

Final Report



City of Penticton

Cycling Plan Update

September, 2012

File No. 1017.0053.06

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EXECUTIVE SUMMARY

Currently the City of Penticton, with a population of approximately 37,000 people, has true bicycle lane corridor along Government/South Main Street, Camri Avenue, Lower Bench Road/Tupper Road and a short section of Power Street adjacent to the South Okanagan Events Centre (SOEC). This is supported by a more extensive network “hybrid” or shared bike routes which are defined by the use of pavement stencils and/or “share the road” signage. Another facility of note is the Channel Pathway on the west side of the River Channel (on Penticton Indian Band Land). This paved pathway runs continuously along the river channel and is connected to the City of Penticton at three locations (Highway 97/Eckhardt Ave, Green Mountain Road, and Highway 97/Skaha Lake Road). Although this pathway is outside the City of Penticton’s jurisdiction it is frequently used by its residents and represents a very convenient and efficient north-south link. Residents currently use this north-south link as a recreational corridor and can be a valuable commuter route if additional capital is invested in improving connections to the City of Penticton. Recently, the City of Penticton has explored a number of other potential corridors where opportunities to expand the City’s bicycle network may exist.

The objectives of this study were to:

- ▶ Review previously completed bicycle network plans
- ▶ Review and provide recommendations for “immediate” projects (i.e. road rehabilitation projects programmed for the 2011, 2012 construction season)
- ▶ Review and provide recommendations for other proposed cycling corridors throughout the City of Penticton, with an emphasis on short-medium term improvements that can be accommodated within the existing roadway (i.e. no major reconstruction).
- ▶ Consolidate and update the City of Penticton’s Cycling Network Plan

The proposed bicycle network improvements were prioritized into three horizons:

- ▶ Short Term (1 to 2 years)
- ▶ Medium Term (5 years)
- ▶ Long Term (Beyond 5 Years)

The proposed implementation plan can be found in Appendix C.

Projects identified to be completed in Short Term horizon include:

- ▶ Warren Avenue
- ▶ Ellis Street
- ▶ Dartmouth Street
- ▶ Skaha Lake Road

Through additional consultation with the public, the City of Penticton reviewed and identifies some key improvements in the short term which was incorporated into the plan. They included:

- ▶ Increase available bike storage and parking
- ▶ Improve wayfinding signage for bicycle users
- ▶ Increase awareness at intersection with green bike lanes along Government Street/
- ▶ Realign the existing shared bike route along Leir Street to Manitoba Street

Projects identified to be completed in the Medium Term horizon include:

- ▶ Eckhart Avenue
- ▶ Duncan Avenue
- ▶ Green Avenue

Through the public consultation process the City identified additional projects to be included in the Medium Term horizon, they include:

- ▶ Improve surface treatment on existing trail west of the bridge at Eckhardt Avenue
- ▶ Create channel crossing at Duncan Avenue
- ▶ Create channel crossing at Green Avenue
- ▶ Create a connection between Kettle Valley Railway north and south along Skaha Lake Road
- ▶ Provide a connection along the Channel Parkway (Highway 97)
- ▶ Create bike lanes along Lakeside Road.

Projects identified to be completed in the Long Term horizon include:

- ▶ Lakeshore Drive
- ▶ Vancouver Avenue
- ▶ Moosejaw Street
- ▶ Wade Avenue/Burnaby Avenue
- ▶ Duncan Avenue/Old Railway
- ▶ Winnipeg Street/Fairview Road
- ▶ Fairview Road to Atkinson Connection
- ▶ Atkinson Street/McGraw Street/Paris Street
- ▶ Haven Hills Road/Johnson Road/Middle Bench Road

The proposed bicycle network is comprised of separate bike facilities, bike lanes and shared bike routes. The bike treatment along each corridor was chosen considering the existing right of way along the corridor and roadway classification. The proposed bicycle network can be found in Appendix B.

1.0 INTRODUCTION

In 2006, the City of Penticton completed a Transportation Master Plan (*Earthtech*) which included a revised Bicycle/Pathway Network Plan. Previous to this work, the City of Penticton had completed a Pedestrian and Cycling Master Plan in 1998 (*Urban Systems Ltd.*). Each plan included an existing and proposed cycling network map and corresponding bicycle facility classification system (i.e. trails/multi-use pathways, bicycle lanes, and “hybrid” or shared bicycle lanes). It is understood that the 2006 Bicycle Network Plan was developed for discussion purposes only and was never formally adopted by the City of Penticton.

Currently the City of Penticton, with a population of approximately 37,000 people, has true bicycle lane corridor along Government/South Main Street, Camri Avenue, Lower Bench Road/Tupper Road and a short section of Power Street adjacent to the South Okanagan Events Centre (SOEC). This is supported by a more extensive network “hybrid” or shared bike routes which are defined by the use of pavement stencils and/or “share the road” signage. Another facility of note is the Channel Pathway on the west side of the River Channel (on Penticton Indian Band Land). This paved pathway runs continuously along the river channel and is connected to the City of Penticton at three locations (Highway 97/Eckhardt Ave, Green Mountain Road, and Highway 97/Skaha Lake Road). Although this pathway is outside the City of Penticton’s jurisdiction it is frequently used by its residents and represents a very convenient and efficient north-south link. Residents currently use this north-south link as a recreational corridor and can be a valuable commuter route if additional capital is invested in improving connections to the City of Penticton. Recently, the City of Penticton has explored a number of other potential corridors where opportunities to expand the City’s bicycle network may exist.

These corridors, including Warren Avenue, Carmi Avenue, and Lower Bench Road/Tupper Avenue, were found to be inconsistent with the previously completed plans in that painted bike lanes were not recommended. In consultation with local stakeholders and in the interest of expanding the City’s bicycle lane network, the City conducted a review of these corridors to determine the feasibility and desire for bicycle lanes on these corridors. It was found that these corridors could accommodate bicycles lanes and that the previous Cycling Network Plans should be reviewed and updated to align with improvements underway and to explore other potential opportunities.

The objectives of this study are:

- ▶ To review previously completed bicycle network plans
- ▶ To review and provide recommendations for “immediate” projects (i.e. road rehabilitation projects programmed for the 2011, 2012 construction season)
- ▶ To review and provide recommendations for other proposed cycling corridors throughout the City of Penticton, with an emphasis on short-medium term improvements that can be accommodated within the existing roadway (i.e. no major reconstruction).
- ▶ To consolidate and update the City of Penticton’s Cycling Network Plan

Finally, a public consultation process was undertaken during the summer of 2012. Following this process further updates to the plan were made and the summary of public feedback is provided here.

2.0 BACKGROUND

Bounded by Okanagan Lake to the North, Skaha Lake to the South, the Okanagan River Channel to the west, and the hillside/agricultural lands to the east; the City of Penticton's 37,000 residents (2010 estimate) are primarily located within this approximately 14 sq.km relatively compact area. Perhaps due to this residential density, the moderate climate, and/or the City's active lifestyle and culture; the City of Penticton achieves relatively high mode split for active modes of transportation (walking and cycling). The percentage of residents who walk or cycle as their primary mode of travel to/from work or school is summarized in **Table 2.1**, along with other Okanagan communities, from the StatsCan "Journey to Work" data (2006 Census).

Table 2.1: Active Mode Split (2006 Journey to Work)

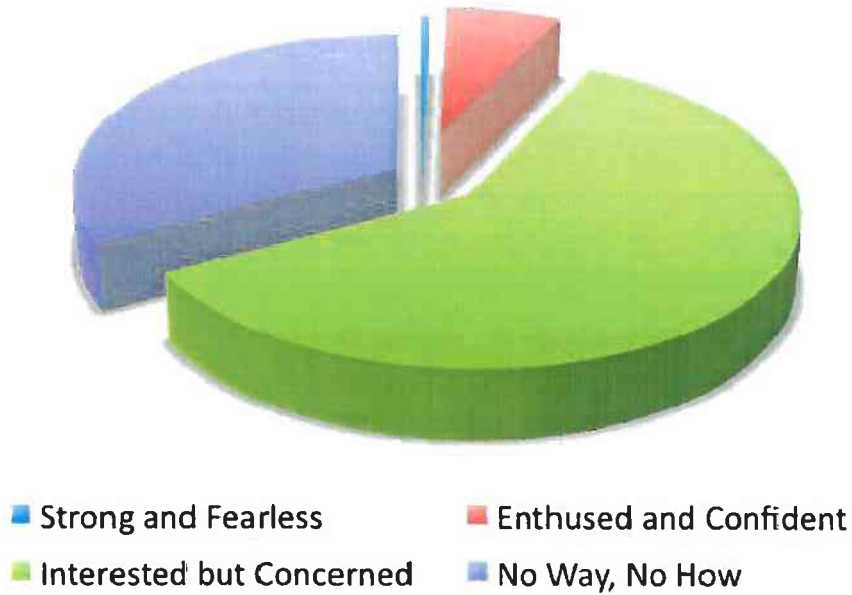
Community	% Walk	% Bike	Combined
Penticton	13.3%	3.5%	16.8%
Kelowna	5.6%	3.0%	8.6%
Vernon	9.3%	2.3	11.6%
Summerland	6.1%	1.1%	7.2%
Peachland	2.4%	0%	2.4%
Oliver	13.8%	1.8%	15.6%
BC	6.9%	2.0%	8.9%

It should be noted that these statistics tend to underestimate the total demand for walking and cycling. For example recreational or pleasure trips are not included, as well as "non-primary" trips (i.e. walking to the bus stop). While the 3.5% of residents found to cycle as a primary mode of transportation to/from work or school is relatively high compared to other Okanagan communities, this level of mode split represents just a fraction of the total potential market for active transportation in the City of Penticton. Research in this area first conducted in the City of Portland, Oregon and confirmed in other cities indicate that cyclists and potential cyclists could be grouped into four categories:

- ▶ **Strong and the fearless** – Those that are highly committed to cycling, are already cycling regularly, and will likely cycling regardless of available infrastructure. Typically less than 1% of residents.
- ▶ **Enthusied and Confident** – Those that have a high interest in cycling, are confident in their cycling abilities, and will make efforts to cycle as long as they reasonable facilities are provided (Approximately 7%)
- ▶ **No way, No how** – A wide cross-section of individuals who are unlikely to cycle and are not interested in cycling for a variety of reasons including age, health, disability, or other circumstances (approximately 33%)
- ▶ **Interested but concerned** – A wide cross-section of individuals who have an interest in cycling as part of their regular travel needs, but have significant concerns (typically related to safety or convenience) that limits their desire and commitment to cycling (up to 60%).

These general groups are illustrated in **Figure 2.1**. We can conclude that the “strong and fearless” and a portion of the “enthused and confident” cyclists are represented in the 3.5% of residents currently cycling as their primary mode of transportation. However, tapping into the larger potential market in the “Interested but concerned” group represents the greatest opportunity to increase cycling in the City of Penticton.

Figure 2.1 – Typical Cyclist Typology



3.0 PLANNING PRINCIPLES

Transportation planning has taken an increased emphasis on “alternate” transportation modes (i.e. walking, cycling, and transit). Communities throughout the world, including the City of Penticton, have recognized that increased use of these modes will result in a more balanced transportation system that is healthier, more liveable, cost effective, and more efficient in terms of the community’s infrastructure investments.

Planning principles simply mean the framework for which plans are developed and refined. In terms of bicycle network planning, two key principles are considered:

1. **Transportation Hierarchy** – much like tradition road network planning, where a classification hierarchy (freeway, arterial, collector and local) is well understood; bicycle network planning can benefit from the use of a similar approach. It has been found that all bicycle facilities are not created equal, and do not necessarily meet the needs or appeal to all users. For example very confident riders may feel comfortable in standard painted bike lanes on busy arterial streets, while many riders may feel safe only on quieter streets or in separated pathways. The goal of a transportation hierarchy is to provide options for all users within the cycling network (but not necessarily within the same corridor).

