matrix (Table 1) and comparing the information against the most recent data that has been gathered at that location. The road has to be classified as a local road to be considered for a complaint driven request for traffic calming. The District will be regularly undertaking data collection on its road network and in addition to volume information, speed data should also be collected, which identifies the 85^{th} percentile speeds.

The following Table 14 is a matrix made up of the recommended traffic calming measures for the District and assigns threshold volumes and speeds relative to the road type. If the data for a particular road exceeds the thresholds, then the complaint would trigger a traffic calming study.

Table 14 - Traffic Calming Matrix

Recommended Measures	Arterial Roads Threshold to Trigger Traffic Calming Study:		Collector Rd Threshold to Trigger Traffic Calming Study:		Local Rd Threshold to Trigger Traffic Calming Study:	
	Volume >12,000 Veh	Op. Speed >60 Kmh 85th % ile	Volume >5,000 Veh	Op. Speed >60 Kmh 85th % ile	Volume > 1,000 Veh	Op. Speed >55 Kmh 85th % ile
Traffic Circles			✓		✓	
Intersection Channelization	✓		✓		✓	
Diverter					✓	
Raised Crosswalk					✓ (school & playground zones only)	
Textured Crosswalk			✓		✓	
Curb Radius Reduction			✓		✓	
Right in/ Right out Island	✓		✓		✓	
Sidewalk Extension (at intersection)					✓	
Chicane (1 & 2 lanes)					✓	
Raised Median Island	✓		✓		✓	
Curb Extension	✓		✓		✓	
Directional Closure					✓	
On Street Parking	✓		✓		✓	
Centreline Painting	✓		✓		✓	

If the road does not meet the minimum requirements for the consideration of traffic calming devices, there are a number of mitigation measures that can be recommended to the concerned citizens. Since very often, the "offenders" in a community are the local residents themselves, grassroots awareness and education campaigns can often improve conditions. Such typically free measures include:

- Installation of ICBC's road safety "Slow Down" lawn signs
- Speed Watch campaign
- Information to PAC or Neighbourhood Watch

Step 2 – Request a Petition

If the road is eligible for traffic calming, to ensure the neighbourhood is in agreement with the issues raised, the complainant will be asked to write a formal letter to the District stating where and why they feel there is a problem. Once the municipal staff has determined the study area and the number of the residents, the complainant will be required to gather a petition from 75% of his or her neighbours, signifying their traffic concerns and support (75% of the 75% solicited) for a review of the conditions.

Step 3 - Consider the Road in Context

If it is clear that the thresholds have been met, then it will be important to understand the role the road plays in the surrounding network. A review of the neighbouring streets will determine whether there is a vulnerability to spillover traffic that attempts to avoid the newly calmed street. If a vulnerability is detected, those streets should be included in the analysis, to ensure any diversion of traffic can be moved appropriately to arterial roads.

Step 4 - Develop Two Concept Plans

As all installations have varying benefits and necessary trade-offs, it is suggested that if possible two different traffic calming plans be developed for the problem area. Each plan should clearly illustrate what benefits the device is designed to achieve, and the disadvantages. The two concept plans developed will be acceptable to District staff prior to presentation to Stakeholders.

Step 5 - Present the Options to Stakeholders

By way of a survey and a letter or public meeting, the options should be presented to the residents who stand to be affected by the changes, for review and feedback. The survey will allow for residents to choose between the two concept plans and rate them accordingly, and to determine if they support, do not support, or are neutral. A 75% acceptance rate (ie: total of support + neutral) is desired for approval. The emergency services should be included in the consultation.

Step 6 - Integrate Feedback, Evaluate Options

The following list of considerations should be included in the evaluation:

- Maintenance (cost, damage from snow removal equipment)
- Delay to Emergency Vehicles
- Heavy Vehicle Access (truck routes and potential future transit)
- Adherence to TAC Design Standards (issues may arise if alterations are made to standards).
- Adherence to MUTCD (Manual on Uniform Traffic Control Devices)

Step 7 – Council Approval

Based upon the feedback from the community stakeholders and in consideration of the evaluation exercise, an amended traffic calming plan can be developed with the 'preferred option' presented by the District Staff to Council for approval and funding. Ensure funding requests includes necessary maintenance increases and follow up studies if required.

Consideration of Traffic Calming in New Developments

Often traffic calming that is designed and built into a new development is ineffective as the developer has not considered what and where the traffic problem may be anticipated. Developers sometimes propose traffic calming measures to appease Council and residents, but the result is ineffectual at best and may even be detrimental. In order for traffic calming to be considered by the District within a new development, a traffic engineer will be required to evaluate the need for traffic calming to justify the proposed measures under these guidelines. This will ensure that the proposed traffic calming is necessary within the new development, that the proposed measures are appropriate for the design of the roadway.

Consideration of Traffic Calming for Capital Projects/New Road Construction

Traffic calming may be desired by the District within capital or new roads projects.

Step 1 - Determine Appropriateness for Traffic Calming

Refer the Traffic Calming Matrix table (Table 14 on page 20) to ensure the road qualifies. In the case of new roads, undertake an exercise to anticipate the expected speeds and volumes the new road will generate.

Step 2 - Evaluate

An evaluation should be done to determine what effects the various traffic calming devices would have on the roadway (ie: reduce speeding, reduce volumes).

Step 3 - Utilize Matrix

Once the evaluation is done, choose a combination of the corresponding measures identified in the matrix (Table 14 on page 20) that would be considered appropriate for the new road/capital project.

Monitoring

If traffic calming measures are implemented, data should be collected, in the subject area, prior to implementation. Subsequent data collection should be undertaken at 6 months and 1 year respectively, after completion of the installation of the devices, to ensure the desired effect was achieved.

4.7 Safe Routes to School

ICBC sponsors a safe routes to school program called 'Way to Go!' school program for elementary and middle schools. The program offers tools to help schools and parents develop safe, alternative travel modes to school. A resource kit is available for schools and parent advisory committees. The resource kit includes a manual on collecting data for the school, mapping exercises, how to determine the best routes to school, information on how to integrate pedestrian and cycling education, similar ideas from other communities and programs and suggested activities to create involvement.

It is recommended that all of the schools within the District of Summerland develop a safe routes to school program to reduce the volumes of vehicles to site, increase safety for school children and to help identify areas of improvement along the road network for the District.

4.8 Data Collection Process

In order to monitor traffic conditions and operations, the District should implement a data collection program. The data collection program should be a two year program which ensures that any intersection or count location within the program is counted no more than three years apart. The following is a suggested program. New intersections or count locations should be added if new development occurs within an area or a new road is constructed.

Table 15: Data Collection Program

Count Location	Type of Count	Year of First Count	Year of Second Count
Hwy 97/Rosedale	Manual Count	2008	2010
Hwy 97/Prairie Valley	Manual Count	2008	2010
Rosedale/Jubilee West	Manual Count	2008	2010
Rosedale/Prairie Valley	Manual Count	2008	2010
Prairie Valley/Victoria	Manual Count	2008	2010
Prairie Valley/Cartwright	Manual Count	2008	2010
Victoria/Jubilee West	Manual Count	2008	2010
Prairie Valley/Doherty	Manual Count	2008	2010
Prairie Valley between Cartwright and Victoria	Hose Count	2008	2010
Prairie Valley between Giant's Head and Atkinson	Hose Count	2008	2010
Rosedale between Prairie Valley and Jubilee West	Hose Count	2008	2010
Jubilee West between Rosedale and Kelly	Hose Count	2008	2010
Hwy 97/Jones Flat	Manual Count	2009	2011
Hwy 97/Johnson	Manual Count	2009	2011
Prairie Valley/Giant's Head	Manual Count	2009	2011
Prairie Valley/Atkinson	Manual Count	2009	2011
Lakeshore/Peach Orchard	Manual Count	2009	2011
Victoria/Dale Meadows	Manual Count	2009	2011
Cartwright/Jubilee West	Manual Count	2009	2011
Jones Flat/Garnet Valley	Manual Count	2009	2011
Prairie Valley west of Cartwright	Hose Count	2009	2011
Prairie Valley between Rosedale and Giant's Head	Hose Count	2009	2011
Victoria north of Jubilee West	Hose Count	2009	2011
Victoria between Dale Meadow and Simpson	Hose Count	2009	2011
Lakeshore between Peach Orchard and Hwy 97	Hose Count	2009	2011

5.0 HEAVY VEHICLES

5.1 Truck Route Bylaw

Municipalities are given the power to establish bylaws through the British Columbia Local Government Act. The Local Government Act places restrictions on what types of activities are subject to bylaw and how they may be controlled. Municipalities are given the power to enforce a municipal bylaw through the British Columbia Community Charter. The Community Charter allows municipalities to fine large vehicle drivers who act in contradiction to the municipal truck bylaw by travelling on restricted routes.

A Truck Route bylaw also specifies gross weight restrictions for specific routes and parking areas for trucks and trailers. Exceptions can be made for agricultural (farm vehicles) and District vehicles. Within the bylaw, trucks are allowed to deviate from the designated truck routes as long as they remain on the designate route as long as possible prior to leaving the route to provide service to a property off the designated route. The truck must then return to the designated route by the shortest (or quickest) possible route. The truck route bylaw must be accompanied by a truck route map, identifying the routes that trucks are allowed. There must also be signage along the routes and at key entry points to the route that make it clear to drivers the permitted routes. Without a bylaw, heavy trucks are legally allowed on all roads within the District.

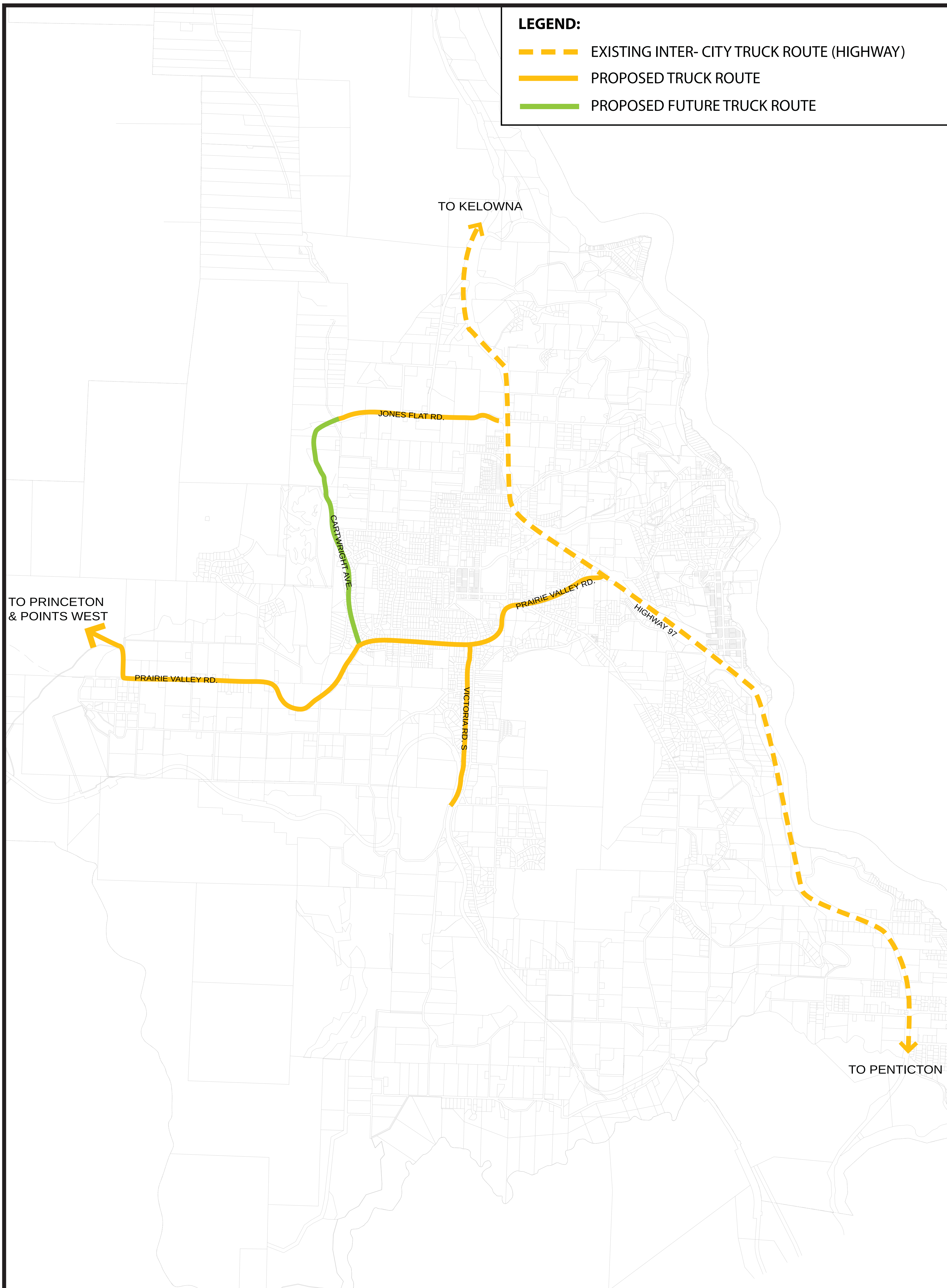
Truck route roads require stronger road bases, thicker asphalt and wider lanes. Sidewalks or wide paved shoulders are required along truck routes to provide separation between vehicles and pedestrians (vulnerable users).

5.2 Truck Routes

The following roads are proposed to be the designated truck routes within the District:

- Prairie Valley Road
- Jones Flat Road
- Cartwright Road
- Rosedale Avenue
- Victoria Road South

See **Figure 14** for proposed truck route.



Truck routes typically require a more significant load base, wider travel lanes and physical separation from pedestrians. Where possible, intersections should be improved to accommodate trucks.

FIGURE 14

5.3 Engine Brake Signage

Engine brake signage can be incorporated into the truck route bylaw. The banning of engine brakes within the District is not recommended due to the steep topography within the District. However, signage, can be used to discourage the use of engine brakes unless it is an emergency. The use of engine brakes and penalties for there use in non-emergency situations can be incorporated into the truck route bylaw.

Engine Brake Sign

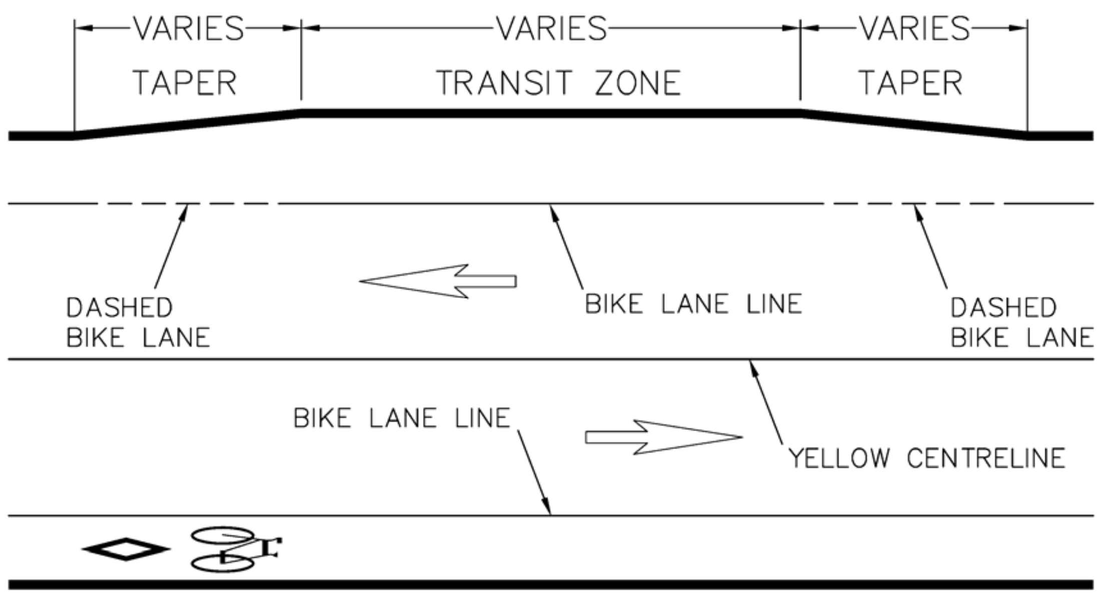
6.0 BICYCLE AND TRAIL NETWORK

Bicycle use is an environmentally, socially and economically viable alternative to automobile travel. Bicycles offer additional mobility options for those looking for an economical alternative and can cover fairly significant distances, while being virtually carbon-zero. Bicycling offers health benefits to users, while being a relatively safe travel mode when operated on designated routes. Bicycles are highly flexible, allowing users to choose a variety routes and with the possibility of combining with other travel modes (ie. transit, vehicles, walking, etc). In order to promote bicycle use, it is necessary to ensure appropriate infrastructure is provided. This section of the master plan identifies the bicycle infrastructure and programs necessary to encourage Summerland residents to cycle. See **Figure 15** for bicycle and trail plan.

6.1 Proposed Bicycle and Trail Network

6.1.1 On-street Primary Routes

On-street primary routes are those routes intended for heavy use by bicycles. On-street primary routes utilize existing roadways, and may require infrastructure upgrades to meet acceptable bicycle standards. Routes can either be dedicated bike lanes of at least 1.5 metres or a shared roadway with lane widths of at least 4.3 metres and appropriate paint markings.



Typical Paint Markings for Bicycle Lanes

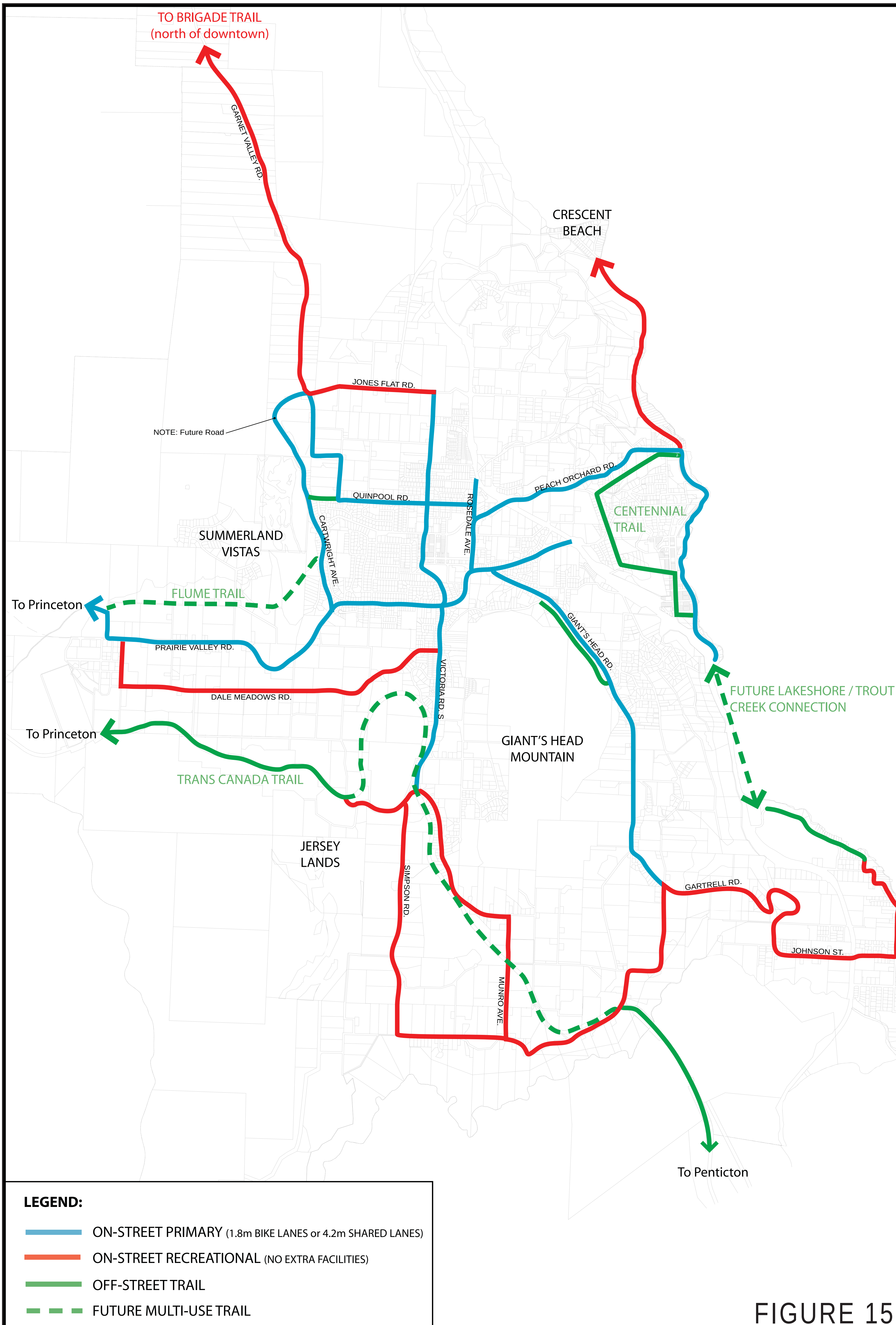
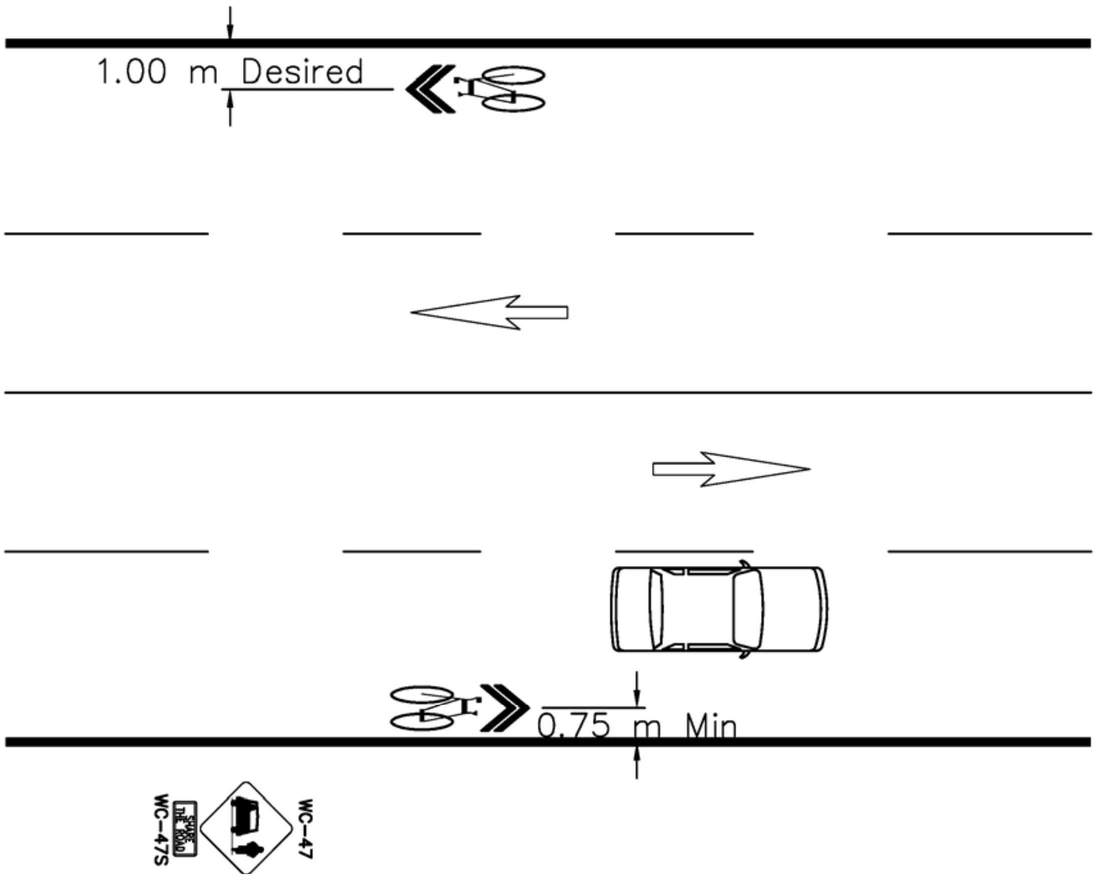


FIGURE 15

SUMMERLAND TRANSPORTATION MASTER PLAN

Bicycle and Trail Network

Boulevard Transportation Group



Typical Paint Markings for Shared Use Lanes

Primary routes will form the backbone of the District's bicycle network. They will function as key commuter routes, allowing bicyclists to safely and efficiently travel between key destinations. Primary routes are recommended along seven (7) key corridors:

- Prairie Valley Road between Highway 97 and the proposed Summerland Hills neighbourhood
- Cartwright Avenue between Prairie Valley Road and Jones Flat Road
- Victoria Road between Simpson Road and Jones Flat Road
- Giant's Head Road between Gartrell Road and Prairie Valley Road
- Rosedale Avenue north of Prairie Valley Road, and Peach Orchard Road east of Highway 97
- Lakeshore Drive North between Peach Orchard Road and Highway 97
- Quinpool Road from Rosedale Avenue to Garnet Avenue and Garnet Avenue, Tingley Road and Garnet Valley Road south of Jones Flat Road.

