Capital Regional District
Regional Pedestrian & Cycling Masterplan

CRD

Making a difference...together

Acknowledgements

The Capital Regional District (CRD) appreciates the efforts of the numerous citizens who participated in the development of this Plan. Their creativity, energy, and commitment to the future of active transportation in the region were the driving force behind this planning effort.

Citizens' Advisory Council (CAC)

- Adam Gotlieb
- Corey Burger
- Dan Pollock
- Deborah LeFrank
- Gerald Smeltzer
- Jason Weedmark
- Jennie Sparks
- Jill Symonds
- Jim Grayson
- Judy Gaylord
- Julie Higginson
- Rob Wickson
- Michael Hanson
- Stephen Hindrichs
- Susanna Grimes
- Lesley Ewing

Citizens at Large

- Darrell Wick
- Mikael Stevulak
- Susi Porter-Bopp
- Paul Rothe

Technical Advisory Committee (TAC)

- Brian Robinson, North Saanich
- Robin Pallett, Sidney
- Bruce Greig, Central Saanich
- Anne Topp, Paul Butterfield, Jim Hemstock, Saanich
- Richard Ding, Oak Bay
- Steve Hutchison, Victoria
- Barbara Snyder, Esquimalt
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- Emma Taylor, Juan de Fuca EA
- Shelley Brown, Victoria Active School Travel
- Emily Flett, B.C. Transit
- Alan Callendar, Ministry of Transportation & Infrastructure

CRD Project Team

- Sue Hallatt, Regional Planning
- Leigh Sifton, CRD Parks
- Chloe Tunis, Bike Planner - Intern
- Andrea Smith, Bike Planner - Intern (Phase I)

Support

- Marg Misek-Evans, Senior Manager - Regional Planning
- Malcolm MacPhail, Senior Transportation Planner

Alta Planning + Design

- Mia Birk, Principal in Charge
- Hannah Kapell. Project Manager
- Kimberly Voros, Project Manager
- Mike Tresidder, Senior Planner
- Adrian Witte, Senior Planner
- Jessica Roberts, Programs Manager

Urban Systems

- John Steiner, Principal-in-Charge
- Brian Patterson, Planner
- Kendra Ferguson, Planner

Advisor

- John Luton

Executive Summary

The CRD Regional Pedestrian and Cycling Master Plan (PCMP) describes a strategic approach for achieving a significant shift in transportation throughout the region. Because every municipality has an acknowledged commitment to multi-modal accommodation, the CRD and members are well-positioned to make this shift a reality.

This Masterplan begins where the 2005 CRD Travel Choices Strategy left off. The climate change imperative, combined with looming infrastructure expenses facing municipalities and increasing public health concerns, has increased the need to achieve more ambitious mode share goals than the existing 5% cycling and 10% walking targets.

The region already has a healthy walking community (10% walk) and some of the highest cycling numbers in the country (9% in some areas and 3.2% overall).1 If pedestrian facilities were upgraded in priority locations and cycling facilities were built with the average person in mind, the CRD could achieve a 15% pedestrian mode share and a 25% cycling mode share in densely populated areas, with a 15% cycling share region wide.

The key to achieving this significant mode shift is for the region to work together to Engineer walkway and bikeway networks that are comfortable and accessible for all users.

The PCMP identifies guidelines, policies, and standards for providing universal pedestrian accessibility, bicycle and pedestrian trip enhancement facilities such as bicycle parking and integration with transit. The Masterplan recommends developing **Encouragement**, **Education**, and **Enforcement** programs to support the culture shift and **Evaluation** system to measure it.

Vision

The Capital Region will be a truly livable and environmentally sustainable community, where walking and cycling are key components of an innovative and integrated transportation system. Citizens of all ages in all parts of the region will find active travel irresistible on a seamless network of Class I on- and off-street facilities appropriate for users of all abilities. In 2038, the CRD will be lauded for its mode share for cycling of 25% in urban areas and 15% region wide and 15% mode share for pedestrian travel.

- Goal 1: More walking and cycling.
- Goal 2: Safer walking and cycling
- Goal 3: More places to walk or cycle.

Pedestrian Priority Areas

Due to long distances involved with regional trips, most regional pedestrian trips are multi-modal, combining walking, transit, cycling, and other modes. A high level of pedestrian accommodation should be provided in identified 'pedestrian priority areas' that have a high density of pedestrian-attracting destinations.

1   CRD Origin and Destination Survey.

The primary inter-community cycling network (PIC) is 775 km of bikeway, of which 125 km are off-street (multi-use trails) and 650 km are on-street.

24% of the PIC bikeway is already completed.

Separated on-street

Existing: 0
Proposed: 329 km

Bike lanes & shoulder bikeways

Existing: 68 km
(that meet Class 1 standard)
Proposed: 191 km

Shared lanes

Existing: 14 km
(that meet Class 1 standard)
Proposed: 45 km

To upgrade the bicycling network to a standard where cyclists of all ages and abilities will feel comfortable, is expected to cost approximately $275M; or the cost of:

- three highway interchanges and 88 km of roadways, or

- half the cost of the retractable roof on Vancouver's B.C. Place Stadium!

Priority Actions:

- Adopt the Primary Bikeway Network, Classifications and Typologies as a Regional Plan.

- Work with member municipalities to fund the priority projects.

- Work with municipalities and disability advocacy agencies to ensure good universal pedestrian design, particularly in areas identified as high pedestrian use.

- Make the Design Guideline document available to member municipalities, regularly update the document in cooperation with staff.

- Establish a Signage Committee to review and revise the Draft Sign Guidelines (Section 5 of the Design Guidelines) for a recommended regional standard.

- Work with BC Transit and member municipalities to install secure bike lockers at priority transit locations.

- Establish a task force that seeks to improve and amend existing provincial laws in support of safer cycling and walking conditions.

- Collaborate with partners in the development of a volunteer driven manual count strategy for the Region.

- Convene a Pedestrian and Cycling Advisory Committee made up of CRD and municipal staff, as well as community representatives.

- Work with municipalities to implement the priority projects and develop the recommended inter-community bicycle network.

- Complete the Regional Trails Network and improve existing trails based on the design guidelines.

Primary Bikeway Network

The PCMP identifies a comprehensive bikeway network that links the entire region. Involving the public in every step in the process resulted in a bikeway network that increases mobility throughout the region and serves cyclists of all ages, abilities, and trip purposes.

The network development is built on the 2006 *TravelChoices* Regional Cycling Network and the Draft *Transportation Corridor Plan* (Halcrow 2010), as well as previous CRD and municipal planning efforts. The network connects major destinations, linking growth and village centres, transit exchanges, parks, and schools throughout the region.

Accompanying the identified network, the PCMP Design Guidelines provide a framework for developing pedestrian and bicycle corridors and signage that are attractive to users of all abilities. This common set of guidelines will contribute to making the region more universally accessible by providing consistent and predictable messaging.

Education and Encouragement

Education, encouragement, and Active and Safe Routes to School programs inform CRD residents about new and improved facilities, help them learn the skills they need, and reward them for living more sustainably. The CRD can continue to lead education and encouragement activities through funding, advising, and marketing.

The PCMP process has brought together planners, engineers, decision makers, and advocates from member municipalities and other regional partners. The CRD can continue this inter-jurisdictional communication to support PCMP implementation in the coming years.

Evaluation and Planning

The CRD can develop a regional counting initiative that makes use of the many traffic counts already being conducted by member municipalities and organizations. These counts can be used to measure mode shift as the network is developed and support further improvements.

The CRD can lobby the Province, on behalf of its member municipalities, to make key changes to legislation that will improve safety for cycling and walking.

Funding and Implementation

The costs associated with developing the primary inter-community bikeway network will be integrated into existing municipal (local roads), regional (regional trails) and provincial (highways) budgets. The costs exceed expected available funds; however, the CRD can assist municipalities in pursuing other funding by coordinating grant application and providing technical support.

The identification of regional priority bikeways provides the Region and its member municipalities a competitive advantage in grant applications and helps prioritize and direct gas tax funds to their highest and most effective use.

The PCMP is unequivocal in its ambitious goal of providing pedestrian facilities and a cycling network that are safe and comfortable for all cyclists and pedestrian - not just those who are courageous and intrepid. The PCMP project team appreciates the efforts of the numerous residents, advocates, agency representatives and municipal staff who participated in the development of this Masterplan. Their creativity, energy, and commitment to the future of the region were the driving force behind this effort.

alta

PLANNING + DESIGN

711 SE Grand Avenue
Portland, OR 97214
503.230.9862 phone
503.230.9864 fax
www.altaplanning.com

A word from Mia Birk, President of Alta Planning + Design,
author, Joyride: Pedaling Toward a Healthier Planet

Congratulations to the residents and leaders of the Victoria region, the Capital Regional District, and its 13 municipalities and three electoral areas! With this comprehensive Regional Pedestrian and Cycling Masterplan, you take a huge step toward integrating walking and bicycling into your daily lives. For the past two years, we have been privileged to work with representatives from the CRD, communities, and advocates within. Together, we have brainstormed and struggled and arrived collectively at this new, bold, exciting vision for a healthier, more active future for generations to come.

The Alta team has worked in hundreds of communities all across North America creating similar visions and plans. We have implemented thousands of walkway and bikeway miles and touched the lives of millions who have started walking and bicycling in their daily lives. In Victoria, we start ahead of the game in many ways thanks to the world-class Galloping Goose and Lochside Trails.

This Masterplan hinges on a high standard of pedestrian accessibility and a long-range vision of an over-900 km network of connected, attractive bikeways that will allow people to choose walking and bicycling for some portion of their daily trips. When realized, we will see 25% of residents in densely populated areas and 15% of the region's residents bicycling regularly, up from 9% and 3.2% now. We will see 15% walking regularly, up from 10% today. This will be much higher in many of the core areas, like downtown Victoria and Saanich.

This vision is based on real-life experience in Portland, Oregon, where we have grown walking and bicycling from negligible to significant transportation modes in less than a generation's time. We followed the models developed in Copenhagen and other European cities that chose to make hard choices, invest in walking and bicycling, and change cultural norms. And we are not alone. Cities like Vancouver, Seattle, Chicago, Montreal, New York, and San Francisco are investing in active transportation and realizing the benefits to safety, health, the environment, neighbourhood livability, personal pocketbooks, and the economy.

Some will say that this vision is unachievable. On the contrary, we have seen that given the right combination of infrastructure and incentives, people will walk and bicycle in vast numbers.

Others will look at the price tag and shake their heads in disapproval. But I ask you to look at it this way: the entire $275 million Masterplan, if fully implemented, will be achieved for the cost of less than three urban interchanges and 70 km of roadways. This modest investment will be returned three-fold in savings in safety, health, fuel costs, and other benefits.[1]

Municipal leaders and residents: As you read this Masterplan, recognize that the Capital Regional District has created this Masterplan with your input. The intent is not to tell you what to do, nor to do it for you, for the CRD does not have this authority. That is why today, when riding from the ferries in North Saanich to downtown Victoria, you may ride through four different municipalities (North Saanich, Central Saanich, Saanich, Victoria), and see five different sign types and an equal variety of bikeway markings. The unique character of each community will be enhanced by the creation of a connected set of logical, attractive bikeways.

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1   Gotschi, Thomas. (2011). Costs and Benefits of Bicycling Investments in Portland, Oregon. *Journal of Physical Activity and Health* 8(Suppl1), 49-58.

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PLANNING + DESIGN

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Portland, OR 97214
503.230.9862 phone
503.230.9864 fax
www.altaplanning.com

Please note that today, the CRD does not have the authority or resources to fund the implementation of this Masteplan. Rather, they can offer it to as a blueprint for your own success should you choose to embrace it. Many of the projects can be rolled into your own local transportation departments' activities. Others will be eligible for grants. But I challenge you to carry forward the momentum we have gained through these two years' worth of meetings and discussion and think bigger and bolder. For if you are truly to realize the benefits of the Masterplan's vision, additional regional funding authority must be sought. Only then will you realize the true value of regional coordination.

In the meantime, however, take the parts that apply to your locality to heart and begin to implement as much as you can. Coordinate with your neighboring communities to ensure that the walkways and bikeways are seamless from a user standpoint, cutting across the political boundaries that define each community in name.

Use the tools contained in the Pedestrian and Cycling Masterplan Design Guidelines. For the first time, you have coordinated regional standards for bikeway signage and markings, although with enough flexibility to reflect the diversity of our region.

Embrace the role of change agent, striving to encourage your residents–particularly your youth– to walk and bike for as many trips as possible.

As a region, you are stronger collectively than as 13 municipalities working alone. Together, you can leverage more funding and momentum than you ever dreamed. Together, you will realize the goals laid forth in this plan.

With respect and enthusiasm for the future of the beautiful Victoria region,

Mia Birk
President, Alta Planning + Design
Author, *Joyride: Pedaling Toward a Healthier Planet*

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Summary

If today's travel trends continue, by 2038 the number of trips moving throughout the Capital Region will have increased by 500,000 to 1.7 million trips per day, representing a 42 percent increase. Over three-quarters of these are taken by automobile. Automobile traffic will represent nearly 60% of the region's GHG emissions and travel time from the western communities into the core will have doubled. Best practices indicate that the most cost-efficient and environmentally friendly solution is to make a concerted effort to shift new trips and a portion of existing trips over to walking, cycling and transit.

This Pedestrian and Cycling Masterplan (PCMP) lays out a plan of action for achieving a significant shift in patterns and modes of transportation throughout the region. The development of the PCMP was a key recommendation of the Travel Choices Strategy – a strategy that lays out the basic framework for transitioning to a multi-modal approach to transportation planning.

The PCMP is also a vital component of the emerging Transportation Corridor Plan – a strategy that aims to identify a network of corridors where each mode has its own prioritized network in an effort to maximize efficiency and safety for all users. The PCMP also considers and supports the goals and objectives identified by BC Transit in their *Transit Future* and the *Rapid Transit* Plans.

We're well on our way towards a sustainable future.

The Capital Regional District and its member municipalities are well-positioned to act on the recommendations outlined in this Masterplan. As a region, the CRD is well out front of many communities where automobile travel is still the priority, and the accommodation of walking, cycling, and transit is an afterthought. Every member municipality in the CRD has an acknowledged commitment to a balanced approach to multi-modal accommodation. Indeed, several municipalities have an expressed policy of not building any new facilities for automobiles.

But the road to building "complete streets" can be challenging and at times, seemingly impossibly complex. Even on local streets, where the road right-of-way does not easily provide enough room to build separate facilities for everyone, hard compromises have to be made. And as the roadway in a community increases in its regional importance (i.e.: when a collector or arterial links to a neighbouring jurisdiction) the stakes are higher in the task of achieving compromise.

Plan Vision

The Capital Region will be a truly livable and environmentally sustainable community, where walking and cycling are key components of an innovative and integrated transportation system. Citizens of all ages in all parts of the region will find active travel irresistible on a seamless network of Class I on- and off-street facilities appropriate for users of all abilities. In 2038, the CRD will be lauded for its 25% mode share for cycling in urban centres and 15% region wide, as well as 15% mode share for pedestrian travel for all trip purposes.

This Masterplan provides a framework for accommodating the most vulnerable road users within the road right-of-way. The network established in this Masterplan, and the accompanying recommended standards expressed in the Design Guidelines, are intended to be a "starting place" in the next step of negotiating which modes should have priority on which corridors. Of critical importance is the philosophy behind cycling and pedestrian planning.

Building on success; learning from the best.

The PCMP is unequivocal in its ambitious goal of providing a cycling network that is safe and comfortable for all riders – not just the courageous and intrepid cyclist. The PCMP has identified a set of pedestrian standards aimed at reclaiming and connecting this valuable, linear public space to accessible, "people oriented" commons.

The PCMP builds on the extraordinary body of research and best practices that have evolved from successful European and North American initiatives, where previously auto-dominant cities have been successfully converted to bicycle and pedestrian friendly environments.

> The PCMP recommends a network of 'Class I' bikeways that are suitable for all users along regionally significant routes that connect key destinations.

Separate facilities for each mode.

Of crucial importance is the understanding we now have as to what conditions must be met for the average user to feel comfortable. Ten years ago, practitioners lobbied for equal rights on the roadway for cyclists. New research asserts that although cyclists, like pedestrians, have equal rights to travel in the right-of-way, the facilities they need to feel safe and comfortable must reflect their vulnerability and provide adequate protection. For example, on busy arterial streets where traffic speeds are over 50 km/h, nearly every rider will feel comfortable cycling a bike on a path that is separated from traffic. The level of separation needed will vary depending upon the road conditions (speed, traffic volume and other characteristics). Under certain conditions, separated bike lanes are not always required, as on quiet country roads where sidewalks are not required to make a place pedestrian-friendly.

Research suggests that on local streets, cyclists feel comfortable sharing the road with slow moving, predictable cars. On rural roads, where the speeds may be faster, but the volume low, cyclists report that they feel safe and comfortable on a paved shoulder with a painted line and proper signs delineating the bikeway. In all of these contexts, the facilities described are "Class I bicycle facilities," where all users would feel comfortable riding.

Raising the sustainability bar.

Recent surveys conducted in Metro Vancouver and Portland have discerned that nearly 60% of any given population is 'interested but concerned' about cycling.[1] Improving the pedestrian en-

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1   Geller, Roger. *Four Types of Cyclists.* Portland Office of Transportation

Despite high regional levels of walking and bicycling, 50% of students in the CRD are currently driven to school.

The pedestrian design guidelines in this Masterplan address the accommodation of mobility scooters in the pedestrian zone.

vironment supports transit use, safety, and public health. The region already has some of the highest cycling numbers already in the country (9% in some urban areas and 3.2 - 5% overall[2]) and a healthy walking community (10% walk). If cycling facilities were built with the average person in mind, and pedestrian facilities were upgraded in priority locations (regional centres and transit stops), the CRD could achieve a 25% cycling mode share in densely populated areas, a 15% cycling mode split region wide, and a 15% pedestrian mode share.

This mode share goal is a significant leap beyond the Travel Choices mode split of 5%. Throughout the planning process, feedback from advocates and direction from CAC/TAC members indicated a need to be more visionary. These mode split targets meet the Region's GHG reduction targets and consider the supportive role cycling and walking play in contributing to the success of the Provincially mandated

increase in transit ridership to 12% mode share by 2020.

The key to achieving this shift is to begin developing a comprehensive bikeway network of Class I facilities that links all member municipalities and Electoral Areas, major destinations, regional centres, villages and schools. This "primary" bikeway is supported by and linked to each municipality's local cycling network.

> This Masterplan proposes ways the CRD could achieve a 25% mode share for bike travel in densely populated areas and a 15% mode split region wide in addition to a 15% mode share for pedestrian travel, by the year 2038.

Design for the universal user.

The CRD *Regional Growth Strategy* anticipates that the regional population is aging; projections suggest that by 2038, nearly 30% of the region's population will be over the age of 65. A recent study on the health of B.C. children has revealed a significant increase in health

issues related in part to inactivity.[3]

Improving walkability addresses mobility and isolation concerns for the aging population as well as public health concerns associated with inactivity for people of all ages. Consistent and predictable design of the pedestrian realm should consider universal accessibility to walkways and roadway crossings, making the pedestrian environment an attractive and safe place to be.

Walkable communities will make the planned improvements to the transit system viable as people will enjoy walking to transit to complete a longer trip across the region. Although the focus of this Masterplan is on active transportation, the plan acknowledges the inextricable tie to transit as citizens will require flexibility in their options if we are to compete with the convenience of the automobile. Long haul trips will likely combine modes – with people cycling to their rapid transit exchange, storing their bike, boarding the bus, and walking to work.

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2   The CRD 2006 Origin Destination Survey found a 3.25 percent mode split, while 5 percent is derived from the 2006 Census.

3   http://vancouver.ca/commsvcs/socialplanning/ initiatives/foodpolicy/tools/pdf/Child_Obesity.pdf

Shared lanes, bicycle lanes, and multi-use trails all meet the Class 1 facility standard (comfortable for all riders), depending on the road; on a country road, a shared lane may be sufficient to meet the standard of Class I, while bicycle lanes are appropriate on streets with more traffic.

Masterplan Vision

The Capital Region will be a truly livable and environmentally sustainable community, where walking and cycling are key components of an innovative and integrated transportation system. Citizens of all ages in all parts of the region will find active travel irresistible on a seamless network of Class I on- and off-street facilities appropriate for user of all abilities. In 2038, the CRD will be lauded for its 15% regional and 25% high density area mode share for cycling and 15% mode share for pedestrian travel.

The mode share target for cycling established in this Masterplan (15% regionally and 25% in high density areas) is more ambitious than the original 5% target identified in the 2002 TravelChoices document. Feedback received from advocates and other stakeholders affirms the TravelChoices sub committee's assertion that a more ambitious mode share for the region must be imagined.

Goal 1: More walking and cycling, as measured by:
- Mode share
- Kilometres travelled
- Trip count

Goal 2: Safer walking and cycling, as measured by:
- Number of cyclists who have taken road skills courses
- Reduction in number and severity of reported crashes
- Perception of safety

Goal 3: More places to walk or cycle, as measured by:
- Total kilometres of on-street regional bikeways network that is a Class facility
- Total kilometres of off-street facilities
- Percentage of the road network with sidewalks
- Percentage of intersections with curb ramps and completed sidewalks within a half-kilometre of transit centres, schools, and parks.

Methodology

A key recommendation in the 2005 *Travel Choices Strategy* was to undertake a regional cycling and pedestrian masterplan. The scope of the PCMP was laid out by the *Travel Choices* Subcommittee's final report.

A phased approach

Building on this guiding document, a Call for Proposals was issued in 2009 and the contract was awarded to the consulting consortium of Alta Planning + Design (project lead), Urban Systems, and John Luton (local advisor). The scope took a phased approach, with the first phase focused on collection of data and background material. Once an accurate snapshot of existing conditions was possible, a draft vision and goals were developed in consultation with community stakeholders. A set of objectives for the Masterplan was crafted by building on the recommendations set out in the TravelChoices Sub Committee submission.

The CRD Regional Trails network functions as a recreation-based linear park as well as a key sustainable transportation corridor that provides nonmotorized access throughout the Region.

These key elements formed the framework for the workplan and ultimately the final plan, which were undertaken in subsequent phases.

Contents of the Masterplan

The PCMP outlines a clear vision, achievable goals and concrete actions for achieving the region's mode shift targets. The Masterplan recommends:

- **Engineering** a network of inter-community routes for bicyclists and pedestrians that allow users to safely, comfortably, and equitably reach all the major gateways, primary destinations, regional centres, employment areas and schools.
- Developing crucial **Encouragement** and **Education** programs to support the culture shift.
- Establishing an **Evaluation** system and **Enforcement** mechanisms.

These five "E's" form the structure of this report. The engineering aspects focus on the right-of-way, while the remaining 'E's' involve supporting policies that are critical for improving safety, mobility, and use of the system.

How to use this Masterplan

This document summarizes the key points of the two-year planning process. Significant technical documentation and resources were created in the development of this Masterplan. The following appendixes provide background and additional detail to accompany the PCMP:

- Appendix A. Bicycle and Pedestrian Network Development Technical Appendix
- Appendix B. Trip Enhancement Facilities
- Appendix C. Transit Integration
- Appendix D. Education
- Appendix E. Encouragement
- Appendix F. Bylaws
- Appendix G. Evaluation & Planning
- Appendix H. Funding & Implementation

This Masterplan identifies which of these appendices provides in-depth information about background information, methodology, and recommendations for next steps.

Engagement and consultation

Public and stakeholder input were key to Masterplan development. Mechanisms used to achieve input include:

- **A Technical Advisory Committee** of representatives from each of the CRD's municipal partners versed in bicycle/pedestrian infrastructure, policies, and future goals.
- **A Citizen's Advisory Committee** of citizen representatives and interested parties from the region.
- **Stakeholder Interviews** gathered background information from representatives of each municipality as well as other organizations and individuals related to each topic.
- **Advocates' Sessions** solicited feedback from the community at key points in the plan development.
- **Technical Workshops** were held to discuss signage standards; collaborate on guidelines for the design of bikeway and pedestrian facilities; and verify recommendations and ensure that projects correspond to municipal priorities.

The Masterplan was developed in collaboration with municipal partners, advocates, and other stakeholders.

The network recommendations are supported by programs and practices to improve network use.

Levels of Separation

The PCMP recommends levels of separation for on-street bikeways based on street classification and user comfort desired.

Separated On-Street

Cycle tracks are separated from roads and sidewalks by parked cars, bollards, or a physical barrier. Intersection treatments improve visibility of cyclists.

Buffered bicycle lanes provide additional shy distance between the bicycle lanes and the travel lane to provide a more comfortable riding environment.

Bicycle Lanes/Shoulders

Bicycle lanes are separated from motor vehicle lanes and indicated with a bicycle stencil and a diamond, and are marked with dedicated signs.

Shoulder bikeways accommodate cycling on streets without a curb and gutter, where a fog line is used to delineate a shoulder.

Shared Roadways

Marked wide curb lanes provide direct routes along the outer lane of a roadway. Signs remind cyclists and drivers to 'share the road.'

Neighbourhood bikeways are routes on local urban streets indicated by signs and stencils. Traffic calming treatments improve the cycling environment.

Shared lanes provide key connections between more formal bikeways and key destinations. They are designated by "Bike Route" signs.

See the Design Guidelines for detailed information about these treatments.

Chapter 1. Engineering

The region currently benefits from a truly regional network of multi-use trails managed by Regional Parks.[4] Other off-street multi-use trails are maintained by municipalities and support the Regional Trails system.

The PCMP identifies a complementary on-street network that provide routes between municipalities, electoral areas, and regional destinations that meets the needs of cyclists aged 8 to 80.

Objective 1: Identify a Primary Cycling Network

This primary inter-community (PIC) bikeway network consists of: (1) a set of standards for a variety of cycling facilities; (2) an established "typology" of those facilities identifying the degree to which cyclists of differing abilities would feel comfortable under a variety of roadway conditions; and (3) a network of bikeways which link major destinations, regional centres, villages, schools, and transit exchanges. The component parts of this network are described in the following strategies.

Involving the public in every step in the process resulted in a bikeway network that enhances mobility throughout the region and serves cyclists of all ages and abilities for all trip purposes.

The methodology and technical details related to the development of the classification, typology, primary bikeway network, and pedestrian priority areas is provided in Appendix A. Bicycle and Pedestrian Network Development Technical Appendix.

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4 All trail-related comments collected during the planning process will be considered during updates to trail management plan updates.

Strategy 1.1: Develop a bicycle facility classification standard

Consistent definitions of facility types provide clarification for municipalities developing bikeway networks. Guidelines facilitate the development of a reliable system, which encourages residents and visitors alike to bicycle for trips between municipalities.

The bikeway facility 'levels of separation' (left) build on the various facility definitions used by the member municipalities and are recommended as a common regional standard. These classifications do not replace use designations commonly used by member municipalities ('local commuter' or 'recreational' route), which are beneficial for system users. Users desire a continuous route where they are comfortable, regardless of design treatments.

Facility type classifications are useful at the planning and engineering level. Facility standards define bikeway types by design criteria and indicate engineering guidance.

Strategy 1.2: Establish a typology for bicycle facilities

The PCMP typology uses three factors to help planners and engineers determine which facility type to use when addressing gaps in the network. The bikeway 'class' indicates the types of users who feel comfortable on a particular facility, based on the 'level of separation' from traffic provided by the facility design. The 'context' in which the proposed facility would be located consider conditions on the roadway such as speeds and volumes, presence of heavy vehicles, trucks or buses, roadway width, visibility, adjacent land uses, and urban or rural context.

The graphic below shows how class, facility separation, and roadway context

inform a typology for facility selection. This Masterplan recommends that the Primary Bikeway Network (PBN) be developed to a Class I standard where possible, to encourage and enable users of all abilities to bicycle comfortably.

The typology continua (following page) show the range of bikeway facilities appropriate to different roadway contexts. A complete set of typologies is provided in the PCMP Design Guidelines.

Strategy 1.3: Establish a primary bikeway with Class I facilities

In the CRD, cycling is allowed on most public roads and trails. A 'bikeway network' consists of designated cycling routes that meet the Transportation

Association of Canada (TAC) guidelines for the design of bicycle facilities. However, not everyone who wishes to ride a bicycle would feel comfortable or safe on portions of the network, even those that meet TAC standards. The PCMP takes cycling a step further by aiming to install Class I facilities where 'interested but concerned' cyclists feel comfortable riding their bikes throughout the region.

The primary inter-community (PIC) bikeway network was developed with participation of many stakeholders and considered previous local and regional planning efforts. The development of the PIC is summarized following, with greater detail provided in Appendix A.

Development of an On-Street Bikeway Typology

USER TYPE CLASSIFICATION

Class 1: suitable for all users

Class 2: suitable for most users

Class 3: suitable for few users

+

LEVELS OF FACILITY SEPARATION

Separated On-Street:
- buffered bicycle lane
- cycle track

Bicycle Lanes/ Shoulders

Shared Roadways
- marked wide curb lane
- neighbourhood bikeway
- shared lane

+

ROADWAY CONTEXT

Highway | Arterial | Collector | Local

=

PRIMARY BIKEWAY TYPOLOGY
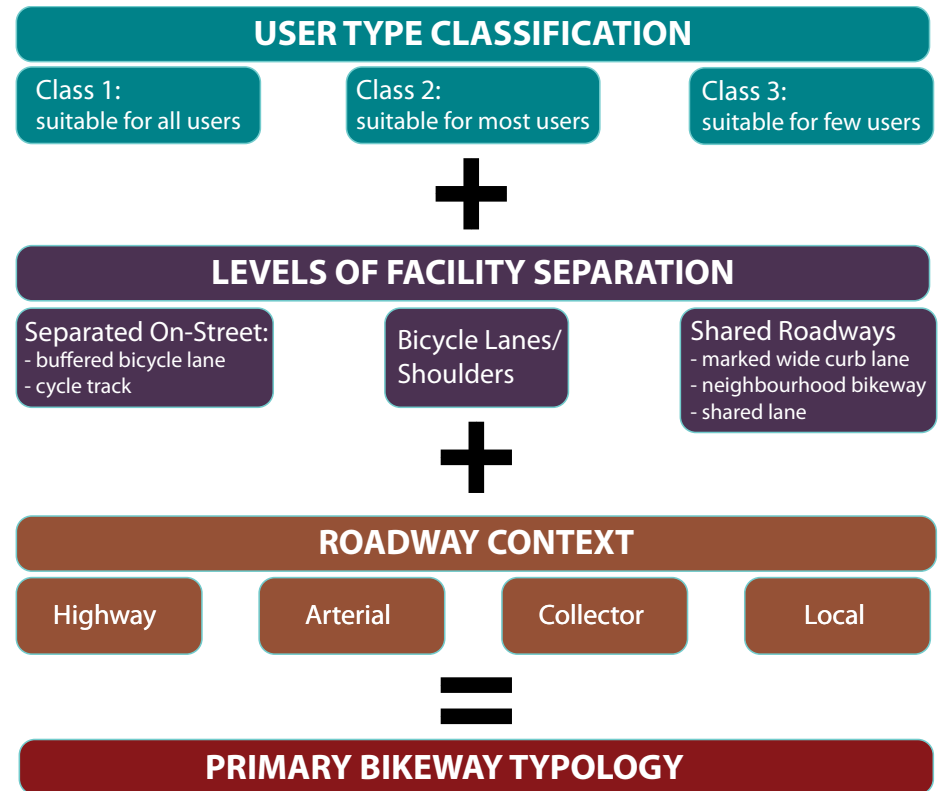
Bikeway Facilities on Arterials with Curb and Gutter
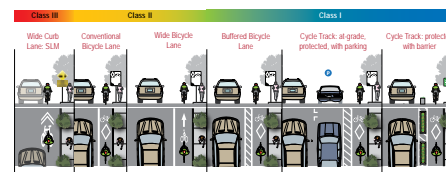
Collection of existing conditions data

In fall 2009, member municipalities were invited to submit existing and planned bikeway facility information. Municipal data was compared to the CRD's data to create a snapshot of existing bikeway facilities. Member municipalities were invited to validate the resulting existing bikeway dataset.

Identification of potential primary bikeway corridors

Potential primary bikeway corridors were selected from a large number of potential corridors during the spring/ summer of 2010. The 'universe of options' for the PIC bicycle network was built with:

- Previous plans, including the *TransportationChoices Recommended Regional Cycling Network* (RCN).
- Existing local and regional bikeway facilities.
- Proximity to key destinations (regional growth/transit centres).
- Input from the Citizens Advisory Committee (CAC) and participants at the advocates sessions, who identified key corridors.

Evaluation of the preliminary network

The preliminary PIC bikeway network was evaluated based on proximity to destinations, roadway or trail type, and connectivity. The corridor selection was then refined and validated by the CAC and the Technical Advisory Committee (TAC).

The identified PIC bikeway network connects regional and village centres, transit exchanges, employment centres, and other regional destinations. The network includes over 900 kilometres of corridors, shown in Map 1.

Bikeway Facilities on Arterials with Curb and Gutter

Class III		Class II		Class I	
Wide Curb Lane: SLM	Conventional Bicycle Lane	Wide Bicycle Lane	Buffered Bicycle Lane	Cycle Track: at-grade, protected, with parking	Cycle Track: protected with barrier

Bikeway Facilities on Arterials without Curb & Gutter

Class III		Class II		Class I	
Shared Lane	Marked Wide Curb Lane	Shoulder Bikeway	Wide Shoulder Bikeway	Cycle Track: protected with barrier	Cycle Track: two-way, curb separated

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SIDNEY

NORTH
SAANICH

Trans Canada Trail

CENTRAL
SAANICH

Lochside Trail

HIGHLANDS

VIEW
ROYAL

SAANICH

LANGFORD

E&N Rail Trail

ESQUIMALT

OAK BAY

SOOKE

METCHOSIN

COLWOOD

VICTORIA

Galloping Goose Trail

■ Major Attractor
▲ Village Centres
PIC Bikeway
━━ Regional Multi-Use Trail
━━ Primary On Street Bikeway
▬ Regional Growth Centres
▬ Park
━ Existing Municipal Bikeway

Notes:
1. Existing municipal bikeways may not meet PCMP facility definitions
2. Existing municipal bikeways data has not been field verified

Map 1. Primary Bikeway Network

Capital Regional District Regional Pedestrian and Cycling Master Plan
Author: Alta Planning + Design
Date: March 2011

0 1 2   4   6
Kilometers

alta
PLANNING + DESIGN

Integration with other regional plans

Several major regional planning efforts for the CRD are currently being developed or were recently completed. The 2005 TravelChoices served as the foundation of the PCMP regional bikeway network. While the TravelChoices network designated regional bikeway corridors primarily in the regional core, the PCMP more evenly distributes inter-community facilities throughout the region.

The TravelChoices Implementation and Investment Plan (TIIP) prioritized investments from the TravelChoices network in areas where more people are likely to use the facilities; i.e. focusing investments in areas with higher population numbers. As shown in Table 1, the PCMP expands on the TIIP prioritization by focusing on a broad network that provides access and options for people across the region. By creating a comprehensive network of facilities that are comfortable and attractive to users of all ages and abilities, the pool of potential users is expected to grow exponentially.

The draft Transportation Corridor Plan (Halcrow 2010) recommends corridors for primary use by specific modes of transportation. The strategic cycling network identified in the draft Corridor Plan includes the Regional Trail system, but does not recommend cycling on roads where transit is considered a priority use (e.g., Douglas Street). By contrast, the PCMP asserts that integration of transit and cycling is integral if the CRD is to reach the ambitions mode share goals. Cyclists and transit vehicles can and should be accommodated within many of the same corridors, with good design to maximize corridor function and safety. Innovative solutions such as buffered bicycle lanes, can be effective in shared transit/ bicycle corridors.

The PCMP primary bikeway network will continue evolving as related plans are developed and specific roads are prioritized for different modes.

This PIC network provides a comprehensive, cross-regional system, supporting ambitious mode split goals and facilitating cycling for transportation and recreation throughout the region.

Facility assignment

Due to the variety of conditions and range of factors that are used to determine the appropriate bicycle facility type appropriate to a particular road, the PCMP recommends a level of separation rather than a specific treatment for each road on the identified primary network (see inset, page 6). Map 2 shows the recommended level of separation on the identified PIC bikeway network.

In some corridors, it may be desirable to construct facilities to a higher level of bikeway to enhance user safety and comfort. In other cases, the level of separation is not warranted by motor vehicle speeds and volumes, and a lesser treatment may be acceptable.

To strategically focus implementation on key corridors within this extensive

Priority Actions:

- Adopt the PIC Bikeway Network, Classifications and Typologies as a Regional Plan

PIC bikeway network, priority corridors were identified. These priorities and cost estimates are discussed in Chapter 5. Funding and Implementation and in Appendix H.

Table 1. Relationship of TravelChoices Implementation and Investment Plan (TIIP) to PCMP Prioritization

CRITERION	TRAVEL CHOICES	
Safety	ICBC Safer Cities Initiative safety index to identify high-risk locations	Makes recommendations for Class I facilities given context of bikeway corridor
Destinations	Sum of employment and post-secondary enrolment per acre (by traffic zones)	Connections to key regional destinations, including regional centres, village centres, parks, and schools
Multi-Modal	Provision for pedestrian use; multi-use trails receive higher score	Prioritized projects provide access to transit centres and bus stops
Connectivity	Projects providing regional connectivity receive high score, projects providing inter-municipal connectivity receive medium score	Recommends a continuous priority regional network based on municipal and stakeholder priorities

Major Attractor
Village Centres
Regional Growth Centres
Park
Existing Regional Multi-use Trail
Recommended PIC Facility Separation
Multi-Use Trail
Separated On-Street
Bicycle Lane/Shoulder Bikeway
Shared Lane
Note: Conceptual Alignment Subject to Change

Map 2. Recommended Facility Separation on the PIC Bikeway Network

0 1 2 4 6 Kilometres

Objective 2: Improve regional walkability

The CRD Regional Trails provide a superb multi-use network, on which pedestrians can traverse across the region on foot. For most pedestrians however, the trail system is more of a recreational than transportation facility. Due to the longer distances involved with regional trips,[5] most regional pedestrian trips are multi-modal, combining walking, transit, cycling, and other modes.

For this reason, pedestrian corridors do not make up a continuous regional network (other than the Regional Trail Network); rather, pedestrian accommodation should be prioritized in areas linking key destinations, where more people are taking shorter walking trips or walking to end a longer multi-modal trip.

_____
5   Eighty percent of CRD residents need to travel from their home to another municipality to acquire goods, services or employment (Source: 2002 O&D Household Survey).

The PCMP considers the needs of pedestrians by identifying pedestrian priority areas, through design guidelines tied to levels of anticipated pedestrian use, and through analysis of pedestrian policies and guidelines.

Strategy 2.1: Identify pedestrian priority areas

Regionally significant pedestrian areas have a high density of pedestrian-attracting land uses, particularly:

- Regional growth/village centres
- Transit centres, transit exchanges and future rapid transit exchanges
- Regional parks and trails
- Civic destinations and schools

Identified pedestrian priority areas are shown in Map 3. In addition to the corridors and high pedestrian use areas, a number of recreational trails can be used to traverse the region on foot. Regional Parks is currently working on an updated _Strategic Plan_ that identifies a number of pathways.

The PCMP recommends focusing on arterial and collector streets in regional centres, areas with anticipated high pedestrian use, and high priority regional corridors, including streets that access transit. The intersection of these pedestrian areas with the _Transportation Corridor Plan_ (Halcrow 2010) identified corridors that are key locations for high levels of pedestrian design.

Priority Actions:

- Work with municipalities, CRD Parks, accessibility advocates and agencies to ensure consistent universal pedestrian design application, particularly in areas identified as high pedestrian use.

The Bicycle and Pedestrian Design Guidelines that accompany this Masterplan outline treatments and resources for providing universal access through the pedestrian realm, accommodating pedestrians of all abilities.
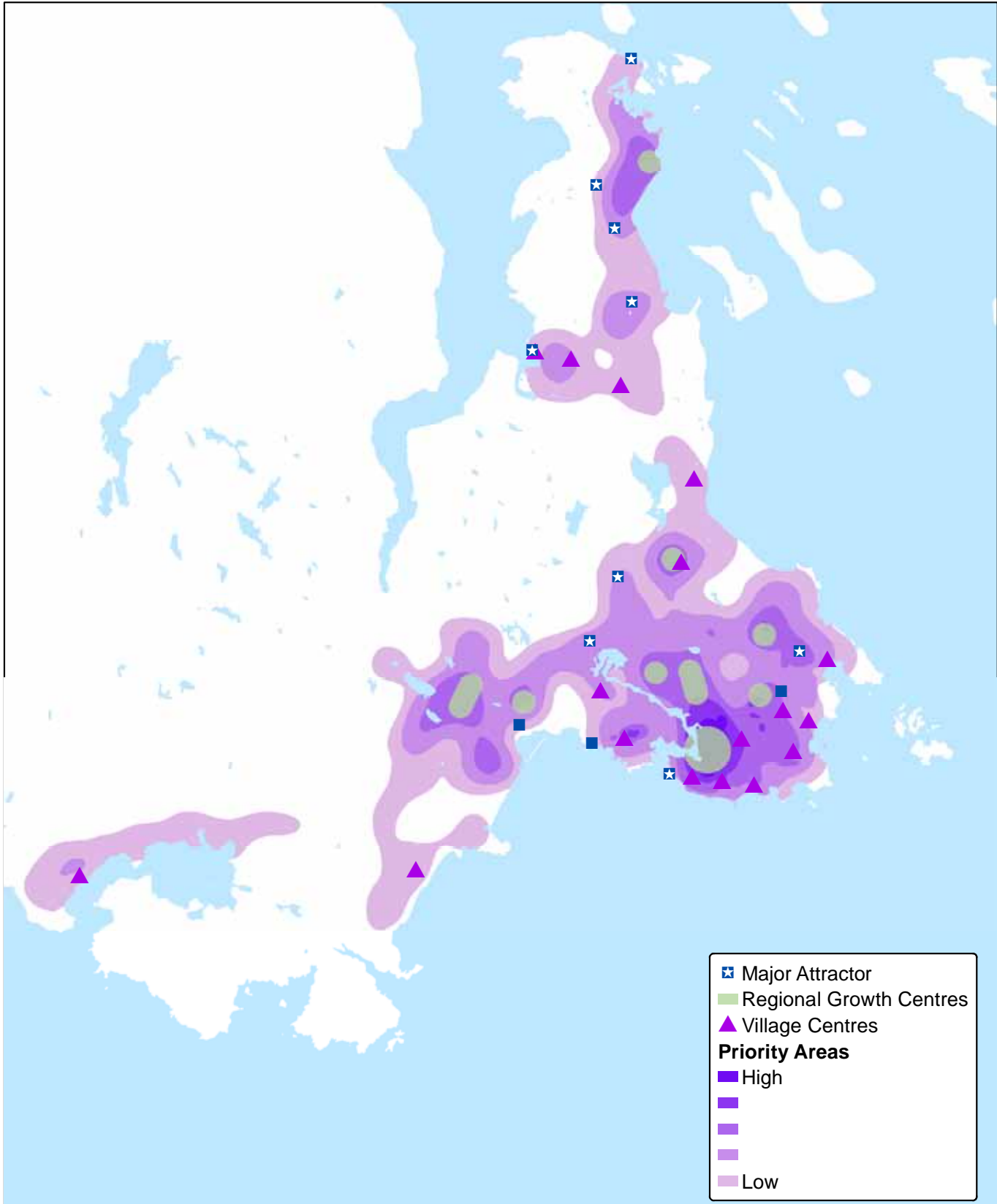
Map 3. Regionally Significant Priority Areas

Legend:
- ⊠ Major Attractor
- ▢ Regional Growth Centres
- ▲ Village Centres
- **Priority Areas**
- ▬ High
- ▬
- ▬
- ▬
- ▬ Low

0 1 2 Kilometres

Strategy 2.2: Identify pedestrian facilities and policies

Design of pedestrian facilities is important to ensure consistency in facility installation throughout the member municipalities. The PCMP Design Guidelines use universal design principles (providing access to pedestrians of all ages and abilities) to identify sidewalk and crossing guidelines appropriate for use in pedestrian high-use areas compared to residential areas.

While universal design is often considered as benefitting people with disabilities, these principles ensure that everyone, whether a child, a senior, or an adult in a wheelchair or pushing a stroller, can safely and comfortably use the provided facilities and get from one place to another.

Objective 3: Promote regional consistency, continuity and connectivity

Strategy 3.1: Develop common standards for pedestrian and cycling design guidelines

The PCMP Design Guidelines were developed to provide a consistent and comprehensive reference for the implementation of walkway and bikeway networks throughout the Region, containing the highest quality standards of pedestrian and bicycle safety comfort and convenience.

Key principles for the guidelines are:

- The walking and cycling environment should be safe.
- Pedestrian and cycling facilities should be consistently designed and installed.
- The networks should connect to places people want to go.
- The environment should be easy to understand and use.
- Improvements should be economical.
- Guidelines should be flexible and applied with professional judgment to ensure context sensitivity.

The design guidelines are a resource around which municipalities can engage in reviewing best practices, sharing and learning from each other. The guidelines should be regularly reviewed and updated as a collective process by member municipalities.

Design guideline development

The guidelines were developed in the following ways:

- A **table of contents** was created in consultation with the PCMP TAC, based on desired treatments and issues identified in workshops.
- **International best practices** were integrated with the Transportation Association of Canada (TAC), Ministry of Transportation and Infrastructure (BC MOTI), and other local design documents.
- **Design guidelines workshops** were held with PCMP TAC/CAC members and other interested stakeholders.

Pedestrian Design Guideline Next Steps

While the guidelines are presented as a single document, they are intended to be a working document that can be built upon as guidelines are established or innovative treatments are developed. The following outstanding issues were identified as part of the review process and are presented as next steps:

- Development of recommendations for accommodating bicyclists and pedestrians through construction.
- Identification of maintenance concerns and strategies.

Workshops to train engineers and planners at the CRD and member municipalities in implementation and use of the design guidelines.

- Collaboration with CRD and other municipal Parks and Recreation departments to further develop multi-use trail guidelines.

Common regional standards for design of bicycle facilities allow cyclists to travel across the region on facilities at their comfort level.

Strategy 3.2: Develop a common wayfinding signage system

Bicycle wayfinding signs help users identify the best cycling routes to key destinations. They also visually cue motorists that they are driving along a bicycle route.

A common set of guidelines for directional signage will contribute to making the region more universally accessible by providing consistent and predictable messaging. It will promote the network by increasing awareness and marketing the network.

The District of Saanich has already pioneered innovative cycle-route signage that has been utilized to varying extents by Central Saanich, Oak Bay, and Victoria. This Masterplan recommends blending the Saanich signage with the Canadian TAC Guideline signage. This would create a sign template that benefits from the unique and already familiar Saanich signage with a standard that is internationally recognized and can be easily integrated into the family of regulatory signage.

The PCMP Design Guidelines provide an overview of signage requirements based on TAC and the Canadian Manual on Uniform Traffic Control Devices (MUTCD-C), as well as recommendations based on best practices for sign colour, placement, frequency, and content.

While guidelines have been developed in coordination with the PCMP TAC and CAC members, it is anticipated that additional collaboration will be required to finalize the regional signage standards and to ensure that they are adopted and used region wide.

Priority Actions:

- Establish a Signage Committee to review and revise the Draft Sign Guidelines (Section 5 of the Design Guidelines) for a recommended regional standard

Objective 4: Improve trip enhancement facilities for active transportation

Trip enhancement facilities (also known as 'end-of-trip facilities') enhance the walking and bicycling experience and can be a determining factor in whether someone decides to make a non-motorized trip. Amenities include bicycle parking, showers and lockers for cyclists and benches, fountains and landmark indicators for pedestrians. Although most municipalities have some policies and standards, no municipalities have a comprehensive approach. This Masterplan recommends a common set of guidelines and standards to establish a minimum expectation, with programs designed to incentivize the installation of trip enhancement facilities.

People are more likely to walk if they can count on amenities such as rest areas, washrooms, water fountains, pedestrian oriented street lighting, and attractive, well maintained landscaping.

Given the anticipated demographic shifts in the region, providing high-quality and frequent trip enhancement facilities will determine whether people will choose or feel that they are able to utilize the bicycle and pedestrian networks.

Existing wayfinding signs used in several municipalities in the CRD.
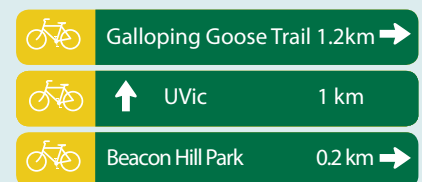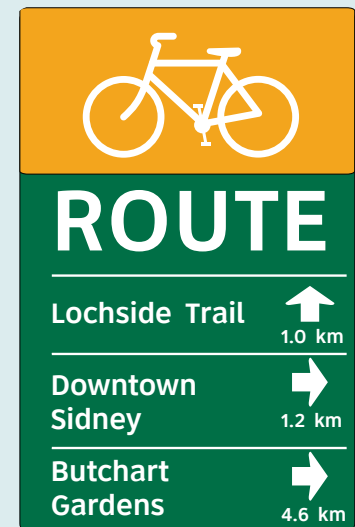
Proposed wayfinding signs integrate existing design of bikeway wayfinding signs with provincial and federal regulations. These signs represent some of the options considered in this process.

Bicycle End-of-Trip Facilities

Short-term bicycle parking facilities include racks which permit the locking of the bicycle frame and at least one wheel to the rack and support the bicycle in a stable position without damage to wheels, frame or components.

Long-term bicycle parking facilities protect the entire bicycle, its components and accessories against theft and against inclement weather, including snow and wind-driven rain.

Other trip enhancement facilities include showers and lockers that benefit bicycle commuters who have a long commute or who require professional clothing attire.

Strategy 4.1: Develop policies and guidelines for bicycle parking standards

Short and long term bicycle parking provide cyclists somewhere to leave their bicycles whether for a short trip into a store or for a day at the office. Policies specifying bicycle parking requirements for new construction and redevelopment ensure that cyclists can depend on parking availability.

Section 6 of the PCMP Design Guidelines provides direction on the design and placement of these facilities.

To encourage consistent and sufficient provision of bicycle parking throughout the region, the CRD should pursue the following actions:

- Develop requirements for bicycle parking and bicycle end-of-trip facilities in both newly constructed buildings and redevelopment.

- Consider adopting the requirements for short-term (Class I) and long term (Class II) parking proposed in the Design Guidelines.

- Work with member municipalities to prioritize the installation and upgrade of bicycle parking in regional centres, villages and transit hubs.

Strategy 4.2: Build up Pedestrian Amenities in Priority Areas

This Masterplan recommends a special focus on installing pedestrian amenities in high pedestrian areas, as described in the Design Guidelines. Pedestrian amenities include: benches, water fountains, shade/shelter structures, and many other amenities.

A key missing pedestrian amenity that was identified by advocates is washroom facilities along the multi-use trails. Currently, three washroom stations are located on the regional trail network. An optimal standard would have washrooms sited every 5 km (an hour's walk). Next steps are as follows:

- CRD Regional Parks should update existing trail management plans to identify and provide appropriate visitor services.

- The CRD should work with member municipalities to develop specific guidance for the provision of trip enhancement facilities in pedestrian priority areas.

Strategy 4.3: Create an Incentives and Partnership Program

Incentives are an important tool for encouraging developers to provide bicycle parking and other end of trip facilities. For example, Esquimalt offers reductions in off-street motor vehicle parking at commercial and industrial buildings if bicycle parking is provided. The CRD should:

- Provide incentives to encourage bicycle parking facilities beyond the minimum requirements.

- Establish bike rack programs that assist in the location, design and funding of racks to stimulate retrofitting short-term bike parking in the existing network.

Appendix B. Trip Enhancement Facilities provides an inventory of existing bicycle end-of-trip facilities and pedestrian trip enhancement features. The Appendix also recommends specific policies and infrastructure to enhance bicycle and pedestrian trips throughout the region.

Objective 5: Integrate active transportation with transit

Keeping in mind that "every transit user is a pedestrian at some point", this Masterplan acknowledges transit's integral role in ensuring the success of an active transportation strategy. Typical considerations for integrating active transportation and transit include:

- Appropriately planning for expected demands.
- Providing connections between active transportation and transit networks.
- Providing appropriate facilities at transit exchanges (e.g. bicycle parking).
- Creating convenient bicycle and pedestrian access at, to, and from transit exchanges.
- Developing policies for carrying bicycles onto transit vehicles.
- Accommodating pedestrians and cyclists in the physical design of transit exchanges.

Appendix C. Transit integration outlines these key considerations and makes recommendations for improving nonmotorized access to transit and interactions with transit.

Strategy 5.1: Improve transit stop connectivity

Bicycle and pedestrian routes to transit stops are often overlooked, sometimes leaving newly upgraded, accessible stops isolated due to lack of connectivity to nearby destinations. The PCMP Design Guidelines identifies standards for new and re-development applications, expanding on the District of Saanich's OCP Development Permit guidelines.

Guidelines for pedestrian facilities, including crosswalks, curb ramps, and other treatments, are addressed in the Bicycle and Pedestrian Design Guidelines. These guidelines assist the CRD and municipalities in providing consistent and accessible pedestrian routes in key locations throughout the region, based on context-sensitive design.

Strategy 5.2: Provide appropriate facilities at transit locations

BC Transit provides bicycle parking and other end-of-trip facilities at transit centres. However, facilities are not provided consistently at transit centres and are insufficient for the potential use.

To ensure provision of adequate bicycle facilities at transit centres, the CRD should:

- Work with BC Transit to develop acceptable rules that allow bikes to be carried on buses when exterior bike racks are full.
- Work with BC Transit to develop and implement standards and quantities of secure bicycle parking based on size of the transit stops.

Priority Actions:

- Secure an agreement with BC Transit and member municipalities to install secure bike lockers at priority transit locations

Trip enhancement facilities such as benches, informational kiosks, and bicycle parking are currently provides in several locations along the regional and local multi-use trail system.

Chapter 2. Education and Encouragement

While it is important to focus on improving the hard infrastructure facilities that make cycling and walking safer, more enjoyable, and more predictable, it is equally important to ensure that CRD residents have the skills, information, confidence and support they need to walk and bicycle more.

This chapter recommends education, encouragement, Active and Safe Routes to School, and bike sharing programs designed to help more CRD residents know about new and improved facilities, learn the skills they need, and receive the accolades they deserve for living more sustainably.

The CRD is uniquely positioned to take a leading role in cycling and walking programs as leader, convener, adviser, funder, and communicator to the public. Appendix D. Education and E. Encouragement provide an overview of existing programs and specific program recommendations.

Objective 6: Develop a regional Active and Safe Routes to School Effort

Over 50% of students are driven to their schools. European experience demonstrates that the incorporation of cycling skills training into the school curriculum can reverse this trend and help to imbed a level of ease and familiarity with active transportation amongst the next generation.

Active and Safe Routes to Schools programs (ASRTS) aim to improve safety, health and fitness habits for children. Programs require partnerships among municipalities, school districts, community and parent volunteers, and law enforcement agencies.

Strategy 6.1: Work with partners to increase the number of children walking and cycling to school

The CRD should work with municipal and other partners to:

- Roll out a region-wide cycling skills course to school-aged children (building on the CRD KidsCAN pilot project).
- Pursue long-term, stable funding for an Active and Safe Routes to Schools Program.
- Provide expertise to serve as a resource for municipalities and other groups.
- Coordinate a quarterly ASRTS Working Group to promote regional communication and coordination.
- Lead ongoing School Travel Planning efforts at individual schools throughout the region.
- Develop a consistent regional evaluation strategy for Active and Safe Routes to School Programs.
- Act as coordinator, working with partners to deliver programs (e.g. iWalk).

Objective 7: Create education programs that increase knowledge and confidence around active transportation

Education programs can directly increase the number of people walking and bicycling as well as their confidence and safety while traveling.

Strategy 7.1 Provide skills and training

To facilitate regional training programmes, the CRD should:

- Sponsor on-going training and professional development in best practices of facility design for municipal staff and other related professionals.
- Work with agencies (e.g. ICBC, Driver Educators, CRD Traffic Safety Commission) to emphasize the rights and responsibilities of motorists and cyclists in training, testing and awareness programs.
- Create family bicycling programs to help parents figure out how to safely transport children by bicycle and help children learn bicycling skills.

Education and encouragement programs promote use of the cycling and pedestrian networks and can be rewarding events with community partners.

Objective 8: Develop a Marketing and Promotion Strategy to improve the status of cycling and walking

A regional approach to marketing and promotion of active transportation makes sense from a financial and staff resource perspective. Experience elsewhere suggests that consistent, abundant messaging can change attitudes and improve perceptions of the inherent walkable scale of their neighbourhoods.

Strategy 8.1: Coordinate a Sunday Parkways event with partners in the Region

Special events such as Ciclovias (Ottawa, Bogota) or Sunday Parkways (Portland) where roadways are shut down from motorized traffic have had an extraordinary effect in creating a celebratory effect, and tend to attract first-time cyclists. The very successful Shelbourne Community Ride (April 2010) drew hundreds of families, some of whom had never ridden a bicycle in their lives. The Greater Victoria Cycling Coalition (GVCC) and other ad hoc groups have identified an interest in supporting and partnering with an ongoing ride.

The CRD can support similar public events which seek to raise the profile of walking and cycling such as Jane's Walk - a national movement inspired by renowned urban planner, Jane Jacobs.

Strategy 8.2: Establish a Web Portal

The CRD should create an active transportation web portal that functions as a clearinghouse for information and key resources for all things relating to cycling and walking. A next step would be development of a regional multimodal trip planning tool.

Strategy 8.3: Develop a Branded Messaging Campaign

The CRD should undertake research to understand most effective messaging and to ensure effective targeted investment in the campaigns. The messaging could dovetail awareness and profile with various issues (helmet campaign, Cycling Rules, visibility, trail etiquette).

Strategy 8.4: Co-sponsor Community Events

Interest in active transportation garners a great deal of enthusiasm from a wide variety of sectors. Typically these groups are volunteer-strong but cash-strapped. A modest amount of funding can be turned into incredible currency in the form of celebrations, awareness, outreach and education.

Strategy 8.5: Personalized Marketing

Personalized transportation marketing programs have been identified as highly effective for commute-based trips. BC Transit has a personalized program for seniors learning to use the transit system. With the CRD's mandate to undertake transportation demand management, a personalized marketing program could be developed which ties into BC Transit's work, as well as other partners such as the Victoria Carshare Coop.

Objective 9: Increase access to bicycles

Strategy 9.1: Support Municipal Bike Share Systems

Based on bike share systems elsewhere, as well as local characteristics, it is likely that a thoughtfully-designed bike share system could be successful in the CRD.

As no bikeshare system has been launched and operated without subsidy from the host community, any steps towards establishing a bikeshare system should involve a feasibility study. Factors to consider include population density, demographics, mixture of land use and non-residential density, cycleability and completion of the bikeway network, cycle culture, intermodal connectivity, timing, and a communications strategy.

Bike share programs can provide safe and convenient access to bicycles for short trips, transit-work trips, and/or tourist trips.

Chapter 3. Enforcement

A bicycle and pedestrian network should be supported by policies that improve safety for cyclists and pedestrians (personal and traffic safety) and security for their bicycles, enhance legal protection for vulnerable road users and enforce traffic safety rules for all road users.

The review of regional and municipal bylaws indicated that there is significant inconsistency across the region regarding how (or even if) cycling and pedestrian provisions are incorporated into municipal regulations. In addition, the PCMP process identified a need to clearly define the range of mobility devices, motorized scooters, e-bikes, and other devices that are increasingly being used on the regional trails.

Objective 10: Improve road safety and protect vulnerable users

Strategy 10.1: Upgrade existing bylaws, introduce new bylaws

Model policies have been adopted by some municipalities in the CRD that could be adopted region-wide ensuring regional consistency and minimizing confusion. Pioneering bylaws have also been adopted by other communities that could be adopted in the region, described in Appendix F. Bylaws.

The CRD should facilitate the region-wide adoption of the following bicycle and pedestrian supportive policies:

- A bylaw that allows cyclists to ride through crosswalks that connect to regional trails (e.g., Saanich and Victoria have developed bylaws that could be adopted region-wide).

- Create a Pedestrian Charter (e.g policies in Esquimalt and Colwood).

- Clarify e-bike (pedal-assist and motorized) definition and regulations for regional trails and bikeways (CRD Parks)

- Consider working to change provincial legislation is support of model policies from other jurisdictions such as:

  - Allow cyclists to treat "stop" signs as "yield" signs (Idaho)

  - One-metre bike passing rule/vulnerable road users law (passed in several U.S. states; Saanich is currently developing policy language for this rule)

- Work with CRD Traffic Safety Commission and the various police to develop an enforcement campaign that clearly links and target enforcement of traffic behaviour known to be dangerous to cyclists and pedestrians.

Priority Action:

- The CRD should take the lead in seeking improvements and amendments to existing provincial laws in support of safer cycling and walking conditions.

Objective 11: Improve personal safety conditions

Strategy 11.1: Conduct bicycle and pedestrian safety audits

Fears for personal safety are frequently cited as a barrier to bicycling and walking, especially on off-road trails where isolation and lighting are factors. The CRD can alleviate some of these concerns on its Regional Trail network by conducting audits and identifying measures that prevent crime through environmental design to provide greater visibility of cyclists and pedestrians.

The recommendations derived from the audits can be integrated into the Design Guidelines document.

Objective 12: Reduce bicycle theft

Strategy 12.1: Implement programs to report and reduce bike theft.

Bike theft is a major deterrent to cycling; whether or not someone feels confident locking their bicycle in a given location determines whether that person feels they can ride. Actions the CRD can take to reduce bicycle theft in the region include:

- Work closely with police on bait-bike programs.

- Consider development of an optional regional bike registration or tracking program.

- Educate cyclists and promote proper lock up procedures.

- Explore ways to support stolen bicycle retrieval through investigations.

Objective 13: Improve driver/cyclist traffic behaviour

Strategy 13.1: Develop and implement a respect campaign

The Bicycle Rules campaign in New York City, developed and promoted by a cycling advocates group, has received global accolades for its approach of fostering responsibility and respect among motorists, bicyclists and pedestrians. The CRD should pursue implementing such a campaign.

Strategy 13.2: Develop and implement a diversion class

A diversion class can be offered to first-time offenders of certain traffic violations, such as running a stoplight or speeding. In lieu of a citation and/or fine, individuals can take a one-time, free or inexpensive class instead.

Chapter 4. Evaluation and Planning

The bicycle network, pedestrian guidelines and supporting recommendations will require substantial investment and planning to implement. A bicycle and pedestrian monitoring program would allow the CRD to track the impacts of investments and help the CRD and member municipalities pursue outside funding.

Objective 14: Develop a benchmarking and measurement system

Regularly measuring and reporting activity provides valuable information to municipalities regarding which measures (and by extension, investments) are garnering the desired results and which measures are less effective. The action of "reporting out" also improves transparency regarding how this Masterplan is being implemented.

Several municipalities and organizations currently conduct counts and surveys of bicyclists and pedestrians. The CRD is well-positioned to accumulate the necessary additional data by building on the 2006 counting pilot project. These efforts can be leveraged in the pursuit of a consistent methodology for the Region, summarized in Appendix G. Evaluation and Planning.

Strategy 14.1: Increase counts, coordinate and collate existing counting data

Without accurate and consistent demand and use figures, it is difficult to measure the impacts of investments.

To consistently count cyclists and pedestrians, the CRD should:

- Provide a standard for bicycle and pedestrian counts and surveys to encourage consistency of data collection, enabling the CRD to use data collected by municipalities.

- Work with cycling advocacy organizations to develop an annual volunteer-driven count program utilizing the recommended count-site map identified in the PCMP.

- Use the National Bicycle and Pedestrian Documentation Project (NBPD) methodology to conduct counts and surveys that can be compared to other communities.

- Produce an annual Pedestrian and Bicycle Account that reports on plan implementation, network completion, safety and user perception, and other information.

Objective 15: Improve inter-jurisdictional harmonization

The PCMP process has brought together planners, engineers, decision makers, and advocates from regional partners. The CRD should continue this inter-jurisdictional communication to support PCMP implementation in the coming years.

Strategy 15.1: Establish an oversight committee structure

To maintain momentum on pedestrian and cycling issues, the CRD should:

- Convene a staff-supported pedestrian and cycling advisory committee to facilitate implementation of the PCMP and on-going updates to the Design Guidelines.

- Utilize a standard reporting form and information transfer process for updating facilities and monitoring (see proposed form and process in Appendix G of the PCMP).