For the City of Penticton, we recommend the following simplified hierarchy of cycling facilities:

- ▶ **Separated Bicycle Facilities** – These include paved trails, multi-use pathways, and modern treatments such as “Cycle Tracks”. This type of facility would appeal to the broadest cross-section of potential cyclists, is generally considered the safest and most comfortable, and may incorporate enhanced landscaping/streetscaping.
- ▶ **Bicycle Lanes** – On-street painted bicycle lanes (i.e. Government Street) that provide distinct space for cyclists within the roadway. On busier streets with higher volumes of traffic and increased traffic speeds, bike lanes may not be considered comfortable for all users.
- ▶ **Shared Bicycle Routes** - These are signed bicycle routes that may be enhanced by pavement marking stencils. Where traffic volumes are low (<3,000 vehicles per day) and traffic speeds are below 50 km/hr, shared routes can be an effective and desirable facility for many users.

A simplified design criteria and summary of facility considerations is provided in **Section 4.0**.

2. **Transportation Grid Spacing** – in addition to the hierarchy the location, and more specifically the spacing, of cycling facilities is also important. In order to provide reasonable access for all residents to cycling routes and to ensure that cycling routes connect along key desire lines, a network of continuous and suitably spaced routes is required. As the existing roadway system is generally oriented north-south (streets) and east-west (avenues), a simple N-S and E-W grid of higher order facilities (separated bicycle facilities and bike lanes) is appropriate.

For the City of Penticton, we recommend a grid spacing of **approximately 1.0 km**, where:

- ▶ The existing Government St/South Main St corridor serves as the N-S spine of the cycling network. The River Channel Pathway provides a parallel N-S route, but these are separated by between 1.2 and 1.5 km. In this case, an addition N-S route is recommended between these two corridors. Based on the spacing and previous planning work this corridor would be the Winnipeg/Fairview/Atkinson Street corridor.
- ▶ A series of E-W routes are recommended to connect the exiting N-S corridors. Beginning at Lakeshore Drive and working south using the approximate 1.0 km spacing, the following corridors are recommended to form the E-W component of the cycling network:
 - Wade Avenue or Eckhardt Avenue
 - Carmi Avenue and Duncan Avenue
 - Warren Avenue
 - Green Avenue
 - Yorkton Avenue and/or South Beach Drive
- ▶ Other routes and corridors may be desired or required to make key connections or serve important destinations. In addition, this city-wide network may be supplemented by a variety of neighbourhood shared bike routes.

Each of these corridors was reviewed at a planning level for suitability, taking into consideration road width, driveway/access requirements, parking, etc. These corridors, along with many other suggestions were also discussed with various stakeholder groups that included:

- ▶ City Staff (incl. Engineering and Planning)
- ▶ Penticton Area Cycling Association (PACA)
- ▶ Okanagan Women On Wheels (OWOW)
- ▶ City of Penticton Transportation Demand Management (TDM) Committee

4.0 BICYCLE FACILITY DESIGN GUIDELINES

There are various cycling treatments that can be applied to the Penticton Cycling Network, through our study and experience we would recommend three types for the City's Network, as recommended in the proposed bicycle facility hierarchy. A brief overview of design criteria, guidelines, and other considerations is provided in the following sections. More detailed information can be found in reference documents such as:

- ▶ Transportation Association of Canada (TAC) Bikeway Traffic Control Guidelines for Canada - 2009
- ▶ National Association of City Transportation Officials (NATCO) Urban Bikeway Design Guide (2011)

4.1 Separated Bike Facility

Separated bike facilities are physically separated from vehicular traffic providing ample width for cyclists and pedestrian users to commute. Various configurations may be used including “cycle tracks” or multi-use pathways.

Buffered Lanes

A buffered bike lane is typically applied along a one direction corridor with existing on-street parking. This type of bike treatment cyclists are separated from moving traffic by parked vehicles. In addition, a painted median may be considered to provide additional separation from parked (opening doors). Due to the fact that the cycling corridor is “constrained” by the parked vehicles and the curb additional width is recommended to allow passing manoeuvres and avoidance of any obstructions in the lane. This type of treatment can be considered variant to the “Cycle Track”.



- ▶ Minimum lane width: 1.5m-2.1m
- ▶ Minimum buffer: 0.5m-0.9m
- ▶ Ideal for use along “one-way” collector and arterial streets

Cycling Tracks

Cycle tracks, also known as separated bicycle lanes, are an exclusive on-street bicycle facility that separates the cyclist from motor vehicle travel lanes, parking lanes, and sidewalks through a variety of physical treatments such as pavement markings, bollards, curbs, medians, or planters. Cycle tracks can be either one-way or two-way, on one or both sides of a street. Some of the benefits of cycle tracks include:



- ▶ Minimum width: 1.5 m with 0.5 m buffer from vehicular traffic (each direction)
- ▶ Ideal for higher speed roads with few intersections
- ▶ Can increase ridership by as much as 20%
- ▶ Separation may be horizontal (buffer, boulevard, or barrier) and/or vertical (curb).

Multi-use Path

Multi-use paths are physically separated from motor vehicles and provide sufficient width and supporting facilities (ie: benches) to be used by cyclists and pedestrians and other non-motorized users.



- ▶ 3.0 m - 4.0 m lane widths based on design criteria
- ▶ Shared by other users (pedestrians)
- ▶ Suitable for users of all ages and skill levels

4.2 Bike Lanes

Bike lanes are exclusively designated for bicycle travel. Cyclists travel adjacent to vehicular traffic. Bicycle stencils should be provided adjacent to the fog line at intervals of approximately 75m or as conditions dictate (i.e. approximately 10m downstream of an intersection)



- ▶ Minimum width: 1.5m
- ▶ Ideal for use along collector and arterial streets
- ▶ Suitable for commuters and more experienced riders

4.3 Shared Bike Routes

Shared bike routes are routes on streets with low vehicle speeds and volumes, which is designated with signage and pavement markings. They may be enhanced with traffic calming measures to reduce traffic volumes and speeds.



- ▶ Suitable for low volume and low speed roads
- ▶ “Stepping stone” to convert recreational cyclists to commuter cyclists
- ▶ Ideal for use along local streets
- ▶ Typically a 4.3 m shared traffic/bike lane

4.4 Coloured Bicycle Lanes

Coloured bicycle lanes can be used in high-conflict areas, to alert drivers of the presence of bicyclists and bicycle lanes. In some cases, a contrasting colour is applied to continuous sections of roadways.



- ▶ Help to better define road space dedicated to bicyclists
- ▶ Applicable in areas where conflicting motor vehicle traffic is high
- ▶ Motor vehicle/bicycle conflict area is long
- ▶ Beneficial speed reduction cause by roadway appearing to be narrower

At this time, Green Bike Lanes may be considered to enhance the conflict areas along busier cycling corridors (i.e. Government Street). A trial approach is recommended to determine the desire and effectiveness of this treatment.

4.5 Bike Boxes

Bike boxes include a bicycle lane leading to a “box” situated behind the crosswalk and in front of the motor vehicle stop bar. The bike box enables cyclists to move to the front of the queue and position themselves ahead of motor vehicles.



- ▶ Allow for easier intersection crossing on high volume cycling route
- ▶ Applicable in areas where cyclists make frequent left turns
- ▶ Cyclists wait no more than one signal
- ▶ Cyclist avoid exhaust fumes

At this time, we recommend that Bike Boxes be considered as a future enhancement as cycling improvements are made and demand dictates.

4.6 End-of-Trip Facilities

Similar to vehicle parking, cyclist will require proper bicycle parking at the end of each trip. By providing bicycling parking to cyclist, theft and loss of property can be reduced once the cycling infrastructure is in place. Investing in cycling infrastructure throughout the City will help promote and sustain the existing cycling culture while attracting new users to the facilities. Safe and secure on-street parking at key locations throughout the City can significantly encourage cycling in addition to developing a comprehensive network of bicycle facilities.



Recommended areas for bike parking:

- ▶ The Downtown core
- ▶ Schools
- ▶ Shopping Centers
- ▶ The Library
- ▶ Community and Recreation facilities
- ▶ Other major employment areas

5.0 CORRIDOR REVIEWS

Based on our review of previously completed planning work, other engineering projects currently underway, and our consultation with staff/stakeholders; a number of potential cycling corridors were identified. These corridors were evaluated and reviewed with respect to their ability to accommodate higher order bicycle facilities (i.e. separated bike lanes or painted bike lanes). In addition, these corridors have been sub-divided into a preliminary implementation strategy that suggests potential projects for immediate (2011), short term (within 5 years), or long term (beyond 5 year) horizons. These horizons are for discussion purposes only and are subject to City of Penticton direction, availability of funding, and other opportunities that may arise.

5.1 Public Consultation

The City of Penticton and Urban Systems held an information session at the South Okanagan Event Center on May 31st, 2012. This session included a public consultation where the community had the opportunity to provide comments on the propose update to the City's bicycle network. The suggestions proposed by the public were evaluated and reviewed for potential fit within the proposed bicycle network. A majority of the suggestions from the public consultation event was incorporated into the plan. In addition to the public consultation, a presentation provided by Andreas Rohl highlighted innovative techniques, infrastructure, and cycling culture that makes Copenhagen a successful cyclist city.

Some of the key outcomes from the public consultation include:

- ▶ Support from the community for improved cycling facilities
- ▶ Increase maintenance on existing bike facilities during challenging seasons
- ▶ Improved wayfinding signage
- ▶ Increase driver and cyclist education on the "rules of the road"
- ▶ Provide a separated/delineated bike facility along the Channel Parkway
- ▶ Increased connections to the existing River Channel Pathway
- ▶ Seventeen suggestions for specific alterations and improvements to the Cycling Network Plan

It should be noted that some concern was expressed by the Penticton Industrial Development Association regarding the interaction of cyclists with trucks in Penticton's industrial areas. The feedback and suggestions received from the public have been reviewed and for the most part incorporated into the Plan.

5.2 Parking Impacts

In various locations it is recognized that on street parking may be impacted by the addition of bike lanes. It is recommended that parking impacts and mitigation strategies be evaluated on a case by case basis. For each corridor preliminary pavement parking designs (based on up to date survey data) should be completed to determine the actual extent of parking impacts (including number of on street stalls affected). Where possible an inventory of available on street and off street parking in the vicinity should be conducted along with an assessment of actual utilization. It should be determined if impacts to on street

parking can be accommodated with the existing (private off-street parking/driveways, adjacent streets, access to off street parking through back alleys, or other off-street facilities). Alternatively strategies add new parking to the affected area may be investigated as required.

5.3 Completed Bicycle Improvement Projects 2011:

Several road resurfacing/rehabilitation projects that have been undertaken by the City of Penticton in the 2011 season have presented an opportunity to provide enhanced cycling facilities (i.e. bike lanes). These projects were reviewed separately as part of this assignment and the corresponding recommendations can be found in **Appendix A** for:

- ▶ Carmi Avenue
- ▶ Lower Bench Road/Tupper Avenue

5.4 Short Term Projects (1 to 2 Years)

Warren Avenue

Warren Avenue has been identified by the City and through a review process (included in **Appendix A**), as a critical east-west connection for the cyclists in the community. This corridor allows users to connect from the Channel Parkway to the north-south Government Street bike lanes. This immediate improvement to the network provides the adequate spacing from existing east-west shared bike routes.

Ellis Street and Power Street

The proposed Ellis Street and Power Street bicycle corridors will provide connections to the existing Government Street bike lanes, which currently acting as the north-south spine for the bicycle network. Through the review process, Ellis Street (Wade Avenue to Vancouver Avenue) has been identified as a priority bicycle corridor to be completed in the short term. Future considerations should be made for bike lanes, while signed bike routes may be used as an interim solution.

Dartmouth Drive

This corridor would provide an alternative north-south bike route for cyclist to travel on. Dartmouth Drive in comparison to Government Street has lower vehicular activity. It is recommended that the City consider an alignment from Dartmouth Drive to Green Avenue, and include painted bike lanes.