6.1.2 On-Street Recreational Routes

On-street recreational routes are those routes meant to support the on-street primary routes. Recreational routes utilize roadways that are currently designed to accommodate bicycles in travel lanes or paved shoulders, with no extra facilities. Recreational routes bridge the gaps between primary routes and ensure greater bicycle connectivity. Recreational routes are recommended for five (5) key routes:

- Dale Meadows Road between Prairie Valley Road and Victoria Road South
- Jones Flat Road between Highway 97 and Garnet Valley Road, and north along Garnet Valley Road
- Lakeshore Drive North, north of Peach Orchard Road
- Nixon Road, Johnson Street, Fir Avenue, Happy Valley Road, Hillborn Street, Lewes Avenue, and Victoria Road South as far north as Simpson Road
- Simpson Road between Victoria Road South and Canyon View Road

6.1.3 Off-Street Trail Routes

There is currently a network of off-street trails meant for use by bicyclists and pedestrians. Off-street trails primarily serve recreational users, but can also be used by commuters as a link to increase connectivity between on-street routes. The key portions of the off-street trail network include:

- Centennial Trail, which links the Solly neighbourhood with Lakeshore Drive
- Trail connection between Highway 97 and Thornber Avenue in the Trout Creek neighbourhood
- Trans-Canada Trail south of Canyon View Road
- Trans-Canada Trail west of Fyffe Road
- Okanagan Brigade Trail

6.1.4 Future Multi-Use Trail Routes

Future multi-use trail routes are planned for those locations where a key link is missing in the trail network. The addition of future multi-use trails will increase recreational opportunities and further encourage bicycle and pedestrian travel. Identified future trails include:

- Lakeshore Drive -Trout Creek connection, running parallel to Lake Okanagan shoreline and adjacent to Highway 97
- Flume Trail, which parallels Denike Street
- Completion of the Trans-Canada Trail through Summerland, along the CN Rail line between Fyffe Road and Canyon View Road

6.2 Bicycle Parking

Bicycle parking facilities are a major factor in choosing bicycling as a mode choice. If a potential bicycle rider is unable to securely park their bicycle, they are less likely to cycle. In addition to the provision of parking, it is essential that bicycle parking facilities offer an element of comfort, including being well-lit and protected from weather. Bicycle parking is typically provided as part of a private development in two (2) ways; or may be provided by the municipality in appropriate public places.

6.2.1 Long Term Parking (Class I)

Class I parking facilities are intended for bicycle users parking a minimum of four (4) hours, typically residents of a residential use or employees of a commercial use. Class I parking must be fully secure and weather protected, as the bicycle may be unattended for a long period of time. Each bicycle must be independently accessible and securable to a sturdy rack, and an enclosure should provide protection from theft and damage to both the bicycle and its accessories.


Examples of Long Term Bicycle Parking Facilities

6.2.2 Short Term Parking (Class II)

Class II facilities are intended for short-term users, typically residential visitors and retail customers, and are not meant to accommodate bicycles overnight. They should provide theft protection to the bicycle and core components (ie. frame, tire), but do not protect from theft of accessories, such as a pump or water bottle. Class II facilities are not required to be weather protected, but may be suggested to do so. Facilities should secure a bicycle in such a way as to not damage the frame and tires, and must permit both the frame and tires to be locked by the users own locking device. Class II facilities should be located no more than fifteen (15) metres from the building entrance.

Examples of Short Term Bicycle Parking Facilities

6.2.3 Bicycle Parking Requirement

It is suggested that the Summerland zoning bylaw, Section 6.0, is amended to include bicycle parking requirements according to Table 16. It is also suggested that the bylaw require a development application to include details indicating the size of Class I and Class II parking facilities, as well as specifications for the fixtures and security measures.

Table 16: Recommended Bicycle Parking Rates

Use	Bicycle Parking Requirement
Residential multi-family	1 space per residential unit (80% Class I, 20% Class II)
Hotel/Motel	1 space for every 15 rooms (60% Class I, 40% Class II)
Commercial, retail	1 space per 200m^2 GFA (25% Class I, 75% Class II)
Commercial, office	1 space per 400m^2 GFA (75% Class I, 25% Class II)
Recreational/Cultural/Educational	1 space per 200m^2 GFA (25% Class I, 75% Class II)
Parking Structure/Lot	10% of motor vehicle spaces provided
Other Uses	As determined by the District

6.2.4 Public Bicycle Parking

In addition to adjusting the District's Zoning Bylaw to include bicycle parking requirements, the District should consider a retrofit program to locate bicycle parking in public places that currently lack parking. Bicycle parking in public places could be a simple outdoor rack for users to lock their bicycle to (ie. Class II) and in public locations with a steady employee base, but private bicycle facilities, an indoor lock-up space (ie. Class I) may be provided. Eligible places include locations such as parks, schools, libraries and hospitals. A review of public locations to determine those in need of bicycle parking should be undertaken to identify the areas where there is a high demand for public bicycle parking.

6.3 Bicycle Shower/Change Facilities

Shower/change facilities remove one of the primary barriers to bicycle commuting, that is that business attire is not conducive to cycling. The District should include a requirement in the zoning bylaw that all retail and office with more than ten (10) employees are required to provide a shower facility for employees.

7.0 PEDESTRIAN NETWORK

7.1 Existing Plan

The District has proposed an existing pedestrian plan which identifies existing and proposed sidewalks. Existing sidewalks are largely in the downtown core, including Henry Avenue, Kelly Avenue and portions of Victoria Road North and South, as well as portions of Main Street, Jubilee Road West, Giant's Head Road and Quinpool Road. There is also a concentration of existing sidewalks along Lakeshore Drive.

Sidewalks are proposed for main routes that currently lack them or as a link between existing routes. Proposed locations of significance include Peach Orchard Road, Cartwright Avenue, Prairie Valley Road, Victoria Road and Rosedale Avenue. Overall, the proposed and existing routes form a comprehensive network that focuses on the downtown core, but provides sidewalk links along key pedestrian routes, permitting pedestrian access to/from the downtown.

7.2 Proposed Plan

The proposed plan is an update to the existing plan, meant to better reflect current conditions and integrate more effectively with related travel modes and changing land uses. Similar to the existing sidewalk plan, the recommended plan identifies existing and proposed sidewalks. Sidewalks should be provided along new urban development frontages when a site is developed regardless of when the sidewalk is proposed to be improved. See **Figure 16** for pedestrian plan.

7.3 Pedestrian Realm Design Considerations

As the Summerland pedestrian network continues to develop, it is important that consideration is given to certain design elements to ensure the pedestrian realm is attractive, safe and accessible. The following is a series of design guidelines that the District should consider in the design of pedestrian facilities.

7.3.1 Sidewalk Width

Sidewalks within the downtown core and areas of higher pedestrian activity are recommended to be a minimum of 2m. In areas of lower pedestrian activity sidewalks should be a minimum of 1.5m and wider where possible.

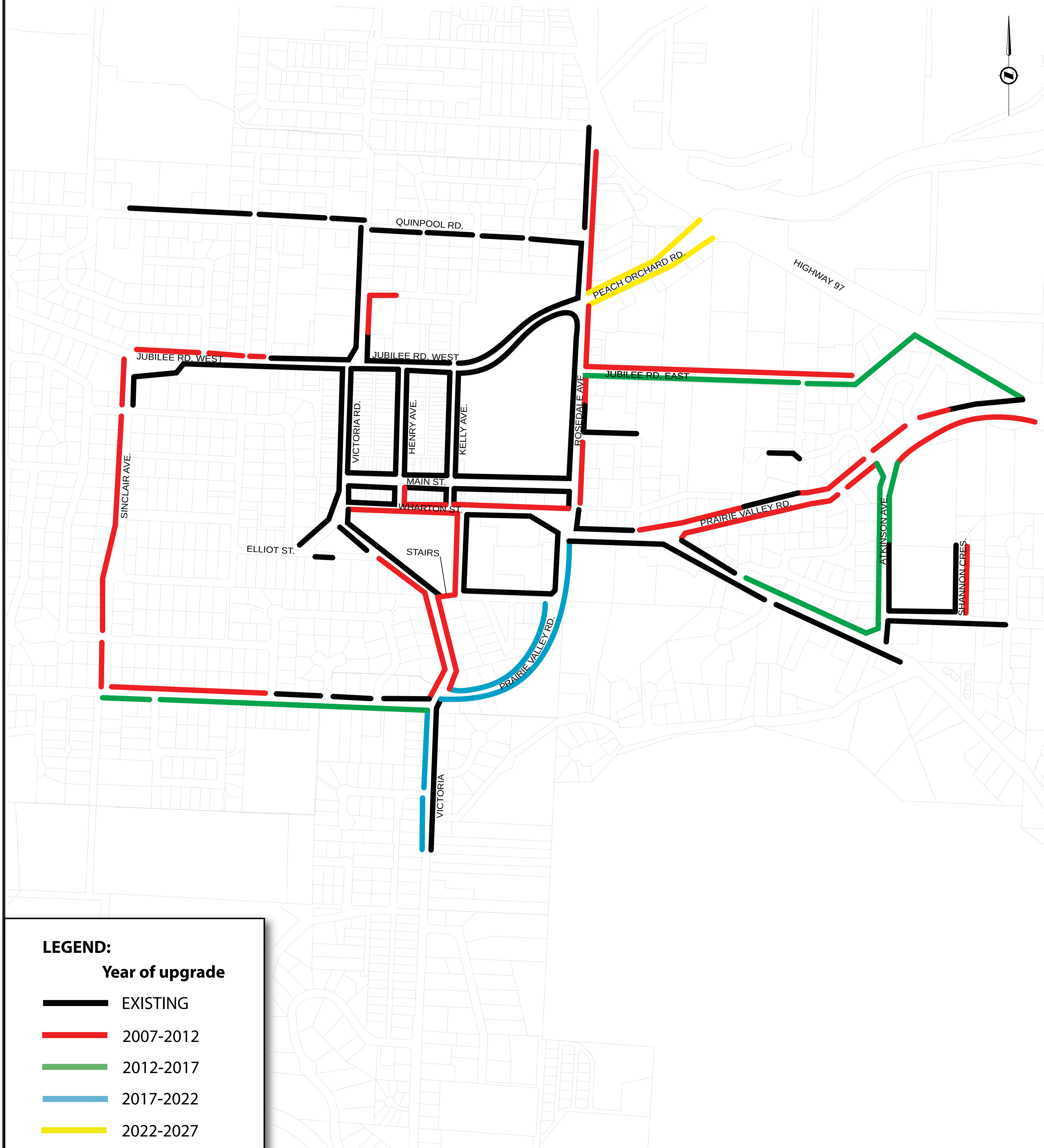


FIGURE 16

SUMMERLAND TRANSPORTATION MASTER PLAN

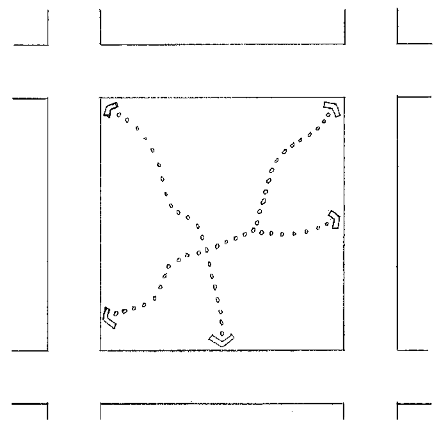
Downtown Sidewalk Plan

7.3.2 Safety

The pedestrian realm must be designed for safety and security. Pedestrian safety means protecting pedestrians from vehicle conflict, but it also means designing a built environment that reduces incidences of crime and the perception of crime. Fundamental built environment elements, such as natural surveillance, lighting and landscaping, as well as programming and maintenance, are key is this regard.

7.3.3 Connectivity

One method to encourage walking as a travel mode is to increase opportunities for walking and make it more convenient than driving. Connectivity is measured by a ratio of intersections to links. Increasing the number of links increases connectivity. By increasing connectivity you offer more ways to reach a given destination. Increasing pedestrian connectivity versus vehicle connectivity decreases travel time and increases convenience, thereby encouraging walking as a travel mode. Pedestrian connectivity should be increased in Summerland by providing mid-block connections on properties that allow it, particularly in areas of high density and high pedestrian volumes.



mid-block pedestrian connections allow pedestrians to increase connectivity relative to vehicle.

7.3.4 Accessibility

Accessibility refers to the provision of infrastructure that is accessible to all users, including those with physical, visual and other disabilities. Disabled users require specific design features to allow them to fulfil all their trips without compromise to safety and mobility. The District should always consider accessibility in their design of pedestrian infrastructure, including:

- Audible pedestrian signals to guide visually-impaired users
- Tactile surface marking to aid navigation by visually-impaired users
- Letdowns at road crossings to permit wheelchair access
- Minimum sidewalk clearings acceptable for two-way wheelchair passage (2.4m)
- Location and design of street furniture to permit use by all users

7.3.5 Signage/Wayfinding

Key pedestrian routes should include appropriate signage and/or wayfinding elements. Signage could be added that guides pedestrians to the location of popular pedestrian destinations, typically civic or institutional destinations. Signage should be in keeping with established signage themes for the District and should be consistent throughout the pedestrian network.

Wayfinding elements are related to signage in that they direct users, but wayfinding uses subtle design elements to guide pedestrians. Wayfinding may employ such vague elements as distinctions in colour or materials to guide users. It can also use specific treatments for specific objectives, such as tactile patterns to guide visually-impaired users or audible indicators to guide the deaf. The District may find that wayfinding is a more suitable alternative to signage, or that a combination of the two (2) is practical. Regardless, it is recommended that the District undertake a signage/wayfinding review of the pedestrian realm to ensure that as the pedestrian network expands that it includes appropriate signage/wayfinding.

7.4 Crosswalk Warrants

All intersections are legal crossing locations, whether they are unmarked or have a higher level of crossing control (ie. signed and marked). The implementation of signed and marked (or higher level of control) crosswalks should not be undertaken unless the location meets the warrant criteria in the *Pedestrian Crossing Control Manual for BC*. The manual's warrants utilize pedestrian type (children, adults and seniors/disabilities) and volumes, crossing opportunities (number of safe gaps in traffic for pedestrian to cross), and an adjustment for community population. The warrant will determine the level of cross as follows:

- Unmarked or not warranted
- Signed and marked
- Special crosswalk – which includes crosswalks with overhead signs, downlighting, pushbuttons, and/or flashers
- Pedestrian activated signals – flashing green signal heads for main street and stop control on side street
- Grade separation – ie. overpasses.

8.0 PUBLIC TRANSIT

Public transit presents significant benefit to a community. Transit offers increased mobility for those unable to drive, mainly physically- and mentally-disabled users and those who are too young or old to obtain a license. Transit is an economical alternative to automobile travel for those residents of lower income. Transit offers a reduction in emissions and energy consumption over private automobile use. It can also be used to support existing land use patterns and proposed future development. While the benefits of transit to the District are undeniable, the economic burden associated with expanding service has prevented any substantial expansion. This section presents a strategy for transit improvements in the District.

The District, despite continued development pressure and rising population base, has been unable to attract a significant, reliable transit service. The only existing service is a loop between Summerland and Penticton, which is operated by the Summerland Transit Society. The route makes three (3) roundtrips daily on half-hour headways, departing Summerland at 7:00 AM, 9:30 AM and 1:45 PM. Trips return to Summerland at 8:15 AM, 1:00 PM and 3:30 PM. Service is by reservation only, requiring users to book their trip via telephone.

Existing transit service in Summerland is limited; however, great interest has been shown by the community to improve transit. To improve service, the following transit objectives have been established.

- Establish a fixed-route, intra-city transit route
- Establish transit route to Kelowna, via Peachland
- Increase frequency of existing Summerland-Penticton route
- Establish land use and regulatory policies that support transit
- Provide guidelines to ensure existing and future infrastructure is designed appropriately

8.1 Proposed Transit System

The following outlines the exchanges and routes necessary to create an integrated, regional approach to transit in the District of Summerland. See **Figure 17** for transit routes.

8.1.1 Downtown-Lakeshore Route

Our study of the District found that an intra-city transit route is feasible for Summerland. The ideal route would connect the downtown with Lakeshore Drive and the Trout Creek neighborhoods, making stops along Peach Orchard Road, Lakeshore Drive, Giant's Head Road and Prairie Valley Road. The proposed route connects the Trout Creek and Solly Street-area residential neighborhoods with the

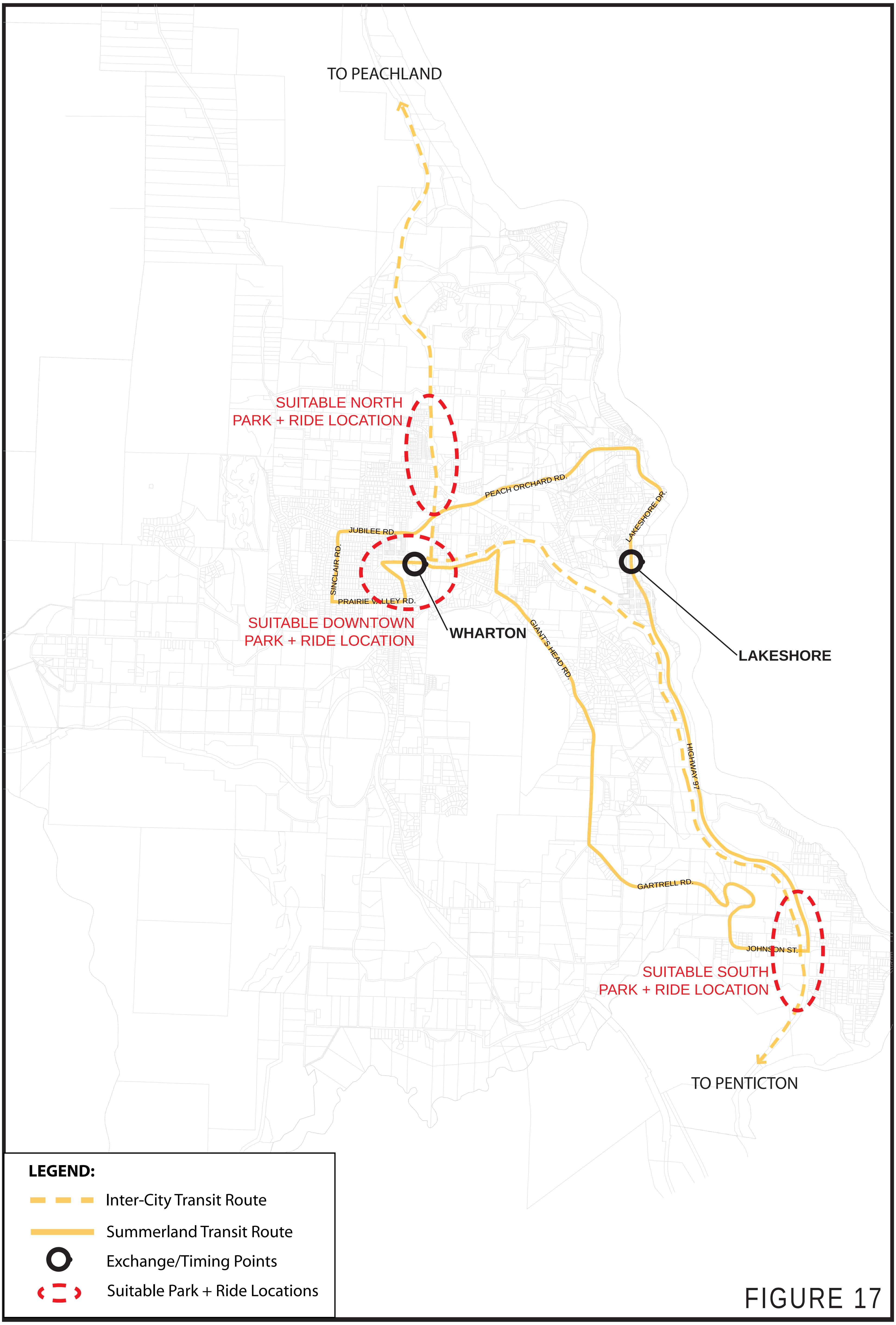


FIGURE 17

SUMMERLAND TRANSPORTATION MASTER PLAN

Public Transit Network

Boulevard Transportation Group

downtown. It would permit summertime tourists to easily travel between the lakeshore area and the downtown.

8.1.2 Summerland-Penticton Route

The Summerland-Penticton route presently exists, as explained earlier. There is a need, however, to establish this as a fixed-route service, with more direct service to Penticton. Reducing travel times would make transit use more attractive as a commute alternative to Penticton.

It is proposed that the Summerland-Penticton route originate at an exchange at Wharton Street, travel eastbound on Prairie Valley Road and southbound on Highway 97. This should be an express service between downtown Summerland and Penticton, with an optional stop at Johnson Street and Highway 97 to retrieve passengers from the Trout Creek neighborhood. By having the inter-city transit routes meet with the intra-city transit buses in the downtown area, residents would be encouraged to make trips to downtown Summerland first rather than Penticton first.