- Create a high level council of elected officials and community leaders charged with championing active transportation in the region.

- Develop a list of community members who are interested in region-wide bicycle and pedestrian planning who can disseminate information on events.

Priority Action:

- Collaborate with partners in the development of a volunteer driven manual count strategy for the Region.

Priority Action:

- Convene a Cycling and Pedestrian Advisory Committee made up of CRD and municipal staff, as well as community representatives.

Regularly counting bicyclists and pedestrians allows the CRD and member municipalities to track progress toward implementing this Masterplan.

Chapter 5. Funding and Implementation

The visionary pedestrian and cycling mode share goals (15% regionally for walking and 15% regionally and 25% in high density areas for cycling) in this Masterplan are ambitious targets that would reinforce the region as a worldwide leader in sustainability. However, realizing these substantial increases in will require significant collaboration and effort by the CRD, member municipalities, electoral areas, partner organizations, and residents.

This Masterplan has identified key priorities for each subsection addressed, particularly focusing where the CRD could facilitate discussions to advance the topic area. In addition, the CRD and municipalities should develop an extensive network of on-street cycling facilities that are comfortable for all types of cyclists to achieve the bicycling mode split goals.

This implementation strategy presents a targeted methodology for how the CRD and municipalities can focus efforts on developing the primary intercommunity (PIC) bikeway network infrastructure. In addition, supporting programs are integral to educating and encouraging residents to use the network. Appendix H. Funding and Implementation contains additional detail about the priority project identification, cost estimates, and funding opportunities.

Objective 16: Develop the Primary Bikeway Network

The PIC bikeway network consists of over 900 km of on- and off-street bikeway facilities through all 13 municipalities and Juan de Fuca Electoral Area. This network was selected to provide a web of bicycle facilities throughout the region, to enable and encourage residents and visitors to bicycle for everyday trips and for recreation.

In order to focus investments on strategic corridors, priority projects were identified through this Masterplanning process. Based on existing jurisdictional authority, each jurisdiction will be responsible for their portion of the PIC bikeway network.

Identification of priority projects

The 200 km of priority projects were identified through workshops with municipal partners and stakeholders to capitalize on and coordinate with current and future planning efforts. Priority corridors were selected as corridors that are vital connections between communities, independent of existing traffic conditions that impact facility type recommendations (see Table 2).

The regional priority projects are shown in Map 4 and summarized in Table 3 (page 25). Ultimately, project priorities within a particular municipality will be determined by the opportunities such as road reconstruction and development as well as community and partner feedback.

Projects not on the priority list are integral to the development of a regional network, particularly where no fa-

Table 2. Regionally Significant Bicycle Corridor Selection Criteria

CRITERION	CONSIDERATIONS
Suitable for bicycling/ walking without improvements	Is the corridor a route that is currently safe and comfortable for cycling? Do existing roadways have low posted speeds and motor vehicle volumes?
Provides/enhances Active and Safe Route to School connection	Does the corridor provide a new or enhanced connection to a school? In the case of rural areas, does the corridor improve access to community centres?
Closes a critical gap	To what degree does the corridor fill a missing gap in the bicycle and/or pedestrian system?
Serves an immediate safety need	Can the project improve bicycling and walking at locations with perceived or documented safety issues? Are roadways designated as either freight or transit routes?
Serves key origins or destinations	How many user generators and attractors does the corridor connect within reasonable walking or bicycling distance, such as schools, parks, regional centers, etc.?
Geographically distributed	To what degree does the project benefit the regional community by offering opportunities for increased connectivity to surrounding communities, regional walkways/bikeways, etc.?
Serves supportive land uses	Does the route travel through areas of higher density, indicating a higher potential use? For rural areas, does the route provide access to regional destinations outside urban areas?
Right-of-way available	Is the corridor currently in public jurisdiction or private ownership?
Interfaces with other transportation modes	Does the corridor provide a new or enhanced connection to a transit centre, exchange, or bus stop?
Has local political and community support	To what degree do CRD member jurisdictions desire the proposed project? (Includes oral and written feedback from the community workshops and feedback received in public surveys.)

Legend

- ■ Major Attractor
- ▲ Village Centres
- ─ ─ Multi-Use Trail
- ─ ─ Separated On-Street
- ─ ─ Bicycle Lane/Shoulder Bikeway
- ─ ─ Shared Lane
- ⋯⋯ Other PIC Bikeways
- Regional Growth Centres
- Park
- ── Existing Regional Multi-use Trail
- Note: Conceptual Alignment

Note: Recommendations were primarily based on roadway classifications defined by the BC Digital Roadway Atlas

Map 4. Recommended PIC Priority Improvements

Capital Regional District Regional Pedestrian and Cycling Master Plan
Author: Alta Planning + Design
Date: March 2011

0 1 2 4 6 Kilometres

cilities exist currently. Regardless of whether they were identified as a regional priority, bikeway projects should occur as roadways are repaved or reconstructed or as grant money is becomes available.

While the CRD's jurisdiction for implementing projects is limited to the Regional Trail System, the identification of projects under individual municipalities' jurisdiction as regional priorities will enhance a funding application and promote the development of these projects.

Facility classification selection and cost opinions

Through collaboration with engineering and planning staff at the CRD and member municipalities, this Masterplan developed a bikeway classification and typology schema, described in Chapter 1 and in the PCMP Design Guidelines. To achieve the mode split targets, the bikeway network should appeal to a variety of users, from eight to eighty years old, and provide direct,

convenient, comfortable, and safe travel from trip origins to destinations. For this reason, the primary bikeway network should be developed or upgraded to Class I (suitable for all users), based on street classification.

This level of facility represents a significant investment; the total cost of the PCMP is estimated at $275 million, with priority projects costing over $100 million. While this is a significant investment for the region, the benefits of a complete bikeway network that provides facilities to accommodate users off all ages and abilities will place the region at the forefront of sustainability and livability.

Strategy 16.1: Develop the priority Regional Trails Network

The 17 kilometre E & N Rail Trail project is the most recent addition to the 84 kilometre Regional Trail system which includes the Galloping Goose (55 km) and the Lochside Trail (29 km). In 2007, funding was secured and engineering design commenced for the E

& N Rail Trail. In 2009, construction started on Phase 1 of the trail which includes 6.6 km of new trail within the E&N Rail Corridor and paving 2.5 km of the Galloping Goose Regional Trail.

Phase I (45% of the complete trail) provides a 14.3 km contiguous route from Esquimalt Road in the City of Victoria to Jacklin Road in the City of Langford using newly constructed rail trail, sections of the Galloping Goose Regional Trail and cycling lanes and sections on municipal roadways. Secure dates and funding for future phases has not yet been established, but for the purposes of this Masterplan, the alignment on the maps includes the E and N Rail Trail at full build out. For a detailed map of the E & N Rail Trail Development Plan, see Appendix H.

This Masterplan did not address concerns about the existing conditions on the Galloping Goose and Lochside Trails. However, the Bicycle and Pedestrian Design Guidelines provide a resource for multi-use trail standards,

The cycling network includes 361 km of separated facilities, 191 km of bike lanes/shoulders, and 45 km of shared lanes.

Education, encouragement, enforcement, and evaluation programs are critical to pursuading people to use the bikeway network.

Table 3. Priority Bikeway Projects by Jurisdiction

	PRIORITY PROJECTS	TOTAL OF ALL PROJECTS		PRIORITY PROJECTS	TOTAL OF ALL PROJECTS
	Length (km) / Cost	Length (km) / Cost		Length (km) / Cost	Length (km) / Cost
Core Region			Kelly Rd ▪		
Esquimalt	3.1 / $1,194,118	8.8 / $2,315,729	Sooke Rd ●		
Admirals Rd ●			Highlands	- / -	- / -
Lampson St ▪			Metchosin	10.1 / $4,380,857	20.5 / $8,341,758
Victoria	22.7 / $3,324,740	54.7 / $12,442,493	Metchosin Rd ▪		
Bay St ●/▪			Sooke Rd ●		
Blanshard St ●			Sooke	14.9 / $18,072,009	22.6 / $26,673,990
Douglas St ●			Grant Rd ●		
Fort St ●/▪			Sooke Rd ●		
Oak Bay Ave ▪			West Coast Rd ●		
Shelbourne St ●			Pauquachin FN/MOTI	1.9 / $1,324,852	4.7 / 3,386,151.4
Wharf St ▪			West Saanich Rd ●		
Yates St ▪			JDF	63.8 / $44,048,005	114.1 / $70,672,868
Oak Bay	2.5 / $660,243	24.1 / $3,585,920	Sooke Rd ●		
Bowker Creek ●			West Coast Rd ●		
Oak Bay Ave ▪			**Peninsula Region**		
Saanich	49.0 / $13,233,645	116.9 / $44,444,921	Central Saanich	17.3 / $4,978,014	52.1 / $14,419,812
Admirals Rd ●			Douglas Street Connector ●		
Blanshard St ●			Mt Newton Cross Rd ▪		
Borden St ▪			Wallace Dr ▪		
Chatterton Way ▪			West Saanich Rd ●		
Cherry Tree Bend ▪			North Saanich	14.6 / $5,845,028	45.4 / $18,055,090
Conceptual Alignment ●			Aldous Terr ▪		
Dieppe Rd ▪			Amity Dr ▪/▪		
Douglas St ●/▪			McTavish Rd ▪		
Douglas Street Connector ●			West Saanich Rd ●/▪		
Falaise Dr ▪			Willingdon Rd ▪		
Glendenning Rd ▪			Sidney	0.6 / $153,802	11.9 / $4,121,489
Interurban Rd ▪/▪			McDonald Park Rd ▪		
McKenzie Ave ●/▪			Ocean Ave ▪		
Quadra St ●			Tsawout FN/MOTI	- / -	0.2 / $3,451
Shelbourne St ●			Tseycum FN/MOTI	0.6 / $1,121,811	0.6 / $1,121,811
Torquay Dr ▪			West Saanich Rd ●		
Wallace Dr ▪			**Other Jurisdiction**		
West Saanich Rd ●			CRD	7.9 / $1,637	8.3 / –
View Royal	0.6 / $101,083	26.5 / $36,024,142	E&N ●		
Admirals Rd ●/▪			Lochside Regional Trail ▪		
Esquimalt FN/MOTI	0.5 / $10,105	0.5 / $10,105			
Admirals Rd ▪					
West Shore Region					
Colwood	13.7 / $4,581,000	25.37 / $8,814,711			
Kelly Rd ▪					
Latoria Rd ▪					
Metchosin Rd ▪/▪					
Sooke Rd /Island Highway ●					
Langford	4.0 / $2,700,032	42.8 / $21,021,059			

● Multi-Use Trail
● Separated On-Street
▪ Bicycle Lane/Shoulder Bikeway
▪ Shared Lane

including consideration for surfacing width, and separation in differing contexts. The CRD should endeavour to comply with these standards.

Priority Actions:

- Seek funding to complete the E and N Rail Trail.
- Assess existing Regional Trail network and standards against the Design Guidelines.

Objective 17: Establish education, encouragement, evaluation, and enforcement programs

The primary "capital" needed to implement programmatic recommendations, especially at the outset, is staff time and expertise. Three scenarios have been developed for implementing the education and encouragement recommendations from this Masterplan: the first ("moderate") scenario assumes that no more than 0.25 FTE is available to assist with both Active and Safe Routes to School (ASRTS) and Education/Encouragement efforts; the second ("strong") scenario assumes that 1 FTE is assigned exclusively to these duties; and the third ("aggressive") scenario assumes that 1 FTE is assigned to education/encouragement and 1 FTE is assigned to ASRTS work.

Each recommendation has been ranked for the three implementation scenarios for reach (number of residents reached) and resources needed (cost/staff time), shown in Table 4. See Appendices D and E for more information on recommended programs.

Objective 18: Establish a funding, investment, and prioritization program

Currently, cycling and pedestrian facilities are undertaken as part of each municipality's capital projects; they are usually integrated into road upgrades but occasionally special projects such as the retrofit of a road are funded separately. The CRD and member municipalities have historically been successful in obtaining grant money; over 40 projects with active transportation components have been funded across the region through grant programs since 2004. However, grant availability and requirements can vary year-to-year.

Strategies to fund the PCMP recommendations include:

- Maintain a list of potential funding sources, including contact information and requirements.
- Apply and assist municipalities in applying for grants that have a high probability of being awarded.
- Recognize opportunities for municipalities to collaborate on grant applications and infrastructure programs.
- Consider the creation of a Regional Trail Development Fund to fund ongoing trail improvements or additions.

Three scenarios for a staged implementation of constructing the bikeway network infrastructure are provided following, based on level of effort and funding availability.

Scenario 1: Moderate Effort

Under the existing funding scenario, municipalities incorporate the majority of bicycle and pedestrian improvements into existing roadway construction or reconstruction projects. Funding for these projects generally come from public works budgets, from general funds, development cost charges, local or business improvement districts, and other sources. Municipalities also receive funding from grants, particularly through the Cycling Infrastructure Partnerships Program (CIPP), Provincial BikeBC and LocalMotion Programs, as well as a number of recent grants from Infrastructure Canada.

This scenario assumes that municipalities and the CRD continue the same level of funding for bicycle and pedestrian projects,6 and continue seeking additional funding through grant opportunities. The PIC bikeway network would be developed piecemeal over an extended period, as other roadway projects were identified and based on municipal priorities. The CRD would assist in the development of the inter-community bikeway network by assisting municipalities in grant funding applications and by continuing to develop the Regional Trails Network.

Scenario 2: Strong Effort

The CRD could make active transportation a regional priority by establishing a dedicated fund through an allocation from municipalities, or through a parcel tax or another source. This source would be available to municipalities for developing projects on the inter-community bikeway network based on local and regional priorities.

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6   Exact funding amounts for bicycle /pedestrian projects are not possible to extract from municipal transportation spending, as bikeway and walkway improvements are generally included in every roadway construction or reconstruction project.

Table 4. Priority Bikeway Projects by Jurisdiction

Scenario 1: Moderate Effort	Scenario 2: Strong Effort	Scenario 3: Aggressive Effort
In this scenario, the only CRD resources applied to implementing education and encouragement efforts is providing a quarter-time staff position to track municipal efforts and regularly convene a Regional Pedestrian and Cycling Steering Committee. This scenario assumes that CRD provides no program funding beyond staff time, and that they rely heavily on community groups and volunteers to execute the recommendations. Under this scenario, CRD will achieve a limited role as a convener, coordinator, and advisor.	Under this scenario, it is assumed that one full-time staff person at CRD will be assigned to tracking Masterplan implementation, including education and encouragement activities. In addition, it is assumed that some monies would be secured to implement key recommendations.	This scenario assumes both one full-time Pedestrian and Cycling Coordinator position as well as 1.5 FTE outreach staff annually, charged with numerous public interface tasks (such as Youth Bike Skills instruction and personalized marketing campaign outreach and logistics). It is also assumed that funding will be secured to move forward on all recommendations (though not necessarily to complete all recommendations within Year 1).

RECOMMENDATION	ACTION UNDER SCENARIO	REACH (# RESIDENTS)	RESOURCES NEEDED (COST/ STAFF TIME)
SCENARIO 1: MODERATE EFFORT			
ASRTS	Communicate with partners	Low	$
Youth Bike Skills Course	None	None	None
Special Event Sponsorship	Support community events	Low	$
Bike Sharing Feasibility Study	None	None	None
Develop User Map	As time allows; online distribution only	Moderate	$
On-Line Tool	None	None	None
Active Transportation Prof. Development Courses	One training per year	Low	$
Personalized Marketing Campaign	None	None	None
Respect Campaign	None	None	None
Data Collection and Survey	Limited annual user counts	n/a	$
SCENARIO 2: STRONG EFFORT			
ASRTS	Communicate with partners; establish shared goals; track progress	Moderate	$$
Youth Bike Skills Course	Expansion to at least one program in each school district	Moderate	$$
Special Event Sponsorship	Host one signature event and support community events	Moderate	$$$
Bike Sharing Feasibility Study	Begin working with municipal partners towards this goal	Low	$
Develop User Map	Create paper & online user maps; print & actively distribute maps	High	$$
On-Line Tool	Begin working with municipal partners towards this goal	Low	$
Active Transportation Prof. Development Courses	Two trainings per year	Moderate	$$
Personalized Marketing Campaign	Actively search for applicable grant funding source	None	$
Respect Campaign	Initiate conversation with law enforcement and municipal partners	None	None
Data Collection and Survey	Widespread annual user counts	Moderate	$$
SCENARIO 3: AGGRESSIVE EFFORT			
ASRTS	Develop and implement work plan with partners through formal ASRTS Working Group; initiate School Travel Planning; evaluate efforts	High	$$$
Youth Bike Skills Course	Reach every seventh grader	High	$$$$
Special Event Sponsorship	Host several high-profile community events (e.g. a series of Sunday Parkway events in the summer and a family biking workshop)	High	$$$$
Bike Sharing Feasibility Study	Contract out full feasibility study	Moderate	$$
Develop User Map	Create paper and online user maps; print and actively distribute maps	High	$$
On-Line Tool	Roll out beta online tool by end of 2012	Moderate	$$$
Active Transportation Prof. Development Courses	Four trainings per year	Moderate	$$$
Personalized Marketing Campaign	Execute pilot campaign in Year 1	Moderate	$$$
Respect Campaign	Execute campaign through formal media channels, grassroots outreach	Moderate	$$$
Data Collection and Survey	Widespread annual user counts and surveys; creation and distribution of annual report card	Moderate	$$$

An advantage of the CRD's involvement is to develop projects across municipal boundaries and with a regional perspective. In addition, the funding would promote the development of world-class facilities suitable for all bicyclist types.

The 'strong effort' scenario would seek to build the priority network in 27 years, requiring a region wide allocation of about $4 million annually.[7]

_____

7 It should be noted that a large portion of the costs associated with the projects are for cycle tracks and separated facilities. Alternate routes may be available to minimize costs for these facilities.

Priority Actions:

• Pursue a dedicated funding source at assist the municipalities and MOTI in developing the primary inter community bikeway network.

Scenario 3: Aggressive Effort

This scenario would develop the network quickly, with significant regional investment. To build the complete PIC network in 27 years would require $10 million annually invested in bicycle transportation infrastructure.

Strategy 18.1: Integrate cycling and pedestrian planning and policies into CRD, member municipality and agency partner planning documents

To bolster support and increase implementation, PCMP policies should be integrated into other planning initiatives to create a more complete and integrated planning and policy framework.

The key future CRD planning documents that relate to the PCMP include:

• CRD Transportation Demand Strategy (expected 2011)
• CRD Transportation Corridor Plan
• CRD Parks Master Plan (updated as the CRD Regional Parks Strategic Plan, expected 2011)
• 2005 Regional Growth Strategy (updated as the Regional Sustainability Strategy, expected 2011)
• Rapid Transit Master Plan
• Victoria Transit Future Plan

As Plans that are in development progress, the PCMP network recommendations may need to be revisited to connect to regional transit centres. In addition, the recommendations in this Masterplan should be revisited as it is implemented; connections to regional multi-use trails and other high-use corridors may require additional treatment. An even more robust network with parallel corridors will be justified to accommodate high levels of cycling anticipated in the Region.

Figure 1. Network Build-Out and Mode Share, Portland Oregon
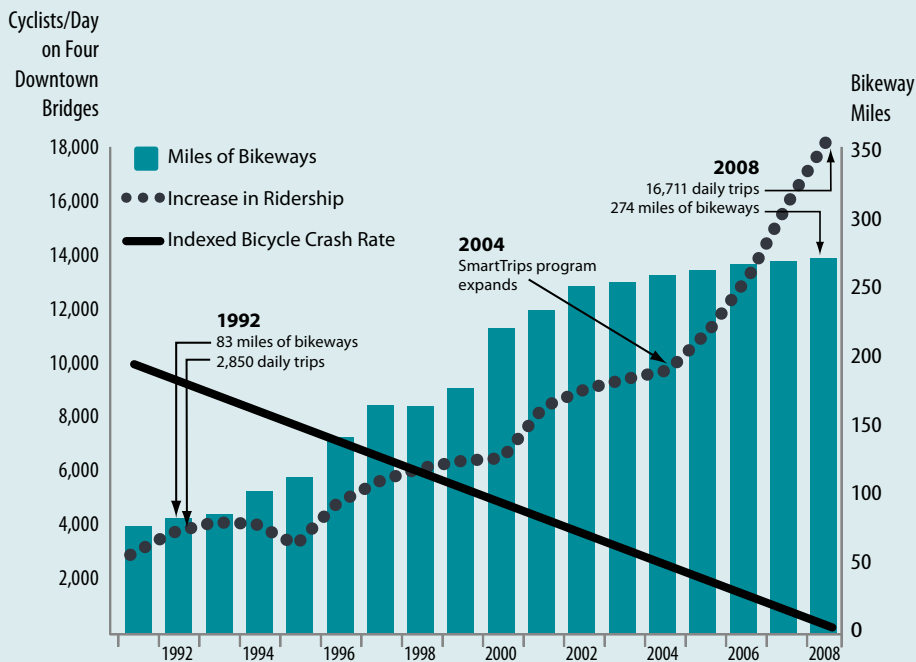
The fact that bicycle ridership increases as the physical bikeway network is constructed has been proven over and over again throughout the world. The City of Portland, Oregon, has tracked the number of bicyclists crossing bridges into downtown since 1991.

As shown in the graph, the data indicates a long-term trend towards increased ridership. While the development of additional bikeway facilities has tapered off since 2002, bikeway traffic has continued increasing since that time.

How to Use This Masterplan

The CRD Regional Pedestrian and Cycling Masterplan provides a lot of information representing substantial involvement from the CRD, municipal partners, organizations, and citizens. The following FAQ provides a quick reference for particularly relevant or substantive pieces of the Masterplan.

Is the Bikeway Network set in stone?

No. This Masterplan is a living document; priorities will shift as opportunities such as development, roadway reconstruction, or specific grant funding opportunities arise. In addition, the inter-community bikeway network was conceived to facilitate bicycle access throughout the region. Alternative routes may be identified to enhance bicycling opportunities for all types of users. The project list should be revisited every five years to realign priorities with those of member municipalities, partners, and citizens.

Why doesn't the Masterplan tell us exactly where bike lanes should go?

The PCMP recommends a facility level of separation dependent on roadway classification. Truck or transit traffic, proximity of schools elder care facilities, turning movements, sightlines, and other factors impact facility design. This Masterplan and the accompanying Design Guidelines provide tools for individual municipalities to determine the appropriate facility for a given location.

What if we can only afford to install a Class II facility for now?

In some circumstances, a Class II facility is a satisfactory substitute for a Class I facility. The classifications are shown as a continuum due to the variety of factors, listed above, that impact what type of facility is appropriate to all levels of users. In most locations, the ultimate goal is to provide a Class I standard throughout the inter-community bikeway network, and a Class II facility should be considered a temporary improvement.

Whose responsibility is it to pay for the road improvements?

The improvements to make a road into a primary inter-community bikeway are the responsibility of the body with jurisdiction over the roads – generally the municipality, or the Ministry of Transportation and Infrastructure (MoTI) for highways and roadways within the Juan de Fuca Electoral Area. The CRD is responsible for the Regional Trails Network, and will be seeking federal assistance (Gas Tax) to fund the remainder of the E & N Rail Trail.

How will the Design Guidelines be used?

The Bicycle and Pedestrian Design Guidelines provide detailed guidance for the development of bicycle and pedestrian facilities, intersection treatments, and trip enhancement elements. They provide references to the federal and provincial guidelines for specific treatments. When considering a bicycle improvement project, engineers and planners should consult the Design Guidelines as a toolbox of options for bikeway and walkway facilities.

Why wasn't a Pedestrian Network identified?

For the most part, walking is undertaken at the local level, so developing a "regional approach" to pedestrian planning is not realistic. Furthermore, most municipalities do not have detailed information about the presence of sidewalks, curb let-downs, and marked crossings. This Masterplan identified regional pedestrian priority areas, which are linked to guidance for accessibility and treatment standards in the Bicycle and Pedestrian Design Guidelines. Individual municipalities are encouraged to use this information to inventory and prioritize sidewalks within the identified pedestrian priority areas within their jurisdiction.

How does this Masterplan interface with local bike networks?

Local bicycle networks were considered when the primary inter-community bikeway network was identified. Corridors not considered to be "regional in nature" do not provide connections between communities or identified regional connections. They are important routes for bicycle circulation within municipalities, and frequently connect to the primary bikeway network. The Bicycle and Pedestrian Design Guidelines include considerations for local street bikeways and neighbourhood greenways, which can assist in the development of consistent and high-quality local bikeways.

Can this Masterplan be used as a bike map?

Because this Masterplan focuses on identifying regional corridors, the network map does not include existing local networks. It also does not consider roadways that municipalities designate as bikeways to be existing if no bicycle accommodation (signs or pavement markings) are present. Finally, several municipalities define bikeways based on user type or trip type (commuter route, recreational route). These designations are more helpful for individual trip planning than specific type of facility (bike lane, shared lane marking, etc.), which are important distinctions from a planning and engineering perspective.

This Masterplan is a blueprint for how the Capital Region can become a worldwide leader in sustainability and active transportation. The ambitious mode split targets are achievable, but will only be possible through collaboration between the CRD, member municipalities, and other regional partners. This Masterplan provides the direction and support to leverage the existing resources within the region to realize regional goals.

The following maps have been extracted from Appendix A

Map 1   Pedestrian Priority Areas (also referred to as Map 3 in the body of the text)

Maps 2 – 6   PCMP PIC Bikeway Network – Existing Facilities

Maps 7 – 11   PCMP PIC Bikeway Network – Recommended Facility Separation

The complete collection of PCMP Appendices (A through H) and the PCMP Design Guidelines can be viewed and/or downloaded at www.crd.bc.ca/regionalplanning/transportation/cycling-walking/masterplan.htm
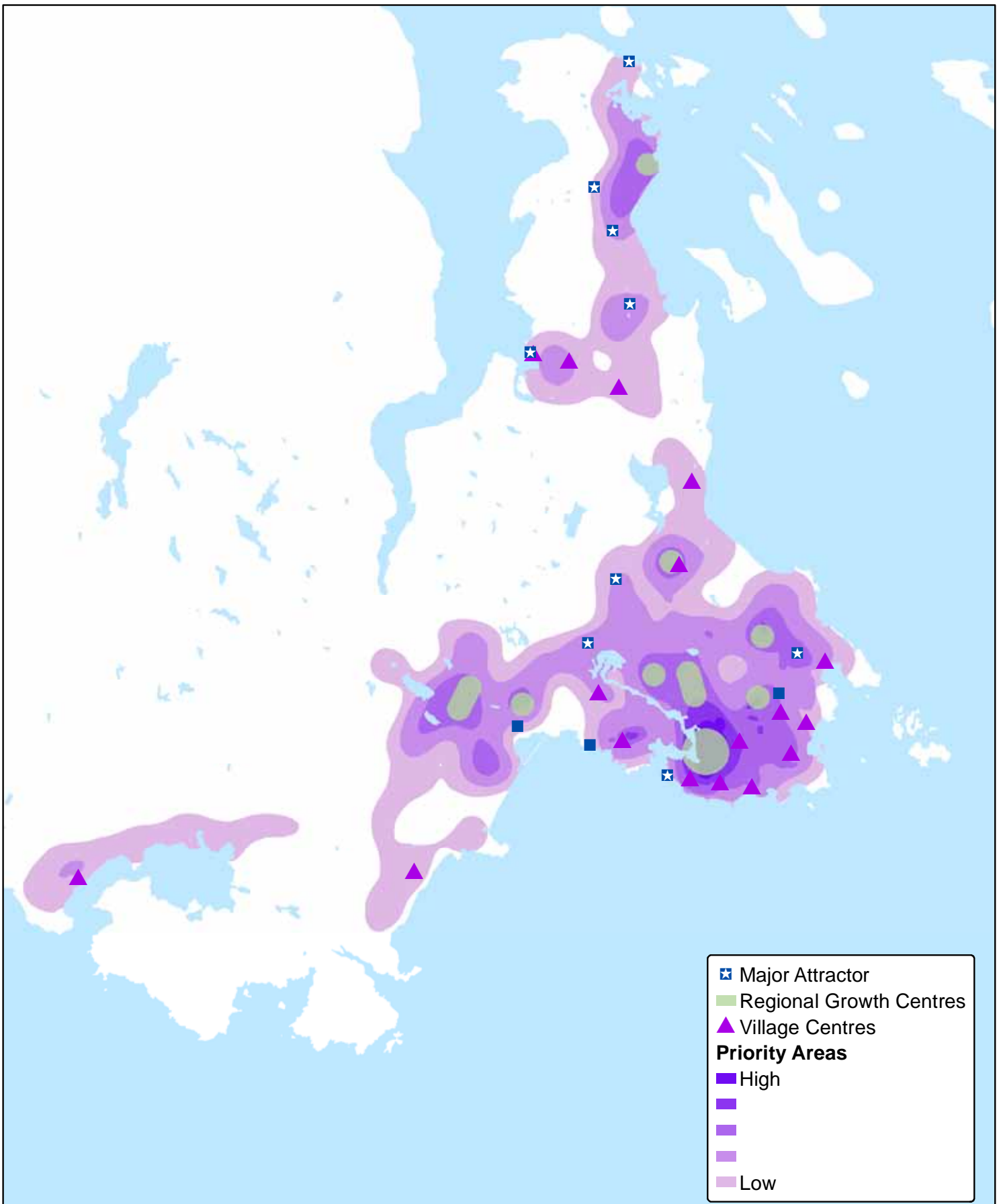
Map 1. Regionally Significant Priority Areas

Legend:
- ✪ Major Attractor
- Regional Growth Centres
- ▲ Village Centres

Priority Areas
- High
- Low

Capital Regional District Regional Pedestrian and Cycling Master Plan
Author: Alta Planning + Design
Date: March 2011

0 1 2 Kilometres

alta

Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Regional Growth Centres
- Parks
- Existing Municipal Bikeway

Existing Facility

Facilities that currently meet Class I standard for separation
- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway
- PIC Bikeway with No Existing Facilities

Note: Conceptual Alignment Subject to Change

SIDNEY

NORTH SAANICH

Tseycum First Nation

Pauquachin First Nation

CENTRAL SAANICH

Tsawout First Nation

Tsartlip
First Nation

West Saanich Rd

Walla

0   0.5   1
Kilometers

Map 2. Existing Bicycle Facilities - Peninsula

Capital Regional District
Regional Pedestrian and Cycling Master Plan

alta

Legend

- ⬟ (blue star) Regional Attractor
- ● (orange) Civic Building
- ● (yellow) School
- ● (red) Transit Exchange
- ▲ (purple) Village Centres
- (pink) Regional Growth Centres
- (green) Parks
- —— Existing Municipal Bikeway

Existing Facility

- —— (green) Facilities that currently meet Class I standard for separation
- —— (green) Multi-Use Trail
- —— (blue) Bicycle Lane/Shoulder Bikeway
- —— (orange) Shared Roadway
- - - - PIC Bikeway with No Existing Facilities
- —— (red) Note: Conceptual Alignment Subject to Change

SAANICH

VIEW ROYAL

Map 3. Existing Bicycle Facilities - Core

Capital Regional District
Regional Pedestrian and Cycling Master Plan

OAK BAY

VICTORIA

COLWOOD

Songhees
First Nation

Esquimalt
First Nation

Galloping Goose Trail

E&N Rail Trail

Street labels

Arbutus Rd
Cadboro Bay Rd
Sinclair Rd
Gordon Head Rd
Cedar Hill Cross Rd
Henderson Rd
McKenzie Ave
Landsdowne Rd
Cadboro Bay Rd
Beach Dr
Bowker Ave
Oak Bay Ave
McNeill Ave
Beach Dr
Foul Bay Rd
Richmond Rd
Shelbourne St
North Dairy Rd
Hillside Ave
Crescent Rd
Richardson St
Fairfield Rd
Blenkinsop Rd
Cook St
Maplewood Rd
Haultain St
Bay St
Begbie St
Fort St
Pandora Ave
Johnson St
Richardson St
May St
Cook St
Borden St
Graham St
Finlayson St
Vancouver St
Yates St
Clearidale Ave
Tattersall Dr
Blanshard St
Douglas St
Government St
Belleville St
Douglas St
Dallas Rd
McKenzie Ave
Boleskine Rd
Gorge Rd E
Harbour Rd
Burnside Rd E
Catherine St
Tillicum Rd
Admirals Rd
Interurban Rd
Craigflower Rd
Tampson St
Esquimalt Rd
Admirals Rd
Helmcken Rd
Burnside Rd
Trans-Canada Hwy
Island Hwy
Island Hwy
Ocean Blvd
Bay Hwy

N

0   0.5   1
Kilometers

alta

Legend

Regional Attractor

Civic Building

School

Transit Exchange

Village Centres

Regional Growth Centres

Parks

— Existing Municipal Bikeway

Existing Facility

Facilities that currently meet Class I standard for separation

— Multi-Use Trail

— Bicycle Lane/Shoulder Bikeway

— Shared Roadway

---- PIC Bikeway with No Existing Facilities

Note: Conceptual Alignment Subject to Change

SAANICH

VIEW ROYAL

HIGHLANDS

Old West Saanich Rd

Oldfield Rd

West Saanich Rd

Wallace Dr

Hartland Ave

Interurban Rd

Wilkinson Rd

Millstream

Trans-Canada Hwy

Trans Canada Trail

Map 4. Existing Bicycle Facilities - West Shore One

Capital Regional District
Regional Pedestrian and Cycling Master Plan

LANGFORD

COLWOOD

Songhees
First Nation

Esquimalt
First Nation

Galloping Goose Trail

E & N Trail

Gorge Rd W
Craigflower Rd
Admirals Rd
Helmcken Rd
Trans-Canada Hwy
Island Hwy
Goldstream Ave
Treanor Ave
Setchfield Ave
Amy Rd
Sooke Lake Rd
Jacklin Rd
Kelly Rd
Sooke Rd
Wishart Rd
Veteran Memorial Pkwy
Metchosin Rd
Latoria Rd
Happy Valley Rd
Humpback Rd
Lagoon Rd
Ocean Blvd
Esquimalt Rd
Admirals Rd
Lampson St

Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

0   0.45   0.9
Kilometers

Legend

Symbol	Description
★	Regional Attractor
●	Civic Building
●	School
●	Transit Exchange
▲	Village Centres
▮	Regional Growth Centres
▮	Parks

Existing Municipal Bikeway

Existing Facility
Facilities that currently meet Class I standard for separation

Multi-Use Trail
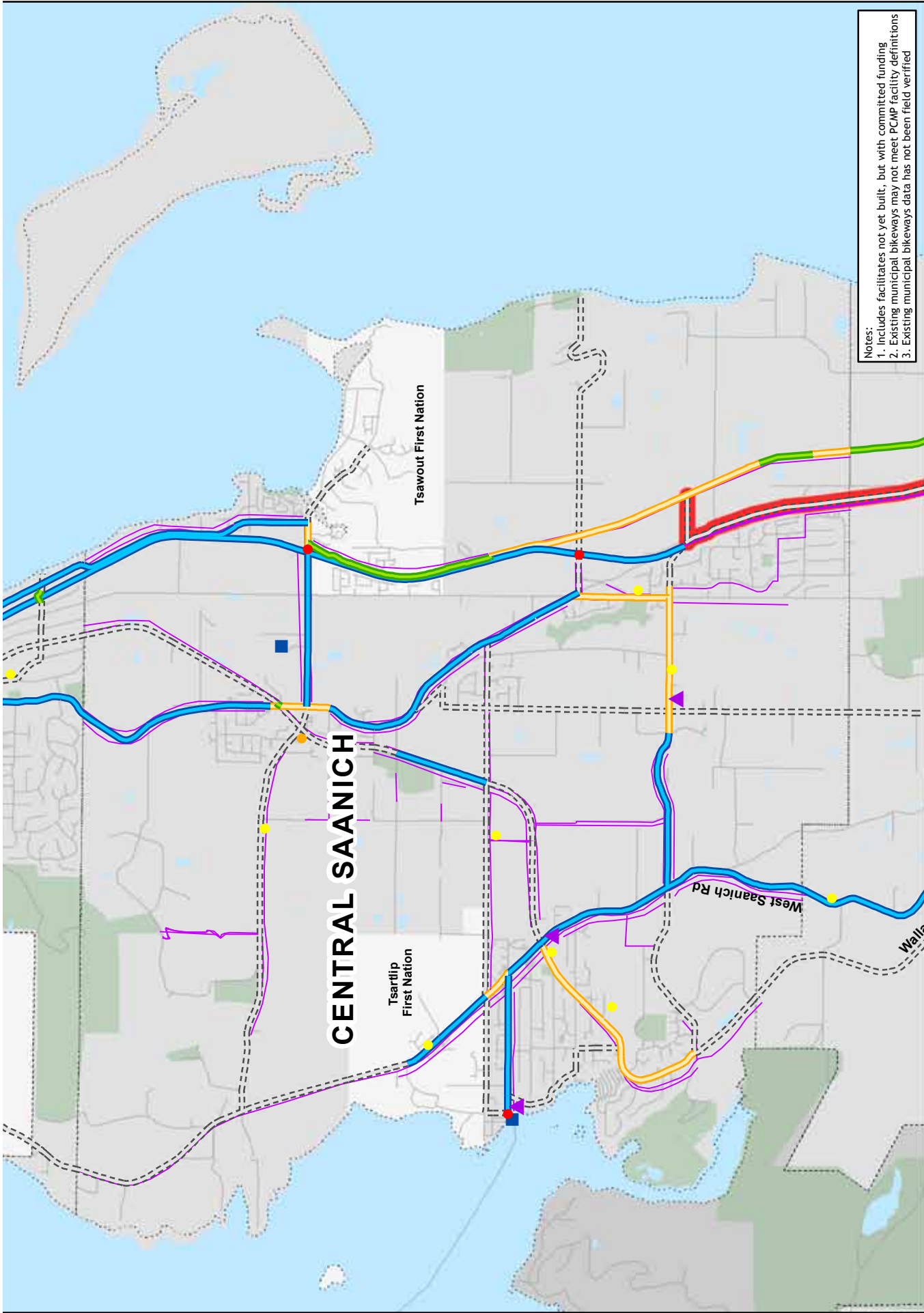
Shared Roadway

PIC Bikeway with No Existing Facilities

Note: Conceptual Alignment Subject to Change

SOOKE

Otter Point Rd

Sooke Rd

T'Sou-ke First Nation

Grant Rd

E Sooke Rd

West Coast Rd

T'Sou-ke First Nation

Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

Map 5. Existing Bicycle Facilities - West Shore Two

Capital Regional District
Regional Pedestrian and Cycling Master Plan

LANGFORD

COLWOOD

Esquimalt First
Nation

METCHOSIN

Trans Canada Hwy

Trans Canada Trail

E & N Trail

Jacklin Rd

Sooke Rd

Island Hwy

Veteran Memorial Pkwy

Wishart Rd

Sooke Rd

Metchosin Rd

Ocean Blvd

Sooke Rd

Happy Valley Rd

Kangaroo Rd

Galloping Goose Trail

Sooke Rd

Becher Bay
First Nation

0   2   4
Kilometers

alta

Pacific Marine Rd

Pacheedaht
First Nation

West Coast Rd

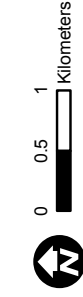|			
⭐	Regional Attractor	——	Existing Municipal Bikeway
🟠	Civic Building	**Existing Facility**	
🟡	School	Facilities that currently meet Class I standard for separation	
🔴	Transit Exchange	▬▬▬	Multi-Use Trail
🔺	Village Centres	▬▬▬	Bicycle Lane/Shoulder Bikeway
🟪	Regional Growth Centres	▬▬▬	Shared Roadway
🟩	Parks	=======	PIC Bikeway with No Existing Facilities
		🟥	Note: Conceptual Alignment Subject to Change

Map 6. Existing Bicycle Facilities - Juan de Fuca

Capital Regional District
Regional Pedestrian and Cycling Master Plan

Trans Canada Trail

Galloping Goose Trail

METCHOSIN

SOOKE

Otter Point Rd

Sooke Rd

T'Sou-ke
First Nation

T'Sou-ke
First Nation

Becher Bay
First Nation

N

0   2.5   5
Kilometers

alta
PLANNING + DESIGN

Legend:

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ◀ Village Centres
- Park
- Regional Growth Centres

PIC Bikeway
Facilities that currently meet Class I standard for separation
- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway

Recommended PIC Facility Separation
- Multi-Use Trail
- Separated On-Street
- Bicycle Lane/Shoulder Bikeway
- Shared Lane
- Note: Conceptual Alignment Subject to Change

SIDNEY

NORTH SAANICH

Patricia Bay Hwy
Swartz Bay Rd
McDonald Park Rd
Patricia Bay Hwy
Ardwell Ave
Resthaven Dr
Lochside Trail
Mills Rd W
Galaran Rd
Beacon Ave
Ocean Ave W
Fifth St
Lochside Dr
Canora Rd
Canora Rd
East Saanich Rd
McTavish Rd
McTavish Rd
Willingdon Rd
Wain Rd
Tatlow Rd
Lands End Rd
Chalet Rd
Madrona Dr
West Saanich Rd
West Saanich Rd
Tseycum First Nation
Pauquachin

Map 7. Recommended Facility Separation on PIC Bikeway Corridors - Peninsula

Capital Regional District
Regional Pedestrian and Cycling Master Plan

CENTRAL SAANICH

Tsawout First Nation

Tsartlip First Nation

First Nation

Roads (labels):
Lochside Dr
Patricia Bay Hwy
Stautw Rd
Island View Rd
Lochside Dr
Amity Dr
Aldous Terr
East Saanich Rd
Wallace Dr
Mt Newton Cross Rd
Mt Newton Cross Rd
East Saanich Rd
Keating Cross Rd
Central Saanich Rd
Oldfield Rd
Seabrook Rd
Veyaness Rd
Stellys Cross Rd
Wallace Dr
Marchant Rd
Verdier Ave
Banyentico Ave
Wallace Dr

0   0.5   1
Kilometers

N

Legend

- ⬟ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Park
- Regional Growth Centres

PIC Bikeway

Facilities that currently meet Class I standard for separation

- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway

Recommended PIC Facility Separation

- Multi-Use Trail
- Separated On-Street
- Bicycle Lane/Shoulder Bikeway
- Shared Lane
- Note: Conceptual Alignment Subject to Change

SAANICH

VIEW ROYAL

Map 8. Recommended Facility Separation on PIC Bikeway Corridors - Core

Capital Regional District
Regional Pedestrian and Cycling Master Plan

OAK BAY

VICTORIA

COLWOOD

0   0.5   1
Kilometers

alta

N

Legend

Regional Attractor

- ⊞ Civic Building
- ● School (orange)
- ● Transit Exchange (yellow)
- ● Village Centres (red)
- ▲ Park
- Regional Growth Centres

PIC Bikeway

Facilities that currently meet Class I standard for separation

- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway

Recommended PIC Facility Separation

- Multi-Use Trail
- Separated On-Street
- Bicycle Lane/Shoulder Bikeway
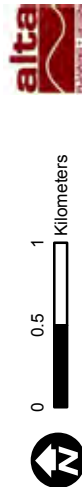- Shared Lane
- Note: Conceptual Alignment Subject to Change

SAANICH

VIEW ROYAL

HIGHLANDS

Keating Cros

Old West Saanich Rd

Oldfield Rd

Elk Rd

Interurban Rd

West Saanich Rd

Hartland Ave

Map 9. Recommended Facility Separation on PIC Bikeway Corridors - West Shore One

Capital Regional District
Regional Pedestrian and Cycling Master Plan

LANGFORD

COLWOOD

Galloping
Helmcken Rd
Admirals Rd
Craigflower Rd
E&N Rail Trail
Esquima
Admirals Rd
Island Hwy
Trans-Canada Hwy
Burnside Rd W
Island Hwy
Ocean Blvd

Songhees
First Nation

Esquimalt
First Nation

Notes:
1. Recommendations were primarily based on roadway
   classifications defined by the BC Digital Roadway Atlas

N

0   0.45   0.9
         Kilometers

alta

Conceptual Alignment

Otter Point Rd

Sooke Rd

Grant Rd

West Coast Rd

T'Sou-ke First Nation

T'Sou-ke
First Nation

SOOKE

METCHOSIN

Galloping Goose Trail

E Sooke Rd

Becher Bay
First Nation

Notes:
1. Recommendations were primarily based on roadway
classifications defined by the BC Digital Roadway Atlas

Map 10. Recommended Facility Separation on PIC Bikeway Corridors - West Shore Two

Capital Regional District
Regional Pedestrian and Cycling Master Plan

Legend

- Regional Attractor
- Civic Building
- School
- Transit Exchange
- Village Centres
- Park
- Regional Growth Centres

PIC Bikeway

Facilities that currently meet Class I standard for separation

- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway

Recommended PIC Facility Separation

- Multi-Use Trail
- Separated On-Street
- Bicycle Lane/Shoulder Bikeway
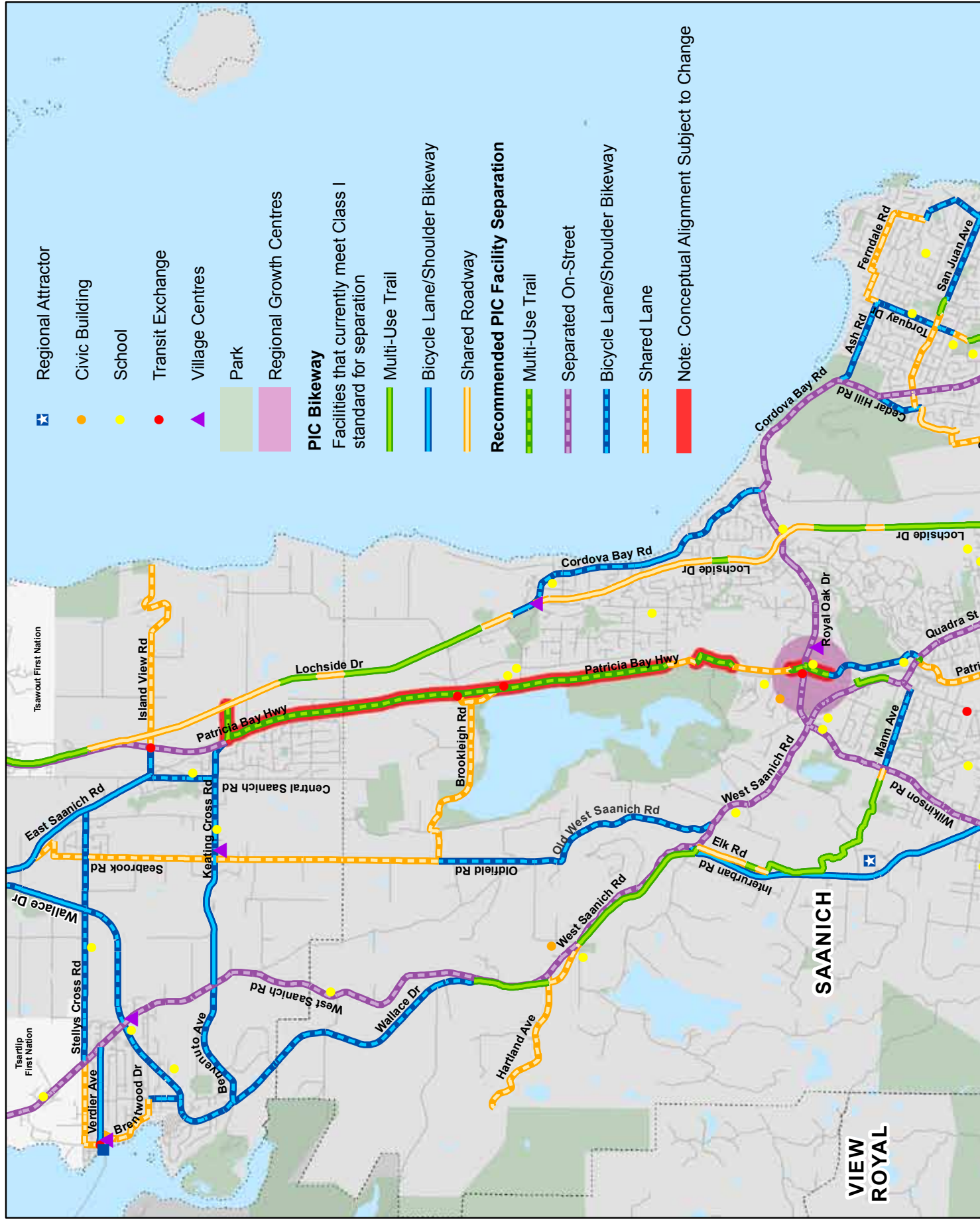- Shared Lane
- Note: Conceptual Alignment Subject to Change

Map labels: Trans Canada Hwy, Trans Canada Trail, LANGFORD, Sooke Rd, Kangaroo Rd, Happy Valley Rd, E & N Trail, Jacklin Rd, Sooke Rd, Veteran Memorial Pkwy, Wishart Rd, Metchosin Rd, COLWOOD, Ocean Blvd, Isl'nd Hwy, Esquimalt First Nation, Twin Island First Nation, Gorge Rd W, Admirals Rd, VICTORIA

0   2   4   Kilometers

alta

Pacific Marine Rd

Pacheedaht
First Nation

West Coast Rd

Regional Bikeway

Facilities that currently meet Class I standard for separation

⬟ Regional Attractor

● Civic Building

● School

● Transit Center

▲ Village Centres

Park

Regional Growth Centres

━━━ Multi-Use Trail

━━━ Bicycle Lane/Shoulder Bikeway

━━━ Shared Roadway

Recommended Regional Facility Separation

┅┅┅ Multi-Use Trail

┅┅┅ Separated On-Street

┅┅┅ Bicycle Lane/Shoulder Bikeway

┅┅┅ Shared Lane

━━━ Note: Conceptual Alignment Subject to

Map 11. Recommended Facility Separation on Regional Bikeway Corridors - Juan de Fu

Capital Regional District
Regional Pedestrian and Cycling Master Plan

Trans Canada Trail

Galloping Goose Trail

METCHOSIN

SOOKE

Conceptual Alignment

Otter Point Rd

T'Sou-ke
First Nation

Sooke Rd

T'Sou-ke
First Nation

Becher Bay
First Nation

Change

ca

N

0   2.5   5
                    Kilometers
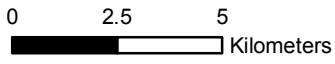
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Glossary of Terms

Active and Safe Routes to School
A national and international movement to help more children walk and bicycle to school through infrastructure and programmatic improvements.
Alta Planning + Design

Advocates' Session
A number of public sessions were undertaken over the course of the masterplanning process. Dates and Titles:

- June 10, 2010 - Phase II Overview
- September 25, 2010 - Education, Outreach and Network Development

CRD staff, Alta Planning + Design

Bikeway
Any roadway or trail which is designated for use by bicyclists. Common types of existing bikeways include marked roadway shoulders, signed routes, and dedicated bike lanes.
Alta Planning + Design

CAC
Community Advisory Committee - made up of residents from across the region with an interest in cycling and walking. See inside front page of Masterplan for a complete list of members
CRD staff, Alta Planning + Design

Class (I, II, III) facility
A general system of quantifying bikeway quality. Class I facilities provide a cycling experience that is attractive and comfortable for all system users while Class III facilities may be comfortable for only the most intrepid users.
CRD staff, Alta Planning + Design

Class I and Class II Bike Parking
Refers to Long Term (Class I) and Short Term (Class II) parking facilities.

Major attractor
Inclusive of unique regional destinations as defined by CRD staff. Examples of these attractors include the University of Victoria, Schwartz Bay Ferry Terminal and Butchart Gardens.
CRD staff, Alta Planning + Design

Major destinations
This includes Regional Centres (as identified by the RGS), Villages (as identified by staff on the PCMP TAC committee)
CRD staff, Alta Planning + Design

Multi-Use Trail
This term is inclusive of both the Regional trail system (e.g., the Galloping Goose, Lochside, Trans Canada Trail and the E&N) maintained by CRD and off-street trails which are included as primary bikeways.
Alta Planning + Design

Primary Inter-Community Bikeway
Regionally-significant: routes that provide connections between municipalities, electoral areas, and regional destinations such as parks, universities, transit exhanges, and other key locations.
CRD staff, Alta Planning + Design

Regional facilities
Refers to the Regional Trails - Galloping Goose Rail Trail, Lochside Trail, and E & N Trail.
CRD staff, Alta Planning + Design

Short Term, Long Term bike parking
Refers to Long Term (Class I) parking facilities for cyclists staying more than three hours and Short Term (Class II) parking facilities for people staying less than three hours.
Alta Planning + Design

TAC
Technical Advisory Committee - made up primarily of member municipality staff. See inside front page of Masterplan for a complete list of members
CRD staff, Alta Planning + Design

The CRD (Capital Regional District)
When the CRD is identified as the body recommended to undertake an action in this Masterplan, it is used as an umbrella term to capture the various departments within the CRD for whom the responsibility would best apply. For example, Regional Planning may undertake some actions while Visitor Services within the Parks Department, may best be suited to deliver others.
CRD staff, Alta Planning + Design

The Region/the region
The Region refers to the CRD as the government agency, whereas the region refers to the physical area which encompasses all 13 municipalities, and the Juan de Fuca Electoral Area.
CRD staff, Alta Planning + Design

Transit exchange
Reflects major transit connections such as exchanges or major stops (high volume) as well as other locations identified by the Transit Future plan and the Rapid Transit plan.
CRD staff, Alta Planning + Design

Transit integration
The practice of closely tying bicycle and pedestrian improvements to the transit system to provide increased system linkages for the "last kilometre" of travel.
Alta Planning + Design

Trip enhancement facilities
Also known as "end-of-trip" facilities and typically inclusive of bicycle parking, and changing rooms for cyclists as well as benches, water fountains and landmark indicators for pedestrians.
Alta Planning + Design

Alta Planning + Design
711 SE Grand Avenue
Portland, OR 97214

www.altaplanning.com

Appendix A. Bicycle and Pedestrian Network Development Technical Appendix

The primary inter-community (PIC) bicycle network forms the basis for the Pedestrian and Cycling Master Plan (PCMP) recommendations, focusing regional and municipal planning efforts on the development of a connected network throughout the Capital Regional District (CRD). The bicycle network was developed based on previous planning efforts, existing conditions, and linking key destinations. The Masterplan also identifies pedestrian 'priority areas' that link destinations and provide access to transit where design should provide a high level of accessibility.

This appendix provides an overview of the methodology used to select the PIC cycling network and pedestrian priority areas, as well as the selection process for recommended bicycle facility types and priority bikeway projects. The appendix also addresses engineering considerations that support the walkway and bikeway networks, including trip enhancement facilities and integration with transit.

Identification of Regional Pedestrian Priority Areas

The PCMP identifies primary inter-community non-motorized corridors that provide direct and convenient connections to key destinations including regional trails, parks, schools, transit centres, regional centres, and other locations.

Definition of Regional Pedestrian Priority Areas

Due to the large distances involved with regional trips, most regional pedestrian trips are a function of multi-modal trips, combining walking, transit, bicycling, or other modes. People will walk to lunch or to a store after bicycling to work in the morning. They will walk from their homes to schools or parks. They will ride transit to another location and walk to their destination. They may drive to a trail and walk along it. For these reasons, a regional pedestrian 'network' is more a discontinuous series of smaller areas within which more people are likely to walk than in a solely residential area.

The term 'pedestrian' refers to a person moving from place to place, on foot and/or with the use of an assistive mobility device (when that person has a disability and/or medical condition). "Walking" or "to walk" are the terms used to describe this movement of a pedestrian.

Sidewalks, multi-use trails, and roadway shoulders are typically recognized as pedestrian facilities.[1] Pedestrian travel is accommodated and enhanced by intersection treatments such as crosswalks and curb ramps, as well as planter zones and other amenities. A planting or buffer zone is the area between the sidewalk and the roadway, which may contain street trees, signal poles, utility poles, street lights, controller boxes, hydrants, signs, parking meters, driveway aprons, grates, hatch covers, or street furniture. The buffer zone is a critical component of an improved pedestrian environment as it provides separation between people walking on the sidewalk and motorized traffic.

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[1] *American Association of State Highway and Transportation Officials* (AASHTO).

Towards a More Inter-modal Definition

BC Transit recognizes the importance of providing adequate pedestrian routes to transit centres. Some key points noted by representatives of BC Transit include:

> *"Having good quality pedestrian connections from residential areas to local transit stops will help to make the entire transit trip more attractive (especially as an alternative to driving). Good pedestrian connections - especially more direct connections - means that there are more potential transit riders within walking distance (typically 400 m for local service, 1 km+ for a rapid transit station) of a bus stop or transit station. Usually, a grid type network will maximize pedestrian access to a transit stop. If there isn't a grid (e.g., cul-de-sacs), then pedestrian cut-throughs can help to reduce walking distances, resulting in more potential users within walking distance."*

> *"It will also be critical to provide high quality pedestrian connections between transit stations and nearby centres or major trip generators. This is especially the case where major transit corridors may not go through the middle of key nodes. For example, the Tillicum major centre is about 500 m south of the proposed rapid transit alignment, so good pedestrian connections will be important."*

> *"Cycling-transit connections are an effective way of greatly extending the reach or coverage from transit. The "typical" 400 m walking distance represents about a 5 minute walk. The average commuter cyclist could cover 3-4 times this distance in the same time, meaning that the potential area within 5 minutes of the transit stop could increase by a factor of 9 to 16. This may also be a way of providing some transit coverage in lower density areas, where you couldn't support a transit route within 400 m of all residents. BC Transit is looking at including bike storage at transit stations and exchanges. There are also bike racks on buses. Cycling infrastructure should include good connections to transit stations and exchanges to enable these multi-modal trips."*

> *"Transit, walking, and cycling can work together to provide a range of alternatives to driving. While walking is a good alternative for short trips and cycling is good for medium-length trips, transit can be a good alternative to driving for longer, regional trips, or for times when it is not practical to walk or cycle (e.g. due to weather, travelling with children, topography, etc). Better integration of these different networks will make it easier for people to choose from a range of transportation options (or a combinations of options) when planning a trip."*

Identification of Pedestrian Priority Areas

Areas more likely to receive high pedestrian use were defined as pedestrian priority areas. The identification of these areas incorporated digital data from the CRD, feedback from BC Transit and other stakeholder groups, as well as proposed regional Regionally Significant Corridor selection criteria.

The following features were considered in the development of regional pedestrian priority areas.

- Regional growth centres
- Village centres
- Future rapid transit exhanges
- Regional, Provincial and Federal parks
- Bus stops
- Regional trails (Lochside, Galloping Goose, and existing/future E&N alignment)

- Primary, secondary, and post-secondary schools
- Civic destinations including justice and government buildings, libraries, museums, recreation centres, and community centres
- Transit exchanges

Variations in urban and rural within CRD were taken into consideration during this process; the same factors were used region wide to identify potential regional pedestrian priority areas, while the analysis of the Juan de Fuca Electoral Area reflects a scoring range more appropriate to rural land use. These pedestrian priority areas indicate locations where increased investment in pedestrian facilities will support the development of a Class I pedestrian environment and promote increased walking for transportation and recreation.

Map 1. Regionally Significant Priority Areas

Legend:

- ⭐ Major Attractor
- 🟩 Regional Growth Centres
- 🔺 Village Centres

Priority Areas
- High
- (gradient)
- (gradient)
- (gradient)
- Low

Capital Regional District Regional Pedestrian and Cycling Master Plan
Author: Alta Planning + Design
Date: March 2011

0 1 2 Kilometres

alta
PLANNING + DESIGN
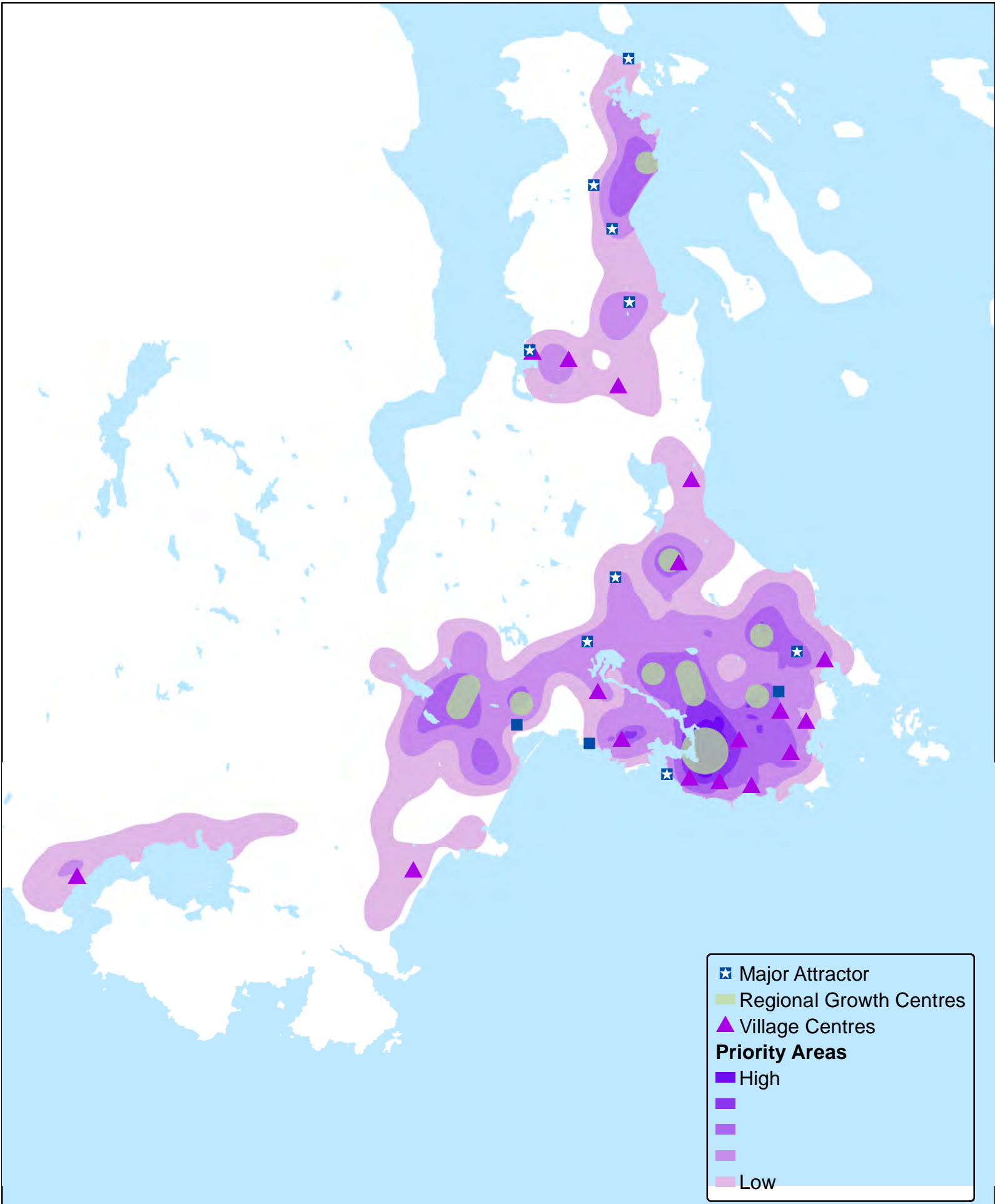
Pedestrian Facility Typologies

Pedestrian travel is accommodated by sidewalks, multi-use trails, crosswalks, curb ramps, and other infrastructure that provides separated space and enhances visibility for pedestrians. The *TravelChoices* Pedestrian Strategy advocates for a continuous network of pedestrian routes within core municipalities, regional centres, and transit nodes. These pedestrian routes would likely consist of all the facility components listed above.

Table 1. Pedestrian Facility Typologies

Description	Example
Roadway Shoulders Roadway shoulders can accommodate pedestrian travel in rural areas. They should provide sufficient width for pedestrians to be buffered from automobile traffic, and be reasonably level and smooth. Some facilities are separated from the travel lane with a linear curb extrusion.	
Sidewalks Sidewalks are pedestrian-only facilities with widths based on expected use and surrounding land uses.	
Multi-use Trails Multi-use trails are physically separated from motor vehicles and provide sufficient width and supporting facilities to be used by cyclists, pedestrians, and other non-motorized users. Regional designation indicates that the trail is under jurisdiction of CRD Parks and acts as a spine of the bicycle and pedestrian networks. The Galloping Goose Trail, E&N Rail Trail, and Lochside Trail are regional multi-use trails.	