Skaha Lake Road /Yorkton Avenue/South Beach Drive

Where South Beach Drive connects to Skaha Lake Road, just east of the Channel Parkway, it is recommended that the Skaha Lake Road cross-section be reduce from a four-lane road to a three lane corridor. The City completed a road diet review for this corridor in 2012, the review is provided in **Appendix A**. This would provide mobility and safety to cyclists and other active modes of transportation. An east-west link in this area would serve the south end of Penticton and would provide access to the southernmost crossing of the River Channel (at Skaha Lake Road). South Beach Drive currently includes a separate bike facility given its proximity to beach front property and higher pedestrian activity.

5.4.1 Public Consultation -Short Term Projects

From the public consultation process, the City identified several short term projects to increase the safety and enhance the user experience when travelling on the bicycle network. They include:

- ▶ Increase available bike storage and parking
- ▶ Improve wayfinding signage for bicycle users
- ▶ Increase awareness at intersection with green bike lanes at Government Street/Eckhardt Avenue, Government Street/ Duncan Avenue, Government Street/Carmi Avenue, Government Street/Industrial Avenue and Government Street/Warren Avenue.
- ▶ Realign the existing shared bike route along Leir Street to Manitoba Street

5.5 Medium Term Projects (5 Years)

Following discussions with the City of Penticton and its key stakeholders, three East-West cycling corridors were identified for potential improvements. Eckhardt Avenue, Duncan Avenue and Green Avenue were considered desirable routes for the implementation of bike lanes. These three proposed cycling improvements, in addition to the proposed cycling facility for Warren Avenue would create a consistent system of East-West cycling routes from Okanagan Lake in the north to Skaha Lake in the south. These East-West connections are critical to the cycling network as they provide continuity and connectivity to the existing north-south bike lanes on Government Street.

Below are the descriptions and the recommended options for each segment for the three East-West cycling corridors.

5.5.1 Eckhardt Avenue

East of Power/Railway Street, Eckhardt Avenue is a mix of commercial, institutional and residential development with vehicles operating at 50km/hr. On-street parking exists along certain section of Eckhardt, the City will have to decide whether to continue, restrict, or prohibit on-street parking along the various segments, especially in narrow parts of Eckhardt. Lane treatment for bike lanes will be needed to manage the conflicts that may occur at Haven Hill Road and Creekside Road intersection between bikes and vehicular traffic.

With the varying widths, potential need for on-street parking, and existing lane configurations, the cross section along Eckhardt will differ from each segment as a result of existing constraints along the corridor.

Railway Street to Caribou Street

This section of Eckhardt Avenue consists of commercial and institutional services. West of Railway St is the continuation of Highway 97 heading north towards Summerland/Peachland. East of Railway is a two lane corridor with turning lane accommodations at the Railway/Eckhardt intersection. Cycling facilities can be accommodated within this 16.5m ROW and on-street parking should be avoided on this segment of Eckhardt.

Caribou Street to Moosejaw Street

This section of Eckhardt Avenue contains institutional facilities and residential development with driveway access from alley or side streets. Cycling facilities can be accommodated within this 13.95m ROW and on-street parking will be restricted to one side.

Moosejaw Street to Argyle Street

This section of Eckhardt is mainly residential development. Access to residential units can be obtained through alleys or side streets. Additional on-street parking should be located in these areas and should avoid the Eckhardt corridor. Cycling facilities can be accommodated within this 10.7m ROW; on-street parking cannot be accommodated for this section on Eckhardt.

Argyle Street to Winnipeg Street

This section of Eckhardt Avenue contains three travel lanes; two eastbound and one westbound. A traffic study would be required prior to installing a cycling facility to ensure queue lengths for turning movements to not encroach onto other travel lanes. It is recommended that on-street parking be banned along this narrow section to accommodate bike lanes. Cycling facilities can be accommodated within this 10.8m ROW only when the existing lane configurations are altered to integrate the proposed bike facilities.

Winnipeg Street to Martin Street

This section of Eckhardt Avenue contains four travel lanes, two eastbound and two westbound. A traffic study would be required prior to installing a cycling facility to ensure queue lengths for turning movements to not encroach onto other travel lanes. It is recommended that on-street parking be prohibited along this narrow section to accommodate the bike lanes. Cycling facilities can be accommodated within this 13.35m ROW only when the existing lane configurations are altered to integrate the proposed bike facilities.

Martin Street to Main Street

This section of Eckhardt Avenue contains four travel lanes, two eastbound and two westbound. A traffic study would be required prior to installing a cycling facility to ensure queue lengths for turning movements to not encroach onto other travel lanes. It is recommended that on-street parking be prohibited along this narrow section to accommodate the additional travel lanes. Residents in this area have off-street driveways or back access via back lanes/alleys. Cycling facilities can be accommodated within this 13.35m ROW only when the existing lane configurations are altered to integrate the proposed bike facilities.

Main Street to Government Street

This section of Eckhardt Avenue consists of residential units on the north side and commercial/institutional services on the south side of Eckhardt. Cycling facilities can be accommodated within this 12.1m ROW and on-street parking, if required, will be restricted to one-side of Eckhardt.

Table 5.1: Corridor Cross-Section Summary (Eckhardt)

ECKHARDT AVENUE	
Segment	Option ¹
Railway Street to Caribou Street	Opt 1– Two Travel Lanes with Bike Lanes
Caribou Street to Moosejaw Street	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)
Moosejaw Street to Argyle Street	Opt 1– Two Travel Lanes with Bike Lanes
Argyle Street to Winnipeg Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Winnipeg Street to Martin Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Martin Street to Main Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Main Street to Government Street	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)

¹ See Section 6.0 – Design Options for details

5.5.2 Duncan Avenue

Duncan Avenue, west of Main Street is a mix of commercial and residential development with vehicular traffic operation at 50km/hr. East of Main Street, Duncan Avenue mainly consists of residential development. On-street parking exists along certain sections of Duncan, the City will have to decide whether to continue, restrict, or prohibit on-street parking along the various segments, especially in narrow parts of Duncan.

With the varying widths, potential need for on-street parking, and existing lane configurations, the cross section along Duncan will differ as a result of existing constraints along the corridor.

Railway Street to Moosejaw Street

This section of Duncan is primarily commercial development with no existing on-street parking. Cycling facilities can be accommodated within this 14.0m ROW and on-street parking, if required, should be restricted to parking on one-side of Duncan. It is recommended that this segment remain two travel lanes with bike lanes and no on-street parking.

Moosejaw Street to Hasting Avenue Connector

This section of Duncan is primarily commercial development with no on-street parking. Cycling facilities can be accommodated within this 11.2m ROW and on-street parking is not recommended for this section of Duncan Avenue.

Hasting Ave Connector to Abel Street

This section of Duncan is primarily commercial development on the south side, and residential units on the north side of Duncan, with no on-street parking. Cycling facilities can be accommodated within this 14.0m ROW and on-street parking, if required, will be limited to parking on one-side of Duncan. Parking will have to be restricted at the Fairview/Duncan intersection.

Abel Street to Atkinson Street

This section of Duncan Ave is mainly residential development. Cycling facilities can be accommodated within this 11.5m ROW; on-street parking is not recommended for this section of Duncan Avenue.

Atkinson Street to Huth Avenue (Alley approx. 60m west of Main Street)

This section of Duncan Avenue contains four travel lanes, two eastbound and two westbound. A traffic study would be required prior to the installation of a cycling facility to ensure queue lengths required for turning movements to not encroach onto other travel lanes. It is recommended that on-street parking be banned along this narrow section to accommodate the bike lanes. Cycling facilities can be accommodated within this 13.7m ROW only when the existing lane configurations are altered to integrate the proposed bike facilities.

Huth Avenue (Alley approx. 60m west of Main Street) to Main Street

This section of Duncan Avenue contains four travel lanes, two eastbound and two westbound. A traffic study would be required prior to the installation of a cycling facility to ensure queue lengths required for turning movements to not encroach onto other travel lanes. It is recommended that on-street parking be banned along this narrow section to accommodate bike lanes. Cycling facilities can be accommodated within this 13.55m ROW only when the existing lane configurations are altered to integrate the proposed bike facilities. Further analysis will have to take place prior to changing the cross section along this segment of Duncan.

Main Street to Manitoba Street

This section of Duncan Ave is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking space that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Duncan Avenue. Cycling facilities can be accommodated within this 13.46 ROW; on-street parking will be restricted to one-side.

Manitoba Street to Government Street

This section of Duncan Ave is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking space that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Duncan Avenue. Cycling facilities can be accommodated within this 11.6 ROW; on-street parking cannot be accommodated for this section on Duncan.

Table 5.2: Corridor Cross-Section Summary (Duncan)

DUNCAN AVENUE	
Segment	Option ¹
Railway Street to Moosejaw Street	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)
Moosejaw St to Hasting Ave Connector	Opt 1– Two Travel Lanes with Bike Lanes
Hasting Ave Connector to Abel Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Abel Street to Atkinson Street	Opt 1– Two Travel Lanes with Bike Lanes
Atkinson Street to Huth Street (Alley)	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Huth Street(Alley) to Main Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Main Street to Manitoba Street	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)
Manitoba Street to Government Street	Opt 1– Two Travel Lanes with Bike Lanes

¹ See Section 6.0 – Design Options for details

5.5.3 Green Avenue

Green Avenue is a mix of residential, commercial and institutional development with significant commercial activity at Green Avenue and Skaha Lake Road. Green Avenue becomes more residential east of Main Street, with vehicular traffic operating at 50km/hr or less through the corridor. On-street parking exists along certain section of Green, the City will have to decide whether to continue, restrict, or prohibit on-street parking along the various segments, especially in narrower parts of Green.

For continuity, the bike lanes on Green Avenue east of Greenwood Drive will need a connection onto Dartmouth. With the varying widths, potential need for on-street parking, and existing lane configurations, the cross section along Duncan will differ as a result of constraints along the corridor.

Channel Parkway to Coleman Street

This section of Green Ave is mainly residential development. Access to residential units can be achieved through alleys or side streets. Residents with driveways or parking spaces that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Green Avenue. At the intersection there is a westbound left onto Highway 97, westbound right, and an eastbound through lane. Cycling facilities can be accommodated within this 14.4m ROW; on-street parking cannot be accommodated for this section on Green.

Coleman Street to Paris Street

This section of Green Ave is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking spaces that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Green Avenue. Cycling facilities can be accommodated within this 13.9m ROW; on-street parking cannot be accommodated for this section on Green.

Paris Street to Skaha Lake Rd

This section of Green Ave is mainly commercial development. Consider using lane treatments for bike lanes along this section of Green leading up to the Green Ave/Skaha Lake intersection. Cycling facilities

can be accommodated within this 14.4m ROW; on-street parking cannot be accommodated for this section on Green.

Skaha Lake Road to Wilson Street

This section of Green Ave is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking spaces that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Green Avenue. Cycling facilities can be accommodated within this 13.7m ROW; on-street parking cannot be accommodated for this section on Green.

Wilson Street to Eraut Street.

This section of Green Ave consists of residential and commercial/institutional facilities. Access to residential units can be obtained through alleys or side streets. Cycling facilities can be accommodated within this 13.7m ROW; on-street parking will be restricted to one side.

Eraut Street to Green Court

This section of Green Ave consists of residential and commercial/institutional facilities. Access to residential units can be obtained through alleys or side streets. Cycling facilities can be accommodated within this 13.3m ROW; on-street parking should be restricted to one side.

Green Court to S. Main Street

This section of Green Ave is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking spaces that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Green Avenue. Cycling facilities can be accommodated within this 14.7m ROW; on-street parking restricted to one-side can be accommodated.

S. Main Street to Greenwood Drive

This section of Green Avenue is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking spaces that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Green Avenue. Cycling facilities can be accommodated within this 10.1m ROW; on-street parking cannot be accommodated for this section on Duncan.

Greenwood Drive to Valleyview Rd

This section of Green Avenue is mainly residential development. Access to residential units can be obtained through alleys or side streets. Residents with driveways or parking spaces that can be accessed through alleys or side streets should park in these designated spaces and avoid parking on Green Avenue. Cycling facilities can be accommodated within this 10.1m ROW; on-street parking cannot be accommodated for this section on Duncan.