8.1.3 Summerland-Peachland-Kelowna Route

There is currently no public transit link between Summerland and Peachland-Kelowna to the north. It is proposed that a route could be established from Summerland to Peachland, a trip of approximately twenty-two (22) kilometers. The trip would be an express route, with no stops proposed between downtown Summerland and the Beach Avenue transit stop in Peachland, where transit connections are available to Kelowna.

8.1.4 Transit Exchanges

Two (2) transit exchanges are proposed. The first is located on Wharton Street. The Wharton Street Exchange would be the terminus for the three (3) routes, facilitating coordinated scheduling and integration between the routes. The location of this exchange is appropriate because of the future changes in land use proposed for the immediate surroundings, which could be built to accommodate transit. The increase in pedestrian traffic that results from the exchange would also be of benefit to the retail uses in the area.

A second exchange is proposed for Lakeshore Drive. The Lakeshore exchange would be a timing point for the Downtown-Lakeshore route, keeping the route on-schedule. The exchange would require minimal infrastructure, as it is located near a municipal park that provides public facilities.

8.2 Scheduling and Coordination

It is essential that the proposed routes have coordinated schedules so that users can rely on the service as a realistic alternative to private automobile use. The idea behind this is that the inter-city routes, those servicing Penticton and Peachland-Kelowna, are express routes that make minimal, if any, stops after they depart from the Wharton Exchange. This keeps their travel times to a minimum. Their departure/arrival at the Wharton Exchange must be coordinated with the local Downtown-Lakeshore route so that users travelling to/from the District can also reach destinations within Summerland efficiently.

8.3 Transit Infrastructure

8.3.1 Bus Stop Guidelines

As the Summerland service is being established, it is important that basic bus stop guidelines are in place to ensure that the provided infrastructure is safe and accommodating to users. BC Transit has developed the Transit Stop Installation Checklist (see *Appendix F*), which offers preferred standards for transit stops. The checklist includes issues of site design, connectivity, accessibility, signage and safety. It is recommended that bus stops in Summerland are developed in consideration of the BC Transit checklist.

8.3.2 Vehicle Selection

The selection of transit vehicles factors heavily in both startup and operational costs. It is suggested that the District consider smaller vehicles than are typically used in major cities, perhaps the 11-metre Dennis Dart or the 7.5-metre Ford Polar, both of which are currently used by BC Transit throughout the province. The smaller vehicles are expected to satisfy ridership demands, while producing fewer emissions and with a less expensive capital purchase price. Hybrid vehicles, currently in use by BC Transit, offer significant emissions reductions and should be considered for the District.

8.3.3 Accessibility

Public transit is relied upon heavily by those without the ability to drive a private automobile, particularly the physically disabled. To show leadership and improve mobility options for the disabled, the District should place emphasis on universal accessibility. This includes careful consideration when designing and constructing bus stops to ensure they are fully accessible, as well as choosing transit vehicles designed to accommodate physically disabled users. It is recommended that accessibility needs are determined in consultation with a task force representing disabled users.

8.4 Transit Supportive Policies

8.4.1 Land Use Planning

Once intra-city transit is established in Summerland, the District should strongly consider reviewing the Official Community Plan to increase densities in those areas best serviced by transit. The traditional rule of thumb is that transit users are willing to walk four-hundred (400) metres to access transit. The District should consider a slight density bonus provision for those properties within four-hundred (400) metres of a transit stop, relative to other properties. Increased density, combined with varied land uses, is the key concept in creating a built environment that is supportive of transit.

8.4.2 Intermodal Integration

Transit users begin and end every trip by walking. By improving the pedestrian realm, users will be encouraged to use transit with greater frequency and walk further distances to access transit. Appropriate pedestrian infrastructure is therefore essential to the success of transit. Bicycle use can also extend the geographic extent of transit's range. Appropriate bicycle trails/routes, combined with on-board bicycle racks, are essential to an effective transit service.

Special consideration for pedestrians and bicyclists should be given to the Wharton exchange. The exchange should be designed with weather protection for passengers waiting for transfer. This could be accomplished by providing a shelter or integrated with the development of surrounding properties. Bicycle users should be given an opportunity to park their bicycle in a safe, weather-protected facility so as to encourage integration of cycling and transit.

8.4.3 Transportation Demand Management

There are various policy and program incentives that can be created to encourage District residents to travel via transit. Transportation demand management is explored in further detail in *Section 10.0*.

9.0 ELECTRIC CARTS

Electric carts present an opportunity to expand the breadth of transportation options available to Summerland residents, while creating a sustainable alternative to automobile travel. Technically referred to as Low-speed Vehicles (LSVs) or Neighbourhood Electric Vehicles (NEVs), electric carts are similar to those used when golfing, but are equipped with some of the safety features found on a passenger automobile. Electric carts provide triple bottom-line benefits to both the user and the District. Carts address sustainability objectives by producing zero emissions, while improving transportation equity by providing an affordable option for lower income residents and increasing mobility for seniors. Electric carts are ideally suited as a second vehicle for couples or families to complete local commute/errand trips, and seniors uncomfortable or unfit to drive an automobile. Through innovative infrastructure design and planning, electric carts also posses the ability to utilize both automobile and non-automobile infrastructure, increasing their versatility and attractiveness to potential users.

Examples of Neighbourhood Electric Vehicles

9.1 Regulatory Environment

In 2000, the Canadian government amended the Motor Vehicle Safety Act to include LSVs as a distinct vehicle class. A LSV is defined as a vehicle that is powered by an electric motor, produces no emissions, and is designed to travel on four (4) wheels at a speed of between 32 km/h and 40 km/h. The definition also states that LSVs include features such as headlights/taillights, turn signals, windshields, a parking brake and seatbelts in compliance with Motor Vehicle Safety Regulations.

While federal legislation permits LSV-class vehicles in Canada, only British Columbia has developed licensing and operating conditions to facilitate LSV use on public roadways. There are a number of restrictive regulations in British Columbia that make using an LSV costly and inconvenient. LSVs must be registered, licensed and insured at rates comparable to passenger vehicles prior to operating on public roads, despite being a sub-passenger vehicle. LSVs are bound to the Motor Vehicle Act regulations for any passenger vehicle, which includes the ability to meet stopping distances and the provisions of mandatory safety equipment, such as headlights, windshield wipers and seatbelts. In addition to passenger vehicle regulations, LSVs must also meet the slow-moving vehicle requirements, typically applied only to farm vehicles. These requirements state that LSVs must display a "slow moving vehicle" sign, illuminated amber flashing lights, must drive in the right lane, and are forbidden to travel on highways and major bridges.

9.2 Local Policy/Regulation

There is currently no regulation in the District that speaks to electric carts or golf carts use on public roads. The following are policy/regulatory steps that need to be taken to facilitate LSV use on public roads in Summerland, based on observation of LSV use in other jurisdictions.

9.2.1 Permitted Roads

Most jurisdictions create specific routes or areas that are identified in their local golf cart plan as being conducive to golf cart use. Other locations allow golf carts on any road with a speed limit of twenty-five (25) miles per hour, approximately forty (40) km/h. Canadian roads, however, typically do not have speed limits less than fifty (50) km/h. Since LSVs are regulated for a maximum speed of forty (40) km/h, it is suggested that in Summerland LSVs are limited to two-lane roads with speed limits no greater than fifty (50) km/h. The District may also create a plan specifically for golf carts, identifying preferred routes and the possibility of infrastructure upgrades to encourage LSV use, including public charging stations and dedicated LSV pathways. As a starting point, it is recommended that LSV be limited to the downtown area (Victoria Road to the east and south, Jubilee West Road to the north and Prairie Valley Road the south and west).

9.2.2 Hours of Use

Typically, golf cart use is only permitted on public roads during daylight hours. Palm Desert, California, for example, allows golf carts on public roads between one (1) hour before sunrise and one (1) hour after sundown. It is suggested that Summerland implement a similar regulation to ensure safety for LSV drivers.

9.2.3 Vehicle Permit

Only carts that meet the LSV requirements in the Canadian Motor Vehicle Safety Act will be registered and insured with ICBC. However, to ensure that LSVs on District roads are suitable and have not been altered or diminished from lack of maintenance, it is suggested that a vehicle permit system could be established by the District. This would allow the District to inspect LSVs to ensure they are fit for public roads, as well as better monitor the use of LSVs in Summerland. Obtaining a permit should have minimal or no cost and, in other examples, requires renewal bi-annually.

9.2.4 Driver Requirements

Generally, LSV drivers must possess a valid driver's license. Some jurisdiction permit the use of a LSV by mentally or physically handicapped drivers, provided they complete a formal assessment from a physician stating they are capable of operating an LSV and permission from the local municipality. Permitting LSV use by those without a valid driver's license is amenable, as it offers increased travel options for those with limited options, however it is suggested, should the District choose to establish an LSV program, that non-licensed users not be permitted to operate LSVs. As the program matures and should there prove sufficient demand from these users, the District may look at instituting a discretionary user-licensing system. This would require negotiations with Insurance Claims of British Columbia, as LSVs are registered and insured.

9.3 Implementation

It is suggested that electric carts are appropriate in Summerland and the District take the following steps towards implementation.

9.3.1 Electric Cart Policy

The District should include statements in the OCP that indicate the District's intentions for electric cart use. This would be a simple amendment to the existing OCP that includes a statement in the transportation section stating an intent to encourage electric cart use in the District.

9.3.2 Electric Cart Plan

The District must establish a plan to guide the process. The plan should include the following:

- Vehicle requirements
- Designated routes and permitted usage areas
- Necessary route/infrastructure upgrades
- Permitted hours of operation
- Outline the electric cart permit process

9.3.3 Electric Cart Education/Promotion

The District should, as part of the electric cart program, undertake a promotions/education program. The objective is to make it known to the community that electric carts are permitted on District roads, a fact that few residents are aware of. The education of the community should alert them to the economic and environmental benefits of cart use, and should be focused on those user groups most likely to choose electric carts.

The District must take steps to ensure residents that wish to obtain an electric cart can do so with relative ease. At current, there are no electric carts available that include the necessary safety equipment that permits use on public roads, a user would have to purchase a vehicle and arrange for the appropriate modifications themselves. As a market for electric carts begins to develop, generated by the heightened demand as a result of the District's initiative, the District should work with local automobile retailers to stock electric vehicles or make them available by order.

9.3.4 Lobby for Regulatory Change

The fact that electric carts are required to meet the requirements for both a passenger vehicle and a slow-moving vehicle makes using LSVs less convenient. The District should lobby ICBC to make electric cart registration form simple. This could take either of two (2) ways. First, ICBC could simply drop the slow-moving vehicle requirements, requiring the cart owners meet the requirements of a typical passenger vehicle. Conversely, the District, perhaps in cooperation with other adjacencies, may choose to lobby for an entirely new vehicle registration class that is specific to electric cars. This would include certain requirements of both the passenger vehicle and slow-moving vehicle classes, but would exclude unnecessary requirements.

9.4 Neighbourhood Electric Vehicle Programs

Generally, the United States is more advanced than Canada in implementing NEV policies/programs at a municipal level. Approximately forty (40) states have passed legislation to allow NEVs on roadways with speed limits of thirty-five (35) miles per hour or less.

9.4.1 Case Study: Palm Desert, California

Palm Desert, California is probably the most complete example of a golf cart transportation program. The City has adopted golf carts into their municipal code, the equivalent of Summerland's municipal bylaw, which states an intent to provide golf cart lanes, minimum standards, operations requirements, permit procedures and reporting practices. The City has established two (2) free public charging stations, with more in the works. Generally, golf carts are permitted on all City streets with speed limits of twenty-five (25) miles per hour, or on routes identified on the Palm Desert Golf Carts Route Map. The Route Map includes three (3) route classifications.

- Designated Paths are separated from the street for exclusive use by carts and bicycles
- Golf Cart Lanes are striped lanes on the edge of a roadway
- Golf Cart Routes are streets on which carts may share lanes with vehicles

The municipal code outlines minimum design criteria for eligible vehicles on golf cart facilities, which were developed by the City Engineer and Golf Cart Transportation Committee. In order to be eligible to use golf cart facilities, a vehicle must meet the following criteria.

- Must be electrically powered
- Must be in a shape and size that conforms to industry standards
- Must present an unobstructed view to the rear from the drivers seat
- Must be equipped and safely operated with:
  - Headlights, rear lights, brake lights and reflectors
  - Parking brake
  - Horn and backup buzzer
  - Windshield and covered passenger compartment

Golf cart users in Palm Desert must possess a valid driver's license or be physically disabled and determined to be able to operate a golf cart by a physician and by the city. Golf carts may only be driven on City streets from one hour prior to sunrise until one hour after sunset and are restricted to two (2) users in a vehicle at a time. Golf cart drivers must obtain a permit. A permit only costs $10 and is valid for two (2) years. Upon receiving a permit, users are given an informational package outlining the requirements and routes.

Other cities with NEV programs include:

- Brillion, Wisconsin
- Seaside, Florida
- Celebration, Florida
- Discovery Bay, Hong Kong
- Playa Vista, California
- Lincoln, California
- Coronado, California
- Leaf Rapids, Manitoba

10.0 TRANSPORTATION DEMAND MANAGEMENT

Transportation demand management (TDM) is an integrated approach to planning and development that utilizes existing capacity in certain transportation modes in order to delay or eliminate the need to provide/expand infrastructure for other modes. In essence, TDM aims to influence user travel mode to achieve an environmental, social and economic balance. Typical municipal objectives are a reduction in single-vehicle trips and an increase in sustainable transportation alternatives, including transit, cycling, walking and ridesharing. Utilizing TDM allows the District to delay roadway improvements, while increasing use of underutilized transit, bicycle and pedestrian facilities.

10.1 Multi-modal Access Guide

The misinterpretation of information or the failure to recognize the options available can be an impedance to shifting travel mode. Multi-modal access guides will provide residents and visitors of Summerland with up-to-date, concise information on how to access destinations and areas by various travel modes. Such a guide typically includes maps, schedules, fares, and other important information to help individuals access destinations by cycling, walking or taking public transport. Guides can be produced in a variety of formats including websites, brochures, maps, or as part of an information package, or tourism booklet of the area. Different versions of the guides may be required to accommodate individuals with disabilities, individuals travelling from specific areas, or for those people who speak another language. The following multi-modal guides should be considered in the District of Summerland:

- maps of area cycling and pedestrian routes, including multi-use trails and linkages
- maps of bicycle lock-up facilities and rental locations (outside and indoors)
- map of Park and Ride locations
- Transit Schedules and Fare information (when fixed route transit is introduced)
- Taxi information and pick-up, drop off locations
- Improved wayfinding at destinations, including signage and information kiosks

10.2 Pedestrian Realm Design

The most effective way to encourage walking as a travel mode is to ensure the pedestrian realm is designed to make the pedestrian realm safe and aesthetically appealing. Recommendations for the pedestrian realm are included in *Section 7.0*.

10.3 Park and Ride

Park and ride facilities allow residents to park their car at a point along a transit route and use transit to complete the remainder of their trip. This offers economic savings to the user in that they exchange the cost of fuel for their trip for the transit fare. It provides significant emissions reductions by preventing further single-occupancy automobile travel. Park and ride facilities are particularly applicable in municipalities with limited density, such as Summerland, as providing extensive transit coverage can be difficult.

It is recommended that the District develop park and ride facilities concurrently with the expansion of local transit. A facility should be located in the area of Highway 97 and Johnson Street, meant to service travellers to/from Penticton, and a second in the area of Highway 97 and Jones Flat Road for travellers to/from Peachland and Kelowna. A third park and ride location should be within the downtown area, near the proposed Wharton Street exchange. Park and Ride lots should be free to users.

10.4 Transit-oriented Development

Transit-oriented development (TOD) is the practice of tailoring land use so that it maximizes the effectiveness of transit. TOD outlines policies and design standards for increasing density, increasing the mixture of land uses and improving pedestrian and bicycle facilities in close proximity to transit stations. While typically applied to a more urban context than Summerland, the District should consider adopting a policy to consider increased densities in those locations serviced by transit. The OCP could be amended to include a statement about how the District will consider increasing density for those properties within close proximity of transit, to a maximum of four-hundred (400) metres from a transit stop. Additional density would be granted to the property owner through development agreement negotiations, and would only be considered for properties of significant size or regional importance.

10.5 Municipal Transit Pass Program

With the proposed expansion of transit in Summerland, there is need to expand transit-supportive programs. District staff should be at the forefront of these initiatives. The District should negotiate a reduced-rate transit pass for all staff members. The District should subsidize a portion or all of the cost of employee transit passes as a way to boost ridership and increase exposure of the service. Eventually, if this program is deemed successful, the District could work with transit and some of the larger employers (grocery chains, industries etc) in the municipality to negotiate reduced transit passes for their employees to encourage wide-spread transit use.

10.6 U-Pass Program

Another method for increasing transit use is the introduction of a U-Pass (university bus pass). U-Pass programs have been developed in Victoria for UVic and Camosun College students and Vancouver for UBC and SFU with great success. The City of Kelowna has recently (September 2007) implemented a U-Pass program for UBCO students. These programs provide an unlimited bus pass to college/university students for a fixed cost. The fixed cost is part of the student's tuition. The U-Pass programs provide an easy, alternative transportation mode to students at a low cost and introduces students to transit. The District should explore options to have the UBCO U-Pass program expanded to include the Summerland Transit system and explore opportunities to expand the program to include Okanagan University/College students.

10.7 Summerland Carshare

Carshare co-ops allow members access to a vehicle on an as-need basis. Members pay a refundable one-time membership fee into the program, a nominal monthly fee, and a set per-kilometre rate every time they use a vehicle. A carshare vehicle provides a flexible travel option for non-automobile owners.

There are two (2) options for initiating a carshare program in Summerland. The Co-operative Auto Network (CAN) operates almost two-hundred (200) vehicles in British Columbia. While none are located in the Okanagan, the District could enter into negotiations with CAN to locate a vehicle in the District. The majority of CAN vehicles are located in Vancouver, but they also operate vehicles in more rural locations, such as Cortes Island and Tofino. The second option, which has been implemented in both Nelson and Victoria, is to establish an independent carshare cooperative. These cooperatives are established in a similar way to CAN and offer a similar service to its members. The Nelson example shows that it is possible for smaller towns to support such a service. It is suggested that an independent carshare cooperative could be established by the District of Summerland and reverted to a not-for-profit organization upon maturation. It is suggested that, whichever approach the District pursues, a NEV (or LSV) is provided as the initial carshare vehicle. This would both increase the exposure of the carshare service and support the District's recommended NEV program.

10.7.1 Carpooling/ Vanpooling

Ridesharing, including vanpooling and carpooling, is a potential travel option for individuals commuting to and from areas in Summerland and do not have convenient access to transit service or live too far to walk or cycle. Carpooling is typically an informal agreement between a small group of individuals who share a ride to a location using personal vehicles, while vanpooling tends to be more of a formal arrangement involving a larger group of commuters, who pay a monthly fee to be a part of a vanpooling agency, with the agency providing the vehicle. Ridesharing can be a great alternative to driving alone; however, it is typically only successful if commuters can find other individuals in their areas and people who have similar schedules.

The District of Summerland should encourage some of the larger employers in the downtown area to provide promotional and educational material on site, advertising the benefits of carpooling with other employees to work. These employers could also provide sign-up sheets for employees to connect with other individuals in their areas, who are working similar shifts or schedules. Similarly, the District itself could promote carpooling and vanpooling using their municipal website and provide information and education material online. A link could be created to an informal Summerland ridematching service for individuals looking to share rides to and from their workplace, or to and from other areas such as Penticton and Kelowna. Some examples of more formal ridematching services include Carpool.ca (http://www.carpool.ca), Jack Bell Rideshare Foundation: (http://online.ride-share.com), Viva Commute: (http://www.vivacommute.ca) and Carpool World: (http://www.carpoolworld.com). The District could also provide a ridesharing board with information on carpooling at the post office.

10.8 Bicycle Parking

Bicycle parking facilities, including parking, are a major factor in choosing cycling as a mode of travel. Bicycle parking is typically provided in two (2) ways. Class I parking must be fully secure and weather protected, as the bicycle may be unattended for a long period of time. Class II facilities are intended for short-term users, typically residential visitors and retail customers, and are not meant to accommodate bicycles overnight. See *Section 6.2* for additional details on bicycle parking and recommendations on parking requirements.

10.9 Priority Parking

Priority parking is a provision made for drivers of certain vehicles to have the most sought after parking spaces reserved for their use. Priority parking should be designed for both micro-vehicles and carpool users. Micro-vehicle spaces are designed with smaller dimensions than typical spaces and are to be used by vehicles less than three (3) metres in length, such as SmartCars, NEVs and motorcycles. Carpool priority spaces should be located in areas of high convenience and exposure, to promote carpooling to non-carpoolers.

10.10 Cash-in-Lieu Parking

The British Columbia Local Government Act permits the District to establish a bylaw option for property owners that permits them to offer a monetary payment in exchange for meeting their off-street parking requirement. The payment amount is to be stated within the bylaw and only those properties located within a specific distance from a municipally-owned parking facility are eligible. All cash-in-lieu funds acquired by the District must be placed in a reserve fund to be used only for the provision of new and existing off-street parking spaces. This allows the District to provide parking where it can best balance the parking demand of the subject property, as well as the entire community.

Based on cash-in-lieu arrangements in other municipalities and findings of relevant research, it is suggested that the District amend the zoning bylaw to include a cash-in-lieu policy. Establishment of the bylaw should include the following:

- The required payment per space
- Portion of total off-street requirement eligible for in-lieu payment
- Maximum distance from a municipal parking facility
- Area(s) where cash-in-lieu parking is permitted

10.11 Air Quality Improvements

Air quality is affected by a number of sources; however, the mitigation or minimizing of impacts on air quality through transportation management is possible. The Synchro analysis indicates that the 2007 pm peak hour emissions are as follows:

- Fuel Consumed – 1,971 L
- CO Emissions – 36.66 kg
- NOx Emissions – 7.08 kg
- VOC Emissions – 8.46 kg

In 25 years, the emissions will be:

- Fuel Consumed – 4,225 L
- CO Emissions – 78.59 kg
- NOx Emissions – 15.17 kg
- VOC Emissions – 18.18 kg

This is a doubling of the emissions produced. A TDM program would reduce emissions by 20-50% as TDM could reduce 20-30% of auto travel.

11.0 IMPLEMENTATION PLAN

The implementation of the transportation master plan requires capital plans and funding. The following sections outline the proposed capital plans to implement the transportation master plan in 5 year horizons and funding opportunities to pay for the improvements.

11.1 Capital Plans

Each capital plan identifies the recommended improvements, property acquisitions and estimated costs to implement in 2007 dollars. See **Figures 18 and 19** for capital plans.