Description	Example

Accessways

Accessways are narrow off-street paths that provide a local connection between major trails, residential areas, or destinations such as schools, parks, civic centers, employment centers, transit exchanges, or other areas. Accessways can be used by both bicyclists and pedestrians.

Pedestrian Pathways

Pedestrian pathways are similar to accessways, but may not be accessible to bicyclists or pedestrians with disabilities. They are often narrow and unpaved, and provide short connections to local pedestrian destinations.

Accessibility on the Regional Pedestrian Network

The pedestrian recommendations resulting from this analysis correspond to the *Bicycle and Pedestrian Design Guidelines.* Design treatments appropriate to areas with differing levels of expected pedestrian traffic are identified in the design guidelines (e.g., crossing treatments appropriate for use in pedestrian high-use areas vs. more residential areas).

Accessibility should be provided for all types and ages of pedestrians through the practice of universal design and access. Accessibility determines who can access or use a particular facility, while the principle of universal design promotes accessibility for all people. While accessibility and universal design are often considered for people with disabilities, these principles are intended to see that everyone, whether a child or a senior, or an adult in a wheelchair or pushing a stroller, can safely and comfortably use the provided facilities and get from one place to another.

Accessibility Standards and Guidelines

A best practices review and discussion of accessibility plans and policies is presented in the design guidelines. The discussion is based on the United States *Americans with Disabilities Act* (ADA), as well as the *BC Parks Trail Design and Construction Standards Manual*, the *BC Building Access Handbook*, and the CRD's *Everyone's parks and trails: a universal access plan for CRD Parks* (2003). Although there is no Canada-wide equivalent to the ADA, it should be noted that in 2005 the Province of Ontario passed the Accessibility for Ontarians with Disabilities Act (AODA) to develop, implement, and enforce mandatory accessibility standards. The first standard to come

into effect is the Accessibility Standards for Customer Service; other standards currently under development include those addressing the built environment (buildings and other structures) and transportation.[2]

Regional Cycling Network Development

The PCMP identifies a continuous primary inter-community (PIC) bikeway network that will meet the needs of cyclists aged eight to 80. Involving the public in every step in the process resulted in a bikeway network that increases mobility throughout the region. This PIC network is regional in nature; it includes many roadways that are part of locally designated municipal bikeway networks and are more likely to serve trips between municipalities and make connections to transit.

Existing Conditions Data Collection

Phase I of the PCMP collected existing data from the CRD and member municipalities, as well as relevant planning documents in the fall of 2009. Member municipalities were invited to submit information about existing and planned bikeway facilities. Data maintained by member municipalities was compared to the CRD's database of existing facilities in order to develop a picture of existing regional cycling conditions. Member municipalities were invited to validate the resulting existing bikeway dataset.

Identification of Potential Regional Bikeway Corridors

The project team identified a 'universe of options' of corridors that could be part of the regional cycling network, using the following data sets:

- Roadways classified as arterials and collectors by the British Columbia Digital Road Atlas (DRA)
- Roads of other classifications as necessary to close network gaps or provide the "last kilometre" of access
- Key opportunities identified by CRD staff, Technical Advisory Committee (TAC) members, Citizens Advisory Committee (CAC) members, or the general public

This 'universe of options' for PIC bikeway corridors was reviewed by CRD staff and the Citizens and Technical Advisory Committees.

Evaluation of the Preliminary Regional Bikeway Network

PIC bikeway corridors were determined from the 'universe of options' through selection criteria and a gap analysis, as well as edits from the Technical Advisory Committee (TAC), Citizens Advisory Committee (CAC), and the public as part of the June 2010 open house.

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[2] Draft AODA guidelines are available at: http://www.accessiblemunicipalities.ca/home.asp?itemid=13949

PIC Bikeway Corridor Selection Criteria

The selection of PIC corridor is based on the performance of individual corridors against the criteria listed in Table 2.

Table 2. PIC Bicycle Corridor Selection Criteria

Criterion	Considerations
Suitable for bicycling/ walking without improvements	Is the corridor a route that is currently safe and comfortable for cycling? Do existing roadways have low posted speeds and motor vehicle volumes?
Provides/enhances Active and Safe Route to School connection	Does the corridor provide a new or enhanced connection to a school? In the case of rural areas, does the corridor improve access to community centres?
Closes a critical gap	To what degree does the corridor fill a missing gap in the bicycle and/or pedestrian system?
Serves an immediate safety need	Can the project improve bicycling and walking at locations with perceived or documented safety issues? Are roadways designated as either freight or transit routes?
Serves key origins or destinations	How many user generators and attractors does the corridor connect within reasonable walking or bicycling distance, such as schools, parks, regional centers, etc.?
Geographically distributed	To what degree does the project benefit the regional community by offering opportunities for increased connectivity to surrounding communities, regional walkways/bikeways, etc.?
Serves supportive land uses	Does the route travel through areas of higher density, indicating a higher potential use? For rural areas, does the route provide access to regional destinations outside urban areas?
Right-of-way available	Is the corridor currently in public jurisdiction or private ownership?
Interfaces with other transportation modes	Does the corridor provide a new or enhanced connection to a transit centre, exchange, or bus stop?
Has local political and community support	To what degree do CRD member jurisdictions desire the proposed project? (Includes oral and written feedback from the community workshops and feedback received in public surveys.)

Each criterion was assigned a 'high,' 'medium,' or 'low' score, based on how well it fulfills each evaluation criterion. Individual scores were summed to arrive at an aggregate score for roadway segment, which were used to evaluate the function of potential bikeway corridors. The objective measurements of each criterion are shown in Table 3.

Table 3. Project Criteria and Scoring

Criteria	Scores	Measurement
Suitable for bicycling/ walking without improvements	High	Project is on a street with posted speed limit of ≤30 kph
	Medium	Project is on a street with ADT[3]<2,000 *(i.e., "collector")* and posted speed limit of ≤50 kph
	Low	Project is on a street with ADT>2,000 or posted speed limit of ≤50 kph
Provides/enhances Safe Route to School connection	High	Project within 400 m of a school (2.0 km for rural context[4])
	Medium	Project within 800 m of a school (3.0 km for rural context)
	Low	Project further than 800 m from a school (3.0 km for rural context)
Closes critical gap	High	Project connects directly to an existing bicycle or pedestrian facility
	Medium	Project within 400 m of existing bicycle or pedestrian facilities (1.5 km. for rural context)
	Low	Project does not connect to the existing system or provide network coverage
Serves an immediate safety need	High	Project is located on a corridor that has a high exposure to risk
	Medium	Project is located on a corridor that has a moderate exposure to risk
	Low	Project is located on a corridor that has a low exposure to risk
Serves key origins/ destinations	High	Project within 400 m of a regional centre, transit centre, school, civic building or regional park
		For rural areas: project within 2.0 km from a residential / commercial hub, transit stop/ park and ride facility, community centre, or park
	Medium	Project within 800 m of a regional centre or regional park
		For rural areas: project within 4.0 km from a residential / commercial hub, transit stop/ park and ride facility, community centre, or park
	Low	Project further than 800 m (4.0 km for rural) from a regional centre or regional park
Geographically distributed	High	Project provides connection in an area where few bicycle or pedestrian routes exist
	Medium	Project provides a connection where a moderate number of bicycle or pedestrian routes exist
	Low	Project duplicates existing bicycle or pedestrian routes
Serves supportive land uses	High	Project within 400 m of supportive land uses (high-density residential or commercial, or a major employment centre) For rural areas, uses may include all parks, tourist destinations, community centres, residential hubs Distances should be within 2.5 km
	Medium	Project within 800 m (rural areas: 5.0 km) of supportive land uses
	Low	Project not close to supportive land uses
Right-of-way available and/or suitable	High	Corridor is under public ownership or license (local government)
	Medium	Corridor is owned or licensed by a public agency (non municipal)
	Low	Corridor is under private ownership
Interfaces with other transportation modes (e.g., transit, rail, etc.)	High	Project within 400 m of transit stops or 800 m of a transit centre or exchange (For rural areas, the distance is 2.5 km and 4.0 km respectively and should include park and ride facilities)
	Medium	Project within 800 m of transit stops or 1,600 m of a transit centre or exchange (for rural areas, the distances may be 4.0 km and 7- 10 km respectively)
	Low	Project not near transit stops, transit centres, or an exchange. In the case of a rural environment, this may trigger the identification of a geographic system gap and would therefore be given greater importance.

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[3] ADT Scale: › 1000 ADT (or 100 per hr. during peak) is typically a *local road* designation; 1000-3000 ADT (both rural and urban context) is typically a *collector*; ›5000 ADT = *arterial* designation.
[4] Threshold for travel distance is extended for the rural context. Distance reflects the Health Canada recommendation which calls for a ½ hour walk per day.

Gap Analysis

The System Gap Analysis was used to identify gaps in the existing PIC bikeway network, based on the GIS networks provided by the CRD and member municipalities in Phase I of the PCMP. Data used included the Digital Road Atlas and common bicycling destinations (e.g., schools, civic destinations, and transit hubs). Network gaps were identified based routes to destinations that may be of interest to utilitarian cyclists (e.g., gaps on routes to regional centres) and potential routes that may serve recreational or touring cyclists (e.g., a loop route of the CRD). This primary identification of network gaps was reviewed by the CAC, TAC, and CRD staff.

Defining Bikeway Gaps

Bikeway gaps range from short 'missing links' on a specific street or path corridor to larger geographic areas with few or no facilities at all. Gaps can then be organized based on length and other characteristics. Gaps can be classified into five main categories:

- **Spot gaps:** Spot gaps refer to point-specific locations lacking dedicated facilities or other treatments to accommodate safe and comfortable pedestrian or bicycle travel. Spot gaps primarily include intersections and other areas with potential conflicts with motor vehicles. Examples include bicycle lanes on a major street 'dropping' to make way for right turn lanes at an intersection, or a lack of intersection crossing treatments for pedestrians on a route or sidewalk as they approach a major street. Spot gaps in the pedestrian network may include intersections with high posted vehicle speeds and volumes, intersections with few gaps in existing motor vehicle traffic that do not provide many pedestrian crossing opportunities or intersections where pedestrian facilities 'drop.'

- **Connection gaps:** Connection gaps are missing segments (400 metres long or less) on a clearly defined and otherwise well-connected walkway or bikeway. Major barriers standing between destinations and clearly defined routes also represent connection gaps. Examples include bicycle lanes on a major street 'dropping' for several blocks to make way for on-street parking, a discontinuous sidewalk along a street, or a freeway standing between a major pedestrian or bicycle route and a school.

- **Lineal gaps:** Similar to connection gaps, lineal gaps are 400 metre to 800 metre long missing link segments on a clearly defined and otherwise well-connected walkway or bikeway.

- **Corridor gaps:** On clearly defined and otherwise well-connected bikeways, corridor gaps are missing links longer than 800 metres. These gaps will sometimes encompass an entire street corridor where bicycle facilities are desired but do not currently exist (does not apply for walkway gaps).

- **System gaps:** Larger geographic areas (e.g., a neighbourhood or business district) where few or no bikeways exist would be identified as system gaps. System gaps exist in areas where a minimum of two intersecting bikeways would be required to achieve the target network density (does not apply for walkway gaps).

Gaps typically exist where physical or other constraints impede bikeway network development. Typical constraints include narrow bridges on existing roadways, severe cross-slopes, and potential environmental damage associated with wider pavement widths. Traffic mobility standards, economic development strategies, and other policy decisions may also lead to gaps in a network. For instance, a community's strong desire for

on-street parking or increased vehicle capacity may hinder efforts to install continuous bicycle lanes along a major street.

Figure 1 presents a theoretical diagram illustrating the five gap types described above.
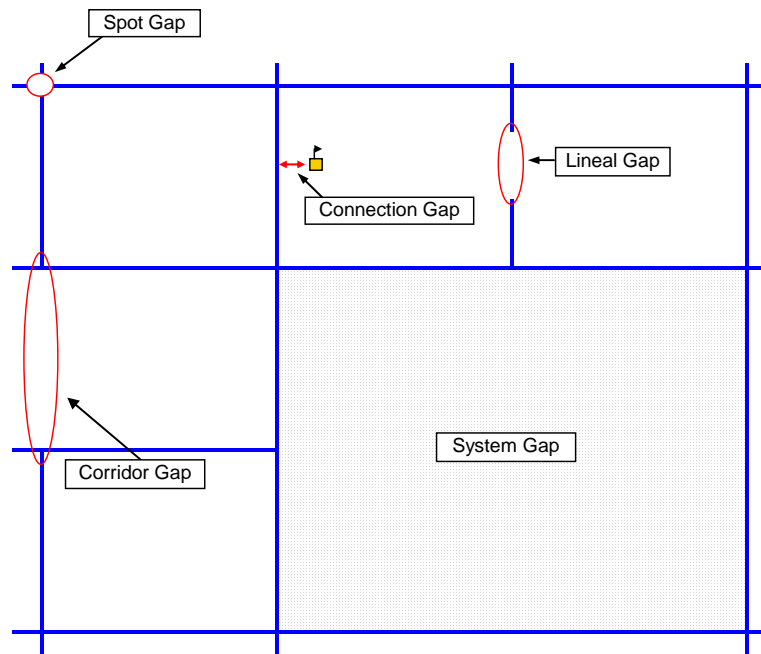
Figure 1. Diagram of Gap Types

Addressing Bikeway Network Gaps
The recommended procedure for addressing gaps in the CRD bikeway network should provide the flexibility to address unique circumstances. Figure 2 graphically depicts the procedure discussed below.

- **Step 1: Identify Gap Type:** Identify the gap type under focus (i.e., spot gap, connection gap, lineal gap, corridor gap, or system gap).

- **Step 2: Identify Appropriate Range of Gap Closure Measure Types:** The type of gap determines the initial range of closure measure options. For instance, longer system gaps can be filled through a variety of treatments, while a limited range of measures are appropriate for shorter gaps such as spot and connection gaps.

- **Step 3: Determine Appropriate Location for Gap Closure Measures:** The type of gap provides guidance for the appropriate gap closure location. Due to their relatively short lengths, spot and connection gaps should be addressed where they exist; alternative routing measures are not appropriate for addressing these gaps. Although spot and connection gaps may prove challenging, they represent the most critical bikeway links.

Typically covering longer distances, lineal, corridor, and system gaps offer greater implementation flexibility. Bicyclists generally prefer direct travel routes, though they may tolerate route diversions to avoid long bikeway gap segments. Identifying the appropriate gap closure location for lineal, corridor, and system gaps involves evaluating the feasibility of adding bicycle facilities to the street or path corridor under focus versus the appropriateness of using alternative routes. The feasibility analysis should consider the following:

- o Whether compelling safety, operational, environmental, economic, or other reasons preclude bicycle facilities on the major street or path corridor under focus.
- o Proximity of alternate route to the major street of path corridor under focus.
- o Connectivity and continuity provided by the alternate route.
- o The feasibility analysis will determine whether bicycle facilities should be added directly on the major street or path corridor, whether alternative routing is necessary, or both.

- **Step 4: Determine Appropriate Gap Closure Measure Type:** The appropriate gap closure measure type depends on the gap type and location. Intersection improvement measures or mid-block crossings represent the most appropriate strategy for addressing spot gaps, while bicycle lane retrofit, shared roadways, and off-street gap closure measures represent the most appropriate strategies for closing connection gaps. Appropriate measures for lineal, corridor, and system gaps depend on the feasibility analysis referenced in Step 3.

- **Step 5: Determine Specific Gap Closure Measure:** Identification of the appropriate gap closure measure type and specific characteristics of the corridor/location under focus will help determine the appropriate specific gap closure measure.
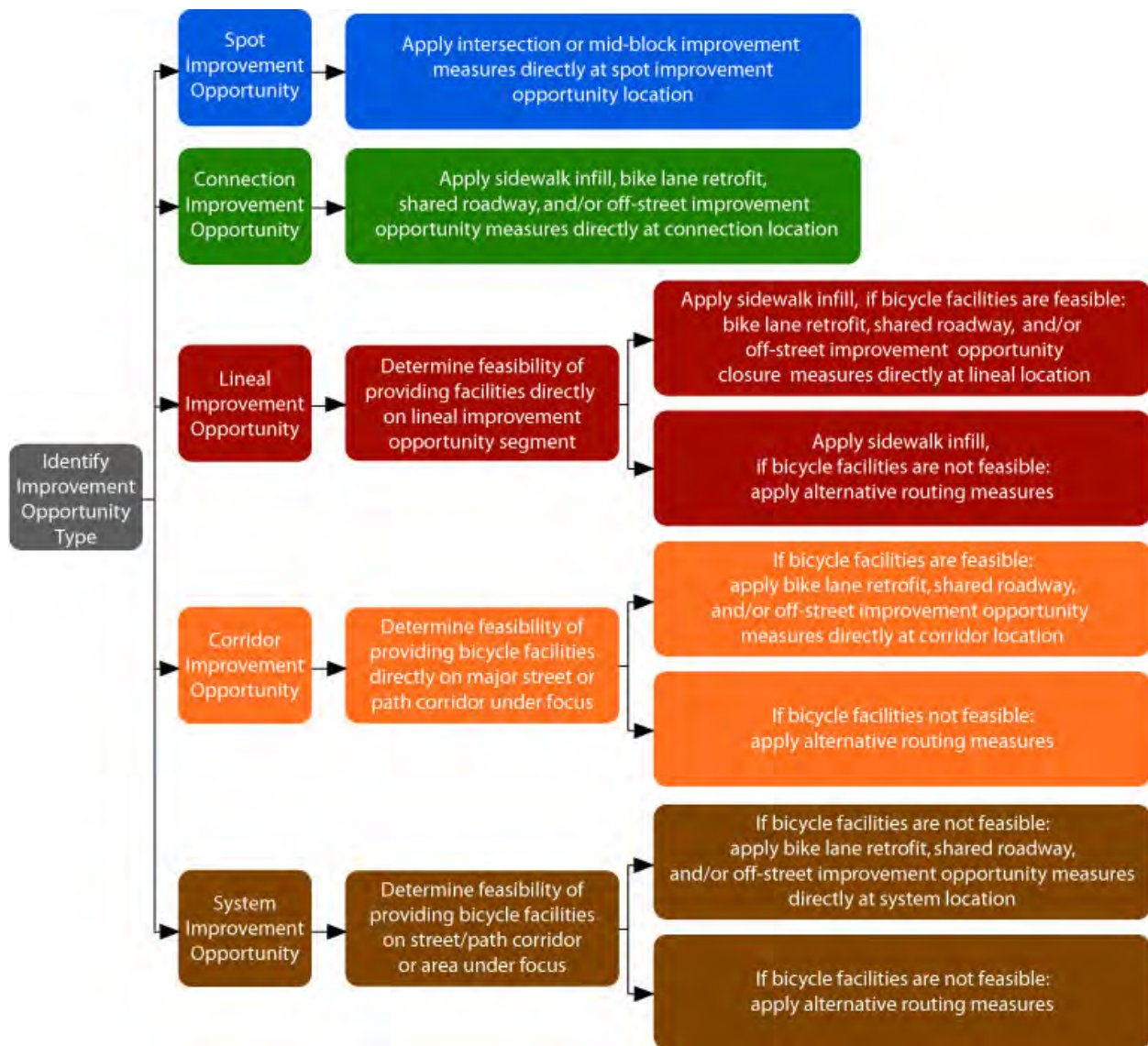
Figure 2. Walkway and Bikeway Gap Closure Strategy

The gap analysis was developed based on existing available data and took the following factors into consideration:

- Several roadways that are part of local bikeway networks but not the regional network were noted as network gaps.
- On-street portions of the Lochside and Galloping Goose Trails were marked as network gaps. The intent was to highlight locations where it may be desirable to construct off-street facilities to provide a continuous facility dedicated to non-motorized transportation that would act as a spine of the regional bikeway and pedestrian network.
- In some areas of the CRD, the analysis did not take into account gaps near every school, park, or transit stop in the most densely populated areas of the CRD (e.g., Portions of Victoria and Oak Bay).

Many of these schools and transit stops are located along local streets and may already have facilities that create suitable cycling and walking conditions.

- In some cases, this analysis noted roadways previously designated as local bikeway links as gaps in the regional network to highlight the fact that these routes have potential regional importance.

Legend

- ✦ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Regional Growth Centres
- Parks
- —— Existing Municipal Bikeway

Existing Facility

Facilities that currently meet Class I standard for separation

- —— Multi-Use Trail
- —— Bicycle Lane/Shoulder Bikeway
- —— Shared Roadway
- ---- PIC Bikeway with No Existing Facilities
- —— Note: Conceptual Alignment Subject to Change

SIDNEY

NORTH SAANICH

CENTRAL SAANICH

Tseycum First Nation

Pauquachin First Nation

Tsartlip First Nation

Tsawout First Nation

West Saanich Rd

Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

Map 2. Existing Bicycle Facilities - Peninsula

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.5   1
Kilometers

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Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Regional Growth Centres
- Parks
- Existing Municipal Bikeway

Existing Facility

Facilities that currently meet Class I standard for separation

- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway
- PIC Bikeway with No Existing Facilities
- Note: Conceptual Alignment Subject to Change

Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

Map 3. Existing Bicycle Facilities - Core

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.5   1
Kilometers

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Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Regional Growth Centres
- Parks

— Existing Municipal Bikeway

Existing Facility
Facilities that currently meet Class I standard for separation

— Multi-Use Trail
— Bicycle Lane/Shoulder Bikeway
— Shared Roadway
- - - - PIC Bikeway with No Existing Facilities
— Note: Conceptual Alignment Subject to Change

HIGHLANDS

VIEW ROYAL

SAANICH

LANGFORD

COLWOOD

Trans Canada Trail

Trans-Canada Hwy

West Saanich Rd

Wallace Dr

Hartland Ave

Oldfield Rd

Old West Saanich Rd

Interurban Rd

Wilkinson Rd

Helmcken Rd

Trans-Canada Hwy

Millstream Rd

Treanor Ave

Setchfield Ave

Sooke Lake Rd

Amy Rd

E & N Trail

Veteran Memorial Pky

Goldstream Ave

Jacklin Rd

Island Hwy

Admirals Rd

Gorge Rd W

Craigflower Rd

Esquimalt First Nation

Songhees First Nation

Admirals Rd

Humpback Rd

Kelly Rd

Sooke Rd

Wishart Rd

Esquimalt Rd

Admirals Rd

Lampson St

Sooke Rd

Galloping Goose Trail

Happy Valley Rd

Latoria Rd

Veteran Memorial Pky

Wishart Rd

Metchosin Rd

Lagoon Rd

Ocean Blvd

Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

Map 4. Existing Bicycle Facilities - West Shore One

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.45   0.9
Kilometers

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Trans Canada Hwy

Trans Canada Trail

E & N Trail

Island Hwy

Esquimalt First Nation

LANGFORD

Jacklin Rd

Sooke Rd

Veteran Memorial Pkwy

Wishart Rd

COLWOOD

Metchosin Rd

Ocean Blvd

METCHOSIN

Sooke Rd

Happy Valley Rd

Kangaroo Rd

SOOKE

Otter Point Rd

Galloping Goose Trail

Sooke Rd

T'Sou-ke First Nation

Grant Rd

West Coast Rd

T'Sou-ke First Nation

E Sooke Rd

Becher Bay First Nation

Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

Map 5. Existing Bicycle Facilities - West Shore Two

0   2   4 Kilometers

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Notes:
1. Includes facilitates not yet built, but with committed funding
2. Existing municipal bikeways may not meet PCMP facility definitions
3. Existing municipal bikeways data has not been field verified

Trans Canada Trail

Pacific Marine Rd

Pacheedaht
First Nation

Galloping Goose Trail

West Coast Rd

METCHOSIN

Otter Point Rd

SOOKE

Sooke Rd

T'Sou-ke
First Nation

T'Sou-ke
First Nation

Becher Bay
First Nation

Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Regional Growth Centres
- Parks

—— Existing Municipal Bikeway

Existing Facility

Facilities that currently meet Class I standard for separation

—— Multi-Use Trail

—— Bicycle Lane/Shoulder Bikeway

—— Shared Roadway

‑ ‑ ‑ PIC Bikeway with No Existing Facilities

▬▬ Note: Conceptual Alignment Subject to Change

Map 6. Existing Bicycle Facilities - Juan de Fuca

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   2.5   5
Kilometers

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Identification and Assignment of Bikeway Typologies

Standardized definitions of PIC bikeway facility types provide clarification for municipalities as they develop bicycle infrastructure. Standard definitions also encourage consistency throughout the region, which facilitates trips between municipalities by residents and visitors alike.

Currently, the CRD and member municipalities undertake different approaches when identifying and assigning bikeway networks. For example, the CRD's 2002 *TravelChoices* network uses facility type (e.g., bicycle lane or shared roadway) to categorize five distinct types of bikeways, while some municipalities differentiate bikeways by intended use (e.g., recreational or commuter route) or as a "local connector" that accommodates recreational or less-experienced cyclists.

The municipalities also vary with respect to design requirements for various types of bikeways; in some municipalities, 'shared roadways' require signage to designate them as bicycle routes, while others designate a line on a map with no specific treatments. This leads to an inconsistent user experience between municipalities.

The PCMP uses the following typology for assigning on-street bikeway facilities to specific roads:

1. **User Classification:** Bikeway class indicates what types of users might feel comfortable on a particular bikeway facility.

2. **Levels of Facility Separation:** Bikeway facilities are designated by Canadian guidelines and best practices for cycle tracks, bicycle lanes, shared lanes, and other facilities.

3. **Roadway Context:** The volume and speed of motor vehicle traffic, as well as presence of trucks, transit, on-street parking, and large numbers of turning vehicles impact the user experience of different types of bikeway facilities.

In combination, these elements can provide guidance for bikeway facility selection as shown in Figure 3.

User Type Classification

Bikeway class indicates what types of users might feel comfortable on a particular bikeway facility. The Cycling in Cities Program at the University of British Columbia found that the most significant factors influencing bicycle use are motor vehicle traffic volumes and speeds.[5] The study also found that most cyclists have a preference for facilities that are separated from motor vehicle traffic or that are located on local roads with low motor vehicle traffic speeds and volumes. Because off-street pathways are physically separated from the roadway, they are perceived as safe and attractive routes for cyclists who prefer to avoid motor vehicle traffic. A stated preference experiment performed in Edmonton found that, for the typical cyclist, one minute cycling in mixed traffic is as onerous as 4.1 minutes on bike lanes.[6]

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[5] http://www.cher.ubc.ca/cyclingincities/survey.html
[6] Hunt and Abraham (2007).

USER TYPE CLASSIFICATION

Class 1: suitable for all users

Class 2: suitable for most users

Class 3: suitable for few users

+

LEVELS OF FACILITY SEPARATION

Separated On-Street:
- buffered bicycle lane
- cycle track

Bicycle Lanes/ Shoulders

Shared Roadways
- marked wide curb lane
- neighbourhood bikeway
- shared lane

+

ROADWAY CONTEXT

Highway | Arterial | Collector | Local

=

PRIMARY BIKEWAY TYPOLOGY

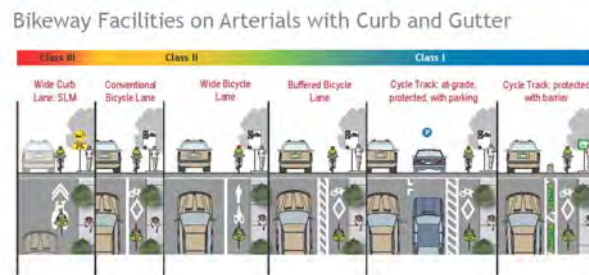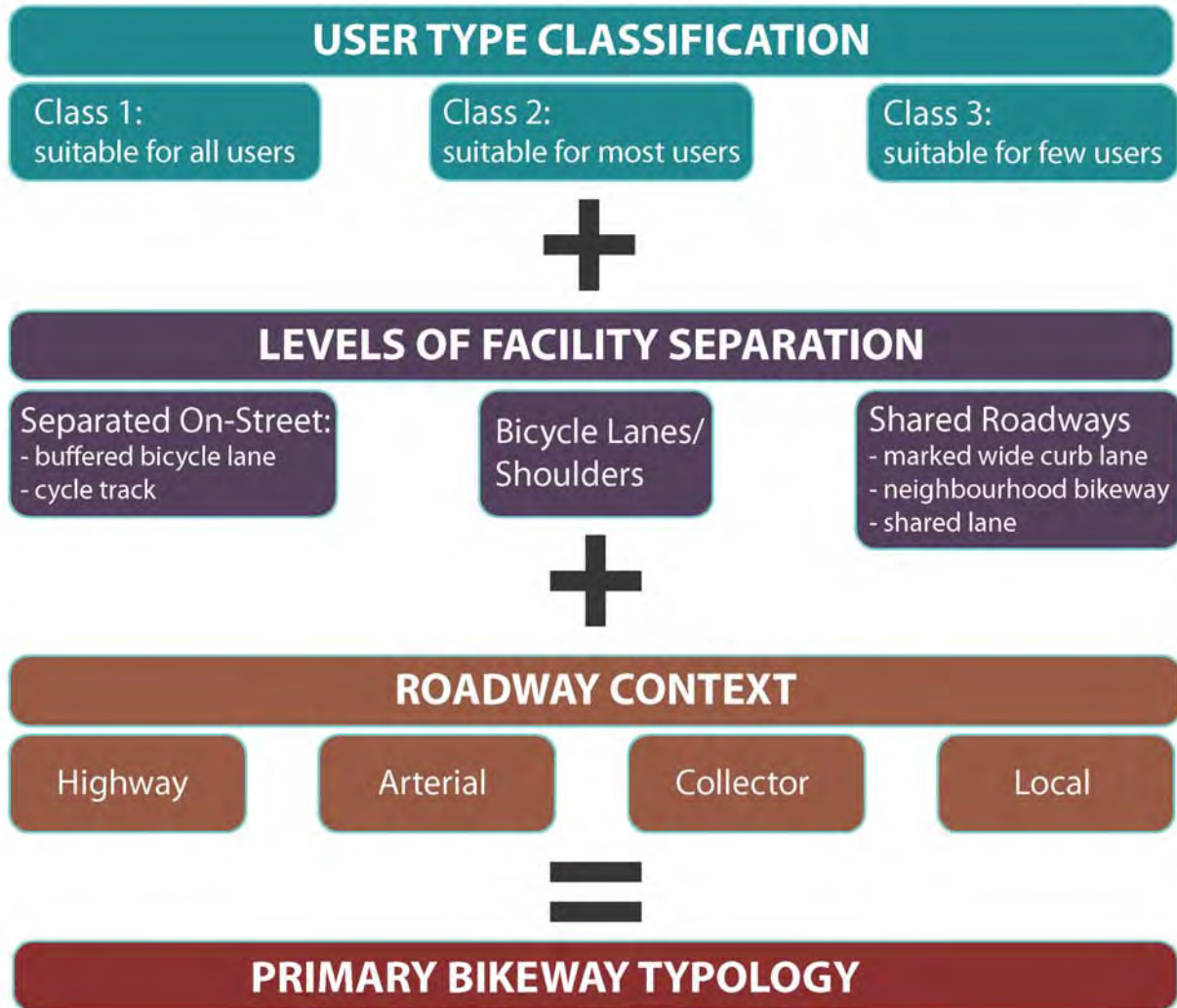Bikeway Facilities on Arterials with Curb and Gutter

Figure 3. Typology of Bicycle Faculty Application

The PCMP identifies the following classes of facilities by user type:

- *Class 1 facilities* provide a high degree of separation between cyclists and motor vehicle traffic and are comfortable for all users including recreational and inexperienced cyclists.
- *Class 2 facilities* provide a moderate degree of separation from motor vehicle traffic and offer enhanced traffic calming treatments on local roadways.
- *Class 3 facilities* generally include on-street facilities with limited physical separation from motor vehicle traffic but may appeal to commuter cyclists due to their route connectivity.

Levels of Facility Separation

Standards for classifying bikeway types are provided in the Transportation Association of Canada (TAC) *Bikeway Traffic Control Guidelines for Canada* (2010 Draft), *Geometric Design Guide for Canadian Roads*, and *MUTCD-Canada*. The variety of existing facility classifications used in the CRD and member municipalities can be synthesized into the categories defined in Table 4.

The classifications identified in Table 4 are common regional classifications that describe bicycle facilities by engineering treatment. This classification system integrates the various municipal classifications and does not preclude the municipalities from continuing to use existing user classification systems. Facility type information is useful at the planning and engineering level, while the designation of a local commuter route is beneficial for system users, who are more concerned about finding a continuous route on a level with which they feel comfortable than identifying design treatments. It is recommended that municipalities use the terms defined in the PCMP at the engineering and planning level to be clear and precise about bicycle facility planning, while use designations can continue to be used for mapping and sharing the network with the public if that is the preferred local method.

Table 4. Recommended On-Street Bicycle Facility Classification

Description	Example

Off-Street Facilities

Regional Multi-use Trails

Multi-use trails are physically separated from motor vehicles and provide sufficient width and supporting facilities to be used by cyclists, pedestrians, and other non-motorized users. Regional designation indicates that the trail is under jurisdiction of CRD Parks and acts as a spine of the bicycle and pedestrian networks. The Galloping Goose Trail, E&N Rail Trail, and Lochside Trail are regional multi-use trails.

Bicycle Pathways

Bicycle pathways are similar to multi-use pathways, but are intended for exclusive bicycle use. They are usually provided adjacent to pedestrian paths.

Description	Example

Separated On-Street Bicycle Facilities

Cycle Tracks

Cycle tracks are a hybrid bicycle facility combining the experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks utilize a variety of applications such as parking placement, channelization, mountable curbs, bollards and pavement markings, and grade separation.

Buffered Bicycle Lanes

Buffered bicycle lanes are designed to increase the space between the bicycle lanes and the travel lane or parked cars. They are appropriate on streets with high automobile traffic volumes and speeds, on-street parked cars, and high volumes of truck or oversized vehicle traffic.

Bicycle Lane/Shoulder Bikeway

Bicycle Lanes

Bicycle lanes provide separated designated roadway space for bicyclists. Bicycle lane treatments include conventional bicycle lanes, coloured bicycle lanes, and other treatments such as contra-flow bicycle lanes, left side bicycle lanes, off-peak bicycle lanes, uphill bicycle lanes, and shared bike/bus lanes.

Description	Example

Shoulder Bikeways

Shoulder bikeways, or paved shoulders, include roadways that provide adequate shoulder width for safe bicycling. Located on streets without curb and gutters, shoulder bikeways include signing and striping, but do not always include bicycle stencils.

Shared Roadway

Marked Wide Curb Lanes

Marked wide curb lanes provide direct routes for experienced cyclists along the outer lane of a roadway.

Neighbourhood Bikeways

Neighbourhood bikeways include a range of treatments for bikeways, from relatively basic facilities consisting of signage and pavement markings to bikeways with varying degrees of traffic calming implemented to improve safety for cyclists and other road users.

Shared Routes

Shared routes provide key connections between more formal bikeways and key destinations. They are indicated by signage and sometimes pavement markings.

Roadway Context

Context describes conditions on the roadway. Many roadway factors impact the experience of cycling; automobile speeds and volumes, presence of heavy vehicles, trucks, or transit vehicles, roadway width, visibility, adjacent land uses, and urban or rural context all contribute to the context of a bikeway. While all these factors are important, the major indicators of the context are automobile speed and volume. In addition, urban or rural context affects engineering treatments appropriate on a particular roadway. Roadway classification indicates many of these context issues and provides guidance for what types of bikeway facilities are appropriate.

The British Columbia Digital Road Atlas (DRA) database was used for classifying roadways. The classifications are defined in Table 5. While this dataset is a useful first step in facility selection, in some cases actual road traffic speeds and/or volumes differ from the DRA. Additional engineering judgement should be applied when selecting bicycle facilities appropriate to a particular roadway.

Table 5. Definition of Roadway Classifications, B.C. Digital Road Atlas

Road Class	Definition	Posted Speeds[*]	Average ADT
Highway/Freeway	Controlled access, typically divided carriageway/ primary or secondary provincial highway, may be single or multilane each way	50-90 km/h	5,400
Arterial	A thoroughfare with a generally large traffic capacity, generally multilane each way	30-70 km/h	3,200
Collector	A road to collect traffic from areas and/or to cross town with the general right of way, generally one lane each way	30-60 km/h	1,900
Local	local, residential roads	20-50 km/h	900

[*] Note: Speeds and ADT summarized from DRA GIS file, rather than a technical definition.

The following pages show the range of bicycle facilities appropriate on roadways depending on their classification. While most people are comfortable riding in a shared lane on a local street, few people would ride in a shared lane on an arterial.

Roads with curbs and gutters are likely to provide sidewalks for pedestrians, as well as having designated on-street parking where parking is allowed. On roads without curbs and gutters, pedestrians are more likely to walk alongside the road. Where the shoulders have been paved for bicycle use, pedestrians often walk in the shoulder bikeway, and parking can be allowed. Higher-level shoulder bikeways provide separated pedestrian space and prohibit parking except in emergencies. If a road designated as a shoulder bikeway is developed with a curb and gutter, marked and signed bicycle lanes should be incorporated into the design of the new roadway.

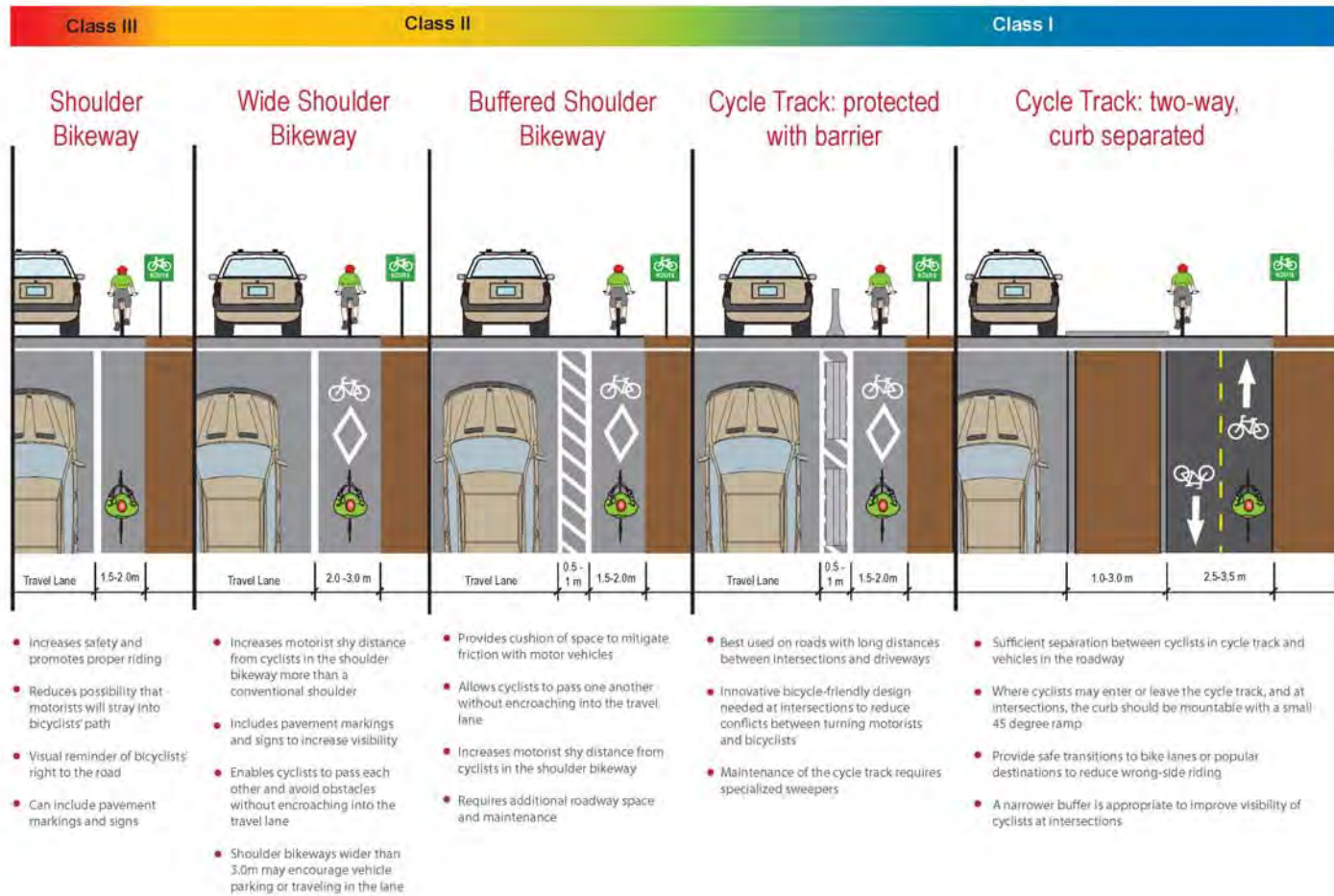CAPITAL REGIONAL DISTRICT

Regional Pedestrian and Cycling Master Plan

Figure 4. Continuum of Bikeway Facilities on Freeways/Highways

Continuum of Bikeway Facilities on Arterials without Curb & Gutter

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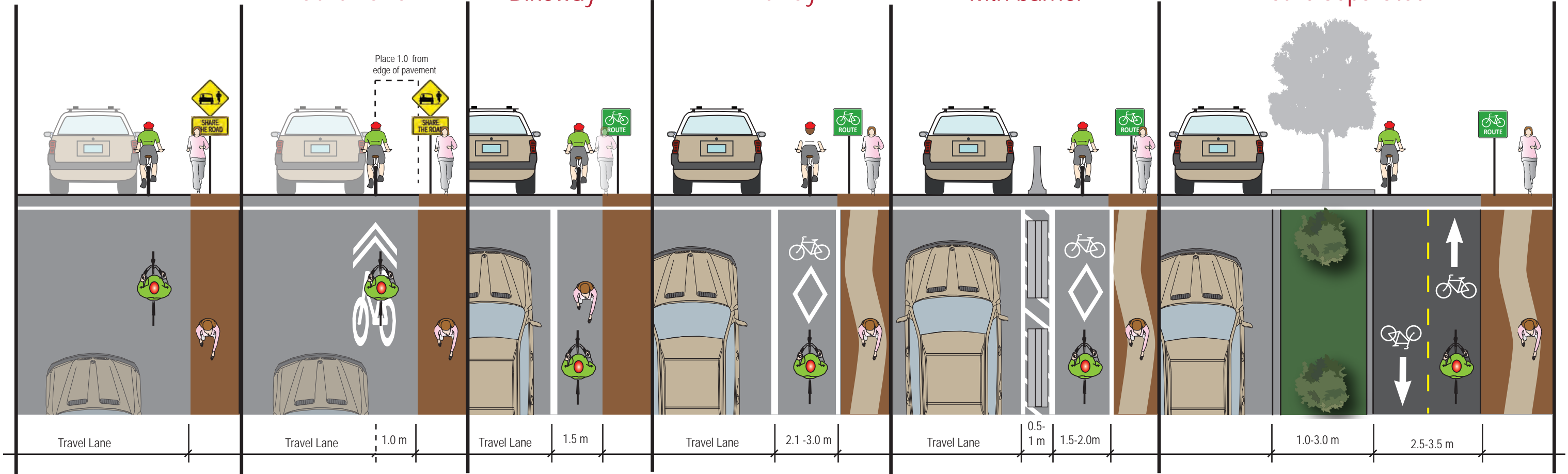| Class III	Class II	Class I

Shared Lane
Marked Wide Curb Lane
Shoulder Bikeway
Wide Shoulder Bikeway
Cycle Track: protected with barrier
Cycle Track: two-way, curb separated

Place 1.0 from edge of pavement

SHARE THE ROAD

ROUTE

Travel Lane

Travel Lane — 1.0 m

Travel Lane — 1.5 m

Travel Lane — 2.1 -3.0 m

Travel Lane — 0.5-1 m — 1.5-2.0m

1.0-3.0 m — 2.5-3.5 m

- No special accomodation for pedestrians

- "Share the Road" and /or "Bike Route" signs identify the road as a bikeway

- Not comfortable for many cyclists

- Visibly reminds motorists to expect bicyclists on the roadway

- Increases motorist shy distance from cyclists sharing a lane

- Not comfortable for many cyclists
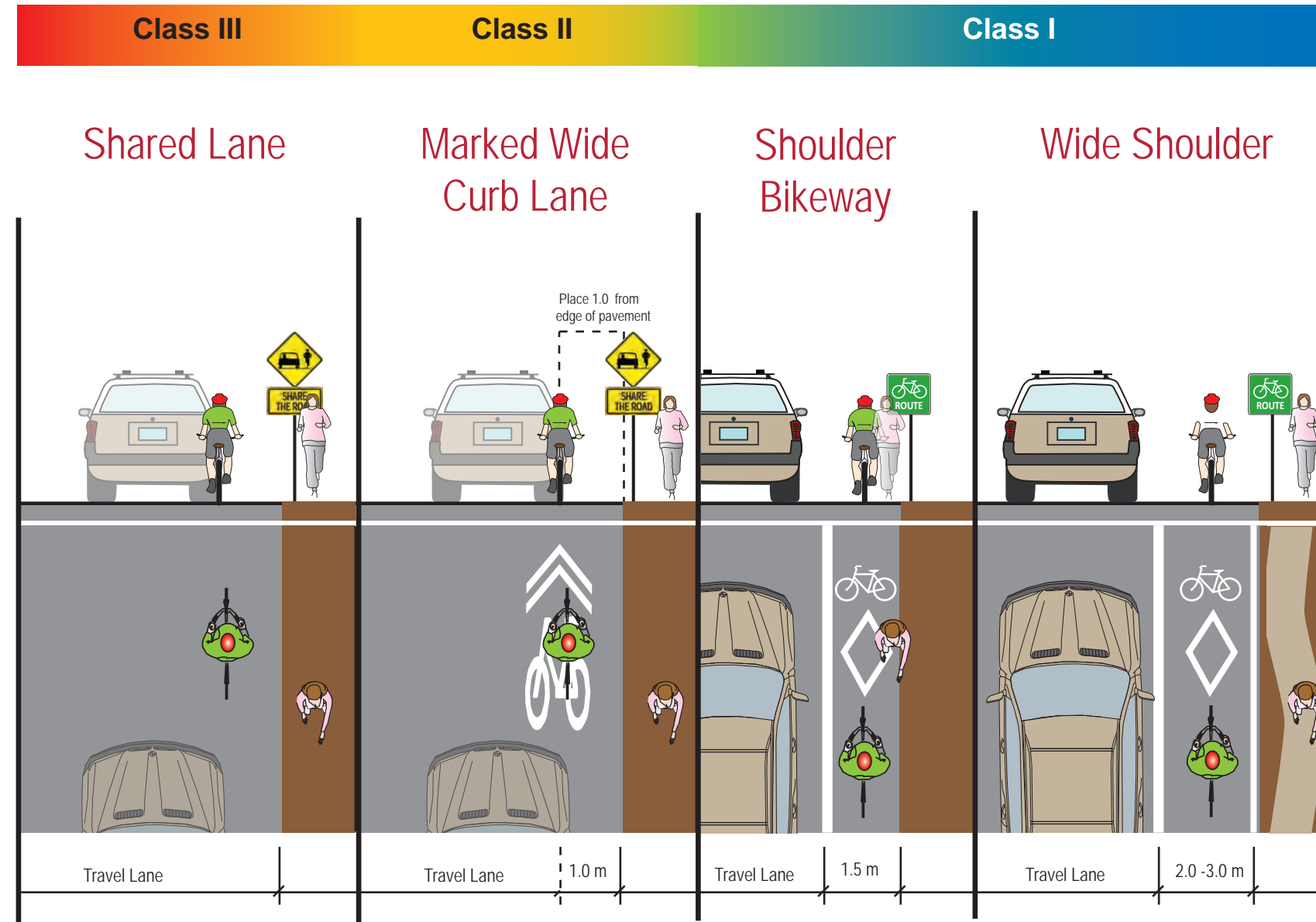
- No specific accomodation for pedestrians

- Can be shared bicycle/ pedestrian space

- Reduces possibility that motorists will stray into bicyclists' path

- Visual reminder of bicyclists' right to the road

- Can include pavement markings and signs

- Can be used for emergency vehicle parking

- Increases motorist shy distance from cyclists more than a conventional shoulder; a buffer may be provided as well

- Enables cyclists to pass one another and avoid obstacles without encroaching into the travel lane

- Mark a shy line from the pavement end

- Can be used for emergency vehicle parking

- Can be shared bicycle/pedestrian space, ideally separated where high levels of use

- Best used on roads with long distances between intersections and driveways

- Innovative bicycle-friendly design needed at intersections to reduce conflicts between turning motorists and bicyclists

- Barrier options include extruded curb, jersey barriers, bollards, and grade separation.

- Can be shared bicycle/pedestrian space, or have a parallel softsurface pedestrian route

- Sufficient separation between cyclists in cycle track and vehicles in the roadway

- Where cyclists may enter or leave the cycle track, or where motorists cross at a driveway, the curb should be mountable with a small 45 degree ramp, allowing cyclist turning movements

- Provide safe transitions to bike lanes or popular destinations to reduce wrong-side riding

Continuum of Bikeway Facilities on Collectors without Curb & Gutter

Class III	Class II	Class I

Shared Lane	Marked Wide Curb Lane	Shoulder Bikeway	Wide Shoulder

Place 1.0 from edge of pavement

Travel Lane | Travel Lane 1.0 m | Travel Lane 1.5 m | Travel Lane 2.0 -3.0 m
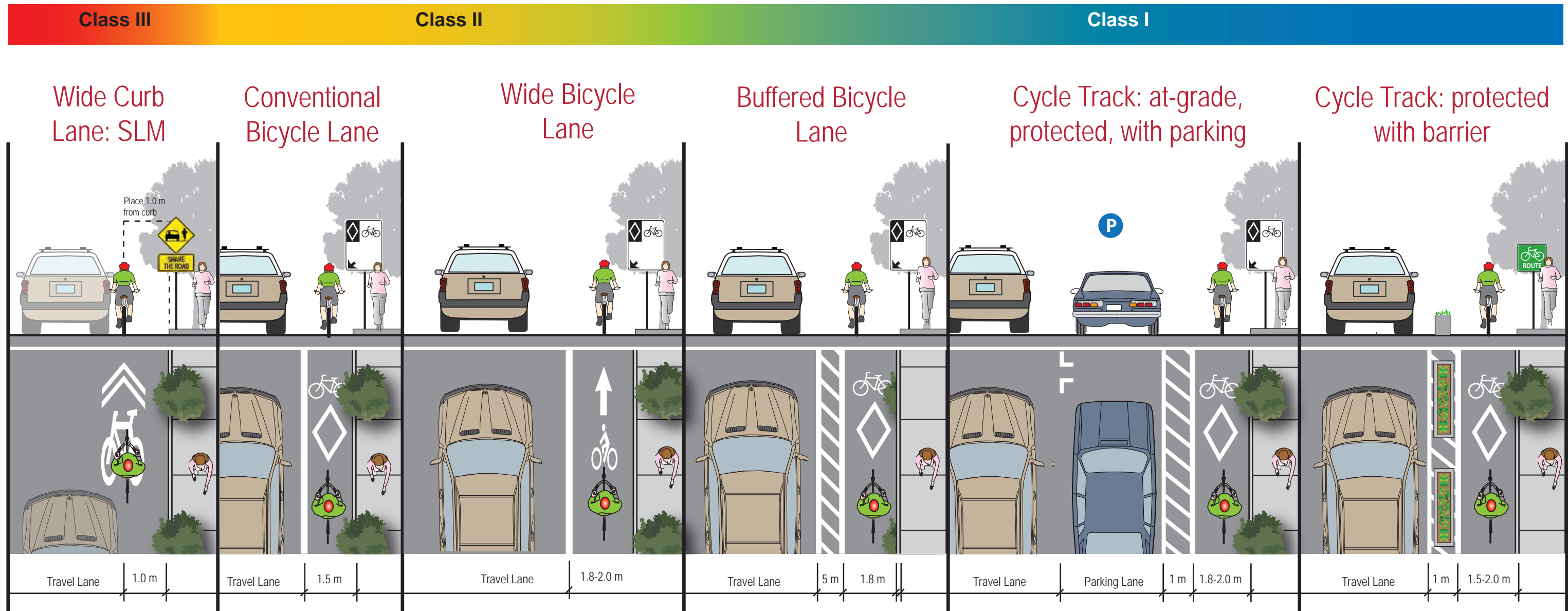
Shared Lane
- No special accomodation for pedestrians
- "Share the Road" and /or "Bike Route" signs identify the road as a bikeway
- Not comfortable for many cyclists

Marked Wide Curb Lane
- Visibly reminds motorists to expect bicyclists on the roadway
- Increases motorist shy distance from cyclists sharing a lane
- Not comfortable for many cyclists
- No specific accomodation for pedestrians

Shoulder Bikeway
- Can be shared bicycle/pedestrian space
- Reduces possibility that motorists will stray into bicyclists' path
- Visual reminder of bicyclists' right to the road
- Should include pavement markings and signs
- Can be used for emergency vehicle parking

Wide Shoulder
- Dedicated space for cyclists and pedestrians
- Increases motorist shy distance from cyclists more than a conventional shoulder
- Enables cyclists to pass one another and avoid obstacles without encroaching into the travel lane
- Mark a shy line from the pavement end
- Can be used for emergency vehicle parking

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Continuum of Bikeway Facilities on Arterials with Curb and Gutter

Class III   **Class II**   **Class I**

Wide Curb Lane: SLM

Place 1.0 m from curb

SHARE THE ROAD

Travel Lane — 1.0 m

- "Share the Road" and /or "Bike Route" signs identify the road as a bikeway
- Shared lane markings increase safety and promote proper riding
- Reduces possibility that motorists will stray into bicyclists' path
- Visual reminder of bicyclists' right to the road

Conventional Bicycle Lane

Travel Lane — 1.5 m

- Dedicated space for cyclists increases comfort and safety of cyclists
- Cyclists must encroach into the travel lane to pass one another
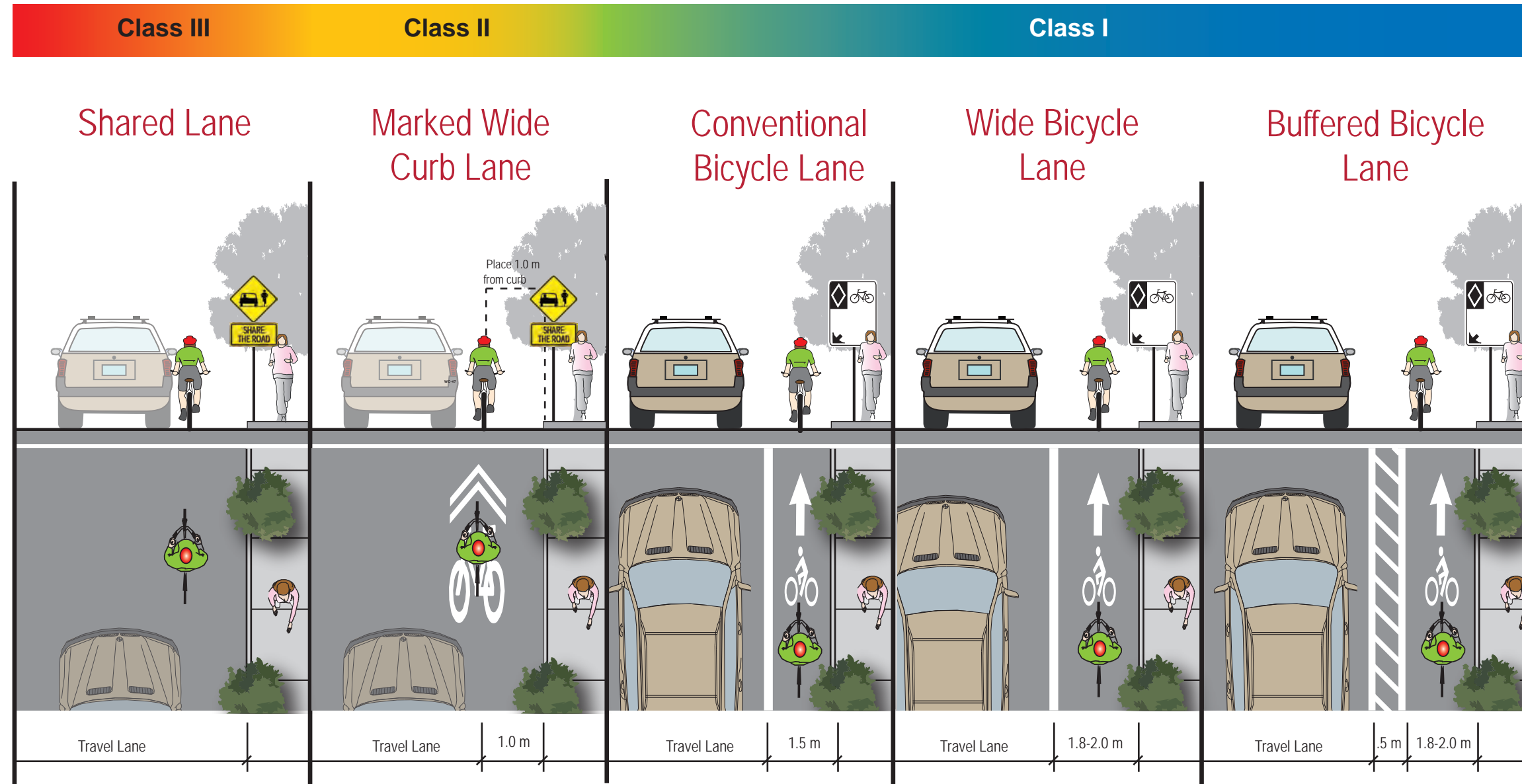
Wide Bicycle Lane

Travel Lane — 1.8-2.0 m

- Increases motorist shy distance from cyclists in the bike lane more than a conventional bike lane
- Enables cyclists to pass one another without encroaching into the travel lane
- Bike lanes wider than 2.0m may encourage vehicle loading in bike lane

Buffered Bicycle Lane

Travel Lane — 5 m — 1.8 m

- Provides cushion of space to mitigate friction with motor vehicles on streets with narrow bike lanes
- Allows cyclists to pass one another without encroaching into the travel lane
- Increases motorist shy distance from cyclists in the bike lane
- Requires additional roadway space and maintenance

Cycle Track: at-grade, protected, with parking

P

Travel Lane — Parking Lane — 1 m — 1.8-2.0 m

- Dedicates and protects space for bicyclists and improves perceived comfort and safety
- Reduces risk of 'dooring' compared to a bike lane, and eliminates of the risk of a doored cyclist being run over by a motor vehicle
- Low implementation cost through use of existing pavement using parking lane as a barrier
- Apply along roadways with high motor vehicle volumes and/or speeds
- Best on streets with parking lanes that stay mostly occupied

Cycle Track: protected with barrier

ROUTE

Travel Lane — 1 m — 1.5-2.0 m

- Barrier options include extruded curb, bollards, and grade separation.
- Best used on roads with high speeds and long distances between interesections and driveways
- Innovative bicycle-friendly design needed at intersections to reduce conflicts between turning motorists and bicyclists
- Maintenance of the cycle track requires specialized sweepers
- Width should never be taken from the pedestrian zone to make room for a cycle track

Continuum of Bikeway Facilities on Collectors with Curb & Gutter

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Class III	Class II		Class I	
Shared Lane	**Marked Wide Curb Lane**	**Conventional Bicycle Lane**	**Wide Bicycle Lane**	**Buffered Bicycle Lane**

Place 1.0 m from curb

| Travel Lane | Travel Lane | 1.0 m | Travel Lane | 1.5 m | Travel Lane | 1.8-2.0 m | Travel Lane | .5 m | 1.8-2.0 m |

- "Share the Road" and/or TAC "Bike Route" signs indicate to cyclists and motorists that the road is a designated bicycle route.
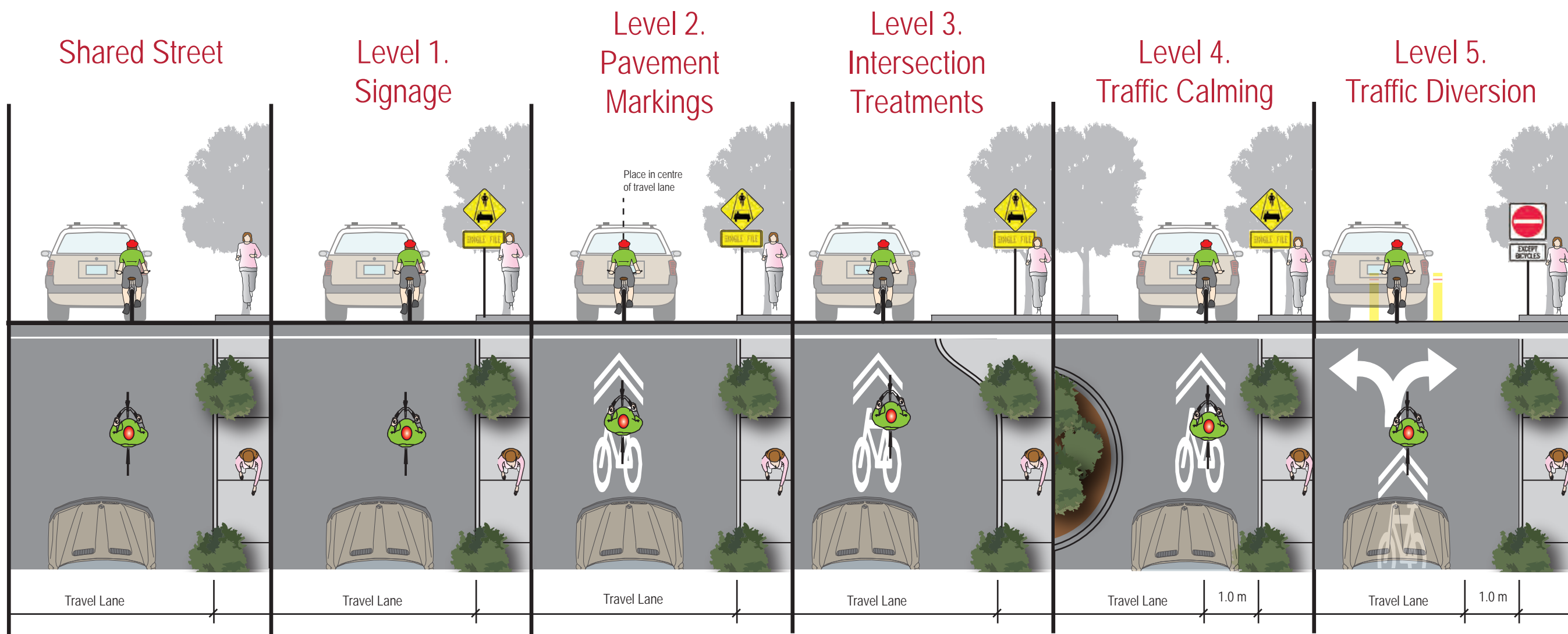
- Increases safety and promotes proper riding
- Visual reminder of bicyclists' right to the road
- Can be used with on-street parking; place marking 3.5 m from curb where parking is present

- Increases safety and promotes proper riding
- Reduces possibility that motorists will stray into bicyclists' path
- Can be curb-tight or adjacent to on-street parking. Where parking is permitted, the lane should be at least 1.5m due to conflicts with car doors

- Increases motorist shy distance from cyclists in the bike lane more than a conventional bike lane
- Enables cyclists to pass one another without encroaching into the travel lane
- Bike lanes wider than 2.0m may encourage vehicle loading in bike lane

- Provides a cushion of space to mitigate friction with motor vehicles on streets with narrow bike lanes
- Allows cyclists to pass one another without encroaching into the travel lane
- Increases motorist shy distance from cyclists in the bike lane
- Requires additional roadway space and maintenance

Continuum of Bikeway Facilities on Local Streets
(with or without curb & gutter)

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| Class II | Class II | | Class I |

| Shared Street | Level 1. Signage | Level 2. Pavement Markings | Level 3. Intersection Treatments | Level 4. Traffic Calming | Level 5. Traffic Diversion |

Place in centre of travel lane

Travel Lane | Travel Lane | Travel Lane | Travel Lane | Travel Lane   1.0 m | Travel Lane   1.0 m

- No specific bicycle accomodation, although many cyclists feel comfortable riding on local streets

- Warning signs inform cyclists that they are on a designated bicycle route and remind motorists to watch for cyclists

- Wayfinding signs provide valuable information for cyclists about key destinations and route finding. They also create a coherent identity for the regional bikeway network

- Encourages cyclists to take the lane on streets that are too narrow for an automobile to pass a cyclist within the travel lane