Table 5.2: Corridor Cross-Section Summary (Green)

GREEN AVENUE	
Segment	Option ¹
Channel Parkway to Coleman Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Coleman Street to Paris Street	Opt 1– Two Travel Lanes with Bike Lanes
Paris Street to Skaha Lake Rd	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Skaha Lake Road to Wilson Street	Opt 3– Two Travel Lanes with Turn Lane and Bike Lanes
Wilson Street to Eraut Street	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)
Eraut Street to Green Court	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)
Green Court to S. Main Street	Opt 2– Two Travel Lanes with Bike Lanes and Parking (1 Side)
S. Main Street to Greenwood Drive	Opt 1– Two Travel Lanes with Bike Lanes
Greenwood Drive to Valleyview Rd	Opt 1– Two Travel Lanes with Bike Lanes

¹ See Section 6.0 – Design Options for details

5.5.4 Partnership Opportunities -Medium Term Projects

The feedback received from the public during the public consultation were documented and reviewed by the City to identify the Medium Term Projects. The proposed projects will include partnerships between the City of Penticton and the Penticton Indian Band (PIB), the Government of Canada and the Province of British Columbia in order to achieve a comprehensive cycling network for the City of Penticton and its neighbouring areas. The proposed improvements include:

- ▶ Improve surface treatment on existing trail west of the bridge at Eckhardt Avenue (with PIB)
- ▶ Create channel crossing at Duncan Avenue (with PIB)
- ▶ Create channel crossing at Green Avenue (with PIB)
- ▶ Create a connection between Kettle Valley Railway north and south along Skaha Lake Road (with PIB and Gov't of Canada)
- ▶ Provide a connection along the Channel Parkway (with the Province of BC)
- ▶ Create bike lanes along Lakeside Road (with the Province of BC)

5.6 Long Term Projects (>5 Years)

In addition to the “Short Term” and “Medium Term” projects identified as part of this study, the City of Penticton should consider additional investments into their cycling network to achieve a comprehensive network with connectivity in the North-South and East-West direction. These would serve to supplement a core cycling network skeleton and to provide additional options for different types of potential cyclists and maximize the potential cycling ridership in the City of Penticton. Some specific corridors that were discussed include:

Lakeshore Drive

Lakeshore Drive currently has no designated cycling facility, although many cyclists use the road way itself as it is signed at 30km/hr. Future considerations for this busy tourist/recreational corridor should consider a separated facility, or a multi-use path to avoid the mix of vehicular and pedestrian traffic.

Vancouver Avenue

Vancouver Avenue is another corridor with no designated cycling facilities at this time. This link provides an important connection between the waterfront area along Lakeshore Drive and the KVR trail/routes toward Naramata. Along with future considerations for separated cycling facilities along Lakeshore Drive, considerations for routes on or adjacent to Vancouver Avenue should also be made. *Moosejaw Street* This route would provide a connection between the proposed bike lanes on Eckhardt Avenue and Duncan Avenue. Future consideration should be made for bike lanes on this corridor, although a signed bike route may be appropriate given the low traffic volumes on this road.

Wade Avenue / Burnaby Avenue

Wade Avenue has previously been investigated for the implementation of bicycle lanes; however perceived impacts to parking have prevented their implementation. As the logical extension of the Government Street bike lane corridor and a useful connection to the downtown and waterfront areas, this corridor remains a recommended cycling route. Bicycle lanes or alternate facilities (i.e. shared bike route with traffic calming measures) should be considered as a future improvement. An extension of the Wade Avenue corridor may include Burnaby Avenue. Opportunities to add bike lanes on this link appear to be feasible given the ample road width and limited on-street parking. Burnaby Avenue would provide a useful connection to Riverside Drive and across the River Channel. Some other complimentary connections may be required to link this segment to other routes (i.e. Westminster Ave from Burnaby Ave to Power St)

Duncan Avenue/Old Railway

Infrastructure from the old railway line can be utilized to create an alternate pedestrian/bicycle crossing connecting the City of Penticton to the east bank of the Okanagan River Channel. Additional investment would be required to construct a pedestrian/bike only bridge which would provide a connection from the City to the existing recreational path on the west side of the River Channel. The alternative to constructing a new ped/bike only bridge would be improving the existing path along the east bank, heading north towards the bridge on the golf course. The opportunity to utilize an existing overpass structure on Highway 97 for active transportation modes can provide additional capacity at existing at-grade crossing, and can improve the safety and mobility of pedestrian and bicyclists.

Winnipeg Street/Fairview Road

For the long term, the City should consider developing additional north-south routes in the City's core area. Winnipeg Street and Fairview Road are corridors that can link cyclists from the Okanagan Lake waterfront to the Channel Parkway. This could also provide a link to the Atkinson Street corridor providing a parallel route to the Government Street corridor. As an alternative to the painted bike lanes on Government Street, separated bike lanes (multi-use pathway or cycle tracks) or traffic calmed shared bike route are recommended. A separated facility can be incorporated into the cycling network with through the re-allocation of available road space by restricting of on-street parking and/or narrowing the travel lanes. Alternatively, an approach may be to develop a "neighbourhood bikeway" by increasing the level of traffic calming (chicanes, mini traffic circles, or traffic diverters) for sections of the road. These techniques would be ideal given the surrounding areas are mainly residential development. This would be subject to further consultation, investigation, and design. As an interim measure the existing signed bike route should be maintained and perhaps enhanced with traffic calming measures.

Fairview Road to Atkinson Connection

While the proposed bike lanes along Duncan Avenue would provide an adequate connection between the Fairview Road and Atkinson Street routes, to be consistent with any future separated cycling facilities along these corridors; an alternative connection may be desirable. This may include a separate pathway along Duncan Avenue between these routes or an off-line connection (perhaps via Cossar Avenue).

Atkinson Street/McGraw Street/Paris Street

The existing bike facilities for these corridors are signed bike routes. These corridors provide a north-south link from Duncan Avenue to Green Avenue. This provides an alternate north-south link and parallels Government Street-South Main Street and the Channel Parkway. It is recommended that the existing signed route be upgraded to a dedicated/separated cycling facility or traffic calmed shared bike route. This link can be incorporated into the cycling network with careful consideration on banning on-street parking or increasing the level of traffic calming (chicanes, mini traffic circles, or traffic diverters) for narrower sections of the road. These techniques would be ideal given the surrounding areas are mainly residential development. This would be subject to further consultation, investigation, and design. As an interim measure the existing signed bike route should be maintained and perhaps enhanced with traffic calming measures.

Haven Hills Road/Johnson Road/Middle Bench Road

The existing bike facilities for these corridors are signed bike routes. These corridors provide a link from Narmata Road to Government Street. This provides an alternate north-south link for the Penticton Cycling Network. It is recommended that the existing signed route be upgraded to a painted bike lane (consistent with the treatment of Lower Bench Road and Tupper Avenue).

Connection between KVR Trail and Wade Avenue

A short connection is proposed to link the KVR trail with the existing the bike route on Wade Avenue improving connectivity and convenience for trail users.

Connection between KVR Trail and Ontario Street

A short connection is proposed to link the KVR trail with the existing the bike route on Ontario Street improving connectivity and convenience for trail users.

6.0 RECOMMENDED CYCLING NETWORK AND IMPLEMENTATION PLAN

The recommended cycling network takes into consideration feedback from the public consultation process and the City of Penticton's vision for enhancing the cycling culture within the community. The proposed cycling network closely resembles a grid network which allows for maximum connectivity and coverage throughout the City. The "1 km" spacing in the proposed cycle network provides optimal connections to key destinations within the City captured by the proposed east-west and north-south cycling corridors.

The proposed network consists of separate bike facilities, bike lanes and shared bike routes. These corridor treatments can capture significant users to the network and provide an improved user experience when travelling to key destination around the City.

Appendix B illustrates the proposed cycling network.

Included with the proposed cycling network is the proposed implementation plan for the cycling facilities. The implementation plan will help prioritize the proposed cycling improvements. However, the priorities of the propose improvement may change if capital works programs are scheduled in the upcoming fiscal year.

A summary of our corridor reviews and recommendations are illustrated in the revised Cycling Network Plan for the City of Penticton (see Appendix B). This includes the existing bike routes and facilities, and recommended corridors/routes for each bicycle facility hierarchy (Separated Bike Facilities, Bike Lanes, and Shared Bike Routes). Alignments shown as dashed arrows indicate yet-to-be-determined alignments. As stated in section 4.0 of this report, please refer to section 4.1 for 'separated bicycle facilities', 4.2 for 'bike lanes', and 4.3 for 'shared/signed bike routes'. Items referencing 'bike alignments' indicate an area where it is desirable to increase the City's bike network, but no existing road/connection exists. Further investigation will be required for a desirable route.

An Implementation Plan figure is illustrated in Appendix C. This plan includes recommendations for immediate (2011), short term (less than 5 years), and long term (more than 5 years) improvements. It should be noted that the priority and the timeframe of the recommended bike improvements should complement the planned infrastructure and capital programs by the City.

APPENDIX A

Immediate Corridor Recommendations



MEMORANDUM

date: June 28, 2011
to: Roy Christensen
cc: Mitch Moroziuk, Chris Alexander
from: James Donnelly, P.Eng., PTOE
file #: 1017.0053.06
subject: **CARMI AVENUE AND LOWER BENCH ROAD/TUPPER AVENUE/MIDDLE BENCH ROAD PAVEMENT MARKINGS**

Roy,

As requested, we have investigated the roadway re-surfacing projects that are currently underway on Carmi Avenue (approximately from Dartmouth Road to Holden Road) and Lower Bench Road/Tupper Avenue (approximately from Grandview Street to Middle Bench Road). It is understood that the City of Penticton is considering the implementation of "bike lanes" on each of these corridors.

The purpose of this memo is to investigate the appropriateness of these routes for a City-wide bike route, determine the appropriate treatment (including pavement markings and signage), and provide any other relevant recommendations. This work represents "Task 1" in the work plan provided to Mitch Moroziuk by email on June 20, 2011 (*subject: Proposed Work Plan and Budget – Penticton Cycling Plan*).

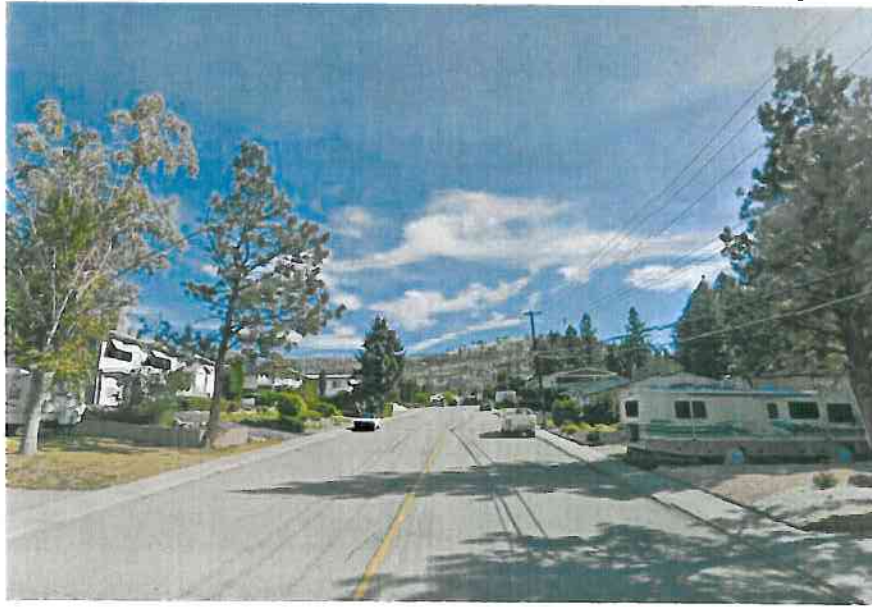
CARMI AVENUE (between Dartmouth Road and Holden Road) –

This section of Carmi Avenue is a collector road with curb and gutter on both sides (and total pavement width of 14.0m). While this total width is large enough to accommodate four travel lanes, it currently operates as a two-lane facility with intermittent on-street parking. Carmi Avenue generally climbs uphill from west to east and serves as the primary collector for the residential area surrounding Columbia Street and Ridgedale Avenue. East of Columbia Street there are a number of private residential driveways that access directly on to Carmi Avenue on both sides. Carmi Avenue has previously been identified as a "bike route" in other plans and hybrid bike lane "sharrows" were in place. This section of Carmi Avenue is illustrated in **Figure 1**.