11.1.1 2007-2012

Improvement	Property Required?	Costs (2007 dollars)
Cartwright Avenue/Prairie Valley Road – intersection realignment		$75,000
Prairie Valley Road/Victoria Road – single lane roundabout	Yes	$825,000
Prairie Valley Road/Rosedale Avenue – single lane roundabout	Yes	$461,000
Upgrade pedestrian and cycling facilities on Prairie Valley Road from Highway 97 to Rosedale Avenue	Yes	$2,303,000
Upgrade pedestrian and cycling facilities on Rosedale Avenue		$1,422,000
Improve pedestrian facilities on Wharton Street	Yes	$242,600
Improve pedestrian and cycling facilities on Victoria Street between Prairie Valley Road and Wharton Street, including pedestrian stair to the park.		$183,100
Upgrade Cartwright Avenue road base for future arterial use and provide pedestrian and cycling facilities to arterial road standard	No	$2,720,375
Stop signs at Peach Orchard Road/Lakeshore Drive, Kelly Avenue/Jubilee West Road and Main Street/Victoria Road. Medians on Jubilee West Road.	No	$25,850
Curb extensions at Kelly Avenue/Jubilee West Road	No	$5,000
Create a multi-use path between Highway 97 and Lake Okanagan between Lakeshore Drive and Trout Creek	Discussion with MoT	$1,168,000
Construct a transit exchange at Wharton Street	No	$97,000
Implement fixed route transit service	No	Not included
	Total	**$9,527,925**

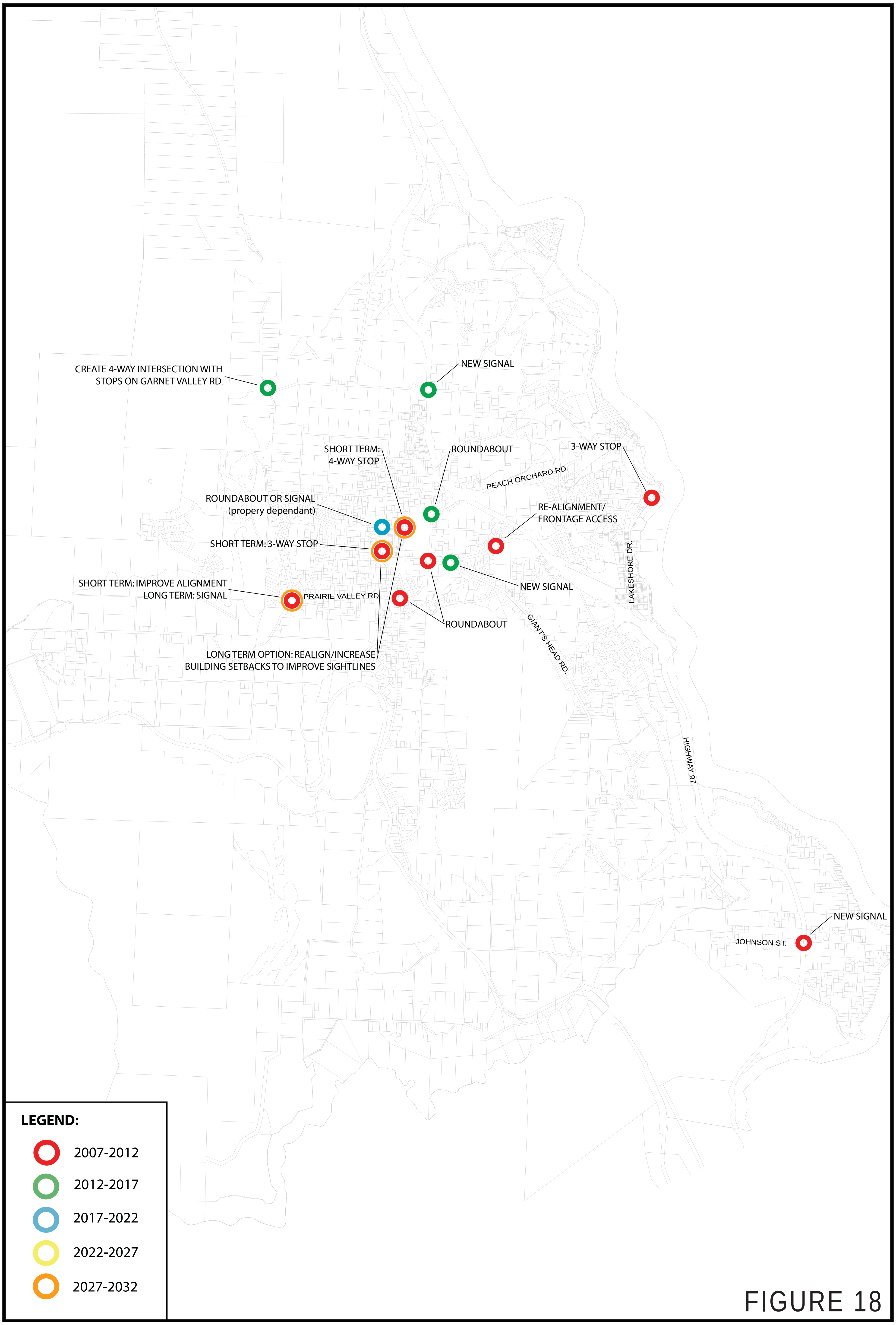


FIGURE 18

SUMMERLAND TRANSPORTATION MASTER PLAN

Intersection Improvement Phasing

Boulevard Transportation Group

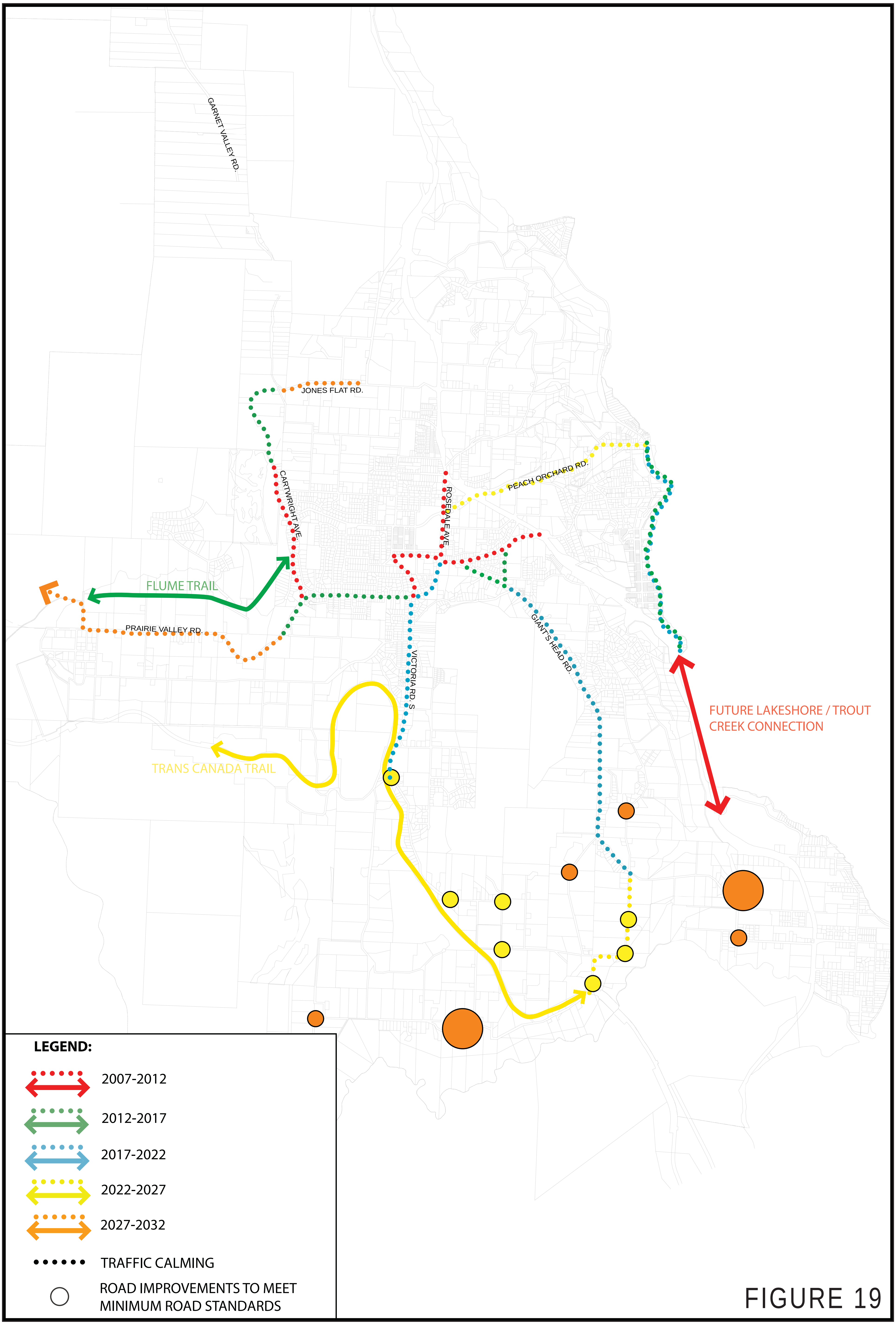


FIGURE 19

SUMMERLAND TRANSPORTATION MASTER PLAN

Road Improvement Phasing

Boulevard Transportation Group

11.1.2 2012-2017

Improvement	Property Required?	Costs (2007 dollars)
Garnet Valley Road/Jones Flat Road – create four way intersection	Yes	$100,000
Jubilee West Road/Rosedale Avenue – single lane roundabout	Yes – NW and SE corners	$525,000
Prairie Valley Road/Giant's Head Road – traffic signal	No	$150,000
Highway 97/Jones Flat Road – traffic signal	No	$200,000
Construct Cartwright Avenue to Jones Flat extension	Yes	$2,620,000
Upgrade Jones Flat Road to arterial standard	Yes	$1,552,500
Complete sidewalks on Atkinson Road and on east side of Giant's Head Road between Prairie Valley Road and Atkinson Road	No	$582,450
Complete Flume Trail between Cartwright Avenue and Doherty Avenue	Yes	$836,085
Consolidate and acquire property or rights of way along Lakeshore Drive for a future Lakeshore multi-use path along the waterfront.	Yes	Property acquisition not included in capital costs.
Upgrade pedestrian and cycling facilities on Prairie Valley Road from Victoria Road to Cartwright Avenue	No	$1,208,000
Construct Lakeshore Drive transit exchange	Potentially	$97,000
Install a minimum of 5 accessible transit stops	No	$36,250
	Totals	**$7,907,280**

11.1.3 2017-2022

Improvement	Property Required?	Costs (2007 dollars)
Jubilee West Road/Victoria Road – single lane roundabout	Yes – NW and SE corners	$410,000
Upgrade pedestrian and cycling facilities on Giant's Head Road	No	$888,350
Upgrade pedestrian and cycling facilities on Victoria Road from Prairie Valley Road to Simpson Road	No	$798,565
Complete construction of the Lakeshore multi-use path along the waterfront	Previously acquired	$780,000
Install a minimum of 10 accessible transit stops	No	$72,500
	Totals	**$2,949,415**

11.1.4 2022-2027

Improvement	Property Required?	Costs (2007 dollars)
Complete the Trans Canada Trail along Kettle Valley Railway	Potentially	$2,000,000
Upgrade pedestrian and cycling facilities along Peach Orchard	No	$686,900
Upgrade pedestrian and cycling facilities along Happy Valley Road/Hillborn Road/Canyon View Road to tie into Trans Canada Trail	No	$622,450
Install a minimum of 10 accessible transit stops	No	$72,500
	Totals	**$3,381,850**

11.1.5 2027-2032

Improvement	Property Required?	Costs (2007 dollars)
Prairie Valley Road/Cartwright Avenue – traffic signal	No	$175,000
Kelly Avenue/Jubilee West Road and Main Street/Victoria Road – improve sightlines when re-development occurs	No	None
Upgrade pedestrian and cycling facilities on Prairie Valley Road between Cartwright Avenue and Summerland Hills	No	$1,080,000
Install or upgrade a minimum of 10 accessible transit stops	No	$72,500
	Totals	**$1,327,500**

11.2 Funding Opportunities

11.2.1 Development Cost Charges

The District of Summerland raises capital funds through Road Development Cost Charges (DCC) on development. DCC are allowed under Provincial legislation and are calculated by determining the cost of infrastructure associated with growth which is reduced by an *Assist Factor* (50% for Summerland roads); these costs are then divided by the forecasted number of development units to determine a cost per unit. This cost is collected at the subdivision or building permit stage and used to fund capital projects. The charges are shown in Table 17 as are charges for selected other cities.

Table 17: Comparison of Road Development Cost Charges

	Single Family	Multi-Family	Apartment	Commercial	Institutional
Penticton	\$2,343	\$615 central \$1230 suburb		\$2.69/ m^3	\$0.43/m^3
Sooke	\$3,173	\$2,053	\$1,929	\$43.55/ m^3	
Langford	North \$3,576 Small \$5,364 Large South \$2,373 Small \$3,560 Large	\$3,291		\$45.96- \$69.25/m^3	\$7.13- \$10.76/m^3
Summerland	\$4,187	\$4,187 (>850 sq.ft) \$2,931 (<850 sq.ft)		\$13.97/ m^3	\$1.22/ m^3
Vernon	\$6,734			\$20.98/ m^3	\$34,215/ac
Kelowna	\$7,388 central \$10,900 to \$19,794 suburb	\$5,911 central \$8,720- \$15,835 suburb		\$24.45/m^3 central \$36.08- \$65.52/m^3 suburb	\$7,388/ac central \$10,900- \$19,794/ac suburb

One can draw two conclusions: Summerland's' DCC rates are reasonable compared with other cities. Secondly, some other municipalities have chosen to make greater use of variable rates to further other policies. The variable rates can encourage or discourage location of development. For example, Kelowna has relatively low rate for development in the city centre and high rates for outlying areas.

Rates can also be designed to support affordable housing. The best practices guide for DCC suggests that charges for multi-family be based on area and applied at the building permit stage rather than based on the housing unit and applied at the subdivision stage[1]. The rational is that it will make smaller homes more affordable, it better reflects the use of roads (wealthier people in big homes make more trips) and it is more affordable for the developer. Typically the total subdivision is done at one time attracting a large DCC whereas building permits are issued in smaller numbers as the project proceeds.

The Development Cost Charge system is currently under review by the District but seems to be operating properly. Rates are comparable to other municipalities. Consideration may be given to using variable rates or shifting the charges to the building permit phase to support other policies such as low cost housing and a compact urban form.

11.2.2 Alternate Sources of Funds

Special Levies

Special levies are taxes that are applied to specific property or added to the property tax bill. They are intended to fund a particular, identified service and they carry certain additional requirements for accountability and transparency. Of course there must be broad public support for such a levy for it to be approved and extensive consultation is a prerequisite. They may be helpful in funding new requirements or services not generally covered by conventional property taxes. For example, a specific levy could be added to the property tax bill to fund an expansion of transit service or to construct a pathway system in the town. Okotoks, Alberta instituted a special levy to cover a recapitalization of their infrastructure. They had discovered that there was a significant deficit in funding infrastructure replacement and that a recapitalization was necessary to restore integrity to their facilities. They were able to convince the public that the need was real and that the funds would be used for that purpose only. [2]

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[1] BC Ministry of Community Development, *Development Cost Charges Best Practice Guide*, 2005 cited at http://www.google.ca/search?hl=en&q=dcc+best+practice&meta= on October, 22 Oct 07

[2] *National Research Council, Alternative Funding Mechanisms, National Guide to Sustainable Municipal Infrastructure, April 2002.*

Strategic Budget Allocations

The intention of Strategic Budget Allocations is to collect taxes and reserve them in an interest bearing fund for future use. They are helpful where there is a large expenditure anticipated that can be clearly defined and which receives public support. Some Strategic Funds are used to stabilize budgets. In Surrey, projects were funded and savings arising from the projects (lower energy costs or reduced maintenance, for example) were used to repay the fund. [3]

Senior Government Programs

Gas Tax Fund

The Province and the Federal Government have an agreement to share gas tax revenue with municipalities and currently expect to deliver more than $100,000,000 of funding each year until 2013[4].

The Gas Tax Agreement finance three funds set up to achieve environmental objectives of reduced green house gases, cleaner water and cleaner air. The three delivery mechanisms are:

- Community Works Funds – to support local priorities that are supportive of the environmental objectives. Funding is allocated by population and the initial phase allowed for Summerland projects in the amount of $190,180 in 2008-2009 and $365,872 for 2009-2010. An extension to this funding was announced on November 6, 2007. $365, 872 (more or less) will be available for Summerland each year until 2014. This funding may be banked and does not have to be applied for. There is a requirement for reporting after the fact to ensure that selected projects met the objectives of the program. The projects also have to be shown to be incremental. Strategic Priorities Fund – these are similar to the Community Works Funds but are larger and have a regional effect. Conceivably these are projects which could be undertaken by the Regional District of Okanogan and Similkameen.
- Innovations Fund – These may constitute five percent of the total and seek new approaches to solving environmental problems.

The Green Municipal Fund

There is an additional program called Capacity Building and Integrated Sustainable Community Planning which supports planning work and the initial assessments needed to determine further project needs. The amount of funding available is limited but can be helpful in planning work and assessments. This funding might be used for studies of infrastructure condition in support of a new

[3] *Ibid.*

Asset Management System. Applications are currently not being accepted but the program will re-open in January 2008 with some new criteria.

The Public Transit Infrastructure Funds

This program is intended for transit systems and their partners. It is expected that the District of Summerland would be eligible as they provide on-street transit facilities and are responsible for network connectivity for transit passengers. Funding up to $106,000 may be available for an approved project.

The Canada Strategic Infrastructure Fund

This $4 Billion fund requires funding from three levels of government and is intended for large projects. Eligible projects must be in excess of $75,000,000. It is not expected to be relevant to the District of Summerland's program.

Infrastructure Canada Program

This program dedicated to local infrastructure and economic development projects has been fully subscribed.

ICBC Road Improvement Program

This program funds road improvements where implemented countermeasures provide ICBC with an internal rate of return of 50% on claims savings over 2 or 5 years depending on the service life of the countermeasure. To obtain funding the District must write ICBC describing the countermeasure(s) being implemented and request funding. ICBC will do an analysis and determine the amount of funding they will provide.

The Municipal Rural Infrastructure Program and *the Public Transit Fund* have been fully subscribed.

Sponsorships

Sponsorships allow for funding of a project or service by a corporation or other organization in return for recognition. Examples include donation of land for environmental protection or for construction of pathways.[5] Sponsorships may be more suitable for cities with a large corporate presence but there still may be some opportunities for sponsorship of transit facilities or pathways.

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[4] *The Gas Tax Agreement cited at http://www.civicnet.bc.ca/siteengine/ActivePage.asp?PageID=294.*

[5] *NRC 2002.*

11.2.3 Funding Source Plans

The large number of funding programs which have been introduced but are now closed illustrates the difficulty of municipalities finding consistent, long term funding. Programs are introduced and quickly oversubscribed because of a built up need. The District needs to have project plans available so that funding may be requested when a new program is announced.

The available funding programs, specifically the Community Works Fund and the Public Transit Infrastructure Fund need to be exploited. These have tight application deadlines and will require significant preparation. The Capacity Building and Integrated Sustainability Planning Fund is also useful although the amounts available are quite small. They can facilitate the preparation of a long term infrastructure management plan as discussed in section 11.1.

Sponsorships or joint public-private arrangements may be useful in specific cases such as the development or maintenance of a pathway or provision of a transit exchange however their widespread use is probably limited.

APPENDIX A

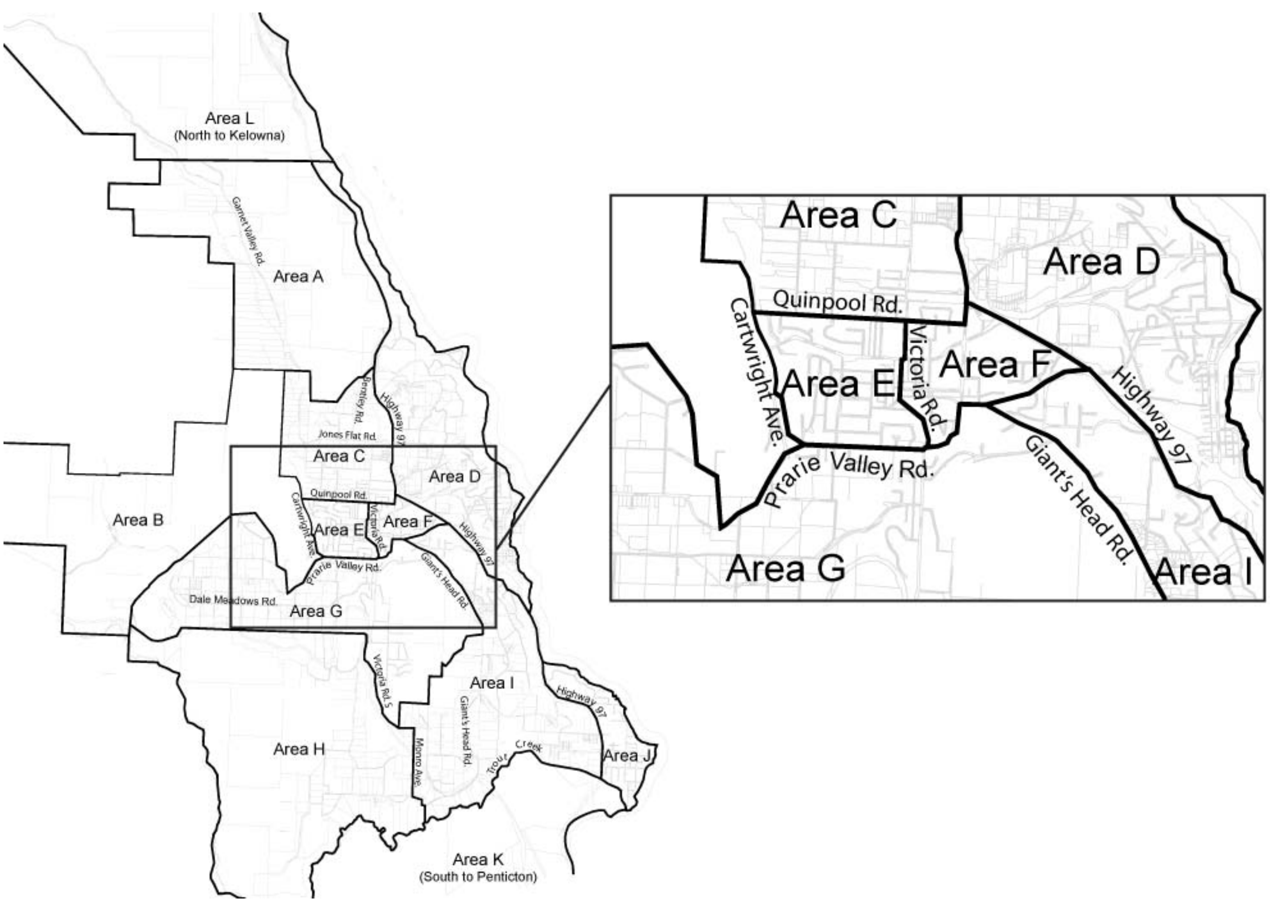
Survey to Residents

Summerland Transportation Survey

Please complete this survey by May 4 and drop it off at City Hall or the Summerland Public Works office, or mail it to Boulevard Transportation Group (#201-791 Goldstream Avenue, Victoria, BC, V9B 2X5). Surveys may also be completed online at www.summerland.ca.