- Highlights that the roadway is intended for use by cyclists and that automobiles must pass with caution
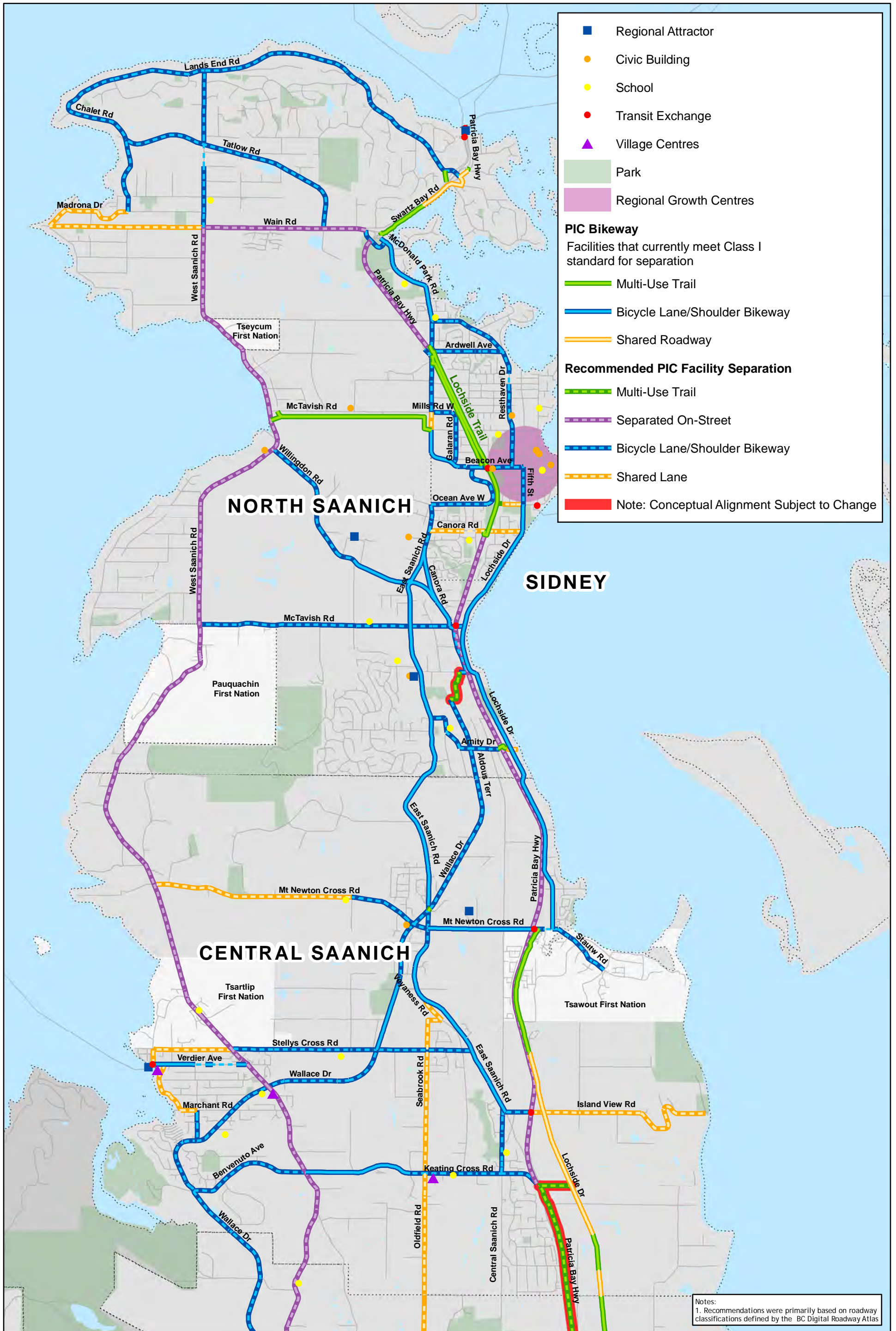
- At a minimum, stop-control all intersections; preferably stop cross -traffic

- At minor intersections, use curb ramps, pavement markings, and bicycle forward stop bars to increase visibility of cyclists

- At intersections with larger streets, provide medians, refuge islands, or bicycle-actuated half-signals

- Reduces vehicle speeds so they generally match cyclists' operating speeds (20-25 kmh), enabling motorists and cyclists to safely co-exist on the same facility

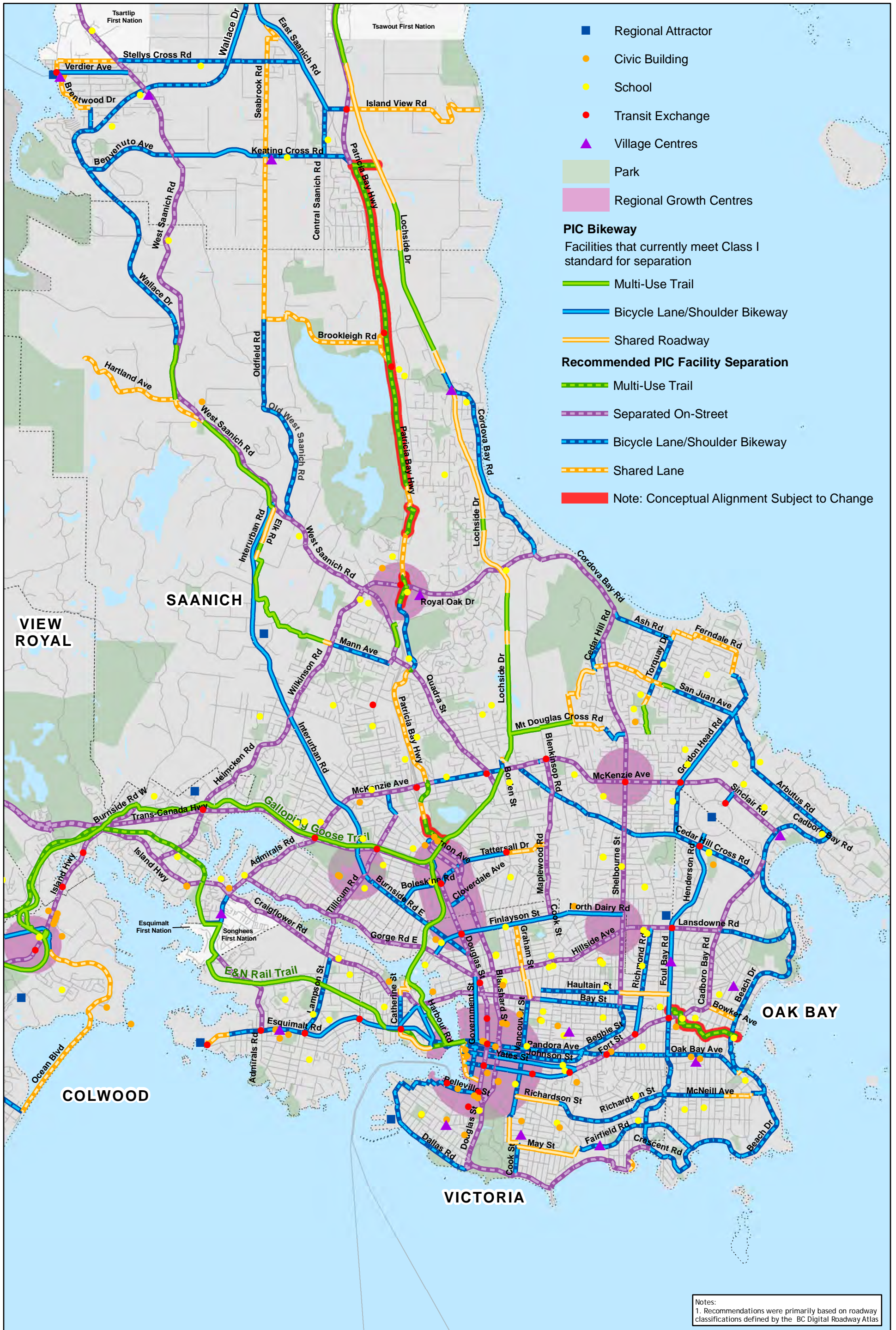- Treatments include chicanes, mini traffic circles, and speed humps

- Maintains through-bicycle travel on a street while physically restricting through-vehicle traffic

- Reduces motor vehicle volumes on the bikeway
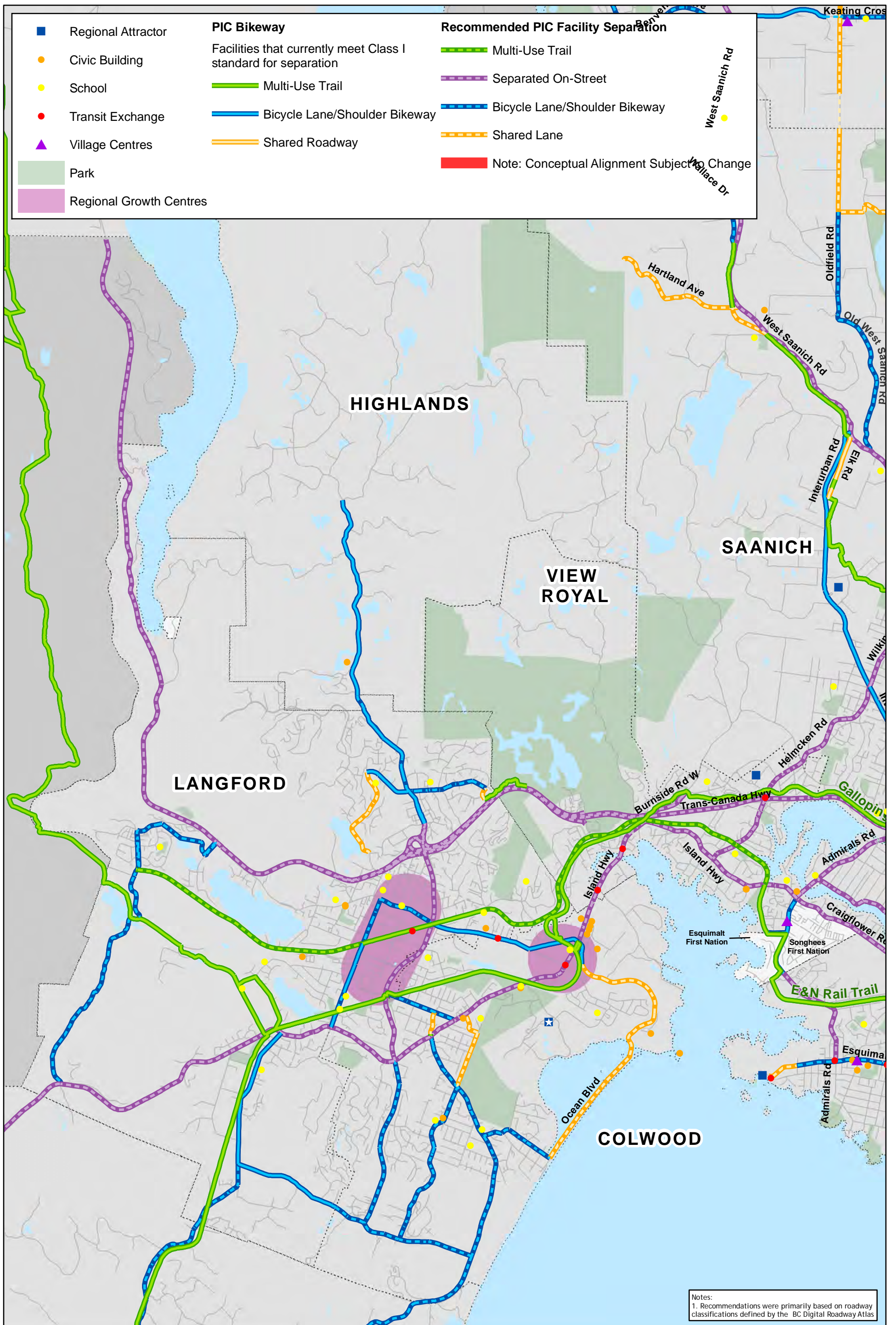
Facility Selection

The following continua show the range of bicycle facilities that are appropriate by road classification. Engineering judgement, traffic studies, previous municipal planning efforts, community input, and local context should be used to refine facility recommendations for a particular street. In some corridors, it may be desirable to construct facilities to a higher level of development than those recommended in this Masterplan to enhance user safety and comfort. For example, in areas where a paved shoulder is the recommended facility type, there may be an opportunity to build a separated multi-use trail, providing greater separation from the roadway. In other cases, the recommended level of separation is not warranted by motor vehicle speeds and volumes, and a lesser treatment may be acceptable.
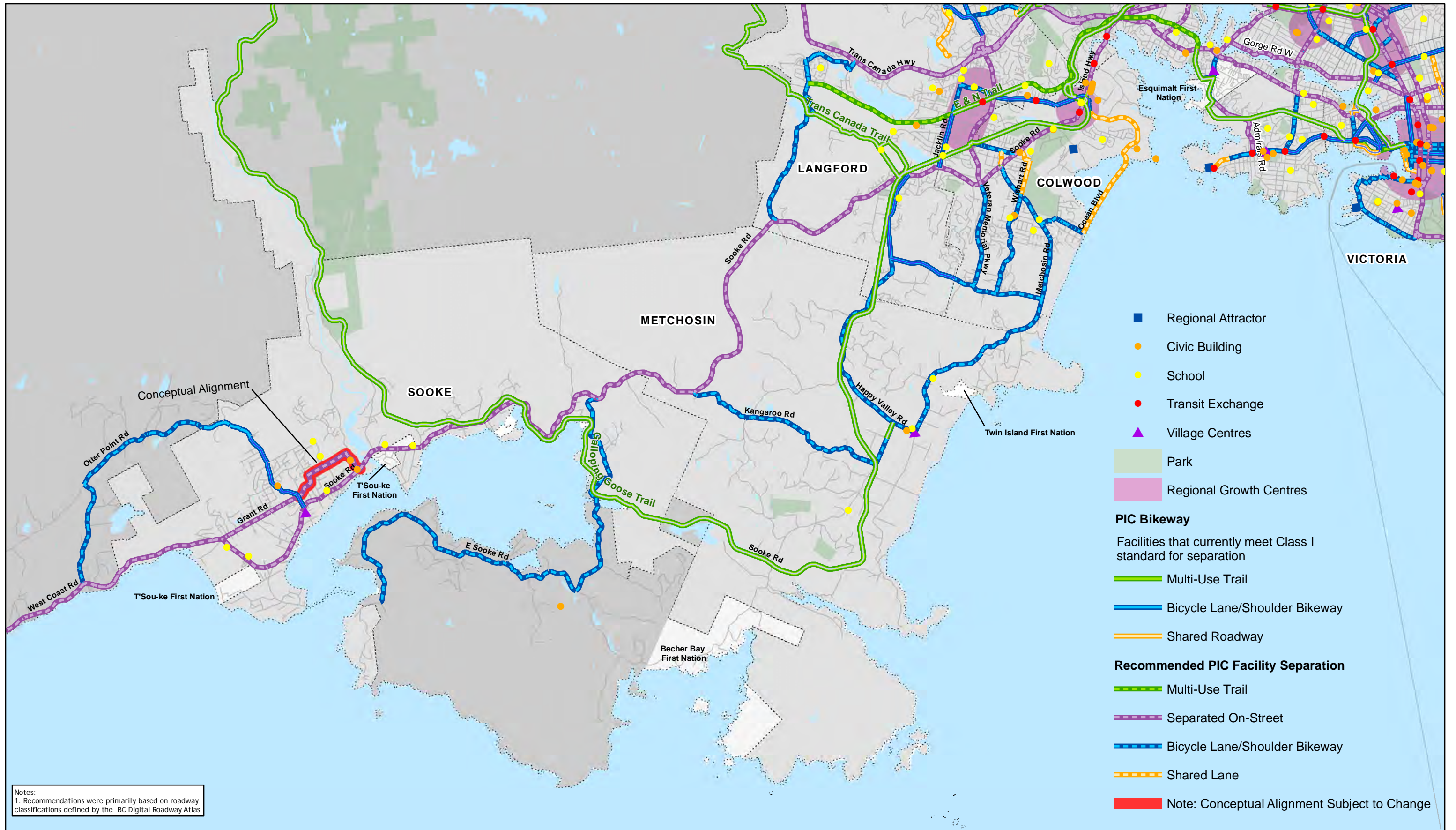
Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Park
- Regional Growth Centres

PIC Bikeway
Facilities that currently meet Class I standard for separation

- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway

Recommended PIC Facility Separation

- Multi-Use Trail
- Separated On-Street
- Bicycle Lane/Shoulder Bikeway
- Shared Lane
- Note: Conceptual Alignment Subject to Change

NORTH SAANICH

SIDNEY

CENTRAL SAANICH

Tseycum First Nation
Pauquachin First Nation
Tsartlip First Nation
Tsawout First Nation

Road labels: Lands End Rd, Chalet Rd, Tatlow Rd, Madrona Dr, Wain Rd, West Saanich Rd, Swartz Bay Rd, Patricia Bay Hwy, McDonald Park Rd, Patricia Bay Hwy, Ardwell Ave, Resthaven Dr, Lochside Trail, McTavish Rd, Mills Rd W, Galaran Rd, Beacon Ave, Fifth St, Willingdon Rd, Ocean Ave W, Canora Rd, Lochside Dr, East Saanich Rd, McTavish Rd, Amity Dr, Aldous Terr, Lochside Dr, East Saanich Rd, Wallace Dr, Patricia Bay Hwy, Mt Newton Cross Rd, Mt Newton Cross Rd, Stautw Rd, Veyaness Rd, Stellys Cross Rd, Verdier Ave, Wallace Dr, Seabrook Rd, East Saanich Rd, Island View Rd, Marchant Rd, Benvenuto Ave, Keating Cross Rd, Oldfield Rd, Central Saanich Rd, Lochside Dr, Patricia Bay Hwy, Wallace Dr

Notes:
1. Recommendations were primarily based on roadway classifications defined by the BC Digital Roadway Atlas

Map 7. Recommended Facility Separation on PIC Bikeway Corridors - Peninsula

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.5   1 Kilometers

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Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Park
- Regional Growth Centres

PIC Bikeway
Facilities that currently meet Class I standard for separation

- Multi-Use Trail
- Bicycle Lane/Shoulder Bikeway
- Shared Roadway

Recommended PIC Facility Separation

- Multi-Use Trail
- Separated On-Street
- Bicycle Lane/Shoulder Bikeway
- Shared Lane
- Note: Conceptual Alignment Subject to Change

Notes:
1. Recommendations were primarily based on roadway classifications defined by the BC Digital Roadway Atlas

Map 8. Recommended Facility Separation on PIC Bikeway Corridors - Core

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.5   1
Kilometers

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Place names and labels: Tsartlip First Nation, Tsawout First Nation, Stellys Cross Rd, Wallace Dr, East Saanich Rd, Verdier Ave, Brentwood Dr, Seabrook Rd, Island View Rd, Benvenuto Ave, Keating Cross Rd, Central Saanich Rd, West Saanich Rd, Wallace Dr, Patricia Bay Hwy, Lochside Dr, Hartland Ave, Oldfield Rd, Brookleigh Rd, Cordova Bay Rd, West Saanich Rd, Old West Saanich Rd, SAANICH, VIEW ROYAL, Interurban Rd, Elk Rd, Royal Oak Dr, Mann Ave, Quadra St, Lochside Dr, Cedar Hill Rd, Ash Rd, Ferndale Rd, Torquay Dr, San Juan Ave, Wilkinson Rd, Interurban Rd, McKenzie Ave, Mt Douglas Cross Rd, Blenkinsop Rd, McKenzie Ave, Gordon Head Rd, Arbutus Rd, Cadboro Bay Rd, Sinclair Rd, Burnside Rd W, Helmcken Rd, Trans-Canada Hwy, Galloping Goose Trail, Borden St, Shelbourne St, Cedar Hill Cross Rd, Island Hwy, Admirals Rd, Carlton Ave, Tattersall Dr, Maplewood Rd, Cook St, Henderson Rd, Craigflower Rd, Tillicum Rd, Burnside Rd E, Boleskine Rd, Cloverdale Ave, North Dairy Rd, Lansdowne Rd, Esquimalt First Nation, Songhees First Nation, E&N Rail Trail, Gorge Rd E, Finlayson St, Hillside Ave, Richmond Rd, Foul Bay Rd, Cadboro Bay Rd, Beach Dr, Lampson St, Catherine St, Harbour Rd, Douglas St, Graham St, Haultain St, Bay St, Begbie St, Bowker Ave, OAK BAY, Ocean Blvd, Esquimalt Rd, Admirals Rd, Vancouver St, Blanshard St, Government St, Pandora Ave, Johnson St, Fort St, Oak Bay Ave, McNeill Ave, COLWOOD, Belleville St, Yates St, Richardson St, Richardson St, Beach Dr, Dallas Rd, Douglas St, Cook St, May St, Fairfield Rd, Crescent Rd, VICTORIA

Legend

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Park
- Regional Growth Centres

PIC Bikeway

Facilities that currently meet Class I standard for separation

- ── Multi-Use Trail
- ── Bicycle Lane/Shoulder Bikeway
- ── Shared Roadway

Recommended PIC Facility Separation

- ┅ Multi-Use Trail
- ┅ Separated On-Street
- ┅ Bicycle Lane/Shoulder Bikeway
- ┅ Shared Lane
- ── Note: Conceptual Alignment Subject to Change

HIGHLANDS

VIEW ROYAL

SAANICH

LANGFORD

COLWOOD

Esquimalt First Nation

Songhees First Nation

E&N Rail Trail

Esquimalt

Keating Cross

West Saanich Rd

Wallace Dr

Oldfield Rd

Old West Saanich Rd

Interurban Rd

Elk Rd

Hartland Ave

West Saanich Rd

Wilkin...

Helmcken Rd

Burnside Rd W

Trans-Canada Hwy

Island Hwy

Island Hwy

Gallopin...

Admirals Rd

Craigflower Rd

Ocean Blvd

Admirals Rd

Notes:
1. Recommendations were primarily based on roadway classifications defined by the BC Digital Roadway Atlas

Map 9. Recommended Facility Separation on PIC Bikeway Corridors - West Shore One

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.45   0.9
Kilometers

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Map 10. Recommended Facility Separation on PIC Bikeway Corridors - West Shore Two

Legend:

- ■ Regional Attractor
- ● Civic Building
- ● School
- ● Transit Exchange
- ▲ Village Centres
- Park
- Regional Growth Centres

PIC Bikeway

Facilities that currently meet Class I standard for separation

- ─── Multi-Use Trail
- ─── Bicycle Lane/Shoulder Bikeway
- ─── Shared Roadway

Recommended PIC Facility Separation

- ─ ─ Multi-Use Trail
- ─ ─ Separated On-Street
- ─ ─ Bicycle Lane/Shoulder Bikeway
- ─ ─ Shared Lane
- ▬▬ Note: Conceptual Alignment Subject to Change

Notes:
1. Recommendations were primarily based on roadway classifications defined by the BC Digital Roadway Atlas

Map labels: LANGFORD, COLWOOD, METCHOSIN, SOOKE, VICTORIA, Esquimalt First Nation, T'Sou-ke First Nation, T'Sou-ke First Nation, Becher Bay First Nation, Twin Island First Nation

Road labels: Trans Canada Hwy, Trans Canada Trail, E & N Trail, Gorge Rd W, Island Hwy, Jacklin Rd, Sooke Rd, Veteran Memorial Pkwy, Wishart Rd, Metchosin Rd, Ocean Blvd, Admirals Rd, Happy Valley Rd, Kangaroo Rd, Galloping Goose Trail, Sooke Rd, E Sooke Rd, Grant Rd, West Coast Rd, Otter Point Rd, Conceptual Alignment

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0 2 4 Kilometers

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Trans Canada Trail

Pacific Marine Rd

Pacheedaht First Nation

Galloping Goose Trail

West Coast Rd

Conceptual Alignment

METCHOSIN

SOOKE

Otter Point Rd

T'Sou-ke First Nation

Sooke Rd

T'Sou-ke First Nation

Becher Bay First Nation

	Regional Bikeway	Recommended Regional Facility Separation
■ Regional Attractor	Facilities that currently meet Class I standard for separation	Multi-Use Trail
● Civic Building		Separated On-Street
● School	Multi-Use Trail	Bicycle Lane/Shoulder Bikeway
● Transit Center	Bicycle Lane/Shoulder Bikeway	Shared Lane
▲ Village Centres	Shared Roadway	Note: Conceptual Alignment Subject to Change
Park		
Regional Growth Centres		

Map 11. Recommended Facility Separation on Regional Bikeway Corridors - Juan de Fuca

N

0   2.5   5
Kilometers

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PLANNING + DESIGN

Relationship with Previous Planning Efforts

TravelChoices Strategy and Implementation Plan

The 2002 *TravelChoices* process initiated the PCMP by laying out the scope of the PCMP in the Subcommittee's final report. The *TravelChoices* planning process identified a recommended PIC network, while the *TravelChoices Implementation and Investment Plan* (TIIP) prioritized specific corridors for implementation. This section describes how the *TravelChoices* network and TIIP prioritization criteria were integrated into the PCMP planning process.

Recommended Network

Early development of the PCMP network and *TravelChoices*-recommended Regional Cycling Network (RCN) were quite similar; both processes drew on previous planning efforts (e.g., OCP's) and identification of routes currently used by cyclists but not designated as official bikeways. Both planning processes created a large pool of potential bikeways that were ranked to select a strategic network. After the network selection step, the network development processes diverge. A group of cyclists, municipal staff, and regional staff ranked the potential RCN facilities on criteria such as existing function and latent demand, while the PCMP network used an objective GIS-based analysis to develop a preliminary network, which was refined through significant municipal and stakeholder consultation.

Map 1 shows the RCN network in comparison to the PCMP network. The networks share many common corridors, including the Galloping Goose and Lochside Regional Trails and key roads such as Shelbourne Street, McKenzie Avenue, and Sooke Road. While the RCN designates more regional corridors in the core, the PCMP provides a more even distribution of facilities throughout the region. This approach provides a robust inter-community network with access to regional destinations that is augmented by local municipal bikeway networks.

Map 13. Comparison of TravelChoices Recommended Cycling Network and PCMP Regional Bikeway Network

Prioritization

In general, the TIIP prioritizes investments along the RCN in areas where more people are likely to use the facilities; e.g., focusing investments in areas with higher population numbers. This represents a broader view of bikeway network developments than the priorities identified in the *TransportationChoices Bicycle Strategy*, which only identifies priorities in the four core municipalities of Saanich, Victoria, Oak Bay, and Esquimalt. The PCMP expands on the TIIP prioritization schema focused on a broad network that provides access and options for people across the region. The expectation is that, by creating a comprehensive network of facilities that are comfortable and attractive to users of all ages and abilities, the pool of potential users grows exponentially.

The TIIP prioritizes specific bicycle projects based on level of improvements and expected number of beneficiaries; improvements that are more significant receive a higher score.

Table 6. Relationship of TravelChoices Implementation and Investment Plan (TIIP) and PCMP Prioritization Schemas

Criteria	*TravelChoices*	PCMP
Safety	ICBC Safer Cities Initiative safety index to identify high-risk locations	Makes recommendations for Class I facilities given context of bikeway corridor
Destinations	Sum of employment and post-secondary enrolment per acre (by traffic zones)	Connections to key regional destinations, including regional centres, village centres, parks, and schools
Multi-Modal	Provision for pedestrian use; multi-use trails receive higher score	Prioritized projects that provide access to transit centres and bus stops
Connectivity	Projects providing regional connectivity receive high score, projects providing inter-municipal connectivity receive medium score	Recommends a continuous priority regional network based on municipal and stakeholder priorities

The PCMP has similarly promoted projects that have a high expectation of increasing bicycling in the region by prioritizing projects where no bicycle facilities exist first, followed by improvements on designated shared bikeways. Additionally, municipal partners were surveyed to identify high priority corridors for cycling improvements in an effort to capitalize on current planning efforts.

Finally, high-priority projects identified in the *TravelChoices Implementation and Investment Plan Phase 2* (TIIP; 2006) were prioritized in the PCMP network.

Pedestrian Projects

The TIIP recommends that pedestrian projects in fast-growing municipalities receive a high priority. The PCMP recommends focusing on regional centres, areas with anticipated high pedestrian use, and high priority regional corridors, including access to transit.

The TIIP also recognizes that, "pedestrian activity is influenced far more by mixing land uses... than it is by the provision of additional pedestrian facilities." This statement supports the PCMP recommendation to provide good design guidelines for pedestrian 'priority areas,' which are within proximity of regional and village centres, schools, and transit centres.

Transportation Corridor Plan

The draft final report of the *Transportation Corridor Plan* (2010) recommends a series of corridors for primary use by particular modes of transportation; the strategic cycling network is afforded primary modal importance on the Galloping Goose and Lochside Regional Trails. Separated bicycle facilities (e.g., bike lanes) are not considered for roadways in many situations when transit is classified as the priority use (e.g., Government Street, Douglas Street, Carey Road, Lansdowne Road, and portions of the Island Highway).

Cycling Network

The cycling network for the *Transportation Corridor Plan* was developed using the E&N Rail Line, the Galloping Goose Trail, and the Lochside Regional Trail as the backbone of the network. The *Transportation Corridor Plan* recommends bicycle lanes in many on-street corridors. In some situations, bicycle use is defined as a 'local' need and dedicated bicycle facilities are not proposed; examples include portions of McKenzie Avenue, Lansdowne Road, and Yates Street.

The PCMP cycling network recognizes most of the cycling corridors designated by the *Transportation Corridor Plan* and many additional corridors identified by both RCN and municipal partners as priorities for bikeway improvements (Map 14). This variation stems, in part, from the different philosophies used to designate bikeway networks. While the PCMP-designated network is based on the idea of providing a robust network aimed at increasing the size of the potential user pool, the *Transportation Corridor Plan* focuses instead on the existing facility usage and assumptions about modal exclusivity within existing transportation corridors.

The greatest point of variation between the PCMP network and the *Transportation Corridor Plan* bikeway network lies in the lack of integration between the cycling and transit networks. The PCMP recognizes that integration of transit trips and cycling trips is integral if the CRD is to reach the ambitions mode share goals. Cyclists and transit vehicles can and should be accommodated within many transportation corridors, though attention to detail is imperative to maximize corridor function and safety. Innovative solutions, such as buffered bicycle lanes that increase separation between cyclists and transit vehicles, can be effective in shared transit/bicycle corridors.

Pedestrian Network

The *Transportation Corridor Plan* recommends that Level 1 priority pedestrian corridors provide pedestrian sidewalks with a minimum width of 2.4 metres, while Level 2 corridors have a minimum sidewalk width of 1.8 metres. The *Transportation Corridor Plan* notes that an exception can be made in the case where there is no pedestrian-related development. The PCMP pedestrian priority areas methodology identifies areas where pedestrian accommodation is particularly critical, and can be combined with the Corridor Plan methodology to target key locations for areas that require a high level of pedestrian design.
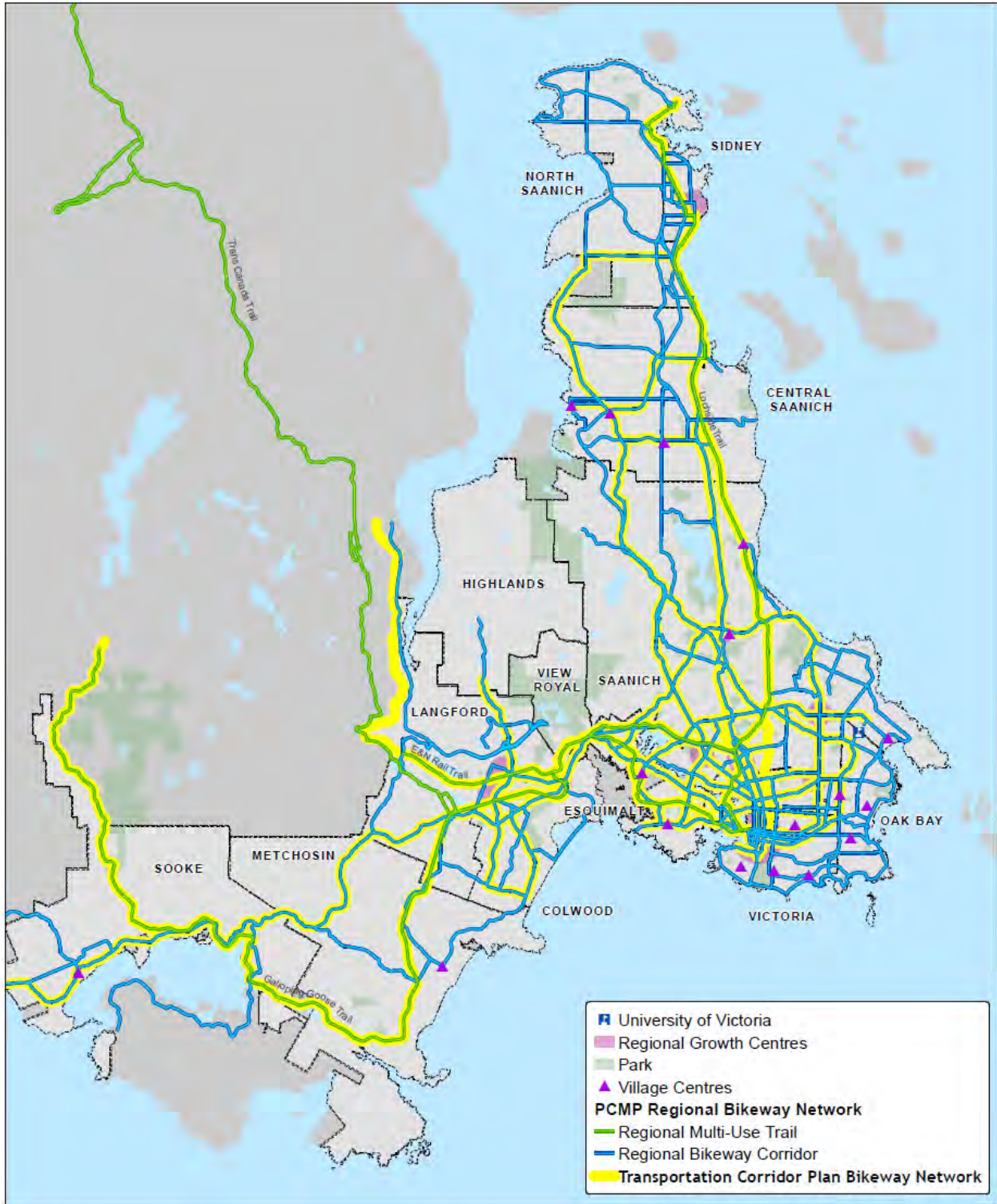
Map 14. Comparison of Transportation Corridor Plan Strategic Bikeway Network and PCMP Regional Bikeway Network

Appendix B. Trip Enhancement Facilities

Trip enhancement amenities (also known as "end-of-trip facilities") include bicycle parking and other facilities such as showers and clothing lockers for cyclists, and benches, water fountains and landmark indicators for pedestrians. They can be a determining factor in whether someone decides to make a bicycling or walking trip. They enhance the walking and bicycling experience by providing cyclists and pedestrians with somewhere to park, rest, or refresh themselves following or during their trip. Numerous studies have shown the value of these facilities in attracting pedestrians and cyclists to employment and activity centres and in supporting multi-modal trips. The CRD's *TravelChoices Strategy* supports "integrating cycling with other modes, such as transit, ferries, airports, railways and local waterways through the provision of end-of-trip and inter-modal facilities" and sees it as a key feature in equalizing cycling with other modes.

Figure 1. Stationnement de Montreal parking meter retrofit for short term bicycle parking.

A coordinated regional approach for trip enhancement facilities for active transportation includes supportive policies, incentives, and proper guidelines. Specific guidelines are provided in the *Bicycle and Pedestrian Design Guidelines*, which integrates regional and international best practices as well as innovative or experimental designs.

Figure 2. Bike lockers provide a longer-term secure parking option.

- **Bicycle parking** includes both long-term (often referred to as Class A or Class I) and short-term (often referred to as Class B of Class II) parking. These cater to different cycling groups depending largely on their trip duration and desired level of protection from weather and theft. Table 1 compares the typical characteristics of short- and long-term bicycle parking.

- **Other end-of-trip facilities** enable cyclists and pedestrians to freshen up following a trip and can include showers, washrooms, and clothing lockers, but may also include other services such as a laundry or dry-cleaning and bike-related services.

Table 1. Characteristics of short- and long-term bicycle parking[*]

Criteria	Short-Term (Class B) Bicycle Parking	Long-Term (Class A) Bicycle Parking
Parking Duration	Less than two hours	More than two hours
Typical Fixture Types	Bicycle racks	Lockers, or racks provided in a secured area
Weather Protection	Unsheltered or sheltered	Sheltered or enclosed
Security	High reliance on personal locking devices and passive surveillance (i.e. eyes on the street)	Restricted access and / or active surveillance / supervision Unsupervised: "Individual-secure", e.g. bicycle lockers "Shared-secure", e.g. bicycle room or cage Supervised: Valet bicycle parking Video, CCTV or other surveillance
Typical Land Uses	Commercial or retail, medical/healthcare, parks and recreation areas, community centres	Residential, workplace, transit, schools

[*] Source: Association of Pedestrian and Bicycle Professionals (APBP)

Existing Conditions

End-of-trip facilities are currently provided throughout the CRD. Short-term parking is provided using bicycle racks in many public places as well as outside private buildings, while long-term parking and other end-of-trip facilities are provided at some publicly accessible sites but mostly on private property (e.g., as part of an office building).

The provision, design, and placement of these facilities are currently coordinated by the individual municipalities in the CRD or by the individual property owners or managers (e.g., CRD Regional Parks). Issues identified as a result of researching for this paper are described below. Regional best practice, as well as experience from elsewhere, can be used to establish a more coordinated, region-wide approach.

Inventory

Consistent information on the location, type, and condition of bicycle parking and other end-of-trip facilities is not widely available in the CRD. Cyclists, and potential cyclists, would be better informed to make trip decisions with dissemination of this information. New York City, for example, uses downloadable Google maps (also available on PDAs) that show cyclists the location of outdoor, sheltered, and indoor bicycle parking (see Figure 1).

Creating such an inventory is challenging given that much of the supply, particularly for long-term parking and other end-of-trip facilities, is located on private property – often screened from the street. Gathering and maintaining this data would require significant effort but should be coordinated at a regional level with input from the member municipalities. An alternative data collection method is to open up the map to stakeholder groups and or the public, perhaps creating an "open-source" inventory.

Figure 3. New York City Parking Inventory Maps
Outdoor (left) and Sheltered (right).

Although an extensive inventory is not currently available, some examples of existing practices in the CRD are provided below.

Bicycle Parking at Transit Exchanges

End-of-trip facilities create connections with transit and increase the reach of these services by making cycling attractive for the "first and last kilometre" of the journey. Bicycle lockers are currently available at two regional transit facilities: McTavish Park and Ride in North Saanich and the Western Exchange Park and Ride in Colwood. Bicycle lockers are rented on a monthly basis ($10/month), and a $30.00 refundable deposit is required for the key. Lockers are managed by various Cycling Coalitions in the region, depending on where

the lockers are located. Locker construction is generally funded out of the overall capital budget for each project.

Bicycle Parking in Victoria

The City of Victoria has adopted innovative strategies for providing bicycle parking. This includes providing covered bike racks and, where sidewalk space is limited, placing racks close to the building to accommodate a single bicycle. Each of the four City-owned parkades has a designated area with bike racks that are installed next to or in view of the 24-hour security booth. Each parkade has a *plug-in* facility where electric bicycles can be charged at no cost.

A sheltered bicycle rack that provides weather protection was included at the downtown Victoria YMCA in exchange for a vehicle parking relaxation. The roof of the shelter also acts as a gateway to the building.

Several businesses are experimenting with on-street bicycle corrals in locations with narrow sidewalks. At one particular location, several hundred customers at a local coffee shop signed a petition asking for an on-street corral and raised money through collecting contributions. The City provided a concrete curb extension covering two vehicle parking spaces with coat hanger-style racks.

Bicycle Parking at the Airport

In preparation for the Pro Walk – Pro Bike Conference held in Victoria in 2004, conference organizers worked with the airport management to provide a place to re-build bikes that had been transported in boxes, and to install bicycle lockers at the airport. These amenities are still provided for traveling cyclists.

Change Facilities

Health and fitness clubs can offer an alternative to providing end-of-trip facilities within each building by building a dedicated 'bike station.' Most clubs already offer these facilities as member services and can also provide them to the general public as an extension of their business, all the while increasing their advertising. Any centralized end-of-trip facility needs to be well thought out and should be located sufficiently close to desired destinations, such as office buildings in a downtown location.

Policies

The practice of specifying short- and long-term bicycle parking requirements for new construction and redevelopment through municipal bylaws is well established and ensures that key destinations provide cyclists "somewhere to park." Typically, these bylaws specify the amount of parking required depending on the land use as well as sometimes providing guidance on placement and incentives. Some municipalities in the CRD also require other end-of-trip facilities. Existing bicycle parking standards in the Region are summarized in Table 2.

Table 2. Comparison of Bicycle Parking Standards

Jurisdiction	Bicycle Parking			Showers, Lockers, etc.		
	Required	Recommended	Optional	Required	Recommended	Optional
Core Region						
District of Oak Bay		x				
City of Victoria	x					
District of Saanich	x				x	
Town of Esquimalt	x		x**		x	x**
Town of View Royal	x*			x*	x	
West Shore Region						
City of Langford			x**			
District of Sooke		x			x	
District of Metchosin						
District of Highlands	x					
City of Colwood	x					
Peninsula Region						
District of Central Saanich	x					
District of North Saanich						
Town of Sidney	x					

* Only required for certain land uses
** To be provided with reduction in motor vehicle parking

Some examples of the policy language currently used in the region include:

- Town of Esquimalt: End-of-trip facilities for cyclists such as secure bicycle parking/storage, lockers, change rooms and showers, should be provided to encourage cycling as a viable form of transportation. (OCP; 2.3.2 General Commercial – Mixed Use Policies).
- Town of Esquimalt: Motor vehicle parking may be reduced in cases where two or more secure bicycle parking spaces are provided, shower and change rooms are provided within the building, 6 visitor bicycle parking spaces are provided on-site, and the building is located within 200 metres of a regional bus route. (Parking Bylaw No. 2011, 2003, Section 13 (5)).
- City of Langford. The City Planner may vary off-street parking by up to 10% of the required off-street parking if the owner of the above described property provides five secure bicycle storage or bicycle parking spaces for each off-street vehicle parking space waived (Zoning Bylaw No. 300, 1999 Section 6.51A.09)

- District of Saanich: Require bicycle parking/storage, and encourage change and shower facilities where appropriate, in commercial, institutional, public, recreational, and multi-family residential buildings. (OCP Bylaw 8940; 4.2.9 Mobility Policies).
- District of Sooke: Provide bicycle facilities (e.g. secure storage, change rooms, showers) and racks throughout the community ... in particular at Edward Milne Community School, the town centre area and SEAPARC. (Sustainable Development Strategy; Strategy #2 - Key Tasks & Catalyst Projects).
- District of Sooke: Make cycling more attractive to District employees by providing secured bike storage and showers at District Hall. (Sustainable Development Strategy; Strategy #2 - Key Corporate Tasks; Encourage alternatives to the vehicle).
- District of Sooke: The District should investigate opportunities to implement a bylaw that requires all retail and office with more than ten (10) employees to provide a shower facility for employees. (Transportation Master Plan, 5.3 Bicycle Shower/Change Facilities).
- Town of View Royal: The inclusion of bicycle parking areas and facilities such as showers, lockers, and change rooms shall be encouraged at commercial, institutional, public, recreational, and multi-family residential development sites. (OCP Bylaw No. 361; 3.4.1 Transportation – Policies).
- Town of View Royal: End-of-trip amenities for cyclists, including, but not limited to, showers, change rooms and temporary bicycle storage must be provided for the convenience of customers and employees in Comprehensive Development (Business Park)_ Zone CD-7 (Land Use Bylaw No. 35, 1990, Zone Table Comprehensive Development (Business Park) CD-7)
- District of Oak Bay: Recommends increased numbers of bicycle racks in high density public areas to "encourage more people to consider cycling as a means of transportation." (OCP Bylaw No #3943; 28.3; Objective 2).
- Town of Sidney: In conjunction with local community groups, the creation of bicycle parking facilities downtown and in other high-density areas will be encouraged and supported where appropriate and the demand is sustainable. (OCP Bylaw No. 1920; Cycling and Pedestrian Transportation; 17.3.9).

Further details about the regulatory tools used to regulate bicycle parking, such as zoning bylaws or traffic bylaws, are included in the Bylaw Review.

Bylaw Bicycle Parking Rates

Bicycle parking rates for a number of municipalities are compared in Table 3. For the most part, these are fairly consistent across the region with some variation in the amount (with requirements tending to be higher in higher density areas) and the mix of long-term and short-term parking.

Beyond off-street requirements, the Victoria Corporate Strategic Plan 2007-2009 also recommends on-street bicycle parking rates depending on the adjacent land use. In general, regional and neighbourhood centres, as well as regional facilities such as hospitals, schools, recreation, and community facilities, are high bicycle parking generators.

The City of Victoria has a cost-sharing program to split the cost of on-street bicycle parking with local businesses, primarily in the downtown core and in major commercial centres. This is a practice adopted in many places to encourage retrofit of the existing system.

Table 3. Comparison of Existing Bicycle Parking Guidelines in CRD

	Sidney		Colwood		Saanich		Central Saanich	Highlands	Esquimalt		Sooke1		Victoria	
	Class I	Class II	Class I	Class II	Class I	Class II	Any	Any	Class I	Class II	Class I	Class II	Class I	Class II
Residential														
Multi-Family Residential	0.5 sp / unit	0.25 sp / unit	1 sp / unit	6 spaces	1 sp / unit	6 spaces	1 sp / 10 vehicle parking spaces (all uses)	1 sp / 10 vehicle parking spaces (all uses)	1.5 sp/unit	6 spaces	0.8 sp/unit	0.2 sp/unit	1 sp/unit	6 spaces
Senior Citizen Housing	4 spaces	6 spaces	0.7 sp / 15 units	0.3 sp / 15 units	0.7 sp / 15 units	0.3 sp / 15 units							0.7 sp/15 units	0.3 sp/15 units
Commercial														
Commercial, General	1 sp/125 m²*						1 space / 10 vehicle parking spaces (all uses)	1 sp / 10 vehicle parking spaces (all uses)	1 sp/10 fulltime employees (1 space min.)	6 spaces			0.5 sp/205 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)	0.5 sp/205 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)
Commercial, Retail		6 spaces	0.5 sp/250 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)	0.5 sp/250 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)							0.25 sp / 200m² GFA	0.75 sp / 200m² GFA		
Commercial, Office		1 sp/125 m²*	0.5 sp/250 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)	0.5 sp/250 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)	0.5 sp/250 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)	0.5 sp/250 m² GFA (<5,000 m²), plus 0.5 sp/500m² GFA (> 5,000 m²)					0.75 sp / 200m² GFA	0.25 sp / 200m² GFA		
Commercial, Shopping Centre			0.3 sp/250 m² GFA (<5,000 m²), plus 0.3 sp/500m² GFA (> 5,000 m²)	0.7 sp/250 m² GFA (<5,000 m²), plus 0.7 sp/500m² GFA (> 5,000 m²)	0.3 sp/250 m² GLA (<5,000 m²), plus 0.3 sp/500m² GLA (> 5,000 m²)	0.7 sp/250 m² GLA (<5,000 m²), plus 0.7 sp/500m² GLA (> 5,000 m²)							0.3 sp/205 m² GFA (<5,000 m²), plus 0.3 sp/500m² GFA (> 5,000 m²)	0.7 sp/205 m² GFA (<5,000 m²), plus 0.7 sp/500m² GFA (> 5,000 m²)
Hotel/Motel	1 sp/500 m²*		0.6 sp / 15 rooms	0.4 sp / 15 rooms	0.6 sp / 15 rooms	0.4 sp / 15 rooms					0.6 sp/15 rooms	0.4 sp/15 rooms	0.6 sp/15 rooms	0.4 sp/15 rooms, plus 6 visitor spaces (over 75 rooms)
Industrial			0.8 sp/950 m² GFA	0.2 sp/950 m² GFA	0.8 sp/950 m² GFA	0.2 sp/950 m² GFA			1 sp/10 fulltime employees (1 space min.)					

	Sidney		Colwood		Saanich		Central Saanich	Highlands	Esquimalt		Sooke1		Victoria	
	Class I	Class II	Class I	Class II	Class I	Class II	Any	Any	Class I	Class II	Class I	Class II	Class I	Class II
Civic Uses														
Recreational		6 spaces	0.2 sp / 40 seats, plus 1 sp / 5 employees (spectator facilities) 0.2 sp / 80m² Surface Area (gym, spa)	0.8 sp / 40 seats (spectator facilities) 0.8 sp / 80m² Surface Area (gym, health spa)	0.2 sp / 100m² Surface Area (spectator facilities) 0.2 sp / 80m² Surface Area (gym, health spa)	0.8 sp / 100m² Surface Area (spectator facilities) 0.8 sp / 80m² Surface Area (gym, health spa)	1 space / 10 vehicle parking spaces (all uses)	1 space / 10 vehicle parking spaces (all uses)			0.25 sp / 200m² GFA	0.75 sp / 200m² GFA		
Cultural	1 sp/250 m²*	6 spaces	0.2 sp / 100m² GFA (library/ museum)	0.8 sp / 100m² GFA (library/ museum) 1/50 seats (church)	0.2 sp / 100m² GFA (library/ museum)	0.8 sp / 100m² GFA (library/ museum) 1/50 seats (church)					0.25 sp / 200m² GFA	0.75 sp / 200m² GFA		
Educational	1 sp/250 m²*		1 sp / 10 employees, plus 0.5 sp / 10 students (elementary) 0.5 sp / 8 (junior/ senior) 0.5 sp / 5 college 1 sp /4 residents (residences)	0.5 sp / 10 students (elementary) 0.5 sp / 8 (junior/ senior) 0.5 sp / 5 college	1 sp / 10 employees	1 sp / 10 students (elementary) 1 sp / 8 (junior/ senior) 1 sp / 5 college					0.25 sp / 200m² GFA	0.75 sp / 200m² GFA		
Day Care			0.2 sp / 80m² GFA	0.8 sp / 80m² GFA	0.2 sp / 80m² GFA	0.8 sp / 80m² GFA								
Hospitals	1 sp/250 m²*	6 spaces	0.75 sp / 500m² GFA	0.25 sp / 500m² GFA, plus 6 space racks at each entrance	0.75 sp / 500m² GFA	0.25 sp / 500m² GFA, plus 6 space racks at each entrance								
Parking Structure											10% of vehicle spaces			
Other Uses											As determined by the District			

* Assessed on 80% of GFA.

1 Based on recommendations in the Sooke Transportation Master Plan – these are not bylaw requirements.

Incentives

Some municipalities provide incentives for a developer to include bicycle parking and end-of-trip facilities beyond the minimum requirements. Esquimalt, for example, offers reductions in off-street motor vehicle parking at commercial and industrial buildings if all of the following conditions are met:

- Two (2) or more secure bicycle storage spaces are provided;
- Shower and change rooms are provided;
- Six (6) visitor bicycle parking spaces are provided; and
- The building is located within 200 metres of a regional bus route.[1]

A slight variation from the Lower Mainland is the City of Vancouver's incentive for reduced motor vehicle parking if a developer provides bicycle parking above the minimum required amount. In Vancouver, required rates of motor vehicle parking have already been adjusted (decreased) to encourage walking and bicycling by reducing parking availability.

A number of municipal bylaws allow the collection of payment-in-lieu of parking. These policies were traditionally only applied under certain conditions (e.g., where buildings cannot be altered due to historic value) and only when the funds could be applied to a collective parking facility nearby. However Bill 27 now allows for collection of payment-in-lieu under any conditions with the funds being placed in a sustainable transportation infrastructure fund and used to fund future projects[2].

Trip Enhancement Facilities Guidelines and Recommendations

This section provides recommendations for developing a coordinated regional approach to end-of-trip facilities for active transportation. Recommendations include sample policies, incentives, and design guidelines. These topics integrate regional and international best practices as well as innovative or experimental designs.

In general, the CRD can encourage municipalities to develop bicycle parking requirements and design guidelines, as part of their bylaws, that would:

- Require bicycle parking and end-of-trip facilities in both newly constructed buildings and redevelopment.
- Consider both long-term and short-term parking requirements.
- Establish standards for the provision of end-of-trip facilities such as showers, washrooms, and clothing lockers.
- Provide incentives to encourage bicycle parking facilities beyond the minimum requirements.
- Provide guidance on the design and placement of these facilities.
- Establish bike rack programs that assist in the location, design, and funding of bicycle racks to stimulate retrofitting short-term bicycle parking in the existing network.

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[1] Parking Bylaw 1992, No. 2011.

[2] Fraser Basin Council (2009). *Transportation Demand Management – A Small- and Mid-Size Communities Toolkit.*

Bylaw Bicycle Parking Requirements

Most municipalities in the CRD maintain a set of bicycle parking requirements that relate the amount of required parking to the size of different land uses. It is recommended that where these bylaws already exist the municipality continue to use those standards.

However, a number of municipalities do not maintain bicycle parking requirements as part of their bylaws, or they base their rates on a percentage of motor vehicle parking required (which is problematic given automobile parking demand is not necessarily an indicator of bicycle parking demand and as alternative modes are encouraged at the expense of driving and parking, this will result in fewer bicycle parking spaces).

Where municipalities do not have existing or appropriate bylaw requirements, the following rates are offered as general recommendations. These are based on existing regional practice and the 2010 *Bicycle Parking Guidelines* produced by the Association of Pedestrian and Bicycle Professionals (APBP) and are included in Table 4.

Table 4. Recommended Parking Requirements, Residential Land Uses

Type of Activity	Long-Term Bicycle Parking	Short-Term Bicycle Parking	Source	Notes
Residential				
Single family dwelling	No spaces required	No spaces required		
Multi-family dwelling				
a) With private garage for each unit*	No spaces required	0.5 spaces / unit, minimum 2 spaces	APBP	
b) Without private garage for each unit	At least 1.0 space/unit distributed at least 50% to long-term		Regional bylaws	
c) Senior housing	0.7 spaces / 15 units, minimum 2 spaces	0.3 spaces / 15 units, minimum 2 spaces	Regional bylaws	
Civic / Cultural				
Non-assembly cultural (library, government buildings, etc.)	0.2 spaces / 100 m2 GFA	0.8 spaces / 100 m2 GFA	Regional bylaws	
Assembly (church, theatre, stadium, park, beach, etc.)	1 space / 10 employees	Spaces for 2% of maximum expected daily attendance	APBP	
Health care/hospital	0.75 spaces / 500 m2 GFA	0.25 spaces / 500 m2 GFA	Regional bylaws	
Day Care	0.2 spaces / 80 m2 GFA	0.8 spaces / 80 m2 GFA	Regional bylaws	
Education				
Elementary	1 space / 10 employees	1 space / 10 students	Regional bylaws	Short-term parking could include a bike compound
Junior/Senior	1 space / 10 employees	1 space / 8 students	Regional bylaws	Short-term parking could include a bike compound

Type of Activity	Long-Term Bicycle Parking	Short-Term Bicycle Parking	Source	Notes
Post-Secondary	1 space / 10 employees	1 space / 5 FTEs	Regional bylaws	More long-term parking may be desirable.
Rail/bus terminals and stations/airports	Spaces for 5% projected a.m. peak period daily ridership	Spaces for 1.5% a.m. peak period daily ridership	APBP	
Retail				
Shopping Centre	0.3 sp/250 m2 GFA (<5,000 m2), plus 0.3 sp/500m2 GFA (> 5,000 m2)	0.7 sp/250 m2 GFA (<5,000 m2), plus 0.7 sp/500m2 GFA (> 5,000 m2)	Regional bylaws	
General retail	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	Regional bylaws	
Office	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	0.5 sp/250 m2 GFA (<5,000 m2), plus 0.5 sp/500m2 GFA (> 5,000 m2)	Regional bylaws	
Auto Related				
Automotive sales, rental and delivery, automotive servicing, automotive repair and cleaning	1 space for each 1,000 m2 of floor area	1 space for each 1,850 m2 of floor area	APBP	
Off-street parking lots and garages available to the general public either without charge or on a fee basis	1 space for each 20 automobile spaces, minimum 2 spaces – unattended surface parking lots excepted	Minimum of 6 spaces or 1 per 20 auto spaces – unattended surface parking lots excepted	APBP	
Industrial				
General	0.8 space / 950 m2 GFA	0.2 space / 950 m2 GFA	Regional bylaws	

[*] A private locked storage unit may be considered as a private garage if a bicycle can fit into it.

Anticipating Demand at Transit Stations

Providing parking at transit stations is particularly important and has been given additional consideration. The amount of parking needs to exceed the average demand, as users should be able to depend on facilities being available. Demand determines not only the amount of parking, but the type of facility provided as well.

The following are examples of guidelines used by other agencies around the world:

- Bicycle parking at exchanges should be between one space per 150 entrants and one space per 1,000 entrants, depending on station type and use. (The London Underground)

- Bicycle parking should be 50-80% occupied on average. If parking is at a location that is likely to experience considerable growth or if there are regular overflow periods (e.g., the station would be popular for use during a large event), it should be closer to 50% occupied and built with the ability to expand easily. (The *CROW Design Manual for Bicycle Traffic*)
- The number of lockers provided should exceed the current demand for lockers (measured by counts of bikes parked at racks and the current usage and wait list for locker at a station) by 10% to allow for fluctuations and growth. (Bay Area Rapid Transit [BART])
- Bike stations should be considered when the demand for long-term parking exceeds 100 bicycles. (BART)

Other factors to consider when estimating demand for a new station or for providing long-term parking where it previously did not exist include:

- Demographics of the service area
- Extent of the bicycle network in the area surrounding the station
- Current ridership capacity
- Mode share
- Trip destination
- Planning goals for the area
- Current parking use at the station
- Current use of bike-on-bus racks
- Type of transit service (bus, light rail or commuter rail)
- Presence of employment and/or major employer near exchange
- Projected regional growth
- Projected bicycle ridership levels

Table 5 outlines a series of questions that help determine the type and quantity of parking at a particular transit station.

Table 5. Recommended Adjustment Factors for Estimating Bicycle Parking at Transit

Factor	Adjustment
Results of the bicycle parking demand model	
How many bicyclists are estimated to park at the site?	Facility should provide parking for at least 20% more bicycles than estimated to regularly use the facility.
Will a particular segment of potential market demand be emphasized over others due to the location?	Hours of parking availability should be convenient for workers and students; marketing efforts should be targeted to potential users.
For each station, how reliable is it to find space for bikes at rush hour?	Quantity of parking should be sufficient to meet bicycle-on-bus or -train capacity.
How much does the demand for park-and-ride spaces exceed supply?	In areas where Park and Ride lots are at capacity, improved bicycle parking can capture a proportion of would-be drivers.
Is there evidence of current bike activity (e.g. parked bikes) at the site?	Facility should provide parking for at least 20% more bicycles than regularly use the facility, and more if demand is estimated to increase.
Type of public transportation	
Does the station connect to a bus route?	Parking should be provided to accommodate riders who may not find space for a bike on their connecting bus.
Does the transit short-cut a hill or other barrier to bicycling?	People are more likely to take transit with their bicycles if they can avoid a large hill, or if transit is significantly faster than bicycling. Increased parking facilities should be provided. In addition, the transit agency may want to work with the responsible agency to remedy the barrier.
Does the transit line offer a time savings as compared with bicycling (e.g., connecting distant destinations with few stops)?	Transit lines offering travel time savings over bicycling should provide more long-term parking.
Surrounding employment and commercial density	
How many jobs fall within biking distance of the site?	Accommodate transit users who may be interested in storing an additional bicycle at the non-home trip-end.
Will the number of jobs within biking distance of the site grow in the future?	Ensure that there is space for expansion in locations that are likely to be close to future employment.
Potential to generate operating revenue	
Is there a need for bicycle repair and accessory sales in the immediate vicinity?	People will use the resources available at the bicycle parking if the community does not have them available otherwise; this is likely to increase the use of bicycle parking and bike-to-transit trips.
Is there a need for some other complementary business activity in the immediate vicinity?	It is possible to recoup some of the expenses of providing bicycle parking by linking complimentary uses, such as bicycle rentals/fleets and food sales.

Incentives

There are a number of incentives that can be used to encourage improved bicycle parking and end-of-trip facilities. These include:

- Providing motor vehicle parking relaxations where bicycle parking is provided beyond the minimum requirements.
- Providing motor vehicle parking relaxations where complete end-of-trip facilities are provided, e.g., long- and short-term parking coupled with showers, washrooms, and clothing lockers.
- In space-constrained applications, such as redevelopment of an existing building, allow for the conversion of motor vehicle parking spaces into long-term bicycle parking to meet the bylaw requirement (typically five bicycle parking spaces can be achieved per motor vehicle parking space).
- Extending or introducing payment-in-lieu of parking programs to allow funds to be collected in-lieu of vehicle parking and placed in a sustainable transportation infrastructure fund to fund active transportation projects, which may include a centralized bicycle parking and end-of-trip facility (e.g. a bike station). Note: this should not replace bicycle parking and end-of-trip facility requirements.

Bike Rack Program

The CRD should encourage the municipalities to establish a Bicycle Rack Program that works with interested land owners to supplement the existing supply of bicycle parking. The CRD can provide information on possible vendors as well as rack design and placement as part of these guidelines. Municipalities should be encouraged to set up some form of joint funding arrangement with interested land owners to install bicycle racks.

Increased Awareness

The CRD should raise awareness of the benefits of short- and long-term bicycle parking and end-of-trip facilities to developers, owners, and managers of privately-owned commercial properties. The 2010 report, *Bike Corrals: Local Business Impacts, Benefits, and Attitudes* found widespread support for bike corrals from local businesses. *The Employer Guide to Bicycle Commuting: Establishing a Bike-Friendly Workplace for your Baltimore Region Employees* is a good example of information the CRD could make available to employers interested in encouraging cycling to work. The document compares the initial cost of 12 automobile parking spaces ($40,000 to $100,000 USD) to the cost of 12 bike rack spaces and one automobile space ($4,600 - $9,600 USD).

Design Principles

This section provides best practices for designing pedestrian amenities and bicycle end-of-trip facilities. Consideration is also provided for proper placement and frequency of amenities.

Pedestrian Amenities

Pedestrians benefit from a variety of amenities, including benches, water fountains, covered areas, street lighting, and street trees, that provide opportunities to rest, replenish, and enjoy the trip. These amenities also provide visual detail that makes a place comfortable and interesting.

Placement

Sidewalks and other walkways should be kept clear of amenities, as well as poles, newspaper racks, and other items in the walkway area. Sometimes this can be done by grouping amenities at a street corner or curb extension. Protruding objects should be minimized and made detectible by pedestrians who are visually impaired.

Recommended locations for placing pedestrian amenities include:

- Transit exchanges
- Major building entrances
- Retail main streets
- Restaurants

While such amenities will likely be installed incrementally along a corridor, a streetscape improvement plan will help give a coherent theme for a corridor.

Benches

A consideration particularly important for elderly pedestrians, benches provide pedestrians with an opportunity to stop and rest before continuing their trip. Street furniture should not block the pedestrian walkway or curb ramps, nor should it create sightline problems. Benches can sometimes be incorporated into building form or landscape features.

Water Fountains

Water fountains provide water for people (and pets, in some cases) and can be attractive landscape features.

Covered Areas

Usually located at a bus exchange, covered areas or shelters provide a place for pedestrians to get out of inclement weather or wait for a bus. Bus exchange accessibility guidelines are provided by BC Transit in the document, *Design Guidelines for Accessible Bus Stops*. These are discussed in greater detail in Appendix C: Active Transportation and Transit Integration.

Street Lighting

Pedestrian-scale lighting improves safety and comfort for pedestrians at night. Lighting improves drivers' ability to see pedestrians, allows pedestrians to see obstacles or uneven pavement on the sidewalk, and increases personal safety. Streetlights should be placed on both sides of arterial and collector streets, and in commercial areas. Crossing areas may benefit from lighting.

Street trees

Street trees provide an attractive cover that calms traffic while shading pedestrians. The appropriate street tree for a particular location depends on maintenance, root growth pattern, foliage texture, growth rate, longevity, canopy spread, resistance to urban pollutants, and tolerance to drought and poor soils.

Trees should not block views of storefronts or impair pedestrian, bicyclist, or driver visibility. They should be spaced so that they provide a continuous overhead canopy when mature – spacing will vary depending on species. A diversity of species can help discourage disease and make an attractive pattern.