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Figure 1: Existing Carmi Avenue (near Columbia Street)



We recommend that the existing pavement markings be enhanced with the addition of a white “fog line” 3.3m from the centreline on each side of Carmi Avenue. This would delineate the single travel lane in each direction. This would leave a 3.7m shared bicycle – parking lane on each side. At this time, we do not believe it is necessary to distinguish between the bike lane and the adjacent parking lane. Bicycle stencils should be provided adjacent to the fog line at intervals of approximately 75m or as conditions dictate (i.e. approximately 10m downstream of an intersection) – as per TAC Bikeway Traffic Control Guidelines. Existing Bike Route/Share the Road signage can be maintained. This configuration is illustrated in **Figure 2** below.

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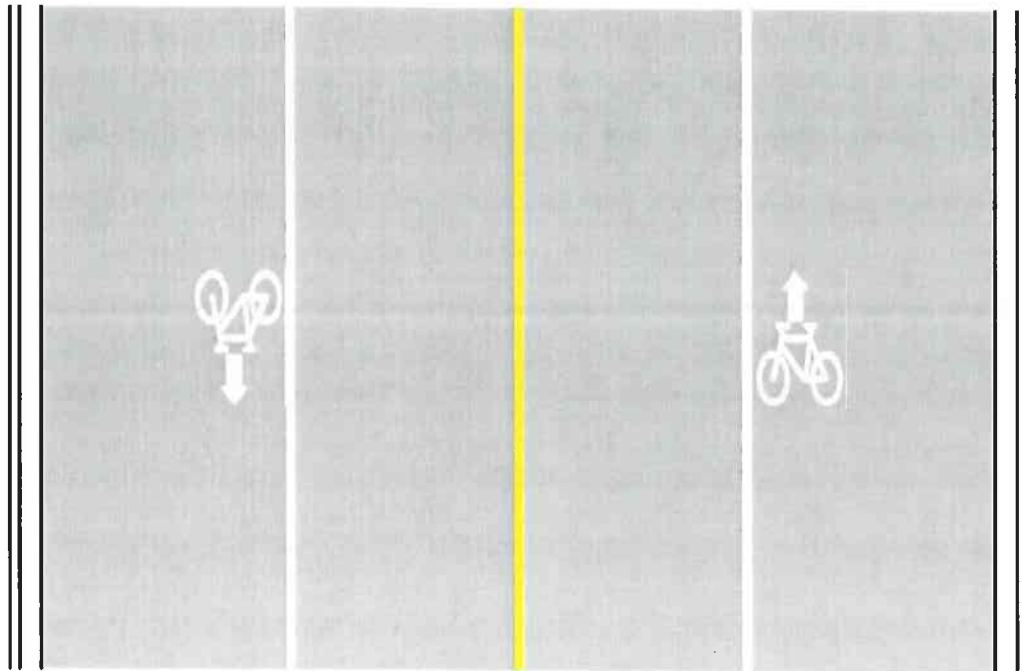
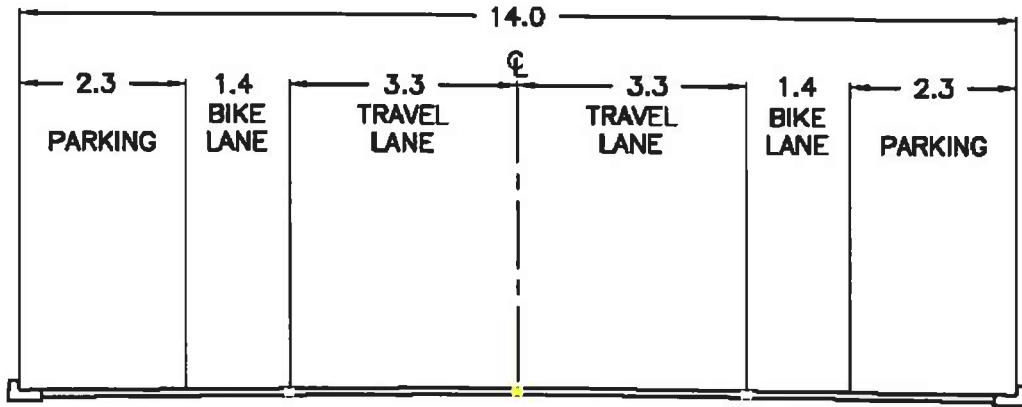
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Figure 2: Proposed Pavement Markings for Carmi Avenue



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LOWER BENCH ROAD – TUPPER AVENUE (between Grandview Street and Middle Bench Road) –

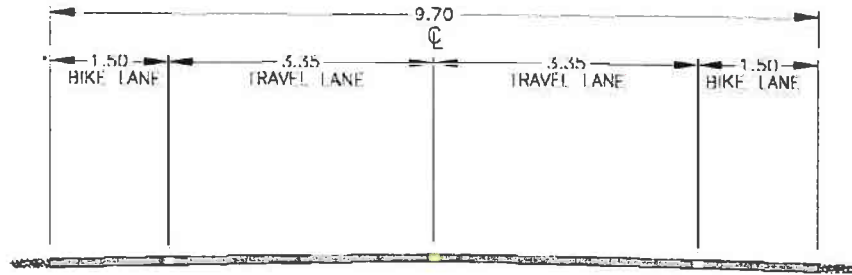
This section of two-lane collector road connects Vancouver Avenue and Penticton’s downtown area to Middle Bench Road and eventually Naramata Road. This route is frequently used by recreational and competitive cyclists. Existing sections of this route are a mix of asphalt curb and rural cross-sections with some private access driveways along the way. The existing pavement width is understood to be approximately 9.2m with two 3.5m travel lanes and a narrow 1.1m paved shoulder on each side, illustrated in **Figure 3**.

Figure 3: Existing Lower Bench Road (near Bankview Road)

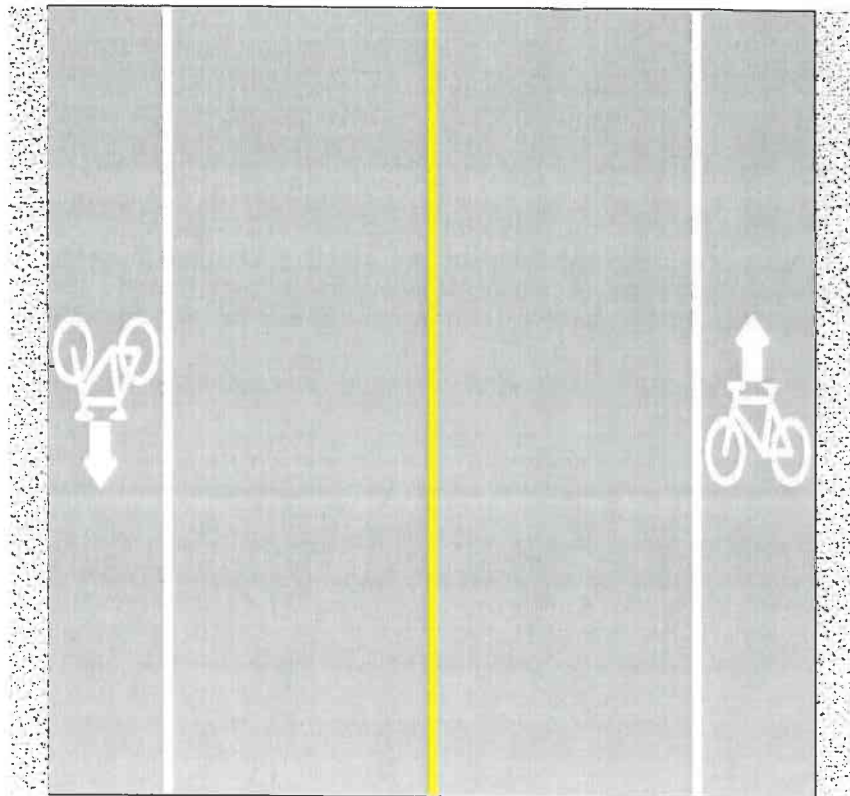


New sections of Lower Bench Road and Tupper Road will be resurfaced to a width of 9.7m. We recommend that these sections be marked with a 3.35m travel lane and a 1.5m bike lane on each side. Bicycle stencils may also be provided adjacent to the fog line at intervals of approximately 75m or as conditions dictate (i.e. approximately 10m downstream of an intersection) – as per TAC Bikeway Traffic Control Guidelines – and existing Bike Route/Share the Road signage should be maintained. It should be noted that there may be locations where existing 3.5m travel lanes meet the new 3.35m travel lanes. In this case an appropriate taper should be provided to transition between the different lane widths. Over time, it is recommended that further sections of Lower Bench Road, Tupper Avenue, and Middle Bench Road, be paved to a 9.7m width with the proposed 3.35m travel lane and 1.5m bike lane widths. This configuration is illustrated in **Figure 4**.

Figure 4: Proposed Pavement Markings for Lower Bench Road / Tupper Avenue



PROFILE



PLAN

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CLOSURE

I trust that this submission meets with your expectations. While we have provide general recommendations for cross-section and pavement markings along each corridor, please keep in mind that pavement marking details at specific locations (i.e. intersections, crosswalks) may require specific consideration. We would be happy to assist you in these cases, if needed.

We will carry on with the following tasks related to the update of the Penticton Cycling Plan, as per our work plan. This will include consideration of other corridors, including further sections of Carmi Avenue between Dartmouth Road and Main Street.

Please do not hesitate to contact me at any time, if you have any questions.

URBAN SYSTEMS LTD.



James Donnelly, P.Eng., PTOE
Transportation Engineer

/jd

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MEMORANDUM

date: June 5, 2011
to: Ian Chapman
cc: Tyler Figgitt, Chun Man
from: James Donnelly
file #: 1017.0053.05
subject: **WARREN AVENUE DESIGN REVIEW**

The City of Penticton (the City) is proposing to reconfigure Warren Avenue from Quebec Street to Dartmouth Drive, to provide bicycle lanes the entire length and on-street parking for much of the project area. The City requested Urban Systems (USL) to review the proposed design to verify traffic impacts and operations, as well as review safety and geometric considerations. This memorandum has been prepared to summarize the results and recommendations of our review.

1.0 METHODS

To complete the City's assignment, USL conducted traffic counts along the Warren Avenue corridor to determine the current operating conditions at Atkinson, Main and Government. Once completed, the base and improvement conditions could be accurately modelled to determine the level of service (LOS) for vehicular and bicycle trips. To review the City's proposed design for the Warren Avenue corridor, USL completed the applicable checks using the latest design guidelines for vehicles, transit and bicycle facility design.

2.0 ANALYSIS AND DESIGN REVIEW

2.1 Traffic Analysis

Upon completing the traffic counts at the intersections along Warren Avenue, three intersections were built using Synchro v7.0; Atkinson/Warren, Main/Warren, and Government/Warren. Once USL established the existing City's intersections, three models were built to demonstrate the City's existing conditions, improved condition and future condition.