1. Identify all trips (work, errands, school, etc) for a typical weekday for all members of your household. Refer to the map below to determine area. Please use additional surveys for each member of the family.

	Start		Finish		Trip Purpose	Mode	# in vehicle
	Time	Area	Time	Area			
Ex.	8:00am	A	8:15am	C	Kids to School	Car	3
Ex.	8:15am	C	8:35am	F	Work	Walk	n/a
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							



2. How often do members of your household use the following travel modes:

	daily	2-3 times per week	once per week	1-3 times per month	less often
Single-occupied vehicle					
Shared vehicle (carpool, vanpool, etc.)					
Transit					
Bicycle					
Walking					

3. Please rank the following transportation modes according to your preferred travel mode (1 - highest):

- [ ] Single-occupancy vehicle
- [ ] Carpool / Vanpool
- [ ] Transit
- [ ] Self-propelled modes (ie. bike, wheelchair)
- [ ] Walking
- [ ] Other: ______________________________

4. Do you or anyone in your household have a mobility impairment?

☐ Yes ☐ No

If YES, please explain travel challenges for the mobility impaired in Summerland:

____

____

5. Please rank the following options according to how you feel funding could be best used to improve transportation in Summerland (1 - highest):

- [ ] Road upgrades (ie. more lanes, new roads, etc.)
- [ ] Expanding bike lanes and bike trails
- [ ] Expanding sidewalks, crosswalks and trails
- [ ] Upgrading signals and sidewalks for the mobility-impaired
- [ ] Improving transit service
- [ ] Other: ______________________________

6. Please indicate barriers to using the following travel modes in Summerland:

Transit:____

____

Bicycle:____

____

Walking:____

____

Shared vehicles (carpool, vanpool, etc):____

____

Other:____

____

7. Are there any additional comments you wish to make regarding transportation in Summerland and the preparation of the Summerland Transportation Master Plan?

____

____

____

____

For more information on Summerland's Transportation Master Plan and to find out how you can get involved, contact Brent Voss at (250) 404-4074 or visit the District's website at www.summerland.ca

APPENDIX B

Results of Survey to Residents

Unit 201 – 791 Goldstream Avenue
Victoria, BC, V9B 2X5
Tel: (250) 388-9877 Fax: (250) 388-9879
Web: www.blvdgroup.ca
Email: nking@blvdgroup.ca

MEMORANDUM

TO: BRENT VOSS – DISTRICT OF SUMMERLAND

FROM: NADINE KING, P.ENG.

SUBJECT: SUMMARY OF TRANSPORTATION SURVEY RESULTS

DATE: JUNE 7, 2007

FILE NO: 761

CC: MIKE SKENE - BOULEVARD TRANSPORTATION GROUP

The Summerland Transportation Survey was sent to all residents who receive a utility bill in April 2007, in addition to being posted on the District's website.

We received a total of 363 responses. The following is a summary of responses to each question.

QUESTION 1 – PLEASE IDENTIFY A TYPICAL DAY OF TRAVEL.

We reviewed all of the car (truck/van) trips for the am (7-9am), noon (11am-1pm) and pm (3-5pm) time periods

Am Highlights

- 30% of respondents travel to Penticton
- 4% of respondents travel to Kelowna
- 28% of respondents travel to the downtown area of Summerland

Noon Highlights

- 20% of respondents travel to Penticton
- 1% of respondents travel to Kelowna
- 32% of respondents travel to the downtown area of Summerland

Pm Highlights

- 10% of respondents travel to Penticton
- 2% of respondents travel to Kelowna
- 23% of respondents travel to the downtown area of Summerland

QUESTION 2 - HOW OFTEN DO MEMBERS OF YOUR HOUSEHOLD USE THE FOLLOWING TRAVEL MODES?

Single Occupied Vehicle (SOV)

- 64% use daily
- 12% use less than once per month

Carpool

- 14% use daily
- 50% use less than once per month

Transit

- 2% use daily
- 95% use less than once per month

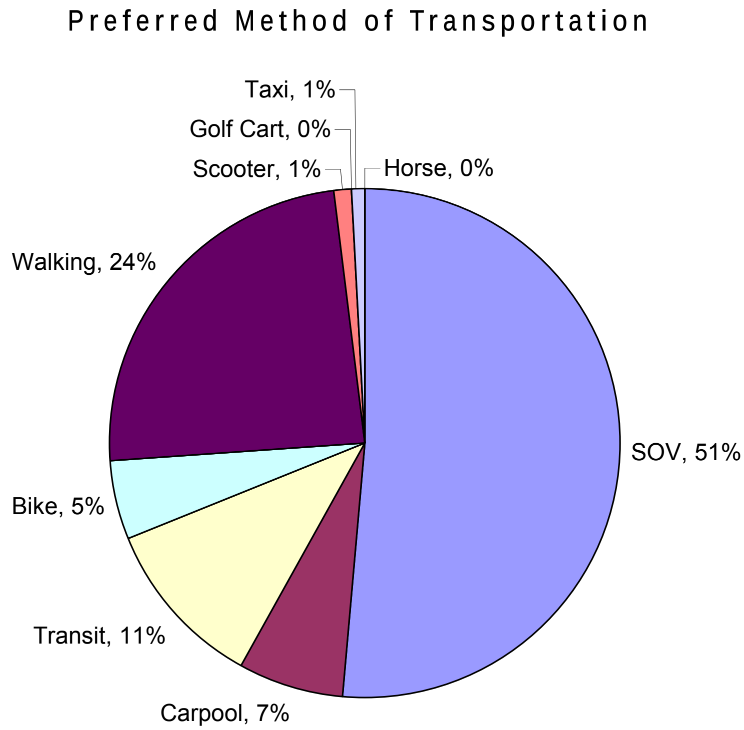
Bicycle

- 7% use daily
- 68% use less than once per month

Walking

- 44% use daily
- 25% use less than once per month

QUESTION 3 - PLEASE RANK THE FOLLOWING TRANSPORTATION MODES ACCORDING TO YOUR PREFERRED TRAVEL MODE

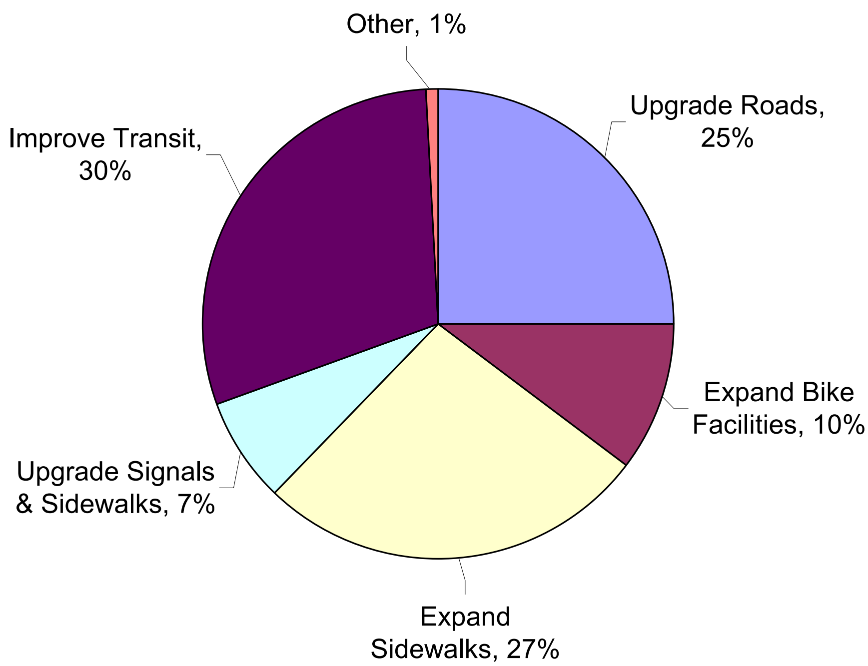


QUESTION 4 - DO YOU OR ANYONE IN YOUR HOUSEHOLD HAVE A MOBILITY IMPAIRMENT?

13% Yes
87% No

QUESTION 5 - PLEASE RANK THE FOLLOWING OPTIONS ACCORDING TO HOW YOU FEEL FUNDING COULD BE BEST USED TO IMPROVE TRANSPORTATION IN SUMMERLAND

Highest Priority for Funding



QUESTION 6 - PLEASE INDICATE BARRIERS TO USING THE FOLLOWING TRAVEL MODES IN SUMMERLAND

Bicycles

- Lack of bicycle paths and lanes
- Existing safety issues
- Poor road conditions
- Too far to travel
- Don't own a bicycle

Walking

- No sidewalks
- Too far to walk
- Unsafe conditions
- Lack of trails
- Poor road conditions
- Health reasons
- Too many hills

Transit

- We don't have any (for 'regular' people)
- None available to Penticton and/or Kelowna
- Too costly for small population

Carpool

- Not convenient with my schedule
- Need a website program

Other Transportation Barriers

- Need extra lane for scooters, bikes & walking
- Parking is a problem
- Taxis are too expensive
- The stairs down from Victoria Rd to Brown Rd are unsafe
- Hwy 97 is a big safety problem

QUESTION 7 – ADDITIONAL COMMENTS

- Need for proper transit
- Repave and repair roads
- Add and/or repair sidewalks
- Add bike lanes
- Need 4-way stops and traffic lights
- Reduce speed limits and have Police presence available
- Need more parking

APPENDIX C

Results of Open House No. 1

Summerland Transportation Master Plan

Open House #1 Exit Survey
May 26, 2007

1. Do you walk in the Community?

☐ Yes ☐ No

2. Do you drive in the Community?

☐ Yes ☐ No

3. Do you cycle in the Community?

☐ Yes ☐ No

4. Do you have any particular concerns that the study should address which is not covered in the material presented?

____

____

____

____

____

____

____

____

____

5. Did you find the Open House informative?

☐ Yes ☐ No

Optional

Name:____

Address:____

Summary of Open House No. Exit Suvery
May 26, 2007

Question 1 - Do you Walk in the Community?

Yes	100%
No	0%

Question 2 - Do you Drive in the Community?

Yes	78%
No	22%

Question 3 - Do you Cycle in the Community?

Yes	67%
No	33%

Question 4 - General Comments/Areas of Concern
I am a cyclist. I am getting some feed back from out of town cyclists that cycle through our town on occasion complaining on the condition of our roads. For myself the safest way to leave Summerland by bike would be Giants Head Rd. But only half the distance is good for cycling except for a mountain bike. This should be addressed to encourage more use of bicycles in Summerland. Camp Boyle is a destination route for a lot of cyclists that come from Penticton. If the condition of Doherty Ave. to the intersection of Berthville Rd. would be improved this cycle ride would be much more enjoyable and safer.
I feel that sidewalks should be better addressed than even the proposed additions
Very difficult to model for the future. Cycling/Walking may be fairly easily enhanced if roads were attended slightly or better kept as in Giant's Head Rd. at South end which is a major cycle route to trestle but in lousy shape at sides where bikes have to go
Para Transit should consider a fixed route for pick up passengers that need to go to Penticton.
I hope Summerland will have more paved shoulders for multi use - with a rumble strip to "protect" the people using it
A regular transit service would be appreciated between Penticton - Summerland and Kelowna especially close to Hospital. Convenient pick-up and drop-off locations downtown. I suggest more businesses be allowed to set up here in order to bring in people from surrounding areas. Some items are not available here - making it necessary to travel to Penticton / Kelowna. An early resolution to the situation would be extremely helpful.
An analysis of the survey result could be useful. There was no reference to traffic lights; pedestrian operated stop lights would be an improvement as would clearly marked i.e. freshly painted crosswalks e.g. Rosedale and Main and Rosedale and Angus.

Question 5 - Did you find the Open House informative

Yes	89%
No	11%

Cycling Comments
Recreational loop and access to downtown - shoulders and rumble strips
KVR (CPR) Connector to Penticton
Lakeshore route
Many bike commuters use Giant Head Rd to trestle Gartnell Rd. to Trout Creek/Hwy 97 and both are not bike friendly places.
Create KVR Summerland - Penticton
Constant grade bike route
Pedestrian Comments
Prairie Valley Rd needs a sidewalk all the way to highway and out to (landfill) Lister Ave
Traffic light - Jubilee & Victoria also Jubilee & Rosedale
Hwy 97 & Jones Flat and Hwy 97 & Matsa Drive are dangerous crossings
Jubilee Rd. hill up to Cartwright has many school children users but snow removal and road width
Future Summerland visitors will drive many vehicles thru school zones via Jubilee
Transit Comments
Service to Penticton
Follow school district bus pick-up drop-off plan to service Summerland locally and proper shelters
Service to Peachland so one can connect to Kelowna transit
Daily schedule to Penticton and back for people going to work
To Peachland
Students to College
Promote a car-pooling website as many already pool but may be unaware of others nearby
Congestion Comments
Giant's Head extremely congested
Prairie Valley Rd. Giants Head Rd.: Improve road conditions for cycling
Electric - cars - golf? On our Street may help to keep the air clean.
Prairie Valley & Aileen poor design (driver confusion re: right of way)
Pedstrian / cycle crossing at Hwy 97 intersections with no lights - dangerous
Research Centre / Hwy 97 interection regular subject of letters to BC Min
Promote electric cycle conversion
Summerland Vistas - Jones Flat connector and not via Jubilee / School zones

APPENDIX D

Results of Open House No. 2

Exit Survey

1. Truck Routes

Do you support the idea of a Southern Connection to accomodate truck traffic? (circle one) Yes No

Additional comments

2. Transit

Do you think Summerland needs a fixed route transit service? (circle one) Yes No

Are there locations not serviced by the identified transit route that you feel should be?

Additional comments

3. Bikes + Trails

Are there any locations not identified on the plan that you feel need bike facilities or trails?

Additional comments

4. Downtown Sidewalks

Are there locations not identified on the plan where you feel sidewalk upgrades are needed?

____

____

Are there locations not identified on the plan where you feel a crosswalk is needed?

____

____

Additional comments

____

____

____

____

5. Road Network

Do you support the Cartwright Connector to Jones Flat Rd to handle future traffic? (circle one) Yes No

Comments

____

____

____

____

6. Roundabouts

Do you support the idea of roundabouts at appropriate intersections? (circle one) Yes No

Additional comments

____

____

____

____

Responses

Table 1.1) Summarization of yes/no question responses

	Yes	No	% Yes	% No	**Total Responses**
Question #1)	3	19	14%	86%	**22**
Question #2)	11	5	69%	31%	**16**
Question #5)	6	5	55%	45%	**11**
Question #6)	11	3	79%	21%	**14**

Written Comments:

Question #1b) Additional comments

(No) Noise level already bad, accidents and corners bad already. Trucks jack knife at Gartrell and Happy Valley, witnessed trucks nearly falling over. Dangerous hairpin turns hard enough for small vehicles.

(No) Happy Valley would need upgrades for increased traffic. There is lots of tourist traffic along this route in the summer.

(No) Too many steep hills and sharp curves. Not a shorter route south.

(No) Truck routes need shortest route through town.

(No) Craziest idea yet. Large trucks with windy curves, children on the road is not safe. Police have tried to slow traffic but did not work. Accidents occur on a regular basis. No. No. NO.

(No) Dangerous and noisy and will make the roads worse. Bad enough already, dangerous for kids and pedestrians.

(No) Truck route will ruin quiet life style of residents. Would also detract from the quiet setting tourists enjoy. Why was a southern truck route not mentioned in the survey that was sent out?

(No) Someone is not thinking clearly. Windy downhill road (hard on brakes). Sharp turns, risk of trucks tipping. A lot of families along this route with young children. Children's safety should be #1 priority. Trucks should turn left on the street going to summerland wastewater treatment plant which also connects to the highway.

(No) This route doesn't follow definition of truck route. Not wide enough, hills too steep, corners too sharp. Designated as a bike route, people take this route to get away from trucks. Slow moving trucks will cause congestion, which is a safety concern (impatient drivers passing).

(No) Road is too narrow, steep and windy. A lot of people use this route with scooters and bikes. Small children walk along route and wait for busses. Feels very strongly that this idea is bad.

(No) Opposes the proposed route. Too much pedestrian and school traffic. Better exit would be Arkell – Shorter, and little pedestrian traffic. Cartwright connection would be a much better route; shorter and more direct.

(Yes) Although would seem very costly to go up and over

(No) Too costly. Consolidate industrial areas closer to highway.

(No) Improve/expand industrial areas closer to highway. Cap further expansion of James Lake Industrial area and expand northeast area.

(No) Proposed route doesn't make logical sense – too narrow and windy, hairpin curves where cars go off the road average of twice per year. Bikers and runners/walkers frequent this route. Will make the route more dangerous for these users.

(No) Safety/ Inadequate infrastructure/ future expense to tax payers

(No) Gartrell and Hillborn sections are too steep. Winter causes more danger. These roads are used by cyclists and pedestrians on a daily basis. No place for a truck route.

(No) Do not need traffic circle at Prairie Valley and Rosedale. Too many turns and sharp corners, no sidewalks. Multiple hills. Cars regularly get stuck in the winter, would be impossible for trucks. Lots of people use this road as a bike route. Intersection of Kelly ave and Jubilee rd could use a 4 way stop.

Question #2b) Are there locations not serviced by the identified transit route that you feel should be?

(Yes) Go into Trout Creek not just along highway. South Victoria, Prairie Valley, Garnet Valley.

(Yes) Busses should go through Trout Creek area.

(Yes) A start needs to be made – expand as demands require

(Yes) Trout Creek should be included in the route.

Question #2c) Additional comments

(Yes) A fixed route system would be better used. Establish some stops at several outlying zones as well as downtown area.

Question #3) Are there any locations not identified on the plan that you feel need bike facilities or trails?

- On Gartrell rd a bike path
- Yes, along Trout Creek and under the bridge at the highway to connect to Sunoka Beach
- Stairs connecting Gartrell rd to Fir/Johnson st.
- The loop from Victoria around Giants Head, down Hilborn and Giants Head rd.
- Rather than the 'Proposed Existing Truck Route', a bike lane along that area would be helpful

Question #3b) Additional comments

- There are no dedicated routes starting where people live. This is especially important for families with strollers and bikes for kids. There needs to be more dedicated shoulders/lanes to accommodate this
- I support all bike and trail areas, to help encourage people to use their cars less

Question #4) Are there locations not identified on the plan where you feel sidewalk upgrades are needed?

- Sidewalk upgrades are needed where Johnson meets Fir in Trout Creek.
- Agur/Cedar ave

Question #4b) Are there locations not identified on the plan where you feel a crosswalk is needed?

- BC Ambulance Station Quinpool side needs a sidewalk

Question #4c) Additional comments

- Money would be better spent putting sidewalks up Cedar where more housing is going in. Kids can ride to school from that area. Put sidewalks where most people live.
- Follow the Victoria model for sidewalks; safer for all ages, statistics demonstrate cheaper for snow clearance, ect.

Question #5b) Additional comments

(No) Why make a new road when Prairie Valley already goes to the highway

(No) Very concered about Sinclair becoming over used as a shortcut. Has no shoulders or sidewalks, which makes it dangerous with the steep slope and blind curves. Use of this road needs to be discouraged.

(Yes) Provided developers pay as well

(No) Cartwright a constructed area, houses close to street – Sinclair would make a better choice.

(No) Keep through traffic out of residential areas.

(Yes) Perhaps better than Southern Connection

(Yes) Supports the idea, but if developments cause increase in traffic, developers should pay for these upgrades, not the tax payers.

(No) Cartwright is way too narrow.

Question #6b) Additional comments

(Yes) No roundabouts, but traffic light.

(No) They are confusing, accidents will occur more than a regular intersection. Think of tourists.

(No) Roundabouts are nice but people in Summerland seems to have a hard enough time with 4 way stops. Don't confuse them further.

(No) It is a hazardous situation to have big trucks entering roundabouts.

(Yes) Supports roundabouts but doesn't think that Rosedale and Prairie Valley is a good spot. A light would better handle the traffic volume, and make it easier for trucks.

(No) Very bad idea. Confusion leads to accidents. Use up too much land. Stop lights would be a better way to handle traffic.

(Yes) Single lane.

(Yes) Limit to single lane roundabout at Rosedale – Prairie Valley. Consider locations for future after assessment.

(No) Not at Wharton & Rosedale & Prairie Valley if it means diverting truck traffic.

(Yes) Other countries use roundabouts, and they seem very efficient, but whether Summerland has the traffic demand for one he is unsure. Costs are also a concern.

(No) Not a good idea, lights would be better use of space.

LETTERS:

Letter #1

- Lives along Southern Truck Route; uses it to commute to work via bicycle
- Making it a truck route would negatively impact entire neighbourhood
- Supports putting a traffic signal instead of a roundabout at intersection of Wharton, Rosedale and Prairie Valley
- This would keep trucks on the highway, where they belong
- Why make roads designated at bike routes on the Master Plan into truck routes?
- This route is on a bus route as well
- This route has narrow roads, steep curves, ect that make it unsuitable
- Cars get stuck in winter on this route, large trucks?
- Route is scenic, used by tourists
- Route used by cycling clubs, and used by athletes to train
- Believes that more trucks on this route would cause more accidents because of impatient drivers
- Does not agree with a truck route along rural roads which are avidly used by pedestrians and cyclists

Letter #2

- Concerned with the proposed truck route 'Southern Connection'
- Believes that intersection of Happy Valley and Gartrell as well as the curves on 'Sand Hill' would be a safety concern.
- Major changes would need to be done to make it suitable
- Believes quickest and shortest route to get out of the James Lake Industrial area is South Victoria to Prairie Valley Highway
- Believes that cutting through Giants Head Park is not a viable option
- Rides bicycle to work, uses this route to commute
- Doesn't think that a bike route and truck route are compatible
- S. Victoria, Gartrell, and Johnson are classified as Major collector Roads? This means that bikes and vehicles would be sharing the road, that is, no separate bike path? Doesn't make sense
- Believes proposed route should be reconsidered

Letter #3

- Doesn't believe that big trucks should be allowed on Gartrell

- Should be weight restrictions, trucks should use Prairie Valley Rd
- Has lived on Gartrell for 28 years
- Many visibility problems that should be taken care of; high grass, bushes, and trees
- Gartrell should be made wider, with a bicycle path
- Many local residents have unsafe driveways, particularly bad spot is the bend below where Gartrell joins Giants Head.
- If road was widened, speed control should be implemented
- Recommends speed bumps, possibly a automatic traffic camera
- Best way would be to build a new road to accommodate trucks

Letter #4

- Believes that the proposed trucking route would have a negative effect for the following reasons:
- Safety of the children at bus stops or walking to/from school
- Safety of commuters, whether riding bicycles, cars, or pedestrians
- Safety and ease of entering and exiting driveways directly on the route
- Increased traffic
- Noise and vibrations from the trucks and the use of truck brakes coming down the hill

APPENDIX E

Results of Open House No. 3

Exit Survey

This is the last scheduled open house in the development of the Transportation Master Plan. Please fill out this survey and add any comments you feel are relevant. After hearing from the community we will incorporated many of the comments and suggestions into this plan.