Bicycle Parking

Bicycle parking is necessary for all cyclists, regardless of whether they are commuting to work or school, going shopping or running errands, or enjoying a recreational outing. The following guiding principles influence the design and location of all types of bicycle parking:

- **Safety and Security:** Surveillance of bicycle parking facilities helps to prevent theft and vandalism, and also helps cyclists to feel more personally secure when locking or retrieving their bicycle. Wherever possible, bicycle parking should be located within view of pedestrians, retail activity or office windows, or should include other security measures such as video surveillance and street

lighting. Bicycle parking facilities should be designed with high quality, theft resistant materials and be firmly anchored to the ground or building.

- **Convenience and Accessibility:** Bicycle parking should be at least as convenient as automobile parking to ensure cycling is an attractive option. Bicycle parking facilities should be located near building entrances and other attractions. Additionally, facilities should be located along the street or along dedicated bicycle routes. Proximity to pedestrian and automobile traffic should also be taken into consideration so as to avoid conflicts with other modes of transportation. Wherever possible, bicycle parking locations that require cyclists to travel over stairs or hills should be avoided. Finally, bicycle parking also needs to be plentiful. Cyclists need to be confident that they will have a designated place to secure their bicycles once they reach their destination.

- **Visibility and Lighting:** The location selected for short-term bicycle parking should be well-lit and easily identifiable by cyclists as they are riding. A highly visible and well lit location will also help reduce theft and vandalism, both of which are significant deterrents to bicycle usage.

- **Avoiding Conflicts with Both Pedestrians and Vehicles:** The location of bicycle parking should not present a conflict with pedestrians, other cyclists, or automobiles. The design of bicycle parking facilities should avoid any protruding bars that could trip or injure cyclists or pedestrians. Very low, bar-type racks should also be avoided for the same reason. Bicycle parking should be separated from automobile parking areas and from roads by a physical barrier.

- **Quality of Design and Aesthetics:** Where appropriate, the design and aesthetic quality of the bicycle rack should reflect the surrounding neighbourhood and environment, and coordinate with other street furniture. Bicycle parking facilities should receive ongoing maintenance, and any graffiti or vandalism should be cleaned or repaired immediately.

Rack Types

The following list of bicycle parking facility types incorporate a small variation of typical support designs. Bicycle 'staples' are the standard two-bicycle racks, which can be placed on- or off-street, as well as in a locked room or parking garage. Bicycle racks are easily adaptable to meet almost any aesthetic purpose so long as it meets the two basic functions of upright support and locking of frame and wheels. Bicycle racks also facilitate the use of 'U' type locks and conventional chains or cables. While staple racks can appear similar, there are small differences that can have impacts on usability and security. The following are key characteristics to consider when choosing a bicycle rack:

- **Support:** The rack must keep the bicycle upright without damaging the wheels or the frame. To do so, the rack must support the bicycle upright by its frame at two points in a horizontal plane to prevent the bicycle from falling.

- **Security:** The rack must be able to be used with common bicycle locks, including cable locks or U-shaped locks, and should be designed so that the frame and one or both wheels can be secured. The bicycle rack should be resistant to being cut or detached using bolt cutters, pipe cutters, or other devices, and should be securely anchored to the ground or the building structure to prevent it from being removed.

- **Flexibility:** The rack must accommodate a wide range of bicycle sizes, wheel sizes, and types. The typical dimension envelope for most bicycles is 1.8 metres in length, 0.6 metres in width, and 1.2 metres in height. Most conventional bicycles have dimensions similar to these, and most acceptable bicycle racks and lockers accommodate these dimensions. In addition, site layouts should strive to accommodate other bicycle types such as recumbent, folding bicycles, trail-a-bike child carriers, bicycle trailers, and cargo bicycles.

- **Materials:** The rack should be covered with a material that will not chip the paint of a bicycle that leans against it. The rack should also not have hazards, such as sharp edges, that could damage a bicycle, injure the cyclist, or damage clothing. The materials used should also resist rusting and corrosion.

- **Attractiveness:** The rack should be compact and attractive. The rack should fit in with the surrounding streetscape and urban environment. Bicycle racks can incorporate unique colours or original designs to match awnings, facades, or other street furniture.

- **Simplicity:** The rack should be simple and intuitive to use and as a general rule should avoid having any moving parts.

- **Capacity:** The bicycle rack should be able to actually hold the number of bicycles claimed. Unfortunately, though, this is not always the case.

- **Space and Cost Effectiveness:** The bicycle rack should maximize the use of the bicycle parking envelope and occupy a small footprint in order to not impede other users. The rack should maximize efficiency by allowing more than one bicycle to be secured to the rack. Finally, the rack should not present a hazard to pedestrians.

Figure 4. U-rack model dimensions.
Source: Capital Bike and Walk Society: Bicycles at Rest Best Practices Guide
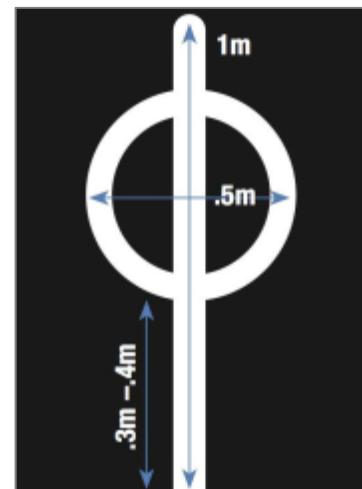
Figure 5. Post and ring rack dimensions.
Source: Capital Bike and Walk Society: Bicycles at Rest Best Practices Guide

There are several common types of bicycle racks that meet many of these design criteria including:

- **U-Racks,** common in Victoria, are attractive, simple, and designed to effectively support two bicycles while utilizing very little space. U-racks can also be clustered together in areas of high demand and incorporate unique colours or design features to match the surrounding streetscape.

- **Post and ring racks,** which can support two bicycles, occupy a very small footprint, and can be effectively attached to other infrastructure such as motor vehicle parking meters. Post and ring racks can also incorporate unique colours to match the surrounding streetscape.

- **Coat hanger or spiral racks,** which allow cyclists to lock one wheel and the frame of the bicycle to the rack and can accommodate multiple bicycles. These racks can also incorporate unique colours to match the surrounding streetscape.

Racks that do not meet these criteria include:

- **Wheelbender racks,** which consist of concrete blocks slotted for a bicycle wheel. These racks hold only the bicycle's wheel, and do not support the use of a U-shaped lock. They can also cause damage to the bicycle wheels.

- **Comb racks or toaster racks,** which are designed to roll bicycles into wheel slots. These types of racks also lack stable support and can cause damage to the bicycle wheels.

- **Wave racks,** which only provide a single point of horizontal contact and lack stability.

The following lists provide guidance on the placement of bicycle racks.

Recommended Clearance

- If the bicycle rack is located perpendicular to a wall, at least 0.6 metres clearance shall be provided if the rack has single-side access. If the rack has double-sided access, 2.5 metres clearance shall be provided.
- If the bicycle rack is located parallel to a wall, at least 0.45 metres clearance shall be provided.
- Clearance from fire hydrants or bus exchanges should be 1.5 m minimum.
- Clearance from potential points of conflict with other users such as intersections and driveways should be 1.2 m.
- Clearance from obstructions such as street trees, utilities and street furniture, garbage cans, etc. should be 1.2 m minimum. A clear distance of 0.9 m is the minimum standard.

Spacing between Racks

- If two separate bicycle racks are provided parallel to each other, a minimum of 0.7 metres must be provided between the racks.
- A clear aisle width of at least 1.8 metres must be provided between bicycle racks that hold more than two bicycles. For typical bicycle racks, this results in approximately 4.2 metres between bicycle racks.
- If bicycle racks are provided in a parallel series, a minimum of 1.8 metres shall be provided between the racks.

Spacing between Rack Ends

- A clear width of 0.9 metres shall be provided between rack ends to balance maximum bicycle parking capacity with adequate bicycle manoeuvrability.

Cargo bikes, tandems, bikes with trailers, and other less-conventional bicycles are too large to park in a standard sidewalk bicycle rack or corral, and are often too large to bring indoors. Table 6 provides an overview of non-conventional bicycle types and parking implications.

Table 6. Non-Conventional Bicycle Types

Bicycle Type	Notes
Tandem (two inline riders)	Length up to 250 cm; other specs similar to conventional bicycles. Will fit in most outdoor bicycle racks, but may extend into aisles.
Recumbent (feet-first, or with a chair or sling-like seat)	Height of seat back similar to height of conventional bicycles. Front wheels frequently smaller than 66 cm, sometimes also rear wheels. Pedals often elevated, sometimes as much as 45 cm above ground. Several subtypes: • Short wheelbase: length < conventional. • Medium wheelbase or compact: length like conventional. • Long wheelbase: length < conventional. If length does not exceed conventional length, a recumbent will typically fit in a bicycle locker. Even if overall length does not exceed conventional length, the distance between tire contact points may exceed the length of guide trays in certain two-level bicycle storage racks.
Adult tricycle	Two formats: • Delta (single wheel in front). • Tadpole (single wheel in rear). Two layouts in each format: • Upright (similar to conventional comfort of hybrid bicycles). • Recumbent (feet first, similar to two-wheel recumbent.
Cargo	Several subtypes: • Longtail (extended length bicycle frames which carry cargo behind the rider). • Cargo trailer (wheeled cart which attached to the rear of the bicycle to carry cargo. • Bakfiets (Northern European-style cargo bicycle which carries cargo in front of the rider, usually in a large basket or wooden cargo hold.

Source: Association of Pedestrian and Bicycle Professionals: Bicycle Parking Guidelines (2nd Edition)

Placement

In order to encourage bicycle use, bicycle parking must be as convenient, if not more so, than motor vehicle parking. The facilities must be located in close proximity to building entrances and elevators. Table 7 provides some general placement guidelines.

Table 7. Bicycle Rack Placement Guidelines

Design Issue	Recommended Guidance
Minimum Rack Height	To increase visibility to pedestrians, racks should have a minimum height of 0.8 metres or be indicated or cordoned off by visible markers.
Signing	Where bicycle parking areas are not clearly visible to approaching cyclists, signs at least 0.3 metres square should direct them to the facility. The sign should include the name, phone number, and location of the person in charge of the facility, where applicable.
Lighting	Lighting of not less than one foot-candle illumination at ground level should be provided in all bicycle parking areas.
Frequency of Racks on Streets	In popular retail areas, two or more racks should be installed on each side of each block. This does not eliminate the inclusion of requests from the public which do not fall in these areas. Areas officially designated or used as bicycle routes may warrant the consideration of more racks.
Location and Access	Access to facilities should be convenient; where access is by sidewalk or walkway, accessible curb ramps should be provided where appropriate. Parking facilities intended for employees should be located near the employee entrance, and those for customers or visitors near main public entrances. (Convenience should be balanced against the need for security if the employee entrance is not in a well-travelled area). Bicycle parking should be clustered in lots not to exceed 16 spaces each. Large expanses of bicycle parking make it easier for thieves to be undetected.
Locations at Buildings	Provide bike racks within 15 metres of the entrance. Where a security guard is present, provide racks behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.
Locations near Transit Exchanges	To prevent bicyclists from locking bikes to bus exchange poles, which can create access problems for transit users, particularly those who are disabled, racks should be placed in close proximity to transit exchanges where there is a demand for short-term bike parking.
Locations within a Campus-Type Setting	Racks are useful in a campus-type setting at locations where the user is likely to spend less than two hours, such as classroom buildings. Racks should be located near the entrance to each building. Where racks are clustered in a single location, they should be surrounded by a fence and watched by an attendant. The attendant can often share this duty with other duties to reduce or eliminate the cost of labour being applied to bike parking duties; a cheaper alternative to an attendant may be to site the fenced bicycle compound in a highly visible location on the campus. For long-term parking needs of employees and students, attendant parking and/or bike lockers are recommended.
Retrofit Program	In established locations, such as schools, employment centres, and shopping centres, the CRD should conduct bicycle audits to assess bicycle parking availability and access, and add additional bicycle racks where necessary.

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Appendix C. Active Transportation and Transit Integration Technical Appendix

Transit connections are an integral part of any non-motorized transportation system. Keeping in mind the common phrase that "every transit user is a pedestrian at some point," this master plan acknowledges transit's integral role in ensuring the success of an active transportation strategy. Quality integration between modes is mutually beneficial in extending the reach and catchment area of transit services (this is particularly beneficial in lower density areas) as well as increasing the distance that can be comfortably travelled by a pedestrian or cyclist.

Transit agencies have identified numerous reasons for providing active transportation connections to transit including[1]:

- Increasing the number of multimodal trips.
- Removing motor vehicles from roads and parking lots to better utilize that space.
- Enhancing quality of life in the community by reducing emissions, noise, and traffic congestion and supporting active living, improved public health, equity, and accessibility.
- Increasing the visibility of walking and bicycling as viable transportation options.
- Contributing to regional commuter assistance programs and extending low-cost transportation options.
- Providing an alternative for pedestrians and bicyclists so that they can bypass areas that are barriers, such as bridges, tunnels, steep hills, roads with traffic, and avoid walking or riding at night or during adverse weather conditions.

This appendix identifies typical issues involving active transportation and transit and summarizes existing best practices. The existing conditions gathered in Phase I of the PCMP process form the baseline of this analysis, along with interviews with transit staff.

Existing Conditions

Transit Providers

Several organizations provide transit throughout the CRD. This section briefly describes transit options that are currently available, as well as planned improvements or changes.

Victoria Regional Transit System - BC Transit

The Victoria Regional Transit System is operated by BC Transit under the management of the Victoria Regional Transit Commission. The Commission is responsible for approving route configurations, transit service levels, and setting fares. The Commission also reviews and makes recommendations for the annual operating budget and capital spending, as well as making recommendations about the municipal share of transit service costs.

Currently, all buses on the Victoria transit system have two-bike racks mounted on the front of the bus. They are available on a first-come, first-serve basis. Bicycles are not allowed within the bus when the rack is full; the cyclist must wait for the next bus. Folding bicycles are considered luggage and are allowed at the discretion of the operator. In addition, loading or unloading of bicycles along Douglas Street from

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[1] Based on responses to a survey included in the TCRP Bicycle and Transit Integration study.

Pandora to Broughton or on Fort at Douglas is prohibited due to heavy passenger traffic. Community Buses only allow the racks to be used during daylight hours due to headlight interference.[2]

Access to Transit
BC Transit defines its service area as the "number of potential riders within walking distance (typically 400m for local service, 1 km+ for a rapid transit station) of a bus exchange or transit station." This corresponds to approximately a five-minute walk for local service and a 10-minute walk for a rapid transit station.

Connections to transit are also dictated by pedestrian and cycling barriers. Ideally, transit access is maximized with a grid-style network of facilities. However where discontinuous networks (such as cul-de-sacs) or other barriers exist, alternative connections such as pedestrian short-cuts, laneways, or dedicated crossings can help increase station accessibility. Transit Oriented Development (TOD) guidelines suggest transit exchanges should be located at the centre of major developments, such as the designated Regional Centres in the CRD.

For "average" commuter cyclists, the service area of a transit exchange is approximately three to four times the pedestrian service area, i.e., 1,200 – 1,600 metres. Cycling and transit can be integrated to extend the reach of transit services into lower density areas that cannot support a transit line within walking distance (i.e., 400 m) of all residents.

Park-and-Rides and Transit Exchanges
Transit stations are hubs where more bicyclists and pedestrians tend to travel to access transit. Features at the transit station and policies for carrying bicycles onto transit particularly impact cyclists' and pedestrians' abilities to utilize the transit system. The draft *Transportation Corridor Report* (2010) defined key locations in the region for interchange between modes.

Park-and-ride and transit exchanges include:

- Beacon Avenue - Patricia Bay Highway (Sidney Exchange)
- McTavish Road - Patricia Bay Highway (Airport Exchange)
- Mount Newton Cross Road - Patricia Bay Highway (Mount Newton Exchange)
- Keating Cross Road - Patricia Bay Highway (Central Saanich Exchange)
- View Royal Exchange
- Helmcken (Victoria General)
- Langford Transit exchanges include:
- Saanich Centre (Town and Country)
- Downtown
- University Heights
- Colwood

Note – this list of park-and-ride and transit exchanges is not complete. An updated list will be made available upon completion of the Victoria Transit Future Plan.

The PCMP is developing a regional active transportation network, which has incorporated existing and future Park and Ride facilities and transit exchanges to ensure good bicycle and pedestrian connections to transit throughout the region.

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[2] http://www.transitbc.com/regions/vic/news/commission/pdf/cmtg-ri-602.pdf

In addition, BC Transit is currently developing guidelines for transit-oriented developments (TODs). The basis for TOD planning is the concept of 'mode hierarchy,' which recognizes transportation modes that have the least environmental impact and greatest contribution to liveability. Intended as a prioritization strategy, the hierarchy promotes funding and development of facilities for modes that affordably enhance access for the majority of residents, rather than using level of service standards focused on vehicle movement. The hierarchy gives precedence to pedestrians, then to bicyclists and public transit.

Rapid Transit

BC Transit is currently developing a *Rapid Transit Plan* which will provide links between the West Shore, Uptown, and downtown Victoria. The plan will consider whether, and how many, bicycles can be accommodated on the Rapid Transit vehicles. This plan will be augmented by the new *Victoria Transit Future Plan* which will offer rapid and frequent trips among the regional centres. (At the time of publication, the corridors have not been finalized nor has the transit technology, e.g., light rail, bus, etc.). These plans represent a significant shift in transit service in the region and will potentially have significant influence on land use (where people will ultimately choose to live and work) and ridership. Mandated by the Province's Climate Action legislation, BC Transit's goal is to double transit mode share to 12%. Success and uptake of the new service will require seamless multi-modal integration with cycling and walking facilities.
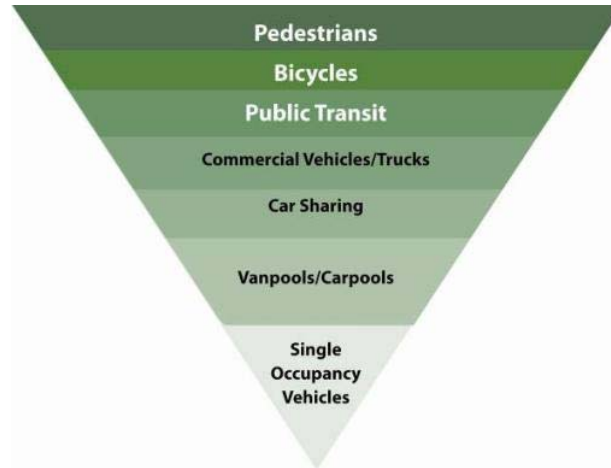
Figure 1. 'Green transportation' modal hierarchy chart, which promotes planning for pedestrian and bicycle travel prior to other modes.

VIA Rail

VIA Rail Canada runs a primarily tourist train between Victoria and Comox (departing at 8 am and returning at 6 pm). The train has been identified as lacking wheelchair accessibility and does not accommodate bicycles well.[3] The Island Corridor Foundation, owners of the rail corridor, and their rail operator, Southern Rail of Vancouver Island, are currently working with VIA Rail to identify an enhanced passenger service that could add additional train service into Victoria in the morning as well as outbound in the afternoon.

Private Busses

Several private companies provide bussing services throughout the region. Some of these include:

- Akal Airporter Bus: A private service provides buses from Victoria Airport to hotels in downtown Victoria and other locations as requested, including the University of Victoria, CFB Esquimalt, senior homes, and other destinations.
- West Coast Trail Express: This bus shuttles people between Victoria and Nanaimo and the trailheads of the West Coast Trail and the Juan de Fuca Trail.

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[3] Source: Evaluation of the E & N Railway Corridor: Foundation Report

Victoria Harbour Ferry

The Victoria Harbour Ferry Company provides service around Victoria's Inner Harbour as well as the Selkirk and Gorge Waterways. Ferry boats are equipped to carry up to twelve passengers. Four exchanges provide connections to destinations including the Harbour Air Terminal, Fisherman's Wharf, and the Galloping Goose Regional Trail. This tourist oriented service currently does not allow bicycle transport.

Private Ferry Services

Several private ferry services provide bicycle transit from downtown Victoria to various locations in Washington State.

- The Black Ball Ferry Lines provide daily year-round service from Port Angeles, WA to downtown Victoria for cyclists and pedestrians. Bike transport costs approximately six dollars.
- The Victoria Express provides daily year-round transportation for pedestrians and cyclists between Port Angeles and downtown Victoria. Bike transport costs approximately five dollars.
- The Victoria Clipper provides daily year round service from Seattle. Bicycles are allowed, and advanced registration is recommended. Bike transport costs approximately ten dollars.

Washington State Ferries

A Washington State Ferry line provides daily service from Sidney to Anacortes. A six-dollar bicycle transport fee applies.

BC Ferries

BC Ferries provides regular service between Vancouver Island and the mainland. Cyclists pay a fee of approximately $2 to transport their bike. The main terminal is Swartz Bay, in North Saanich, which provides service to Tsawwassen, Saltspring Island, and the Southern Gulf Islands. A smaller ferry runs from Brentwood Bay across the Saanich Inlet to Mill Bay.

Existing Design Standards

BC Transit and the District of Saanich provide guidance for design of bus exchanges and roadways for accessibility. This section provides an overview of those guidelines, which will be integrated into the PCMP Bicycle and Pedestrian Design Guidelines.

BC Transit

BC Transit's Master Operating Agreement states that bus exchanges are the responsibility of the municipalities. BC Transit's Marketing Department provides signage for bus exchanges, such as wheelchair symbol decals to be used on designated accessible bus exchanges. While funding bus exchange improvements is typically the responsibility of individual municipalities, a potential new program could become available to fund upgrades to transit exchanges.

BC Transit provides guidelines for bus exchanges in the publication, *Design Guidelines for Accessible Bus Stops.* While the document does not provide hard and fast rules, it serves as general design guidelines and identifies minimum requirements for bus exchanges to be deemed accessible. Guidelines for accessible transit exchanges include consideration for shelters, seating, curb cuts, walkways, circulation, and ramps.

Saanich

The District of Saanich has developed access to transit Development Permit Guidelines (2008). These guidelines include considerations for handyDART pick-up and drop-off zones. Guidelines for drop-off locations on streets include:

- Where the drop-off area utilizes the public street, the curb cut should be located at the rear-loading area.
- The locations should be of sufficient length to accommodate the bus/van.
- The location should be signed appropriately for use only by the handyDART vehicle.

The travel path to the front door should be reviewed for continuous connectivity and accessibility. The Guidelines also recommend that speed-humps be designed to minimize impact on passengers - speed tables are preferred or speed buttons spaced to allow the wheels of the handyDART vehicle to pass between the humps.

Saanich also makes recommendations about bus exchange locations:

- Bus exchanges should be located as close to seniors' homes, hospitals, institutions and other high transit usage locations as practically possible to reduce walking distances. Developers of seniors' homes and high-density developments should consider locating their facilities close to transit routes/ exchanges.

Issue Identification

This section describes typical issues related to the integration of active transportation and transit. This includes:

- Appropriately planning for expected demands.
- Providing connections between active transportation and transit networks.
- Providing appropriate facilities at transit stations (e.g., bicycle parking).
- Creating convenient access at, to, and from transit stations.
- Developing policies for carrying bicycles onto transit vehicles.
- Accommodating pedestrians and cyclists in the physical design of the station.

Expected Demands

Estimates of potential ridership inform the type of station that should be provided as well as the level of pedestrian and cycling accommodation. Potential ridership forecasts consider a number of factors in the station area including population and employment, the level of transit service being proposed, parking provision (as an indicator of auto-use) and management, and the extent and walk- / bike-ability of the pedestrian / bicycle network (note: as an example, Table 1 presents possible bike-ability measures).

Table 1. Potential Bikeability Measures

Bikeability Measure	Unit of Measure	Reasoning
Road Network Density	Linear km per ha	Areas with a greater density of roads allow cyclists greater route choice and distribute traffic volumes.
Bike Network Density	Linear km per ha	The presence of facilities designed for cyclists increases their comfort and safety.
Connectivity	Connected node ratio	Areas with greater roadway connectivity enable cyclists to easily go more places and have greater route choice.
Slope	Average slope across the area	Topography can decrease the ease of cycling and is an issue that is difficult to change.
Land Use Mix	Average distance (m) along the road network between residential and retail/commercial	People are more likely to cycle in areas with many available activities.

San Francisco Bay Area Rapid Transit (BART) uses this method to determine bicycle parking needs and to estimate bicycle use in the future. Table 2 shows the assumptions behind developing the "Bicycle Access Growth Factor". In the future, BART is considering expanding the population and employment input to include a 2 km radius of the station. The variables in this analysis could be adapted to the BC Transit service area in the CRD.

Table 2. BART Bicycle Access Potential Growth Assumptions[4]

Variable	Rating Value	Source
Home-Based Ridership	Maximum of 10 points given to station based upon home-based weekday passenger entries.	Station Profile Study, August 1999.
Ridership Rate	Maximum of 15 points given to station based upon total weekday passenger entries.	Station Profile Study, August 1999.
Bicycle Mode Share in AM Peak	Maximum of 30 points given to station based upon percent bicycle mode share during AM peak period.	Station Access Evaluation System, 2002
2000 Population within 1 Mile of Station	Maximum of 15 points given to station based upon Year 2000 population within 1 mile of station.	Station Access Evaluation System, 2002.
Households with No Car within 1 Mile of Station	Maximum of 10 points given to station based upon number of households with no car available within 1 mile of station.	Station Access Evaluation System, 2002.
Topography/Traffic/ Barrier Factor	Maximum of (-)20 points given to station based upon factors affecting bicycle travel such as surrounding topography, traffic on roadways leading to station, and impediments to bicycle travel including railroad tracks and freeway ramps.	Based upon field data collection.

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[4] Source: www.acta2002.com/thirdfunding/BART_Bicycle_Access_Parking_Plan_Table%20A-11.pdf

Bus Exchange and Station Planning

Transit exchange and station planning includes determining the appropriate spacing and type of bus exchanges and stations. The active transportation network plays a role in informing both of these factors.

Station Spacing

Station spacing will vary depending on whether an area is urban, suburban, or rural:

- **Suburban/Rural Areas:** Transit exchanges located in lower-density residential areas are generally served by less frequent local bus services often with considerable distances between exchanges. (Some suburban areas in the region however, have a high density of exchanges.) Given that distances between trip origins/destinations and larger transit exchanges are often prohibitive to walking, these situations may encourage transit patrons to cycle, if adequate and secure bicycle parking is provided (or if bicycles can be taken onto the transit vehicle), and as long as there is a safe and comfortable bicycle route to the station. The latter may include providing dedicated on- or off-street bicycle routes and traffic signals fitted with bicycle and pedestrian activation. Bicycle parking should be easily recognizable, located close to the boarding area, and be as secure as possible from theft.

- **Urban Areas:** Exchanges and stations in urban areas tend to be spaced closer together and service high levels of walking trips and short-distance bicycle trips. The higher level of pedestrian traffic means that consideration should be given to managing bicycle and pedestrian interactions through pavement markings, bicycle lanes, and other treatments.

Station Typology

Station typology is dictated by the transit planning process; however there are a number of design considerations for pedestrians and cyclists depending on the station type. Some common transit station types are described below.

- **Park-and-Rides:** Park-and-rides are located in out-lying areas with good auto access to facilitate auto-transit connections. These are also appropriate locations to link bicycle-transit connections. Bicycle parking at a park-and-ride should be plentiful, secure, signed, and located close to the boarding area. Specific consideration needs to be given to the interaction of bicycles and automobiles, especially to and from the park-and-ride and within the parking area. Park-and-rides are often located at stations where transit travels long distances quickly and so the cycling catchment could be further than the typical service area of a local transit exchange (i.e., further than 1,200 - 1,600m).

- **Bus:** Local bus exchanges will likely attract fewer bicyclists than other station types. While they may not merit expensive infrastructure improvements, well-marked and safe routes to the exchange should be provided. This includes sidewalks, bike lanes, or marked wide curb lanes on the road, signage and markings alerting drivers about the presence of bicyclists, and safe crossing facilities. Bicycle racks may be considered for higher use exchanges. Major and regional bus exchanges serviced by multiple lines, high ridership, or acting as a transfer point may require more sophisticated treatments, in particular more parking options, such as covered and/or more secure long-term parking.

- **Rapid Bus, Light Rail, and Commuter Rail Stations:** Rapid bus, light rail platforms, commuter rail stations, and transit exchanges will attract large numbers of bicyclists. These stations should have well-marked sidewalks and crossings as well as on-street or off-street bicycle facilities

leading to and from the station. Bicycle parking, both short- and long-term, should be provided and end-of-trip facilities considered. Pedestrian circulation is a major consideration and particular emphasis should be given to providing safe and convenient connections between modes and transit lines. In high-activity areas bicycle and pedestrian movements will need to be managed through signage or pavement markings (e.g., directing bicyclists to dismount on the sidewalk).

Facilities

Facilities that make the experience more comfortable for a pedestrian or a cyclist are critical in attracting and maintaining transit riders. Recommended provisions at transit exchanges, which will vary depending on the type and use of exchanges, include:

- **Seating:** Either benches or seats should be made available and can be attached to the bus exchange post. Seating should be placed so that waiting passengers are visible to the bus driver.

- **Shelter:** Shelter can be a dedicated bus shelter or make use of surrounding building elements such as awnings to provide adequate cover for rain and wind protection.

- **Trip information:** Essential information that should be provided at every exchange includes the route number and the exchange number. It is preferable to also provide a route map and timetable. Real-time arrival information may be appropriate where there are frequent bus arrivals and multiple lines at an exchange.

- **Bicycle parking:** Guidance is provided above and in Appendix B on the amount, design, and placement of bicycle parking at transit exchanges. In general, minor and local exchanges can make do with existing street furniture or simple bike racks. As station size and catchment area increases, more secure options need to be provided.*

- **Trip enhancement amenities:** Major transit hubs and stations may offer end-of-trip facilities beyond parking such as showers, washrooms, clothing lockers, etc.

- **Pedestrian scale lighting:** Lighting designed for pedestrians increases security and visibility for riders and transit operators.

- **A trash container.**

* The Transit Cooperative Research Program (TCRP) report, *Bicycle and Transit Integration* recommends that bicycle parking receive priority siting near the bus or train loading zone. Parking should also be located so that cyclists do not need to carry bicycles up or down stairs or through large crowds of travellers. The parking facility should be located in the clear view of the general public, vendors, or transit staff. Security is a particular concern if parking is provided in a garage and in these cases should be located in a central, frequently travelled part of the garage, ideally near an attendant. Most guidelines recommend against providing bicycle racks in unattended garages. Garages may also require treatments to manage conflicts between bicycles, automobiles, and pedestrians at entrances and within the garage.

Accessibility

Pedestrian Access to the Station

Difficult and unsafe routes to transit exchanges can discourage or prevent pedestrians and users in wheelchairs or with strollers from using the transit system. The District of Saanich has developed a set of Design Guidelines as part of its OCP Development Permit Guidelines

(http://www.saanich.ca/living/dpa.html). The standards provide direction that is suitable for a region-wide application. For example, sidewalk widths suggest the provision of a minimum 1.5 metre unobstructed pathway around the bus exchange or shelter and a pathway between the bus and the waiting area (e.g., across the boulevard).

Other factors that are typically used to evaluate the safety of pedestrian access to a transit exchange or station include:

- Traffic environment
- Crossing location distance/quality
- Posted speeds
- Sightlines and distances
- Number of travel lanes
- Curb-to-curb width

- Curb height
- Traffic volume
- Pedestrian collisions
- Existence/condition of sidewalks
- Slope

Sidewalks, ramps, and crossings are also essential parts of the pedestrian network and connect transit exchanges with nearby land uses. Routes near transit are priority locations in the PCMP regional pedestrian network, and the CRD should work with BC Transit, municipalities, and local developers to identify innovative opportunities to ensure that bus exchanges are accessible for all users. In addition, standards and guidelines for marked crossings and mid-block crosswalks are provided in the PCMP design guidelines.

Crossings are particularly important, and where possible these should be provided along the most direct path, as pedestrians are typically unwilling to walk out-of-direction to access a crosswalk. This includes mid-block crossings, which should be treated appropriately depending on the crossing opportunities afforded by traffic and prevailing conditions of the roadway. Treatments to improve pedestrian crossings include:

- Clearing visual obstructions – street trees, telephone poles, limiting on-street parking, etc.
- Moving the exchange to an existing marked or signalized crossing.
- Adding curb extensions or median refuges to shorten the crossing distance.
- Adding pedestrian signals.

Bicycle Access to the Station

The local bicycle network should connect to transit exchanges and stations, particularly higher-volume hubs that should also host ample secure bicycle parking. One noticeable example is San Francisco Bay Area Rapid Transit (BART), which works with local jurisdictions to provide safe, direct, and well-marked routes to and from BART stations. BART works to ensure that:

- All actuated traffic signals near the station can be activated by bicycles.
- Local jurisdictions provide bikeway links between BART stations and bikeway networks, and give streets leading to stations top priority for bicycle facilities.
- Local jurisdictions maintain streets leading to stations from adjoining streets and bikeways.

Ottawa has developed a system of off-street trails that provide direct connections from neighbourhoods to large transit hubs. These systems are most appropriate at regional transit hubs and park-and-rides. The TCRP report titled *Bicycle and Transit Integration* also encourages bicycle permeability and providing bicycle paths from neighbouring communities that are the same length as or shorter than roadway routes.

Permeability is particularly important in areas with a disconnected street pattern. Where feasible, bicycle lanes and bicycle-actuated signals should be provided within five kilometres of major transit stations.

The density of the area surrounding transit stations and the frequency of transit affects how far the average transit user travels to access transit. When planning for access management, BC Transit should take into account the distances users are likely to bicycle in order to encourage people who live further from transit stations to bike to them.

Pedestrian Access within the Station/Exchange

Accessible curb ramps and sidewalks should be provided, at a minimum, on the block of all bus exchanges (to the maximum extent possible). At the exchange, ADA guidelines require a "firm, stable boarding surface" and waiting areas should be large enough to accommodate both seated and standing passengers, extend or connect to the street, and meet any applicable disabled access regulations.

Where waiting areas are separated from the boarding zone, e.g., by a cycle track or similar facility, safe and convenient crossings should be provided. Accessibility requirements will also need to be met.

Bicycle Access within the Station

Once the bicyclist has entered the transit station area or the exchange's immediate surroundings, they should be able to readily locate bicycle parking and safely access it. Conflicts between bicyclists, pedestrians, automobiles, and buses should be managed. This may include reducing vehicle and bicycle speeds, providing safe crossing opportunities, maintaining visibility between users, and perhaps even separating movements. At many transit stations in Europe, bicycle paths are clearly marked by coloured pavement treatments (see Figure 2), which should be considered in locations where there is substantial interaction of bicycles and automobiles (as in the case of auto passenger drop-off zones, a.k.a. Kiss-and-Rides).

Figure 2. Separated Bicycle Lanes at a Transit Station in the City of York, UK

If bicycle parking is provided below or above grade, an elevator, escalator, ramp system, or wheel gutter (less desirable) should be provided. Elevators should accommodate several bicycles and preferably have opposing doors for "wheel through" entry and exit. Signage and marking should supplement other visual cues to locate these facilities. Wheel gutters are required inside BART stations where bikes will move up or down stairs, as bicycles are not allowed on escalators. Parking structures in the Netherlands provide escalators appropriate for bicycle use (Figure 3). Ramps should be at least 3 metres wide, with a maximum gradient of 6-7%.

The CROW Design manual for bicycle traffic designates 50 metres as the maximum walking distance from the parking facility to destinations within the station and the boarding area. These routes should also be safe and well-lit. In San Francisco, some sidewalks are used as bicycle routes in the station area, but only if they have been designed to safely accommodate the expected volumes of bicycle and pedestrian traffic. Bus exchanges and exchange platforms are often integrated into the general sidewalk.

Figure 3. Bicycle Escalator at a Bicycle Parking Garage in Amsterdam

As a result, cyclists sometimes ride on the sidewalk/platform and interfere with pedestrian travel. In locations where bicycling on the sidewalk is prohibited, signage may be warranted to emphasize this ordinance. In other locations, engineering solutions such as additional curb cuts can enable cyclists to stay on the street longer before accessing the exchange.

Bicycles on Transit

Determining whether cyclists can carry bikes onto transit is a significant decision. Carrying bicycles onto transit enables cyclists to avoid potentially difficult situations, including large hills, busy streets, long distances and inclement weather. It also reduces the fear of being stranded in the case of equipment failure, and pre-empts theft of bikes that would otherwise have to be locked up at the bus exchange.

At the moment, buses provide the only transit options in the CRD (with the exception of the VIA Rail service). In May 2010, the Victoria Regional Transit Commission published a report on the Bikes on Buses Pilot Project.[5] The project sought to increase bicycle capacity on Victoria's bus fleet, particularly on the long haul bus routes. The report concluded by recommending further work with the manufacturers of buses to reduce the headlamp exposure restriction to three-bike racks. The commission did not recommend the other alternatives.

If light rail is constructed in the future, allowing bicycles onto the train can take up significant amounts of passenger space, although some designs reduce space necessary for bicycle accommodation. Many transit agencies restrict bicycle-carrying times to outside peak commuter hours, limiting the utility of bike-transit trips for commuting and would significantly reduce potential mode split. Such policies need to be supported with options for secure bicycle parking such as full-service bicycle centres and other protected parking facilities.

Mechanisms for allowing bicycles on transit vehicles are described below as well as some other considerations.

Front–mounted Bike Racks

The majority of buses that allow bikes use a rack placed at the front of the bus; this is the case amongst the BC Transit fleet. When not in use, the bike rack folds up on the front of the bus. When a bicyclist wants to use the rack, they pull it down and lift their bicycle onto the unit. Some buses are capable of kneeling to help with mounting of the bicycle.

Most bike racks hold two bicycles, but some transit agencies have been testing racks with capacity for three to five bicycles. In BC, the regulations in the Motor Vehicle Act relating to headlight interference and load projections pose significant barriers to implementation. In 2005, TransLink piloted a three-rack installation, but the project failed due to concerns about bike loading on the street side (passenger collision danger) and the width of the rack affecting bus turning radius.

The two-bike front racks add six to nine inches of length to the bus (folded), requiring additional storage in the bus yard. For certain size buses, racks can interfere with windshield wiper, headlight, and turn signal operations. In hillier regions such as Seattle, buses have had problems with bottoming-out as they turn up large hills.

The primary capital costs of a bike-on-bus program include the purchase and installation of the rack units. In 2005, these cost between $500 and $1,000 each (including installation) for two-bicycle racks and more recently King County Metro paid $660 per rack for a three-rack design from Sportworks Northwest. Purchasing bike racks on new buses reduces the labour cost of retrofitting. It is recommended that at a

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[5] http://www.transitbc.com/regions/vic/news/commission/pdf/cmtg-ri-602.pdf

minimum a visual inspection of the rack is performed each day along with a 30-day general maintenance inspection, which consists of tightening bolts and checking for wear and tear.[6] Maintenance of the bike racks costs about $50 to $100 per rack per year. They need to be replaced after 6-7 years, often due to rust or colliding with other objects.

Some transit agencies deploy bus bike racks (at least initially) on only specific routes and add indicator lights to show when a rack is down. Generally, all transit agencies offer the use of the rack free of charge and without a permit, although some agencies require you to attend a training session or state that you watched a training video on how to use the rack. Bicycle racks should not be left down when not in use as they may not be visible to drivers and other road users.

Certain types of bicycles are sometimes prohibited for clearance or visibility reasons, e.g. recumbents, tandems, tricycles, unicycles, electric bicycles, and other non-standard bicycles. Some agencies have a minimum age for using the racks, and others limit usage to people who can load their bikes themselves.

Rear-Mounted Bike Racks

Rear-mounted racks were experimented with by some transit agencies, but are problematic because of user safety concerns. They also block access to the engine and reduce driver visibility, as drivers cannot see the rack and monitor the safety and security of bicyclists as they load and unload their bicycles. Bicycles can also get dirtied by exhaust at the rear of the bus. These are not recommended.

Bikes-in-Buses

Another option is to allow the bicyclist to carry their bicycle onboard. Allowing bikes in buses is often cumbersome, requiring bicyclists to lift the bike up stairs, and is problematic for loading/unloading during busy periods. In these situations, bus drivers are usually given the authority to decide when to allow bicycles on the bus. In a few cases, where buses have additional space for luggage, bicycles are allowed to be stored in this compartment, often underneath the bus. Some policies allow bicycles to be located in the wheelchair securement station when not utilized by passengers with mobility challenges. In general, the policy of allowing bikes in buses is not recommended, except on longer routes on weekends and holidays for recreational and tourist traffic. The policy should be clearly stated and consistent to allow cyclists to plan their trips.

Figure 4. Bike rack on a MAX light rail train in Portland, OR.

Bikes-on-Rail

Train cars that allow bicycles may or may not provide dedicated space for bicycles. Many times the space is shared with seating dedicated for passengers with special needs (who receive priority). Passengers with bicycles then need to board a car with open space or wait for the next train. This is often communicated to passengers through signage on the train car and through information dissemination tools such as the transit agency website.

Some transit agencies have begun allocating specific areas for bicycles. Newer design light rail trains provide hooks to vertically hang bicycles. This reduces the footprint of the bicycle, but it can be difficult

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[6] Sportsworks Northwest. Bike Racks for Buses: Service and Maintenance.
http://www.bicycleracks.com/busrack_support_maintenance.asp Accessed 3/19/2009.

for some users to lift their bicycle onto the hook. Also, if the racks are full, the passenger may use the unoccupied priority seating or wait until the next train arrives that has hooks available.

Time Restrictions

Agencies can also establish policies regarding appropriate times of the day when bicycles are allowed on or in transit vehicles. These typically exclude bicycles being carried aboard during peak commuter times. This typically excludes folding bikes (in their folded position). These restrictions should be coupled with secure parking at transit stations to store bicycles rather than carry them aboard.

Education and Marketing

First-time and novice users are often concerned about how to load their bicycle on to the bus or train and have fears about the system being time-consuming or otherwise difficult to use. There are numerous examples where advertising, events, and targeted audience participation have successfully introduced users to bicycle loading. Information should be made available on the transit agency (and other) website. Videos are an effective means of instruction.

TriMet, the transit agency in Portland, OR, has a model bike rack which they bring to fairs and employment centres. This allows users to experiment with the system before having to depend on it. Similarly, in Chicago representatives of the mayor's bicycling education program have staged demonstrations of bike-on-bus racks at events for hands-on training.

Capacity Concerns

The TCRP report, *Integration of Bicycles and Transit* (2005) found anecdotally that young adults, students, and low-income commuters are the most frequent users of bike-on-bus systems. Bus routes serving populations that are more likely to bicycle, such as colleges and low-income areas, may have capacity issues.

If a rack is full, the bicyclist typically has to wait for the next bus. This problem has led several transit agencies to explore different options, such as three-bike racks, rear-mounted racks, secure bicycle parking options, and allowing bicycles onboard buses.

The increased frequency of service (when the Rapid Transit Plan and the Transit Future Plan are implemented) will alleviate some of the capacity concerns on the most popular routes.

Physical Design

Beyond the design considerations noted above, there are a number of physical design issues that need to be addressed. In particular, the bicycle/transit interface and bicycle rail line crossings are addressed below.

Figure 5. Pavement markings direct bicyclists onto the streetcar platform from the bicycle lane.

Bicycle/Transit Interface

In addition to providing safe routes to get to transit, it is important to minimize potential conflicts between bicyclists and transit vehicles and people waiting or boarding transit. Where bicycles and transit vehicles share lane space, buses frequently exchange to pick up or drop off passengers. This can delay cyclists or require them to pass the transit vehicle. The nature of the vehicle can make it difficult for drivers to see cyclists and crashes that do occur will likely be severe.

Where possible, it is recommended that bus routes and regional bicycle corridors not be located along the same roadway corridors. However, on longer regional routes, alternative parallel routes may not be available to accommodate bicycle traffic. Also, construction of new transit facilities can provide opportunities for developing longer bikeways, such as the proposed design for the Douglas Street corridor.

Where bikeways are provided alongside transit routes, recommendations for improving bicyclists' safety around buses include the following:

- Designate dedicated space for bicyclists through use of bike lanes or cycle tracks (although this introduces new conflicts between bicycles and pedestrians boarding the bus).
- Continue the bicycle facility on the inside of the boarding platform and clearly mark the pedestrian crossing (see Figure 5).
- Provide advance crossbars, a bike box, or a dedicated signal cycle to increase cyclists' visibility at intersections.
- Provide regular track crossings with sufficient angle for cyclists to safely cross (see below).

Some jurisdictions, including Vancouver, BC, have dedicated bus lanes where automobiles are prohibited. Bicyclists can share this space and 'leapfrog' buses as they exchange to load or unload passengers. Alternatively, a bicycle lane can be provided on the left side of the bus lane, to reduce conflicts with the merging bus.

Track Crossings

The E&N Rail corridor presents many rail crossings stretching from Vic West to Langford. Discussions are also underway, exploring the future installation of streetcars and/ or light rail as part of the Rapid Transit strategy. It is imperative that the new designs take into account bicycle movements, as bicyclists are uniquely susceptible to crashes with rail and/or streetcar infrastructure due to the width of the flange gap of streetcar tracks.

Figure 6. Signs alert cyclists that they are approaching tracks and direct them to approach the tracks at a near 90° angle.

Bicyclists attempting to cross tracks at a less than a 60-degree angle are likely to have their wheel caught in the flange gap, resulting in a crash. The severity of such crashes can be significant because the bicyclist is usually thrown from their bicycle. Figure 7 shows an area along the Interstate Avenue MAX light rail line in Portland, OR where the bicycle lane crosses the MAX tracks. There is a separated bicycle and pedestrian crossing, which are both well-marked and signed.

Conclusions

Integration of the active transportation network with transit facilities has a number of benefits, the least of which is extending the reach of the transit system. There

Figure 7. Fencing and pavement markings direct bicyclists to cross streetcar tracks at a 90° angle.

are a number of considerations in developing a truly multi-modal system. These include:

- Appropriately planning for expected demands.
- Providing connections between active transportation and transit networks.

- Providing appropriate facilities at transit stations (e.g., bicycle parking, resting amenities for pedestrians).
- Creating convenient access at, to, and from transit stations.
- Maintaining existing policies that remove barriers to cyclists by allowing bicycles to be carried on racks fitted to the front of the bus.
- Accommodating pedestrians and cyclists in the physical design of the station and its environs.

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Appendix D. Education

Active and Safe Routes to School (ASRTS) is a national and international movement to help more children bicycle and walk to school. Active and Safe Routes to School can include a variety of multi-disciplinary programs aimed at promoting walking and bicycling to school and improving traffic safety around school areas through education, incentives, law enforcement, and engineering measures. Active and Safe Routes Programs typically involve partnerships among municipalities, school districts, community and parent volunteers, and law enforcement agencies. The primary goals of ASRTS are to improve safety, health, and fitness habits for children while improving air quality and diminishing traffic congestion. Most ASRTS programs focus on elementary and middle school travel.

This appendix describes the need for Active and Safe Routes to School (ASRTS) leadership in the CRD and recommends specific initiatives to meet this need.

Needs and Trends

The CRD has identified sustainable transportation as a key strategic goal. Guided by the *TravelChoices* Strategy (adopted in 2005), the Region, with its 13 municipal partners, has a mandate to significantly reduce the frequency and length of trips taken by automobile. A substantial portion of the 1.2 million trips taken each day in the region are school-based trips, of which nearly 50% of the trips are taken by automobile.

Although the problem of auto-reliance has been accurately identified, the solutions are not as easily addressed. With respect to school-based trips, it is not enough to simply "encourage" schools and parents to tackle this multi-faceted problem on their own. In light of the policy, environmental, and health mandate for restoring physical activity to school transportation, the CRD should make a long-term commitment to Active and Safe Routes to School programs in the region.

Existing and Past Efforts

The CRD benefits from a significant number of individuals and organizations working on ASRTS in the region. Groups such as Victoria Active School Travel (VAST), Hub for Action on School Transportation Emissions (HASTE), Capital Bike and Walk Society, and Bike to Work Victoria all have resources and expertise to offer, as do talented individuals working in the field such as Shelley Brown (with the City of Victoria), Deborah LeFrank (previously with Safer School Travel), Bernadette Kowie and Shoshana Litman (previously with Way to Go!), John Luton (formerly with Capital Bike and Walk Society, now City Councillor in Victoria), and others.

The region also has been home to several noteworthy ASRTS efforts in the past. The Way to Go! School Program (a BC-wide school trip reduction program aimed at families), the Safer Saanich School Travel planning effort that completed School Travel Plans for 18 elementary schools in the municipality, the KidsCAN Road Skills Course pilot completed last year, and the HASTE-managed International Walk to School Day are all examples of significant accomplishments in the region towards changing school travel habits.

Existing Organizations

Victoria Active School Travel (VAST)

Victoria Active School Travel is a currently dormant organization comprised of professionals with previous experience in active transportation and school travel planning. The members include: John Luton and Julie Higginson with Capital Bike and Walk Society, Deborah LeFrank and Lana Taves (previously of Safer School Travel), Shoshana Litman (previously with Way to Go!), and Shelley Brown with the City of Victoria.

Victoria Active School Travel brought together stakeholder and community interests to identify challenges, barriers, gaps in infrastructure, and programs that, when addressed, will help children and their families choose active means of transportation like cycling and walking for more of their trips to and from school.

Figure 1. In-classroom education is an important part of a robust Active and Safe Routes to School Strategy.

VAST received several grants between 2008 and 2010 that enabled the organization to work with two grade 4/5 classrooms at Sir James Douglas Elementary School in Victoria. The program was based on HASTE web based tools and other initiatives to help the children learn about the effects their school travel choices have on both their health and the health of the environment. The project culminated with a fantastic Clean Air Day event at the school.

VAST also participated in the planning and execution of "The Way Forward 2010: Summit on Child and Youth Friendly Planning", on the 16th of April. This was a cross-sector summit to enable planners, public health professionals, elected officials, community groups, and NGOs in the Capital Region to tap into "low-hanging fruit" opportunities to turn the region into a national leader in child and youth friendly planning, while decreasing GHG emissions and achieving positive health impacts.

Hub for Action on School Transportation Emissions (HASTE)

HASTE supports schools and their communities taking action on reducing transportation emissions in British Columbia by providing online resources, training, materials, and plans for school and classroom emissions reductions campaigns, as well as a centre for networking for students, teachers, and schools to improve the health of individuals, communities, and the environment. HASTE is a project of the Environmental Education Action Program Society and is funded by the BC Ministry of Environment, the Ministry of Education, the Ministry of Transportation, the Ministry of Healthy Living and Sport, LiveSmart BC, and the Climate Action Secretariat.

Key tools and programs from HASTE include:

- **MyTravel Emissions Calculator and Tracking Program**: Helps students calculate the impacts of their travel, make a plan on cutting their emissions, and track the progress made by both individuals and a whole class.

- **Walking/Cycling Route Planning Tool:** Helps plan walking or cycling routes to and from school and produce and share finalized routes with others.

- **Anti-Idling Cookbook:** Offers ideas and tools for conducting an anti-idling program at schools.

- **Walking School Bus/Bicycle Train Program:** Advice, support, and training for organizing escorted student travel programs.

Figure 2. Walking School Buses are just one type of encouragement program.

- **School Travel Planning:** An STP Facilitator works with community representatives (school boards, municipalities, police, public health professionals, parents, educators, and children/youth) to identify and solve their school transportation problems. Each school writes a School Travel Plan which includes an action plan section containing infrastructure recommendations, education and encouragement program ideas, and other support programs.

- **iWalk:** International Walk to School Week

- Bike to School Week

Current and Past Efforts

Way to Go! School Program

The Way to Go! School Program offered direct support to parent volunteers around British Columbia in reducing school auto trips. The program offered a how-to manual and a resource kit to participants as well as training and staff support.

During the program's prime, the RoadSense Team (a partnership between autoplan brokers in B.C. and the Insurance Corporation of British Columbia) funded the necessary staff and program resources to make Way to Go! available to all elementary and middle schools in the province of British Columbia. The cost of the program was $180,000 per year towards Way to Go! staff, travel costs, resource development and production, distribution of information and resources, and all communication and administration costs related to providing the program province wide.

Figure 3. Parent volunteers become part of the effort.

Way to Go! was funded from December 1997 to the end of June 2008 when the funding was discontinued as an aspect of the accord between the brokers and ICBC. In the summer of 2008, many Way to Go! resources were transferred to Hub for Action on School Transportation Emissions (HASTE: www.hastebc.org).

School Travel Planning Pilot

In the past few years, through the efforts of Green Communities and the Canadian Active and Safe Routes to School Partnership (http://www.saferoutestoschool.ca/partnership/) and through funding from the Canadian Partnership Against Cancer, B.C. has been involved with pilot and second stage work on School Travel Planning (STP).

School Travel Planning is a community-based approach that has been used with success to increase the number of children and families choosing active transportation modes to get to and from school.

The STP approach requires a much more significant commitment from the local government authority in supporting the planning and infrastructure to allow for children's safe and active travel to school. The School Travel Planning Guide and Toolkit are available from the project website (http://www.saferoutestoschool.ca/schooltravel.asp).

Key community stakeholders (school boards, municipalities, police, public health professionals, parents, educators, and children) work together with an STP Facilitator to identify and solve their school transportation problems.

Each school writes a School Travel Plan which includes an action plan section describing steps they plan to implement such as:

- Education (e.g., safety training for walking and cycling, awareness raisin);
- Encouragement (e.g., celebrations of physical activity and environment, event days, recognition and rewards for walking/biking); and
- Engineering improvements at or near school sites (e.g., pedestrian crossings, adult crossing guards, repairs and upgrades to sidewalks, signage, and bike racks).

KidsCAN Road Skills Course

The CRD launched the KidsCAN project as a pilot in 2008 in partnership with the certified CAN Bike instructors at Bike to Work Week Victoria to adapt the curriculum and teach the course to 50 grade seven students. The program was funded by the

Ministry of Education's Community Connections program.

Figure 4. Students learn bicycling safety during a road skills course.

The KidsCAN program was based on the well-respected one-day adult cycling skills training course taught by Bike to Work Victoria. At CRD's direction, Bike to Work Victoria modified the course for use in schools. The final curriculum included four hours of in-class time followed by four hours of escorted on-road instruction. The course was held during school hours and was integrated into the teachers' workplans every Friday for the month of November. In advance of the course, students were provided with a bike safety checklist with tips for ensuring their bicycles would be road-worthy for the course. A bike mechanic was on site to perform safety checks before students took the on-road portion of the course.

Student participants enjoyed the course and showed measurable increases in comprehension of key road skills (such as riding on the sidewalk, riding with traffic, wearing a helmet, and fitting a helmet properly). Media

coverage was positive, school officials in the participating school district were very supportive of the program, and other schools and school districts have contacted the CRD asking to be included in the program.

Suggestions also received from the community identify the importance of offering parents similar road safety courses to ensure positive modelling and accurate, consistent road skills among children and adults, alike.

Municipal Efforts

All municipalities were surveyed about current cycling and pedestrian efforts. Their reported efforts relevant to Active and Safe Routes to Schools are listed below.

Colwood

Colwood Council passed a resolution to establish an "Active and Safe Routes to School" committee, but at the time of writing this has not yet been done.

Oak Bay

Oak Bay funded an Active and Safe Routes to School study in 2007.

Saanich

In 2002, Saanich initiated the "Safer City" effort, jointly funded by the Saanich Police and the Insurance Corporation of B.C. (ICBC), to develop a road safety plan for motorists, cyclists, pedestrians, and all other road users. One part of the program was the implementation of School Travel Planning at 18 schools in Saanich between 2003 and 2007.

Victoria

Early in 2009 the City of Victoria (representing Victoria Active School Travel – VAST) received a grant from the Victoria Foundation to support VAST's active school travel initiative with Victoria schools. This grant

Figure 5. Local law enforcement is often involved with Active and Safe Routes to School efforts.

enabled VAST consultants to work with two classrooms of grade 4/5 students at Sir James Douglas School on projects promoting active school travel and the impacts of car travel on both the environment and students' health.

One of the projects the students worked on was promoting an "idle free" school program in coordination with Clean Air Day. The students produced art work for both a bilingual brochure and school posters and encouraged peers, parents, and school employees to leave the car at home on Clean Air Day.

Students in target classrooms also participated in the web-based MyTravel program from HASTE (Hub for Action on School Transportation Emissions). This web program enabled students to calculate the greenhouse gas (GHG) emissions related to their school travel, pledge to change their behaviour, and track the GHG reductions resulting from new school travel habits.

Need for CRD Leadership

The survey of regional Active and Safe Routes to School efforts indicated that the region needs a clear lead agency to convene existing ASRTS resources and to take a significant step forward in addressing active school transportation. CRD is well poised with both the mandate and the reach to serve this role.

CRD is also uniquely qualified to serve as a leader based on its strong policy support for increasing active transportation and improving the health of residents in the region. The CRD also has direct experience managing social marketing changes to effect individual behaviour change (for example, in the areas of water conservation and recycling).

It is anticipated that CRD's role in ASRTS leadership would be that of a regional coordinator and project manager; this recommendation is not intended to replace or make redundant any of the existing organizations or projects currently in existence. Rather, the CRD's role should be to enhance, support, and synergize with existing resources towards a truly regional, more efficient, and sustained program.

Possible Roles for the CRD

The following regional and collaborative roles are proposed for the CRD in ASRTS leadership:

- **Convener**: Bring the right people together.
- **Coordinator**: Assist interested parties in working in concert.
- **Adviser**: Develop deep and broad expertise around Active and Safe Routes to School, and become the repository of institutional memory.
- **Public voice**: Create a campaign to educate and engage the public directly on youth school travel issues.
- **Monitor**: Develop an evaluation strategy, see that evaluation metrics are collected and report back to funders, stakeholders, decision makers, and the general public about the results of ASRTS efforts.
- **Funder**: Fund ASRTS efforts directly, from its operating budget, and indirectly, by leading and participating in efforts to secure additional funding (e.g., from the Province, health agencies, foundations, etc.).

Staffing Structure

In order to make significant progress on Active and Safe Routes to School in the region, it is absolutely necessary to create staff who are specifically assigned to working on these efforts. The following staff positions are identified as essential components to ensuring a successful ASRTS program.

It should be noted that while these positions may be hired by and housed under CRD, it is also possible for the CRD to contract with other organization(s) or individual(s) to fulfill these functions. In any case, the CRD should take a leading role in securing funding for these positions, hiring the right people for the job, setting their duties and work plan, and supervising their work. Because of the coalition nature of ASRTS efforts, it may make sense to fund, hire, and supervise staff in partnership with other agencies.

Figure 6. There is substantial interest around the region for bicycling skills training for schoolchildren.

- **Regional ASRTS Coordinator**: This person should be charged with implementing the ASRTS recommendations contained in the Pedestrian and Cycling Master Plan (PCMP) as well as implementing the strategic plan to be developed by an ASRTS Working Group. The Regional ASRTS Coordinator should receive training to become an expert in the field, serve as the liaison to the Working Group, manage the School Travel Planning effort (including serving as the facilitator on all or some of the projects), oversee regional ASRTS evaluation efforts and reporting, and supervise

ASRTS Outreach Staff. This position would ideally oversee a youth cycling skills program (building on the KidsCAN Cycling Pilot project) and could report to a regional Pedestrian and Cycling Coordinator (PCMP recommendation), should such a position be developed.

- **ASRTS Outreach Staff**: Outreach staff will be needed for the School Travel Planning effort and to deliver a comprehensive KidsCAN Skills Safety Course. Depending on the desired programs to be implemented, these staff may be hired as part-time temporary staff, or it may be possible to combine several staffing needs to create one or more full-time outreach positions (such as having them work on SmartTrips targeted marketing outreach in the summer).

CRD Primary Functions

Expand Organizational Capacity and Expertise

The key to establishing a successful ASRTS program is to identify and support a champion – often in the form of a designated staff person. Typically, at the outset, the portfolio is added to an existing job description, but in the long term the ASRTS coordinator is ultimately a stand-alone position. The Regional ASRTS Coordinator should receive training on School Travel Planning facilitation, the national Active and Safe Routes to School approach, and the KidsCAN Cycling Road Skills program.

The importance of having dedicated staff capacity cannot be overstated. No successful ASRTS program in North America or Europe has been sustained without the institutional memory, expertise, and relationships that a dedicated staff position bring.

Regional Communication and Coordination

There is great interest in ASRTS in the region and numerous individuals and organizations with significant knowledge in this arena. At present, though, there is no central clearinghouse for sharing information, coordinating efforts, and developing a common vision for the rollout of ASRTS efforts.

The CRD should coordinate a quarterly ASRTS Working Group, staffed by the Regional ASRTS Coordinator, to bring together representatives from all four school districts, municipalities, law enforcement, and HASTE. Other possible partners include the Vancouver Island Health Authority, the Insurance Corporation of British Columbia (ICBC), the Directorate of Agencies for School Health (DASH BC), and Bike to Work Victoria.

The ASRTS Working Group would be charged with:

- Reporting on infrastructure projects that affect school travel;
- Developing a strategic plan for implementing the region-wide ASRTS efforts (including School Travel Planning and the KidsCAN Cycling Road Skills program);
- Securing and expanding long-term, stable funding for ASRTS efforts in the CRD; and
- Developing an evaluation strategy and collecting data for evaluation.

School Travel Planning

A key component of ASRTS programming is School Travel Planning (STP). The STP work could be integrated into responsibility of the Regional ASRTS Coordinator with assistance from Green Communities Canada and/or HASTE.

KidsCAN Cycling Road Skills Course

In 2008, the successful KidsCAN Cycling Road Skills Course pilot project demonstrated that there is great interest around the region, especially at the school district level, in providing substantive bicycle skills training to schoolchildren. Building on this success, the ultimate goal is to expand the program to all four school districts, with the hope of reaching every seventh-grader in the region. CRD Regional Planning is currently developing a business plan to explore the costs and strategy options for region-wide implementation.

Recommendations coming out of the pilot program suggest that the curriculum developed should be used for future phases, but engaging video segments should be developed, along with a loaner bike program to ensure that all children are able to participate in the on-road component. The ASRTS Working Group could be tasked with developing a phasing strategy for reaching schools in the region and resolving outstanding logistical issues such as the provision of program insurance, an evaluation strategy, and the role of the municipalities in program implementation. The Regional ASRTS Coordinator could be responsible for managing the program, scheduling and supervising teachers, promoting the program, and communicating with the media, seeking in-kind donations, and managing evaluation.

Developing a Standardized Evaluation Approach

CRD, with the assistance of the Active and Safe Routes to School Working Group, could develop a consistent evaluation strategy for ASRTS in the region. The evaluation should be on two fronts:

- **Evaluating the regional program:** One of the ASRTS Working Group's annual tasks should be evaluating the state of ASRTS efforts in the region. To this end, they should develop a set of benchmarks that are published annually in a report. These benchmarks should be grounded in the ASRTS strategy and work plan developed by the Working Group.

- **Evaluating individual schools**: An evaluation strategy should be developed for individual schools, which will be initiated as part of the School Travel Planning process. The methodology and materials can be those developed by the Green Communities ASRTS Planning, including the classroom hands-up student survey and the family survey.

CRD Secondary Functions

The following programs are currently offered by other organizations in the region. The CRD could support these programs through the ASRTS Working Group and, as capacity allows, through the Regional ASRTS Coordinator, but not take the lead in managing the program.

- **iWalk (International Walk to School Week):** HASTE currently hosts International Walk to School Week every October. Schools can sign up online and receive a planning resource, incentive packet, and entry into a grand prize drawing. The iWalk effort is one that successfully introduces a large number of children and families to walking to school. In 2010, for example, approximately 85,000 children participated internationally.

Figure 7. International Walk to School Week draws large numbers of children and families to walk to school.

- **The MyTravel Emissions Calculator and Tracking Program:** HASTE offers the MyTravel Calculator as an easy to use online tool for individuals and groups to measure the greenhouse gas emissions (GHGs) arising from their travel to and from school. The MyTravel Database allows the user to collect, review, and track a group, classroom, or school's travel data submitted through the MyTravel Online Calculator. Anyone interested in tracking a group's emissions can register with HASTE and sign up and use the database.

- **Anti-Idling Campaign:** Based on the greenhouse gas reduction mandate, the Climate Action Project at the CRD is already working on public anti-idling campaigns. An ASRTS program would provide opportunities for cross-departmental work with this group. HASTE also provides anti-idling materials (including signs, fact sheets, pledge forms, and monitoring forms) and scalable campaign plans for schools to implement an anti-idling campaign.