The existing conditions for Warren Avenue corridor are as follows:

- ▶ 2011 traffic volumes
- ▶ Existing signal timings and lane configuration at Atkinson/Warren
- ▶ Existing signal timings and lane configuration at Main/Warren
- ▶ Existing 4-way stop and lane configuration at Government/Warren

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The 2011 improved conditions for the Warren Avenue corridor are as follows:

- ▶ 2011 traffic volumes
- ▶ Existing signal timings and lane configuration at Atkinson/Warren
- ▶ Existing signal timings at Main/Warren
- ▶ Through-left upgraded to a permitted/protected left-turn only lane for both eastbound and westbound traffic approaching Main/Warren
- ▶ Existing 4-way stop and lane configuration at Government/Warren upgraded to a signalized intersection with a permitted left-turn only lane for all approaches

The 2021 improved conditions for the Warren Avenue corridor are as follows:

- ▶ 2011 traffic volumes projected to 2021.
- ▶ Existing signal timings and lane configuration at Atkinson/Warren
- ▶ Existing signal timings at Main/Warren
- ▶ Through-left upgraded to a permitted left-turn only lane for both eastbound and westbound traffic approaching Main/Warren
- ▶ Existing 4-way stop and lane configuration at Government/Warren upgraded to a signalized intersection with a permitted left-turn only lane for all approaches

The results from the three models are summarized in a table below:

		Atkinson/Warren											
		BASE 2011 PM				WITH IMPROVEMENTS 2011 PM				WITH IMPROVEMENTS 2021 PM			
	Movements	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS
Eastbound	EBL	9.2	0.07	4.8	A	9.2	0.07	4.8	A	10	0.12	6.9	A
	EBT	11	0.43	37.6	B	11	0.43	37.6	B	12.7	0.54	54.4	B
	EBR	-	-	-	-	-	-	-	-	-	-	-	-
Westbound	WBL	9	0.08	6.1	A	9	0.08	6.1	A	9.5	0.1	6.7	A
	WBT	13.9	0.67	56.5	B	13.9	0.67	56.5	B	14.3	0.63	65.4	B
	WBR	-	-	-	-	-	-	-	-	-	-	-	-
Northbound	NBL	-	-	-	-	-	-	-	-	-	-	-	-
	NBT	14.3	0.54	41.9	B	14.3	0.54	41.9	B	14.9	0.57	49.4	B
	NBR	-	-	-	-	-	-	-	-	-	-	-	-
Southbound	SBL	-	-	-	-	-	-	-	-	-	-	-	-
	SBT	13.4	0.46	34.9	B	13.4	0.46	34.9	B	11.3	0.42	36.5	B
	SBR	-	-	-	-	-	-	-	-	-	-	-	-

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		Main/Warren											
		BASE 2011 PM				WITH IMPROVEMENTS 2011 PM				WITH IMPROVEMENTS 2021 PM			
Movements		Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS
Eastbound	EBL	-	-	-	-	36.5	0.67	30.3	D	48.9	0.78	38.5	D
	EBT	22.3	0.62	33.8	C	21.6	0.56	46.7	C	22.8	0.59	51.1	C
	EBR	-	-	-	-	-	-	-	-	-	-	-	-
Westbound	WBL	-	-	-	-	19	0.23	12.7	B	20.6	0.3	14.9	C
	WBT	18	0.49	28.3	B	23.5	0.64	53.6	C	24.9	0.68	57.1	C
	WBR	-	-	-	-	-	-	-	-	-	-	-	-
Northbound	NBL	6.9	0.18	9.1	A	7.9	0.18	10.7	A	8.1	0.22	12	A
	NBT	11.5	0.41	45.6	B	12.5	0.41	51.7	B	13.5	0.46	56.8	B
	NBR	-	-	-	-	-	-	-	-	-	-	-	-
Southbound	SBL	6.8	0.17	9.1	A	7.8	0.17	10.7	A	8	0.21	12	A
	SBT	11.3	0.44	48.2	B	12.3	0.45	54.6	B	13.3	0.49	59.8	B
	SBR	-	-	-	-	-	-	-	-	-	-	-	-

		Government/Warren											
		BASE 2011 PM				WITH IMPROVEMENTS 2011 PM				WITH IMPROVEMENTS 2021 PM			
Movements		Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS
Eastbound	EBL	21.3	0.66	-	C	14.6	0.46	26	B	28	0.65	53.8	C
	EBT	21.3	0.66	-	C	10.7	0.3	22.1	B	15.4	0.29	38.4	B
	EBR	21.3	0.66	-	C	-	-	-	-	-	-	-	-
Westbound	WBL	13.4	0.35	-	B	9.6	0.03	3	A	14.8	0.03	4.5	B
	WBT	13.4	0.35	-	B	10.5	0.28	20.9	B	17.7	0.47	62.8	B
	WBR	13.4	0.35	-	B	-	-	-	-	-	-	-	-
Northbound	NBL	13.2	0.33	-	B	7.7	0.1	5.4	A	-	-	-	-
	NBT	13.2	0.33	-	B	7.3	0.18	14.4	A	11.1	0.29	33.6	B
	NBR	13.2	0.33	-	B	-	-	-	-	-	-	-	-
Southbound	SBL	25.1	0.76	-	D	7	0.04	3.8	A	-	-	-	-
	SBT	25.1	0.76	-	D	10.1	0.56	41.3	B	21	0.76	109.1	C
	SBR	25.1	0.76	-	D	-	-	-	-	-	-	-	-

Movements that experienced a change in Level of Service are highlighted in red. The change in LOS is due in part to the lane configuration and by the increase in delay due to normal traffic growth over the next ten years. However, with the proposed improvements and the projected growth, the LOS is at an acceptable LOS 'D' or better. Although there is a minor change in LOS, the delays do not warrant any changes in the signal timings or lane configurations. Note that at Main/Warren, the worst movement is the eastbound left turn (LOS = D and estimated queue length required = 38.5m). In this case, no protected-permitted left turn phase has been assumed. This movement should be monitored over time to determine if an advanced protected-permitted left phase will be required between now and 2021.

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2.2 Bicycle Analysis

There has been many advancements in recent years to develop a more balanced and multi-modal transportation system, with municipalities shifting towards a more multi-modal network, tools have been developed to measure and analyze LOS for bicycles, transit and pedestrians.

The National Cooperative Highway Research Program (NCHRP), in the USA, has developed a method to measure bicycle LOS, comprised of two components; the NCHRP examined the intersection LOS and segment LOS. Physical facility geometry such as number of lanes, outside lane width, bike lane and sidewalk width, and buffer and median presence, are combined with condition metrics such as traffic volumes, auto speeds, pavement condition, percent heavy vehicles and on-street parking to produce a numerical score for each intersection and segment. These scores aim to represent the level of comfort each facility user experiences, which is further translated into the well-known A through F letter grade scale. The NCHRP method for assessing pedestrian and bicycle level of service is also best applied to urban street environments; a separate multimodal greenway or pathway cannot be accurately assessed as the numerical model is founded on the concept of on-street facilities

By applying the latest techniques developed by the NCHRP, USL was able to quickly determine the existing and future LOS for bicycles at the three intersections along the Warren Avenue corridor.

The LOS is calculated based on the approach leg, for this exercise, the eastbound and westbound approach for each intersection was evaluated.

Eastbound/Westbound Approach	Existing	With Improvements
Atkinson/Warren	D	A
Main/Warren	E	C
Government/Warren	E	B

With the addition of the bike lane, the analysis showed a significant improvement in the LOS for bicycle.

2.3 Design Review

USL conducted a design review on 'Warren Avenue Proposed Line Painting' drawings using Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads 1999 Edition, Bikeway Traffic Control Guidelines for Canada 2009 2nd Edition and TransLink Transit Infrastructure Design Guidelines 2002 Edition.

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From these guides, USL offers the following considerations for a better cyclist experience on the upgraded facilities on the Warren Avenue corridor. The City may wish to consider the following:

- ❖ *Dash the bicycle lane lines at the approaches to intersections.*

Dashing the bicycle lane lines at the approaches to the intersections legally allow vehicles to encroach on the cycle lanes to complete right-turn movements. Dash white lines are typically applied 15m back from the stop bar and where a bike lane is adjacent to on-street parking.
- ❖ *Reduce vehicle travel lane widths to a minimum of 3.3m and increase the bicycle lane to a minimum of 1.5m.*

There are a number of locations on the proposed design where the lane widths are in excess of 3.5m and the bicycle lane is 1.2m or less. Wide traffic lanes tend to increase vehicular speeds and reducing the travel lane to 3.3m may provide more of a traffic calming effect. In addition, narrower traffic lanes may provide the corridor with more of an “urban” feel, reduce vehicular speeds, and increase driver awareness.

Increasing the bike lanes to 1.5m will provide a more comfortable user experience on as well as provide a safety component to areas where on-street parking is allowed and increase. Having at minimum 1.5m lane will provide cyclists will room to avoid swinging car doors, limited passing opportunities and other potential conflicts.
- ❖ *Ensure proposed on-street parking does not conflict with commercial site access/ business lots*

In reviewing the design, it appears there may be areas where the proposed on-street parking conflicts with commercial on-site parking. A number of businesses along the Warren Avenue corridor have parking stalls perpendicular to Government Street and Warren Avenue that access these stalls along the entire frontage, rather than from a discrete driveway. An example of this conflict is on the south side of Warren Avenue, east of Government Street and again east of Barnes Street.
- ❖ *Use a steeper paint taper (6:1 vs. 14:1) for the limits of on-street parking.*

The City may wish to consider reducing the bicycle lane tapers. It appears that the City utilized a 15:1 or 16:1 to transition to define the define the limits of on-street parking. Reducing the taper may allow for some additional parking space as well as discourage vehicles from parking within the long taper.
- ❖ *Define on-street parking limits at Warren and Camrose intersection.*

The current design implies the on-street parking extends into the limits of the Warren Avenue and Camrose Street intersection. The City may wish to install no parking signs or apply paint to

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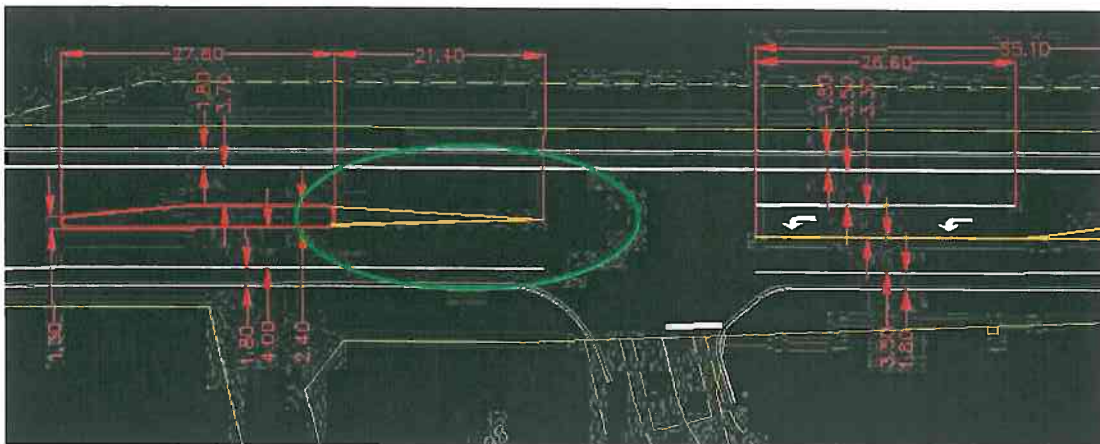
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control vehicles from parking on the intersection approach. This will provide better sightlines and manoeuvrability for all users approaching the intersection.

- ❖ *Use dashed white lines at the entrance and exit of the proposed bus bay.*
Dashed white lines should be used at the entrance and exit locations of the bus bay to clearly indicate where the bus will cross the bicycle lane.
- ❖ *Apply gore paint lines for proposed painted medians.*
Applying a painted gore will create a clearly defined and guide vehicles into the correct travel lanes.
- ❖ *Apply a painted treatment for the bike lanes at the Main/Warren approaches.*
Numerous local jurisdictions are applying a green painted bicycle lane treatment at potential conflict points. Green paint treatment to draw attention and generally raise awareness to active transportation modes. Please find attached Skid Resistant Material brochure from Lafrentz Road Marking. Both Kelowna and Coldstream are currently using, or proposing to use, the "chrome green" bauxite aggregate in their communities.
- ❖ *Extending raised island east of Main Street.*
Consider extending the raised island east of Main Street (see figure below) instead of using a painted extension to ensure the westbound left-turn bay has adequate protection from eastbound through traffic. If extending the island is not viable, it is recommended that the departure width match the receiving width to avoid vehicle conflicts.