1. Bikes + Trails

Do you support the proposed bike routes and trails? ☐ Yes ☐ No

2. Pedestrians

Do you support the proposed pedestrian plan? ☐ Yes ☐ No

3. Transit

Would you take transit if provided...

...within the District	☐ Yes	☐ Maybe	☐ No
...to Peachland and north	☐ Yes	☐ Maybe	☐ No
...to Penticton	☐ Yes	☐ Maybe	☐ No

Additional comments

4. Road Improvements

Do you agree with the road improvement order of priorities? ☐ Yes ☐ No

Exit Survey

5. Intersection Improvements

Do agree with the intersection improvements order of priorities? ☐ Yes ☐ No

6. Truck Routes

Do you support designated truck routes with the District? ☐ Yes ☐ No

7. Traffic Calming

Do you support the traffic calming concept for Jubilee West? ☐ Yes ☐ No

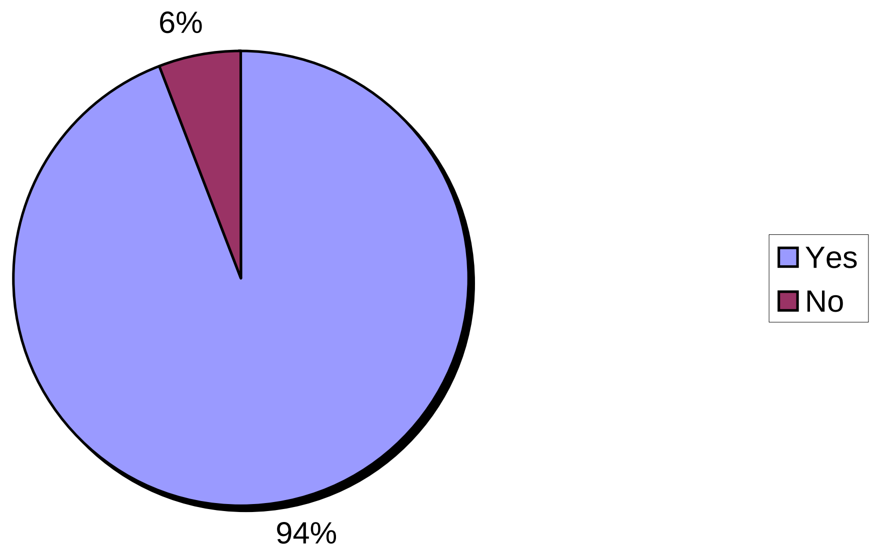
8. Wharton Street

Which parking option do you prefer for Wharton St?

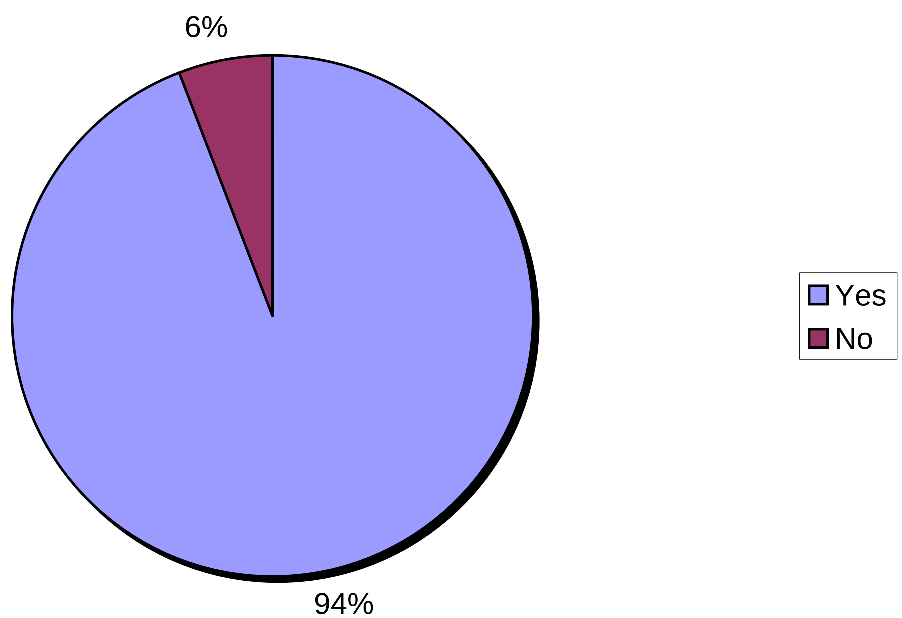
- ☐ Angled Parking (southside)
- ☐ Angled Parking (northside)
- ☐ Parallel Parking (both sides)

Comments

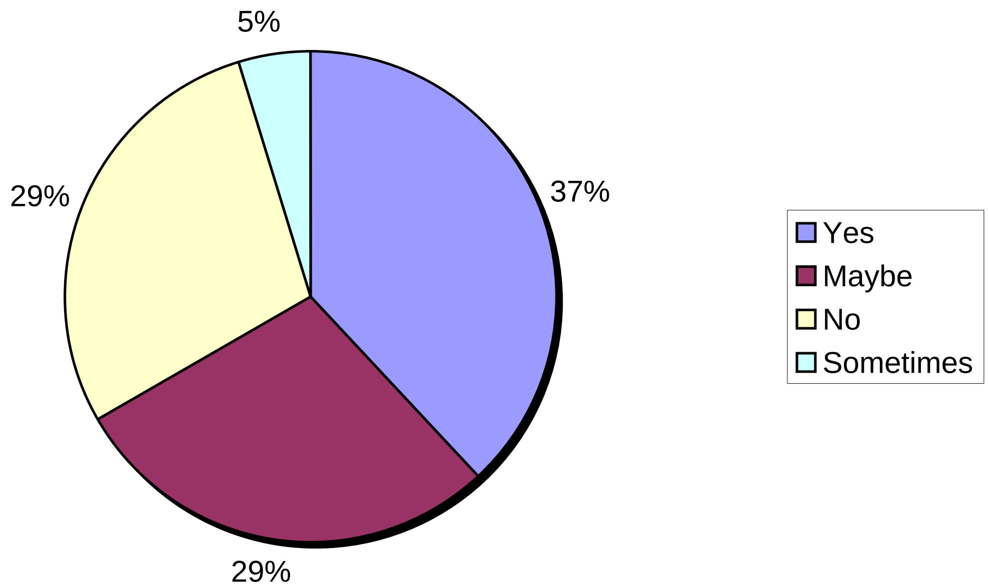
1. Do you support the proposed bike routes and trails? (17)



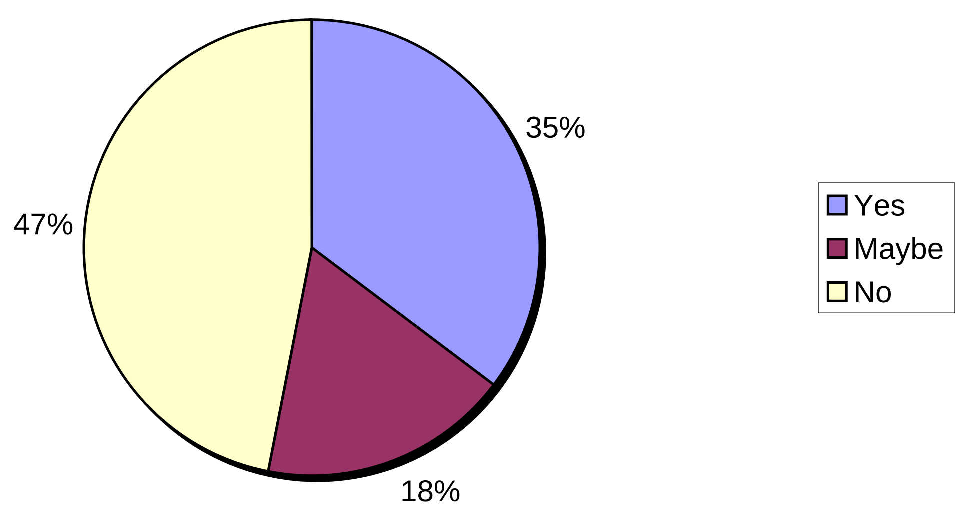
2. Do you support the proposed pedestrian plan? (17)



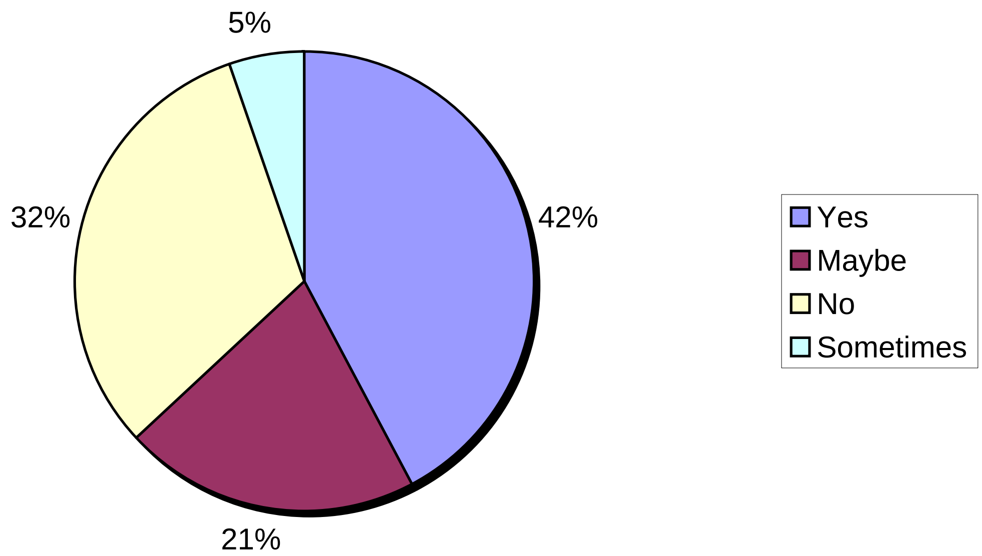
3. Would you take transit if provided within the District? (21)



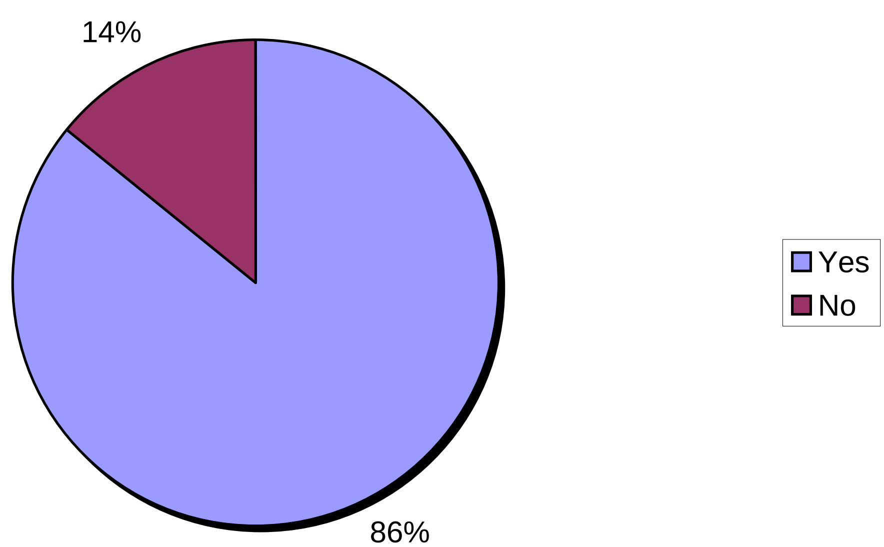
3. Would you take transit if provided to Peachland and North? (17)



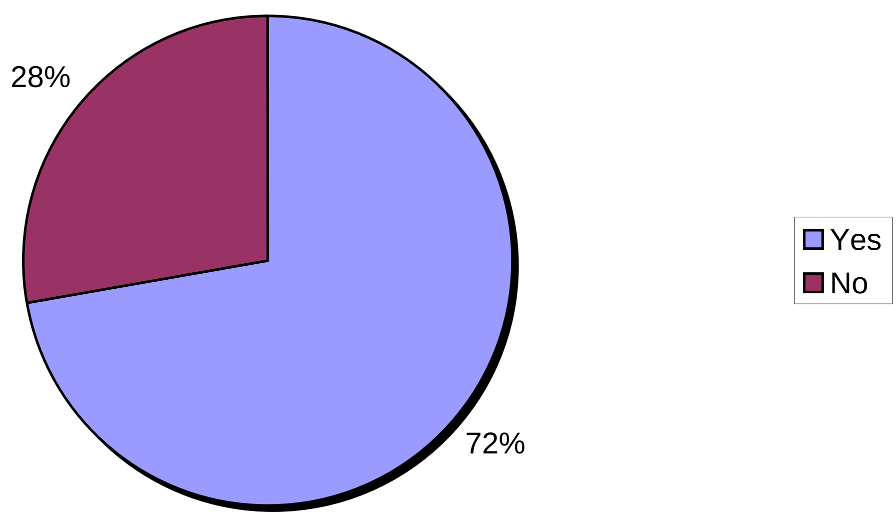
3. Would you take transit if provided to Penticton? (19)



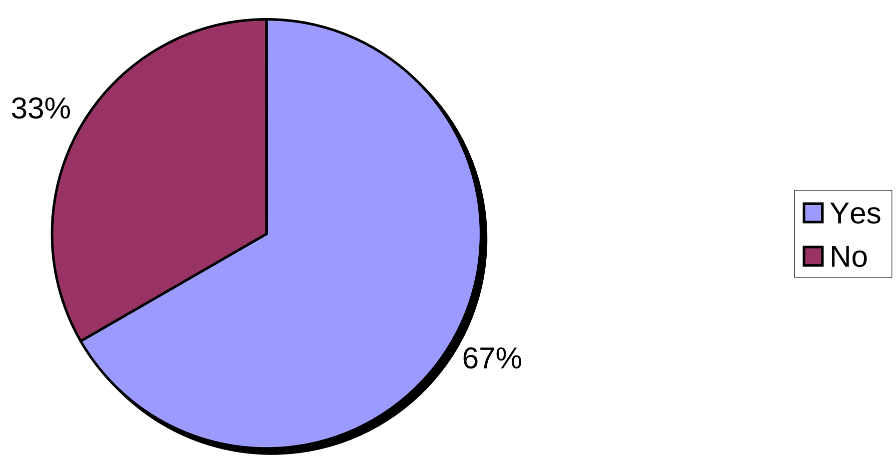
4. Do you agree with the road improvement order of priorities? (14)



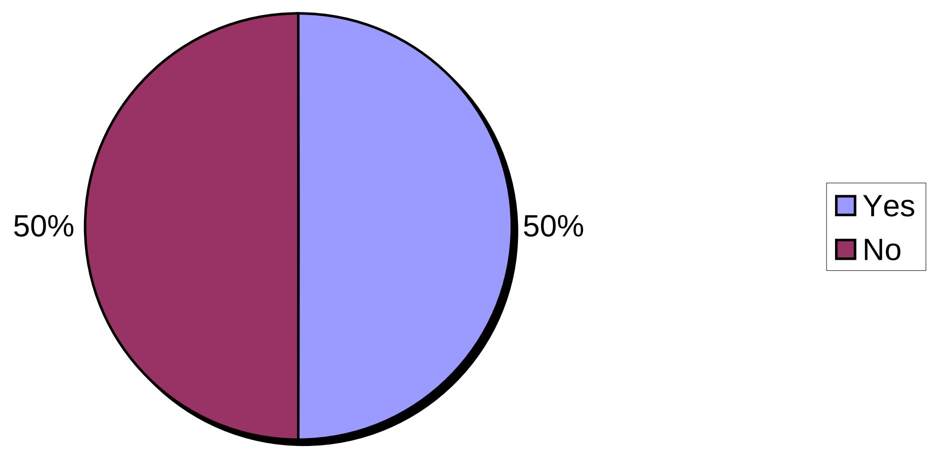
5. Do you agree with the intersection improvements order of priorities? (18)



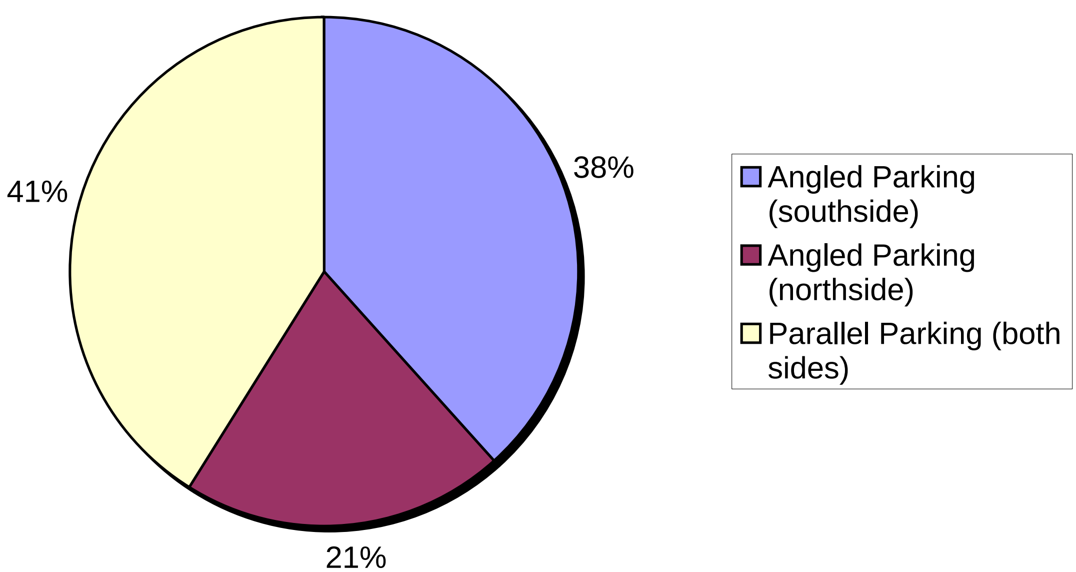
6. Do you support designated truck routes with the District? (18)



7. Do you support the traffic calming concept for Jubilee West? (16)



8. Which parking option do you prefer for Wharton St?



Open House #3

Exit Survey Comment Summary

Question 1
Colour road, don't paint lines. Make bike lanes same elev. as road.
Cartwright requires bike paths
Colour code bike routes; don't put near roundabouts; risk of accidents
You forgot the privately built trail from Martens to Avery's Orchard
Add bike trails, widen existing roads. Existing roads not bike friendly
Giants Head to Gartrell needs a bike path or a walking path
From town along PVR to hwy - a must! Give attn to winter conditions

Question 2 Comments
Hespeler to PVR along Atkinson = priority. Re-route pedestrians on PVR
Insufficient
Need safe sidwalks in front of Rosedale medical & around museum
But I'd like to see the walkway along Giant's Head continued ASAP
Same comments as before, particularly sidewalks for peds

Question 3 Comments
≤15 min headway/bus. Re-route buses to Giants Head School via back entrance. Close off entrance to GH school to vehicles.
A regular Penticton run would be appreciated
Transit route up Sinclair "Suicide Hill" does not make sense to me
We don't need huge full-sized buses
Transit to Peachland/Penticton. I suspect limited bus usage
Would definitely consider it an option
If it's a full-size bus. No bus up Johnson to Fir to Gartrell (dangerous)

Question 4 Comments
Sidewalks should have been on PVR from Hwy 97 to Rosedale 30 yrs ago.
Improve roads in conjunction with upgrades - do everything at same time
S Victoria should be done sooner
Traffic circles work great in Europe & should here as well
Yes

Question 5 Comments
- Roundabouts = bad decision. - Costs - Land - Confusion - Mainenance -
Require improvement to Jubilee Rd X Hwy 97 intersection.
Question roundabout for truck traffic on PVRD + Rosedale
No - we HATE roundabouts
Roundabout idea is not going to work with our senior population
Stop light at Thornber and Hwy 97. Light at Johnson should be proper
No signal @ Jones Flat. Not warrented.
The intersection plan is a disaster Traffic circles cause more problems
No roundabouts! Confusing, dangerous, not good for large trucks
(Jubilee & Rosedale - higher priority)
Yes - plus a normal traffic light at ARKELL & 97.
Johnson & Fir - could a stop sign be put in there (dangerous for kids xing)

Question 6 Comments
Car priority??? Not likely
Yes to Jones Flat - Cartwright PVR. No to Hillborn - Victoria. No to Johnson - Gartrell. Prefer arkell - Gartrell.
Cartwright is a single family residential w/ children!
Truck route isn't coming up sand hill (back route from Trout Creek)
As long as S Victoria is out of the picture

Leave Cartwright as is. Make as safe as possible for all users
Signage to stop truckers from using e-brakes in residential areas
No truck driver will use detours. Time is money -----
Restrict truck traffic on certain roads (Solly Rd)

Question 7 Comments
"Keep it simple" 2 speed bumps no parking
* Winter snow removal!!
Only if speed is an issue.
No parking period
Maybe - how about speed bumps
Lanes are too narrow. Median to wide
Calm traffic on Giants Head/Speeds are extremely excessive!
Giants Head Rd is a speedway Need to look at ways of calming traffic!

Question 8 Comments
Sidewalk and drop-off delivery lane next to it on northside
Consider angle parking on a frontage on south side
Do not take any of the park away
However, many older people have difficulty parallel parking well
NO Parallel parking!
The street should be closed off at Rosedale
Don't need Wharton; turn into a parking lot; need more dowtown
Depends if main st remains the way it is today. Angle both sides or changed?

APPENDIX F

BC Transit Stop Installation Checklist

BC Transit

Transit Stop Installation CHECKLIST

transit friendly • personal safety • accessibility issues • encouraging use • passenger safety • driver safety • comfort • traffic flow • multi-mode • bus stop design • bus stop sign placement • street-scape design • street furniture • shelter design • crosswalk placement •

DESIGN GUIDELINES:
These guidelines reflect BC Transit's preferred standards. BC Transit staff is available for consultation on the practical applications of these guidelines.

Considerations to Promote CONNECTIVITY

✓

Placement of Stop

- Convenient location to major land uses (pedestrian generators)
- Convenient to transfer movement

Pedestrian Access

- Route to be direct as possible, integrating short-cuts
- Connecting path should be clear of obstructions, firm surface material, well drained
- Consider impact of stops on adjacent properties
- Adjacent, or as close as possible to stop going in the opposite direction
- Accessible stops should have matching adjacent stops
- Convenient for errand running and "trip linking" tasks
- Grade of road should not impede accessibility

Visibility

- Drivers' sightlines should not be obscured by trees, shrubs, poles, buildings
- Where there are bike lanes: locate sufficient distance for cyclists to stop safely
- Buses should not restrict visibility of traffic signals
- Do not place on curves
  - 150 m. sightlines going into zone and coming out of zone
- Ensure clear sightlines on the right side of the bus - no obstructions
- Stop should be well lit

Proximity to Crosswalks

- Intersection stops: if near side is necessary, ensure 4.5 metres distance
- Mid block stops: always locate stop on far side of crosswalk so that pedestrians cross from behind the bus not in front
  - Avoid locating stop close to driveways especially those with high traffic volumes

Driveways

- If impractical, ensure full visibility for vehicles exiting driveways
  - Place on far side of driveway (sight distance for left turning still a problem)
- Consider volumes and turning movements of other vehicles

Street furniture should not impede waiting area or through pedestrian path like this advertising panel.