- **Walking School Buses/Bicycle Trains:** HASTE provides numerous online resources to assist interested parents and community members in setting up a Walking School Bus or Bike Train. Online route planning tools can help develop a good route to school, while several webinars provide training and advice.

Active and Safe Routes to School Resources

School Travel Planning

School Travel Planning brings together community stakeholders to identify barriers to active transportation for each school and develop a written action plan for addressing those barriers. The flexibility of the School Travel Plan framework being tested in this pilot project allows communities to customize their approach to fit local circumstances.

Through a five-step process each school, with assistance from the community stakeholders, writes a School Travel Plan that includes an action plan describing steps they plan to implement such as:

- Engineering improvements at or near school sites (e.g., pedestrian crossings, repairs/upgrades to sidewalks, signage);
- Introduction of school infrastructure (e.g., bike shelters, bike racks, lockers);
- Education (e.g., traffic safety education for pedestrians and cyclists, education about personal security);
- Community mobilization (e.g., walking school buses, walking buddies, ride sharing);
- Encouragement (e.g., celebrations of physical activity and environment); and
- Event days, recognition and rewards for walking/biking.

Schools create a School Travel Plan (STP) to show how they intend to make travel to and from their sites safer and more sustainable for pupils, parents, and teachers. The STP document itself should then link in with the school's development or improvement plan. It is an important tool in reducing the number of pupils who travel to school by car. STPs are created in consultation with the whole school community. They are all very different, as each considers the local situation and current trends. In addition to safer travel, STPs are about improving health, broadening education, and combating social exclusion. They contribute towards making the local community greener and improving the quality of life for everyone.

Resources Available	Web Address
	http://www.sustrans.org.uk/assets/files/Safe%20Routes/resources/infosheets/SRS_Developing_an_STP_ST16.pdf
	http://www.saferoutestoschool.ca/partnership/downloads/Green-Communities-STP-Pres-Mar2-3-09.pdf
	http://www.saferoutestoschool.ca/schooltravel.asp

Model Programs

International Walk to School Day/Month (iWalk)

International Walk to School Day (iWalk) is the annual, premier event of the Active & Active and Safe Routes to School program. It is a mass celebration of active transportation and its related issues are used to introduce communities to the AASRTS program.

Resources Available	Web Address
IWALK logo and flyer downloads	http://www.iwalktoschool.org/downloads.htm
IWALK Promotional Flyer	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_iwalk_form1.pdf
Sample media releases	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_iwalk_media1.doc http://www.iwalktoschool.org/downloads/iwalk_release_2010.rtf
Sample PSAs	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_iwalk_PSA1.doc
Colouring Sheet	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_iwalk_colour1.pdf
IWALK Student Pledges	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_iwalk_pledge1.pdf

Walking/Wheeling Wednesdays

Whatever name your school gives it, the idea is to designate one day per month or one day per week as a Walk to School Day, starting right after International Walk to School Day in October. Families do not need to make a commitment to walk every day, just on walk to school days, giving them opportunities to slowly break the driving habit and adjust their schedules accordingly.

Resources Available	Web Address
	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wwwed_chart1.doc
	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wwwed_log1.pdf
Notice to Teachers	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wwwed_notice1.pdf
Sample Walking Wednesday Flyer	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wwwed_flyer1.pdf

Anti-idling Campaign

An anti-idling campaign educated students, parents, school faculty and staff, and bus drivers about the harmful effects of idling and debunks myths about the advantages of motor vehicle idling. This type of program can include an awareness campaign, pledges for those who drive to and from schools, and data collection and analysis activities for students.

Resources Available	Web Address
No Idling Information Card	http://www.saferoutestoschool.ca/downloads/guide/chapter4/revised_info_card-dec05.pdf
Observation Form	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_ni_observ1.pdf
Commitment Intervention Form	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_ni_inter1.pdf

Neighbourhood Walkabout

A neighbourhood walkabout should engage students, parents, teachers and administrators, local government staff, and anyone else with a vested interest in walking and bicycling safety near schools. The walkabout is an opportunity to audit the walking (and/or) bicycling conditions near school, identify hazards or barriers to walking and bicycling, and identify next steps to improve conditions.

Resources Available	Web Address
	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_nw_process1.doc
	http://drusilla.hsrc.unc.edu/cms/downloads/walkability_checklist.pdf
	http://www.bicyclinginfo.org/pdf/bikabilitychecklist.pdf
	http://drusilla.hsrc.unc.edu/cms/downloads/Pennsylvania_Keystone%20Healthy%20Routes_Urban.pdf
	http://www.rwjf.org/files/newsroom/interactives/walkability/walk_app.html
	http://www.rwjf.org/files/newsroom/interactives/sprawl/bike_app.jsp

Walking School Bus

Parents and guardians often cite distrust of strangers and the dangers of traffic as reasons why they do not allow their students to walk to school. Walking School Buses are a way to make sure that children have adult supervision as they walk to school. Walking School Buses are formed when a group of children walk together to school and are accompanied by one or more adults (usually parents or guardians of the children on the "bus"). As the walking school bus continues on the route to school they pick up students at homes or designated meeting locations. Walking school buses can be informal arrangements between neighbours with children attending the same school or official school-wide endeavours with trained volunteers and structured meeting points with a pick-up timetable.

Resources Available	Web Address
School Checklist	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wsb_checklst1.doc
Sample parent letter	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wsb_letter1.doc
Sample parent flyer	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wsb_flyer1.doc
Sample parent survey	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wsb_survey1.doc
Family Checklist	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wsb_checklst2.doc
Sample Name Tag	http://www.saferoutestoschool.ca/downloads/guide/chapter4/chap4_wsb_tags1.pdf
Walking School Bus Guide (USA)	http://www.saferoutesinfo.org/guide/walking_school_bus/pdf/wsb_guide.pdf

Curriculum Integration: Lesson Plans

Class Transportation Survey
Students will learn to measure, analyze, and interpret transportation data. They will better understand the impact of their transportation choices on CO2 emission levels. This is an excellent lesson plan to use in conjunction with HASTE's MyTravel Emissions Calculator and Tracking tools. Grade level: 7-12

Source: Cool School Challenge: http://www.coolschoolchallenge.org/index.aspx

Materials: http://www.coolschoolchallenge.org/Downloads/Activities/ClassTransportationSurvey.pdf

Barriers to Change: The Myths about Vehicle Idling
In this lesson, students will learn the common misconceptions about vehicle idling, the effects of idling on climate change, and the logic of social marketing (marketing towards behaviour change with information and positive reinforcement). When the students understand that misconceptions about idling are contributing to climate change, they'll realize that they are in a position to initiate change. Grade Level: 7-12

Source: Climate Change North: http://climatechangenorth.ca/

Materials: http://www.hastebc.org/files/LP_27_print.pdf

Backgrounder for Sustainable Transportation and Investigating Options for Sustainable Transportation
This lesson covers the impacts of transportation emissions, infrastructure, and manufacturing and discusses cleaner and more sustainable transportation options. Students begin by reading a backgrounder on sustainable transportation, then conduct research into options for transportation that could be implemented where they live. The final product is a community transportation plan that incorporates maps and descriptions of required technologies, communicated by means of a report and/or presentation to the class.

Source: The Pembina Institute: http://www.pembina.org/

Materials: http://www.hastebc.org/files/sustainable-transportation-bg.pdf

Travel Solutions to Global Warming
In this lesson, the teacher demonstrates a burning candle experiment, with students posing hypotheses, to review the relationship of the carbon cycle, fossil fuels, and the atmospheric CO2 level. Students then graph the relative populations and production of CO2 by different countries and discuss the results. Students follow up by using a personal trip log to discover simple but powerful solutions. Grade Level: 5-8

Source: Northeast Sustainable Energy Association: http://www.nesea.org/

Materials: http://www.hastebc.org/files/travel%20solutions.pdf

Idle-Free Teacher's Resource Kit
This kit contains tools for 4th, 5th, and 6th grade classes to learn about idling and to take action. Each grade has grade-specific lessons that are aligned to the expected outcomes. These lessons provide the teacher with solid background information that will lead students to a better understanding of the problematic nature of idling. Once students and teachers understand the importance of having an idle-free school and decide to undertake making the school idle-free, the kit provides ways to implement an action plan for each grade level.

The kit also provides links to downloadable posters, information sheets, and other support pieces. Grade Level: 4-6

> **Source:** Clean Nova Scotia: http://www.clean.ns.ca/
>
> **Materials:** http://www.hastebc.org/files/IdleFree_Intro&Bkgd_0.pdf

A Teacher's Guide to Clean Air

This guide is for grade five teachers in British Columbia. Anywhere in BC, teachers will find an activity or piece of information that will help bring the clean air topic into the classroom. Much of the guide's content and clean air actions are meant to be shared with parents, so it is encouraged for the discussion topics to find their way home with students. Grade Level: 5

> **Source:** BC Transit: http://www.bctransit.com/
>
> **Materials:** http://www.hastebc.org/files/Clean%20Air_Guide_final.pdf

Idle Off

This activity is designed to help students understand the environmental impact of leaving an engine idling. Students will sort out myth from truth on the topic of engine idling and transportation and compare and create guidelines for when to turn engine motors off.

> **Source:** Destination Conservation: http://www.dcplanet.ca/
>
> **Materials:** http://www.hastebc.org/files/idle_off-2_0.pdf

Color our World

In this lesson, students examine the concept of ecological footprints and learn how we can alter our actions to decrease our footprint and the demand we place on the earth. This activity is meant to help students think more critically about how their everyday actions impact the earth. In analyzing their footprints, students will have a chance to see firsthand how everything we do is connected to the people and world around us. The curriculum considers school transportation as one of the important contributing factors in reducing one's ecological footprint.

> **Source:** Better Environmentally Sound Transportation: http://www.best.bc.ca
>
> **Materials:** http://www.best.bc.ca/pdf/Colour_Our_World_Classroom_Guide.pdf

How to Reclaim Your Street

This curriculum is not specifically designed for students, but can be used for older grades. It is based on BEST's "Offramp" program, designed by Arthur Orsini for use in high schools. The lesson includes an overview of the causes and outcomes of auto-oriented transportation systems and auto-dominated travel behaviour. Participants are encouraged to examine actions they can take to reduce car use, reuse street space, and reach out to others about travel behaviour.

> **Source:** Better Environmentally Sound Transportation: http://www.best.bc.ca
>
> **Materials:** http://www.best.bc.ca/downloads/15-downloads.html

Active and Safe Routes to School Curriculum

This spreadsheet summarizes opportunities to integrate Active and Safe Routes to School topics into mathematics, science and technology, health and physical activity, arts, and language curricula from first through eighth grades.

> **Source:** Green Communities | Active and Safe Routes to School
>
> **Materials:** http://www.saferoutestoschool.ca/downloads/guide/chapter7/chap7_curr_connect1.doc

Evaluation

Resources Available	Web Address
	http://www.saferoutestoschool.ca/downloads/guide/chapter5/chap5_eval_survey1.doc
	http://www.saferoutestoschool.ca/downloads/guide/chapter5/chap5_eval_survey2.tif
	http://www.saferoutestoschool.ca/downloads/guide/chapter5/chap5_eval_survey3a.tif
	http://www.saferoutestoschool.ca/downloads/guide/chapter5/chap5_eval_survey3b.tif
	http://www.ywalk.ca/downloads/sustainable_transporation_survey.pdf

Special Topics

Resources Available	Web Address
Involving Students with Disabilities in ASRTS (USA)	http://www.saferoutesinfo.org/resources/collateral/Involving%20students%20with%20disability_web.pdf
Managing a Crisis (USA)	http://www.saferoutesinfo.org/guide/media/managing_crisis.cfm
Implementing Safe Routes to School in Low-Income Schools and Communities	http://www.saferoutespartnership.org/media/file/LowIncomeGuide.pdf
Reducing Liability Concerns and Getting Kids Active through Safe Routes to School (webinar – USA)	http://bit.ly/a6QtVr
Secondary School TDM Inventory	http://www.urbanthinkers.ca/sites/default/files/Sec%20Sch%20TDM%20Report%20-%20August%202009.pdf
Liability from Active School Travel Assessment	http://www.saferoutestoschool.ca/downloads/Risk_Mgmt_and_AST-Apr_2010.pdf

Organizations

Organization	More Information
Victoria Transport Policy Institute	An independent research organization dedicated to developing practical tools for incorporating social and environmental values into transportation decision making. http://www.vtpi.org/
Better Environmentally Sound Transportation (Vancouver, BC)	http://www.best.bc.ca/
Green Communities | Active and Safe Routes to School	http://www.saferoutestoschool.ca/
Urbanthinkers	http://www.urbanthinkers.ca/
National Center for Safe Routes to School (USA)	http://www.saferoutesinfo.org/guide/encouragement/mileage_clubs_and_contests.cfm
Safe Routes to School Online Guide (USA)	http://www.saferoutesinfo.org/guide/
National Highway Traffic Safety Administration (USA) Safe Routes to School Guide	http://www.nhtsa.gov/people/injury/pedbimot/bike/Safe-Routes-2002/toc.html
International Walk to School	http://www.iwalktoschool.org/
Hub for Action on School Transportation Emissions (HASTE)	http://www.hastebc.org/
Bike to Work BC	http://www.biketowork.ca/contact
YWalk	http://www.ywalk.ca/
Manitoba Student Transportation Network	http://www.resourceconservation.mb.ca/gci/MSTN/

Appendix E. Encouragement

While improving walking and bicycling infrastructure is critical to increasing active transportation use, the importance of education, marketing and promotion efforts should not be underestimated. Education, marketing and promotion can ensure that more CRD residents will know about new and improved facilities, learn the skills they need to integrate walking and bicycling into their everyday lives, and receive positive reinforcement about why and how to integrate walking and bicycling into their everyday lives. In essence, these efforts market walking and bicycling to the general public and ensure the maximum "return on investment" in the form of mode shift to walking and bicycling. This memorandum describes current efforts and future recommendations related to education, marketing and promotion efforts for walking and bicycling.

Figure 1. Education, marketing and promotional events encourage residents to consider walking and bicycling viable transportation options.

Need for CRD Education, Promotion and Marketing Initiative

In our survey of municipal efforts, it became clear that the region lacks a coordinated, energetic leader on education, promotion and marketing of walking and bicycling. Some municipalities are too small to apply financial and staff resources to these efforts and, despite general interest and several partnership initiatives such as the Saanich signage effort, all municipalities lack staff capacity to begin new initiatives.

In addition, while the Pedestrian and Cycling Master Plan (PCMP) effort has revealed a general common understanding of the need for cycling and walking initiatives, in the past there has never been a formalized common regional vision for cycling and walking. The PCMP can provide that clarity of vision and a clear plan for how to proceed. Eleven of twelve municipal contacts interviewed for the PCMP identified education efforts as a priority for the CRD's leadership.

Role of the CRD

The CRD, as a regional organization already engaged in education, encouragement and promotion around other issues (such as recycling and water conservation), should play the following roles:

- **Convener**: Bring the right people together.
- **Coordinator**: Assist interested parties in working in concert.
- **Adviser**: Develop expertise around education, promotion and marketing, and become the repository of institutional memory.
- **Public voice**: Create a campaign to educate and engage the public directly on walking and bicycling issues.
- **Monitor**: Develop an evaluation strategy, ensure that evaluation metrics are collected and report back to funders, stakeholders, decisionmakers and the general public about the results of education, promotion and marketing efforts (a bicycle and pedestrian report card will be presented and discussed in more detail in the Benchmarking and Measurement System memorandum).
- **Funder**: Fund education, promotion and marketing efforts directly, from its operating budget, and indirectly, by leading and participating in efforts to secure additional funding.

- **Implementer**: Where there is no clear existing implementing agency (such as in the area of youth bicycling education) or where the CRD is the uniquely qualified agency to act (such as in the area of public behaviour change campaigns), consider directly creating and implementing programs to fill the void.

Recommended Staffing Structure

In order to make significant progress on education, promotion and marketing of walking and cycling in the region, it is absolutely necessary to create staff who are specifically assigned to working on these efforts. We recommend creating the staff positions described below.

Please note that while these may be hired by and housed under the CRD, it is also possible for the CRD to contract with other organization(s) or individual(s) to fulfill these functions. In any case, the CRD should take a leading role in securing funding for these positions, hiring the right people for the job, setting their duties and work plan and supervising their work.

Figure 2. Outreach staff are crucial for interacting with the public.

- **Pedestrian and Cycling Coordinator**: This person should be charged with generally overseeing the implementation of the PCMP, but in the context of this memorandum, their role should be to implement the education, promotion and marketing recommendations. In addition, the Pedestrian and Cycling Coordinator should be the liaison to the Regional Pedestrian and Cycling Steering Committee (see Recommendations, below).

- **Outreach staff**: For certain outreach efforts (such as SmartTrips), it will be necessary to have additional outreach capacity. Depending on the desired programs to be implemented, these staff may be hired as part-time temporary staff, or it may be possible to combine several staffing needs to create one or more full-time outreach positions (such as having them work on the KidsCAN Skills Safety Course for the Active and Safe Routes to School effort in the spring and fall, having them work on SmartTrips in the summer, and having them assist with data collection and evaluation in the winter).

Existing and Past Efforts

All municipalities were surveyed about current cycling and pedestrian efforts. The results of that survey are listed below.

Existing Municipal Efforts

Oak Bay
Oak Bay has a Bike to Work Program. The Community Association of Oak Bay participates in many bicycle and pedestrian related events.

Victoria
Victoria is an active Bike to Work Week BC participant with nearly 175,000 km having been biked by participants in 2009 alone.

The Greater Victoria Cycling Coalition has been working toward promoting the use of the bicycle and improving the cycling environment since 1990.

Saanich

Saanich also participates regularly in the regional Bike to Work Week BC. The District of Saanich Bicycle and Pedestrian Advisory Committee helps to improve the local biking and walking conditions.

View Royal

The View Royal Sustainability Task Force was initiated by the Town Council in 2008 to engage the community in activities and discussions about sustainability and liveable communities. The Task Force currently consists

Figure 3. Bike to Work Week encourages bicycle commuting through incentives and supportive activities.

of eight members from different segments of the population to give a diverse cross-section of talents and expertise. They organize the Green View Royal website and outreach to encourage sustainable lifestyle choices such as using active transportation that reduces vehicle kilometres traveled and subsequent GHG emissions.

Langford

The City of Langford participates in Safe Routes to School and Bike to Work Week.

Colwood

Colwood has participated in Bike to Work Week in the spring for many years. Colwood has an active cycling committee.

Central Saanich

The municipality fields an annual Bike to Work Week team with strong support from the administration. In 2009, a day-off-with-pay was one of the daily incentive prizes and was a very effective motivator.

Central Saanich formerly had a separate Cycling and Pedestrian Advisory Committee, but with limited staff resources to support committees, the committee was disbanded a number of years ago, and the committee's responsibilities were added to the terms of reference of the Advisory Planning Commission.

North Saanich

There are six or seven cycling events each year in North Saanich. Traffic volumes in the area are low enough to make this happen safely.

Sidney

The Heart Smart walk, which is a section along Sidney's waterfront walkway in the downtown, utilizes distance-marking signage to encourage walking or jogging. Sidney has many elderly residents, and, in this area particularly, they tend to use the Heart Smart walk as part of a daily exercise program. While Town staff themselves take part in Bike to Work Week, Sidney was not involved in implementing it.

Existing and Past Events

Bike to Work Week

Bike to Work BC is a registered non-profit society working to increase commuter cycling in the CRD through Bike to Work initiatives such as providing Bike to Work Skills Courses, supporting Bike to Work events in communities, building partnerships and collecting data.

Way to Go! School Program

The Way to Go! School Program was funded through the Autoplan Broker Road Safety program from December 1997 to the end of June 2008 when the ABRSP was discontinued as an aspect of the accord between the Brokers and ICBC. In the summer of 2008, many Way to Go! Resources were transferred to Hub for Action on School Transportation Emissions (HASTE: www.hastebc.org).

Figure 4. Programs that target schoolchildren are an important part of an overall education, marketing and promotion strategy.

School Travel Planning Pilot

In the past year or two, through the efforts of Green Communities and the Canadian Safe Routes to School Partnership (http://www.saferoutestoschool.ca/partnership) and through funding from the Canadian Partnership Against Cancer, BC has been involved with pilot and second stage work on School Travel Planning. The approach requires a much more significant commitment from the local government authority in supporting the planning and infrastructure to allow for children's safe and active travel to school. The School Travel Planning Guide and Toolkit are available from the project website (http://www.saferoutestoschool.ca/schooltravel.asp). HASTE is able to provide training and resources for implementing School Travel Planning in British Columbia.

Recommendations

The survey of municipal efforts indicated that the region lacks a coordinated, energetic leader on education, promotion and marketing of walking and bicycling. Some municipalities are too small to apply financial and staff resources to these efforts and, despite general interest and several partnership initiatives such as the Saanich signage effort, all municipalities lack staff capacity to begin new initiatives.

In addition, while the PCMP effort has revealed a general common understanding of the need for cycling and walking initiatives, in the past there has never been a formalized common regional vision for cycling and walking. The PCMP can provide that clarity of vision and a clear plan for how to proceed. Eleven of twelve municipal contacts interviewed for the PCMP identified education efforts as a priority for the CRD's leadership.

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- **Public voice**: Create a campaign to educate and engage the public directly on walking and bicycling issues.
- **Monitor**: Develop an evaluation strategy, ensure that evaluation metrics are collected and report back to funders, stakeholders, decision makers and the general public about the results of education, promotion and marketing efforts (a bicycle and pedestrian account is discussed in Chapter 6. Evaluation and Planning).
- **Funder**: Fund education, promotion and marketing efforts directly, from its operating budget, and indirectly, by leading and participating in efforts to secure additional funding.
- **Implementer**: Where there is no clear existing implementing agency (such as in the area of youth bicycling education) or where the CRD is the uniquely qualified agency to act (such as in the area of public behaviour change campaigns), consider directly creating and implementing programs to fill the void.

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- **Outreach staff**: For certain outreach efforts (such as SmartTrips), it will be necessary to have additional outreach capacity. Depending on the desired programs to be implemented, these staff may be hired as part-time temporary staff, or it may be possible to combine several staffing needs to create one or more full-time outreach positions (such as having them work on the KidsCAN Skills Safety Course for the Active and Safe Routes to School effort in the spring and fall, having them work on SmartTrips in the summer, and having them assist with data collection and evaluation in the winter).

Regional Coordination

In order to facilitate coordination and momentum on pedestrian and cycling issues, CRD should convene a Pedestrian and Cycling Steering Committee consisting of municipal staff (planners, engineers or other staff tasked with working on these issues), community and staff from partner agencies (such as BC Transit or the Victoria Island Health Authority). The group should meet bimonthly in the two years following the Pedestrian and Cycling Master Plan completion with the goal of working energetically towards implementing

the plan recommendations. It is suggested that this group be a subcommittee of the Inter-jurisdictional Transportation Advisory Committee in order to ensure coordination with regional transportation planning, projects, and issues.

After that window, the group may choose to meet on a quarterly basis in order to coordinate efforts and work together on common goals. Major task areas include:

- Implementing Pedestrian and Cycling Master Plan recommendations
- Coordinating regional walking and bicycling efforts
- Leveraging funding and seeking new funding sources
- Working together on cross-jurisdictional efforts (such as Sunday Parkways, SmartTrips and the like)

KidsCAN Road Skills Course

Last year's successful KidsCAN Cycling Road Skills Course pilot project demonstrated that there is great interest around the region, especially at the school district level, in providing substantive bicycle skills training to school children.

Phase II of the KidsCAN Cycling Road Skills Course project is to expand the program to all four school districts, with the long-term goal of reaching every seventh-grader in the region. A business plan is currently in development to determine the costs and strategy needed to reach that goal.

The curriculum developed during the pilot program should be used for future phases, but engaging video segments should be developed, along with a loaner bike program to ensure that all children are able to participate in the on-road component.

The Active and Safe Routes to School (ASRTS) Working Group should develop a phasing strategy for reaching schools in the region and resolve outstanding logistical issues such as the provision of program insurance, evaluation strategies and the role of the municipalities in program implementation.

Figure 5. Students learn bicycling safety during a road skills course.

The Regional ASRTS Coordinator will be responsible for managing the program, scheduling and supervising teachers, promoting the program and communicating with the media, seeking in-kind donations and managing evaluation.

Professional Development Classes

Professional development courses provide training to transportation and other professionals who do not have extensive experience or training in bicycle and pedestrian facilities. This can be a successful way to institutionalize knowledge of bicycle facility design at an institution and create an agency culture that values bicycling.

After the Pedestrian and Cycling Master Plan (PCMP) is released, a series of professional trainings should be hosted to educate planners and engineers at municipalities, as well as interested community members, about the contents of the PCMP (e.g. emerging best practices, bicycle/pedestrian user counts, the Active and Safe Routes to School plan, etc.). Trainings should be designed to fulfill continuing education requirements for

professionals. If interest is sustained, trainings may be an ongoing service provided by the CRD. The Pedestrian and Cycling Steering Committee can assist in identifying topics for future trainings.

Sunday Parkways

Sunday Parkways (also called Summer Streets, Ciclovias, or Play Streets) are periodic street closures (usually on Sundays) that create a temporary park that is open to the public for walking, bicycling, dancing, hula hooping, roller skating, etc. The purpose of the event is to encourage walking and biking to the general public by providing a car-free street event.

Sunday Parkways have been very successful internationally and are rapidly becoming popular in North America, including the cities of Winnipeg and Ottawa. Vancouver's first event, called Vancouver Live Streets, is schedules for September 12, 2010. These events promote health by creating a safe and attractive space for

Figure 6. Closing streets for a car-free community event creates a temporary park for walking, cycling, skating, dancing, etc.

physical activity and social contact, and are cost-effective compared to the cost of building new parks for the same purpose. These events are generally very popular and well-attended, and have been shown to be uniquely effective at reaching the "interested but concerned" population who need much more encouragement and training to consider bicycling.

The CRD should work with municipalities to launch one Sunday Parkways event in the first year, working towards an eventual goal of one per month from June to September. Sunday Parkways will require close collaboration between the CRD and participating municipalities, so it will be necessary to come to a clear sense of agreement about roles, responsibilities and financial commitments before proceeding. The City of Portland created a manual for use by other communities; it is recommended that the CRD use this as a starting place for work planning (http://www.portlandonline.com/transportation/index.cfm?a=274625&c=51522).

Sample Programs:

- New York City Summer Streets:
    - http://www.nyc.gov/html/dot/summerstreets/html/home/home.shtml
    - http://www.streetsblog.org/2009/08/10/streetfilms-nyc-summer-streets-2009/ (video)
- Portland Sunday Parkways:
    - http://www.portlandonline.com/Transportation/index.cfm?c=46103
    - http://www.streetfilms.org/portlands-sunday-parkways/ (video)

Family Biking Programs

Families and children in the CRD who want to bicycle more often currently have few, if any, resources available to help them learn what they need to know. Reaching families and children is especially important because increasing active youth school transport is a goal of the CRD, and in order for families to consider bicycling for school transport, they need to learn basic bicycling skills.

Family bicycling programs help parents figure out how to safely transport children by bicycle and help children learn bicycling skills. The format can vary. Some events are panel discussions; others are open-house style events (e.g. at a park), while others may be classes.

Activities may include:

- Training for kids on how to ride a bicycle without training wheels
- Bicycle skills/safety course for children (e.g. rodeo)
- Information about options to transport children (e.g. trailers, cargo bicycles, kid seats, family tandems) and the opportunity to test ride these devices
- Group ride or parade (possibly with bicycle decorating station)
- Bicycle safety check
- Basic bike maintenance course
- Distribution of bicycling maps & brochures

Figure 7. Family biking programs provide families with bicycling skills, tools for transporting small children, and fun activities to do as a family.

Sample program: San Francisco Bicycle Coalition's Family Day (http://www.sfbike.org/?family_day)

Multimodal Trip Planner

Print walking and bicycling maps, such as the Davenport Cycling Map of Greater Victoria, are a tremendously useful resource for people who want to give walking and bicycling a try. The utility of a print map, however, is limited by its distribution, and since pleasant cycling and walking routes are often different from major driving routes, users won't be able to guess the locations of optimal routes.

With the increasing popularity of handheld mobile devices such as smart phones, the opportunity to create a multimodal trip planner could be a game-changer in making non-driving trips attractive and competitive with driving.

There are several efforts in the region to create single-mode trip planners (such the UBC Cycling Route Planner), but a system that integrates transit, walking and bicycling would offer a major step forward in sharing information with the public.

A multimodal trip planner should:

- Integrate up-to-date transit schedules
- Offer users the ability to click on a map for starting and ending points if desired (as opposed to having to enter a street address)
- Allow participating jurisdictions to easily update their information as cycling and walking infrastructure is
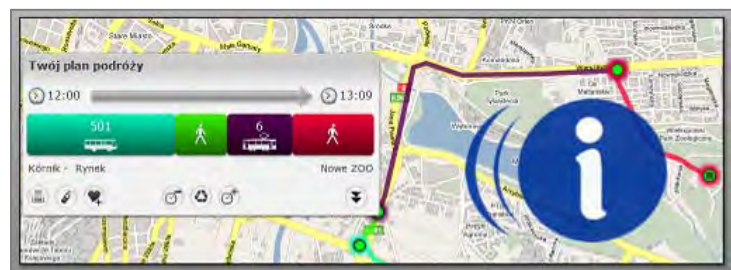

Figure 8. Multimodal trip planners offer a major step forward in sharing travel information with the public.

implemented

- Work on the widest variety of web and mobile platforms

It is suggested that the CRD consider an open source solution to keep costs low and to permit the community to contribute to developing an optimal tool. One option is the Open Trip Planner, currently in development and being beta tested in New York City, Portland, Poznań (Poland), and Bilbao (Spain). More information is available here: http://opentripplanner.com/

SmartTrips

SmartTrips programs are proven to reduce drive-alone trips by approximately 10% and increase bicycling, walking and transit use within a target area. The program invites residents or employees of the target areas to order a customized information packet containing travel information (e.g. an event calendar, walking and bicycling maps, a bicycling guide, transit maps and schedules, etc.). Customized packets are assembled and delivered (by foot or by bicycle where possible) to residents at their homes or employees at their workplaces,

Figure 9. Residents often do not know where to find walking and cycling resources; a SmartTrips program delivers brochures, maps and incentives directly to their homes.

along with an incentive gift of their choice.

In addition to the customized information packet, the program also hosts numerous encouragement activities such as group walks, guided bicycle rides and classes and workshops. Trained staff appear at community or employer events to answer questions about walking, bicycling and transit use.

This approach is based on the annual award-winning City of Portland SmartTrips program, which has consistently shown a 9-13% reduction in drive-alone trips in the selected target area since 2004 at a cost of approximately 20 USD per household. More information on Portland SmartTrips: http://www.portlandonline.com/transportation/index.cfm?c=43801

This evidence-based program should be a key aspect of the CRD's efforts to increase cycling and walking in the region. A thoughtful rollout strategy will select appropriate target areas based on factors known to indicate that a SmartTrips program can be successful (moderate to high residential density, availability of walking/bicycling infrastructure and transit service, commercial and community destinations within reasonable distance of homes, etc.) and work closely with municipalities and BC Transit to implement a program.

Pedestrian, Bicycle and Motorist Respect Campaign

A high-profile marketing campaign that highlights the importance of respect between bicyclists, pedestrians and motorists is an important part of creating awareness of walking and bicycling and improving safety for all road

Figure 10. Respect campaigns increase the general public's awareness of bicycling and can be used to promote safe roads by and for all users.

users. A well-produced safety campaign will be memorable and effective. Most importantly, the campaign should emphasize responsibility and respect between road users.

One good example is the New York City "Biking Rules" campaign, which encourages bicyclists to pledge to respect pedestrians through a simple code of conduct as well as community-produced videos. Other examples include the Portland (Oregon) "I Brake for People" campaign and the Sonoma County (California) Transit "You've got a friend who bikes!" campaign.

A Respect Campaign in the CRD should combine compelling graphics and messages with an easy-to-use website focused at motorists, pedestrians and bicyclists. The safety and awareness messages can be displayed near high-traffic corridors (e.g., on billboards), printed in local publications and broadcast as radio and/or television ads.

Figure 11. Campaigns that appeal to road users' sense of shared responsibility and respect are more effective than those that lecture the public.

Sample programs:

- Sonoma County, CA (USA): http://www.sctransit.com/bikesafe/bikes.htm
- NYC Biking Rules Campaign: http://bikingrules.org/
- Portland, OR (USA) "I Brake for People": http://bikeportland.org/2007/10/15/pdot-to-launch-pedestrian-safety-campaign-5564

Diversion Class

A diversion class is offered to first-time offenders of certain walking-related or bicycle-related traffic violations, such as running a stoplight on a bike. It can be aimed at pedestrians, bicyclists, and/or motorists. In lieu of a citation and/or fine, individuals can take a one-time, free or inexpensive class instead. In Marin County (California, USA) interested citizens can take the class even if they did not receive a ticket. This program is a good way to educate road users about walking and bicycle rights and responsibilities, and can also increase public acceptance of enforcement actions against pedestrians and bicyclists.

Sample program:

- Marin County, CA (USA): http://www.marinbike.org/Campaigns/ShareTheRoad/Index.shtml#StreetSkills

Regional Evaluation and Benchmarking

In order to assess the effectiveness of the Pedestrian and Cycling Master Plan, it is important to track accomplishments and whether the Plan is meeting its stated timeline and objectives. An annual report should include relevant walking and cycling metrics (number

Figure 12. Reports should be shared with the public to demonstrate the region's commitment to improving walking and cycling.

of walkers/riders, new walking/biking facility kilometres, major completed projects, crashes) and may also include information on user satisfaction, public perception of safety or other qualitative data that have been collected related to walking and bicycling. The annual report should be shared with funders, stakeholders, decisionmakers and the general public.

A more detailed effort to develop an evaluation rubric will be completed later in this project as part of the Interjurisdictional Harmonization process.

Sample annual reports:

- City of New York – NYC: http://www.nyc.gov/html/dcp/pdf/transportation/bike_survey.pdf
- City of San Francisco - San Francisco, CA: http://www.sfbike.org/download/reportcard_2006/SF_bike_report_card_2006.pdf
- City of Copenhagen - Copenhagen, Denmark: http://www.vejpark2.kk.dk/publikationer/pdf/464_Cykelregnskab_UK.%202006.pdf

Bike to Work Week

Bike to Work Week is an ongoing successful effort to increase commuter cycling. The CRD can support the continued success of Bike to Work Week in numerous ways, including: inviting Bike to Work Victoria staff to participate in the Regional Pedestrian and Cycling Steering Committee; continuing to partner with Bike to Work Victoria on the KidsCAN Road Skills Safety Course; and providing funding, technical support (e.g. GIS mapping services) and/or staff time to support the program.

Jane's Walk

Inspired by the "people's planner" Jane Jacobs, the annually Jane's Walk event (held on May 1st) is a series of free neighbourhood walking tours, developed and delivered by citizens, as a way to help put people in touch with their environment and with each other, by bridging social and geographic gaps. This fledgling event (launched in 2007) creates a space for cities to discover themselves and to reacquaint its citizens with the inherent walkability and joy a dense, urban environment can offer. www.janeswalk.net

Figure 14. Bike to Work Week is an effective way to introduce commuters to cycling through encouragement and skills building

Figure 13. Jane's Walk is an exciting, citizen-lead walk that helps reacquaint people with the joys of walking in an urban setting.

Bike Sharing

Public bike sharing systems are comprehensive mobility systems that use a fleet of bicycles and stations spread over an area to provide inexpensive and accessible transportation to urban communities. They have been described as a "system of individual public transport" and are well-suited to short trips, typically five kilometres or less. Bike sharing systems are energy efficient and zero emission as well as quick and cost-effective to implement as compared to other transportation infrastructure. They can operate alone or to extend the reach of mass transit systems.

Bike share programs can provide safe and convenient access to bicycles for short trips, transit-work trips, and/or tourist trips. The international community has experimented with bike share programs for nearly 40 years. Until recently, bike share programs worldwide have experienced low to moderate success because of theft and vandalism. In the last five years, innovations in technology that cause increased accountability have given rise to a new generation of technology-driven bike share programs. These new bike share programs can dramatically increase the visibility of cycling and lower barriers to use by requiring only that the user have a desire to bike and a smart card, credit card or cell phone.

This section contains an overview of bike share systems, summarizes key elements necessary to success, and discusses next steps that could be undertaken by the CRD to assess the feasibility of a bike sharing system in the region.

Figure 15. Montreal's bike share system, which debuted in 2009, features 2,400 bicycles at 300 stations throughout the city.

Benefits of Bike Share Systems

Bike share programs, such as systems in Montreal, Minneapolis, Melbourne, Barcelona, Paris and Lyon, help increase cycling mode share, complete gaps in the public transit system, reduce a city's travel-related carbon footprint and provide additional 'green' jobs related to system management and maintenance. In North America, many cities are considering bike share programs, though they have not yet been widely implemented.

Transportation Carbon Intensity Reduction

Public bike systems reduce carbon intensity by reducing the number of automobile trips. This is achieved through a direct replacement of automobile trips with cycling trips as well as by extending the reach of the transit system to make it more attractive than travelling by car. European cities with public bike systems have recorded up to a 10% direct replacement of automobile trips as well as an increase in transit ridership. Given that North American cities utilize automobiles for a much higher percentage of short-distance trips than European cities there is potential for even higher automobile trip reduction.

Unlike many other transportation demand management (TDM) measures that reduce automobile trip-making, there is actually a net increase in the number of trips made with a public bike system in place. Because they are essentially zero-emission, this is achieved without any additional contribution to CO_2 or other greenhouse gas emissions.

Urban Mobility Spectrum[1]

Bicycle sharing provides an effective substitute for short distance trips made by automobiles in urban areas (i.e., trips less than five kilometres). This represents a large share of all trip-making. Short-distance automobile trips:

- Make up much of the congestion on urban arterials
- Contribute disproportionately to urban emissions (see below)
- Are involved in numerous automobile crashes

Short-distance automobile trips represent the most carbon-intense portion of the drive cycle. In fact, cold starts are believed to generate approximately 60% more CO_2 emissions than warm starts and even more than general driving. Short distance trips tend to occur in congested areas with high concentrations of traffic control, which require idling and low-speed operation – both of which have a more pronounced effect on emissions than un-congested driving conditions.

Bike share systems are not foolproof; poor design, inadequate supply of bicycles and a lack of maintenance are among the potential pitfalls faced when building and implementing a bike share system.

Public bike systems are holistic mobility solutions and provide environmental, economic, and social benefits. Their potential to reduce carbon intensity by shifting automobile trips to other modes and numerous other benefits are summarized in 1.

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[1] Adapted from Call-a-Bike Factsheet on website: http://www.callabikeinteraktiv.de/kundenbuchung. February 2008.

Table 1. Benefits of Bike Sharing Systems

Category	Benefit	Description
Mobility	Trip Distance	Fills the gap between trips too long for walking but not long enough to justify waiting for transit (1-5 kilometres)
	Travel Option	Provides a low-cost, accessible system to encourage personal mobility
	Increased Mobility	Encourages trips that would not have otherwise been taken with no additional transportation infrastructure (e.g., approximately 3% of bike share trips in Lyon would not have otherwise been made)
	Transit Integration	Improves transportation options for the first and last leg of a transit trip, therefore extending the reach of the transit system
		Increases transit ridership and diversifies service options meaning more and varied service can be offered by transit
	Congestion / Travel Time	Travel time on the cycling network is more reliable than driving (congestion effects) or transit (schedule)
Energy / Environment	Emissions	Replaces auto trips (likely more than 10%) with zero emission mode of travel
	Station Design	Employs solar technology, etc.
	Resource Sharing	Average of 20 registered users per bike
		Number of subscribers / population
Economic	Implementation	Quick and cost-effective to implement compared to other modes (e.g. new transit line, road widening, etc.)
	Job Creation	Creates "green" jobs – short-term during implementation and long-term during operation
	Local Business	Increased business for local retail
Society	Health	Cycling improves individual health resulting in reduced health care costs
	Cost to Individual	Purchase, storage and maintenance of bicycles is borne by system operator
		Cost-effective compared to transit and automobile
	Behavioural Change	Encourages wider behaviour change and increased use of bicycles in general. Positive effects on allocation of road space, improved cyclist safety (in numbers)

Key Elements of Bike Share Systems

Bike Fleet

Fleet bikes should be distinctive, designed for easy city use, and clearly branded to increase their visibility. Bikes typically come with full fenders, chain guards and, in some cases, a locking mechanism attached to the bike's frame. In most systems, bikes come equipped with a Radio Frequency Identification (RFID) tag, used to locate the bike within the system. This function is typically used in fleet management, utilization analysis, and identification of lost or stolen bikes.

Figure 16. Fleet bikes, such as those used in the Deutsche Bahn Call-a-Bike system, should be easily distinguishable.

Parking and Locking Mechanisms

Bikes lock to either a rack or kiosk where users collect and drop bikes using a smart card or credit card. Card-access systems are found throughout the world. These systems are generally simple to operate, making them accessible to the general public.

Kiosks should be secure, intuitive, and well-lit, and should display information about costs and registration. The kiosks should denote availability of bikes through indications of status (typically red or green light). Most systems can show availability of bikes online or on a mobile device. They should also provide a map of other nearby stations and directions on bike check-out and return methods.

Station Design, User Interface and Check-in/Check-out Protocols

All bike share programs require a user interface to collect and retrieve bicycles through a check-in/check-

Figure 17. The Melbourne bike share program can be accessed with a fob or a credit card.

out system. The interface should be simple and easy to understand (e.g., give instructions and diagrams and offer multiple languages). Stations should provide clear directions on how to access and return a bicycle. Other recommended elements include:

- Instructions on where and how to return bicycles
- Cost and pricing information
- Contact information to report damaged bikes or stations
- Maps of nearby stations and recommended bicycle routes
- Damage-resistant locking mechanisms
- Quick access to avoid queues and maximize safety

The best systems will offer multiple options to register and pay for bike check out (e.g., smart card or credit card). Programs using a smart card system generally do not provide users with a lock. If users have registered

for the service with a credit card, they can simply swipe the appropriate card and go. Many systems also allow the user to have short term (daily or weekly) access to the system at station locations.

Station Networks

Station networks should be designed with regard to anticipated users and trip types. For example, some systems in the Netherlands target rail commuters who need a bike to get from the rail station to work. In Paris, stations are placed to create a citywide network with stations available about every 300 - 500 meters. A good station network will:

Figure 18. Check-in/check-out procedures at a card-access kiosk. Instructions are available in several languages.

- Place bikes at easily-found, high-traffic locations
- Connect to public transit stops and stations
- Serve the needs of recreation and utilitarian trips
- Appeal to the targeted population by placing stations near desirable destinations
- Include sufficient stalls at each station to exceed anticipated demand under normal conditions
- Take terrain into consideration (most cyclists prefer to avoid hilly terrain when possible)
- Have stations placed within a reasonable travel distance of each other (difficulty created by inconvenient rental/return locations could contribute to underutilization of the system)
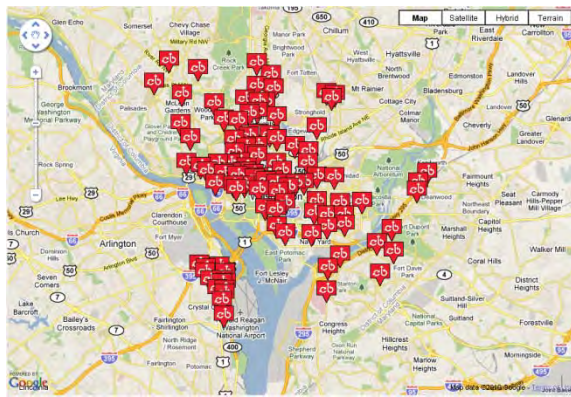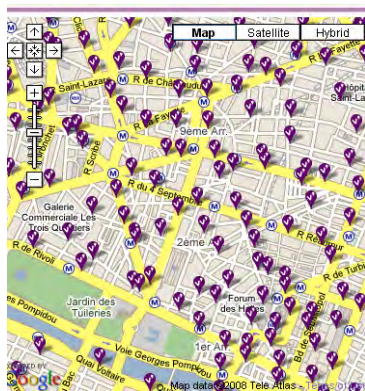

Figure 19. The map on the left shows station locations in a small portion of Paris. The map on the right shows all the stations in Washington D.C. In Paris, the stations are placed evenly throughout the city; in D.C the stations are placed near transit stations and key travel destinations.

Newer "fourth generation" systems are taking advantage of solar and wireless technology to provide flexibility for adjusting the number and location of stations (as well as making station siting and installation easier and cheaper).

Maintenance and Management

A key aspect of any bike share program is system and fleet maintenance and management. These activities can help keep the bike share system in top operating order and provide sufficient bikes to accommodate normal demand.

Status Information System

A status information system will allow operators to:

- Track bike status (e.g., track a bike's location and whether it is in or out of service)
- Track bike location and usage history
- Track station usage
- Track each user's usage statistics and billing information

The bike system status information allows system operators to track management, develop and refine bike redistribution strategies, track maintenance, and perform other critical system activities. Some systems may also handle billing and subscription related activities.

Bicycle Redistribution Mechanism

Users need a high level of confidence that a bicycle will be available at the station of their choice and that a return dock will be available when they are done with the bike. User patterns do not evenly redistribute bikes – stations at the base of a hill will end up with more bikes than ones at the top of a hill, for example, and transit stations may run out of bikes during early morning commute hours, while the evening hours will likely see the opposite result: a lack of empty parking spots to return bikes.

In order to meet user expectations and keep the system balanced, bicycles will have to be redistributed from one station to another from time to time. Past performance of systems in Lyon and Paris indicates that many locations experience peak times of use when a rack will be either completely full or completely empty, making the check-out or return of bikes impossible. Information about bicycle demand should be gathered through Radio Frequency Identification (RFID) tags and any other means used to track bicycle locations. GPS units are not widely used yet, but large-scale deployment is anticipated over the next one to two years. Redistribution may require attention throughout the day as activity patterns shift. Areas likely to require redistribution include:

Figure 20. Maintenance and management are a key part of bike share systems, as in this photo of bike redistribution from Barcelona.

- Transit stations
- Large employment centers (e.g. downtown Victoria and Central Saanich)
- Colleges and universities (according to class schedules) such as the University of Victoria
- Transit stations and interchanges (e.g. Beacon Avenue, Patricia Bay Highway, University Heights)
- Stations located at the top or bottom of large hills (e.g., people may decide to walk or take transit up the hill rather than take the bike)

Fleet and Station Maintenance

Bike fleet maintenance includes common activities such as filling tires with air and tuning up bike gears. Station maintenance may include repairing electronic or communication components, cleaning stations from

soil and graffiti and replacing damaged touchscreens. Bikes and stations not kept in good repair can create safety and liability issues.

Most 3rd generation systems, including Paris, Montreal, and Minneapolis (Minnesota), have sophisticated backend systems so that operators can monitor required bike and station maintenance in real time. Others systems, such as the Bycyklen stations in Copenhagen, have little to no automation and require regular inspection to ensure that stations and bicycles remain in good repair.

Bike fleets and stations will require both scheduled (preventative) maintenance and as-needed maintenance as issues arise. A bike share program should include a plan for fleet and station maintenance. Suggested plan elements include:

- A method for users to report bike damage, necessary repairs or vandalism
- A schedule for regular station inspection and/or maintenance
- A clearly identified party or group in charge of fleet or system maintenance
- A funding source or identified method to pay for scheduled and as-needed maintenance required to keep bicycles and stations in working order

Cost, Funding and Operational Models

Costs associated with a bike share systems fall into four categories:

- Direct capital costs (e.g., bikes and terminals)
- Direct operating costs (e.g., administration, maintenance, and electricity to power terminals)
- Associated capital costs (e.g., streetscape improvements)
- Associated operating costs (e.g., the existing bikeway network, bicycle maintenance, bicycle redistribution, insurance costs)

Figure 21. The bike share system in Montreal is partially owned by the City and managed by Bixi.

It is common for a government agency to undertake operation of a bike share system with an operating partner, as most bike share systems are not financially self-sustaining. Funding for public bicycle systems commonly comes through a combination of advertisements, user fees, and public government funds, and many systems operate as a public-private partnership. As an example, the Bixi system in Montreal is partially owned by the City and managed entirely by Bixi.

Earlier European bike share systems were developed by outdoor advertising companies such as JC Decaux and Clear Channel Communications. In Paris, advertiser JC Decaux funds the entire system and relies upon revenue from billboard space (granted to the company by the city) and bike rentals to pay the bills. If advertising rights are included as part of the partnership agreement, the region should consider what type of proposals are acceptable, including limitations on content, ad placement, and duration of advertising rights. Municipal codes and provincial laws sometimes place restrictions on where advertising may occur, which could impact the use of this funding mechanism.

This funding model is not being adopted in North America. In fact, Washington DC recently replaced its 100-bike DC Smartbike system operated by Clear Channel Communications, with a publicly funded system that is ten times as large, called Capital Bikeshare. It is widely felt among cities that such a model better incentivizes the operator for good performance and allows for greater accountability to the municipalities.

Most North American cities are now funding start-up and operating costs with a combination of public funding, sponsorship, and user fees. Different sponsorship models for bike share systems are developing every day, with examples from London (25 million pounds for naming rights by Barclays Bank), Toronto (unknown amount of funds by ING Bank), and Minneapolis (one million USD for bike fender sponsorship by Blue Cross Blue Shield insurance company). More models and pricing examples for sponsorship will surely develop even within the next year, as we are just at the beginning of a completely new market.

There are not yet enough data to accurately project when bike share systems will become financially self-sustaining from user fees alone. Early projections indicate a time frame of approximately three years.

System costs vary widely based on program scope and size. The start-up and launch costs for most third generation systems are approximately 5,000 CAD per bike for the whole system, and operating costs are approximately 2,000 CAD per year per bike.

Lessons Learned

The history of bike share programs in the United States and Europe provides an understanding of lessons learned and barriers overcome by technology.

First and Second Generation Bike Share Systems

First-generation bike share programs began in 1968 in Amsterdam and subsequently spread to other cities throughout the world. Program organizers assembled a fleet of bikes and gave them a distinguishing feature, such as painting them white. Bikes were left around the city in key locations for free use. Theft and poor organization were the key reasons given for program failure in many first-generation bicycle programs.

Figure 22. The coin deposit required by the Bycyklen system does not always provide enough incentive for the user to return the rented bike.

Second-generation systems attempted to minimize theft and increase organization by modifying bikes to require a minimal check-out deposit payable at designated bike pick-up/drop-off stations. Like first-generation systems, bikes were still painted or otherwise branded to ensure that each vehicle was recognized as part of the bike share system. Bikes were also equipped or retrofitted with a locking mechanism that allowed them to be checked out and returned. An example of this system is the Copenhagen Bycyklen, founded in 1995, which required a coin deposit to release the bicycle for use. However, the return of the required deposit does not always present the user with enough incentive to return the bike, and theft remains a common problem. It was estimated that 300 bikes (about 15% of the fleet) was lost to the Bycyklen theft in 1996.

The primary problem in historic systems is that users do not feel a sufficient sense of accountability, which results in:

- Little or no reason for borrowers to return bicycles to designated locations

- Bicycles in poor condition due to lack of user regard
- Bicycle theft
- Bicycles in poor condition due to lack of maintenance
- Inadequate or no funding to maintain or advertise the system

Characteristics of Successful Technology-Driven Bike Share Programs

Third and Fourth Generation Bike Share System

The third generation of bike share systems is characterized by credit card transactions and RFID chips. These crucial technology upgrades allow user identification and a security deposit to ensure accountability towards theft and vandalism.

The so-called "fourth generation" has been coined to characterize modular systems that do not require excavation because they use solar power and wireless communication, as opposed to hardwired installation. This system was pioneered by the Montreal Bixi system. The system is actually completely taken in for the winter. Even with this technology available, some cities, such as London, have chosen to utilize a hardwired system.

Match the Bike Share System to the Target Group

Systems experiencing higher levels of success have identified key target groups and tailored their bike share programs accordingly. Smart Card systems may be appropriate in areas where local users will be able to pick up and return bikes at different locations within the city.

Match the Program to the Existing Conditions

Many practitioners mention that bike share systems targeted at the general population work best in moderate to large cities with a minimum population of about 200,000 people. Other case studies have shown that smaller cities have achieved success with systems targeted at a specific population demographic, such as rail commuters. Other bike share programs have targeted university students or employees of one or more large companies.

Figure 23. The Velib system in Paris launched with a large fleet of 10,000 bicycles at 750 stations.

Initial Bike Roll-out

Case studies suggest that a system must have enough critical mass at roll-out to attract users to the system. For example, the Paris program began operation with nearly half its fleet (10,000 bikes at 750 stations). Spring or summer is an ideal time to roll-out a bike share system, as it reduces weather-related barriers to bicycle travel. Starting a bike share program in conjunction with another event will help draw attention to the program.

Provide a Mechanism for Bike Redistribution

It is important for users to be able to rely on the availability of a bike to rent and to find space for a return. Bike redistribution is likely to be most necessary at particular stations, related to travel patterns. Over time, usage trends can be identified and a bike redistribution mechanism developed to help balance the locations of

high demand and availability. In addition, the number and location of docking stations can be adjusted to better meet real-life demand patterns.

Price Bicycle Rental Affordably

Pricing rental on a graduated scale will encourage prompt return of bicycles and reinforce the idea of user accountability. The Montreal Bixi system is free for the first half-hour, and then charges about 1.50 CAD for the second half hour, $3.00 for the third half hour, and $6.00 for the fourth half hour and each additional half hour.

Allowing free rental for the first thirty minutes encourages users to try the system. In Paris and Lyon, this policy has resulted in about 95% of rides being free. A system run by advertiser JC Decaux in Brussels is considered to have poor ridership, in part due to a lack of free service. Even in the now-defunct Washington DC Smartbike system, which gave users 3 hours free, the average trip time was less than 30 minutes. Graduated pricing is also used so as not to compete with private bicycle hire businesses.

Ensure User Accountability

Most successful systems ensure user accountability by providing an incentive to return the bike and treat it well during use. Systems enforce a varying amount of accountability. In systems that require a user to register prior to use, the system operator can bill users for bicycle damages or unreturned bikes. Pre-registration presents a barrier to spontaneous use, however, and will usually rule out use by tourists.

In some programs rental time is restricted to a maximum (typically three hours). If a bicycle is not returned within the allotted window, the user (identified by their check-out code) is fined a set amount, or simply charged for the cost of the bike. This system can be frustrating to users unless stations are frequent and easy-to-find.

The least stringent accountability system is associated with the Copenhagen Bycyklen system. Users receive their coin deposit back, but have very little incentive to return the bike to a designated location.

Create a System Optimized for the Average Bicycle Trip Length

Cities such as Montreal, Paris, and Lyon have been very successful in creating systems where bicycles serve as a major source of public transit within the core downtown area, aimed at trips under five kilometres and lasting fewer than 30 minutes. As the first half hour of bike rental is free in these systems, users are provided with an incentive to use the system for short trips. As users become accustomed to using the bikes, they may begin to use them for longer trips.

Extension of Public Transit System

To function as an effective part of the public transit system, bike share programs should conform to the same standards as other modes for dependability, affordability, and convenience. Recommendations and system characteristics that will help to ensure success include:

- Frequently spaced, convenient stations that take terrain and other environmental factors into account
- Bikes that are consistently and readily available at transit transfer points (e.g., train stations and other transit hubs) to ensure a reliable linkage between other

Figure 24. By locating stations at major public transit hubs, bike share systems can become part of the greater transit system.

modes of public transit and the bike share system

- Bikes available at key trip start and end points in the downtown area (sports stadiums, train stations, major employers, and parks)
- A bike redistribution system to ensure availability of bikes at all station locations
- Unlimited hours of service or hours of service that match those of local transit providers
- Rental window of a suitable duration to allow bicycle use for utilitarian trips (e.g., permitting two or three hour rentals facilitates using a bicycle for a trip to a meeting across town or to the grocery store)

Next Steps for Bike Share Programs in the CRD

A bike share program in the region could benefit both visitors and residents, but it would not come without cost and tradeoffs. Prior to implementing a bike share system, the CRD should consider the potential costs and issues presented below.

- **Cost**: There are many ways to fund both the start-up and the operation of a bike share system, and it is changing every day. There is not enough data yet to know whether a bike share system is financially self-sustaining. Most North American bike shares are funded by public funding to start, and will find sustainability through a combination of public funds, sponsorship, and user fees. Based on cost estimates from North American systems (about 2,000 CAD per bike/year) a system of 1,000 bikes would cost the CRD $2 million/year. Though some of this cost may be absorbed by an operating company and user fees, it is likely that the CRD or other operating agency would still have to provide some form of funding for both launch and ongoing operations, either in financial resources or advertising space.

- **Safety/Liability**: While it is standard practice for system operators to require users to sign a liability release waiver, the system owner/operator will incur some legal responsibility for the system's safety. In many other North American systems, insurance companies have been willing to underwrite the exposure. Although this issue was a big question mark for bike sharing in North America, it has thus far not proved to be an issue in North American deployments. Nevertheless, CRD's tolerance for liability exposure should be examined and measures considered to limit exposure. In addition, mandatory all-ages helmet laws present a challenge to any bike share scheme in the region.

  Melbourne, Australia is the only other place in the world that has deployed a bike sharing system in a region with mandatory helmets. Because the system was launched in the winter, it is not yet clear what the reasons for low ridership are. However, it is clear that a solution must be found for distributing helmets to bike share users, whether helmets are mandatory or not. Currently, the solution is to work with local retailers to help provide low-cost helmets widely. Issues such as public health, logistical costs, and liability prevent easy distribution of used helmets.

- **Existing Bicycle Facilities**: The existing regional network is a patchwork of on- and off-street facilities. =Though complete in many areas, bikeway network gaps in some areas may result in lower ridership. Completion of the recommended bikeway network in areas targeted by the bike share program can help increase system use although there are examples where less extensive bicycle networks have not proved critical and the success of the systems has encouraged investment into expanding the network.

- **Number of Bikes/Size of System**: The fleet size and the number of stations would depend on the target population, the chosen system model and, crucially, on the amount of funding available. A GIS

analysis can be performed to evaluate the optimal size system for the region. In North America, systems are starting with a critical mass core, and growing outward based on demand.

Therefore, the CRD could design a system that serves parts of the region best-positioned for success (e.g. higher density, more bicycle infrastructure, proximity to destinations). This would mean that fewer bikes/docks are needed, costs would be lower, and the number of users/trips would be higher per dollar invested. The challenge to this approach is that each municipality would not receive comparable benefits from the regional system at first, and this might put the CRD in a politically challenging position.

It is important to note that a critical mass of bikes is needed for a successful start. This particular number can be determined with further analysis.

- **System Model**: The CRD should consider the purpose and organization of a bike share system. We list some basic models for consideration. Please note that these models are not mutually exclusive:

Figure 25. A system may be targeted towards users in the city center or tourists, as well as employees at major workplaces or transit users.

  o City Center (e.g. Paris-style): The system is designed for high turnover, short trips and transit connections in the city center. This type of system in the CRD would be deployed in regional growth centers and village centers (e.g. Brentwood Bay, Fairfield Plaza and Keating Industrial Park), particularly where many employees already take transit to work.

  o Tourist Oriented: This type of system would be oriented around major tourist origin points (e.g. Empress Hotel, the cruise ship terminal in Victoria), destination points (e.g. Butchart Gardens, BC Ferry terminal, Gulf Islands, Sooke Pot Holes, Hatley Park, Fort Rodd Hill ,Glendale Gardens, and Woodlands), and multi-use path corridors (e.g. Galloping Goose, Lochside, E&N, Interurban and Trans Canada trailheads). A tourism-oriented system must facilitate on-the-spot registration and will likely benefit from a credit card option (as opposed to just smart card). Tourism agencies, hotels, and tour operators should be included as partners. To the degree that tourism activities overlap with employment centers (e.g. downtown Victoria and Central Saanich), a tourist-oriented system can serve other goals as well.

  o Employer Oriented: An employer-oriented system would be designed to serve employees at major workplaces. Bicycles could be used for connecting from transit stops to workplaces, travel on larger campuses or within large facilities, and midday errands and recreation trips. This type of system could be funded partially or entirely by employers. If the CRD implements a larger regional system, employers could be solicited to fund their own fleet of bicycles that are compatible with the larger system.

  o Transit Oriented: A transit-oriented system would focus on connecting high-capacity transit with residential areas (the "first mile problem") and with employment centers (the "last mile problem"). It can also be used to supplement already congested transit systems over short

distances. This type of system does not experience a high turnover of users throughout the day, so it will be more expensive for the benefit of fewer users.

- **Intra-Regional Coordination**: North Vancouver has just released an RFP for a bike sharing system, Vancouver is expected to in the very near future, and Seattle is currently seeking funding with an RFP to follow. If the CRD implements a bike sharing system that is compatible with some or all of these systems, it will realize synergies in marketing, public comprehension, and acceptance, as well as in the number of users.

- **Governing Structure**: The CRD would necessarily be a leader in implementing any truly regional bike-sharing system, but other partners are likely to be implicated as well. CRD should consider if/how BC Transit, municipalities, electoral areas (Juan de Fuca, Southern Gulf Islands, and Salt Spring Island) and/or non-profit organizations (such as the Greater Victoria Cycling Coalition) would be involved.

  Key questions include:

  - What financial commitments and risks would each partner contribute? What non-financial commitments will each partner contribute (e.g. staff time, providing access to public right-of-way and/or permits for docking space)?
  - How would liability exposure be shared between partners? What additional insurance coverage is needed, if any?
  - How will decisions be made? Will CRD retain final decision-making rights with nonbinding input from partners, or will all partners form a new governing body for the purposes of running the bike-sharing program?
  - What documentation and memoranda of understanding are needed to achieve the desired governing structure?
  - Who will be the public face of the program? Who will speak to the media?
  - How will the success of the program be evaluated, and when and how will decisions be made about expanding, continuing or discontinuing the program?
  - Which entities will decide where stations are located?
  - If municipalities choose not to participate in the initial system, is there an opportunity for them to join in later? How would that work financially and organizationally?

- **System Operator**: Who will manage both rollout and day-to-day operations of the system? Does the CRD wish to manage the system in house, or would it be more advantageous to contract with an experienced team specializing in bike sharing?

- **Selection of Destinations and Station Placement**: A targeted survey and data gathering effort can help identify locations where stations are likely to attract high ridership. The data used to site potential station locations should include transit connections, bicycle network data, day and night time population, key activity centers (e.g., major tourist attractions and employment centers), and topography. These data can be overlaid using maps or Geographic Information Systems (GIS) to create an initial plan for station locations. Site visits should be used to augment user surveys and refine the initial placement plans to create stations that function well in each location and the meet needs of potential customers. It should be noted that certain rural areas in the West Shore area of the CRD (e.g., Sooke, Metchosin, and Juan de Fuca) do not have a minimum residential density that would support bike sharing, and the station placement plan should take this into consideration.

- **Phasing**: Does the CRD have sufficient funding to roll out a complete system immediately? If not, what phasing scheme makes the most sense? Many systems focus on highest-density locations first, then strategically expand to secondary areas and along major transit/retail corridors as time continues.

- **Equity**: Socioeconomically disadvantaged areas are less likely to score well as high-yield locations for bike sharing in part due to the requirement of having a credit card and placing a large deposit for bicycles. Many jurisdictions are sensitive to the possible public perception that a bike-sharing system will only serve the well-to-do. If equity is a major goal of bike sharing, how does that affect funding sources, station placement, phasing, the definition of success, and evaluation efforts?

- **Evaluation**: What is the overall objective of the system, e.g. an extensive of public transportation services, tool to increase visibility of cycling, etc.? How does the CRD and its partners define success of a bicycle sharing venture? What metrics must be collected to evaluate success, and who is responsible for evaluation? If targets are not met, what response will be taken (e.g. discontinuing program vs. investing further to make the system work better)? What are direct opportunity costs of investing in bike sharing (e.g. vs. expanding the bikeway network), and do the benefits outweigh the costs?

- **Weather**: CRD has a significant number fairly cold, rainy days. Potential system users, especially infrequent cyclists, may not choose to utilize the system when they perceive conditions are not optimal or adequate for cycling.

- **Terrain**: CRD's topography could impact the amount of bicycle activity within the city. Hilly terrain could cause a reduction in trip distance or duration or an outright reduction in the number of trips taken. The impact of terrain may be magnified by the weight and gearing of the selected rental bike.