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3.0 CONCLUSION

The City's proposed paint line modifications to accommodate a bicycle facility do not significantly influence the traffic operation at Atkinson/Warren, Main/Warren or Government/Warren. The vehicular traffic is performing at a LOS 'D' or better for all three intersections examined up to the 2021 horizon. Improving the timing/phasing for the signals may add to the performance of the intersection in the future. During our design review, we have identified a few issues that the City may wish to consider prior to construction that may improve the cycling experience and safety.

If you should have any questions or concerns, please do not hesitate to contact me.

URBAN SYSTEMS LTD.



James Donnelly, P.Eng, PTOE
Transportation Engineer

/cm

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MEMORANDUM



Date: September 14, 2012
To: Ian Chapman, P.Eng, City of Penticton
cc: [James Donnelly, P.Eng., PTOE
From: Chun Man, EIT
File: 1017.0053.07
Subject: Skaha Lake Road Road Diet Review

1.0 INTRODUCTION

Urban Systems completed a road diet review and a multi-model level of service (MMLOS) analysis in the City of Penticton (the City) along the southern section of the Skaha Lake corridor (Yorkton Avenue to Highway 97). The City of Penticton is currently reviewing existing bicycle master plans and updating the network to include the latest planning and design techniques.

The update to the bicycle master plan identified Yorkton Avenue and Skaha Lake Road as critical east-west connectors servicing the southern section of Penticton. This memo illustrates the proposed capital and operational improvements achieved with new bicycle lanes onto the existing road corridors.

2.0 ANALYSIS AND DESIGN REVIEW

2.1 Traffic Analysis

Traffic count data was provided by the City of Penticton and the Ministry of Transportation the intersections along Skaha Lake Road and Yorkton Avenue. The Synchro analysis included three intersections:

- ▶ Highway 97/Skaha Lake Road
- ▶ Yorkton Avenue/Skaha Lake Road
- ▶ Yorkton Avenue/South Main Street

The study intersections were used to create three scenarios for the traffic analysis:

- ▶ Existing Conditions (2012)
- ▶ Improved Conditions (2012)
- ▶ Future Conditions (+10 years)

The “Existing Conditions” for the Skaha Lake Road corridor are as follows:

- ▶ 2012 traffic volumes
- ▶ Existing T-intersection and lane configuration at Yorkton/South Main

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The “Improved Conditions” used Synchro to analyze the impacts from the proposed road diet application along existing corridors to accommodate bike lanes as part of long term vision for the City of Penticton.

The “**2012 Improved Conditions**” for the Skaha Lake Road corridor are as follows:

- ▶ 2012 traffic volumes
- ▶ Existing signal timings and lane configuration at Highway 97/Skaha Lake
- ▶ Existing T-intersection and lane configuration at Yorkton Avenue/South Main Street

As part of the road diet review, the following proposed lane configurations were assumed to understand the road diet impacts at the “**2012 Improved Conditions**” scenario:

- ▶ All through movements at Skaha Lake/Yorkton reduced to one lane
- ▶ Southbound curb lane converted to right turn lane at Skaha Lake/Yorkton
- ▶ Eastbound curb lane converted to a right turn lane at Skaha Lake/Yorkton

The “**2022 Improved Conditions**” for the Skaha Lake Road corridor are as follows:

- ▶ 2012 traffic volumes projected to 2022
- ▶ Existing lane configuration at Highway 97/Skaha Lake Road
- ▶ Existing T-intersection and lane configuration at Yorkton Avenue/South Main Street

As part of the road diet review the following proposed lane configurations were assumed to understand the road diet impacts at the “**2022 Improved Conditions**” scenario:

- ▶ All through movements at Skaha Lake/Yorkton reduced to one lane
- ▶ Southbound curb lane converted to right turn lane at Skaha Lake/Yorkton
- ▶ Eastbound curb lane converted to a right turn lane at Skaha Lake/Yorkton

The results from the Synchro analysis are summarized in the tables below:

Table 1: Highway 97/Skaha Lake Road

		Highway 97/Skaha Lake Road											
		BASE 2012 PM				WITH IMPROVMENTS 2012 PM				WITH IMPROVMENT 2022 PM			
MOVMENTS		Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS
Eastbound	EBL	29.2	0.7	109.7	C	29.2	0.7	109.7	C	34.9	0.79	128.1	C
	EBT	21.3	0.55	65.2	C	21.3	0.55	65.2	C	24.1	0.61	74.7	C
Westbound	WBT	26.8	0.56	37.4	C	26.8	0.56	37.4	C	32.1	0.65	43.8	C
	WBR	-	-	-	-	-	-	-	-	-	-	-	-
Southbound	SBL	24.4	0.27	26.9	C	24.4	0.27	26.9	C	26.7	0.27	33.1	C
	SBR	5.8	0.6	50.7	A	5.8	0.6	50.7	A	8.2	0.67	87.7	A

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Table 2: Yorkton Avenue/Skaha Lake Road

		Yorkton Avenue/Skaha Lake Road											
		BASE 2012 PM				WITH IMPROVMENTS 2012 PM				WITH IMPROVMENT 2022 PM			
MOVMENTS		Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS
Eastbound	EBL	-	-	-	-	-	-	-	-	-	-	-	-
	EBT	15.9	0.14	5.3	B	19.2	0.2	9.8	B	19.4	0.24	11.1	B
	EBR	-	-	-	-	10.1	0.04	2.8	B	9.6	0.04	3	A
Westbound	WBL	-	-	-	-	-	-	-	-	-	-	-	-
	WBT	12.3	0.26	7.2	B	15.4	0.41	14.3	B	15.5	0.45	16	B
	WBR	-	-	-	-	-	-	-	-	-	-	-	-
Northbound	NBL	3.4	0.02	1.8	A	3.9	0.02	2.1	A	4.1	0.02	2.4	A
	NBT	2.9	0.13	8.2	A	4.3	0.26	22.6	A	4.9	0.31	28.7	A
	NBR	-	-	-	-	-	-	-	-	-	-	-	-
Southbound	SBL	3.9	0.14	7.7	A	4.5	0.14	8.9	A	5.1	0.18	11.2	A
	SBT	2.9	0.15	9.3	A	4.4	0.25	23.3	A	5	0.3	29.5	A
	SBR	-	-	-	-	1.6	0.05	2.8	A	1.6	0.05	3.2	A

Table 3: Yorkton Avenue/South Main Street

		Yorkton Avenue/South Main Street (Unsignalized)											
		BASE 2012 PM				WITH IMPROVMENTS 2012 PM				WITH IMPROVMENT 2022 PM			
MOVMENTS		Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS	Delay (Sec)	v/c	Queue	LOS
Eastbound	EBL	13.4	0.23	6.9	B	13.4	0.23	6.9	B	15.6	0.3	10.2	C
	EBR	13.4	0.23	6.9	B	13.4	0.23	6.9	B	15.6	0.3	10.2	C
Northbound	NBL	0.5	0.05	1.3	A	0.5	0.05	1.3	A	0.6	0.06	1.6	A
	NBT	2.1	0.05	1.3	A	2.1	0.05	1.3	A	2.3	0.06	1.6	A
Southbound	SBT	0	0.23	0	A	0	0.23	0	A	0	0.27	0	A
	SBR	0	0.23	0	A	0	0.23	0	A	0	0.27	0	A

Intersection movements that experienced a change in Level of Service (LOS) are highlighted in red. As illustrated **Table 1 - 3** at the “**2012 Improved Condition**” horizon, the proposed lane configuration do not impact the LOS.

At the “**2022 Improved Condition**” horizon the Synchro analysis illustrate a change in LOS when compared to the previous horizons. Highway 97/Skaha Lake is operating at an acceptable LOS ‘C’ or better along the corridor. The two signalized intersections (**Table 1** and **Table 2**), Highway 97/Skaha Lake and Skaha Lake/ Yorkton do not experience a decrease in LOS as a result of the proposed lane configuration. The intersection of Yorkton/South Main (**Table 3**) only experiences a slight decrease in LOS, however the proposed improvements allow all movements to maintain acceptable LOS, delay times and queue lengths over the next ten years.

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2.2 Bicycle Analysis

In recent years advancements in developing a multi-modal transportation system has led municipalities to shift towards a more balanced network, tools have been developed to measure and analyze LOS for bicycles, transit and pedestrians.

The National Cooperative Highway Research Program (NCHRP), has developed a method to measure bicycle LOS, comprised of two components; the NCHRP examined the intersection LOS and segment LOS. Physical facility geometry such as number of lanes, outside lane width, bike lane and sidewalk width, and buffer and median presence, are combined with condition metrics such as traffic volumes, auto speeds, pavement condition, percent heavy vehicles and on-street parking to produce a numerical score for each intersection and segment. These scores aim to represent the level of comfort each facility user experiences, which is further translated into the well-known A through F letter grade scale. The NCHRP method for assessing pedestrian and bicycle level of service is also best applied to urban street environments; a separate multimodal greenway or pathway cannot be accurately assessed as the numerical model is founded on the concept of on-street facilities

By applying the latest techniques developed by the NCHRP, USL was able to quickly determine the existing and future LOS for bicycles at the three intersections along the Skaha Lake Road corridor.

The LOS for each intersection was calculated based on the approach leg, MMLOS analysis, the eastbound and westbound approach for each intersection was evaluated.

Table 4 – Intersection LOS - MMLOS

Intersection	Existing (2012)	With Improvements (2012)	With Improvements (2022)
Highway 97/Skaha Lake	B	B	B
Skaha Lake/Yorkton	B	A	A
Yorkton/South Main	A	A	A

LOS analysis was also completed for the segments adjacent to the above intersection. The results are illustrated in Table 5.

Table 5 – Corridor LOS - MMLOS

Roadway	Segment	Existing (2012)	With Improvements (2012)	With Improvements (2022)
Skaha Lake	Highway 97 to Sudbury	C	A	A
Skaha Lake	Lee to Yorkton	C	A	A
Yorkton	Skaha Lake to Wilson	C	A	A
Yorkton	Cypress to South Main	B	A	A

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3.0 DESIGN REVIEW

The width of the bike lanes should be measure from the "lip of gutter" to the edge of bike lane paint marking. This will allow cyclists to use the allocated lane width to navigate comfortably around slower facility users and avoid existing catch basins and miscellaneous obstructions.

The paint marking for the northbound left-turn lane on Skaha Lake Road/Yorkton Avenue is recommended to be design to the MUTCD standards to avoid potential conflict with left-turning vehicles in opposing directions. The reference to the Two-Way-Left-Turn (TWLT) lanes is attached in the memo.

As the proposed improvements are implemented through varies plans and phases, the City should also consider improving their wayfinding strategies to promote and increase the awareness of the active transportation facilities. By investing in a wayfinding plan, visitors and new users can navigate with ease around the City and help foster a more active culture.

4.0 CONCLUSION

The proposed road diet plan for the southern section of Penticton can be implemented with negligible effects at the intersection and corridor. The proposed TWLT lanes suggested by the City of Penticton will allow the remaining road right of way to be allocated to cyclists along the Skaha Lake Road corridor. This will improve the existing active transportation network, and increase the cycling culture that already exists within the City.

URBAN SYSTEMS LTD.**Prepared By:**

A handwritten signature in black ink that reads "Chun Man".

Chun Man, EIT
Transportation Engineer

/cm

Reviewed By

A handwritten signature in blue ink that reads "James Donnelly".