This driveway location conflicts with bus movement, and jeopardizes pedestrian safety.

Waiting Area

- ☐ Adequate curbspace in waiting area – avoid spillover
- ☐ Ensure loading zone is wide enough to accommodate passing pedestrians, alighting and waiting riders
- ☐ All weather, slip resistant surface (impervious), well drained - especially to step from/to the bus
- ☐ Passenger protection from passing traffic
  - landing pad marked vertically with bold contrasting strips, oriented to the sidewalk

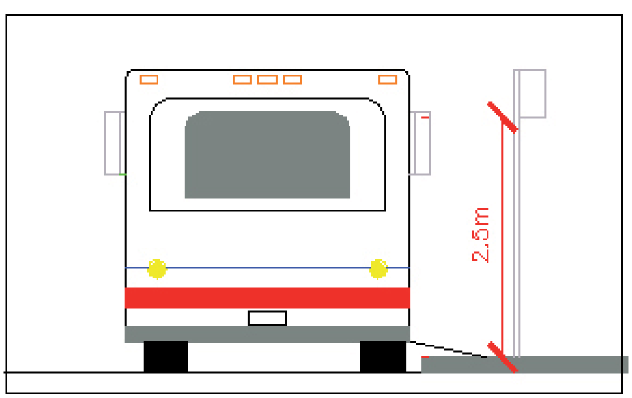
Shelter

- ☐ Shelter with seating- - Install under the following conditions:
  - Number of transfers at a stop
  - Space available for construction - no obstructions, level, etc.
  - Consider demographics of area/riders – seniors, physically challenged
  - Proximity to major centres
  - Frequency of service
  - Adjacent land use compatibility
  - Neighbourhood requests
- ☐ Shelter design:
  - Shelter dimensions should be 1.28m wide X 2.4 m - 3.5 m long (4.2 ' x 7.9' –11.6 ')
  - Four sided shelters require an opening that is a minimum width of 800 mm (2.62 ft)
  - Glass panels should be marked with horizontal contrasting stripe
  - Transparent sides
  - Seating oriented to view oncoming transit, pedestrians and adjacent buildings
  - Lit shelters are preferred where practicable, down lighting in shelter area improves safety and visibility
- ☐ Shelter location should be:
  - Parallel and facing curb
  - Ensure driver can see waiting passenger
  - Should not impede landing area or pedestrian path

Benches/seating

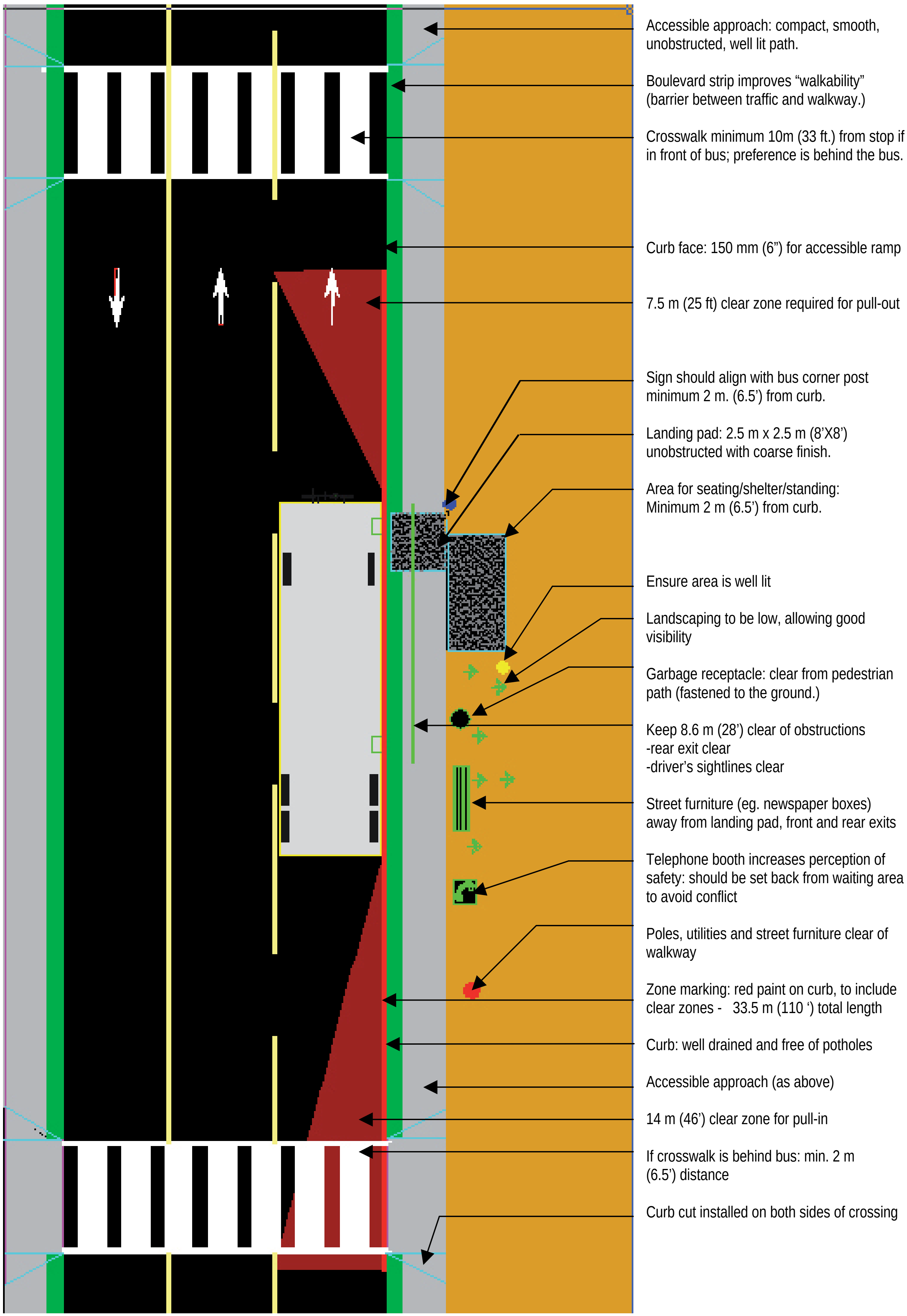
- ☐ Install when shelter is not possible, but demographics warrant seating
- ☐ Install where there is evidence transit patrons are sitting or standing on nearby land structures
- ☐ Avoid complete exposure to elements
- ☐ Coordinate with existing or new trees for shade, wind and rain protection
- ☐ Locate away from driveways
- ☐ Separate from curb at least 1.75- 2 metres (6')
- ☐ Ensure adequate clearance for mobility
  - especially near landing pad
  - allow room for through pedestrian traffic
- ☐ Do not install near rear door

Shelter openings should face the bus. This shelter is turned around – passenger has her back to the bus.



IMPORTANT! Bus stops should have a clear and unobstructed pedestrian area (2.5 m wide or 8') the distance from the bus stop sign (front bus bumper location) through to a minimum of 8.5 m (28 ') to include the rear exit doors. This provides clear driver sightlines and unimpeded access by pedestrians.

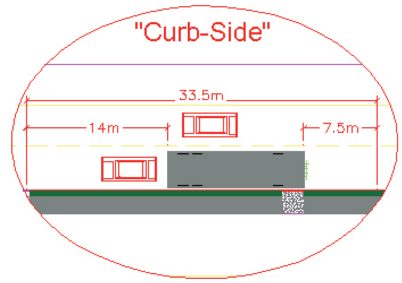
In a bus stop zone, a bus should be parallel to the curb, 75 – 150 mm (3-6") from the curb, with the front of the bus at a right angle to the bus-stop sign.


Accessible approach: compact, smooth, unobstructed, well lit path.
Boulevard strip improves “walkability” (barrier between traffic and walkway.)
Crosswalk minimum 10m (33 ft.) from stop if in front of bus; preference is behind the bus.
Curb face: 150 mm (6”) for accessible ramp
7.5 m (25 ft) clear zone required for pull-out
Sign should align with bus corner post minimum 2 m. (6.5’) from curb.
Landing pad: 2.5 m x 2.5 m (8’X8’) unobstructed with coarse finish.
Area for seating/shelter/standing: Minimum 2 m (6.5’) from curb.
Ensure area is well lit
Landscaping to be low, allowing good visibility
Garbage receptacle: clear from pedestrian path (fastened to the ground.)
Keep 8.6 m (28’) clear of obstructions
-rear exit clear
-driver’s sightlines clear
Street furniture (eg. newspaper boxes) away from landing pad, front and rear exits
Telephone booth increases perception of safety: should be set back from waiting area to avoid conflict
Poles, utilities and street furniture clear of walkway
Zone marking: red paint on curb, to include clear zones - 33.5 m (110 ‘) total length
Curb: well drained and free of potholes
Accessible approach (as above)
14 m (46’) clear zone for pull-in
If crosswalk is behind bus: min. 2 m (6.5’) distance
Curb cut installed on both sides of crossing

SITE DESIGN

✓ Curb Side Site Design

- ☐ Ensure condition of curb lane is without potholes; grates and storm drain covers flush with surface flush with surface
- ☐ Height of curb is minimum 150 mm (6”)
- ☐ Obstructions cleared in landing area by 1metres
- ☐ Length of stall long enough to accelerate and decelerate
  Approach: 14 m (46’) Stop: 12 m (40’) Pull out:: 7.5 m (25 ft)
- ☐ Repair pot holes, well drained, no depressed or raised grates within bay
- ☐ Overhead clearance to accommodate double decker: 5 metres (16.5’)
- ☐ Desirable curb lane width: 3.5 metres (11.5 ‘)
- ☐ Adequate curb space for the expected number of buses
- ☐ Delineate bus stop length, including clearance zone before and after stop area, along curb with red paint

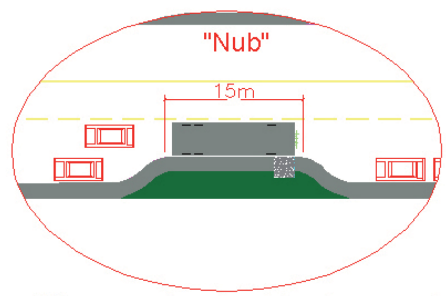


Most streets and roads

Alternative Site Designs

✓ Bus Curb Bulbs or “Nubs”

- ☐ Alternative bus stop design which gives high visibility to transit and sends the message to drivers that transit vehicles have priority on that corridor
- ☐ Site design has same factors as Curb Side design
- ☐ Install under the following circumstances:
  - high patron volumes
  - where on street parking is permitted

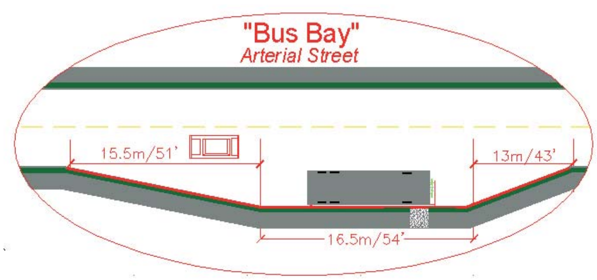


Where on-street parking is present

✓ Bus Bay Design:
Not preferred as transit is slowed considerably when merging into traffic

Design considerations are the same as Curb-Side with special attention to:

- ☐ Bay length must accommodate access/egress (see inset)
- ☐ Lane width - minimum – 3.5 m (11.5’)
- ☐ Remove overhead obstructions - 5 m clear (16.5’)
- ☐ Remove lateral obstructions cleared within 1 metre (3.2’) of c
- ☐ Adequate curb space for number of buses expected at one time



Install Bus Bays **only** under the following circumstances:

- *major highway conditions*
- *layovers expected*
- *inadequate sight distances*
- *bus parking in curb lane is prohibited*
- *signal priority treatment exists at next intersection*
- *right turn lane is used by buses as queue jumper lane*
  not too close to an intersection where waiting vehicles impede transit access/egress
- ***must be able to accommodate full bus bay with adequate acceleration and deceleration lengths (see inset.)***

BUS DIMENSIONS

	Length	Width	Height (*in metres*)	
HIGH FLOOR 40’	12.3	X 2.5	X 3.05	
LOW FLOOR 40’	12.4	X 2.57	X 3.1	(Standard)
DOUBLE DECKER	12	X 2.5	X 4.3	(High demand routes)
35’ DART	10.9	X 2.41	X 3.18	(Residential routes)

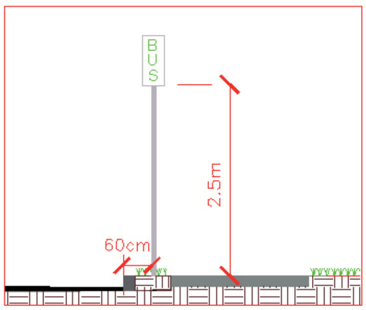
SIGN PLACEMENT

✓ *The placement of the bus stop sign is very important to the overall operation as it signals to the driver where to safely stop the bus and provides a consistent message to the transit user where to wait.*

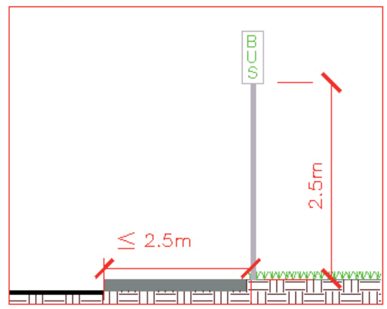
Sign Location

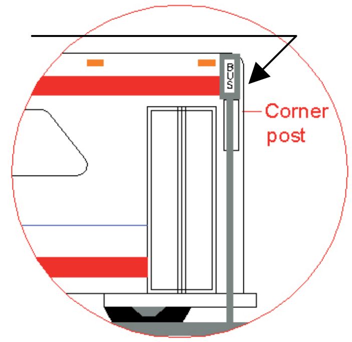
- install in location adjacent to corner post or right front bumper when the bus comes to a full stop.
- If practicable, in stall 2.5 metres from curb on far side of sidewalk
- Minimum distance should be, 60 cm. (24 ") to ensure post does not conflict with bus mirror.

"Sign"-Near side of sidewalk



"Sign"-Far side of sidewalk





Sign should be positioned adjacent to bus mirror but not in conflict

ACCESSIBLE BUS STOPS

✓ *All of the standards listed in this document integrate accessibility standards. Below are some key considerations which stand out as crucial to accommodating people with disabilities. Further design detail is available in BC Transit's* ***DESIGN GUIDELINES FOR ACCESSIBLE BUS STOPS*** *publication.*

General

- Non – slip finishes
- Eliminate hazards, mark dangerous areas
- Visual and tactile cues made through colour contrast and texture
- Ensure area is well lit for orientation and security
- Make visible – ensure drive can see waiting passenger

Sidewalk conditions

- Concrete barrier curb 150 mm (6 ")
- Transit stop waiting pad, 2.5 m x 2.5 m (minimum 7' x 6.5 ')
- One or two paved connections from pad to the sidewalk, width 1.5 m (5')
- Remove obstructions, provide a minimum clear width of 1.5 m (5 ')
- Waiting pad must have an accessible ramp on either side
  - slope 12:1, (6 feet for 6 inches of curb)
  - ramp must be minimum 1.2m wide

CURB CUT DIMENSIONS

Max slope: slope face - 8% (side slope 12%)
Lip height (flush with street) maximum 12.7 mm
Min. width of curb cut: 800 mm (2.6 ')

No sidewalk present

- Installation of an elevated concrete pad on the shoulder of the road
- Install transition at each end of pad (see ramp details above)

Connectivity

- Corresponding inbound and outbound stops should be accessible
- Install international wheel chair symbol decals

Ensure there is room to let the ramp down. Commonly, the shelter, bench or garbage receptacle impede deployment

OTHER AMENITIES

✓ Curb Cuts/Curb let downs

- should be consistently designed throughout the municipality
- installed as right angles to the street (if possible, 2 per corner)
- flush at the top and bottom of the slope
- joint free
- pavement markings for visually impaired
- free draining
- contrasting colour/surface to surrounding area
- ensure accessible route is continuous – no sudden barriers leaving traveller stranded

Crosswalk located too close to stop, (contravenes Motor Vehicle Act) utility pole blocks exit door and driver sightlines. Utility pole blocking pedestrian curb cut.

Misplaced sign, shelter obstructs sidewalk

✓ Street Furniture

- Ensure minimum 1 metre lateral clearance (preferred 1.5 metre for wheelchair clearance) and 2.0 metre headroom
- Accommodate newspaper boxes where possible provided they are well maintained and do not impede mobility
- Install garbage receptacles - locate away from landing pad
- 1 metre separation from other street furniture
- Garbage receptacles:
  - should be regularly maintained
  - design should be animal/ vandal proof
  - facilities bolted down
  - avoid direct sunlight
  - container should not allow pooling of liquids (insects)

In high pedestrian traffic areas, every effort should be made to make the bus stop "look like a desert": street furniture set back, ample room for waiting and alighting passengers, clear unobstructed pedestrian throughway (wide enough to accommodate expected traffic flow.)

FREQUENCY OF STOPS

Recommended Spacing:

	Spacing Range	*Typical Spacing*
Central Business Districts	90m – 300m	185m
Urban Areas	150m – 365m	230m
Suburban Areas	185m – 760m	300m
Rural Areas	200m – 800m	380m

RURAL STOPS

✓ Rural Setting

- Adhere to as many standards as is practicable
- Install a landing pad, brushed concrete, raised, to separate from traffic
- Install curb cuts at each end – for accessible transition onto shoulder pathway
- Cut back landscaping for sightlines and personal safety
- Consistent signage with urban/suburban stops

PERSONAL SAFETY CONSIDERATIONS

✓ *By addressing the needs of "vulnerable users" within the built environment, the entire community benefits from improved and well cared for facilities.*

At night these stops no longer feel safe: they are isolated, landscaping is overgrown creating "hiding spots" and there is no lighting nor any houses looking on.

Lighting

- ☐ Adequate lighting - shining directly on waiting and surrounding areas
- ☐ Coordinate location with existing street lights
- ☐ Coordinate with lighting from adjacent land uses (ie: consider lighting when choosing a location)

Location

- ☐ Site should "feel" safe a night
- ☐ Avoid remoteness
- ☐ Locate where adjacent land use offers "passive surveillance" or "eyes on the street"
- ☐ Neighbouring houses looking on
- ☐ Commercial businesses open late
- ☐ Public phone near by - if out of sight, a sign should describe the location
- ☐ Bus stop for same route in opposite direction, located within easy sight distance
- ☐ Install within an adjacent land use that holds extended hours (restaurant, 24 hr.)

This bus stop has all the amenities: street furniture is appropriately placed, good lighting, sightlines and passive surveillance with adjacent active land uses.

Landscaping

- ☐ Low shrubbery or canopied trees – no bushes or evergreen trees

Maintenance

- ☐ Add all new stops to public works repair and maintenance schedules

Public Phone

- ☐ Public phone near by improves sense of safety
- ☐ Do not install if illegal activities are likely to occur
- ☐ If out of sight, a sign should describe the location
- ☐ Limit phone to outgoing calls only
- ☐ Set back from bus stop by at least 15 metres
- ☐ Post BC Transit Customer Information Line for real time information

TRAFFIC SAFETY

✓

Traffic Flow

- ☐ Consider impact with loading zones, on-street parking
- ☐ Impact on traffic operations
- ☐ Parking restrictions
- ☐ Passenger origins and destinations

Consider the impact of on-street parking and loading zones on bus access. The safer the access, the safer the traffic conditions for all modes.

Boulevard Transportation Group

QUESTIONS?
Call BC Transit Planning
385-2551

APPENDIX G

Cost Breakdowns for the Capital Plans

Preliminary Cost Estimate

2007-2012

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Cartwright/Prairie Valley					
Intersection upgrade	1	lump sum	$ 75,000.00	lump sum	$ 75,000.00
				Total	**$ 75,000.00**
Prairie Valley/Victoria Roundabout					
Roundabout (see attached for details)	1	lump sum	$ 825,000.00	lump sum	$ 825,000.00
				Total	**$ 825,000.00**
Prairie Valley/Rosedale Roundabout					
Roundabout (see predesign for details)	1	lump sum	$ 461,000.00	lump sum	$ 461,000.00
				Total	**$ 461,000.00**
Prairie Valley from Rosedale to Hwy 97					
Upgrades (see predesign for details)	1	lump sum	$ 2,303,000.00	lump sum	$ 2,303,000.00
				Total	**$ 2,303,000.00**
Rosedale from Prairie Valley to Hwy 97					
Upgrades (see predesign for details)	1	lump sum	$ 1,422,000.00	lump sum	$ 1,422,000.00
				Total	**$ 1,422,000.00**
Wharton Street					
Add parking	335	m	$ 300	m	$ 100,500.00
Add sidewalk	380	m	$ 295	m	$ 112,100.00
mobilization	1	lump sum	$ 25,000	lump sum	$ 25,000.00
traffic control	1	lump sum	$ 5,000	lump sum	$ 5,000.00
				Total	**$ 242,600.00**
Victoria Street - Prairie Valley to Wharton					
Add sidewalks and curb & gutter	260	m	$ 435	m	$ 113,100.00
Add stairs	1	lump sum	$ 50,000	lump sum	$ 50,000.00
mobilization	1	lump sum	$ 15,000	lump sum	$ 15,000.00
traffic control	1	lump sum	$ 5,000	lump sum	$ 5,000.00
				Total	**$ 183,100.00**
Cartwright Road Upgrade					
New arterial road	1215	m	$ 2,000	m	$ 2,430,000.00
Remove existing asphalt	10025	m^2	$ 15	m^2	$ 150,375.00
mobilization	1	lump sum	$ 95,000	lump sum	$ 95,000.00
traffic control	1	lump sum	$ 45,000	lump sum	$ 45,000.00
				Total	**$ 2,720,375.00**

Preliminary Cost Estimate

2007-2012

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Stop Signs & Medians on Jubilee					
Stop sigs	5	signs	$ 150	m	$ 750.00
Medians	2	lump sum	$ 6,300	lump sum	$ 12,600.00
mobilization	1	lump sum	$ 7,500	lump sum	$ 7,500.00
traffic control	1	lump sum	$ 5,000	lump sum	$ 5,000.00
				Total	**$ 25,850.00**
Kelly/Jubilee					
Curb extensions	2	lump sum	$ 2,500	lump sum	$ 5,000.00
				Total	**$ 5,000.00**
Trout Creek Trail to Lakshore					
Add trail	1200	lump sum	$ 215	lump sum	$ 258,000.00
Add fill	27000	m^3	$ 30	m^3	$ 810,000.00
mobilization	1	lump sum	$ 50,000	lump sum	$ 50,000.00
traffic control	1	lump sum	$ 50,000	lump sum	$ 50,000.00
				Total	**$ 1,168,000.00**
Transit Exchange					
Exchange (see attached for details)	1	exchange	$ 97,000	stops	$ 97,000.00
				Sub Total	**$ 97,000.00**

Total Capital Plan $ 9,527,925.00

Notes:

Estimate does not include any underground utility relocations or drainage

Disclaimer:

Whereas any opinions of probable cost prepared by Boulevard Transportation Group ("the Engineer") will be based on incomplete or preliminary information, and will also be based on factors over which the Engineer has no control, the Engineer does not guarantee the accuracy of these opinions of probable cost and shall have no liability where the probable costs are exceeded.