Figure 26. Weather can be a barrier to bicycling and may impact bike share ridership numbers.

Conclusions

Based on experience with bike share systems throughout North America and the world, as well as indications of local characteristics, it is likely that a thoughtfully-designed bike share system could be successful in the CRD. A CRD bike sharing system should be designed to reflect the following factors:

- **Population density**: Areas with low density will struggle to support a bike share system. Victoria, Saanich, areas of Central Saanich Oak Bay, Colwood, Langford, and Esquimalt have residential densities which are more likely to support bike sharing. Rural areas such as Sooke, Metchosin, and Juan de Fuca will not be able to support bike sharing.

- **Demographics**: Many areas of the CRD are home to "older" populations that are traditionally less inclined to cycle. However, a high number of tourist trips throughout the region could support the system, especially in the Inner Harbour area.

- **Target Audience**: As part of deciding on the desired model (e.g. tourist, employer-oriented, etc.), it is important to determine who the target audience is and how they can best be reached. Potential large/concentrated groups of users should be identified (e.g. University of Victoria students/staff/faculty or personnel at the DND Canadian Forces Base Esquimalt) and their travel habits studied to determine whether bike sharing is likely to be an appealing option for them.

- **Mixture of land use and non-residential density**: many areas in the CRD are 'bedroom communities' where residents travel long distances to work. Tying a bike share system would to transit would be essential to the success of any system.

- **Cycle-ability**: the region's topography is generally supportive of cycling, and the bicycle network is improving. For any bike sharing system to succeed, however, improving the overall network and fixing the most challenging "missing links" will be important. If bike sharing is targeted at tourists, for example, improving on-street bicycle connections to the Galloping Goose will be critical to attracting tourist use of a bike sharing system.

- **Cycle culture**: the CRD has the highest cycling mode split in Canada. Policies within the CRD support increased cycling and innovative treatments. A bike share system should be designed with the input and buy-in of agencies and community groups who can champion the system as part of the CRD's cycle culture, thus developing a sense of regional pride in the system.

- **Intermodal Connectivity**: bike sharing will be more successful in areas with a higher transit mode split. There may be opportunities to "fill the gaps" between existing transit coverage, which would have mutual benefits of stretching the transit dollar further.

- **Timing**: A CRD bike sharing system should be implemented only after key bicycle facilities are implemented that would otherwise challenge the success of the system. Likewise, the system should be designed to be compatible with the Vancouver, North Vancouver, and Seattle systems that are currently in development to whatever degree is feasible.

- **Communications**: The CRD already has experience with direct public campaigns (such as those related to recycling, water conservation, and greenhouse gas emissions). These internal resources should be used to assist the success of a CRD bike sharing program by educating the public about the purpose and benefits of bike sharing, and creating awareness of the system prior to launch.

The following next steps are recommended for pursuing bike share programs in the CRD:

- **Focus network improvements on closing gaps in high-use areas.** In particular, connections to the Galloping Goose Trail and U Vic from the downtown area and to tourist destinations such as Butchart Gardens from transit stations.

- **Ensure that policies are supportive of bike share systems.** Policies such as mandatory helmet laws detract from the success of bike share systems.

- **Pursue potential partnerships.** Meet with BC Transit staff and representatives from the tourism industry and employment centers to determine partnerships and explore potential funding scenarios.

- **Decide on system model and analyze station placement.** The goals and overall model (e.g. employer-based, tourism-based, etc.) should be determined and a GIS-based analysis begun to determine optimal station locations.

Appendix G. Evaluation and Planning

Regularly measuring and reporting bicycle and pedestrian investment and activity allows individual municipalities, the CRD, and their residents to measure progress towards achieving stated goals for walking and bicycling. In addition, a quality data monitoring program can help the CRD and member municipalities to obtain funding for new projects. Most grant programs require awardees to monitor the results of funded projects, including a baseline count and monitoring usage over time. Cities with established bicycle and pedestrian monitoring programs have an advantage over other cities when pursuing funding.

In addition, the PCMP process has brought together planners, engineers, decision makers, and advocates from member municipalities and other regional partners such as BC Transit and the Ministry of Transportation and Infrastructure who play a role in regional transportation planning and implementation. The second half of this chapter describes how the CRD could continue this inter-jurisdictional communication to support implementation of the PCMP recommendations in the coming years.

Benchmarking and Measurement

The *TravelChoices Strategy* and several other regional and municipal planning documents include the goal of increasing active transportation participation. Without accurate and consistent demand and usage figures, it is difficult to measure the positive benefits of investments in these modes, particularly when compared to other transportation modes. This information can inform the design of pedestrian and cycling facilities, e.g. locations of under-served demand, support for trail widening or extension, walking speeds (for crossing signal timing), etc. Demands on similar facilities can be used to estimate potential demands on a proposed facility to support grant applications. Consistency of data collection would allow the CRD to use data collected by the member municipalities and integrate it into regional transportation modeling. The CRD's existing count program for cycling and walking is not sufficient for benchmarking purposes.

Consistency of data collection would allow the CRD to use data collected by the member municipalities and integrate it into regional transportation modeling. The CRD's existing count program for cycling and walking is not sufficient for benchmarking purposes. Appendix G. Evaluation and Planning contains detailed information about count and surveying methodologies and technologies. The CRD is well-positioned to accumulate the necessary additional data by building on the original 2006 pilot project using the National Bicycle and Pedestrian Documentation Project, and adopting the methodology into a standardized program. The program is suited to utilising the region's existing capacity amongst its community volunteers to conduct the manual counts. In addition to simply counting the number of bicyclists and pedestrians, the CRD may wish to expand the survey to include additional information such as whether cyclists are riding on the sidewalk and/or against the designated flow of traffic as well as tracking gender and helmet use.[1]

This appendix provides an overview of previous and on-going count and survey efforts in the CRD, followed by a review of count and survey methodologies and technologies that have been used to count bicyclists and pedestrians throughout the world. Each section contains recommendations for how the CRD can use these strategies to count and survey pedestrians and bicyclists. A best practices review of bicycle and pedestrian report cards provides details of how other jurisdictions are presenting the results of counts and surveys to the

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[1] While additional information is helpful for the report card and tracking purposes, additional information such as age may be difficult to collect via counts due to helmet use or numbers of cyclists being recorded and can be included in a survey.

public. Finally, the memorandum recommends strategies for the CRD to combine counts and surveys with existing information in order to develop a bicycle and pedestrian report card.

Existing Data

The PCMP Technical Advisory Committee and the Citizen's Advisory Committee provided information on municipalities and advocacy groups that conduct bicycle and/or pedestrian counts or surveys. Major sources for regional bicycle and pedestrian data in the CRD include:

- Origin and Destination Household Travel Survey (ODHTS)
- Manual Traffic Occupancy Counts (part of screenline motor vehicle traffic counts)
- National Bicycle and Pedestrian Documentation Count (NBPD; including Rider Survey)
- Automated Non-Motorized Transportation (NMT) Counts
- Canadian Census
- Regional Trail automated counters

Table 1 summarizes key elements of each data source, which are described in greater detail following.

Table 1. Existing Bicycle Data

	ODHTS	Manual Counts	NPBD Count	NPBD Survey	Census	Regional Trails Counts
Category	Sample of population	Manual count	Manual Count	Targeted survey	Sample of population	Trail counts
Years on record	2001, 2006*	1992, 2000, 2001, 2002, 2005, 2007, 2008, 2009	2006	2006	2006, every 5 years previously	2010, pending
Uses	Measure/ track changes in travel behaviour Input for modeling Assess travel demand	Background for major projects to determine average car occupancy at key intersections and number of trips by mode.†	Same as Occupancy Counts Target specific location	In-depth analysis of travel behaviour such as linked trips Community perceptions	Can be used to measure mode split at various levels of aggregation Only considers travel to work	Measure/ track level of use on regional trails General trends (e.g., time of day)
Benefits/ Challenges	Statistically accurate at the regional and municipal level only	Automated counts cannot collect bike/ped data, Some manual counts at key intersections are collected	Pilot project Comparable with other jurisdictions No comparison with other modes	Pilot project Comparable with U.S. jurisdictions if conducted annually	Statistically accurate to sub-municipal areas Comparable to jurisdictions across the country	Does not track mode, direction of travel Cannot provide overall use estimates
Data format	Database file	Accessible through Regional Transportation Data Management System (RTDMS)	Excel	Excel	Excel	Excel

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* Also conducted in 1992, but the mapping format does not allow comparison.
† 1, 2 , 3 , 4+ person auto, light trucks , medium trucks, heavy trucks, buses and bicycles. Data used extensively for the Victoria Regional Rapid Transit Project.

Origin and Destination Household Travel Survey (ODHTS)

The ODHTS is a survey of travel behaviour that attempts to give an accurate, comprehensive view of all personal travel over a typical weekday/weekend 24-hour period in the CRD. The CRD has conducted this survey to assess the nature of personal travel in the CRD (demographic, mode, origins, destinations, timing, and purpose of trips). The data is a sample of the general population in the 13 CRD municipalities, Juan de Fuca Electoral Area, Saltspring Island, and the southern portion of the Cowichan Valley Regional District (Subdivision C south of Duncan). The survey provides baseline data for the Regional Transportation Model, which is used for transportation planning and evaluating progress toward the TravelChoices mode split goals.

Methodology

The first survey was conducted in 1992, with subsequent studies in 2001 and in 2006, timed to coincide with the Canadian Census. For reliable mode share statistics for the region, the survey aims for a 3,000 household sample size.

The 2001 ODHTS collected information on 24-hour weekly travel characteristics. Respondents (who were randomly selected and contacted by phone) submitted travel diaries via mail or online

A 2005 report recommended improvements for increased participation,[2] and differences between the 2001 and 2006 surveys include:

- Cash prizes were offered with a 30% chance of winning.
- Telephone reminders were used to encourage survey completion.
- An advance notification letter from the Chairman of the CRD board explained the importance of the survey, reassured confidentiality, and generally promoted the survey.
- Salt Spring Island was included.
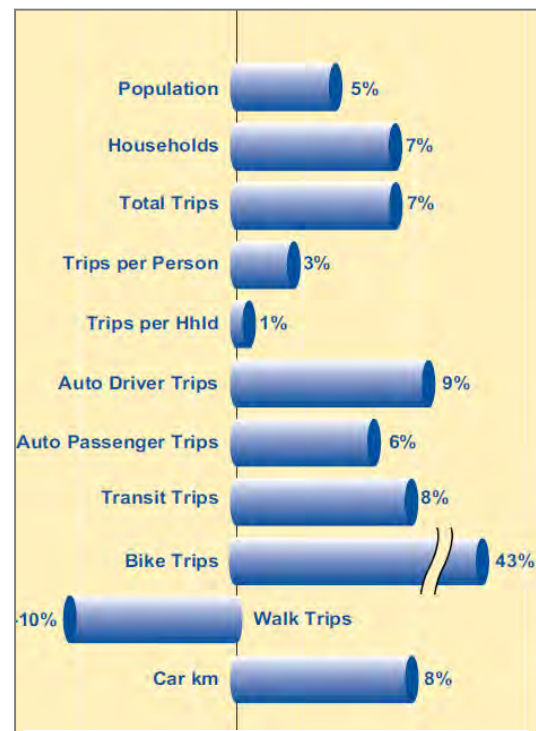
Results/Data Uses

The OHDTS survey provides information about the origins and destinations of trips for the entire region and various sub-areas. It also provides information about the timing, general purpose, and mode split of trips. The survey also includes demographic information on age and gender and vehicle ownership. In terms of bicycles specifically, it provides a very accurate region-wide picture of cycling trip flows, timing, and mode share. It also provides demographic information about cyclists (age and gender). The 2006 survey found a 43% increase in cycling since 2001, as well as a 7% increase in trips made by residents (Figure 1).

The results are used to understand overall regional travel patterns and to recalibrate the regional transportation model. They are published in a report which is available in hard copy and downloadable from

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[2] CRD. (2005). 2006 CRD Origin-Destination Survey Preparation Study.
www.crd.bc.ca/reports/regionalplanning /generalreports /transportation /researchanddata /householdtravelsurve /2006 /2006crdodprepfinalre/2006crdodprepfinalre.pdf

the CRD website.[3] The system will be spatially enabled in the future, so that information can be accessed through maps.

Manual Traffic Occupancy Counts

The CRD hires a contractor to conduct manual counts for occupancy and non-motorized travel data. This information provides a picture of activity by mode at key intersections and background information for major projects. The manual counts were used extensively by the Victoria Regional Rapid Transit Project team to examine travel by mode at major intersections on the proposed alignment.

Table 2. The CRD's Annual Manual Count Budget

Methodology

Automated traffic counts use tube counters to measure vehicular traffic volumes at 374 locations throughout the region on a rotating basis, with each location counted at least once every few years. Manual occupancy counts supplement automatic counts placing staff alongside counters at 10-20 locations each year. Manual counts collect data that is not picked up by tube counters, primarily vehicle type and occupancy, but also the number of cyclists (note: pedestrians are not counted). Counts are conducted for the four afternoon hours between 2:30pm and 6:30pm. Table 2 summarizes the CRD's annual budget for these counts.

Item	Qtd./Cost
Number of locations	20
Number of staff per location	2
Count Hours	2
Hourly Wage	$15.00
Labour cost per count	$1,200.00
Counts per year	4
Annual labour cost per count	**$4,800.00**
Printing & Copying	$200.00
Annual Total (per count)	**$5,000.00**

Results/Data Uses

Some of the count results are publicly available on the CRD website as a pilot project. They can be downloaded in a Google Earth format.[4] The information provided includes:

- Average vehicle occupancy.
- Number of cyclists travelling past the count point by hour and direction of travel.
- Weather conditions on day of count.

The data is used to double-check automated counts; to develop adjustment factors for estimating all-day, all-year use; to track the impact of infrastructure improvements; to provide indicators of overall cycling activity levels. It may be possible in the future to calibrate the automatic tube counters to detect bicyclists, which would substantially add to this data set.

National Bicycle and Pedestrian Documentation Count (NBPDC)

A tandem data collection initiative, the NBPDC is a manual count of bicycle traffic paired with intercept surveys of cyclists at selected sites around the region. It is part of a larger effort being coordinated by Alta Planning in partnership with the Institute for Transportation Engineers (ITE) to accumulate reliable and consistent data for determining bicycle and pedestrian trip generation factors for various land uses across North America.

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[3] http://www.crd.bc.ca/regionalplanning/transportation/origindestination.htm
[4] http://www.crd.bc.ca/regionalplanning/transportation/studies/TrafficCounts.aspx

Methodology

The CRD conducted this count with participation and support from municipalities and cycling advocates. NBPDC counts were conducted periodically throughout 2006. Volunteers stationed at various 'count locations' around the region counted passing bicycles for a two hour period on a typical weekday. Other volunteers in similar locations randomly selected passing cyclists to ask them survey questions about their trip purpose and reasons for cycling.
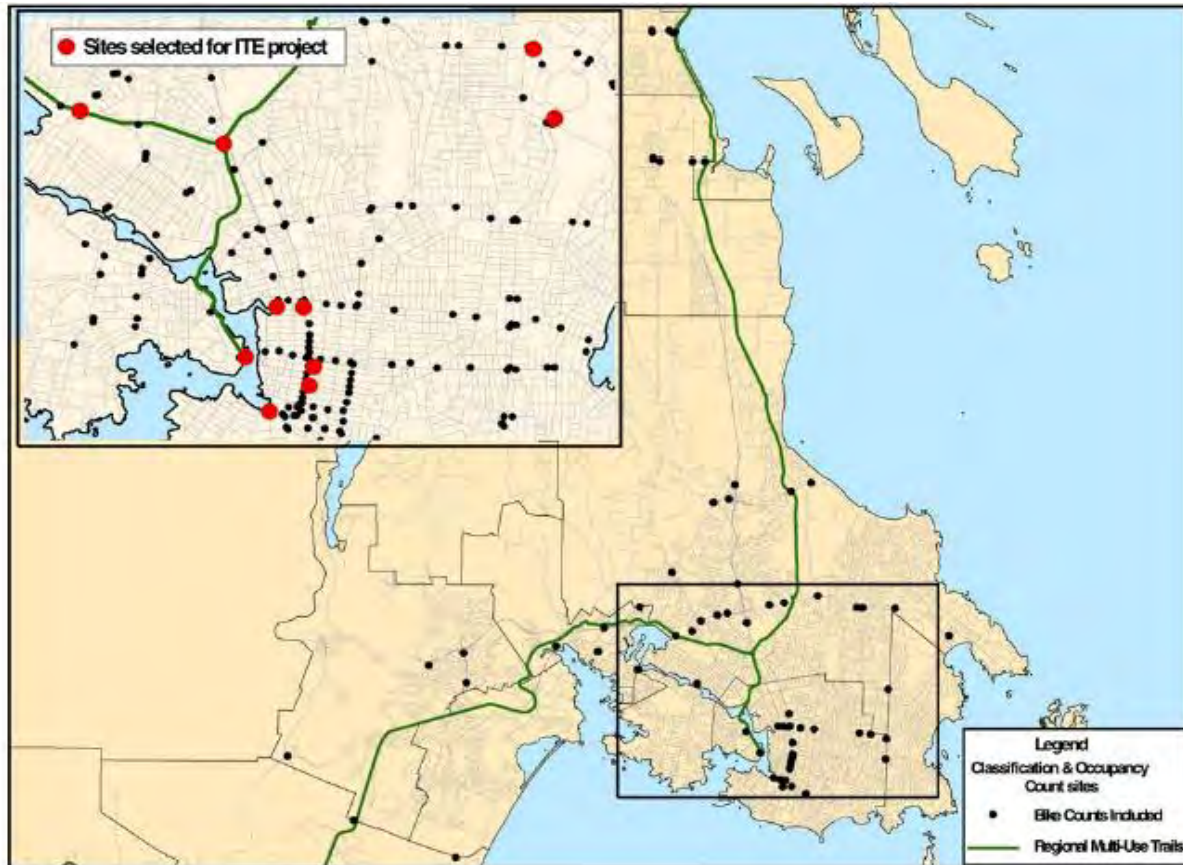
Figure 2. Bike count locations for NBPDC.

Count locations included a downtown Victoria screenline, suburban major road/highway locations, major bicycle and pedestrian trails, and specific bicycle and pedestrian generators, such as the University of Victoria and a recreation centre/movie theatre/shopping centre complex (see Figure 2). Ideally, this count should happen at the same time as the nationwide counts in September, always at the same locations. If possible, counting four times a year would provide seasonal differences.

This count provides a macro-level snapshot of how much cycling traffic is present along particular routes and pieces of infrastructure. The intercept survey provides a route-specific picture of people's trip purposes and attitudes towards personal travel. It is also possible that the intercept survey may provide a better understanding of linked trips and travel preferences than a travel diary survey such as the ODHTS. One limitation of this methodology is that there is no comparison to other modes or people taking other modes; for example, the survey does not identify why non-participants are not participating.

Census

The Census is a national survey of the Canadian population conducted by Statistics Canada. Journey to work data is based on a 20% sample. The Census is conducted every five years, most recently in 2006, using mail in and web-based surveys. In many jurisdictions the Census is the only community-wide information available on modal split. However, the Census long-form, which reports on trip length and other important information, is no longer being collected.

The Census provides a general demographic portrait of the CRD at various levels of aggregation. Most specifically, it provides mode split information for the journey to work, and place of work information. Cycling and walking are bundled in the community profiles published on the national website [5], so cycling data must be tracked down specifically. Note that there is a widely-held belief that the Census under-reports cycling activity, because it misses people who cycle only some of the time and for purposes other than work. However, the Census data shows a bike mode share of 5% which is higher than the bike mode share of 3.2% of all trip purposes, established in the CRD ODHTS, which suggests that the Census data might actually be over-reporting bike mode share.

CRD Regional Parks

CRD Regional Parks currently counts bicyclists and pedestrians both manually and automatically. In 2010, Parks purchased 18 permanent automatic path counters (infrared TRAFX machines as well as loop detectors) for use on the regional trails. Count locations include:

- Cooper's Cove: the Galloping Goose Regional Trail on the south side of the Sooke in advance of the Sooke Highway crossing.
- Luxton Fairgrounds: the Galloping Goose Regional Trail at the Luton Fairgrounds parking lot at the intersection of Marwood Avenue and Hazelwood Road in Langford.
- Galloping Goose Regional at the intersection with Talcott Road in View Royal.
- Switch Bridge: the Galloping Goose Regional Trail on the north side of the intersection with Crease Avenue in Saanich.
- Selkirk Trestle: the Galloping Goose Regional Trail on the east side of Selkirk Trestle.
- Switch Bridge: the Lochside Regional Trail on the south side of the intersection with Darwin Avenue in Saanich.
- Blenkinsop Trestle: the Lochside Regional Trail on the north end of the Blenkinsop Trestle.
- Heritage Farms: the Lochside Regional Trail at the end of Lochside Dr. near the entrance of Saanich Heritage Center in Central Saanich.

The data provides point specific data (i.e. there is no indication of direction, of distance of travel and in some cases mode of travel). In addition, the automated counters do not provide clear numbers as to the total number of trail users in a day, month, or year. They can be used to indicate general trends (i.e. times of travel, etc.). Additional verification through manual counts would be valuable to determine error factors and to calibrate the machines.

Greater Victoria Cycling Coalition

The Greater Victoria Cycling Coalition (GVCC) counts B bicyclists, pedestrians, and automobiles to support bicycle advocacy in the region. The manual counts are conducted by volunteers who are trained annually to collect afternoon peak-hour counts. Count locations are determined by current GVCC advocacy efforts, and counts have included information about use of lights and visibility vests, helmet compliance, gender, and other

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[5] http://www.statcan.gc.ca/start-debut-eng.html

information. GVCC also conducts intercept surveys of cyclists on the regional trails and of members, to support the findings from the counts.

In 2010, the GVCC used these counts, in combination with a member survey, to advocate for cycling facilities. For example, the GVCC recently published a entitled: *The Johnson Street Bridge & Cycling*.[6][1] See inset for a summary of their analysis.

> The analysis of cycling trips over the Johnson Street Bridge from 1998 to 2010 found that the number of cycling trips in the region has been growing steadily, and an increasing share of the trips over the bridge are made by bicycle. The report also predicts that in 2026, half of all trips over the bridge could be made via active transportation, which would be 8,000 bicycle trips per day, 16,000 by active transportation. GVCC used the bridge counts and member surveys to advocate for improvements to the bridge and bridgehead.

Capital Bike and Walk

In 2009, the Capital Bike and Walk advocacy group partnered with GVCC to conduct counts. Funded by a community grant from Vancity Savings, the effort involved volunteers from Capital Bike and Walk, GVCC, and the Vancouver Island Tourism Alliance. The counts were conducted on Bike to Work Day in October and focused on the E&N Rail Trail project, using locations on the Galloping Goose Regional Trail that would integrate into the proposed trail alignment and in Langford, to establish baseline numbers. The report notes that, "Counts on the adjacent road segments establish a baseline of on-road cycling data that will help in the assessment of both potential markets for trail cycling and the possible impacts of new trails on growing participation across nearby neighbourhoods."

The analysis uses a "k" factor multiplier to estimate daily volumes using afternoon peak hour counts, and recommends that future counts should be conducted where bicycle projects are scheduled or have been completed.

Municipalities
Most municipalities count cyclists and pedestrians as part of counts conducted for specific projects. In addition, several count automobiles with technologies such as loop detectors or manual counts, which also count cyclists and pedestrians. In addition, several municipalities also specifically count cyclists and pedestrians on shared-use trails.

Central Saanich

Central Saanich has conducted bicycle and pedestrian counts manually with consultant assistance. Bicyclists and pedestrians are counted in association with a specific road project or for a grant application. Counts are not usually taken after the facility has been built. Central Saanich counts motor vehicles with automatic counters.

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[6][1] http://www.gvcc.bc.ca/jsb/JSB%20report%20to%20CoV%20June%2010%202010.pdf

Colwood

The City of Colwood has been counting bicycle and pedestrian traffic over the past ten years. The City uses staff time and consultants to conduct manual counts. The number of count locations changes each year, based on facilities that are being observed. The data that are collected are used to apply for grants for bicycle and pedestrian facilities.

Juan de Fuca

The electoral area of Juan de Fuca has not counted bicyclists or pedestrians in recent years.

Saanich

Saanich has counted bicyclists and pedestrians since 1988, usually counting before and after installation of new facilities, as well as 60-90 manual and 60-80 automatic counts for automobiles. The District uses automatic hose counts for automobile counts but has not specifically counted or analyzed bicycle/pedestrian use.

Victoria

Victoria has counted bicycle and pedestrian traffic for at least 30 years. The program conducts counts at every signalized intersection every five years. In addition, the City counts screenline locations and locations based on special requests. Until 2005, the Victoria Real Estate Board also collected downtown pedestrian counts annually.

The City employs summer students to conduct manual turning movement counts at signalized intersections. Where possible, they count pedestrians, cyclists, and classify trucks; however, gathering that quantity of data can prove challenging. In addition, counts are only completed in the summer, due to student availability.

Automatic counts include motor vehicle speed studies and are completed annually at screenline locations and where the City has received a request for additional data. Data is collected using Jamar Petra and Traxpro technology, and is used to determine traffic signal timings, capital resource allocation, collision analysis, sidewalk café reviews, sidewalk width design, pavement maintenance and design, traffic calming installations, and crosswalk analysis.

Ministry of Transportation and Infrastructure (MoTI)

MoTI does not conduct manual bicycle and pedestrian traffic counts in the CRD. In other communities, these counts are used to plan for specific transportation projects. MoTI also has permanent automatic counters for counting motor vehicles throughout the CRD and has temporary stations to use as needed.

Best Practices for Counting Bicyclists and Pedestrians

There are two types of counts that can be used to measure bicycling and walking. *Screenline Counts* monitor the number of cyclists or pedestrians crossing a theoretical line across a roadway or trail. They are primarily used to identify general trends in volumes. *Intersection Counts* are used to monitor the number of cyclists passing through or turning at an intersection. They also provide information about volumes, as well as indicating bicyclist and pedestrian exposure to turning motor vehicles for a safety analysis. Depending on the volumes of bicyclists, intersection counts may be more complicated and require additional counters because they record two streets as well as turning movements. Pedestrian counts should be conducted at high crash locations and where safety studies are desired.

Annual counts can assist the CRD with understanding existing bicycling patterns, planning for future bikeways, and measuring the success of programs and facilities. The CRD can provide regional standards and

guidelines for data collection and analysis, assist electoral areas with data collection, and compile data from all municipalities to provide a regional analysis. The regional data can be made available online, so that anyone who applies for a user account can access the survey database.[7] Currently, the CRD conducts motor vehicle counts along regionally significant roads and manual traffic occupancy counts, which collect data on bicyclists and pedestrians.

Counting Methods

Counts can be automated, using several different methods to continuously count in a particular location, or they can be manually recorded by a group of staff or volunteers. This section summarizes counting technologies and strategies.

As has previously occurred in the CRD, count efforts can be incorporated with the National Bicycle and Pedestrian Documentation Project, an annual bicycle and pedestrian count and survey effort sponsored by the Institute of Transportation Engineers Pedestrian and Bicycle Council.[8] Additional bicycle and pedestrian data collection opportunities include: collecting before-and-after pedestrian, bicycle, and vehicle data for roadway projects, counting bicyclists and pedestrians in all traffic studies.

Automated or Continuous Counts

Automatic count technologies are useful in conducting longer-term counts, establishing daily, weekly, or monthly variations and almost always require fewer person-hours. The most common technologies used for automatic bicycle and pedestrian counts are:

- Passive infrared (detects a change in thermal contrast) - best suited for locations where there is little grouping, however it cannot distinguish between bicycles and pedestrians. [9]
- Active infrared (detects an obstruction in the beam) - can distinguish between bicyclists and pedestrians, and is therefore appropriate for shared use pathways.
- Video imaging/playback (either analyzes pixel changes or data are played back in high speed and analyzed by a person) - can provide information concerning user type, behaviour, and demographics, in addition to count data.
- Piezometric (senses pressure on a material either tube or underground sensor) - most appropriate for counting bicycles on-street in a shared-use environment.
- In-pavement magnetic loop (senses change in magnetic field as metal passes over it) - best for detecting bicyclists traveling along bike lanes or pathways.
- Ultrasonic (emits ultrasonic wave and listens for an echo).
- Doppler radar (emits radio wave and listens for a change in frequency).

The choice of an automatic count technology primarily depends on the type of data that is required, the project budget, and the number of staff available. All automatic count technologies require calibration. The physical installation of the counting device is another important consideration. Some infrared technology requires sensors to be installed on both sides of the pathway, while other devices can be effectively installed in locations with poles/street lights on just one side of the pathway or sidewalk, such as in an urban setting.

All automated count technologies have an error factor, meaning that they will fail to detect a certain percentage of passing bicycles or pedestrians. Depending on the technology and model, 'no-detection rates'

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[7] See City of Toronto data https://www.jpint.utoronto.ca/drs/new_index.html
[8] http://bikepeddocumentation.org/
[9] Schneider R.J., L.S. Arnold, and D.R. Ragland. *A Pilot Model for Estimating Pedestrian Intersection Crossing Volumes*. UC-Berkeley Traffic Safety Center.

vary from 1% to 48%. Correction factors can be developed by comparing automated counts with manual counts. For example, if comparisons with manual counts indicate that an automatic counter has a 5% no-detection rate, the jurisdiction can factor up its automated counts by 5%. To date, there is a limited amount of peer reviewed literature on the subject of automatic count technology reliability. The infrared sensors tend to undercount pedestrians most likely because they do not detect pedestrians when they are walking exactly side-by-side. Table 3 outlines count technologies most adaptable to bicycle and pedestrian counts.

Table 3. Automated Count Technologies[*]

Technology	How it Works	Bike/ped differen- tiation?	Where	Can it be moved?	Notes	Cost
Passive infrared	Detects a change in thermal contrast	No	Sidewalk, path	Easily		$,2000-3,000
Active infrared	Detects an obstruction in the beam	Yes	Sidewalk, path	Easily		$800-$7,000
Video imaging	Analyzes pixel changes	Unknown	Intended for indoor use	Yes	Difficult detection outdoors, no bike/ped application yet	$1,200-$8,000
Video playback	Video analyzed by a person	Yes	Anywhere	Yes	Difficult detection at night, in bad weather. Considerable staff time	$7,000
Piezometric tube	Senses pressure on tube	No	Path, on street	Easily	Bicycles only. Potential tripping hazard	$1,600
Piezometric pad	Senses pressure	No	Sidewalk, path	No		$2,000-3,000
In-pavement magnetic loop detectors	Senses magnetic field change as metal passes	No	Path, on street	No	Requires cutting into pavement or into ground to install	$2,000-3,000

[*] Additional information on these technologies can be found on the NBPD Website: http://bikepeddocumentation.org/ and the New Zealand Transport Agency published a comprehensive review: http://www.nzta.govt.nz/resources/sustainable-transport/cycle-counting-in-nz/

Manual Counts

The CRD's existing count program for cycling and walking is not sufficient for benchmarking purposes. The CRD is well positioned to accumulate the necessary additional data by building on the original 2006 pilot project using the National Bicycle and Pedestrian Documentation Project, and adopting the methodology into a standardized program. The program is suited to utilising the region's existing capacity amongst its community volunteers to conduct the manual counts. In addition to simply counting the number of bicyclists and pedestrians, the CRD may wish to expand the survey to include additional information such as whether cyclists are riding on the sidewalk and/or against the designated flow of traffic as well as gender and helmet use.[10]

When to Count

Bicycle counts should be conducted mid-week for on-street facilities, with additional counts performed on the weekend to capture recreational riders:

- Weekday (Tuesday, Wednesday or Thursday), 7:00 to 9:00 am and either 4:00 to 6:00 or 5:00 to 7:00 pm.
- Saturday, 12 noon – 2:00 pm.

Ideally, counts should be taken four times per year to account for seasonal variations. Alternatively, counting during the late spring and early fall provides yearly benchmarks to track changes in mode split. Counts should not be conducted during prime vacation times or on other atypical days such as national holidays or large sports games. For comparison with other data, it is recommended that the CRD conduct counts along with the NBPD effort, which counts in January, May, July, and September.

Where to Count

Count locations should be places where there is a presence of bicyclists and pedestrians either existing numbers or an expected increase after improvements have been made. There is little point in conducting counts in locations where pedestrians and bicyclists are almost non-existent. While traffic counts are traditionally conducted along major roads, bicycle and pedestrians are less likely to use those roadways. To get an accurate baseline and tracking of bicycling and walking in the region, the CRD should count on lower-speed streets where bicyclists and pedestrians are more likely to be.

The CRD should aim to count at approximately 40 locations region wide. They can be prioritized with the actual number of counts dependent on volunteer participation. As the program grows, the CRD may be able to increase the number of count locations. Counting bicycle and pedestrian movements through intersections is particularly challenging and often requires more than one counter.

- General count locations should be selected based on the following considerations and suggested criteria: Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc.).
- Locations near proposed major future bicycle/pedestrian improvements.
- Representative locations in urban, suburban, and rural locations.
- Key corridors that can be used to gauge the impacts of future improvements.
- Locations where counts have been conducted historically.
- Locations where bicycle and pedestrian collision numbers are high.

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[10] While additional information is helpful for the report card and tracking purposes, additional information such as age may be difficult to collect via counts due to helmet use or numbers of cyclists being recorded. This information can be included in a survey.

- Locations where there are on-going counts being conducted by other agencies through a variety of means, including videotaping.
- Gaps and pinch points for bicyclists and pedestrians.
- For multi-use paths and parks, locations near the major access points are best.
- For on-street bikeways, count both sides of the street at locations where there are few if any alternative parallel routes are best.
- For traditional downtown areas, a mid-block location near the center of the downtown is best. Count all pedestrians and bicycles on one side of the street on the sidewalk and adjacent travel lane/bike lane.
- For shopping malls, a location near the main entrance and transit stop is best. Count everyone in both directions at one access point, typically a sidewalk and street.
- For employment areas, either on the main access roadway or near off-street multiuse paths is best. Count everyone in both directions at one access point, typically a sidewalk and street.
- For residential areas, locations near higher density developments or near parks and schools are the best. Count everyone in both directions at one access point, typically a sidewalk and street.

Select locations that meet as many of the criteria as possible. Counters will need to be in a safe, visible location and should be on public property in a location that does not block pedestrians or bicyclists. The CRD or managing authority must receive written permission from property owners if you will be on private property. Map 1 through Map 5 show locations of historic counts and additional recommended count locations. Locations were chosen on the basis of density of bicyclist-attractive destinations (from the Pedestrian Priority Areas analysis developed through the PCMP process) and the recommended Priority Corridor network. Count locations should be additionally chosen on the basis of planned or anticipated transportation improvements, as well as all the factors provided above.

Who to Count

Count efforts require considerable coordination to identify sufficient numbers of volunteers to regularly count. All counters should be trained – the National Bicycle and Pedestrian Documentation Project provides training materials online. Counters should be trained for interaction with the public, the count process, and use of the form. They should also be trained as to how to count nonstandard bicycles such as tandems or trail-a-bikes, as well as strollers.

The CRD should coordinate with advocacy groups such as the GVCC, Capital Walk and Bike, as well as the University of Victoria and other groups who are likely to participate. Pizza or snacks can be offered at the training to increase participation. Software such as doodle[11] can help reduce staff time coordinating scheduling of volunteers.

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[11] http://www.doodle.com/

Legend

- ■ Regional Attractor
- ● Additional Recommended Count Locations

Historic and Recommended Count Locations
- ● 2005
- ● 2006
- ● 2007
- ● 2008
- — Existing Municipal Bikeway

Existing Bicycle Facility
Facilities that currently meet Class I standard for separation
- — Multi-Use Trail
- — Bicycle Lane/Shoulder Bikeway
- — Shared Roadway
- ---- PIC Bikeway with No Existing Facilities

Pedestrian Priority
- Low
- High

Map labels: SIDNEY, NORTH SAANICH, CENTRAL SAANICH, Tseycum First Nation, Pauquachin First Nation, Tsartlip First Nation, Tsawout First Nation, West Saanich Rd, Wallace

Notes:
1. Counts are recommended at historic locations in addition to new recommended count locations
2. Includes facilities not yet built, but with committed funding
3. Existing municipal bikeways may not meet PCMP facility definitions
4. Existing municipal bikeways data has not been field verified

Map 1. Previous and Recommended Count Locations - Peninsula

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   0.5   1   Kilometers

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Map 2. Previous and Recommended Count Locations - Core

Capital Regional District
Regional Pedestrian and Cycling Master Plan

Legend

Additional Recommended Count Locations — ● (blue)

Historic and Recommended Count Locations
- ● 2005 (green)
- ● 2006 (red)
- ● 2007 (yellow)
- ● 2008 (orange)

— Existing Municipal Bikeway

Existing Bicycle Facility
Facilities that currently meet Class I standard for separation
— Multi-Use Trail
— Bicycle Lane/Shoulder Bikeway
— Shared Roadway
- - - - PIC Bikeway with No Existing Facilities

⬢ Regional Attractor

Pedestrian Priority
- Low
- High

Notes:
1. Counts are recommended at historic locations in addition to new recommeded count locations
2. Includes facilitates not yet built, but with committed funding
3. Existing municipal bikeways may not meet PCMP facility definitions
4. Existing municipal bikeways data has not been field verified

Map 3. Previous and Recommended Count Locations - West Shore One

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   1   2 Kilometers

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Legend

Additional Recommended Count Locations — blue dot

Historic and Recommended Count Locations
- 2005 — green
- 2006 — red
- 2007 — yellow
- 2008 — orange

Existing Municipal Bikeway — magenta line

Existing Bicycle Facility
Facilities that currently meet Class I standard for separation
- Multi-Use Trail — green
- Bicycle Lane/Shoulder Bikeway — blue
- Shared Roadway — orange
- PIC Bikeway with No Existing Facilities — dashed

Regional Attractor — blue square

Pedestrian Priority
- Low
- High

Notes:
1. Counts are recommended at historic locations in addition to new recommended count locations
2. Includes facilitates not yet built, but with committed funding
3. Existing municipal bikeways may not meet PCMP facility definitions
4. Existing municipal bikeways data has not been field verified

Map 4. Previous and Recommended Count Locations - West Shore Two

Capital Regional District
Regional Pedestrian and Cycling Master Plan

0   2   4 Kilometers

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Notes:
1. Counts are recommended at historic locations in addition to new recommended count locations
2. Includes facilities not yet built, but with committed funding
3. Existing municipal bikeways may not meet PCMP facility definitions
4. Existing municipal bikeways data has not been field verified

Pacific Marine Rd

Trans Canada Trail

Galloping Goose Trail

Pacheedaht
First Nation

West Coast Rd

METCHOSIN

SOOKE

Otter Point Rd

T'Sou-ke
First Nation

T'Sou-ke
First Nation

Becher Bay
First Nation

Legend

Additional
Recommended
Count Locations

**Historic and Recommended
Count Locations**

- 2005
- 2006
- 2007
- 2008

Existing Municipal Bikeway

Existing Bicycle Facility

Facilities that currently meet Class I
standard for separation

Multi-Use Trail

Bicycle Lane/Shoulder Bikeway

Shared Roadway

PIC Bikeway with No Existing Facilities

Regional Attractor

JDF Pedestrian Priority

Low

High

Map 5. Previous and Recommended Count Locations - Juan de Fuca

Capital Regional District
Regional Pedestrian and Cycling Master Plan

N

0   2.5   5
Kilometers

alta
PLANNING + DESIGN
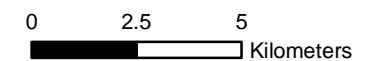
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Origin-Destination Surveys

Origin-destination counts provide information about where people are traveling as well as trip distance and total mileage. Usually collected in the form of household travel surveys, origin-destination surveys ask participants to log every trip they take over a day or week. These surveys usually collect information on trip purpose, mode or travel, travel time, and similar information. Because of the amount of information collected, the forms can be complicated for participants, and survey analysis and interpretation can represent a major effort.

Recent innovations in GPS technology represent an opportunity to simplify data gathering efforts. A number of studies have utilized GPS devices such as cell phones to track participants' trips. These studies also gather information about route choices, which can be used to determine where additional bicycle facilities would be beneficial, and where participants use an alternate route to a designated bicycle route.[12] This type of technology has recently been applied in the Region of Waterloo in Southern Ontario; Portland, Oregon; San Francisco, California. However, these efforts can be technologically demanding and require substantial staff time. As these technologies improve, GPS-based origin-destination surveys may be appropriate for the CRD in the future.

Development of a Regional Estimate

Once counts have been taken throughout the region, there are several strategies and best practices for developing a regional estimate for pedestrians and bicyclists. Some best practices include:

- A core set of locations are used to create a single annual count reporting figure.
- To adjust for the annual volatility of one day counts, the three-year rolling average should be reported (i.e., the indicator value for 2010 is based on the average of the counts from 2009, 2010 and 2011).
- The year 2000 should be used as a baseline which allows for simple comparisons between years and makes it clear that the indicator is not a count of all pedestrians and cyclists in the region, but is the best estimate of trends in walking and cycling levels over time.[13]
- Seasonal adjustment factors have been developed through the National Bicycle and Pedestrian Documentation Project (NBPD), which can be applied to determine an annual estimate.[14]

Count data offers the opportunity to research how demographics, land use, and other factors influence bicycling. This is true for both screenline and intersection counts (although intersection counts will need to be converted into approach and departure volumes).

Surveying Bicyclists and Pedestrians

International best practices have established that both quantitative and qualitative data are important in program monitoring. A set of key figures can be used to identify trends in walking/cycling, miles of pedestrian and bicycle facilities, safety, etc. It is important to supplement this quantitative data with surveys aimed at identifying user characteristics (e.g. trip purpose, walking and biking habits, etc.) and gauging resident perceptions of the bicycle and pedestrian network. Questions can also be tailored to inform the location and design of future facilities.

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[12] Oregon Transportation Research an Education Consortium. (2008). *Understanding and Measuring Bicycling Behavior: A Focus on Travel Time and Route Choice.* http://www.ibpi.usp.pdx.edu/media/OTREC_Dill_BikeGPS_Report.pdf

[13] Counts should be indexed to Base 100.

[14] National Bicycle and Pedestrian Documentation Project. (2009). *Count Adjustment Factors.* Available at: http://bikepeddocumentation.org/

Surveys can be directed at particular groups of potential bicyclists and pedestrians. Some examples include:

- Employer surveys – presence of bicycle parking, end-of-trip facilities or incentives
- Employee surveys – which transportation demand management (TDM) strategies are most effective/desirable
- School surveys – how do (elementary, high school, or university) students get to school? What are the barriers parents perceived to walking or bicycling to school?

Survey Content

The survey should gather information on resident and employee travel patterns in the CRD, opinions and suggestions on opportunities, challenges and potential facilities and programs from a large and diverse population of residents in the CRD. The survey will ask specific questions such as, "how often do you/ would you bike or walk," "what are your chief concerns," and "what types of improvements would you like to see." The survey will also include questions about encouragement and outreach, as well as transit integration. The purpose of the survey is to help inform the development of bicycle facilities and programs as well as to serve as a benchmark for travel patterns.

One concept that is relatively easy to present and intuitive for people to understand is to simply ask respondents to rate different aspects of bicycling and walking on a scale from 0 to 10, where 0 = strongly disagree and 10 = strongly agree.[15] The report card can then report the average response value in a concise way that allows for easy comparison of perceptions of bicycling and walking over time. The average rating of cyclists can be depicted as one red bicycle, so the top rating would be ten red bicycles.

Other questions that the survey could ask, which could be incorporated into the report card include:

- How frequently do you walk or bicycle? (Two times or more weekly = frequent walker/cyclist)
- Why do you walk/bike? (Shopping, work, school, leisure, fitness/exercise, etc.)
- What motivates you to walk/cycle? (Exercise, environment/air quality, enjoy time outdoors, cheaper than driving/transit, faster than transit, identify as a bicyclist, enjoy the alone time/downtime.)
- What are the barriers to walking/bicycling? (Not enough bike lanes,/sidewalks, not comfortable walking/biking with cars, too difficult to cross major streets, not enough light at night, I have things to carry, places are too far away, I need to travel with small children, hills/don't want to get sweaty before work, not enough time for walking/biking, I am worried about crime ,work hours change/are too early/late.)
- Are you aware of CRD & partner organizations' walking and bicycling resources?
- How satisfied are you with the region's walking/bicycling infrastructure?
- What are the perceptions regarding pedestrian, cyclist and motorist road manners?
- What are common unsafe walking, cycling, or driving behaviours?
- Demographics (gender, age, ethnicity, etc.)

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[15] Alternatively, respondents can be asked if they are satisfied with a given aspect of bicycling or walking, as is done in Copenhagen's Bicycle Account report.

Survey Distribution Methods

There are numerous ways to conduct surveys or questionnaires, including phone interviews, inserting questionnaires into utility bills and pay cheques, newsletters, web sites, on-line questionnaires, and field interviews. Random intercept interviews in the field, supplemented by post card surveys often yields the best cross section of a community and higher quality information than any other approach. Phone interviews and other approaches may be good supplemental efforts but also may have a significant bias in the sampling group, since entire ethnic and income groups may be under represented. In-person interviews will also provide details on the person being interviewed that other approaches will not allow.

Intercept Surveys

Intercept survey efforts focus on capturing respondents who have arrived at key generators and attractors using a variety of transportation modes. Intercept surveys can be performed at the same time as annual counts. However, depending on the number of counts performed, this may result in a very low sample size. It is common for intercept survey respondents to be given the option of mailing in their survey response (so that they can complete it later) or completing it online.

Intercept surveys could be collected from the following locations:

- Multi-use trails (e.g., the Galloping Goose, Lochside, E&N and Trans-Canada Trails)
- Ferry terminals and other major transit exchanges
- Regional shopping centres and employers
- Regional recreational or community centres
- Regional growth centers and urban villages

Agencies may wish to add extra surveyors to locations where major non-motorized transportation programs and/or projects are expected to be developed within the next several years.

There is no specific requirement for the number of surveys per location, although they will likely reflect the overall level of activity in each location. The balance between bicycle and pedestrian surveys should also generally reflect the relative activity levels of each mode. Where volumes of people are low, surveyors should count every third person, and also be sure to interview a true random sampling of people. General survey locations should be selected based on the following considerations and suggested criteria:

- Pedestrian and bicycle activity areas or corridors.
- Non-motorized program areas (such as Safe Routes to School, Personal Travel Planning).
- Locations near proposed major future non-motorized program areas and other bicycle/pedestrian improvements.
- Representative locations in urban, suburban, and rural locations.
- Key corridors that can be used to gauge the impacts of future improvements.
- Locations where surveys have been conducted historically.
- Locations where bicycle and pedestrian collision numbers are high.
- Locations where there are on-going surveys being conducted by other agencies.
- Gaps and pinch points for bicyclists and pedestrians.

Additional considerations for bikeway survey locations include:

- For multi-use paths, locations near the major access points are best.
- For on-street bikeways, locations at signalized intersections or bicycle parking areas are best.
- The other option is to interview bicyclists and their end points, such as work, shopping, or other areas.

Sidewalk survey locations should include the following considerations:

- For traditional downtown areas, a location near the center of the downtown is best.
- For shopping malls, a location near the main entrance and transit stop is best.
- For employment areas, either on the main access roadway or near an off-street multi use paths is best.
- For residential areas, locations near higher density developments or near parks and schools are the best.

Surveyors will need to be in a safe, visible location and on public property. Surveys on private property such as a mall or major employer require permission.

Web-Based Survey Instrument
Internet/mail-in surveys can be distributed by local bicycling groups to their member base and contact list – although this will limit the survey sample to those that currently ride and will not inform the CRD of barriers for non-participation. Using this methodology, the City of Melbourne (Australia) had more than 4,000 cyclists participate in their 2008 survey. A pedestrian survey can be distributed to the general population in a similar fashion.

The CRD could post the survey on their web site and solicit appropriate organizations to provide links. Groups such as the Greater Victoria Cycling Coalition (GVCC) and Capital Bike and Walk could post the survey link and solicit participation. Informational cards with the survey URL can also encourage people to fill out the web-based survey. Cards can be distributed in civic locations, local bicycle shops, health clubs, gyms and fitness studios including at Bike to Work Week events.

Bicycle Account

Cities around the world have begun monitoring their bicycle and pedestrian programs in order to track the number of non-motorized users, gauge user perceptions of the bicycle and pedestrian networks and identify trends in safety. Results are published in a periodic bicycle and pedestrian account or report card, which can be distributed to the public as a means of publicizing the region's commitment to improving walking and bicycling conditions. These performance measures track progress towards achieving stated objectives related to bicycles and pedestrians.

This section proposes a methodology for the CRD to integrate existing data collection efforts and target future efforts for an attractive document that can be shared with the public. Appendix G provides best practices for bicycle and pedestrian accounts. Both system usage and system expansion should be tracked through the bicycling/walking account. The baselines were established during the PCMP planning process. Data used in the account should be available over time and can be used for year-to-year comparisons.

Establishing a System Usage Baseline

System usage includes not only numbers of bicyclists and pedestrians, but also user perceptions of the network and safety. Specific data that can be collected related to system usage include:

- Number of bicyclists and pedestrians
- Bicycle and pedestrian trip lengths
- Kilometres bicycled and walked
- Bicycle and pedestrian trip purposes
- Bicyclist and pedestrian demographics
- Bicycle ownership

- Bicycle sales/ownership
- Bicycle theft rate
- Number of crashes, injuries, locations.
- Helmet use
- Transit boardings, bikes on buses, bike rack usage

User perceptions can include sense of safety; satisfaction with amount, design, and maintenance of bikeways; satisfaction with general road maintenance, satisfaction with bicycle parking, and ease of combining cycling with public transit. Many groups provide short surveys after education and encouragement programs or events, which could provide stories to add human interest to the account.

Establishing a System Extent Baseline

The system usage baseline is generally more easily quantified, as it measures the existing bikeways and walkways. However, not all municipalities track this information, and establishing a baseline of existing facilities allows tracking of future investments. The change in system usage can then be tracked by implemented improvements. Data that establish the extent of the system include:

- Kilometres of bicycle facilities/shared roadways by type
- Bicycle network coverage (as a proportion of overall road network).
- Kilometres of sidewalks.

- Multi-modal connections.
- Bicycle parking – quantity and location.
- Number of education or encouragement programs

The bicycle and pedestrian account would evaluate the region's movement toward accomplishing the goals related to walking and bicycling. The PCMP goals and actions can be objectively evaluated as part of this process.

Report Card Best Practices

Several cities currently publish report cards on a regular basis. Some cities monitor bicycling in multiple reports, which are sometimes created by different agencies (e.g., Portland, San Francisco, and New York City). Copenhagen and Melbourne bring metrics of the bicycle network and cycling rates together with survey results of cyclists' perceptions in bi-annual Bicycle Account reports.

Parking is a critical component of a bicycle program which some cities monitor by creating an online map and giving residents the opportunity to write in corrections or request new locations (such as in New York City, Portland, and San Francisco). Several agencies (including the City of Boston, MA and the State of Victoria, Australia) make count and/or parking data available online[16]. Making data available to the public opens up the opportunity to develop consumers of the bicycle data, such as other public agencies or university researchers. In theory, more people actively utilizing the bicycle data would serve to make the data collection program indispensable and should increase its chance of receiving sustained funding.

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[16] A product of Barack Obama's Open Government Initiative, Data.gov is a citizen-friendly platform launched on May 21, 2009 to provide access to Federal datasets. With a searchable data catalogue, Data.gov helps the public find, access, and download non-sensitive Government data and tools in a variety of formats.

San Francisco

The San Francisco *Report Card on Bicycling* (2008) is developed by the San Francisco Bicycle Coalition. The Report Card is a complement to the *2008 State of Cycling* report, which provides the baseline analysis of bicycling in San Francisco, based on bicycle counts and surveys conducted from 2006 to 2008.

The biannual report summarizes results of counts and surveys conducted in San Francisco to "provide a portrait by the numbers" of the city. For each category, the city was given a grade, which is then explained using examples from count and survey data. The previous report card from 2006 is held as a baseline, and the 2008 numbers compared through the categories. Many informational graphics are used throughout the Report Card to convey the information, such as a map of count locations and the change over time.

Figure 3. The San Francisco Report Card on Bicycling (2008) provides an overview of cyclist attitudes from an annual survey.

The report ends with the following caveat, recognizing the difficulty of capturing all the important information:

> *We recognize that the 2008 Report Card of Bicycling in San Francisco is an imperfect analysis of the state of cycling in San Francisco, due to missing and/or unreliable information from official sources and our own limitations in gathering cyclist opinions, but nonetheless feel it provides an authentic and useful account of bicyclist sentiment and opinion. We continue to look forward to a fuller and more reliable process of evaluation and analysis by official agencies in the City as we go forward towards 2010.*

Copenhagen[17]

Beginning in 1995, The *Copenhagen: City of Cyclists Bicycle Account* was most recently published in 2008, and evaluates city cycling conditions, new initiatives as well as the way in which the Copenhageners themselves perceive cycling facilities. Each *Bicycle Account* contains:

- **Key Figures** - A list of key metrics that cyclists regard as the most essential. Initially defined in collaboration with cyclist focus groups, a couple of key figures have been replaced by others over the years.
- **What Cyclists Think** - Presents cyclist attitudes based on a representative telephone interview survey carried out by a consulting firm. These responses assist the City to identify where it should focus future improvements
- **Current Issues** - Each report contains current events that impact bicyclists, such as combining cycling with public transport or the socio-economic benefits of cycling.

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[17] http://www.sfbike.org/download/copenhagen/bicycle_account_2004.pdf

The report also shows target goals and figures for the City to determine whether they are accomplishing their goals. In additional to the quantifiable results of the counts and surveys, the report emphasizes new and on-going strategies for increasing ridership, such as highlighting improvements on a particular bridge, or an engineering technique of synchronizing traffic signals to benefit cyclists traveling at 20 km/h. The report notes new trends in cycling, such as the popularity of cargo bicycles, which impact perceptions of bicycling and bicycle infrastructure.

Another section of the report highlights the socioeconomic benefits of cycling, including health and life expectancy benefits, mortality rates, and cost to users.

Figure 4. The Copenhagen: City of Cyclists Bicycle Account (2008) uses informational graphics to inform the public about the state of cycling.

New York[18]

Developed by Transportation Alternatives, the *New York City Bicycle Report Card* was based on government efforts to improve cycling, the organizations assessment of the 'reality on the street,' and an online public opinion questionnaire. The grading system is as follows:

- A.   Top Effort/Top Condition
- B.   Good Effort/Good Condition
- C.   OK Effort/Acceptable Condition
- D.   Poor Effort/Unacceptable Condition
- E.   No Effort/Life Threatening Condition

A simple two-page document without complicated graphics or many pictures, the Report Card provides quite a bit of information about the state of cycling in New York City.

Figure 5. The New York City Bicycle Report Card evaluates cycling on the basis of three information sources.

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[18] http://www.transalt.org/files/newsroom/magazine/2006/winter/4-5.pdf

Recommendations for Counting and Surveying Bicyclists and Pedestrians

The CRD is well-positioned to accumulate the necessary additional data by building on the original 2006 pilot project using the National Bicycle and Pedestrian Documentation Project, and adopting the methodology into a standardized program. The program is suited to utilising the region's existing capacity amongst its community volunteers to conduct the manual counts. In addition to simply counting the number of bicyclists and pedestrians, the CRD may wish to expand the survey to include additional information such as whether cyclists are riding on the sidewalk and/or against the designated flow of traffic as well as tracking gender and helmet use.[19]

Surveys should gather information on resident and employee travel patterns in the CRD, opinions and suggestions on opportunities, challenges and potential facilities and programs from a large and diverse population of residents in the CRD. The purpose of the survey is to help inform the development of bicycle facilities and programs as well as to serve as a benchmark for travel patterns.

Facilities Update Process

Keeping-up-to date digital information to represent the regional bikeway and pedestrian network construction allows the region to report its progress towards completing the bicycle and pedestrian networks. Documenting facility construction provides updates about the region's progress towards completion of the bicycle and pedestrian network and can indicate areas where additional resources could be applied. Information about facility construction can be used in conjunction with bicycle and pedestrian counts and evaluation of encouragement, promotional or educational programs to examine usage trends. This information can be tracked over time to gauge the region's progress toward regional transportation goals. Identifying funding sources that are commonly used to pay for bicycle and pedestrian infrastructure provides a valuable resource for other municipalities seeking funding. Finally, funding levels can be compared to facility updates to increase efficiency of existing revenue streams and to leverage existing efforts to substantially increase funding for bicycle and pedestrian infrastructure.

This memorandum provides a synopsis of existing efforts to update bicycle and trail networks in GIS and proposes a strategy for a consistent and regular network update process.

The PCMP will recommend a regional bikeway network that includes existing and proposed facilities. While many network links have been constructed, additional links will be added to the network over the coming years as new facilities are constructed or existing streets are retrofitted with bikeway facilities. This network will continue to evolve and should be reviewed and updated regularly to ensure that it continues to effectively meet the needs of the CRD's residents and visitors. This update framework should include two processes:

- **Facilities Update:** a frequent and regular process that documents the construction of facilities that are already included in the proposed regional bikeway network. The product of this process is an up-to-date digital map of existing and proposed regional bikeways.

- **Network Update:** a less-frequent process that adds network links to the regional system. This process does update digital data, but should also include a discussion about the role the additional network links play in terms of augmenting or enhancing the regional system. Before an update to the network is undertaken, a number of questions should be asked, such as:

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[19] While additional information is helpful for the report card and tracking purposes, additional information such as age may be difficult to collect via counts due to helmet use or numbers of cyclists being recorded and can be included in a survey.

o   Does the proposed link provide a connection to a new school or another regional attractor?
o   Does it serve a new regional center or village center?
o   Will it provide a connection to an area currently underserved by regional connections?

Whereas the *facilities update* is a regular house-keeping process that can be handled through regular staff communication on an annual or bi-annual schedule, the *network update* process should be more collaborative in nature and may require convening of a formal process to assess the potential additions. The facilities update process is discussed here while the network update process will be covered in more detail in the forthcoming implementation plan.

Existing Update Processes

One outcome of the *2001 Transportation Choices Bicycle Strategy* (a working paper associated with the *2002 Travel Choices Strategy)* process was a recommended regional network that included nearly 550 km of on- and off-street facilities as well as a dataset containing information about the location and type of existing bikeway facilities. This network has been updated by CRD staff periodically over the last eight years through informal conversations with municipal partners.

Phase I PCMP Bicycle Network Update

During Phase I of the PCMP planning process, the existing bikeway network maintained by the CRD and the local network datasets were updated to reflect existing spring 2009 conditions. The most recent update to the CRD's data occurred in 2008, while the age of data from other local bikeway networks varied by as much as one to three or more years. Based on the digital data received, draft maps were provided to each municipality for comment, and then were integrated into a file showing all existing bikeways within the region. This process revealed the following potential barriers to regional data collection:

- **Variations in data format and delivery methods.** Files were submitted in a wide variety of formats ranging from marked-up paper maps to digital PDF maps and files for use with Geographic Information Systems (GIS) files. Some files were delivered via email or FTP site while others were received as hard copy files which were, in turn, digitized.
- **Variations in data attributes that are collected.** Datasets may track the same type of information (e.g., bikeways) but may not include the same information about these facilities (e.g., the width of bike lanes). It is useful to know the location of bikeways and the inclusion of similar attributes allows more robust and detailed analysis.
- **Variations in the definitions of data attributes that are collected.** For example, a facility some municipalities define as a multi-use trail must be paved, while another municipality may not share this requirement. This variation in the definition of the data attributes can create challenges when the data is used for some applications (e.g., a region wide route planner for mobility-impaired pedestrians).

This data process can be simplified through the development of a standardized update process facilitated by the CRD.

Best Practices of Regional Network Update Processes

Regional Districts and Metropolitan Planning Organizations (MPOs) work closely with member jurisdictions, overseeing the development of bicycle and pedestrian networks and maintaining data about regional networks. A review of bikeway network update protocols at several MPOs throughout North

America was undertaken to help formulate recommendations for the CRD. These findings are summarized in Table 4. Aspects of the update process to be considered include:

- Frequency of update
- Data attributes and definitions
- Responsible party
- Update mechanism

Interviews with jurisdictional data managers revealed the following commonalities:

- Regional data managers typically maintain both regional bikeway networks with data received from local municipalities. Several locations did not differentiate between regional and local networks, but expressed interest in identifying a 'regional' network to emphasize the importance of the connections and to highlight these key corridors as funding priorities.
- Data updates tend to occur irregularly, generally in conjunction with plan updates every three to four years. Three of four agencies indicated the desire to update data more frequently as the data can be used for multiple applications (e.g., multi-modal trip planners and demand modeling).
- Ad hoc updates result in varying levels of detail and accuracy within the region or study area.
- At a minimum, most datasets include name and facility types. Additional facility quality information is desirable but is more challenging to collect for a variety of reasons (e.g., limited staff capacity, the relative level of effort and access to technology).
- There is an increasing trend of tying data to the roadway or transportation network through a unique identifier and paying increased attention to the spatial data attributes (facility information such as roadway name and bicycle facility type) and topological correctness (line segments used to represent bikeway networks are digitally connected so continuous travel along the 'facility' is possible). The addition of a unique identifier allows the data to be used in a multi-modal transportation network. Spatial data attributes and topological correctness are also necessary for the data to be used in routing applications.
- Data managers in most agencies reported a call for updated bikeways facility information typically resulted in marked-up hard copy maps. In several instances, the results were collected as digital files. This can reduce the staff time required to maintain the data, but staff time will still be required to input the digital data into the format maintained by the CRD if the dataset if attributes such as topological correctness are to be maintained.

Table 4 provides an overview of how other regional governments treat and update digital data.

Table 4. Case Study Summary of Digital Bicycle and Pedestrian Assets

Agency	Digital data assets	Frequency of Update	Data Attributes & Definitions	Usage and data properties	Party Responsible for Data Updates	Update Mechanism	Comments
Metro - Portland Oregon	Bikeways and multi-use trails Corridors of regional significance All local and regional bikeways Sidewalk data is not regularly collected	Corridors of regional significance: every 4 years, (with the *Regional Transportation Plan)* All local and regional bikeways: every 3 years (with updates to the regional bikeway map)	Street name Type of bicycle facility (bike lane, trail, and low or high traffic through street). Digital data maintained by the regional government includes routes of both local and regional significance.	Data is topologically correct; can be used in network routing applications	Metro in partnership with member jurisdictions who are responsible for submitting facility updates. The public can contact with updates on facilities that have been constructed.	Corridors of regional significance are updated at each municipality via a PDF form (Appendix A) asking for facility extents attributes and rationale for inclusion in the regional network. Potential additions are reviewed by Metro staff.	Metro is interested in developing a process that would allow more frequent updates to the regional bikeway datasets.
TransLink – Vancouver, British Columbia	All local bikeways and multi-use trails Sidewalk data is not regularly collected	No formal update process. Municipalities submit updates ad hoc. Annual update recommended	Route and street name Facility type Attribute information: surface type, wayfinding signage, traffic calming features	Data is topologically correct; can be used in network routing applications	TransLink compiles data while member municipalities are responsible for submitting updates	An annual update was recommended in the 2010 *Regional Cycling Network* study. Ideally the update would include updates to attribute data shown in Appendix B. This system has not yet been adopted.	There was discussion of developing a regional bikeway network though no action has been taken to formally develop and designate a system. The complexity of the data schema has resulted in spotty attribute data for network links added after construction of the initial data set.

Agency	Digital data assets	Frequency of Update	Data Attributes & Definitions	Usage and data properties	Party Responsible for Data Updates	Update Mechanism	Comments
Sound Regional Consortium	maintain a regional bikeway network.						

Recommended Strategies for Bikeway Data Updates

The CRD should initiate a process to regularly update the regional dataset with existing and proposed regional network facilities. Regular updates will reduce the time and burden on parties that perform the updates, which can require hours of field work for verification and comparison with digital datasets. Regular updates can also be used as an opportunity to collect information about facility cost and funding mechanisms that can be used in regional benchmarking and evaluation. The benefits of having a regularly updated data file extend beyond planning to cyclists by applying the network on-line tools such as a multi-modal trip planner.

Bikeway Network Update Approach

There are several potential update scenarios that the CRD can consider when selecting a facilities update approach.