James Donnelly, P.Eng, PTOE
Senior Transportation Engineer

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FIGURE C2-14

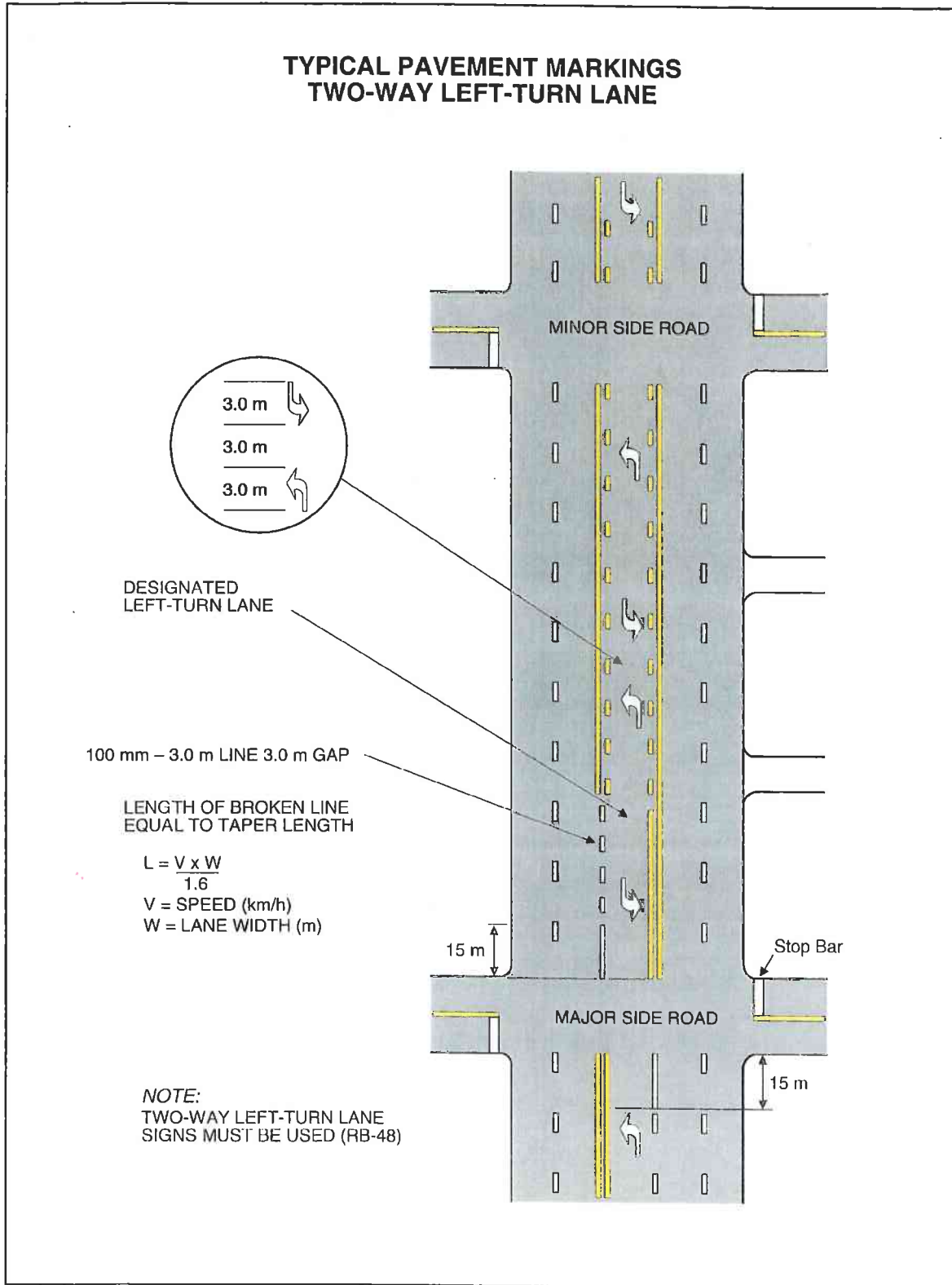
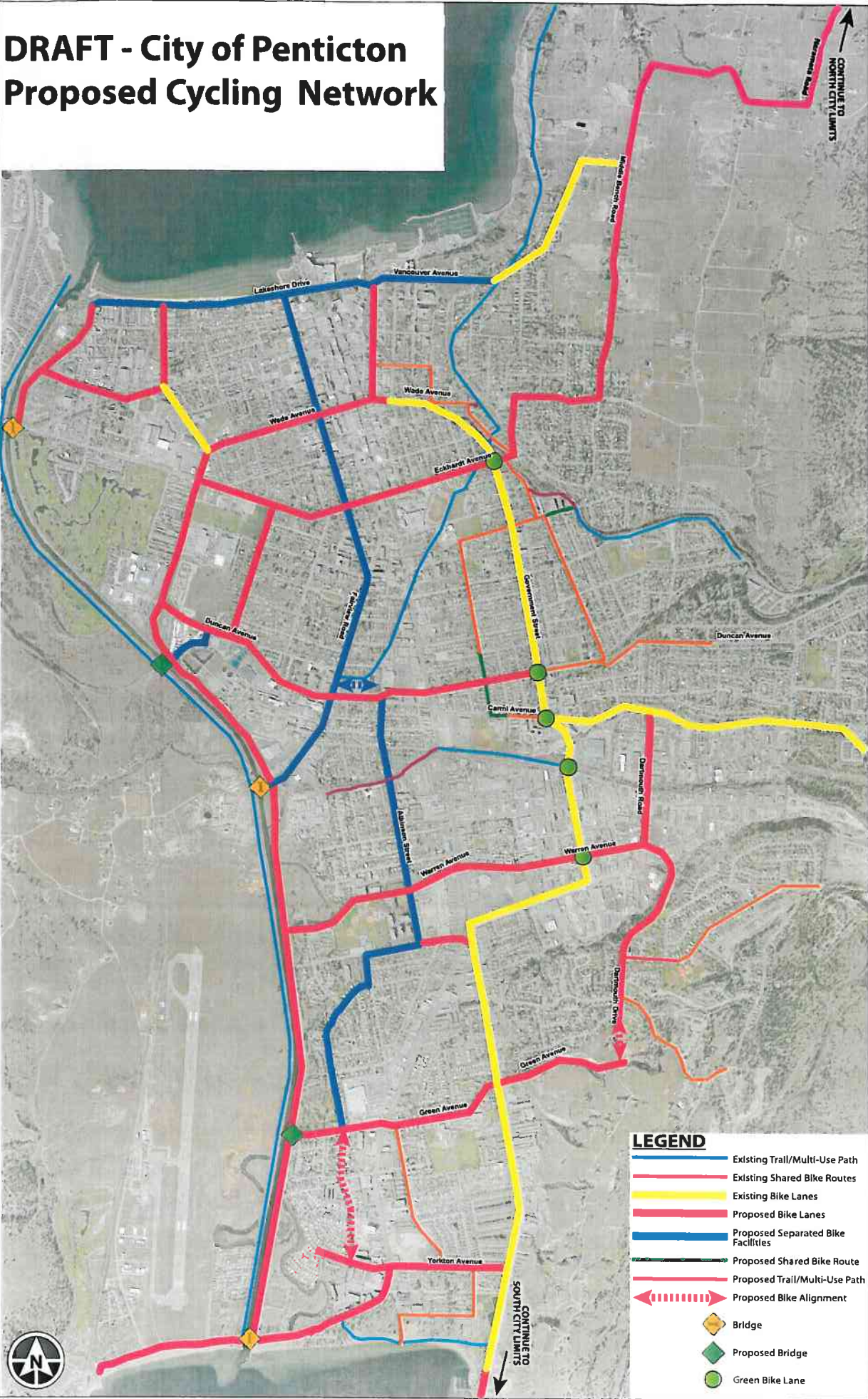


FIGURE C2-14

APPENDIX B

Proposed Cycling Network Plan

DRAFT - City of Penticton Proposed Cycling Network

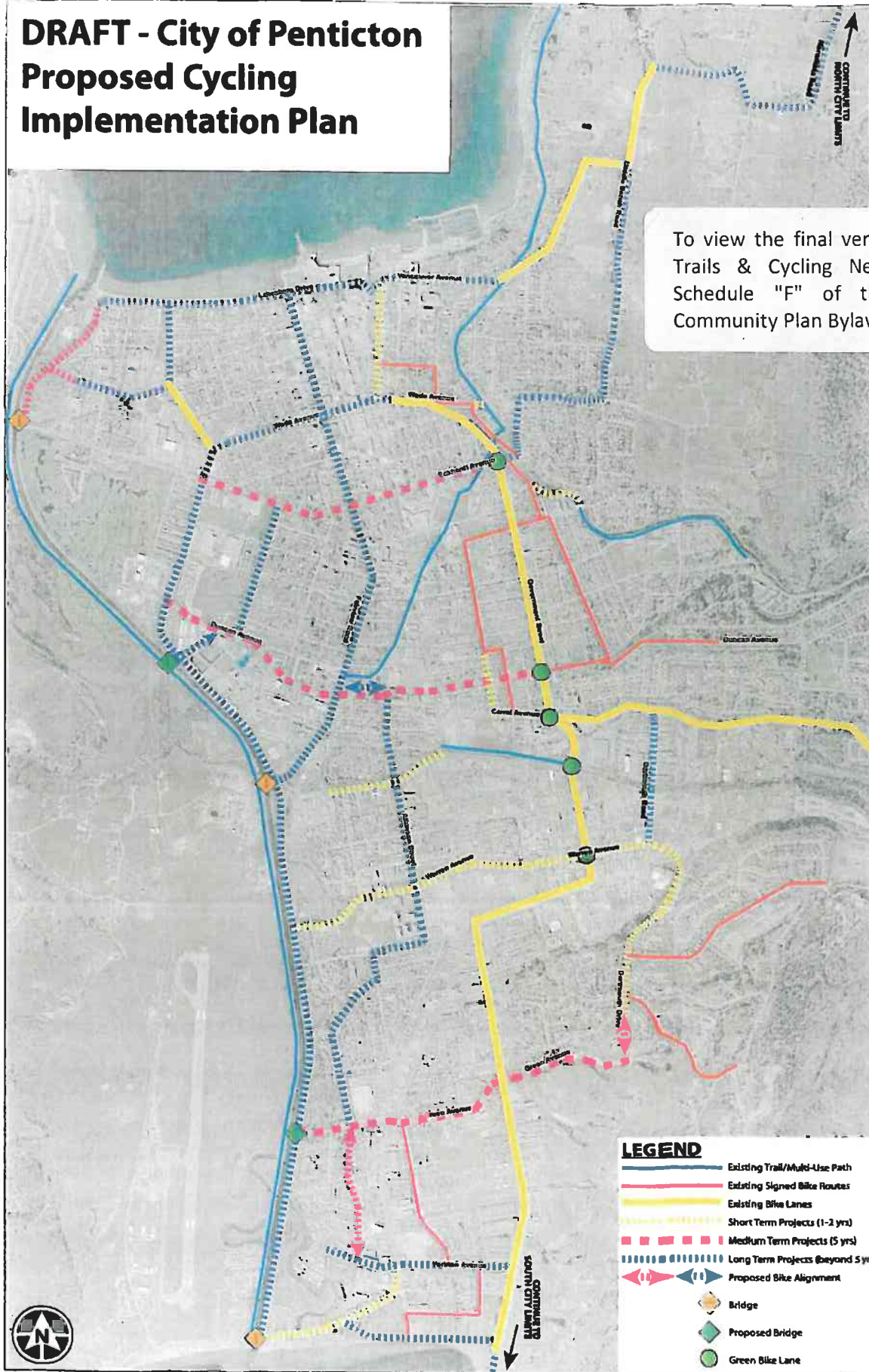


LEGEND	
	Existing Trail/Multi-Use Path
	Existing Shared Bike Routes
	Existing Bike Lanes
	Proposed Bike Lanes
	Proposed Separated Bike Facilities
	Proposed Shared Bike Route
	Proposed Trail/Multi-Use Path
	Proposed Bike Alignment
	Bridge
	Proposed Bridge
	Green Bike Lane

APPENDIX C

Proposed Implementation Plan

DRAFT - City of Penticton Proposed Cycling Implementation Plan



To view the final version of the Trails & Cycling Network see Schedule "F" of the Official Community Plan Bylaw.

LEGEND

- Existing Trail/Multi-Use Path
- Existing Signed Bike Routes
- Existing Bike Lanes
- Short Term Projects (1-2 yrs)
- Medium Term Projects (5 yrs)
- Long Term Projects (beyond 5 yrs)
- Proposed Bike Alignment
- Bridge
- Proposed Bridge
- Green Bike Lane