Preliminary Cost Estimate

2012-2017

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Garnett Valley/Jones Flat Intersection					
Creating Four Way	1	lump sum	$ 100,000.00	lump sum	$ 100,000.00
				Total	**$ 100,000.00**
Jubilee West/Rosedale Roundabout					
Roundabout (see attached for details)	1	lump sum	$ 524,000.00	lump sum	$ 525,000.00
				Total	**$ 525,000.00**
Prairie Valley Road/Giant's Head					
Traffic Signal (3 legged)	1	lump sum	$ 150,000.00	lump sum	$ 150,000.00
				Total	**$ 150,000.00**
Highway 97/Jones Flat					
Traffic Signal (4 legged)	1	lump sum	$ 200,000.00	lump sum	$ 200,000.00
				Total	**$ 200,000.00**
Cartwright Extension to Jones Flat					
new arterial road	1055	m	$ 2,000	m	$ 2,110,000.00
Draingage under new arterial	1	lump sum	$ 250,000	lump sum	$ 250,000.00
Street lighting	60	lights	$ 2,500	lights	$ 150,000.00
mobilization	1	lump sum	$ 100,000	lump sum	$ 100,000.00
traffic control	1	lump sum	$ 10,000	lump sum	$ 10,000.00
				Total	**$ 2,620,000.00**
Upgrade Jones Flat to Arterial					
upgrade 1/2 Jones Flat Road to arterial	1425	m	$ 1,000	m	$ 1,425,000.00
Catchbasins	15	basins	$ 2,500	basin	$ 37,500.00
mobilization	1	lump sum	$ 75,000	lump sum	$ 75,000.00
traffic control	1	lump sum	$ 15,000	lump sum	$ 15,000.00
				Total	**$ 1,552,500.00**
Atkinson and Giant's Head Sidewalks					
Add sidewalks	1270	m	$ 435	m	$ 552,450.00
mobilization	1	lump sum	$ 25,000	lump sum	$ 25,000.00
traffic control	1	lump sum	$ 5,000	lump sum	$ 5,000.00
				Total	**$ 582,450.00**

Boulevard Transportation Group

Preliminary Cost Estimate

2012-2017

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Flume Trail					
Add trail	1469	m	$ 215	m	$ 315,835.00
Blasting	1	lump sum	$ 50,000	lump sum	$ 50,000.00
Add paved shoulder on Denike	1425	m	$ 330	m	$ 470,250.00
				Total	**$ 836,085.00**
Prairie Valley between Victoria and Cartwright					
add sidewalk and bike lanes both sides	650	m	$ 1,125	m	$ 731,250.00
add sidewalk on one side	280	m	$ 435	m	$ 121,800.00
mobilization	1	lump sum	$ 50,000	lump sum	$ 50,000.00
traffic control	1	lump sum	$ 5,000	lump sum	$ 5,000.00
				Total	**$ 908,050.00**
				Round to	**$ 1,208,000.00**
Transit Exchange					
Exchange (see attached for details)	1	exchange	$ 97,000	stops	$ 97,000.00
				Sub Total	**$ 97,000.00**
Accessible Bus Stops					
Bus stops	5	stops	$ 7,250	stops	$ 36,250.00
				Sub Total	**$ 36,250.00**

Total Capital Plan $ 7,907,285.00

Notes:

Estimate does not include any underground utility relocations or drainage

Disclaimer:

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Preliminary Cost Estimate

2017 to 2022

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Jubilee West/Victoria Roundabout					
Roundabout (see attached for details)	1	lump sum	$ 410,000.00	lump sum	$ 410,000.00
				Total	**$ 410,000.00**
Giant's Head Improvements					
add paved shoulders to Gartrell	2495	m	$ 330	m	$ 823,350.00
mobilization	1	lump sum	$ 50,000.00	lump sum	$ 50,000.00
traffic control	1	lump sum	$ 15,000.00	lump sum	$ 15,000.00
				Total	**$ 888,350.00**
Victoria Road - Prairie Valley to Simpson					
add paved shoulders	968	m	$ 330	m	$ 319,440.00
add sidewalk and bike lanes both sides	377	m	$ 1,125	m	$ 424,125.00
mobilization	1	lump sum	$ 40,000	lump sum	$ 40,000.00
traffic control	1	lump sum	$ 15,000	lump sum	$ 15,000.00
				Total	**$ 798,565.00**
Lakeshore Multi-use Path					
Mixture of sidewalk+curb and gutter, paved path and boardwalk	1480	m	$ 500	m	$ 740,000.00
mobilization	1	lump sum	$ 40,000	lump sum	$ 40,000.00
				Total	**$ 780,000.00**
Accessible Bus Stops					
Bus stops	10	stops	$ 7,250	stops	$ 72,500.00
				Sub Total	**$ 72,500.00**

Total Capital Plan $ 2,949,415.00

Notes:

Estimate does not include any underground utility relocations or drainage

Disclaimer:

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Preliminary Cost Estimate

2022-2027

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Complete Trans Canada Trail along Kettle Valley Railway					
Add 3m path	8400	m	$ 215	m	$ 1,806,000.00
mobilization	1	lump sum	$ 100,000	lump sum	$ 100,000.00
				Total	**$ 1,906,000.00**
				Rounded to	**$ 2,000,000.00**
Peach Orchard					
add paved shoulders	1930	m	$ 330	m	$ 636,900.00
mobilization	1	lump sum	$ 40,000	lump sum	$ 40,000.00
traffic control	1	lump sum	$ 10,000	lump sum	$ 10,000.00
				Total	**$ 686,900.00**
Gartrell, Happy Valley, Hillborn					
add paved shoulders	1765	m	$ 330	m	$ 582,450.00
mobilization	1	lump sum	$ 30,000	lump sum	$ 30,000.00
traffic control	1	lump sum	$ 10,000	lump sum	$ 10,000.00
				Total	**$ 622,450.00**
Accessible Bus Stops					
Bus stops	10	stops	$ 7,250	stops	$ 72,500.00
				Sub Total	**$ 72,500.00**

Total Capital Plan $ 3,381,850.00

Notes:

Estimate does not include any underground utility relocations or drainage

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Preliminary Cost Estimate

2027-2032

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Prairie Valley/Cartwright Traffic Signal					
Signal	1	lump sum	$ 175,000	lump sum	$ 175,000.00
				Sub Total	**$ 175,000.00**
Prairie Valley Road - Cartwright to Bathville					
add paved shoulders	2785	m	$ 330	m	$ 919,050.00
mobilization	1	lump sum	$ 50,000	lump sum	$ 50,000.00
traffic control	1	lump sum	$ 15,000	lump sum	$ 15,000.00
				Sub Total	**$ 984,050.00**
				Round to	**$ 1,080,000.00**
Accessible Bus Stops					
Bus stops	10	stops	$ 7,250	stops	$ 72,500.00
				Sub Total	**$ 72,500.00**

Total Capital Plan $ 1,327,500.00

Notes:

Estimate does not include any underground utility relocations or drainage

Disclaimer:

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Boulevard Transportation Group

Preliminary Cost Estimate

Victoria - Jubilee Roundabout

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Asphalt	1543	m^2	$ 12.00	m^2	$ 18,516.00
Sidewalk	170	m^2	$ 25.00	m^2	$ 4,250.00
Subgrade	778	m^3	$ 15.00	m^3	$ 11,670.00
				Sub Total	$ 34,436.00
Install:					
Gravels - 250mm - 75mm crush	486	m^3	$ 32.00	m^3	$ 15,552.00
Gravels - 150mm - 25mm crush	292	m^3	$ 50.00	m^3	$ 14,600.00
Curb & Gutter	206	m	$ 80.00	m	$ 16,480.00
Curb	128	m	$ 80.00	m	$ 10,240.00
Mountable Curb	138	m	$ 80.00	m	$ 11,040.00
Stamped Concrete for Apron	265	m^2	$ 200.00	m^2	$ 53,000.00
Landscape for Splitter Islands	132	m^2	$ 25.00	m^2	$ 3,300.00
Sidewalks	362	m^2	$ 75.00	m^2	$ 27,150.00
Centre Island Landscaping	115	m^2	$ 25.00	m^2	$ 2,875.00
Ashpalt	981	m^2	$ 25.00	m^2	$ 24,525.00
Signgage	30	sign	$ 150.00	sign	$ 4,500.00
Paint Markings	472	m	$ 8.00	m	$ 3,776.00
Light Standards	4	light	$ 2,500.00	light	$ 10,000.00
				Sub Total	$ 197,038.00
General					
Mobilization	1	lump sum	$ 25,000.00	lump sum	$ 25,000.00
Traffic Control	1	lump sum	$ 15,000.00	lump sum	$ 15,000.00
				Sub Total	$ 40,000.00
				Sub Total	$ 271,474.00
				gst - 6%	$ 16,288.44
				contingency - 30%	$ 81,442.20
				engineering - 15%	$ 40,721.10
				Total	**$ 409,925.74**

Notes:
Estimate does not include any underground utility relocations or drainage

Disclaimer:

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Preliminary Cost Estimate

Prairie Valley - Victoria Roundabout

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
House demolition	1	lump sum	$ 50,000.00	lump sum	$ 50,000.00
Milling	14.4	m^2	$ 12.00	m^2	$ 172.80
Asphalt	3640	m^2	$ 12.00	m^2	$ 43,680.00
Sidewalk	224	m^2	$ 25.00	m^2	$ 5,600.00
Subgrade	2233	m^3	$ 15.00	m^3	$ 33,495.00
				Sub Total	$ 132,947.80
Install:					
Gravels - 250mm - 75mm crush	1340	m^3	$ 32.00	m^3	$ 42,880.00
Gravels - 150mm - 25mm crush	894	m^3	$ 50.00	m^3	$ 44,700.00
Curb & Gutter	382	m	$ 80.00	m	$ 30,560.00
Curb	174	m	$ 80.00	m	$ 13,920.00
Mountable Curb	157	m	$ 80.00	m	$ 12,560.00
Stamped Concrete for Apron	314	m^2	$ 200.00	m^2	$ 62,800.00
Sidewalks	742	m^2	$ 75.00	m^2	$ 55,650.00
Centre Island Landscaping	177	m^2	$ 25.00	m^2	$ 4,425.00
Ashpalt	2220	m^2	$ 25.00	m^2	$ 55,500.00
Signgage	30	sign	$ 150.00	sign	$ 4,500.00
Paint Markings	1	lump sum	$ 8,000.00	lump sum	$ 8,000.00
Light Standards	4	m^3	$ 2,500.00	m^3	$ 10,000.00
				Sub Total	$ 345,495.00
Relocation:					
Hydro Pole	1	pole	$ 2,500.00	pole	$ 2,500.00
				Sub Total	$ 2,500.00
General:					
Mobilization	1	lump sum	$ 50,000.00	lump sum	$ 50,000.00
Traffic Control	1	lump sum	$ 15,000.00	lump sum	$ 15,000.00
				Sub Total	$ 65,000.00
				Sub Total	$ 545,942.80
				gst - 6%	$ 32,756.57
				contingency - 30%	$ 163,782.84
				engineering - 15%	$ 81,891.42
				Total	**$ 824,373.63**

Notes:

Estimate does not include any underground utility relocations or drainage

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Preliminary Cost Estimate

Prairie Valley-Jubilee-Peach Orchard Roundabout

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Milling	13.5	m^2	$ 12.00	m^2	$ 162.00
Sawcut	10	m	$ 10.00	m	$ 100.00
Asphalt	2480	m^2	$ 12.00	m^2	$ 29,760.00
Sidewalk	172	m^2	$ 25.00	m^2	$ 4,300.00
Subgrade	1191	m^3	$ 15.00	m^3	$ 17,865.00
				Sub Total	$ 52,187.00
Install:					
Material	Quantity	Unit	Unit Cost	Unit	Total
Gravels - 250mm - 75mm crush	744	m^3	$ 32.00	m^3	$ 23,808.00
Gravels - 150mm - 25mm crush	447	m^3	$ 50.00	m^3	$ 22,350.00
Curb & Gutter	258	m	$ 80.00	m	$ 20,640.00
Curb	212	m	$ 80.00	m	$ 16,960.00
Mountable Curb	138	m	$ 80.00	m	$ 11,040.00
Stamped Concrete for Apron	265	m^2	$ 200.00	m^2	$ 53,000.00
Landscape for Splitter Islands	111	m^2	$ 25.00	m^2	$ 2,775.00
Sidewalks	362	m^2	$ 75.00	m^2	$ 27,150.00
Centre Island Landscaping	115	m^2	$ 25.00	m^2	$ 2,875.00
Boulevard	251	m^2	$ 25.00	m^2	$ 6,275.00
Ashpalt	1478	m^2	$ 25.00	m^2	$ 36,950.00
Retaining Wall	20	m	$ 150.00	m	$ 3,000.00
Fill behind Retaining Wall	150	m^3	$ 30.00	m^3	$ 4,500.00
Signgage	30		$ 150.00		$ 4,500.00
Paint Markings	840	m	$ 8.00	m	$ 6,720.00
Light Standards	4	m^3	$ 2,500.00	m^3	$ 10,000.00
				Sub Total	$ 252,543.00
Relocation:					
Material	Quantity	Unit	Unit Cost	Unit	Total
Hydro Pole	1	lump sum	$ 2,500.00	lump sum	$ 2,500.00
			Sub Total	Sub Total	$ 2,500.00
General:					
Mobilization	1	lump sum	$ 25,000.00	lump sum	$ 25,000.00
Traffic Control	1	lump sum	$ 15,000.00	lump sum	$ 15,000.00
				Sub Total	$ 40,000.00

Sub Total	$ 347,230.00
gst - 6%	$ 20,833.80
contingency - 30%	$ 104,169.00
engineering - 15%	$ 52,084.50
Total	**$ 524,317.30**

Notes:

Estimate does not include any underground utility relocations or drainage

Disclaimer:

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Preliminary Cost Estimate

New Arterial Road
Cost per m of road

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Stripping & Excavation	9	m^3	$ 15.00	m^3	$ 135.00
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	5	m^3	$ 32.00	m^3	$ 160.00
Gravel - 25mm Crush at 150mm	4	m^3	$ 50.00	m^3	$ 200.00
Asphalt	11	m^2	$ 25.00	m^2	$ 275.00
Non mountable curb and gutter	2	m	$ 80.00	m	$ 160.00
Sidewalk (concrete)	4	m^2	$ 75.00	m^2	$ 300.00
Paint Marking	2	each	$ 8.00	each	$ 16.00

Subtotal	$	1,246.00
gst - 6%	$	74.76
Contingency - 30%	$	373.80
Engineering - 15%	$	186.90
Total	**$**	**1,881.46**

Round to $2000/m

Notes:

Estimate does not include traffic control or mobilization

Doest not include any blasting

Disclaimer:

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Preliminary Cost Estimate

Medians (assume 2m x 10m)

Date: April 4, 2008
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Milling	7.2	m^2	$ 20.00	m^2	$ 144.00
Asphalt	20	m^2	15	m^2	$ 300.00
Installation - Civil Works:					
Non mountable curb and gutter	24	m	$ 80.00	m	$ 1,920.00
Concrete	20	m^2	$ 75.00	m^2	$ 1,500.00
Signs	2	sign	$ 150.00	sign	$ 300.00

Subtotal	$	4,164.00
gst - 6%	$	249.84
Contingency - 30%	$	1,249.20
Engineering - 15%	$	624.60
Total	**$**	**6,287.64**

Round to $6300/median

Notes:

Estimate does not include traffic control or mobilization

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Preliminary Cost Estimate

Adding 2m Shoulders (Rural Sections) on Both Sides of the Road
Cost per m of road

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Milling	0.6	m^2	$ 20.00	m^2	$ 12.00
Stripping & Excavation	1.6	m^3	$ 15.00	m^3	$ 24.00
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	1	m^3	$ 32.00	m^3	$ 32.00
Gravel - 25mm Crush at 150mm	0.6	m^3	$ 50.00	m^3	$ 30.00
Asphalt	4	m^2	$ 25.00	m^2	$ 100.00
Paint Marking	2	each	$ 8.00	each	$ 16.00

Subtotal	$ 214.00
gst - 6%	$ 12.84
Contingency - 30%	$ 64.20
Engineering - 15%	$ 32.10
Total	**$ 323.14**

Round to $330/m

Notes:

Estimate does not include traffic control or mobilization

Disclaimer:

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Preliminary Cost Estimate

Adding Sidewalk on one side of the road

Cost per m of road

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Stripping & Excavation	0.8	m^3	$ 15.00	m^3	$ 12.00
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	0.5	m^3	$ 32.00	m^3	$ 16.00
Gravel - 25mm Crush at 150mm	0.3	m^3	$ 50.00	m^3	$ 15.00
Sidewalk (Concrete)	2	m^2	$ 75.00	m^2	$ 150.00

Subtotal	$ 193.00
gst - 6%	$ 11.58
Contingency - 30%	$ 57.90
Engineering - 15%	$ 28.95
Total	**$ 291.43**

Round to $295/m

Notes:

Estimate does not include traffic control or mobilization

Disclaimer:

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Preliminary Cost Estimate

Adding Sidewalk and Curb & Gutter on one side of the road

Cost per m of road

Date: Nov, 2007

Project No.: 761

Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Stripping & Excavation	1	m^3	$ 15.00	m^3	$ 15.00
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	0.65	m^3	$ 32.00	m^3	$ 20.80
Gravel - 25mm Crush at 150mm	0.37	m^3	$ 50.00	m^3	$ 18.50
Sidewalk (Concrete)	2	m^2	$ 75.00	m^2	$ 150.00
Non mountable curb and gutter	1	m	$ 80.00	m	$ 80.00

Subtotal	$ 284.30
gst - 6%	$ 17.06
Contingency - 30%	$ 85.29
Engineering - 15%	$ 42.65
Total	**$ 429.29**

Round to $435/m

Notes:

Estimate does not include traffic control or mobilization

Disclaimer:

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Preliminary Cost Estimate
Adding Parking on one side
Cost per m of road

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Milling	0.3	m^2	$ 20.00	m^2	$ 6.00
Stripping & Excavation	0.96	m^3	$ 15.00	m^3	$ 14.40
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	0.6	m^3	$ 32.00	m^3	$ 19.20
Gravel - 25mm Crush at 150mm	0.36	m^3	$ 50.00	m^3	$ 18.00
Non mountable curb and gutter	1	m	$ 80.00	m	$ 80.00
Asphalt	2.4	m^2	$ 25.00	m^2	$ 60.00

Subtotal	$ 197.60
gst - 6%	$ 11.86
Contingency - 30%	$ 59.28
Engineering - 15%	$ 29.64
Total	**$ 298.38**

Round to $300/m

Notes:
Estimate does not include traffic control or mobilization

Disclaimer:

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Preliminary Cost Estimate

3m Multi-Use Path
Cost per m of road

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Stripping & Excavation	1.2	m^3	$ 15.00	m^3	$ 18.00
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	0.75	m^3	$ 32.00	m^3	$ 24.00
Gravel - 25mm Crush at 150mm	0.45	m^3	$ 50.00	m^3	$ 22.50
Asphalt	3	m^2	$ 25.00	m^2	$ 75.00

Subtotal	$ 139.50
gst - 6%	$ 8.37
Contingency - 30%	$ 41.85
Engineering - 15%	$ 20.93
Total	**$ 210.65**

Round to $215/m

Notes:

Estimate does not include traffic control or mobilization

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Boulevard Transportation Group

Preliminary Cost Estimate

Transit Exchange on Wharton
Assumes 2 buses stopped at one time

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Sawcut	65	m	$ 15.00	m	$ 975.00
Concrete Sidewalk	130	m^2	$ 20.00	m^2	$ 2,600.00
Stripping & Excavation	600	m^3	$ 20.00	m^3	$ 12,000.00
Installation - Civil Works:					
Gravel - 75mm Crush at 300mm	90	m^3	$ 32.00	m^3	$ 2,880.00
Gravel - 25mm Crush at 200mm	60	m^3	$ 50.00	m^3	$ 3,000.00
Non-Mountable Curb & Gutter	75	m	$ 80.00	m	$ 6,000.00
Sidewalk (Concrete)	135	m^2	$ 75.00	m^2	$ 10,125.00
Asphalt	150	m^2	$ 25.00	m^2	$ 3,750.00
Shelter Pad	20	m^2	$ 75.00	m^2	$ 1,500.00
Landscape	120	m^2	$ 25.00	m^2	$ 3,000.00
Signs	2	each	$ 150.00	each	$ 300.00
Relocate & Regrade:					
Relocate Utility Pole	2	each	$ 1,500.00	each	$ 3,000.00
General:					
mobilization	1	L.S.	$ 10,000.00	L.S.	$ 10,000.00
traffic control	1	L.S.	$ 5,000.00	L.S.	$ 5,000.00

Subtotal	$ 64,130.00
gst - 6%	$ 3,847.80
Contingency - 30%	$ 19,239.00
Engineering - 15%	$ 9,619.50
Total	**$ 96,836.30**

Notes:

Estimate does not include any underground utility relocations or drainage

Disclaimer:

preliminary information, and will also be based on factors over which the Engineer has no control, the Engineer does not guarantee the

Preliminary Cost Estimate
Accessible Bus Stop

Date: Nov, 2007
Project No.: 761
Prepared by: N. King

ITEMS	Quantity	units	Unit Cost	units	Total Cost
Removals:					
Stripping & Excavation	12.4	m^3	$ 15.00	m^3	$ 186.00
Installation - Civil Works:					
Gravel - 75mm Crush at 250mm	7.75	m^3	$ 32.00	m^3	$ 248.00
Gravel - 25mm Crush at 150mm	4.65	m^3	$ 50.00	m^3	$ 232.50
Non mountable curb and gutter	10	m	$ 80.00	m	$ 800.00
Concrete Sidewalk and Pad	31	m^2	$ 75.00	m^2	$ 2,325.00
Grass seed and soil around the pad	18	m^2	$ 25.00	m^2	$ 450.00
Concrete Ramps to access pad	8	m^2	$ 75.00	m^2	$ 600.00
Garbage Receptacle	1	lump sum	$ 450.00	lump sum	$ 450.00
Sign	1	sign	$ 150.00	sign	$ 150.00

Subtotal	$ 5,441.50
gst - 6%	$ 326.49
Contingency - 15%	$ 816.23
Engineering - 10%	$ 544.15
Total	**$ 7,128.37**
Round to $7,250/m	

Notes:
Estimate does not include traffic control or mobilization

Disclaimer:

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