Scenario 1. Facilities Update as a Regular Item at a Committee Meeting
In this scenario, the CRD could add a call for recently constructed bikeway links as a regular agenda item to a standing committee. Potential committees include a bicycle and pedestrian advisory committee recommended as part of this planning process or the already-established Inter-jurisdictional Transportation Advisory Committee (See Memo 19 – Inter-jurisdictional Harmonization Process). Committee members could provide updates that would be recorded on a paper map or digital map and fill in required information. This scenario may limit the attribute data that could be collected at the time each network link is added as the committee member may not know construction or funding details (e.g., bike lane width).

Scenario 2. Facilities Update as a Digital Process
In this scenario a designated staff person or community member would be responsible for providing digital data updates to the CRD. The CRD could send a call for facilities updates on a semi-annual basis. Data could be submitted through a medium such as Google Earth KML file or other web mapping interface. This method could standardize the data inputs received by the CRD and could allow the capture of more complete attribute data through entry into a digital form at the user's convenience. This mechanism could be developed in partnership with the CRD Department of Information Technology & GIS Services.

Frequency of Update

The bikeway network should be updated at least annually, in conjunction with other benchmarking measurements, or quarterly, in conjunction with the meeting of a bicycle and pedestrian advisory committee.

Recommended Bikeway Network Attributes

Bikeway data collected by the CRD about should include the following attributes:

- Roadway Name
- Regional bicycle facility type
- Local bicycle facility type (if different than the regional designation)
- Facility extent
- Facility cost

- Funding sources
- Date of completion
- Any notes or comments
- Signing
- Surface
- Jurisdiction

Additional attributes that would make the data set compatible with the trip planning application developed by the University of British Columbia are included in Appendix A. The Appendix also provides recommendations about how these attributes could be generated.

The CRD Department of Information Technology & GIS Services should develop a metadata specification and include standard field types and definitions for inclusion in their *GIS Data Standards for External Agencies.*

Inclusion in Larger Regional Datasets

There is also potential for the regional bikeway network dataset to be integrated into the Digital Roadway Atlas of BC (DRA) network dataset created and maintained by GIS Innovations. This would require that on-street bikeways be topologically corrected to DRA data wherever possible and attributes be included that allow easy transfer of attributes between datasets. This would allow the CRD member municipalities regular access to the regional bikeway network as part of the roadway dataset. This conversation should be discussed in further detail in conjunction with GIS Innovations and the CRD Department of Information Technology & GIS Services.

Updates to Regional and Local Bikeway Data

The CRD and member municipalities could consider simultaneous updates to both regional and local bikeway networks where the CRD is responsible for maintenance of all bicycle facilities data for the region. Creating a mechanism that updates all datasets simultaneously could increase the comprehensiveness of bicycle facilities data within the region and provide a standardized data format that would facilitate data exchange and allow local bikeway networks to be integrated into a multi-modal trip finder. This data could also be integrated into the Road Atlas of BC data. This partnership may require funding contributions from member municipalities.

Collection of Sidewalk and Facility Data

Developing a database of existing sidewalks would allow the CRD and member municipalities to prioritize improvements in the pedestrian network. The PCMP process has identified a prioritization system to determine areas of regional pedestrian importance; if sidewalk data were available region-wide, the criteria could be applied to determine priorities. This information can be used to leverage funding for priority projects, or to identify projects that could be built in conjunction with a roadway or development project, or if funding for projects in a particular location becomes available. Attribute data for a sidewalk file could include:

- Width
- Presence of obstructions

- Surface quality
- Year built

Additional pedestrian network data that would be beneficial to collect include curb ramps and marked or mid-block crossings.

Data Needs for University of British Columbia Bicycle Trip Planning Application

- **Length**: Length values in metres will be maintained by default but an extra field may be necessary in order to calculate the values for the purposes of other calculations, analysis or routing applications.
- **Speed**: Approximate cyclist travel times will be calculated for each segment. This could be a simple as assigning an average travel speed of 10 miles per hour to each segment, or refining the metric to account for variations in slope and travel surface. For example, most people are going to travel faster on flat, paved surfaces compared to trail surfaces or hilly terrain.
- **Time**: This attribute can be calculated based on the length and speed fields.
- **Direction**: Notation of direction is already available, provided that the GIS Innovations ID is available and the road related features can be joined and this attribute pulled from the DRA. For non-road segments, this attribute should be in keeping with the DRA attribute for consistency.
- **Category**: These attributes are used to classify all segments of the network according to cycling or road class. Value examples are 1=designated cycling route, 2=alternate cycling route 3=major road, 4= highway
- **NO2**: Nitrogen Dioxide concentration attributes can be assigned per segment depending on road type. As per the UBC Google Routing documentation the values are in Table 5.

Table 5. Nitrogen Dioxide Concentration Attributes by Street Classification

Category	NO2 (ug/m3)	Category	NO2 (ug/m3)
Highway	30	Resource	18
Freeway and Ramp	27	Lane, Local and Strata	15
Arterial	22	Recreation	13
Service	20	Trail	10
Collector	17		

- **Elevation Dat**a. As per the UBC Google Routing documentation – The cycling route planner contains an option which selectively routes the user based on the path with the least elevation gain, or restricted to segments below a percent slope threshold. This is calculated using the elevation at the TO and FROM node for each line segment. Accurate elevation data in raster format at the finest spatial resolution is recommended in order to utilize this feature fully. Elevation values should be in metres.

- **Green Route Index.** The UBC Google Routing planner can calculate a route based on a route's "green" value. The green value is based on a percentage of area within 50 metres of a node that is classified as "green" (trees, shrubs, vegetation etc.). These attributes can be generated from analyzing the 2005 land cover analysis data produced for the CRD and Habitat Acquisition Trust.

Interjurisdictional Communication Process

The PCMP process brings together planners, engineers and decision makers from member municipalities and other regional partners such as BC Transit and the Ministry of Transportation and Infrastructure who play a role in regional transportation planning and implementation. The feedback and comments received through this process have guided the development of all aspects of this project. This section discusses the benefits of continued inter-jurisdictional communication and recommends strategies to continue and expand this communication in coming years.

Cycling and Pedestrian Advisory Committee (CPAC)

In order to facilitate coordination and momentum on pedestrian and cycling issues, the CRD should convene a Cycling and Pedestrian Advisory Committee (CPAC) consisting of municipal staff, the public, and staff from partner agencies such as BC Transit, MoTI or the Vancouver Island Health Authority. The group should meet bimonthly following completion of the PCMP with the goal of working energetically towards implementing the plan recommendations.

This group could be a subcommittee of the existing Inter-jurisdictional Transportation Advisory Committee in order to ensure coordination with regional transportation planning initiatives and issues. After two years, the group may choose to meet less regularly to coordinate efforts and work together on common goals. Major task areas include:

- Implementing PCMP recommendations
- Coordinating regional walking and bicycling efforts
- Leveraging funding and seeking new funding sources
- Representing active transportation projects in the *TravelChoices*

Implementation and Investment Plan process
- Working together on cross-jurisdictional efforts (such as Sunday Parkways, SmartTrips and the like).

Additional roles could include:

- Developing technical expertise/design guidelines
- Working with law enforcement officials
- Evaluating the impact of new laws or policies

- Meeting/interfacing with the general public
- Coordinating public outreach
- Encouraging volunteer efforts
- Responding to advisory requests from the CRD Board

Subcommittees could be formed to address specific tasks such as: Education and Encouragement, Bikeways, and Planning, and Pedestrian Accessibility Issues. This committee can take several forms, as outlined in Appendix G. Additional considerations include:

- **Funding and Staff Support:** Ideally, a staff person would be assigned to oversee the administrative details associated with managing a committee: scheduling meetings, developing agendas, facilitating

meetings, recording the minutes, bringing agency issues to the committee, and reporting back to the agency about recommendations and findings.

- **Size and Membership:** Typical successful advisory committees have 10-15 members. Organizations can appoint members though open or solicited applications.
- **Member Selection:** The CPAC should develop a list of desired members from specific areas or organizations (see Table 3).

Table 3. Typical Committee Membership

Public Members	Municipal Members
A member at large representing the region's key geographic areas (core, peninsula and west shore)	A planner or engineer from each municipality with an interest in bicycle and pedestrian issues
A member with specific interests and expertise in public health and fitness issues	CRD Parks director and/or their designee
universal design	
Representatives of related advocacy groups	

CAC Best Practices

Regional governments[20] throughout North America are responsible for coordinating complex transportation projects and developing networks that provide service to both visitors and residents. Several interviews on the subject of regional coordination were conducted to help develop recommendations for the CRD.

Agencies were asked about the format and structure of any groups that consider bicycle and pedestrian issues, membership requirements of these groups, typical duties and perceived benefits of participation. Most agencies reported that regular communication and coordination was handled by a bicycle and pedestrian advisory or implementation committee comprised of municipal staff members, with some participation by the public and elected officials. Additionally, several jurisdictions have a venue or forum that allows citizens and advocates to regularly come together and provide feedback on bicycle and pedestrian issues.

A scan of other regional governments in the Pacific Northwest is included in Table 6 below. Detailed case studies of TransLink in Metro Vancouver and Portland Metro in Oregon are also presented. This is followed by recommendations of how the CRD would best instigate inter-jurisdictional coordination beyond the PCMP process.

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[20] The structure of regional governments varies significantly throughout North America. In British Columbia, regional governments are known as Regional Districts, while in the United States regional governments are referred to as Metropolitan Planning Organizations, or MPOS.

Table 6. Summary of Intergovernmental Coordination Case Studies

Agency	Communication Structure	Roles and Duties of Advisory or Implementation Committee	Communication Strategies and Challenges	Comments or Recommendations
Metro - Portland Oregon	• A well developed system of advisory committees provides forums for decision making and discourse on transportation issues. Two bodies are specific to transportation: • Joint Policy Advisory Committee on Transportation (JPACT) is a 17-member committee of elected officials and representatives of agencies involved in transportation that make recommendations to the Metro Council on transportation needs in this region. • The Transportation Policy Alternatives Committee provides technical input to the JPACT on transportation planning and funding priorities for the Portland metropolitan region. Several members representing the public are included as members. • A quarterly trails forum open to everyone provides information on regional trail planning projects.	• The primary duty of JPACT and TPAC include distribution of federal funding dollars. • Secondary duties include technical advice on transportation issues. •	• The Active Transportation Partnership aims to increase the region's effectiveness in securing funding to complete the active transportation network. See case study, for more information.	• A staff level group that met regularly would be beneficial as a location to trade information about funding, design strategies and coordination of projects on municipal boundaries.
TransLink – Vancouver, British Columbia	• The Major Roads and Transportation Advisory Committee (MRTAC) is comprised of senior engineers and staff from each municipality. TransLink staff provides administrative and technical support. • The Bicycle Sub-Committee reports to the Major Roads and Transportation Advisory Committee.	• MRTAC is responsible for management of the Major Road Network, a series of arterial roadways in Metro Vancouver. • The Bicycle Sub-Committee administers the Bicycle Capital Cost Sharing Program (BIICS) and discusses issues of regional significance (e.g., innovative bikeway treatments).	• Smaller jurisdictions do not always attend, but are invited via email. One communication strategy is to see that all attendees see the benefits of meeting attendance (e.g., members view the meetings as a place to ask questions and learn about new bicycle or pedestrian treatments.)	• Encourages development of common implementation standards to provide a single standard for each municipality, regardless of staff capacity. • Does not have a pedestrian advisory committee, but is considering this need carefully.

Agency	Communication Structure	Roles and Duties of Advisory or Implementation Committee	Communication Strategies and Challenges	Comments or Recommendations
Lane County Council of Governments	• A bicycle advisory committee comprised of jurisdictional members and the transit agency staff meet weekly to trade information and coordinate on bicycle related projects. • A committee of staff members that manage digital data meet quarterly to discuss data integration and management.	• The primary duty of the bicycle advisory committee is to review projects that have a bicycling component and make recommendations on the distribution of federal funding dollars. • The primary role of the data management committee is to handle integration of regional data sets. Most recently the group is meeting to discuss the integration of traffic controls into the bikeway network data.	• Working to ensure that committee members see the benefit of regular meetings in terms of information exchange and opportunities for collaboration.	•
Puget Sound Regional Consortium	• The Bicycle/Pedestrian Advisory Committee that meets bi-monthly. Organization is fluid and occasionally ad-hoc subcommittees are convened to address specific projects. Several non-motorized transportation advocates sit on the council.	• The Bicycle/Pedestrian Advisory Committee coordinates with and advises PSRC staff, policy boards, and other advisory committees on a variety of bicycle and pedestrian-related planning issues. Topics and issues include best practices and design guidelines, plan implementation and performance monitoring, comprehensive plan certification, and policy framework the selection of projects receiving federal funding.	• Smaller municipalities are invited to attend but are often absent, perhaps due to travel time to meetings, the level of development in the nonmotorized network in the municipality and level of political support. • The group is closely allied with the Washington State bicycle/pedestrian coordinator who is a frequent meeting attendee. Support from multiple levels of government provides additional support when advocating for pedestrian and bicycle supportive policies.	• This group provides a voice to advocate for the needs of cyclists and pedestrians that is embedded in the government and can complement existing advocate groups.

Communication and Coordination Case Study: TransLink, Lower Mainland, British Columbia

Background
Among other duties, TransLink, in partnership with the municipalities manages, the Major Road Network (MRN), which consists of a series of arterial roads throughout Metro Vancouver. Oversight of MRN programs is the responsibility of the Major Roads and Transportation Advisory Committee (MRTAC) composed of senior engineers and senior staff from each municipality in the region. TransLink staff provides administrative and technical support to MRTAC. At the next level is the Bicycle Sub-Committee (also referred to as the Bicycle Working Group), which reports directly to MRTAC. Until recently, the Bicycle Working Group reported to MRTAC indirectly through the MRTAC Planning Sub-Committee, which was recently disbanded. This restructuring removes an extra layer of effort, which was not seen as being particularly useful or necessary.

Committee Purpose/Role
The Bicycle Sub-Committee has several purposes:

- To administer the Bicycle Infrastructure Capital Cost Sharing (BICCS) Program. The BICCS program consists of two funding streams: 1) Allocated Funding, which is distributed to all municipalities based on proportion of regional population; and 2) Regional Needs, which is application based funding. Municipalities submit applications for the Regional Needs funding for specific projects, and also participate in the evaluation process. After submitting an application, each municipality will make a presentation to the committee describing the project, and each municipality evaluates the project using established criteria.
- To discuss issues of regional significance, such as the Regional Cycling Strategy and discussing new/innovative bikeway treatments and developing standards for regional consistency (an example is the region's discussion on the use of green as the colour to be used for coloured bike lanes).
- Awareness raising / Information sharing. The committee helps municipalities by providing an information sharing forum to ask questions and provide advice either at meetings or via e-mail. This also helps raise awareness of what others in the region are doing.

Committee Structure
The Bicycle Sub-Committee consists of:

- Staff from all 22 municipalities (designated staff member primarily responsible for cycling)
- Metro Vancouver (the regional government)
- Provincial Government
- University of British Columbia
- TransLink

All of the above municipalities and agencies are invited to participate, and are included on an e-mail distribution list. Some of the very small municipalities (i.e. Anmore, Belcarra, and Bowen Island) do not participate but are included in communications and invited to participate. Many other municipalities participate only occasionally. The highest level of participation occurs when funding decisions for the BICCS program are being made. The committee includes a Chair and a Vice-Chair, who are both municipal representatives. The TransLink staff member is a liaison member.

The committee typically meets once every 4-6 weeks throughout the year, but the schedule is flexible (dates are not pre-determined and fixed).

Additional Information and Lessons Learned
Based on their existing Bicycle Working Group structure, TransLink provided additional information on public involvement and lessons learned:

- **Participation:** They ensure municipal involvement by having municipal representatives act as the Chair/Vice-Chair, which helps provide ownership in the process. The Committee has also recently decided that the Chair/Vice-Chair will be rotated on an annual basis to allow all municipalities to participate, which helps to keep them engaged in the process. They also try to ensure that the suburban municipalities are provided this role as much as possible.

- **Funding:** TransLink's role as a funding agent is the biggest "carrot" to fostering strong participation. When funding decisions are on the table, participation is much stronger and if there was no funding available, many municipalities would likely not participate. Because TransLink offers its own funding program, there is generally relatively little discussion about other funding opportunities (i.e., provincial, federal grants) and not much discussion about working together regionally to leverage other funding sources. However, that role could be beneficial to the CRD.

- **Information sharing / best practices:** One of the key enticements to participate is information sharing, particularly regarding innovative treatments or best practices, since TAC provides little guidance for many innovative facilities (e.g., separated bicycle lanes or neighbourhood bikeway treatments). Many municipalities do not have large engineering or planning departments and do not have a lot of expertise in bicycle planning and design, so this provides a useful forum to discuss ideas and ask questions. The group also shares information about bicycle parking standards (for example, a review was recently completed of all the bicycle parking requirements in the region so everyone is aware of what others are doing).

- **Working with advocates:** Cycling advocates are not part of the committee, but on occasion advocates are invited to participate in meetings, for example to promote bike month or bike to work week.

- **Pedestrians:** There is no committee structure for pedestrians, although TransLink is increasingly realizing that there may be a role for them to play in this area.

Communication and Coordination Case Study: Metro, Portland, Oregon
Background
Among other duties, the Portland Metro-area regional government, Metro, is primarily responsible for allocation of federal transportation dollars and coordination of regional transportation and networks, including multi-use trails. A number of advisory standing advisory committees serve as forums for discussion and decision making on transportation-related issues. Key committees that have a transportation related focus are:

- *The Joint Policy Advisory Committee on Transportation* (JPACT): a 17-member committee of elected officials and representatives of agencies involved in transportation that make recommendations to the Metro Council on transportation needs in this region.

- *The Transportation Policy Alternatives Committee provides* technical input to the JPACT on Transportation on transportation planning and funding priorities for the Portland metropolitan region.

In addition to Metro's standing transportation committees the region has developed an Active Transportation Partnership (ATP) dedicated to increasing the region's effectiveness in securing funding to complete the active transportation network. The ATP was developed to implement recommendations of the Blue Ribbon Committee for Trails. Implementation focuses on the development of Active Transportation Corridors that are a "set of routes, facilities and programs that achieve a particular transportation objective."

Active Transportation Partnership's Communication Structure
The ATP coordinator is responsible for outreach to local jurisdictions and developing local support for the completion of region-wide active transportation projects. To create a successful program it is necessary to develop a support base at multiple levels, including the public, advocates, staff and elected officials. Strategies range from developing a website that contains information on the benefits of active transportation, to maintaining an email list that can be used to advertise upcoming events, to finding a high-level elected official that can champion active transportation. Key lessons learned and strategies for success include:

- Using groups that already exist as the basic building blocks of a communication network.
- Providing each local jurisdiction with background information and a clear picture of how they will benefit from active transportation projects.
- Soliciting project ideas from local jurisdictions that should be considered for funding under the ATP.
- Working with small staff level advisory groups to generate support during the planning efforts.
- Forming an Active Transportation Executive Council comprised of prominent community leaders, advocates and other important parties; providing this group with key speaking points and allowing them to act as the public face of active transportation.
- Developing a list of community members that are interested in active transportation; using this group for crowd sourcing (e.g., mapping of local trails) and dissemination of information.
- Providing a source of information that is readily accessible to everyone (i.e., a webpage).

Additional Communication Recommendations
The CRD should consider additional strategies that will complement the CPAC and that could result in increased communication and cooperation on cycling and pedestrian issues.

- **Focus communication efforts on shared resources**, for example development of consistent evaluation methods or providing workshops on the Bicycle and Pedestrian Design Guidelines.
- **Consider the creation of an active transportation web portal** by either enhancing the existing CRD cycling and walking webpage or creating a separate site that functions as a clearinghouse for information and key resources for all things relating to cycling and walking.
- **Consider creating a high level council**, such as a blue ribbon committee of elected officials and community leaders charged with championing active transportation objectives in the region.
- **Develop a list of community members** who are interested in region wide bicycle and pedestrian issues and who can disseminate information on events and provide other support.

Appendix H. Funding and Implementation

In order to realize the ambitious vision of the Capital Regional District's (CRD) Regional Cycling and Pedestrian Master Plan (PCMP), the CRD should collaborate with member municipalities, electoral areas, partner organizations, and residents. The largest implementation task is the development of a comprehensive bikeway network that accommodates cycling by residents and visitors of all ages and abilities. Cycling facilities are usually undertaken as part of each municipality's capital projects; they are integrated into road upgrades and can also be implemented through a road retrofit project.

While the CRD's jurisdiction for implementing projects is limited to the Regional Trail System, the identification of projects under individual municipalities' jurisdiction as regional priorities will enhance a funding application and promote the development of these projects.

Development of the Priority Project List

The priority project list was developed to identify locations within the PIC network where projects cross municipal boundaries and benefit the larger regional community. Workshops were held with TAC members and other municipal staff to focus on a municipality or sub-region. Priority projects, shown in Table 1, were identified by municipal staff and provide key connections throughout the CRD. Ultimately, project priorities within a particular municipality will be determined by the opportunities such as road reconstruction and development as well as community and partner feedback.

It is recognized that the CRD's jurisdiction is limited to the Regional Trail System. However, the identification of projects under individual municipalities' jurisdiction as regional priorities is expected to enhance a funding application and promote the development of these projects.

Table 1. Priority Projects

Road	Recommended Facility Type	Length (km)
Douglas Street Connector	Multi-Use Trail	1.53
Wallace Dr	Bicycle Lane/Shoulder Bikeway	7.60
Central Saanich Total:		17.3
Colwood		
Kelly Rd	Bicycle Lane/Shoulder Bikeway	0.62
Latoria Rd	Bicycle Lane/Shoulder Bikeway	2.12
Metchosin Rd	Bicycle Lane/Shoulder Bikeway/Shared Lane	4.82
Colwood Total:		7.6
CRD		
E&N	Multi-Use Trail	7.79
Lochside Regional Trail	Shared Lane	0.07
CRD Total:		7.9

Road	Recommended Facility Type	Length (km)
Admirals Rd	Separated On-Street	1.69
Esquimalt Total:		3.1
Esquimalt/MOTI		
Admirals Rd	Bicycle Lane/Shoulder Bikeway	0.51
Juan de Fuca Electoral Area		
Sooke Rd	Separated On-Street	0.41
West Coast Rd	Separated On-Street	63.43
Juan de Fuca Electoral Area Total:		63.8
Langford		
Kelly Rd	Bicycle Lane/Shoulder Bikeway	0.14
Sooke Rd	Separated On-Street	3.91
Langford Total:		4.0
Metchosin		
Metchosin Rd	Bicycle Lane/Shoulder Bikeway	3.81
Sooke Rd	Separated On-Street	6.24
Metchosin Total:		10.1
North Saanich		
Aldous Terr	Bicycle Lane/Shoulder Bikeway	0.40
Amity Dr	Bicycle Lane/Shoulder Bikeway/Shared Lane	0.52
McTavish Rd	Bicycle Lane/Shoulder Bikeway	3.50
West Saanich Rd	Separated On-Street/Bicycle Lane/Shoulder Bikeway	8.04
Willingdon Rd	Bicycle Lane/Shoulder Bikeway	2.14
North Saanich Total:		14.6
Oak Bay		
Bowker Creek	Multi-Use Trail	1.58
Oak Bay Ave	Bicycle Lane/Shoulder Bikeway	0.89
Oak Bay Total:		2.5
Pauquachin/MOTI		
West Saanich Rd	Separated On-Street	1.92

Road	Recommended Facility Type	Length (km)
Admirals Rd	Separated On-Street	1.67
Blanshard St	Separated On-Street	1.90
Borden St	Bicycle Lane/Shoulder Bikeway	0.18
Chatterton Way	Bicycle Lane/Shoulder Bikeway	1.25
Cherry Tree Bend	Shared Lane	0.38
Conceptual Alignment	Multi-Use Trail	0.58
Dieppe Rd	Shared Lane	0.38
Douglas St	Separated On-Street/Shared Lane	3.98
Douglas Street Connector	Multi-Use Trail	5.63
Falaise Dr	Shared Lane	0.74
Glendenning Rd	Shared Lane	0.48
Interurban Rd	Bicycle Lane/Shoulder Bikeway/Shared Lane	0.79
McKenzie Ave	Separated On-Street/Bicycle Lane/Shoulder Bikeway	12.18
Quadra St	Separated On-Street	0.36
Shelbourne St	Separated On-Street	5.78
Torquay Dr	Shared Lane	0.17
Wallace Dr	Bicycle Lane/Shoulder Bikeway	2.99
West Saanich Rd	Separated On-Street	9.52
Saanich Total:		49.0
Sidney		
McDonald Park Rd	Bicycle Lane/Shoulder Bikeway	0.35
Ocean Ave	Shared Lane	0.28
Sidney Total:		0.6
Sooke		
Grant Rd	Separated On-Street	4.23
Sooke Rd	Separated On-Street	8.05
West Coast Rd	Separated On-Street	2.58
Sooke Total:		14.9
Tseycum/MOTI		
West Saanich Rd	Separated On-Street	0.61

Road	Recommended Facility Type	Length (km)
Bay St	Separated On-Street/Bicycle Lane/Shoulder Bikeway	3.58
Douglas St	Separated On-Street	5.62
Oak Bay Ave	Bicycle Lane/Shoulder Bikeway	1.05
Wharf St	Shared Lane	0.39
Victoria Total:		22.7
View Royal		
Admirals Rd	Separated On-Street/Bicycle Lane/Shoulder Bikeway	0.65

Projects that are not identified as priority projects are still integral to the development of a primary inter-community network. Improvement should occur as roadways are repaved or reconstructed or as grant money becomes available. In many cases, bikeway facilities exist along designated regional bikeway corridors, but are not to Class I standards as previously defined. While the eventual goal is to have a continuous network of Class I facilities, corridors that have existing bikeway facilities are a lower priority for upgrading than those that have no facilities. However, improving the road to a Class I standard is recommended when reconstruction or a development project lead to reconstruction of a road.

Map 1. Recommended PIC Priority Improvements

Legend

- ■ Major Attractor
- ▲ Village Centres
- — Multi-Use Trail
- — Separated On-Street
- — Bicycle Lane/Shoulder Bikeway
- — Shared Lane
- ⋯ Other PIC Bikeways
- Regional Growth Centres
- Park
- — Existing Regional Multi-use Trail
- Note: Conceptual Alignment

Note: Recommendations were primarily based on roadway classifications defined by the BC Digital Roadway Atlas

Capital Regional District Regional Pedestrian and Cycling Master Plan
Author: Alta Planning + Design
Date: March 2011

0 1 2 4 6 Kilometres

Bikeway Corridors without Existing Bicycle Accommodation

In addition to projects that were identified as priorities, PIC bikeway corridors that do not currently include bicycle accommodation are a high priority for implementation. While the eventual goal is to improve all links of the primary inter-community bikeway network to Class I (suitable for all users) facility types, locations that are key connections that do not have any bicycle accommodation are priorities for improvements. Table 2 lists recommendations for key roadways that currently have no bicycle facilities. These roads were identified in the *Transportation Corridor Study* (Halcrow 2010) as strategic on-street cycling routes.

Table 2. Projects with No Existing Bikeway Facilities

Road Name	From	To	Recommended Facility Type	Length (km)
Blanshard St	Pandora Ave	Superior St	Buffered Bike Lane	1.09
Burnside Rd W	Tillicum Rd	Davin St	Bike Lane	0.99
Cedar Hill Cross Rd	McKenzie Ave	Palo Alto St	Bike Lane	2.29
Cedar Hill Rd	Ash Rd	Shelbourne St	Buffered Bike Lane	0.54
Esquimalt Rd	Fraser St	Lampson St	Bike Lane	0.77
Glanford Ave	Quadra St	Mann Ave	Buffered Bike Lane	0.13
Gorge Rd W	Tillicum Rd	Harriet Rd	Buffered Bike Lane	0.88
Helmcken Rd	N of Holland Ave	Burnside Rd	Buffered Bike Lane	0.38
Interurban Rd	Dunsterville Ave	Hastings St	Bike Lane	0.21
Johnson St	Pandora Ave	Blanshard St	Bike Lane	0.70
Keating Cross Rd	Buena Vista Rd	Patricia Bay Hwy	Bike Lane	0.45
Mann Ave	Wilkinson Rd	Glanford Ave	Bike Lane	1.07
McKenzie Ave	Quadra St	Gordon Head Rd	Bike Lane	0.63
Millstream Rd	Industrial Wy	Treanor Ave	Bike Lane	0.91
Pandora Ave	E of Harbor Rd	Blanshard St	Bike Lane	1.00
Quadra St	West Saanich Rd	McKenzie Ave	Buffered Bike Lane	2.38
Royal Oak Dr	Patricia Bay Hwy	Chatterton Wy	Buffered Bike Lane	0.97
Shelbourne St	Arbordale Ave	Mortimer St	Buffered Bike Lane	1.97
Tillicum Rd	Trans-Canada Hwy	Gorge Bridge	Bike Lane	2.13
West Saanich Rd	Mall Access	Glanford Ave	Buffered Bike Lane	0.41
Wilkinson Rd	West Saanich Rd	Interurban Rd	Buffered Bike Lane	1.94

CRD Priority Projects

The CRD's jurisdiction for implementing bikeway projects is limited to the Regional Trail System, which includes the Galloping Goose (55 km) and the Lochside Trail (29 km). As of 2009 the CRD has begun construction of Phase 1 of the E & N Rail Trail, as well as paving 2.5 kilometres of the Galloping Goose Regional Trail.

Phase I will provide a 14.3 km contiguous route from Esquimalt Road in the City of Victoria to Jacklin Road in the City of Langford using newly constructed rail trail, sections of the Galloping Goose Regional Trail and cycling lanes and sections on municipal roadways. Phase 1 represents 45% of the complete trail. Secure dates and funding for future phases has not yet been established, but for the purposes of this Masterplan, the alignment on the maps includes the E and N Rail Trail at full build out. Map 2 provides a detailed map of the E & N Rail Trail Development Plan.
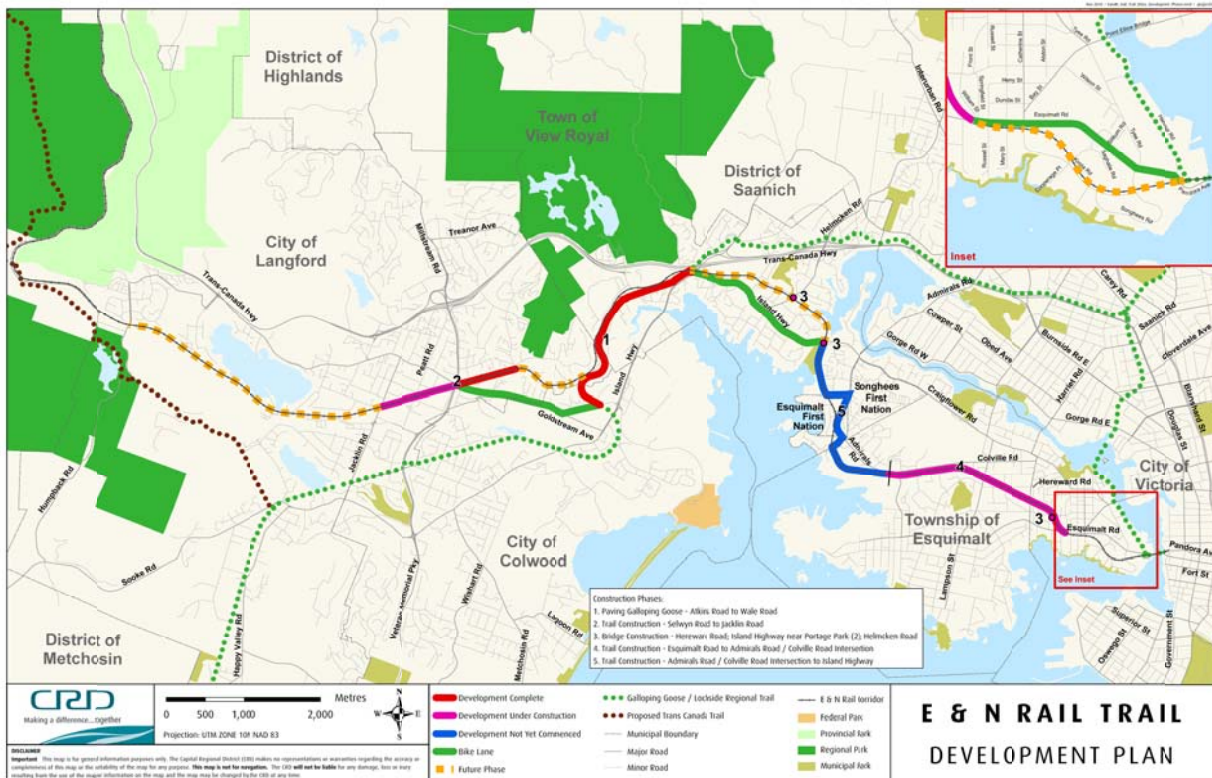
Map 2

This Masterplan did not address concerns about the existing conditions on the Galloping Goose and Lochside Trails (e.g., trail segments on low-speed and low-volume roadways). However, the Bicycle and Pedestrian Design Guidelines provide a resource for multi-use trail standards, including consideration for surfacing width, and separation in differing contexts. The CRD should endeavour to comply with these standards.

Cost Estimates

The identified PIC cycling network is about 900 km in length, almost 200 km of which was identified as priority. In addition, nearly 540 km does not currently have any specific bicycle accommodation. The total cost of the PCMP is estimated at $220 million, with priority projects costing over $100 million. Unit prices were provided by similar bicycle and pedestrian master plans and experience in nearby communities. Table 3 shows cost opinions for elements of on-street bicycle improvement projects.

Table 3. Planning-Level Costs for Bicycle Improvements

Facility Type	Two-Way Cost Per Metre	Details
Two-Way Cycle Track (3.0 m)	$990.00	Includes new asphalt in greenfield, signs, intersection treatments
	$2,040.00	Includes sawcut, new asphalt in greenfield, signs, barrier, intersection treatments
Cycle Track (1.8 m with 50 cm buffer; roadway widening with C & G)	$1,850.00	Includes sawcut, moving sidewalk and C&G, signs, barrier, intersection treatments
	$690.00	Includes sawcut, new asphalt in greenfield, signs, paint, intersection treatments
Buffered Bike Lane (1.8 m with 50cm buffer; roadway widening with C & G)	$1,090.00	Includes sawcut, moving sidewalk and C&G, signs, paint, intersection treatments
Buffered Bike Lane (1.8 m; pavement restriping)	$70.00	Includes paint removal, re-painting, signs
Separated Bikeways		
Bike Lane (1.8 m; roadway widening with C & G)	$740.00	Includes sawcut, moving sidewalk and C&G, signs, paint, intersection treatments
Bike Lane (1.8 m; pavement restriping)	$40.00	Includes paint removal, re-painting, signs
Shoulder Bikeway (1.5 m; roadway widening without C & G))	$420.00	Includes sawcut, new asphalt in greenfield, signs, paint, intersection treatments
Shoulder Bikeway (1.5 m; pavement striping)	$20.00	Includes paint removal, re-painting, signs
Shared Lane		
Marked Wide Curb Lane	$20.00	Includes paints, signs
Shared Lane	$10.00	Includes signs
Neighbourhood Bikeway	$50.00	Includes signs, pavement markings, intersection treatments, traffic calming

Table 4 shows the cost breakdown by municipality.

Table 4. Summary of Plan Cost Opinion by Municipality

	Existing Network (km)*					Proposed Network					Planning-Level Costs**	
	Separated On-Street	Bike Lane/Shoulder	Shared Lane	Multi-Use Trail	Total	Separated On-Street	Bike Lane/Shoulder	Shared Lane	Multi-Use Trail	Total	Priority Projects	All Projects
Core Region												
City of Esquimalt	-	1.04			1.04	4.90	3.43	0.46		8.79	$1,194,118	$2,315,729
City of Victoria	-	11.80	4.62	0.16	16.57	27.17	25.66	1.90		54.73	$3,196,926	$12,442,493
District of Oak Bay	-	3.42	-	-	3.42	4.36	17.03	1.12	1.58	24.10	$669,032	$3,585,920
District of Saanich	-	13.36	6.43	9.52	29.19	64.70	30.34	15.65	6.21	116.9	$13,233,645	$44,444,921
Esquimalt First Nation	-				0		0.51			0.51	$10,105	$10,105
Town of View Royal	-											
West Shore Region												
City of Colwood	-	1.02		0.03	1.05	8.57	14.09	5.70		28.36	$399,994	$8,814,711
City of Langford	-	7.22		0.19	7.40	29.45	11.76	1.63		42.83	$2,700,032	$21,021,059
District of Highlands	-	2.99			2.99	-	-	-	-	0	-	-
District of Metchosin	-			0.4	0.4	6.24	14.24			20.48	$4,380,857	$8,341,758
District of Sooke	-	0.97			0.97	19.48	3.07	0.04		22.59	18,072,009	$26,673,990
Pacheedaht First Nation	-				0	1.10	1.50	0.21		2.80		$3,386,151
Juan de Fuca Electoral Area	-	1.23			1.23	95.23	17.56	1.31		114.10	$44,045,005	$70,672,868
Peninsula Region												
District of Central Saanich	-	11.42	2.88	0.05	29.19	20.01	18.43	11.72	1.94	52.11	$4,978,381	$14,419,812
District of North Saanich	-	10.02	0.85	2.73	13.61	17.99	23.46	3.48	0.46	45.39	$5,845,028	$18,055,090
Pauquachin First Nation	-				0		1.92			1.92	$1,324,458	$1,324,852
Town of Sidney	-	1.83		2.23	4.07	1.31	8.96	1.61		11.88	$153,802	$4,121,859
Tsawout First Nation					0		0.17			.17	-	$3,451
Tseycum First Nation	-				0	0.92				0.61	$1,121,811	$1,121,811
Other Jurisdictions												
Capital Regional District	-		260.36		260.36				8.33	8.33	N/A	N/A
Total*					**359.4**					**614.71**	**$101,431,000**	**$275,455,501**

* Existing facilities include regional bikeways meeting the recommended separation only, excluding local networks and facilities not meeting standards.

** Planning-level cost estimates make the following assumptions: Multi-use trail and 'conceptual corridor' costs were not provided due to the significant contingencies associated with off-street multi-use trails and sensitivity of alignment. It was assumed that the majority of bikeway improvements would be accomplished without the need to widen the roadway. For cost accounting purposes, it was assumed that approximately 30 percent of projects would require roadway widening.

*** Approximately 30 km of additional proposed bikeway extend north along Highway 101, outside of the municipalities considered in this study.

Funding Opportunities

Annual spending on cycling and pedestrian infrastructure is often considered an indicator of municipalities' commitment to non-motorized transportation. However, this is an imperfect metric due to the difficulty of separating improvements made specifically for bicyclists and pedestrians, drivers, or other road users. Many municipalities in the CRD have a policy of not increasing capacity for automobiles, and all roadway improvements consider bicycle and pedestrian transportation. Furthermore, spending on bicycle and pedestrian infrastructure is highly variable, based on type of facility (shared lane markings are inexpensive, while cycle tracks can cost many millions of dollars) and size of the municipality. Rather than making a comparison between levels of funding for bicycle and pedestrian improvements, the PCMP should compare kilometres of bikeways and sidewalks, where available.

Funding Sources and Strategies

In recent years, the CRD and its member municipalities have been successful in maximizing their investments through grant programs. Over 40 projects with active transportation components have been funded in whole or in part across the region through grant programs from senior levels of government since 2004/05. These grants have largely been through the Provincial BikeBC and LocalMotion Programs, as well as a number of recent grants from Infrastructure Canada.

Although agencies across the region have been successful in leveraging funding from external sources to maximize their investments, many of the grant programs that have been used over the past few years have now allocated all of their available funding and are no longer available. As funding opportunities change regularly, this information is subject to change. The CRD and its member municipalities should regularly check with all levels of government to keep up-to-date on currently available funding opportunities.

The following observations can be made regarding the use of other funding sources in the CRD in recent years:

- Over 40 projects with active transportation components have been funded in whole or in part across the region through grant programs from senior levels of government since 2004/05.
- Grants for active transportation projects have been distributed across the region, with almost all of the municipalities in the region having been awarded a grant since 2004/05.
- Since 2004/05, the Province has contributed approximately $875,000 in funding for active transportation projects through the Cycling Infrastructure Partnerships Program (CIPP). The majority of projects funded under this program have been for on-street bicycle lanes, as well as some pedestrian improvements.
- Since 2007, the Province has contributed over $4,400,000 in funding for active transportation projects across the region through the LocalMotion program. The majority of projects funded under this program have been for a combination of pedestrian and cycling improvements, pathways, or road improvement projects with active transportation components.
- Over the past year, the Federal and Provincial governments have made significant investments in a range of grants through Infrastructure Canada, most notably through the Infrastructure Stimulus Fund and Building Canada Fund. The majority of projects under this program have been for larger-scale road improvements with active transportation components of pathway improvements.
- The majority of the grant funding was allocated towards cycling facilities or multi-use pathways. Several projects included both cycling and pedestrian infrastructure, while only a few projects were exclusively for pedestrian infrastructure.

- Most of the grant programs that have been used over the past few years have now allocated all of their funding and are no longer available. The Provincial CIPP Program is on-going. Current applications are due in early September 2010.

- Since 2006, the CRD has secured over $14,000,000 in grant funding to support cycling and pedestrian infrastructure, shown in Table 5. In total, eight projects were/are being completed with these funds.

Table 5. Grant Programs used in the CRD

Project Title	Grant Program						Type of Project					
	CIPP	LocalMotion	Building Canada Fund	Infrastructure Stimulus Fund	Towns for Tomorrow	Other	On-Street Ped. Facility	On-Street Bikeway	Off-Street Trail	Streetscape Improvement	Road Improvement	Other
CRD												
Esquimalt - Galloping Goose Regional Trail Upgrade				√					√			
Trans-Canada Trail Acquisition						√			√			
Saanich Peninsula Walking Guide						√						√
E&N Rail Trail		X				√			√			
Cycling Safety and Road Skills Training Program						√						√
Galloping Goose Trail Section Upgrade		√							√			
E&N Rail Trail Paving						√						√
E&N Bridge Construction												√
SSI Partners Creating Pathways						√			√			
Central Saanich												
East Saanich Road Cycling/Pedestrian Upgrade		√						√	√			
Brentwood Bay Revitalization											√	√
Central Saanich - East Saanich Road Renewal			√								√	
Wallace Drive Bicycle Lanes	√							√				
Colwood												
Goldstream/Sooke Rd Bicycle Lanes	√							√				
Metchosin Road Sidewalk and Bicycle Lanes		√						√	√			

Project Title	Grant Program						Type of Project					
	CIPP	LocalMotion	Building Canada Fund	Infrastructure Stimulus Fund	Towns for Tomorrow	Other	On-Street Ped. Facility	On-Street Bikeway	Off-Street Trail	Streetscape Improvement	Road Improvement	Other
Esquimalt												
Esquimalt New Sidewalk Construction Program – Ph. 1		√						√	√			
Langford												
Jacklin Rd/Galloping Goose	√								√			
Treanor Ave Bicycle Lanes	√							√				
Bicycle Lanes and Sidewalks - Spencer Rd Interchange		√						√	√			
Improving Active Transportation Along Goldstream Ave		√						√	√			
North Saanich												
East Saanich Road Bicycle Lanes		√						√				
Lochside Drive	√							√				
West Saanich Rd Cycling Commuter Link Wain Rd to Downey Rd	√							√				
Oak Bay												
North Henderson Road, Foul Bay and Lansdowne Intersection Bicycle Lanes		√						√				
Oak Bay - Beach Drive Upgrade			√								√	
Province of BC												
North Saanich - McTavish Interchange				√				√	√		√	

Project Title	Grant Program						Type of Project					
	CIPP	LocalMotion	Building Canada Fund	Infrastructure Stimulus Fund	Towns for Tomorrow	Other	On-Street Ped. Facility	On-Street Bikeway	Off-Street Trail	Streetscape Improvement	Road Improvement	Other
Saanich												
Burnside Road Bicycle Lanes	√							√				
West Saanich Road Streetscape & Bicycle Lanes	√							√		√		
Admirals Road Sidewalk & Bicycle Lane Project	√							√	√			
San Juan and Gordon Head Coastal Greenway		√							√			
Shelbourne St Corridor Improvements for Mobility Impaired		√					√					
Bowker Creek Greenway – Ph. 1 - Browning Park and Wordsworth Section		√							√			
Centennial Trails Phase 1									√			√
McKenzie Ave Bicycle Lanes - Borden to Blenkinsop								√				√
Sidney												
Sidney - Lochside Waterfront Walkway Revitalization Project		√							√			
Sooke												
Construction of a Marine Boardwalk									√			√
Sooke Town Centre Accessible Sidewalk				√			√					

Project Title	Grant Program						Type of Project					
	CIPP	LocalMotion	Building Canada Fund	Infrastructure Stimulus Fund	Towns for Tomorrow	Other	On-Street Ped. Facility	On-Street Bikeway	Off-Street Trail	Streetscape Improvement	Road Improvement	Other
Victoria												
Caledonia Avenue Greenway Bicycle Lane	√							√				
Douglas Street Bicycle Lanes	√							√				
Fort Street Bicycle Lanes	√							√				
Fort St Cycling and Pedestrian Improvement Project	√							√	√			
Esquimalt Road - Cycling and Pedestrian Facilities		√						√	√			
View Royal												
Parson's bridge		√										
Island Highway – Helmcken to Shoreline												√
Island Highway – Six Mile Road to Colwood												√
Island Highway Bridge Upgrade Project		√									√	

Municipal Government

There are a number of funding sources and strategies that municipal governments can use to fund and implement pedestrian and bicycle facilities, as described below:

- **General Funds:** General funds are provided by property tax or other regular jurisdictional revenue streams. Capital projects are generally not allowed to utilize funding from this source unless funding is allocated as part of the annual budget. Bicycle and pedestrian infrastructure, education, enforcement, and encouragement projects may be an acceptable use of general fund dollars.

- **Development Cost Charges:** Municipalities can charge developers a series of "development cost charges" (DCCs) on new developments. The intent of these charges is to assist the municipality in funding the costs associated with infrastructure to serve a growing and changing community. These charges include sewer, water, recreation, and transportation charges. Municipalities can use the transportation and recreation DCCs collected for active transportation infrastructure expenditures.

- **Street User Fees or Maintenance Fees:** The revenue generated by a street user fee is used for operations and maintenance of the street system, and priorities are established by the Public Works Department. Revenue from this fund should be used to maintain on-street bicycle and pedestrian facilities, including routine sweeping of bicycle lanes and other designated bicycle routes.

- **Local Improvement Districts (LIDs):** Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation.

- **Business Improvement Districts (BIDs):** Pedestrian improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Business Improvement Districts collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for pedestrian and bicycle improvements, such as wider sidewalks and landscaping.

- **Road Rehabilitation:** Active transportation facilities can be implemented as part of ongoing road rehabilitation projects. Accordingly, municipalities may adjust certain pedestrian and bicycle infrastructure priorities (moved forward or deferred) to reflect their plans for major roadworks. In addition, many municipalities have established policies that require consideration of pedestrian and cycling facilities in any road rehabilitation project.

- **Other Capital Works:** Often active transportation facilities can be implemented as part of a separate capital works project. For example, cycling infrastructure can be implemented in conjunction with sewer or sidewalk improvements.

- **Cash-in-lieu Parking:** Recent changes to the Local Government Act allow municipalities to use funding from cash-in-lieu parking reserves to fund alternative transportation such as active transportation network upgrades.

- **Development Opportunities:** Municipalities may require private developers to construct pedestrian and bicycle facilities along roadways fronting new developments. This represents an important contribution to the community's pedestrian and bicycle network, but may offer the municipality opportunities for providing more widespread active transportation improvements in conjunction with development. For example, municipalities may choose to accelerate a given bicycle project to complete a bicycle route if private development occurs along a portion of that road segment.

Senior Government Funding Sources

In addition to the local government funding sources described above, the CRD and its member municipalities should pursue all available public sector sources of funding for active transportation facilities and programs, including the programs identified below. However, to take advantage of many of these public sector funding opportunities applicants are required to have previously completed detailed designs and corresponding accurate cost estimates. The costs of preparing detailed designs are often not eligible for cost share funding — only the capital costs of construction are eligible. As funding opportunities change regularly, the information in this section is subject to change. Municipalities should regularly check with all levels of government to keep up to date on funding opportunities.

- **BikeBC:** *BikeBC* is a provincial initiative to promote new, safe, and high quality cycling infrastructure through cost-sharing with local governments. *BikeBC* is a $31 million umbrella initiative that consists of the three programs described below:

- **Provincial Cycling Investment Program (PCIP)**: This program focuses on strategic investments to build important cycling corridors of regional and provincial significance. Some possible projects include new bicycle trails and bicycle lanes, improvements to existing cycling infrastructure, and providing for bicycle lockers and other equipment that makes cycling a safer and more convenient option for travelers. Eligible projects under this program could include regional connections to other municipalities or major connections within the municipality that make use of high quality cycling facilities such as off-street pathways and bicycle lanes.

- **Cycling Infrastructure Partnerships Program (CIPP):** The purpose of this program is to encourage transportation cycling by accelerating the development of cycling infrastructure throughout British Columbia. Through this program, the Ministry of Transportation & Infrastructure provides up to 50 percent cost-sharing (to a maximum of $100,000 per municipality) for new bicycle facilities, up to a total of $500,000. The application deadline for CIPP grants varies each year; the deadline for 2010/2011 grants was September 1, 2010. Eligible proposals include, but are not limited to, projects that:

  o Are part of an adopted bicycle network plan,
  o Are shelf ready,
  o Promote transportation (commuter) cycling,
  o Help to reduce traffic congestion,
  o Help to reduce greenhouse has (GHG) emissions,
  o Provide a safe cycling environment, and
  o Are new projects.

- **Gateway Program:** The Province will invest a total of $60 million for bicycle facilities through the proposed Gateway program in Metro Vancouver. The CRD and its member municipalities are not eligible for funding under this program.

  Further Information:
  Ministry of Transportation and Infrastructure
  Alan Callander, Manager, Active Transport/Municipal Policy
  250-356-5563
  alan.callander@gov.bc.ca
  http://www.th.gov.bc.ca/BikeBC/

- **Local Government Infrastructure Planning Grant Program:** The Ministry of Community and Rural Development offers grants to support local governments in projects related to the development of sustainable community infrastructure that will improve public health and safety, protect the natural environment, and strengthen local and regional economies. Grants up to

$10,000 are available to study the feasibility, costs, technology, and location of proposed sewer, water, drainage, transportation, or other local government infrastructure. Grants can be used for a range of activities related to assessing the technical, environmental, and/or economic feasibility of municipal infrastructure projects.

Further Information:
Ministry of Community and Rural Development, Infrastructure and Finance Division
250-387-4060
infra@gov.bc.ca
www.cd.gov.bc.ca/lgd/infra/infrastructure_grants/infrastructure_planning_grant.htm

- **Towns for Tomorrow:** The Province is investing $21 million in British Columbia's smaller communities to improve local infrastructure. This program provides funding for communities with populations less than 15,000 people to pursue projects that enhance the quality of life for residents, including projects that reduce emissions, encourage physical activity, and improve the environment. This program provides up to 80 per cent of project funding for municipalities and regional districts with less than 5,000 residents, to a maximum contribution of $400,000. For communities of 5,000 to 15,000 residents, the program covers up to 75 per cent of eligible project costs, with a maximum contribution of $375,000. Eligible projects include, but are not limited to water projects, wastewater projects, public transit projects, environmental energy improvement projects, local road projects, recreation and cultural projects, tourism projects, protective and emergency services infrastructure projects, and community development projects.

  Further Information:
  Ministry of Community and Rural Development, Infrastructure and Finance Division
  250-387-4060
  infra@gov.bc.ca
  http://www.townsfortomorrow.gov.bc.ca

- **Gas Tax Fund:** Gas tax is collected annually by the federal government. Jurisdictions receive a proportion of the federal dollars based on their population through the Gas Tax Fund (GTF). The GTF provides 100% funding to local governments for a variety of capital and planning projects. The GTF provides a predictable and long-term funding source for local governments. The GTF supports environmentally sustainable municipal infrastructure, such as public transit, drinking water, wastewater infrastructure, green energy, solid waste management, and transportation. There are several programs available through the GTF:

  o **Community Works Fund** provides allocated funding to municipalities, BC Transit, and their partners. Eligible costs range from construction to project development and planning. Funds are allocated twice annually on a per capita basis.

  o **Strategic Priorities Fund** provides funding for strategic investments that are larger in scale or regional in impact. This fund is created by pooling 50% of the region's per capita allocation among local governments within the CRD. Grants may fund up to 100% of project costs.

  o **Innovations Fund** supports projects that reflect an innovative approach to achieving the intended outcomes of reduced GHG emissions, cleaner air, and cleaner water. Grants may fund up to 100% of project costs.

  Further Information:
  Union of British Columbia Municipalities
  Brenda Gibson, New Deal Management Services
  250-356-0862
  bgibson@civicnet.bc.ca
  http://www.ubcm.ca/EN/main/funding/gas-tax-fund.html

- **Infrastructure Canada:** Historically, Infrastructure Canada has managed several programs that provide funding for environmental and local transportation infrastructure projects in municipalities across Canada in addition to the Gas Tax Fund. Typically, the federal government contributes one-third of the cost of municipal infrastructure projects. Provincial and municipal governments contribute the remaining funds, and in some instances, there may be private sector investment as well.

  > **Further Information:**
  > Infrastructure Canada
  > http://www.infc.gc.ca/ip-pi/index-eng.html

- **Green Municipal Funds:** The Federation of Canadian Municipalities (FCM) manages the Green Municipal Fund, with a total allocation of $550 million. This fund is intended to support municipal government efforts to reduce pollution, reduce greenhouse gas emissions, and improve quality of life. The program provides funding for three types of initiatives: sustainable community planning, feasibility studies and field tests, and implementing capital projects. All local governments are eligible to apply for Green Municipal Funds. Grants are provided up to 50% of eligible costs, to a maximum of $350,000. The expectation is that knowledge and experience gained in best practices and innovative environmental projects will be applied to national infrastructure projects.

  > **Further Information:**
  > Federation of Canadian Municipalities
  > Monique Delinelle, Applications Coordinator
  > 613-241-551 ext. 357
  > mdelinelle@fcm.ca
  > http://gmf.fcm.ca

- **Other Federal Programs:** At any given time, there are usually one or more federal grant programs for which active transportation facilities would be eligible. As an example, in the past, Environment Canada provided grants through the Environmental Partners Fund for bicycle-related projects, which demonstrated a benefit to the environment and formed partnerships with the community.

  Note that eligibility for some federal programs is limited to not-for-profit organizations. By forming partnerships with local not-for-profit organizations, local governments can access a number of alternative funding sources and grant programs for bicycle projects. Also, because the primary applicant for funds is the not-for-profit group, they are nominally in charge of the project. As well, many of the grants available to not-for-profit groups from the federal government are designed to provide jobs for people receiving Employment Insurance. Therefore, in order to qualify, the project must create new, preferably skills-based jobs, and only those receiving EI are eligible to fill them.

Other Funding Sources

There are a number of other sources of funding that local governments can consider for financing active transportation projects and programs:

- **Parcel Taxes:** The CRD could levy a parcel tax for the provision of pedestrian and cycling improvements. As per Section 803 of the Local Government Act, regional districts are authorized to levy parcel taxes for any regional district service. The parcel tax could apply to the CRD in its entirety or to specific areas only. Revenue generated through the parcel tax must be dedicated towards pedestrian and cycling improvements, thereby providing the CRD with a stable source of

funding for those types of improvements. Establishing a parcel tax would require the CRD to obtain elector assent through either a petition or a counter-petition process.

- **The Insurance Corporation of British Columbia (ICBC):** ICBC has, in the past, provided funding for active transportation facilities, particularly where these have the potential to reduce crashes, improve safety, and reduce claims costs to ICBC. Funding is available through ICBC's Road Improvement Program (http://www.icbc.com/road-safety/safer-roads/invest-roads).

- **Private Sector**: Mountain Equipment Co-Op is an example of a business that provides funding that could be applied to bicycle and pedestrian facilities and programs. To protect the environment in areas having significant recreational value, and to facilitate public access and recreational use of areas, Mountain Equipment Co-Op supports applications from member groups and not-for-profit organizations. Similarly, VanCity provides funding through its Environmental Fund.

  Many corporations wish to be good corporate neighbours, to be active in the community and to promote environmentally-beneficial causes. A bicycle network is well-suited to corporate sponsorship, and has attracted significant sponsorship both at the local level and throughout North America. Examples in B.C. include Construction Aggregates in Sechelt, which constructed an overpass over a gravel conveyor to provide a link for pedestrians and cyclists, and 7-Eleven and Molson Breweries which have sponsored multi-use pathways in Vancouver, Burnaby, and New Westminster.

- **Deeds, Donations, and Dedications:** In many communities, multi-use pathways have been funded in part or in whole by local residents who purchased "deeds" to sections of the pathway. The Trans Canada Trail, for example, is funded partially by sales of one metre sections for $40. Kelowna partially funded development of a pathway along Mission Creek in Kelowna through community donations. Similar to park bench dedication programs, a dedication program can be set up for residents and corporations to donate bicycle facilities, such as bicycle racks or lockers. In many cases, these deeds, donations, and dedications are tax-deductible where they are administered by a not-for-profit agency.

- **Service Clubs:** Efforts to provide new bicycle facilities can be coordinated with service clubs, such as the Lions Club, the Rotary Club, and Kiwanis. In Oak Bay, for example, the Kiwanis Club provided funding for the construction of bicycle parking facilities.

- **Advertising:** There are several options for obtaining funding for bicycle projects from advertising revenues. The costs of producing and distributing a bicycle route map can be partially or fully offset by selling advertising space on the map. Advertising on bicycle racks can reduce the costs of providing bicycle parking. Potential advertisers include bicycle stores, commercial recreation operators, hotels, restaurants, and transportation services. The Hillside Centre in Victoria has advertising on bicycle racks.

- **Parking:** Another potential source of revenue to finance the construction and maintenance of bicycle facilities is to implement parking charges for municipal motor vehicle parking facilities, which are currently accessible at no cost. To minimize objections to parking price increases, all funds generated from increased parking charges should be allocated entirely to bicycle facilities; no funds should be diverted for other purposes.

Funding Recommendations

The CRD and member municipalities should continue to seek funding to implement the PCMP. The CRD can build regional awareness of and competitiveness for grants.

Share Information

- Maintain an up-to-date list of potential funding sources and key information including contact information and project requirements.
- Create a forum for member municipalities to communicate about current funding strategies and potential future funding mechanism. Create a standard baseline level of data collection for funding information. CRD may be a clearinghouse or simply facilitate the process.
- Stay abreast of all new and completed provincial and federal grant and funding partnership programs. Changes to existing funding programs or the addition of new funding programs should be shared with its member municipalities.

Pursue Grant Funding

- Invest staff time and resources in applying for grants that have a high probability of being rewarded, as well as those that are able to offer a sufficient amount of money to make an impact on cycling and pedestrian levels in the region.
- Recognize opportunities for municipalities to collaborate on grant applications and infrastructure programs. The CRD could help by providing logistical support, promoting staff cooperation, and helping to identify locations that could benefit from cross-jurisdictional pedestrian and cycling infrastructure.

Dedicated Bicycle and Pedestrian Fund

- Consider the creation of a Regional Trail Development Fund (similar to the Regional Park's Land Acquisition Fund), which would provide funding for ongoing trail improvements or additions.

Policy Integration

Draft goals and objectives were developed as part of Phase I of the Regional Pedestrian and Cycling Master Plan (PCMP) planning process. These included:

- More cycling and walking.
- Safer cycling and walking.
- More places to walk or cycle.

These are consistent with the Regional Growth Strategy (RGS), which generally aims to "enhance social well-being and regional quality of life." Key elements of the RGS that relate to active transportation include the following statements:

- "An integrated system of parks, green space, greenways and trail system protects important natural areas and links town to country."
- "The proportion of trips taken in single occupant automobiles is reduced, trips by public transit are increased, and there is a region–wide foot path and cycle network."
- "Communities are socially and physically complete with new development that enhances the identity and walkable human scale of neighbourhoods."

To bolster support and increase implementation of the Plan, PCMP policies should be integrated into other planning initiatives to create a more complete and integrated planning and policy framework. The key CRD planning documents that could relate to the PCMP include:

- *The CRD Transportation Demand Strategy* (expected 2011)

- *The CRD Transportation Corridor Plan*
- *The CRD Parks Master Plan* (updated as *the CRD Regional Parks Strategic Plan*, expected 2011)
- *2005 Regional Growth Strategy* (updated as the *Regional Sustainability Strategy*, expected 2011)
- *Rapid Transit Master Plan* (forthcoming)
- *Victoria Transit Future Plan* (forthcoming)

Each plan has a unique relationship to the goals and objectives outlined in the PCMP. For example, the *Capital Regional District Transportation Demand Strategy* relates to PCMP Goal 1 of "more cycling and walking." Increased walking and cycling however depends in part on realizing Goals 2 and 3. Table 6 lists each goal and suggests sample strategies that create linkages between planning documents.

Recommendations for Policy Integration

The strategies listed in Table 6 are those that the CRD can utilize to accomplish plan goals. Strategies range from providing guidance for education and encouragement programs, which creates a linkage between PCMP Goal 2 and the Transportation Demand Management Plan, to filling bicycle and pedestrian network gaps, which creates a linkage between PCMP Goal 3 and the Corridor Demand Strategy and the Regional Growth Strategy. As a next step the CRD should consider developing a work plan that utilizes these strategies and contains information such as specific programs, responsible parties, potential costs, and a timeline.

Table 6. Sample Strategies that Link the PCMP and Other CRD Planning Documents

PCMP Goal	Regional Growth Strategy	Transportation Demand Strategy	Transportation Corridor Plan	CRD Parks Master Plan	Rapid Transit Master Plan	Victoria Transit Master Plan
Goal 1: More cycling and walking, as measured by: • mode share • kilometres travelled • trip count	Ensuring that the regional bicycle system includes a variety of facilities, both on-street and off-street that accommodate the needs and preferences of all types of bicyclists.	Marketing bicycling and walking directly to local residents by distributing literature and conducting direct outreach programs, and encouraging local jurisdictions to develop similar initiatives.	Creating Bicycle and Pedestrian Design Guidelines that outline best practices for infrastructure development and provide continued guidance on the use of bicycle-friendly designs and innovative treatments through updates and other communication with local jurisdictions.	Developing regional corridors and tourist routes as an economic development strategy, marketing regional transportation options.	Supporting bicycle and pedestrian improvement projects that close gaps in the regional network either by implementing specific projects recommended in the PCMP or through other treatments.	Supporting bicycle and pedestrian improvement projects that close gaps in the regional network either by implementing specific projects recommended in the PCMP or through other treatments.
Goal 2: Safer cycling and walking, as measured by: • crash data • surveys which assess how safe people feel	Reviewing and developing consistent traffic laws, and cultivating awareness of bicycling and transportation among local law enforcement jurisdictions through specific training and workshops regarding bicycle and pedestrian issues.	Develop a regional Safe Routes to School (SR2S) program that includes bicycle safety education for schoolchildren.	Backing reallocation of roadway rights-of-way to accommodate bicycle and pedestrian facilities, while preserving existing rights-of-way and promoting safety-enhanced shared on-street facilities such as bicycle boulevards.	Creating or fostering youth education programs that encourage bicycling and walking among youth and develop good health and fitness habits among young people.	Stimulating bicycle-friendly development activity and support facilities, such as bicycle rental and repair, around transit stations.	Stimulating bicycle-friendly development activity and support facilities, such as bicycle rental and repair, around transit stations.
Goal 3: More places to walk or cycle, as measured by: • total kilometres of bikeway • total kilometres of shared use trails • percentage of the road network that has sidewalks	Encouraging local governments to execute bicycle projects that connect local facilities to the regional bicycle corridors.	Ensuring that the regional bicycle system includes a variety of facilities, both on-street and off-street that accommodate the needs and preferences of all types of bicyclists.	Updating the PCMP regularly and in conjunction with other regional transportation plans to provide continued direction, chart progress, and respond to changing circumstances.	Prioritizing completion of the regional multi-use trail system.	Stimulating transit agencies to create and maintain convenient and secure short-term and long-term bike parking facilities – racks, on-demand bike lockers, in-station bike storage, and staffed bicycle parking facilities – at transit stops, stations, and terminals.	Stimulating transit agencies to create and maintain convenient and secure short-term and long-term bike parking facilities – racks, on-demand bike lockers, in-station bike storage, and staffed bicycle parking facilities – at transit stops, stations, and terminals.